Pickens County Multi-Jurisdictional Hazard Mitigation Plan

Prepared for:
Pickens County
222 McDaniel Avenue
Pickens, SC 29671

FINAL
March 31, 2018

Prepared by:
All Clear Emergency Management Group, LLC
3434 Edwards Mill Road, Suite 112-162
Raleigh, NC 27612

Pickens County Multi-Jurisdictional Hazard Mitigation Plan

Prepared for

Pickens County
Emergency Management Office
1509 Walhalla Highway
Pickens, SC 29671

Prepared by

All Clear Emergency Management Group, LLC
3434 Edwards Mill Road, Suite 112-162
Raleigh, NC 27612

FINAL
March 31, 2018

STATE OF SOUTH CAROLINA)
) RESOLUTION # 2018-12
COUNTY OF PICKENS)

A RESOLUTION AUTHORIZING THE ADOPTION OF THE PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.

Whereas, Pickens County, South Carolina, recognizes the threat that natural hazards pose to people and property; and

Whereas, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

Whereas, an adoption of a hazards mitigation plan is required as a condition of future grant funding of mitigation projects; and

Whereas, Pickens County, South Carolina, participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Jurisdictional Hazard Mitigation Plan; and

Whereas, Pickens County, South Carolina, is aware that revision and updating of the plan is critical for active and effective Hazard Mitigation Planning.

Now, therefore, be it resolved, that the Council for the County of Pickens, South Carolina, hereby adopts the Pickens County Multi-Jurisdictional Hazard Mitigation Plan as an official plan; and

Be it further resolved, that Pickens County, South Carolina, submit the adoption of the Multi-Jurisdictional Hazard Mitigation Plan to the Federal Emergency Management Agency officials for final approval.

Passed and approved, this 4th day of June, 2018.

COUNTY COUNCIL OF PICKENS COUNTY

R. B. Costner III

Roy B. Costner, III, Chairman, County Council of
Pickens County, South Carolina

(SEAL)

Attest:

Lynn H Bryant

Clerk to County Council of
Pickens County, South Carolina

TOWN OF CENTRAL)
COUNTY OF PICKENS)
STATE OF SOUTH CAROLINA)

RESOLUTION #08-13-18
Multi- Jurisdictional Hazard Mitigation Plan

A RESOLUTION ADOPTING THE
2018 PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Town of Central participated in the preparation of a multi-jurisdictional plan, 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, the Town of central is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, the Town of Central has reviewed the Plan and affirms that the Plan be updated no less than every five years.

NOW THEREFORE, BE IT RESOLVED BY the Central Town Council that the Town of Central adopts the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan as this jurisdiction's Multi-Hazard Mitigation Plan, and resolves to execute the actions in the plan.

ADOPTED this 13th day of August, 2018 at a duly called meeting of the Central Town Council.

Town of Central
Pickens County, SC

Clyde J. Martin

Mayor Clyde J. Martin, Jr.

ATTEST:

Susan A. Brewer

Town Clerk Susan A. Brewer

R-2018-007

A RESOLUTION ADOPTING THE 2018 PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the City of Clemson, SC recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, the City of Clemson participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, adoption of a hazard mitigation plan is required as a condition of future grant funding of mitigation projects.

Now, therefore, it be resolved, that the City of Clemson, SC hereby adopts the Pickens County Multi-Jurisdictional Hazard Mitigation Plan and resolves to take official action as may be reasonably necessary to carry out the strategies outlined in the Plan.

Passed and approved, this 4th day of September, 2018

J.C. Cook, III, Mayor

Attest: Beverly A. Coleman, City Clerk

Resolution 2018-19

A RESOLUTION ADOPTING THE

2018 PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the 2018 Pickens County Multi-Jurisdictional Hazard mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the City of Easley, participated in the preparation of a multi-jurisdictional plan, 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, the City of Easley, is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, the City of Easley, has reviewed the Plan and affirms that the Plan be updated no less than every five years.

NOW, THEREFORE, BE IT RESOLVED. I, Larry Bagwell, Mayor of the City of Easley along with the Easley City Council, adopts the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan as this jurisdiction's Multi-Hazard Mitigation Plan, and resolved to execute the actions in the plan.

Adopted this 13th day of August, 2018 at a regular monthly meeting of the Easley City Council.

Larry Bagwell

Mayor

ATTEST:

City Clerk

STATE OF SOUTH CAROLINA	)	
	)	**RESOLUTION 18-3**
COUNTY OF PICKENS	)	
	)	
CITY OF LIBERTY	)	

A RESOLUTION ADOPTING THE 2018 PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the City of Liberty participated in the preparation of the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, the City of Liberty has reviewed the Plan and affirms that the Plan be updated no less than every five years.

THEREFORE, be it **RESOLVED** that the Liberty City Council hereby adopts the *2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan* as the official plan of the City of Liberty.

ADOPTED this 10th day of December, 2018 at a duly called meeting of the Liberty City Council

Brian Petersen
Mayor, City of Liberty

ATTEST:

Bruce Evilsizor, Administrator

Town of
NORRIS
On The Right Track
Since 1907

RESOLUTION No. 08132018

A RESOLUTION ADOPTING THE 2018 PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, Norris, participated in the preparation of a multi-jurisdictional plan, 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, Norris, is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, Norris, has reviewed the Plan and affirms that the Plan be updated no less than every five years.

NOW THEREFORE, BE IT RESOLVED BY Norris Town Council that Norris adopts the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan as this jurisdiction's Multi-Hazard Mitigation Plan, and resolves to execute the actions in the plan.

ADOPTED this 13th day of August, 2018 at a duly called meeting of the Norris Town Council.

Odell Williams, Mayor

State of South Carolina
County of Pickens
City of Pickens

Resolution 2018-06

A RESOLUTION ADOPTING THE PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the City of Pickens are subject to the effects of natural hazards and manmade hazard events that pose threats to lives and cause damages to property, and with the knowledge and experience that certain areas, i.e., flood hazard areas, are particularly susceptible to flood hazard events; and

WHEREAS, the City desires to seek ways to mitigation situations that may aggravate such circumstances; and

WHEREAS, the Legislature of the State of South Carolina have delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety and general welfare of its citizenry; and

WHEREAS, the City of Pickens has been charged by the Federal Emergency Management Agency and the State of South Carolina with the responsibility of developing a hazard mitigation plan aimed at reducing the community's vulnerability to natural hazards; and

WHEREAS, it is the intent of the City Council of the City of Pickens to fulfill this obligation in order that the City of Pickens will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the City; and

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to receive future Hazard Mitigation Grant Program Funds; and

NOW, THEREFORE, be it resolved that the City Council of the City of Pickens hereby adopts the Pickens County Multi-Jurisdictional Hazard Mitigation Plan as the City of Pickens' Hazard Mitigation Plan and resolves to take official action as may be reasonably necessary to carry out the strategies outlined within the Plan

PASSED, ADOPTED and APPROVED by the Council of the City on 1st day of October, 2018.

Mayor

Council Member

Council Member

Council Member

Council Member

Council Member

Council Member

ATTEST:

Brittany Chapman, Clerk to Council

Resolution #07272018

A RESOLUTION ADOPTING THE 2018 PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

Whereas, the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

Whereas, Six Mile participated in the preparation of a multi-jurisdictional plan, 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan; and

Whereas, Six Mile is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

Whereas, Six Mile has reviewed the Plan and affirms that the Plan be updated no less than every five years; and

NOW THEREFORE, BE IT RESOLVED BY Six Mile Town Council that Six Mile adopts the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the plan.

Adopted this 27th Day of July, 2018

Roy C Stoddard

Mayor

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1. Executive Summary

Disasters can happen anywhere and Pickens County is no exception. Due to the rising costs of natural disasters, the Federal Emergency Management Agency (FEMA), as well as state and local emergency management officials, has shifted focus from disaster recovery to increased prevention strategies. The Disaster Mitigation Act of 2000 (DMA2K) provided emergency management agencies the legal authority and the roadmap to increase mitigation activities at the local level. As a condition of eligibility for federal mitigation grant funding, DMA2K requires local communities to produce or update a hazard mitigation plan every five years. In 2017, Pickens County Emergency Management undertook a new multi-jurisdiction plan, an update to the previous single-jurisdiction plan covering only Pickens County government. Each jurisdiction within Pickens County participated in this effort and is a signatory to this plan.

A hallmark of the mitigation planning process is community engagement. In order to ensure a truly coordinated mitigation planning effort, communities are required to engage the public throughout the process. In Pickens County, planning commenced with extensive public surveys designed to gauge community preparedness, hazard awareness, and assess which types of mitigation strategies are the most needed. The data collected from the surveys helped ensure that the mitigation goals and objectives developed throughout the planning process were consistent with community values. The next step after issuing the surveys was to identify which hazards threatened the community and collect information about previous hazard occurrences. Hazards that did not pose an identifiable risk were not included in later planning stages. For hazards which did pose a risk, further analysis determined the impact they had on the community. It should be noted that for many hazards, specific information regarding the impact of that hazard could not be determined because the data required for such analysis was not available. It was not within the scope of this project, nor were there funds available to collect the necessary data for inclusion in this plan. For hazards where specific analysis was not possible, risks were discussed in general terms. The following table summarizes the natural and man-made hazards which Pickens County faces.

Table 1: Pickens County, South Carolina Hazard Profile

Hazard	Events	Years in Record	Recurrence Interval (Years)	Probability (Yearly)	Source†
Crime					
- Civil Disturbance	-	-	-	-	SC Hazard Profile
- Property Crime (Pickens Co.)	36236	27.58	0.0008	131385%	UCR
- Violent Crime (Pickens Co.)	5053	27.58	0.0055	18321%	UCR
- Property Crime (Clemson)	12576	28	0.0022	44914%	UCR
- Violent Crime (Clemson)	1035	28	0.0271	3696%	UCR
- Property Crime (Easley)	23174	28	0.0012	82764%	UCR
- Violent Crime (Easley)	2242	28	0.0125	8007%	UCR
Dam/Levee Failure	-	-	-	-	SC Hazard Profile/DHEC
Transportation System Disruption					
- Motor Vehicle Accidents	11,773	5	0.00042	235460%	Dept. Public Safety
Utility System Disruptions	-	-	-	-	
Drought	51	40	0.78	128%	NCDC/SHELDUS/SCO
Earthquake	21	382.7	18.22	5.5%	NGDC/SHELDUS
Economic Crisis	-	-	-	-	
Flooding	48	23.4	0.49	205%	NCDC
Hazardous Materials	101	27	0.27	374%	NRC
Hurricane/Tropical Storm	33	166	5.03	20%	NHC
Public Health Threat	-	-	-	-	
Radiological	0	14	*	*	SC Hazard Profile
Severe Storm					
- Hail	184	62.4	0.33	295%	NCDC/SHELDUS
- Lightning	49	55.4	1.13	88%	NCDC/SHELDUS
- Thunderstorm/Wind	317	62.4	0.20	508%	NCDC/SHELDUS
Temperature Extremes					
- Heat	11	41.4	3.76	27%	SHELDUS/NCDC
- Cold	9	24.4	2.71	36.9%	NCDC
Terrorism	0	35	*	*	SC Hazard Profile
High Wind					
- Tornado	25	67.4	2.7	37%	NCDC/SHELDUS
- Windstorm	191	57.4	0.30	333%	NCDC/SHELDUS
Urban Fire**	3932	1	0.0003	393200%	State Fire Marshall
Wildfire	3,647	71	0.02	5137%	State Forestry
Winter Storm	178	57.4	0.32	310%	NCDC/SHELDUS

† NCDC: National Climatic Data Center; NGDC: National Geophysical Data Center; NHC: National Hurricane Center; NRC: National Response Center; SCO: South Carolina State Climatology Office; SHELDUS: Spatial Hazard Events and Losses Database for the United States; UCR: Uniform Crime Reports

Other factors which affect the potential risk to Pickens County, such as social vulnerability, development trends, critical facilities, building values, and locations of historic and natural resource places, were evaluated during the planning process. Additionally, a review of existing risk-reduction mechanisms in place for Pickens County and the municipalities within it was conducted prior to the initiation of the mitigation planning stage of the process.

The plan's mitigation goals and objectives were established to address problems or weaknesses identified earlier in the planning process. The five goals established in this process were:

1. Reduce the impact of hazards on the most vulnerable populations.

2. Future mitigation and response plans will have the ability to include more specific mitigation actions or address more specifically the existing hazards.

3. The community will have the capability to initiate and sustain emergency response operations during and after a hazard event.

4. Reduce the impact of hazards on the general public and community.

5. Develop partnerships with organizations, resources, etc. within the community to compensate for limited resources, with the purpose of reducing risk in the community.

These goals are to be accomplished through various mitigation actions also established during the mitigation process. The order in which these actions are to be executed was determined through a prioritization based on a simple cost-benefit analysis.

The progress and effectiveness of this mitigation plan will be monitored and evaluated by the Hazard Mitigation Planning Committee at an annual meeting. If additional mitigation goals or actions are identified and deemed necessary by the committee, the plan will be updated within the five year planning cycle, as necessary.

2. Introduction

Hazard mitigation is “any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards” (DMA2K). Simply put, taking actions now to reduce risk in the future. Mitigation is one of the five mission areas identified by the Federal Emergency Management Agency (FEMA) in the National Preparedness Goal. Mitigation encompasses those capabilities designed to reduce a community’s impact from a given hazard. Mitigation is unique in that it can be done before, during, and after a disaster. Prior to the Disaster Mitigation Act of 2000 (DMA2K), most legislation provided funds mainly for disaster relief and recovery, not mitigation. However, DMA2K highlighted the importance of mitigation planning and preparing for disasters before they occur. In compliance with the DMA2K, Pickens County, South Carolina, prepared this hazard mitigation plan in order to assess the county’s vulnerabilities to natural and manmade hazards (U.S. Homeland Security *Getting Started*).

The 2018 Pickens County Natural Hazards Mitigation Plan is an update to the 2011 plan which focused solely on Pickens County government. Prior to the 2011 plan, the county participated in the Appalachian Council of Governments multi-jurisdictional hazard mitigation plan which focused solely on natural hazards. Pickens County made the decision to create a plan specific to Pickens County and in this 2018 version, to include all of the local jurisdictions within the county. Another key change that was made was to focus on manmade as well as natural hazards. The knowledge gained from assessing the natural and manmade hazards will then be used to prepare a mitigation plan with cost-effective actions aimed at reducing risk and building a more sustainable community.

In order to further address the specific hazards, Pickens County decided to undergo a multi-jurisdiction planning process for the 2018 Plan Update. This plan will cover Pickens County and the jurisdictions of Central, Clemson, Easley, Liberty, Norris, Pickens and Six Mile.

2.1 Mission Statement

Mitigation activities will be guided by the mitigation mission statement of Pickens County Emergency Management which is as follows:

> Pickens County Emergency Management coordinates and integrates all activities necessary to build, sustain, and improve the capability to mitigate against, prepare for, protect against, respond to, or recover from threatened or actual natural disasters, acts of terrorism or other manmade disasters. (Pickens County, SC *Emergency Management*)

2.2 Background

Pickens County is situated along the northern border of South Carolina in the western part of the state. It is bordered by Oconee County to the west, Anderson County to the south, Greenville County to the east, and Transylvania County, North Carolina to the north. According to the US Census Bureau, it contains 496.89 square miles of land.

Development is concentrated in the southern half of the county, interspersed with pasture/open land and smaller areas of deciduous and evergreen forest. The northern portion of the county is primarily deciduous forest with some evergreen stands scattered throughout (Fry et al.). Elevations range between 600 and 3,547 feet above sea level, and include the state's highest point, Sassafras Mountain (U.S. Department of the Interior *GNIS Detail*).

The temperature in Pickens County averages 71.9°F for a high and 47.6°F for a low. There is an average of 53.44 inches of precipitation.(South Carolina State Climatology Office).

The U.S. Census Bureau estimates that Pickens County has 119,224 residents according to the 2010 Census, representing a 7.6% increase in population from the 2000 Census. There are seven incorporated communities within the county: Central, Clemson, Easley, Liberty, Norris, Pickens, and Six Mile. In addition to these municipalities, Clemson University is located in Pickens County, but will be considered as part of the City of Clemson for the purposes of this plan (U.S. Department of Commerce *Pickens County QuickFacts*). As of 2000, approximately 37% of the population resided in these municipalities, with 63% living in unincorporated Pickens County (Pickens County *General Statistics*). The median age of residents in Pickens County is 34.9 years old, which is slightly younger than the median age of South Carolinian residents. There are 45,228 households within the County. Of these households 30% have children under 18 years old living in them and 25.% have individuals over 65 years old. Owner-occupied households make up 68.9% of all households in the county, with renter-occupied households at 31.1%. Data from the 2010 census was not available for all locations within Pickens County, so these figures could not be updated in the latest version of the plan.

Between 2011 and 2015, industrial and economic growth since the last plan has been low. There were three industrial expansions and three new industries in Pickens County, all but one coming in 2011. In 2013 TaylorMade Golf moved their manufacturing to Pickens County Commerce Park.

Housing developments during that time frame have also been low. According to the American Community Survey, the number of housing units in Pickens County has increased 1.2%, with growth primarily occurring within Liberty (an increase of 14.6%), Easley (an increase of 4.5%) and unincorporated Pickens County (an increase of 2.3%).

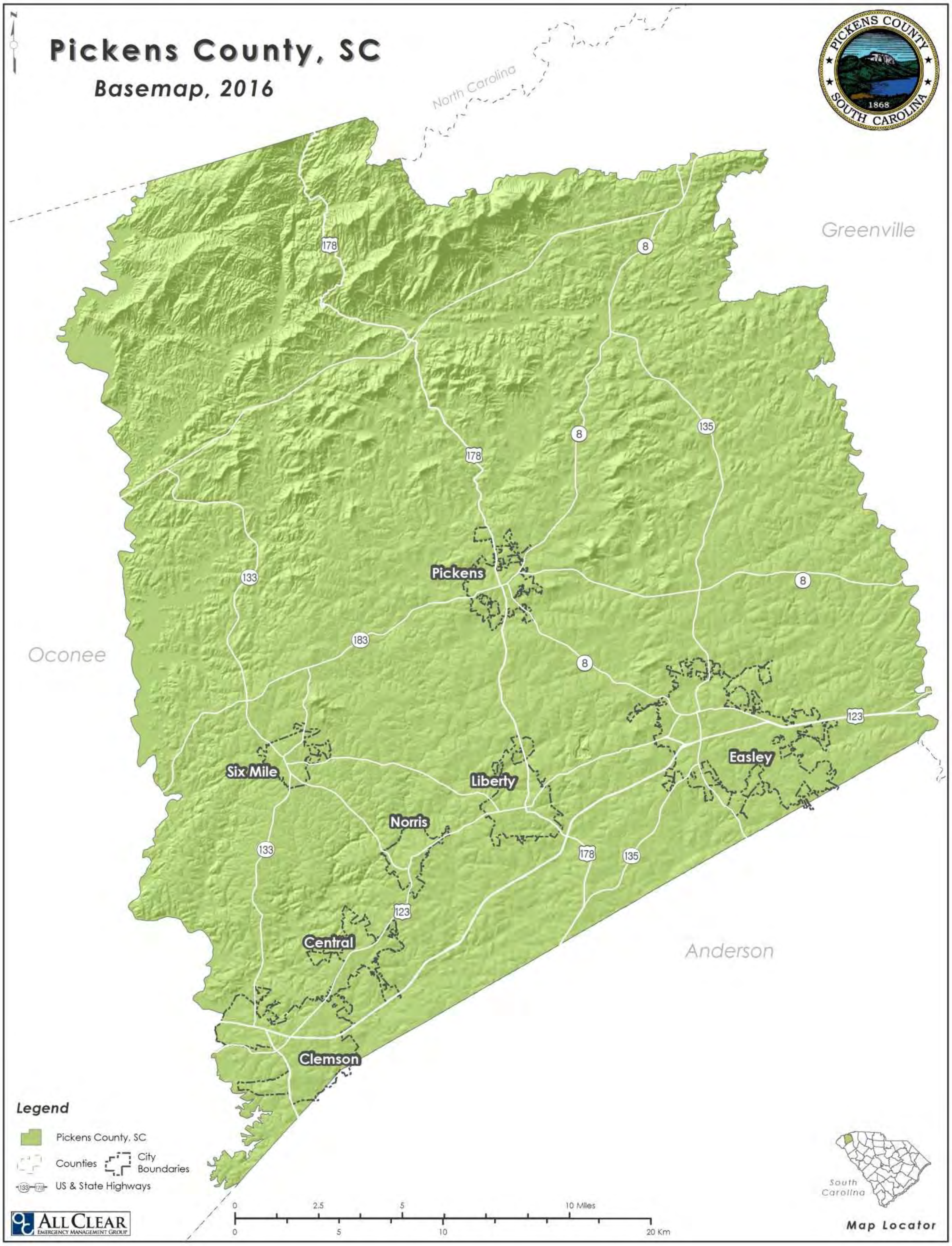


Figure 1: Map showing Pickens County, South Carolina and the municipalities of Central, Clemson, Easley, Liberty, Norris, Pickens, and Six Mile.

2.2.1 Central

The Town of Central is located in the southwest portion of Pickens County, immediately adjacent to the City of Clemson. The town occupies 2.4 square miles, and its elevation is 915 feet above mean sea level.

The town received its name as it was the “Central Station” between Atlanta and Charlotte along the Atlantic and Richmond Air railroad line. It was formally incorporated as a town in 1875. Initially, the primary industry of Central revolved around the railroad and catering to those involved in the railroad. The railroad’s repair operations were based in Central until the late 1890s and the town featured other shops and a hotel with a reputation for good food. In the early 1900s the Issaquena Mill opened in Central, which was a textile factory, and Wesleyan College began classes, leading to a rise in population in Central until the Great Depression. During the 1950’s through 1980’s several mills in Central prospered. Mainly a Cotton Mill and American House Spinning. During that time Central was known as the mill town. In the 1990’s as manufacturing jobs disappeared Central became more of a college town catering to Clemson University and Southern Wesleyan University. Currently, the only mill left is the Cotton mill known as Central Textiles. The 1990s once again brought prosperity to Central when new industries, new homes and apartments and recreational facilities were developed. (Sheriff).

In 2010, the Town of Central had a population of 5,159 with a median age of 22.5. This is significantly younger than the median age in Pickens County or the State of South Carolina, due to the student population from Southern Wesleyan University and Clemson University. There are 1,972 households, of which, 16.6% have children under

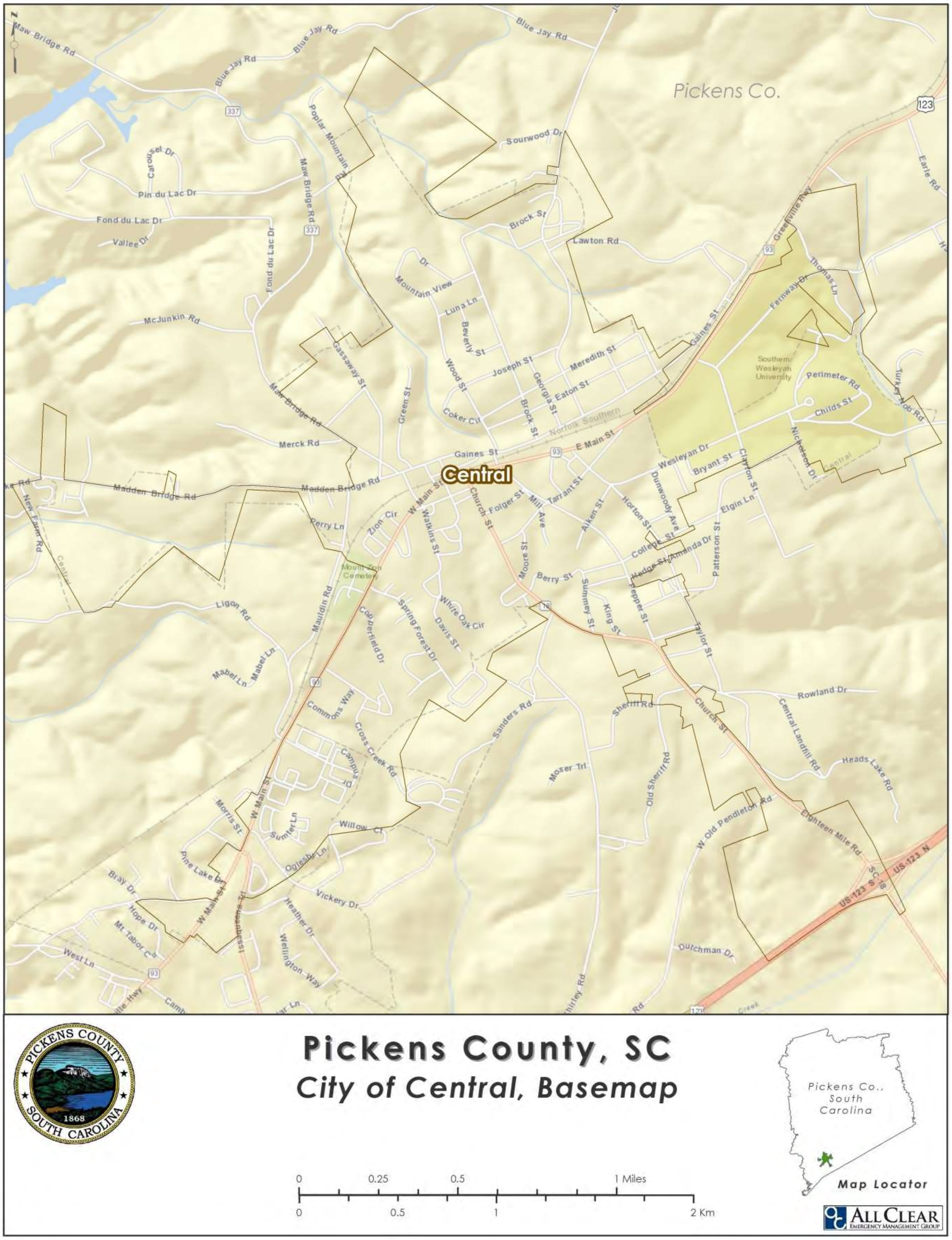


Figure 2: Basemap of Central, SC

the age of 18 years old residing there, and 14.8% with adults over the age of 65. 22.7% of these households were owner-occupied and 77.8% were renter-occupied.

2.2.2 Clemson

The City of Clemson is the second largest city in Pickens County, and is located in the southwest corner, along Lake Hartwell and occupied 7.4 square miles. The City of Clemson is also home to Clemson University and its large population of students.

First settled in 1872 as a railroad stop to serve the agricultural community, particularly the Fort Hill Plantation, Clemson was originally called Calhoun. The Town of Calhoun was officially incorporated in 1937, but changed its name 5 years later to Clemson. The establishment of Clemson College in 1889 caused the center of the city to shift away from railroad towards the college. After World War II, the college and town both began to grow rapidly, in large part, due to the GI-Bill (City of Clemson). The primary employer in the City of Clemson is Clemson University and most industries within the city are related to the growth of the University. New development in Clemson is primarily construction of college housing and new retail establishments.

In 2010, the population of Clemson was 13,905 with a median age of 24.3 years old. This young median age is due to the presence of the University, as 34.8% of the population was between 20-24 years old. Of the 5,914 households, 18.8% had children under the age of 18 and 18.8% had individuals 65 years or over. 43% of the households were owner-occupied with 58% being occupied by renters (United States Census Bureau).

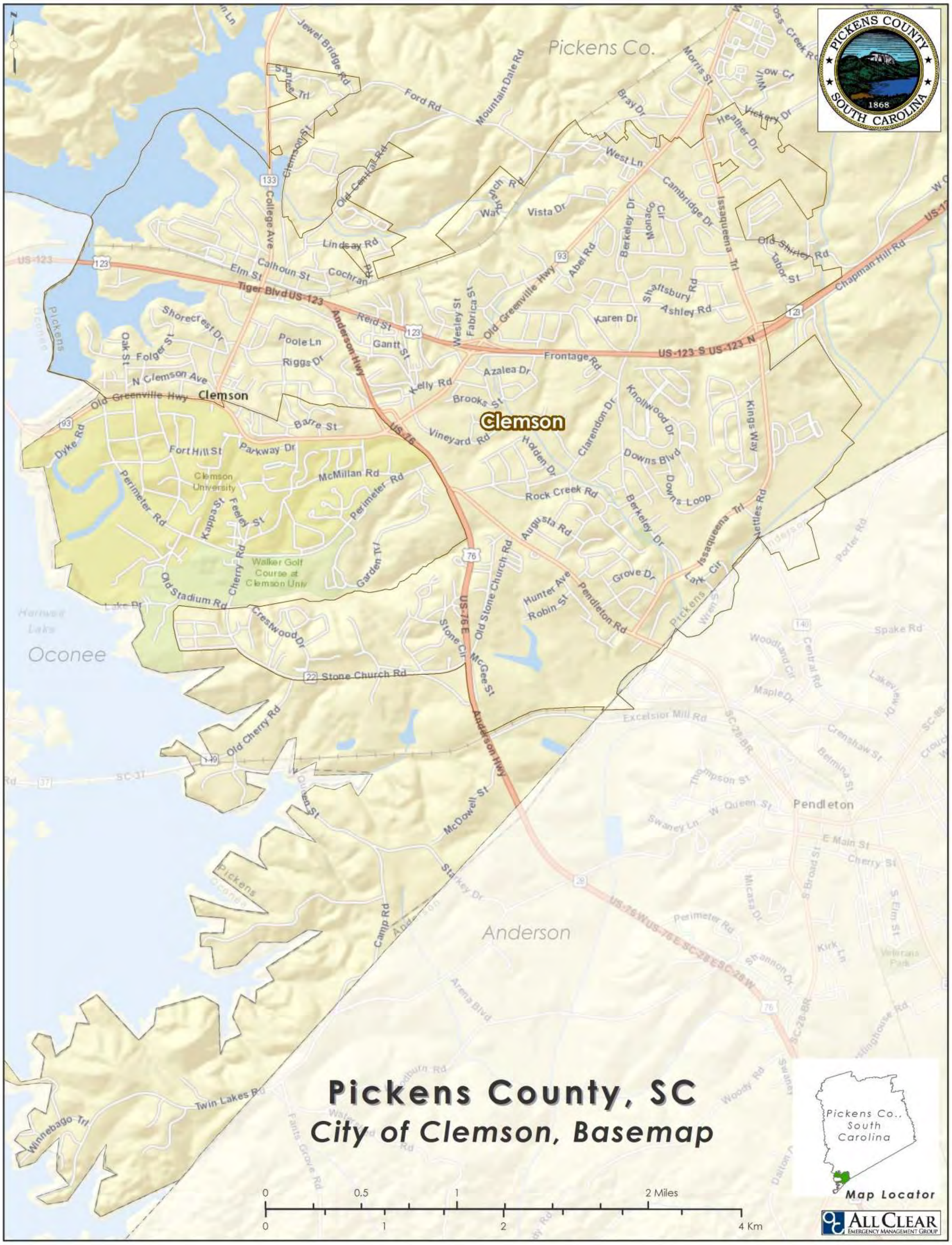


Figure 3: Basemap of Clemson, SC

2.2.3 Easley

Easley is the largest city in Pickens County. It is located along Highway 123 and in the southeastern part of the county. It is west of the City of Greenville, in Greenville county. The city occupies 12.4 square miles and is at an elevation of 1,079 feet above sea level.

The town of Easley was first surveyed in 1873, immediately after the Charlotte-to-Atlanta Airline Railroad finished laying track through what was to become the town. This railroad allowed the textile industry in Pickens County and within Easley develop. The Easley community was best known for textiles with Alice Manufacturing being headquartered in the City. At one time, there were eight large textile facilities (plants) in the Easley area, each of which held strong community presence with housing, shopping, and religious activities. Equally strong was the availability of rail access which sustained the growth and production of the textile facilities. As the textile industry fell to NAFTA and other economic impacts, Easley, along with many other communities, began to witness a downturn in the economy. In recent years, the City has begun to invest in multi-family dwelling and food service growth with substantial success. Additionally, the City has begun investing in a project known as, “The Doodle Trail” which has proven to boost the economy even more. Some of the blighted areas of the community are being renovated with more growth and renovation expected. (City of Easley).

As of the 2010 Census, Easley had a population of 19,993 with a median age of 40.5. Of the 8,289 households, 30.6% had children under the age of 18 years old and 31.1% had individuals over the age of 65 years. 65.3% of the households were occupied by owners and 34.7% were occupied by renters.

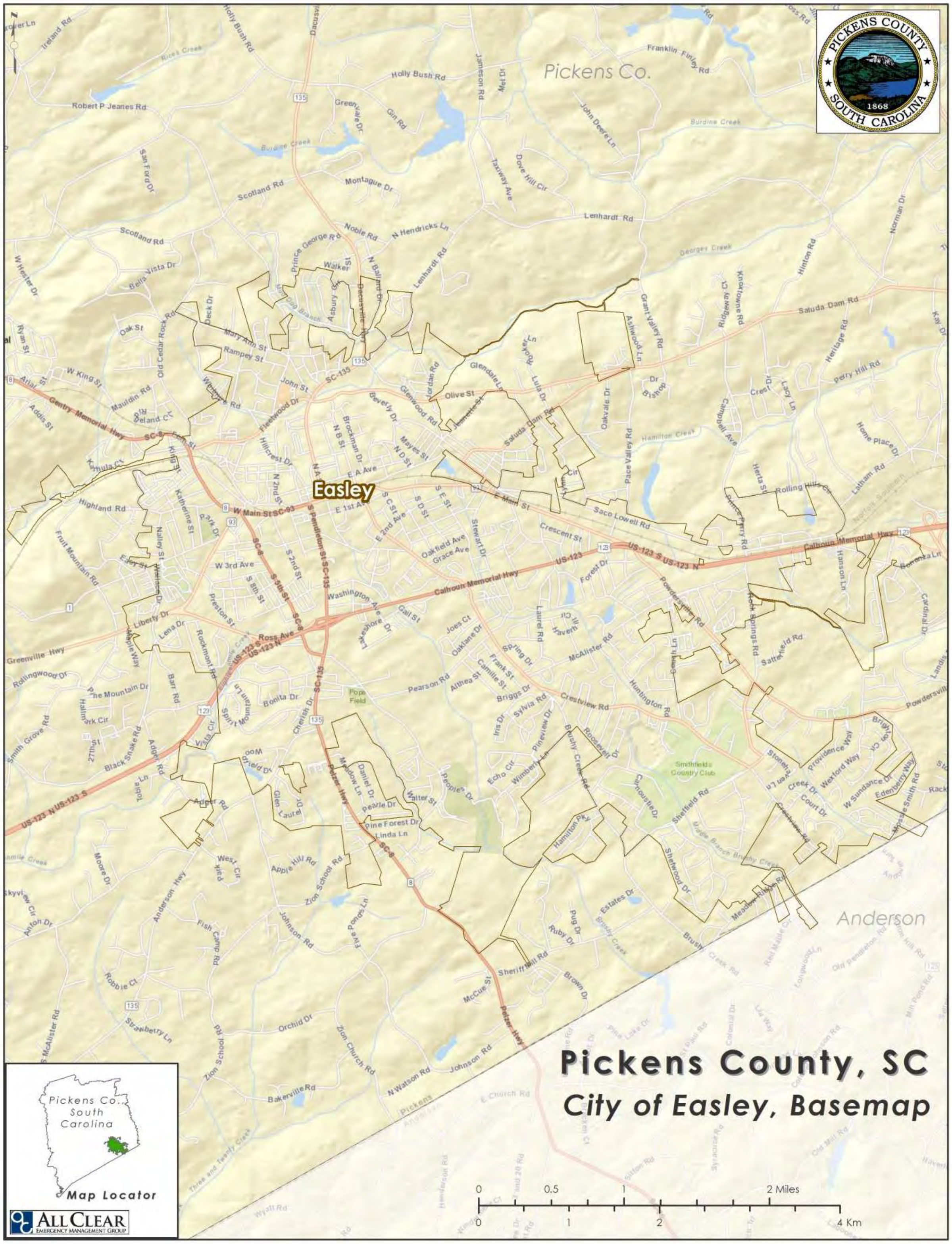


Figure 4: Basemap of Easley, SC

2.2.4 Liberty

Liberty is located in the south-central part of Pickens County, along Highway 93, between Norris and Easley. It occupies 4.45 square miles at an elevation of 1,020 feet above sea level.

Originally part of the Cherokee hunting grounds, white settlers first came to the area in large numbers in the 1780s. By 1800 the area was called Liberty Springs, and prior to the civil war, most of the residents were subsistence farmers. Liberty became an official town in 1876 after the Charlotte-Atlanta Airline Railway was completed, and ran through town. In 1901, the Liberty Mill opened in Liberty, which was the town's first cotton mill. Soon after, in 1905 the second cotton mill opened in Liberty, called the Calumet Mill and later renamed the Maplecroft Mill. The mills remained a critical part of the town, until the 1990s saw local textile manufacturing decline in the face of foreign competition (City of Liberty).

As of the 2010 Census, Liberty had a population of 3,269 with a median age of 39.6. Of the 1,375 households, 31.6% had children under the age of 18 years old and 30.6% had individuals over the age of 65 years. 70.8% of the households were occupied by owners and 29.2% were occupied by renters.

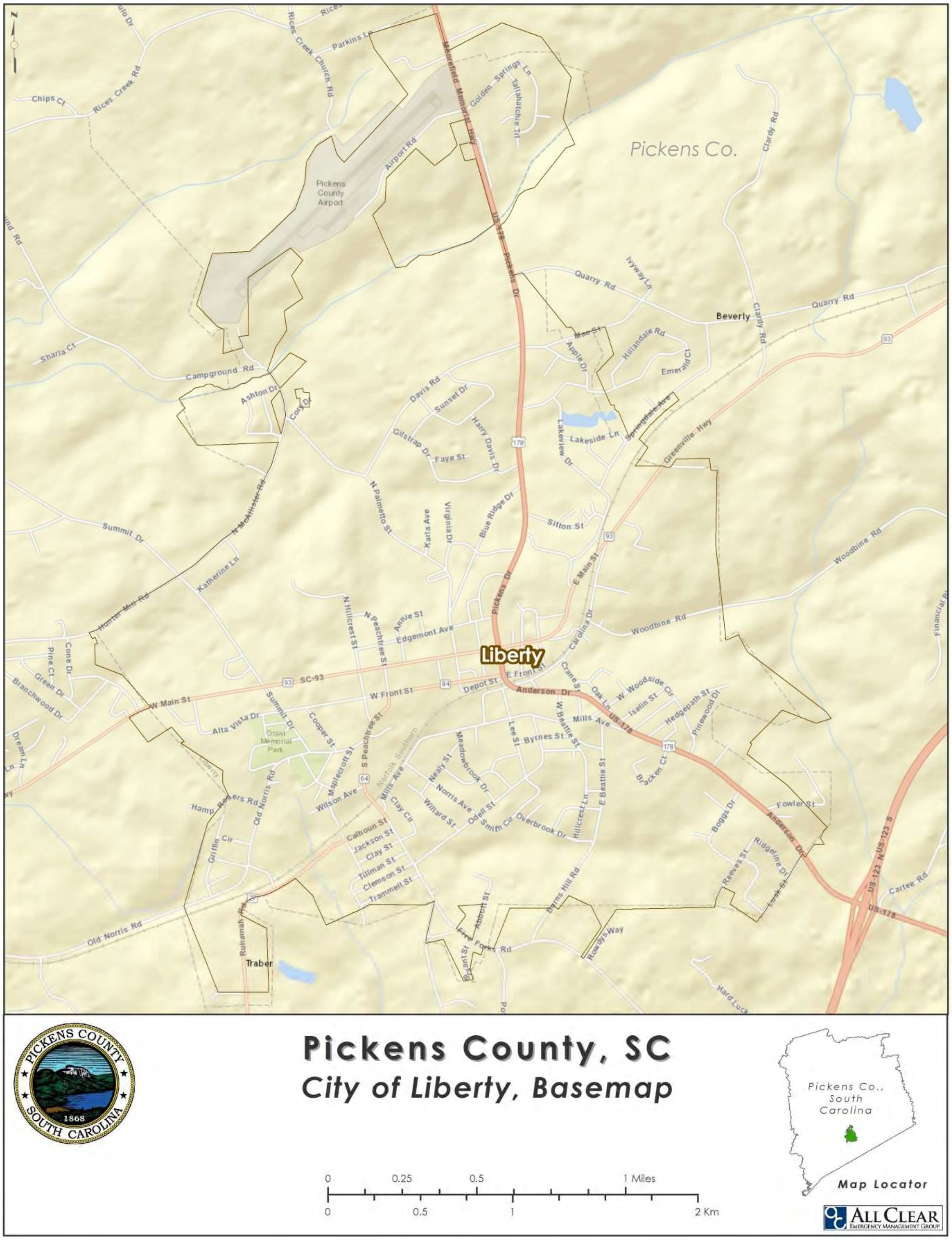


Figure 5: Basemap of Liberty, SC

2.2.5 Norris

Norris is a small town in southern Pickens County, between Central and Liberty. The town covers 1.884 square miles at an elevation of 1,001 feet above sea level.

The history of the Town of Norris actually begins with the establishment of the Town of Cateechee. The concept began in the dreams and imagination of Colonel Daniel Keating Norris. Colonel Norris was a wealthy cotton planter of upper Anderson County as the nineteenth century began drawing to a close. In 1877, Colonel Norris moved to the upstate from Vance, in the South Carolina low country.

As time went on, Colonel Norris began to focus on building a manufacturing plant in which to produce cotton cloth. Colonel Norris interested his two brothers along with others to invest in this new venture. This cotton mill was the first for Pickens County and construction began in 1895 with the construction of a dam on the Twelve Mile River. The community that sprang from this new mill construction was affectionately called Cateechee. Cateechee was the name of the legendary Indian maiden who had ridden from Keowee Town above Six Mile all the way to Ninety Six, SC to warn settlers there of an impending attack by the Cherokee. Colonel Norris named the mill after himself, and the Norris Cotton Mill was established in 1896.

With the boon from the establishment of the Norris Cotton Mill, the thriving little farming community nearby to Cateechee is now known as the Town of Norris. At the establishment of the Norris Cotton Mill in Cateechee, the Town of Norris had a large number of lumber mills.

As of the 2010 Census, the population of Norris was 813 with the median age being 39.8 years old. The town hosts 326 households, 34.4% of them with children under 18 years of age and 32.5% of them with adults over the age of 65 years. Owners occupy 77.9% of the households, with renters making up just 22.1% (United States Census Bureau).

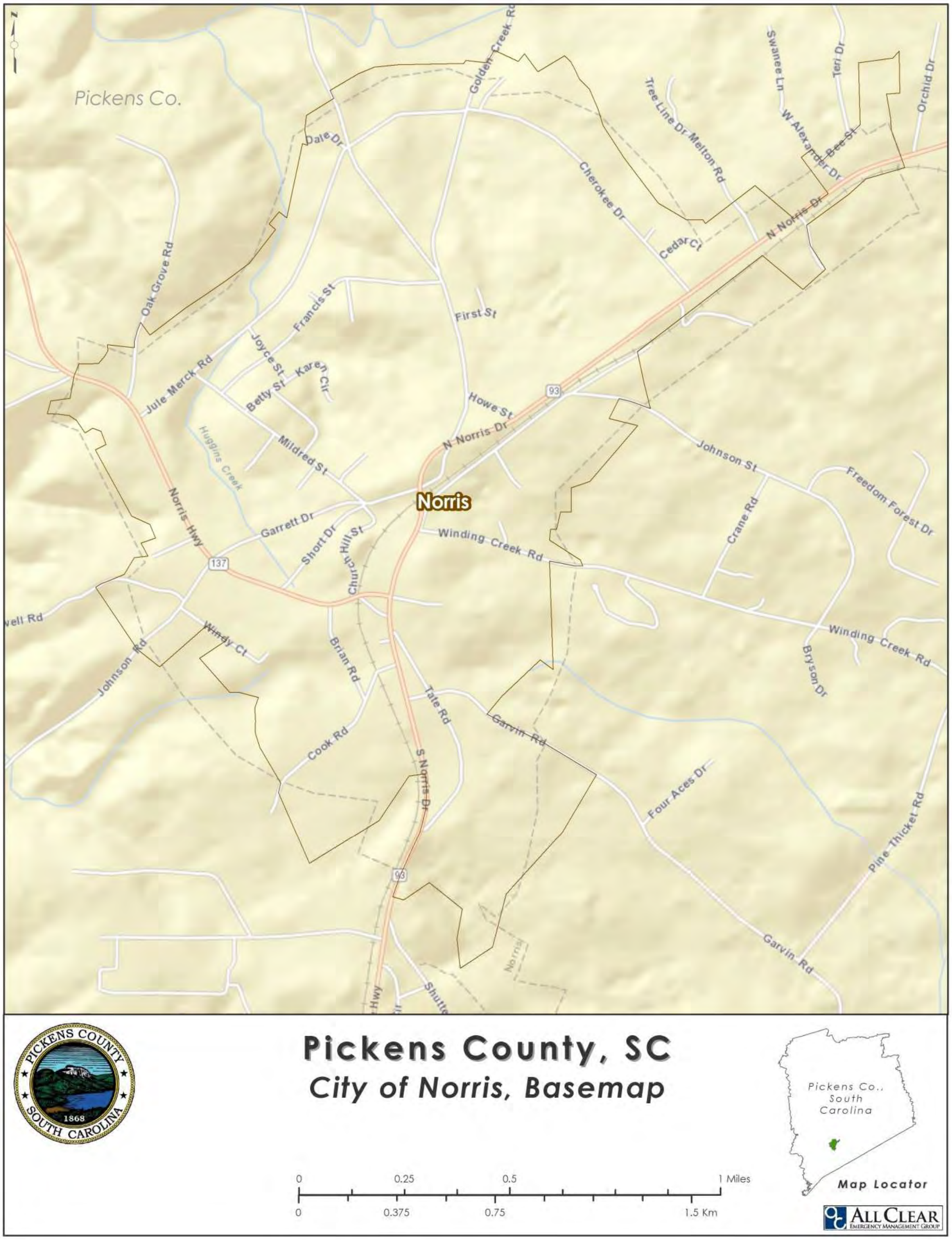


Figure 6: Basemap of Norris, SC

2.2.6 Pickens

The City of Pickens is located in the central part of Pickens County and is the County Seat. It occupies 2.83 square miles of land at an elevation of 1,093 feet above sea level.

Originally part of the Cherokee lands, the first white settlers to the Pickens area were Scottish-Irish. The town of Pickens was founded in 1868 and named after General Andrew Pickens, who served in the Revolutionary War. A shortline railroad was built in 1898 between Pickens and Easley (City of Pickens).

As of 2010, the population of Pickens was 3,126 with a median age of 39.8 years old. There were 1,246 households with 31.9% of them having children under 18 years old and 28.3% having adults over the age of 65 years. 57.3% of households are occupied by the owners and the remaining 42.7% are occupied by renters (United States Census Bureau).

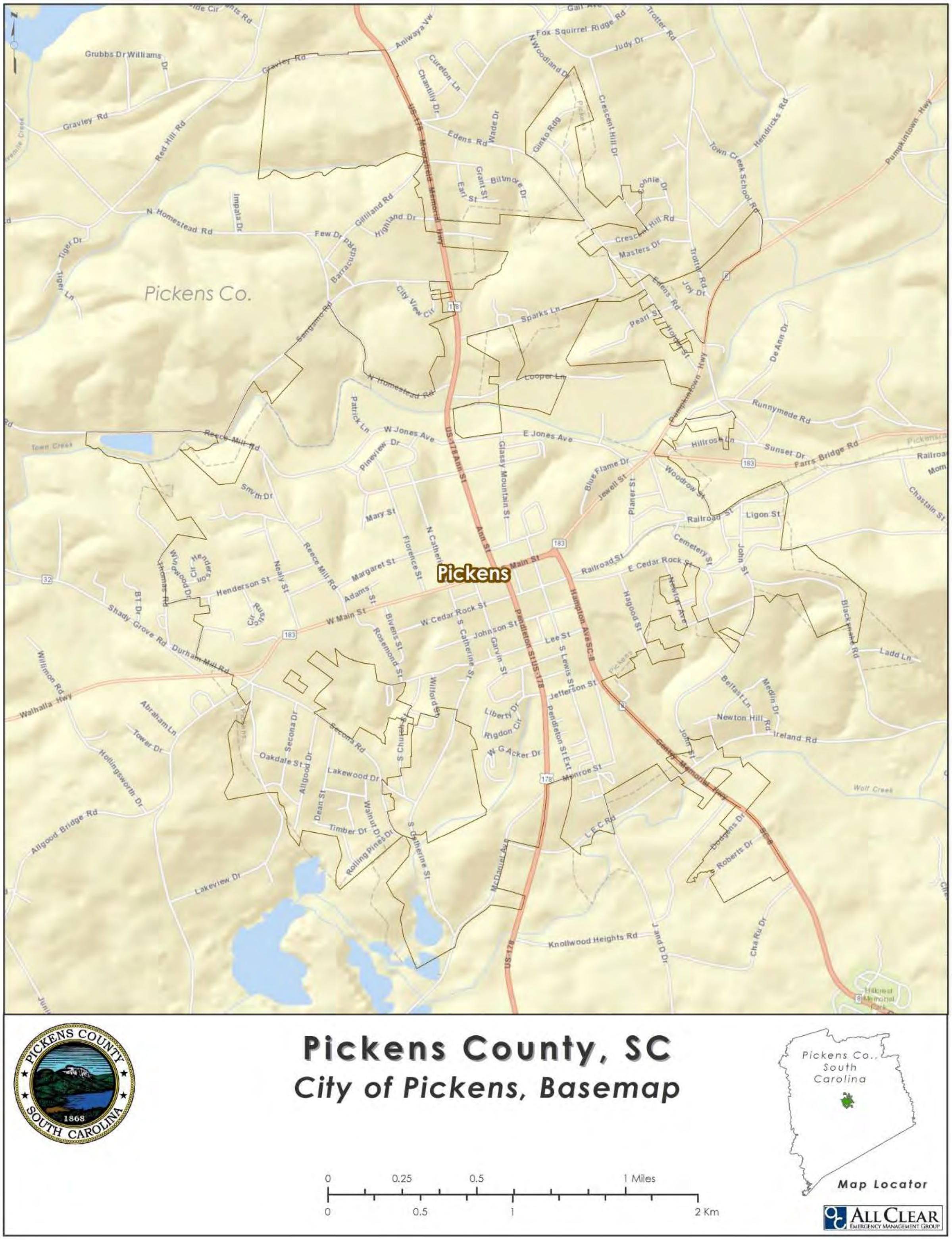


Figure 7: Basemap of City of Pickens, SC

2.2.7 Six Mile

Six Mile is the smallest incorporated town in Pickens County, and is located in the western part of the County. It covers 1.8 square miles and 1,024 feet above sea level.

Scotch-Irish, Dutch-German and English settlers began moving into the area that was to become Six Mile around 1800, due to the proximity of the Keowee Path. These pioneers cleared the land and planted crops, and by 1836 the area's first church was founded, followed by the first post-office in 1878. The town was incorporated in 1910 and more businesses began to open. Until World War II, Six Mile was primarily a farming community. After the war, it was unprofitable to just grow cotton, so textile mills opened to create additional avenues of revenue. (Town of Six Mile). Currently, Six Mile is home to several "Mom and Pop" stores, as well as some larger chains. There is one industrial company within the town's limits, which employs fewer than ten people.

By 2010, Six Mile had grown to 675 people with a median age of 43.2 years old, which is older than the median age of Pickens County. There are 277 households, with 30.3% having children younger than 18 years old and 31.4% with adults over the age of 65 years old. 73.3% of those households are occupied by the owners and 26.7% are occupied by renters (United States Census Bureau).

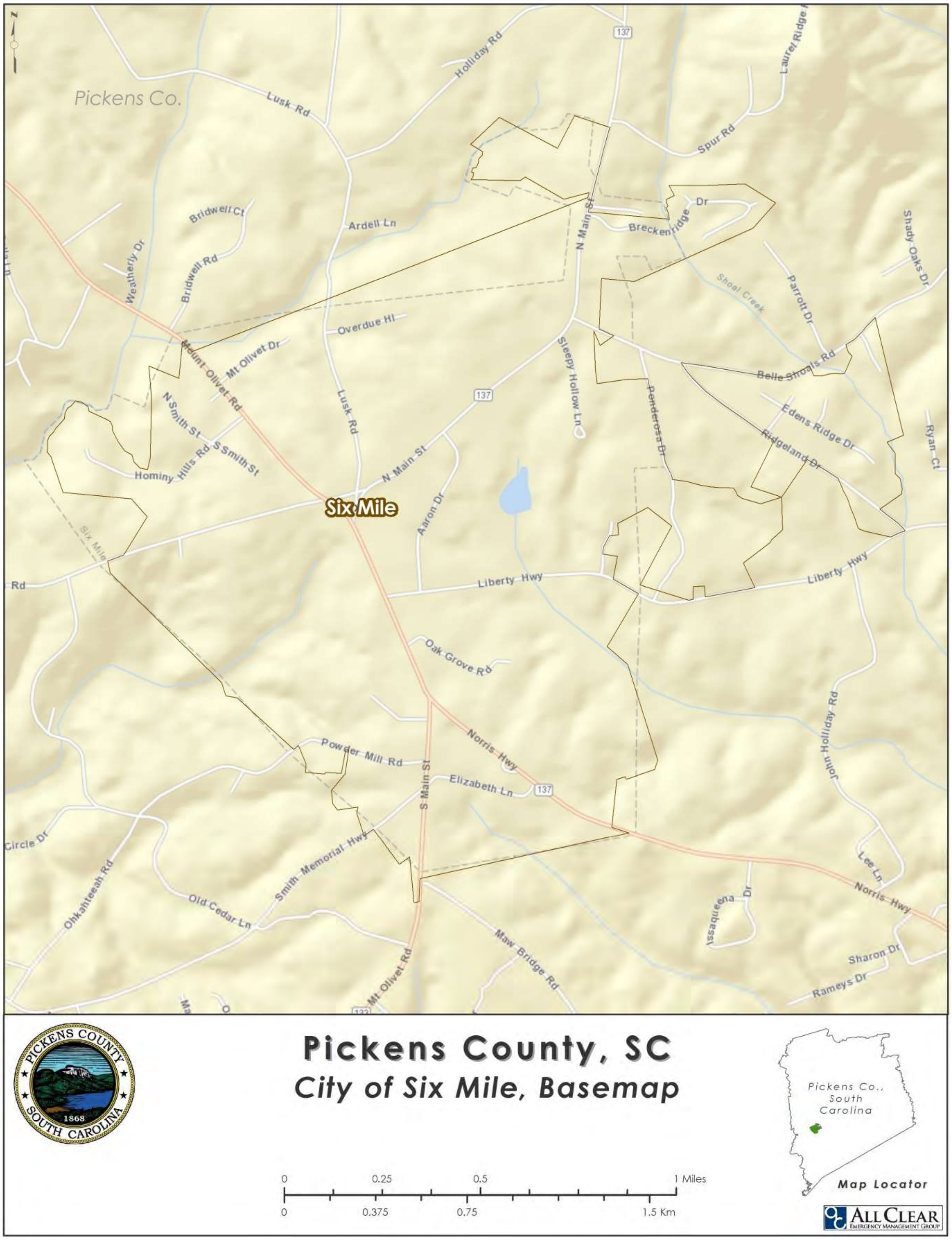


Figure 8: Basemap of Six Mile, SC

2.3 Purpose

The Disaster Mitigation Act of 2000 requires that local governments have a hazard mitigation plan as a condition of receiving Hazard Mitigation Grant Program funds after a hazard event. It specifies that a plan must explain the process used to identify hazards and assess risk and vulnerabilities and describe mitigation actions and the strategy for implementing those actions (Disaster Mitigation Act of 2000 44 CFR pt 201, 206). This plan is intended to fulfill those local Hazard Mitigation Plan requirements by identifying hazards and community vulnerabilities and establishing goals, objectives, and mitigation activities which are consistent with community values and the resources available to Pickens County.

2.4 Planning Process

The Federal Emergency Management Agency (FEMA) explains that hazard mitigation is most effective when based on a comprehensive long-term plan that is established before an emergency event (U.S. Department of Homeland Security. *Getting Started*). In order to produce such a plan, a planning process involving community engagement, developing goals and objectives, and monitoring progress must be followed. However, the DMA2K does not specify the exact process which must be used, but instead encourages each community participating in hazard mitigation planning to use a process tailored to the needs and characteristics of their community. This section of the Hazard Mitigation Plan details the process used by Pickens County during hazard mitigation planning.

2.4.1 Getting Organized

Pickens County Emergency Management has the responsibility of maintaining and updating the county's hazard mitigation plan. The first step in this process was to establish a Hazard Mitigation Planning Committee (HMPC) composed of the following key county officials and representatives from the school district, the business community, each jurisdiction and Clemson University:

County Officials

- Rick Clark — Sheriff, Pickens County
- David Childress — Assistant Director, Pickens County EMS
- Scottie Ferguson — Stormwater Manager
- Ray Holliday — Planner, Pickens County
- Kandy Kelley — Coroner, Pickens County Coroner
- Denise Kwiatek — Director, Pickens County Emergency Management
- Karen Kent — Coordinator, Pickens County Emergency Management
- Philip Trotter — Building Codes, Pickens County
- Bob Wilbanks — Building Codes, Pickens County
- Pierce Womack — Deputy Director, Pickens County Emergency Management

School District Staff

- Aaron Boyles — Pickens County School District Director of Transportation

Business Representative
- Connie Leopard EMS&S, Ortec, Inc.

Clemson University Representatives
- Lynn Fisher Emergency Manager, Clemson University

Central Representatives
- Ben Smith Executive Officer, Town of Central Fire & Town

Clemson Representatives
- Andy Blondeau Assistant City Administrator, City of Clemson
- John W. Bill Box Fire Marshall, City of Clemson
- Nathan Hinkle Stormwater Manager, City of Clemson

Easley Representatives
- Tommy Holcombe Building Codes, City of Easley
- Butch Womack Fire Chief, City of Easley

Liberty Representatives
- Jimmy Powell Assistant Fire Chief, City of Liberty
- Chris Rowland Fire Chief, City of Liberty
- Shirley Hughes City Administrator

Norris Representatives
- Wendell Melton Norris Councilman, Town of Norris
- Odell Williams Mayor, Town of Norris

Pickens Representatives
- Bobby Abercrombie Water Superintendent, Pickens City
- Corey Cox Public Utilities, Pickens City
- Travis Riggs Interim Police Chief, Pickens City

Six Mile Representatives
- Jim Hayes Zoning Administrator, Town of Six Mile
- Roy Stoddard Mayor, Town of Six Mile

In order to ensure all members of the planning committee as well as the public were informed and engaged throughout the process, a project website was created. This website (https://sites.google.com/a/allclearemg.com/pickensco-hazard-mitigation/home) was publicized and linked on the Pickens County EMA website throughout the process. This website provided an avenue for public comment on each phase of the project. The first kick off meeting was held on April 5, 2016. Representatives from key county departments and each of the jurisdictions were invited to participate in the Hazard Mitigation Planning Committee and attend the first meeting through direct emails from

Denise Kwiatek, the Director of Pickens County Emergency Management. This meeting not only served as an introductory meeting, it was also the first working meeting of the Planning Committee. The HMPC decided upon an initial outreach strategy that would best work to involve the residents of Pickens County in the mitigation planning process, and reviewed the hazards that were included in the previous plan and discussed new hazards of concern. Copies of the minutes from the April 5 kickoff meeting were sent to representatives who were not able to attend the meeting in person and additional comments or feedback was solicited from these representatives via email. Due to extremely limited staffing in the jurisdictions, it was also decided at the kickoff meeting that in person meetings would be held when necessary, but the majority of planning would be done through group and individual emails and phone calls.

2.4.2 Assess Hazards and Vulnerabilities

As decided upon during the kickoff meeting, the consultant would develop a set of surveys focused on the public and municipalities. The public survey was adapted from the one used during the previous planning process and was designed to assess awareness of hazards, preparation for emergency events, and support for a variety of mitigation strategies. This survey was available online, and promoted through various outreach activities by each of the participating jurisdictions. From previous experience within the County and jurisdictions, the Planning Committee determined that using a public survey would result in the most interaction with the public. The survey and a summary of its results are in Appendix D and Appendix E, respectively. The public survey was made available from April 20, 2016 until June 27, 2017. The final survey was a community capability assessment designed to determine existing loss prevention mechanisms. This assessment was updated from the last plan by each of the jurisdictions. During the outreach by the jurisdictions, a one page flyer, titled, “Pickens County Hazard Mitigation Fact Sheet” was distributed, to inform the public what Hazard Mitigation is, and why it is important. This flyer also included a link to the public survey, the project website, and information on how they could participate. A copy of this flyer is found in Appendix C.

Table 32 in Section 5.3 provides a summary of this capability matrix.

The next step in hazard mitigation planning was to identify which hazards affect Pickens County, and to determine the location, severity, previous occurrences, and probability of future events for each hazard. Natural hazards that put Pickens County at risk were identified through the South Carolina Hazard Mitigation Plan 2013, the State of South Carolina Hazard Assessment for 2008, and an initial risk assessment conducted by the HMPC for the previous plan update. This risk assessment was also the primary basis for the identification of manmade hazards that were analyzed in the plan. For this plan update, at the April 5, 2016 planning meeting, the HMPC reviewed the previous list of hazards and agreed that those hazards were still the ones that posed a risk to Pickens County and its jurisdictions. The HMPC also suggested additional areas of concern. These additional areas of concern were subsets of existing man-made hazards and were incorporated into this plan. The public survey also asked residents to identify which hazards were of concern to them. The public results aligned with the HMPC's identification of the hazards that pose a threat to Pickens County and its jurisdictions.

To determine the location, severity, and previous occurrences of hazards a variety of governmental, educational, and institutional websites and databases, news media, and government reports and software were consulted. The following lists the specific sources used:

- Appalachian Council of Governments
- Clemson University
- FBI's Universal Crime Reports
- FEMA
- FEMA's Digital Flood Insurance Rate Maps
- Hazards and Vulnerability Research Institute
- Hazus
- National Climatic Data Center
- National Geophysical Data Center
- National Hurricane Center
- National Inventory of Dams
- National Response Center
- National Seismic Hazard Mapping Project
- Pickens Sentinel
- South Carolina Department of Health and Environmental Control
- South Carolina Department of Public Safety
- South Carolina Emergency Management Division News Releases
- South Carolina Emergency Management Division Situation Reports
- South Carolina Fire Incident Reporting System
- South Carolina Forestry Commission
- South Carolina Hazard Mitigation Plan 2013
- South Carolina Hazards Assessment 2008
- South Carolina Office of State Fire Marshal
- South Carolina State Climatology Office
- Southeast Regional Climate Center
- Spatial Hazard Events and Losses Database for the United States
- State of South Carolina Public Health Hazards and Vulnerability Assessment
- Storm Prediction Center
- Strom Thurmond Institute
- The Weather Channel
- University of South Carolina
- US Army Corps of Engineers
- US Bureau of Labor Statistics
- US Census Bureau
- US Department of the Interior
- US Drought Monitor
- US Forest Service Wildland Fire Assessment System
- US Geological Survey
- USGS Landslide Susceptibility Map
- WTOC, Savannah, Georgia, News, Weather and Sport

Frequency data collected from past occurrences of hazards was used to calculate the probability of future hazard events. It was calculated by dividing the number of occurrences of a specific event by the number of years on record. In the event that there were no records of hazard occurrence or the record period was only one year, probability could not be calculated.

Data collected from these sources was also used to determine the county's and the jurisdictions' vulnerability and assess the impact of each identified hazard. Additional vulnerabilities were identified in the county and each jurisdiction by collecting social vulnerability, projected development, critical facility, building density and estimated replacement value, and historic and natural resource data. Due to the resolution of most datasets, county data was used in lieu of jurisdiction specific data when necessary. Due to limitations on the jurisdiction's staff availability, HMPC work was primarily completed via email and telephone calls during this step of the planning process.

The final step before the development of the mitigation plan was to review existing Pickens County plans and ordinances to see what, if any, mitigation strategies were in place or where new mitigation actions could be incorporated. The documents used for this step were the Pickens County Comprehensive Plan, the Unified Development Standards Ordinance, the Pickens County Stormwater Ordinance, and the Flood Damage Prevention Ordinance. Each jurisdiction's representatives reviewed their jurisdiction's plans and ordinances as part of their capability survey, which was redistributed during the next in person meeting on October 24, 2016.

2.4.3 Develop a Mitigation Plan

Representatives from each jurisdiction, with the exception of Liberty, met in person on October 24, 2016. Due to staffing changes, Liberty was unable to participate in the in person portion of this meeting. Follow up emails and phone calls between Liberty's representative and the consultants resulted were sufficient to update the City's administration on the status of the hazard mitigation planning process and for the City's representative to provide information and feedback that the other jurisdictions were able to provide during the in person meeting.

The HMPC had a full agenda during that meeting. First, the final public outreach strategy was presented to the HMPC for approval, and the representatives agreed to implement the action points within. This outreach strategy included educating the residents of Pickens County about hazard mitigation and the plan for soliciting public comment once the draft plan was ready. The next item on the agenda was re-issuing a copy of the Pickens County Hazard Mitigation Factsheet, in the event that representatives needed a new copy. This fact sheet would be used in conjunction with activities identified in the outreach strategy. Preliminary results of the public survey were reviewed, and representatives were encouraged to solicit additional feedback from communities that were underrepresented. Representatives were then asked to review their community profiles, and to provide information for any identified gaps. Each jurisdiction then reviewed their community capability matrix, and time was provided during the meeting for representatives to complete to update the matrix as necessary. Each jurisdiction was also provided with a list of remaining questions, specific to their community. Time was provided for the representatives to complete the remaining pieces of information needed.

The next part of the meeting was for communities to conduct a hazard and vulnerability assessment, by examining the assets present in the community, and the risks faced individually by the jurisdiction as well as countywide. The process followed: hazard identification, assess identification, risk analysis and vulnerability summary. Each hazard was ranked during the meeting based on a vulnerability and consequence formula. Questions 8 and 9 from the public survey helped provide significant information regarding vulnerability within each jurisdiction during this step. For instance, 82 of 159 survey respondents indicated that they had been directly impacted by winter storms. This was far higher than any other hazard listed. This information was reflected in the vulnerability analysis, indicating high vulnerability of winter storms. Likewise, disruption of utility service was the highest rated hazard of concern for residents of Pickens County who took the survey. This hazard too, received a high vulnerability rating by the HMPC. More information about this process can be found in Section 6.2.

The HMPC was provided with the existing problem statements to update and instructed regarding the procedure for creating new problem statements if the jurisdictions deemed it necessary. The HMPC also reviewed the current mitigation strategies and were tasked with making improvements and additions necessary to meet the needs of each of their communities. The Mitigation Goals, Actions and the Action Plan were reviewed and discussed. During this discussion, a benefit cost review was also conducted. The HMPC was asked to consider additional mitigation action items for inclusion into the plan, as well as incorporating feedback received from the public from their jurisdictions through the survey or public meetings. Each HMPC member with outstanding pieces of information necessary for plan completion or additional mitigation actions were requested to submit the information within. Through series of phone calls and emails with HMPC members or their designate, all outstanding information was collected by December 2016, with a draft plan ready for public comment by January 2017.

During this timeframe, the Director of Pickens County Emergency Management attended the Town of Six Mile Council Meeting, held on November 1, 2016, in order explain the importance of hazard mitigation to the leadership and residents of Six Mile and to solicit additional feedback. Six Mile was specifically chosen for an additional public meeting due to a lack of representation in the public questionnaire.

The draft plan was published online and through social media for public review and comment. A public meeting was held at the offices of Pickens County EMA (See inset photo) where the public was invited to come and discuss the mitigation plan and provide any feedback necessary. Suggestions from the public were then incorporated into the plan as appropriate. This meeting was advertised through the local newspaper. The draft plan was also presented at a City of Pickens Council Meeting, held on May 15, 2017. Ms. Kwiatek discussed the planning process, and presented the draft plan for review by the council and the residents of the City of Pickens and the residents of Pickens County who were also invited, in order to receive additional comments on the draft plan before it was finalized.

The planning committee also invited several neighboring/partnering jurisdictions to review the plan. A copy of the invitation is in Appendix B. The following individuals were contacted as part of this invitation to review the plan.

- Scott Krein, Director, Oconee County Emergency Management
- David Baker, Director, Anderson County Emergency Management
- Damon Hubber, Director, Greenville County Emergency Management
- Dr. Danny Merck, Superintendent, Pickens County School District
- Marion Lawson, Assistant Superintendent, Pickens County School District
- Bobby Skelton, Student Affairs, Pickens County School District

A final public meeting was held on June 26, 2018 after the adoption of the Hazard Mitigation Plan by Pickens County. Denise Kwiatek, Director of Pickens County Emergency Management explained why it is beneficial for the county and municipalities to participate in a multi-jurisdictional hazard mitigation plan. During the meeting, participants were given a mitigation fact sheet.

2.4.4 Plan Maintenance

Once this plan has been approved by the Federal Emergency Management Agency, Pickens County and the jurisdictions of Central, Clemson, Easley, Liberty, Norris, Pickens and Six Mile will formally adopt the Hazard Mitigation Plan. Documentation of these adoptions will be included in Appendix A. Upon final FEMA approval, the 5 year review cycle will begin.

Meetings of the Hazard Mitigation Planning Committee will be conducted annually. These meetings will be coordinated by Pickens County Emergency Management and held with the purpose of monitoring the progress and evaluating the effectiveness of the mitigation activities and updating the Hazard Mitigation Plan as needed. This meeting .will be publicized through Pickens County Emergency Management and those participating municipalities and open to the public. This plan will be a living document used to guide municipal improvements and grant funding decisions where appropriate. Each jurisdiction is required to participate in these plans, and be ready to share with the HMPC progress made towards mitigation actions, lessons learned, or any other useful information. The HMPC will then assess whether priorities need to be adjusted for the next year, or if additional mitigation actions need to be added.

The leadership of each jurisdiction will ensure that each office, department, board, or commission receives a copy of the hazard mitigation plan, and an explanation as to its goals. The leadership of the jurisdictions will ensure that mitigation becomes a guiding principle for all planning activities within their jurisdiction, and that mitigation is incorporated into any new or revised plans.

3. Hazard Identification and Risk Assessment

There are two main categories of hazards which can affect a community; they are natural and manmade. Natural hazards are not directly caused by human activities; however these activities can intensify or lessen the impact of natural hazards. Earthquakes and tornadoes are two examples of natural hazards. Manmade hazards, on the other hand, are caused directly by human activities, and can be further categorized as technological hazards or terrorism. The difference between these hazards is that technological hazards are accidental whereas terrorism is intentional, criminal, and malicious (U.S. Department of Homeland Security *Integrating Manmade Hazards*). Technological hazards include, but are not limited to, utility disruption, transportation system disruption, and dam or levee failure.

The Disaster Mitigation Act of 2000 only requires communities to evaluate natural hazards (Disaster Mitigation Act of 2000 44 CFR pt. 201, 206). However, the Hazard Mitigation Planning Committee decided to assess the impact of both types of hazards in this mitigation plan so that the county would be as prepared as possible for all threats to the health and safety of the community. If during the course of the planning process, a specific hazard was determined to pose no identifiable risk to the county, that hazard was not included in subsequent planning activities. The following sections of this chapter, as required by §201.6(c)(2) of DMA2K, "include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards…[with] sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards."

3.1 Introduction

It is important to note that hazards have the potential to cause other, secondary hazards. For example, a hurricane or tropical storm can cause severe storms further inland, which can then cause flash flooding. However, for ease of understanding the threats individual hazards pose, they are considered separately here.

Each hazard that poses a threat to Pickens County or its jurisdictions is discussed in detail in the following section. A variety of sources were used to compile a record of past occurrences of each hazard type. This is important to determine the recurrence interval for a particular hazard. A recurrence interval, or return period, is a statistical technique based on frequency analysis, and is used to estimate the probability of occurrence of a specific event. When possible, a map of the locations of the previous events is provided.

Once the hazards that pose a threat to Pickens County and its jurisdictions were identified, analysis was conducted to determine the risk each hazard event poses to the county. Where appropriate, a map of the hazard area is provided. However, maps are mainly limited to natural hazard events due to the nature of manmade hazards being dependent upon human actions, and not necessarily predictable. The Federal Emergency Management Agency's software, Hazus, was also utilized to help develop a more thorough risk analysis for a few particular hazards. Hazus is specifically designed for earthquake, hurricane, and flood hazards. In some instances, this analysis was used to supplement the risk assessment that Pickens County Emergency Management had previously performed.

3.2 Civil Disturbance/Crime

Crime and civil disturbance (violence or disorder committed by a group) are manmade hazards that are relatively unique. Because crime and civil disturbances are not accidental, they cannot be categorized as technological hazards. At the same time, it is not appropriate to treat civil disturbance and crime as acts of terrorism either because the underlying motivations of the perpetrators are quite different, even though technically, terrorism is illegal, and therefore a crime (U.S. Department of Homeland Security *Integrating Manmade Hazards*). For this reason, civil disturbance/crime and terrorism will be discussed separately in this plan.

Crime and civil disturbance, to a lesser extent, have long been recognized as threats to the safety and wellbeing of individuals and communities. Crime in particular is a hazard that is experienced on a daily basis within a community.

In the United States, crime is classified as a felony or misdemeanor. Felonies are usually punishable by a sentence of more than a year in a federal or state prison, or in some instances, death. Misdemeanors, the less serious acts, are usually punishable by a jail sentence of less than a year in a city or county facility and may be accompanied by or substituted by a fine (Home and Neighborhood Safety).

3.2.1 Past Occurrences of Civil Disturbance/Crime

Since 1930 the Federal Bureau of Investigation has administered the Uniform Crime Reporting (UCR) Program which collects specific crime statistics from local law enforcement agencies on a voluntary basis. In this program, crime is divided into three parts; and only Part I crimes are reported. Part I crimes are further divided into violent crimes and property crimes. Violent crimes include murder and non-negligent manslaughter, forcible rape, robbery, aggravated assault. Property crimes include burglary, larceny-theft, and motor vehicle theft.

The following are tables showing crime instances reported by the City of Clemson Police Department, the Easley Police Department, and the Pickens County Sheriff's Office. This data is not without limitations however, as only communities with more than 10,000 residents can participate in the UCR Program, and it does not take into account Part II or Part III offenses. These include other assaults, forgery and counterfeiting, fraud, embezzlement, buying, receiving, or possessing stolen property, vandalism, weapons charges, prostitution, other sex offenses, drug abuse violations, gambling, offenses against family and children, driving under the influence, liquor laws, drunkenness, disorderly conduct, vagrancy, suspicion, curfew and loitering, runaways, and all other offenses except traffic violations. While arson has been considered a Part I offense since 1979, arson data was not available (U.S. Department of Justice *Uniform Crime Reporting Statistics*). Data was not available after 2012.

There was no data available regarding past occurrences of civil disturbance in Pickens County.

Table 2: Number of Violent Crime Offenses reported to the FBI's Universal Crime Reporting Program by the City of Clemson Police Department 1985-2012

Year	Murder and Non-Negligent Manslaughter	Forcible Rape	Robbery	Aggravated Assault	Violent Crime Total
1985	0	1	3	29	**33**
1986	1	3	2	19	**25**
1987	0	5	3	11	**19**
1988	1	5	1	23	**30**
1989	1	3	4	21	**29**
1990	0	3	4	18	**25**
1991	0	3	9	29	**41**
1992	0	4	2	34	**40**
1993	0	5	3	32	**40**
1994	0	2	11	17	**30**
1995	0	1	5	29	**35**
1996	0	9	8	67	**84**
1997	1	9	8	49	**67**
1998	0	5	8	49	**62**
1999	0	3	6	31	**40**
2000	1	5	6	36	**48**
2001	1	1	8	33	**43**
2002	0	2	9	9	**20**
2003	0	2	2	18	**22**
2004	1	6	5	34	**46**
2005	0	3	2	18	**23**
2006	0	3	8	14	**25**
2007	0	8	5	17	**30**
2008	0	4	3	36	**43**
2009	1	0	7	25	**33**
2010	0	3	6	17	**26**
2011	0	1	3	30	**34**
2012	1	4	3	34	**42**
Average	**0.32**	**3.68**	**5.14**	**27.82**	**36.96**

Table 3: Number of Property Crime Offenses reported to the FBI's Universal Crime Reporting Program by the City of Clemson Police Department 1985-2012

Year	Burglary	Larceny-Theft	Motor Vehicle theft	Property Crime Total
1985	91	398	18	**507**
1986	100	370	19	**489**
1987	118	433	27	**578**
1988	111	451	19	**581**
1989	132	552	26	**710**
1990	119	539	29	**687**
1991	120	453	41	**614**
1992	85	460	45	**590**
1993	120	364	25	**509**
1994	82	425	23	**530**
1995	79	302	19	**400**
1996	106	323	18	**447**
1997	85	368	32	**485**
1998	73	252	33	**358**
1999	53	263	26	**342**
2000	81	367	22	**470**
2001	67	280	28	**375**
2002	66	266	43	**375**
2003	68	268	31	**367**
2004	60	222	29	**311**
2005	49	217	37	**303**
2006	61	190	28	**279**
2007	90	225	18	**333**
2008	48	244	17	**309**
2009	67	221	51	**339**
2010	78	328	26	**432**
2011	77	272	42	**391**
2012	86	343	36	**465**
Average	**84.71**	**335.57**	**28.86**	**449.14**

Table 4: Number of Violent Crime Offenses reported to the FBI's Universal Crime Reporting Program by the Easley Police Department 1985-2012

Year	Murder And Non-Negligent Manslaughter	Forcible Rape	Robbery	Aggravated Assault	Violent Crime Total
1985	0	6	5	79	**90**
1986	1	2	4	66	**73**
1987	2	2	15	48	**67**
1988	1	0	5	47	**53**
1989	1	4	6	58	**69**
1990	0	8	9	69	**86**
1991	3	6	7	66	**82**
1992	1	12	15	49	**77**
1993	2	7	24	81	**114**
1994	4	5	16	90	**115**
1995	1	5	18	91	**115**
1996	0	5	20	69	**94**
1997	1	1	15	41	**58**
1998	1	7	10	49	**67**
1999	1	2	14	69	**86**
2000	0	6	22	41	**69**
2001	1	12	10	29	**52**
2002	0	7	13	35	**55**
2003	4	7	13	66	**90**
2004	0	6	11	47	**64**
2005	0	10	14	49	**73**
2006	1	3	14	59	**77**
2007	1	6	20	76	**103**
2008	0	8	17	38	**63**
2009	0	2	7	55	**64**
2010	2	4	10	57	**73**
2011	1	8	10	88	**107**
2010	3	10	12	81	**106**
Average	**1.14**	**5.75**	**12.71**	**60.46**	**80.07**

Table 5: Number of Property Crime Offenses reported to the FBI's Universal Crime Reporting Program by the Easley Police Department 1985-2012

Year	Burglary	Larceny-Theft	Motor Vehicle Theft	Property Crime Total
1985	151	426	31	**608**
1986	155	398	19	**572**
1987	119	399	39	**557**
1988	147	456	30	**633**
1989	185	592	33	**810**
1990	127	685	25	**837**
1991	204	600	36	**840**
1992	178	551	37	**766**
1993	133	388	33	**554**
1994	146	533	34	**713**
1995	179	678	21	**878**
1996	149	691	46	**886**
1997	136	634	44	**814**
1998	106	664	30	**800**
1999	151	579	30	**760**
2000	178	565	30	**773**
2001	130	577	28	**735**
2002	125	525	50	**700**
2003	138	728	38	**904**
2004	138	813	56	**1007**
2005	184	846	67	**1097**
2006	124	679	42	**845**
2007	126	751	64	**941**
2008	105	755	46	**906**
2009	86	699	30	**815**
2010	161	830	47	**1038**
2011	164	837	55	**1056**
2012	224	1048	57	**1329**
Average	**148.18**	**640.25**	**39.21**	**827.64**

Table 6: Number of Violent Crime Offenses reported to the FBI's Universal Crime Reporting Program by the Pickens County Sheriff's Office 1985-2012

Year	Murder And Non-Negligent Manslaughter	Forcible Rape	Robbery	Aggravated Assault	Violent Crime Total
1985	1	15	7	103	**126**
1986	3	12	8	95	**118**
1987	3	3	2	96	**104**
1988	3	11	6	104	**124**
1989	1	13	3	110	**127**
1990	3	19	9	157	**188**
1991	4	18	11	110	**143**
1992	0	16	10	115	**141**
1993	3	27	6	158	**194**
1994	0	25	2	135	**162**
1995	1	15	8	113	**137**
1996	1	18	6	108	**133**
1997	0	14	16	145	**175**
1998	4	28	15	112	**159**
1999	3	19	19	162	**203**
2000	0	15	16	134	**165**
2001*	0	9	9	74	**92**
2002	1	31	11	230	**273**
2003	1	29	25	70	**125**
2004	0	29	11	179	**219**
2005	2	17	7	206	**232**
2006	4	23	7	182	**216**
2007	0	27	12	208	**247**
2008	0	25	12	212	**249**
2009	2	35	22	203	**263**
2010	4	25	12	221	**262**
2011	7	11	18	186	**222**
2012	4	14	16	220	**254**
Average	1.96	19.39	10.93	148.14	**180.46**

* Only contains seven months of data

Table 7: Number of Property Crime Offenses reported to the FBI's Universal Crime Reporting Program by the Pickens County Sheriff's Office

Year	Burglary	Larceny-Theft	Motor Vehicle Theft	Property Crime Total
1985	288	399	40	**727**
1986	361	467	47	**875**
1987	238	480	40	**758**
1988	298	532	56	**886**
1989	296	549	64	**909**
1990	359	651	58	**1068**
1991	363	637	54	**1054**
1992	411	594	55	**1060**
1993	266	545	45	**856**
1994	290	585	56	**931**
1995	268	678	57	**1003**
1996	344	752	64	**1160**
1997	376	705	94	**1175**
1998	418	703	71	**1192**
1999	343	779	70	**1192**
2000	334	710	69	**1113**
2001*	189	382	56	**627**
2002	533	904	141	**1578**
2003	457	520	115	**1092**
2004	458	1009	176	**1643**
2005	621	1224	158	**2003**
2006	493	1046	203	**1742**
2007	559	1144	213	**1916**
2008	491	1053	213	**1757**
2009	420	1106	136	**1662**
2010	610	1225	171	**2006**
2011	633	1326	196	**2155**
2012	608	1285	203	**2096**
Average	**404.46**	**785.36**	**104.32**	**1294.14**

* Only contains seven months of data

3.2.2 Potential future civil disturbance and crime events

The recurrence interval of a particular hazard event is a statistical estimate of time between the events. Table 8 shows the recurrence intervals of violent and property crimes in days for the City of Clemson, Easley, and Pickens County. Statistics are not available for the municipalities of Pickens, Central or Liberty, as their populations fall below the reporting threshold. The Pickens County Sheriff's Office serves the communities of Six Mile and Norris, so their crime rates are included in the Pickens County data.

Table 8: Recurrence Interval in Days and Percent Chance of Occurrence per Day of Violent Crime and Property Crime

Location	Recurrence Interval in Days		Probability per Day	
	Violent Crime	Property Crime	Violent Crime	Property Crime
City of Clemson	9.88	0.81	10%	123%
Easley	4.56	0.44	22%	227%
Pickens County	2.01	.28	50%	356%

This table shows that, statistically, a violent crime is reported to the City of Clemson Police Department every 9.88 days; to the Easley Police Department every 4.56 days; and to the Pickens County Sheriff's Office every 2.01 days. This represents a probability of occurring per day of 10%, 22%, and 50% respectively. This table also shows higher frequencies of property crimes with the recurrence intervals being 0.81, 0.44, and 0.28 days for the City of Clemson, Easley, and Pickens County respectively, which correspond to 123%, 227%, and 356% chance of occurring per day. Crime in the City of Clemson decreased since the last hazard mitigation plan was developed, but increased in the City of Easley and within Pickens County Sheriff's Office jurisdiction.

Recurrence interval is a statistical means to determine the frequency of an event, however, crime and civil disturbance are human caused intentional acts, and therefore cannot be predicted with precision. While the recurrence interval and probability numbers appear to suggest that it is more likely that crime would be committed in areas outside of Easley and Clemson, these statistics do not take crime occurrences per capita into consideration. Additionally, according to the FBI's caution against ranking UCR crime data, there are many factors that also influence the frequency and type of crimes being committed. These factors are:

- *Population density and degree of urbanization.*
- *Variations in composition of the population, particularly youth concentration.*
- *Stability of the population with respect to residents' mobility, commuting patterns, and transient factors.*
- *Modes of transportation and highway system.*
- *Economic conditions, including median income, poverty level, and job availability.*

- *Cultural factors and education, recreational, and religious characteristics.*
- *Family conditions with respect to divorce and family cohesiveness.*
- *Climate*
- *Effective strength of law enforcement agencies.*
- *Administrative and investigative emphases of law enforcement.*
- *Policies of other components of the criminal justice system (i.e., prosecutorial, judicial, correctional, and probational).*
- *Citizens' attitudes toward crime.*
- *Crime reporting practices of the citizenry*. (U.S. Department of Justice *Caution Against Ranking*)

3.3 Dam/Levee Failure

Dams and levees are used for a variety of beneficial purposes including recreation, flood control, water storage, irrigation, mine tailings, electrical generation, debris control, and navigation. For as long as dams have been used, there has been a history of dam failures. As technology and engineering standards have improved, the safety of dams has also increased. However, all dams still face the possibility of failure.

Partial or complete failure of a dam happens when there is an uncontrolled release of the water held by the dam. This in turn can lead to the inundation of downstream areas which has the potential to cause loss of life or property. According to FEMA, dams and levees can fail for numerous reasons; the main ones are:

- **Overtopping**: the amount of water above the dam exceeds the capacity of the reservoir and spills over the top of the dam

- **Sabotage**: the intentional act of damaging a dam in order to cause it to fail

- **Structural failure**: materials used in the construction of the dam fail due to design errors, workmanship errors, or material flaws

- **Movement and/or foundation failure**: the foundation of the dam is insufficient to resist the force of the water pressing against it; can also refer to geological instability due to changing water levels

- **Piping and/or internal erosion**: when soil particles within the dam move due to water seeping through the levee or earthen dam, either weakening the dam/levee or creating a passage for water to move freely through the dam/levee wall

- **Inadequate maintenance and inspection**: regular inspection allows lesser failures or malfunctions to be discovered and corrected before leading to catastrophic failure (U.S. Department of Homeland Security *Why Dams Fail*)

3.3.1 Past dam/levee failure events

There is no record of a significant dam failure occurring within Pickens County. According to the South Carolina 2008 Hazard Assessment, there were 15 dam incidents in the state between 1975 and 2007, resulting in five deaths and one injury. In October 2015, a 1,000 year rain event in the state caused 51 regulated dams to fail, but none were within Pickens County (South Carolina Department of Health and Environmental Control).

3.3.2 Explanation of potential future dam/levee events

Due to the fact that there have been no dam failures recorded within Pickens County, no future probability can be calculated for this hazard type. Dividing zero by any number of years on record would result in a zero probability, which is misleading. Just because no significant dam failures have occurred within Pickens County or its jurisdictions for the years that data is available, does not mean the potential does not exist. The inappropriateness of the probability equation applies equally to all jurisdictions within Pickens County for that same reason.

At least 93 dams are located within one mile of Pickens County, including 82 within the county itself. Of the 82 dams within the county, 72 are included on the National Inventory of Dams (NID). To be included in the NID, dams must meet one or more of the following conditions:

1) *High hazard classification – loss of one human life is likely if the dam fails;*
2) *Significant hazard classification – possible loss of human life and likely significant property or environmental destruction,*
3) *Equal or exceed 25 feet in height and exceed 15 acre-feet in storage*
4) *Equal or exceed 50 acre-feet storage and exceed 6 feet in height.*

(US Department of Defense *National Inventory of Dams*)

The Interagency Committee for Dam Safety created a hazard potential classification system to guide dam design criteria. While this classification system is based on probable loss of life and economic, environmental, and lifeline impacts, a dam classified as low hazard potential is not free from risks. Any dam that fails could be dangerous to life and property downstream.

As given by the Interagency Committee for Dam Safety's publication *Federal Guidelines to Dam Safety Hazard Potential Classification System for Dams*, the classifications are as follows:

1. LOW HAZARD POTENTIAL

Dams assigned the low hazard potential classification are those where failure or misoperation [sic] *results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.*

2. SIGNIFICANT HAZARD POTENTIAL

Dams assigned the significant hazard potential classification are those dams where failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominately rural or agricultural areas but could be located in areas with population and significant infrastructure.

3. HIGH HAZARD POTENTIAL

Dams assigned the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life (U.S. Department of Homeland Security *Federal Guide*).

Table 9 is the summary of the classification system provided by *Hazard Potential Classification System for Dams*

Table 9: Dam Hazard Classification (US Department of Homeland Security *Federal Guide*)

Hazard Potential Classification	Loss of Human Life	Economic, Environmental, Lifeline Losses
Low	None expected	Low and generally limited to owner
Significant	None expected	Yes
High	Probable. One or more expected	Yes (but not necessary for this classification)

Figure 9 shows the location and hazard classification for all the dams within one mile of Pickens County. Of the 93 dams, 74 are classified as low hazard potential dams, 9 are classified as significant hazard potential dams, and 10 are classified as high hazard potential dams. Figure 10 identifies each of the high hazard potential dams. Table 10 provides more details about these dams.

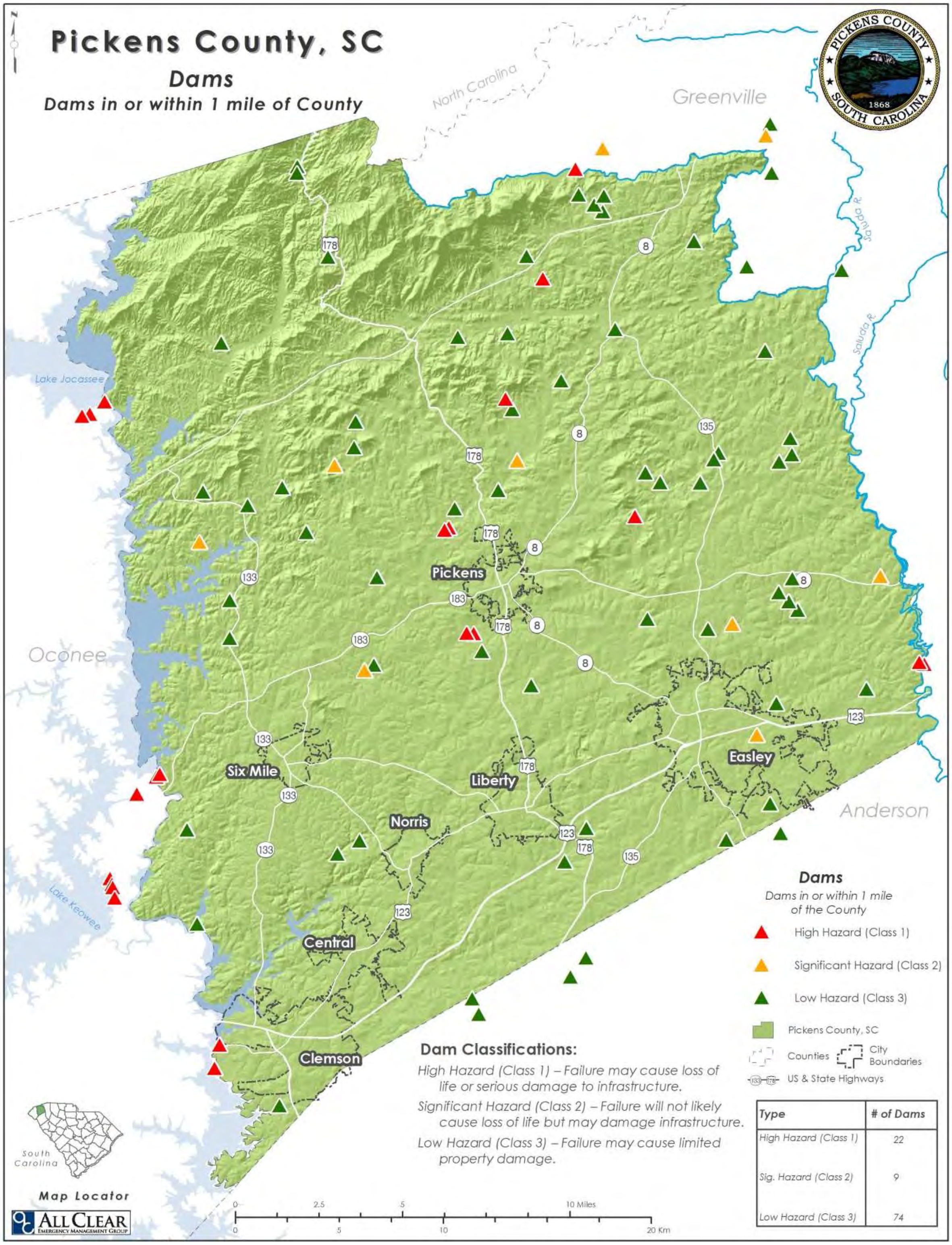


Figure 9: Dam Classifications
Green represents low hazard potential, yellow represents significant hazard potential, and red represents high hazard potential.

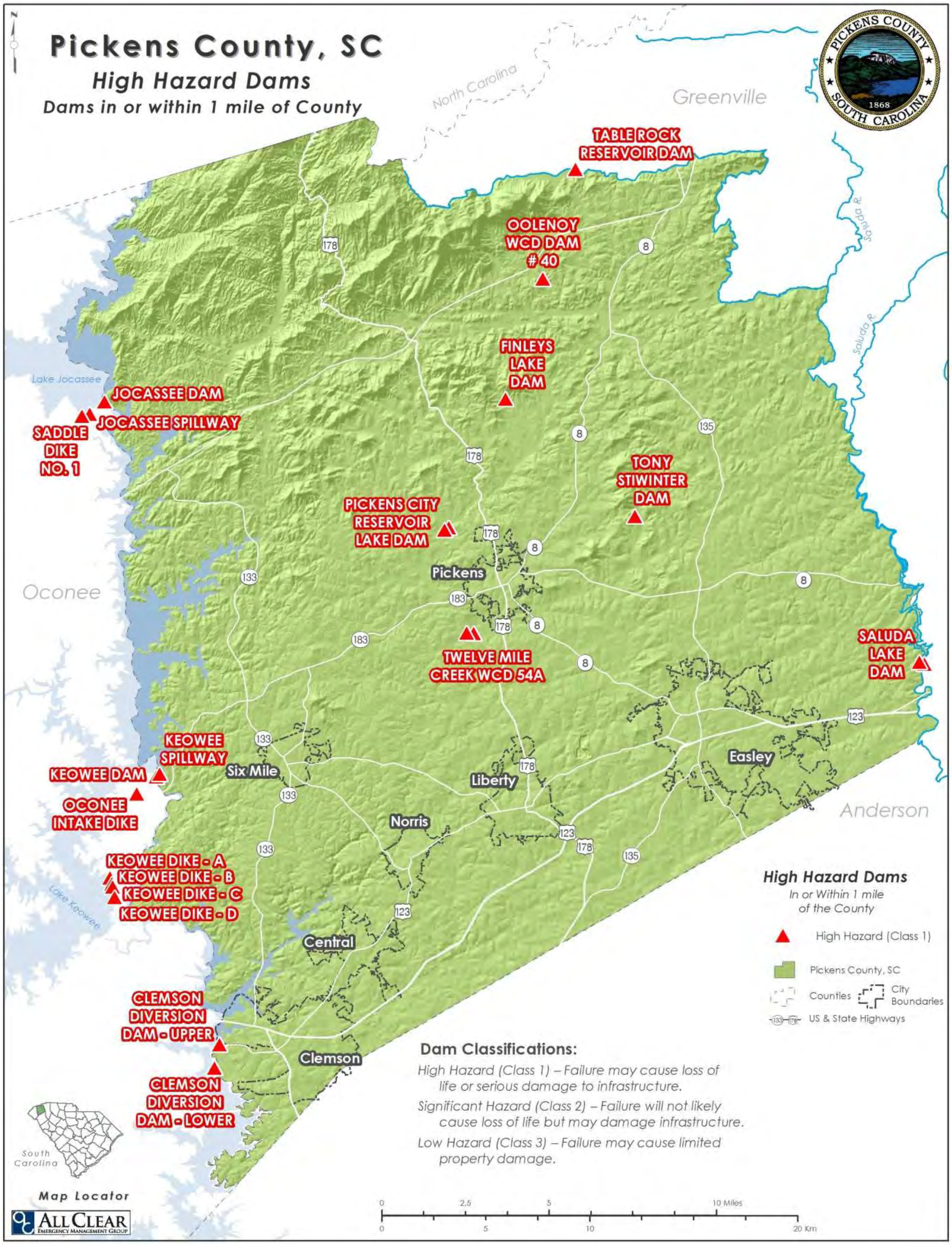


Figure 10: High Hazard Dams

Table 10: Details of High Hazard Potential Dams (U.S. Department of Defense *National Inventory of Dams*)

Dam Name	Ownership	Year Completed/ Modified	Max Storage (acre-feet)	Last Inspection Date
Table Rock Reservoir	Local Government	1925 / 1980	30,000	12/5/13
Saluda Dam	Utility	1905	7,519	6/1/2015
Oolenoy WCD Dam #40	State	1984	2,600	2/23/2015
Twelve Mile Creek WCD #22	Local Government	1960	1,800	5/13/2015
Pickens City Reservoir Lake Dam	Local Government	1956	377	11/26/2001
Finley's Lake Dam	Private	1956	174	4/2/2014
Tony Stiwinter Dam	Private	1989	5	4/2/2014
Jocassee Dam	Utility	1973	1,160,298	7/29/2015
Jocassee Spillway	Utility	1973	1,160,298	7/29/215
Keowee Dam	Utility	1971	955,586	7/25/2015
Keowee Spillway	Utility	1971	955,586	7/28/2015
Oconee Intake Dike	Utility	1971	955,586	7/28/2015
Saddle Dike No.1	Utility	1973	1,160,298	7/29/2015
Keowee Dike A	Utility	1969	955,586	7/28/2015
Keowee Dike B	Utility	1969	955,586	7/28/2015
Keowee Dike C	Utility	1969	955,586	7/28/2015
Keowee Dike D	Utility	1969	955,586	7/28/2015
Upper Clemson Diversion Dam	Federal Government	1961	0	7/24/2012
Lower Clemson Diversion Dam	Federal Government	1961	0	7/24/2012

The dams of highest concern to Pickens County Emergency Management during their previously undertaken risk assessment were the Keowee Dam system, Jocassee Dam system, and the Clemson diversion dams.

3.4 Disruption of Transportation Systems

Transportation systems move people, animals, and goods from one location to another using various modes, including air, pipeline, rail, road, and water. Safe, reliable transportation systems are vital to any society; and disruption of those systems can pose a hazard to that community.

Transportation systems are more than just a vehicle and a driver; for systems to operate there must be infrastructure in place. A path must exist for the vehicle to move from one location to another safely. These paths include airways, canals, pipelines, railways, roads, and waterways. In addition to these paths, terminals must be in places for exchange of passengers, the sending and receiving of cargo, and maintenance of the vehicles. Common terminals are airports, bus stations, refueling depots (including gas stations), seaports, train stations, trucking terminals, and warehouses. Vehicles, such as airplanes, automobiles, bicycles, boats and barges, buses, helicopters, trains, and trucks make up the next component of transportation systems. The last component of transportation systems is operations. Private transport is operated by the owner; public transportation or freight transport can be operated by a government or private company.

The disruption of a transportation system is a hazard that has multiple causes. For instance, other hazards, either manmade or natural, can cause transportation disruption as a secondary hazard. Dam failure may make waterways impassible; utility disruption could leave gas stations without gasoline; earthquakes may destroy runways or railways; floods, hazardous material spills, landslides or erosion all have the ability to shutdown roadways. Severe storms and winter or ice storms may immobilize transportation systems for days. These are just a few ways other hazards can cause disruption to transportation systems. Likewise, transportation problems can also cause disruptions. Motor vehicle accidents may close roads, trains can derail, airplanes and helicopters can crash, and bridges may collapse (Overview of Transportation Engineering).

Transportation disruption can lead to fatalities, injuries, hazardous materials (hazmat) emergencies, environmental and property damage, economic consequences, delay or stoppages of goods and services delivery, and delay emergency responses (City of Hillsboro).

3.4.1 Past transportation system disruption events

The South Carolina Department of Public Safety reported that 11,773 motor vehicle accidents occurred in Pickens County from 2010 through 2014, resulting in 75 deaths and 4,507 injured persons (South Carolina Department of Public Safety *2010-2014*).

Most transportation system disruptions are minor and short lived; thus there is no reliable record of them, however there are notable exceptions. For example, the derailment of 24 cars of a Norfolk Southern train on June 10, 2010, caused a disruption in the transportation system. The railway was closed for two days while workers removed the derailed and damaged freight and tanker cars from the tracks. Clean-up efforts also forced the closure of nearby roads due to the heavy equipment required. It is reported that the damage to the tracks was approximately $650,000 (Eleazer).

Another incident that impacted transportation was the severe winter storm over a two day period in January 2011. Up to nine inches of snow fell in Pickens County, and ice formed on roads causing severely hazardous driving conditions. This storm required the assistance of South Carolina Army National Guard who provided transportation support for first responders (South Carolina Emergency Management Division *News Releases* and South Carolina Emergency Management Division *Situation Reports*).

More recently, the October 2015 storms caused several roads throughout Pickens County to close due to flooded roadways. Crews had to work to clear trees and a clogged drain before the Maw Bridge Road could be opened again and repair the roadway when a bridge on Poplar Mountain Road was damaged due to erosion and subsequently closed (Shaw, 2015).

3.4.2 Explanation of potential future transportation system disruption events

Figure 11 shows the location of major transportation systems within Pickens County. As noted on the map, many highways, roads, and bridges exist. There are also three main railway lines, one traversing the county, going through the communities of Clemson, Central, Norris, Liberty, and Easley; a line that goes between Easley and Pickens; and a third line that goes through Pendleton, and south of Clemson.

The figure also shows the one public airport, Pickens County Airport, which is located just north of Liberty. The Amtrak station in Clemson, and the Clemson Area Transit, a public bus transportation system, are not noted on the map.

The transportation network is vital to the residents of Pickens County because of the geographic characteristics of the county. Many residents live in subdivisions that have only a limited number of access roads. Due to the number of streams, creeks, and other waterways in the county, many of these access routes have bridges. If either the roads or bridges become impassable in an emergency, residents would be cut off from evacuation routes and first responders would not be able to reach those in need.

Transportation disruption is not only a hazard that can be caused by other hazards, but it is a hazard that can cause other emergencies. The train derailment in Liberty caused a hazardous material release, which posed a risk to local residents, the crews involved in recovery, and the environment. Furthermore, when transportation is disrupted for a longer period of time or over a larger geographic area, the delivery or shipment of goods can be severely impacted. This could have negative consequences for the local economy, as approximately 50% of the non-agriculture labor force in Pickens County works in manufacturing, wholesale, or retail (Pickens County *Economic Characteristics*), all of which depend on the ability to receive raw materials or goods and to send out or sell their products.

Additionally, the most important element identified in the risk assessment Pickens County conducted prior to commissioning the 2011 hazard mitigation plan was the food supply. Without a safe means of transportation, the food supply could be cut off, threatening the health and well-being of the residents of Pickens County. Also identified on the county's risk assessment pertaining to transportation systems were the railroad, road network, fuel supply, and the Pickens County airport. The assessment indicated that the railroads, road network, and fuel supplies had an equal level of risk, which was slightly less than the risk level associated with the food supply, but are still considered very important to the health and safety of the county. The airport had the lowest level of risk of all the elements evaluated on the assessment, and is considered somewhat important in relation to these other elements.

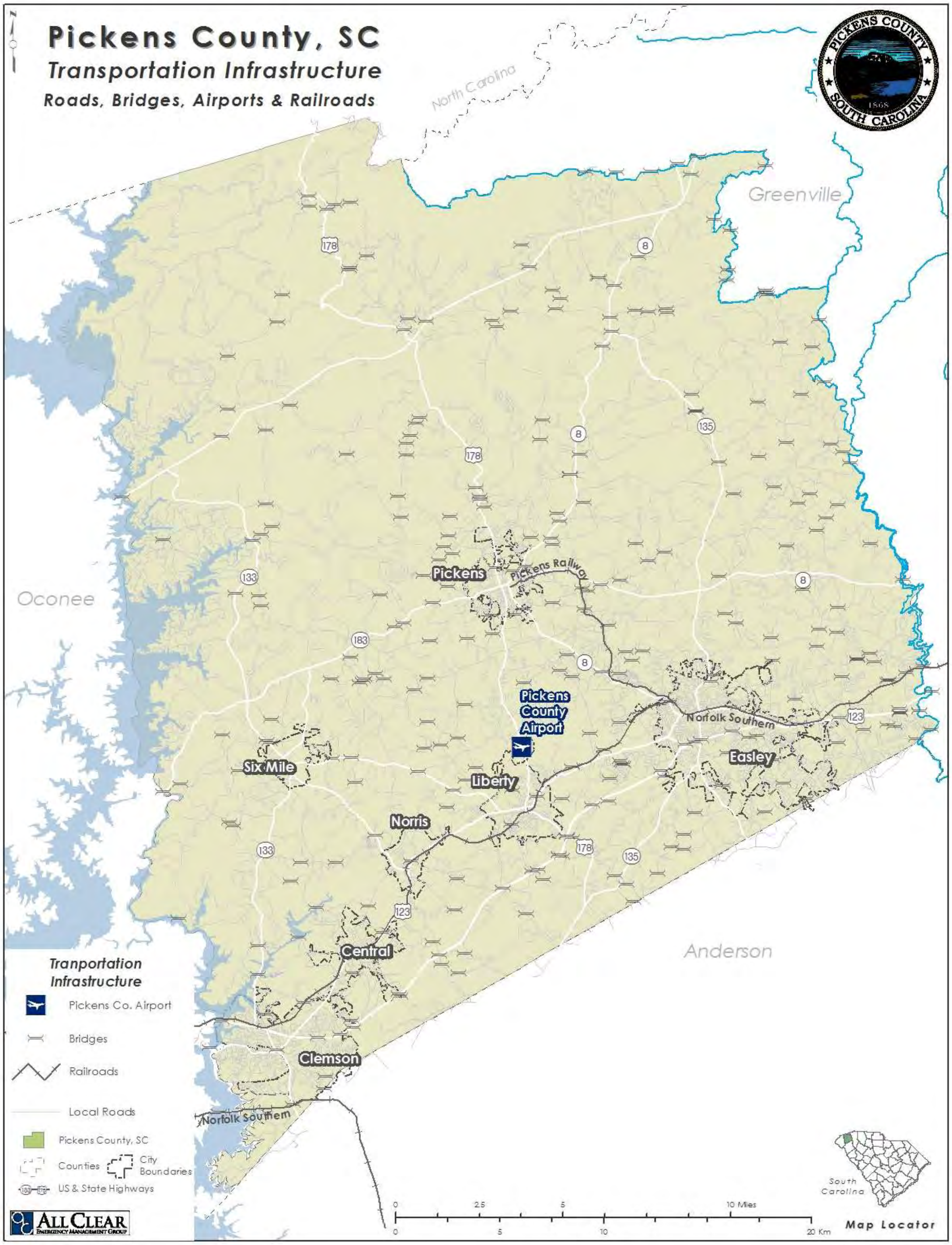


Figure 11: Major Transportation System Components

3.5 Disruption of Utility Services

Utilities refer not only to electricity, natural gas, water, wastewater, and telecommunication services, but the infrastructure required to provide service to communities. Similar to disruption of transportation, disruption of utility services can be caused by other hazards and contribute to other emergencies.

Utilities are networked systems, meaning there are nodes and links. Nodes can be substations, pumping stations, switching offices, treatment stations, or others. Links are simply the pipes or lines that run between nodes and carry the electricity, water, wastewater, natural gas, or signals. The distributed nature of utility systems make them vulnerable to a variety of hazards, but effects of such damage is difficult to quantify, as it depends on the location of the problem, the amount of redundancy in the system, and the ability of the system to cope with the losses.

Electrical utilities are subject to outages due to severe weather, maintenance, accidents, and demand exceeding capabilities. Severe weather is the most common reason customers may lose power. Lightning can cause outages by striking electrical equipment directly or by hitting trees, which can then fall onto power lines. Another weather related cause of power outages is an ice storm. When ice builds up on power lines it may become too heavy for the lines or the poles, and cause the lines or poles to fall. Similarly, ice on trees becomes too heavy for the branches or the entire tree to remain standing, and they can then fall onto lines, knocking them out and causing an electricity outage. Trees also become a hazard in high wind events, such as those from tornadoes, hurricanes, severe storms, or downbursts. Again, the strong wind can blow branches or trees onto the lines, or strong winds can cause the lines to touch, creating a short circuit. When electrical equipment comes into contact with water, it can become severely damaged, so in the event of riverine or flash flooding, technicians may shut off power to that node to prevent irreparable damage.

Other causes of electrical outages are accidents and high demand. Vehicles may crash into poles and break them, resulting in broken lines. Construction accidents can cut or short out power lines, resulting in loss of service to some residents. Occasionally, during times of high usage, demand can exceed supply, causing some customers to experience blackouts. Routine maintenance can also cause electrical outages, but unlike most causes, it is known about before the service interruption.

Adverse weather events can also pose a threat to natural gas systems. Flooding does not usually affect the pipelines, as they are pressurized, but can cause problems for compressor stations, which run on electrical power. Earthquakes, landslides, erosion, and other small ground movements however can cause distribution and transmission pipes above and below ground to break. Furthermore, tornadoes and other high wind events can uproot or rupture natural gas pipelines.

Potable water distribution systems face similar hazards as natural gas pipelines. Pipes are not normally affected by floods, but are subject to rupture from earthquakes, landslides, erosion, and ground settlement. Construction accidents can also damage water distribution pipes. However, water treatment plants are frequently located in flood prone areas because they need a fresh water source. During times of riverine or flash flooding, untreated water can inundate the plant limiting its ability to treat the drinking water. The result of flooding is then raw or inadequately treated water entering the distribution system. Earthquakes may also damage a treatment plant and power outages can prevent pumps from operating. Water systems that rely on wells are also threatened by floods, as the flood waters contaminate the well heads. Water mains may also rupture during times of extreme cold due to frost action.

Another threat to water systems is contamination or pollution of the water. This can be from a deliberate act or an accident. This is different than an outage, because the water is still distributed to residents; it is just of a quality that can pose a threat to the health and wellbeing of the community. Contamination of potable water sources may result in a boil advisory or an avoidance advisory, depending on the type of contamination. Individuals who do not heed the advisory, or consume water before the advisory is issued, may become ill. Businesses, such as restaurants, depend on clean water, and may have to close during times of contamination, and thus face an economic loss. Contamination may also occur when the domestic water system's source is not adequately analyzed for possible contaminants and complications and is not adequately treated before distribution, such as the case in Flint, Michigan.

Wastewater treatment plants and their sewer lines are another utility that are threatened by a variety of hazards. To facilitate collection, wastewater treatment plants are commonly located in geographic lows, making flooding the primary hazard of concern, whether the treatment plant is in a floodplain or not. When a wastewater treatment facility becomes flooded it may cause the plant to shut down partially or completely, or it may cause the release of untreated or partially treated water. Additionally, power outages can contribute to the release of untreated or partially treated water by shutting down treatment plants and lift stations. Flooding can also cause sewer lines to backup and overflow. Like water and natural gas utility systems, wastewater treatment facilities and sewer lines are threatened by earthquakes, landslides, and erosion. Also similar to potable water distribution systems, frost action may lead to the rupture of sewer pipes.

Telecommunication utilities provide telephone, radio, and television services. These utilities tend to be less hazard prone than others for many reasons. Flooding can cause outages; however, most telecommunication facilities are located outside of flood-prone areas to avoid this hazard. Most facilities are also located away from landslide prone areas, reducing the risk to that particular hazard. Broadcast radio and television antennas and cellular towers in hilly areas are an exception, and still threatened by landslides, as they are constructed along geographic highs to provide service to the greatest area possible. Significant landslides also pose a hazard to telecommunication cables that are buried in the ground, as do larger earthquakes, but copper, fiber-optic, and coaxial cables usually have enough flexibility to withstand minor ground movement. Like electricity utilities, telecommunication utilities also can have above ground lines that are subjected to hazards such as wind and ice. However, telecommunication cables are less likely to short circuit if they happen to come into contact with each other because they have a lower voltage than electrical lines. Facilities without a backup power source may also be susceptible to power outages (City of Hillsboro).

3.5.1 Past utility services disruption events

No comprehensive records about past utility service disruptions could be found, but there were two recent instances reported in local media outlets. On November 30, 2010, a tornado hit the City of Easley, and caused power and gas outages and a few minor gas leaks (DiBagno). Additionally, during the winter storm that occurred January 10-11, 2011, Blue Ridge Electric reported that 71 of their customers in Pickens County lost electricity (Blue Ridge Electric). A boil advisory was issued for three Clemson neighborhoods on October 27, 2016 due to low pressure in the distribution system caused by a water line tie-in (Cumberbatch, 2016).

3.5.2 Explanation of potential future utility services disruptions events

Pickens County is home to many utility systems, each of which consists of a variety of facilities and their specific distribution network. Figure 12 shows the location of many of these facilities. Due to the scale of the map, areas that have multiple facilities of the same type of utility located in close proximity to each other are designated with the utility symbol followed by a superscript x and the number of facilities in that area. For example, the map shows "**EP^{x4}**" in Easley, which means there are four electrical power facilities close together in the city.
The other symbols on the map are **S** for sewage treatment facilities, **W** for water storage facilities,  for water treatment plants, and  for towers. Distribution components of utility systems are not included on the map because the data is incomplete and might prove to be misleading if incorporated on the utility map. Additionally, there was no available data regarding the location of the natural gas facilities and telecommunication facilities in Pickens County.

Within one mile of Pickens County, there are 15 **electrical power facilities**, as indicated on Figure 12, all of which are owned by Duke Energy. When the power goes out, it can be more than just an inconvenience for residents and businesses. Hospitals have backup power sources to deal with electricity outages, but people dependent upon electricity powered home medical devices usually do not, and therefore, are of the highest risk during a power outage. Additionally, during periods of extreme heat or extreme cold the health of young children, the elderly, and individuals with certain medical conditions can be placed in jeopardy without air conditioning or heat. If there is no electricity, refrigerators will not keep food from spoiling after a few short hours, so an unsafe food supply becomes a threat. Most businesses cannot operate without electricity, so there is a potential for economic losses as well. Even traffic lights fail to operate creating a danger on the roadways. If a power outage is caused by downed power lines, the lines themselves are extremely dangerous. Loss of electrical utilities can cause other utilities to experience outages, as was discussed previously (City of Hillsboro).

When **natural gas lines** fail, there is the potential for explosions or fires, which can injure or kill individuals and destroy property. While most explosions and fires are limited to one structure, on September 9, 2010, a massive natural gas explosion and subsequent fire in San Bruno, California, killed eight people (Melvin), injured more than 50, destroyed 38 houses, and damaged another 120 (Gomez et al.). Catastrophes of this severity are unusual, as the more common danger to residents experiencing a natural gas utility failure is the inability to heat homes during cold weather.

Water utility outages also have the potential for serious consequences. If there is a problem resulting in disruption with one of the six drinking water treatment plants, the 28 water storage facilities, or any of the distribution lines serving Pickens County, fire hydrants may not have enough water to help fight fires, resulting in more damage than normal from structural fires. A lack of water can have economic consequences too. If restaurants or businesses cannot adequately sanitize their facilities, they will have to temporarily close or risk the health of customers. Businesses that depend on water cooled machinery can also experience an economic loss if their machinery overheats or they shut the equipment down to prevent overheating. Furthermore, a water main break can create localized flooding problems which can cause property damage of varying degrees.

The disruption of **wastewater utilities** can be a health hazard as well. Untreated or inadequately treated wastewater that is released from any of the 18 local sewage treatment facilities or sewer lines can contaminate the immediate area, seep into the groundwater, or enter surficial waterways. If the wastewater enters groundwater or surface water, the contamination can spread widely, and drinking water sources may become unsafe and recreational areas may have to be closed to prevent inadvertent exposure (City of Hillsboro).

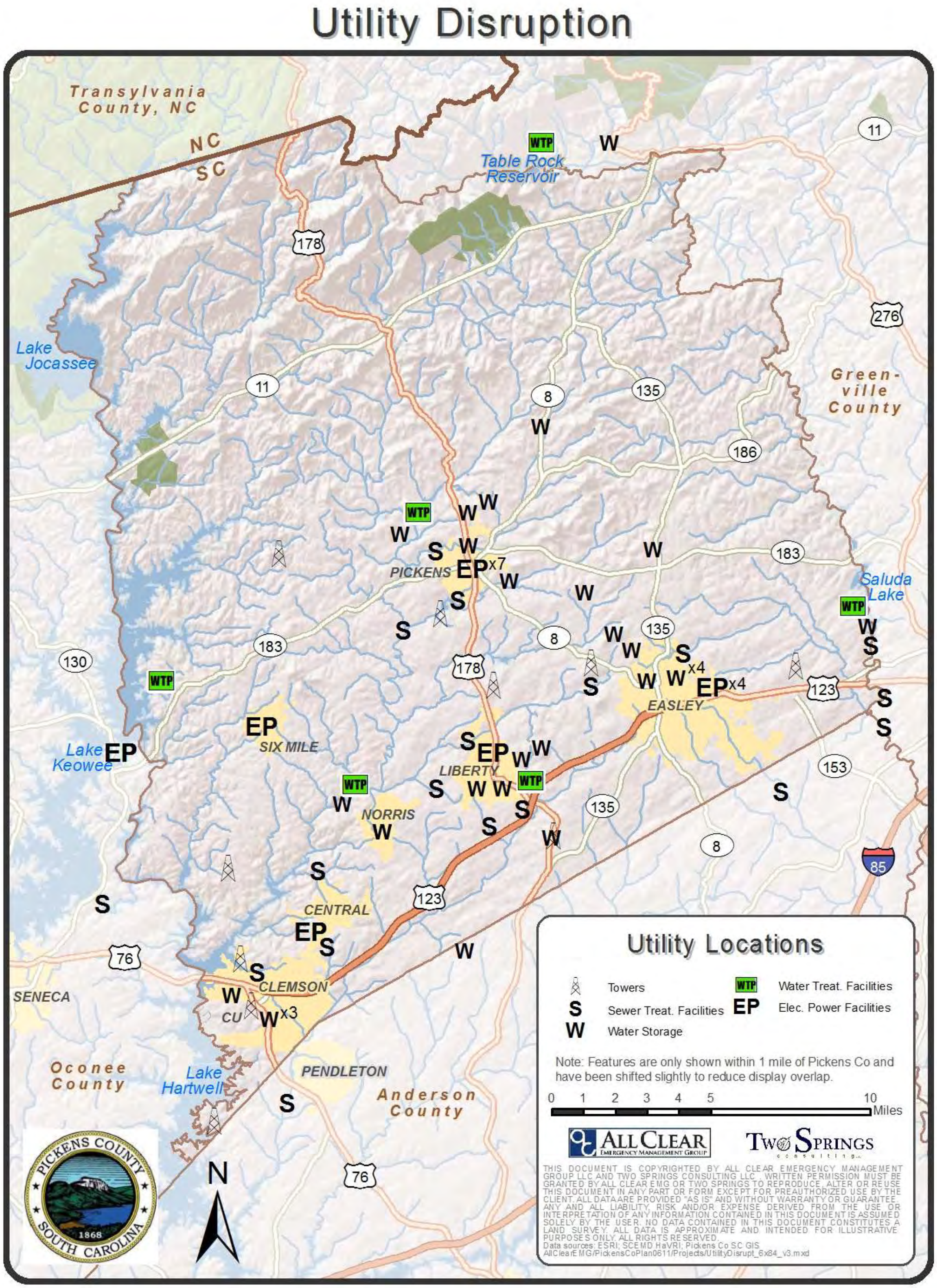


Figure 12: Utility System Components

(Note: Updated GIS data not available for the latest plan update)

Figure 12 also shows ten **towers** located in the county; however, some are not for utility services. There are two water towers near Liberty and three watch towers: the Issaqueena Lookout Tower, Clemson Lookout Tower, and Woodall Lookout Tower. There are three AM radio towers, corresponding to WCCP in Clemson, WTBI in Pickens, and WELP in Easley, and two FM radio towers for WSBF in Clemson, and WLWZ in Easley. These radio stations, as well as television stations located in neighboring areas, can provide a vital link to the community during an emergency, allowing authorities to disseminate information to as many people as possible in a short as possible time frame. If other telecommunication utility systems, such as landline and cellular telephones, experience an outage, it can prevent residents of Pickens County without a way to call for help in an emergency. Business also face the potential for productivity losses if telephone or internet services are not functioning, which may result in economic losses.

3.6 Drought

Drought is a phenomenon that can have lasting agricultural, environmental, and economic consequences. However, droughts are difficult to define with precision because the impacts they have vary region to region.

Meteorological drought occurs when there are less than usual amounts of precipitation over a certain period of time. This is a much generalized definition because it depends on a region's specific climate.

Agricultural droughts affect crop production or the local ecology of a region, and may occur independently or as a result from meteorological or hydrological droughts. Because the amount of water a plant needs depends on soil properties, weather conditions, its stage of development, and individual characteristics of the plant itself, the determination of agricultural droughts need to account for these varied factors.

Hydrological droughts are a third type of drought. These types of droughts occur when the effects of meteorological droughts are evident in surface and subsurface water systems, meaning, when streamflow, lake and reservoir levels, and groundwater supplies are lower than normal. Because it takes longer for the effects of precipitation short falls to show up in the hydrological cycle, the effects of hydrological droughts lag behind those of meteorological or agricultural droughts, thus prolonging the duration of a drought hazard.

Many goods and services, such as water, food, and hydroelectric power, are dependent upon water supply, and when there is an inadequate supply of water to meet the demand for those services due to meteorological, agricultural, or hydrological drought, it is classified as a **socioeconomic drought**. This type of drought differs from the previous three as it is dependent on supply and demand (Types of Drought).

The National Oceanic and Atmospheric Administration's (NOAA) U.S. Drought Monitor categorizes drought conditions not on type but on intensity instead. The intensity categories correspond to the Palmer Drought Index, which uses temperature and rainfall data to determine wetness, and is standardized to local climate. The U.S. Drought Monitor intensity categories are:

D0 Abnormally Dry—corresponds to a Palmer Drought Index (PDI) of -1.0 to -1.9 and is characterized by slow planting and growth of crops or lingering water deficits if coming out of drought.

D1 Moderate Drought—corresponds to a PDI of -2.0 to -2.9 and characterized by damage to crops and pastures, low water levels in streams, wells, and reservoirs, water shortages developing.

D2 Severe Drought—corresponds to a PDI of -3.0 to -3.9 and characterized by likely crop and pasture losses, water shortages. Water restrictions are imposed.

D3 Extreme Drought—corresponds to a PDI of -4.0 to -4.9 and characterized by major crop and pasture losses, widespread water shortages and restrictions.

D4 Exceptional Drought—corresponds to a PDI of -5.0 or less and characterized by water emergencies caused by shortages of water in wells, streams, and reservoirs and exceptional crop and pasture losses (U.S. Drought Monitor Drought Severity Classification).

The South Carolina State Climatology Office (SCO) uses a slightly different drought classification system with following classifications:

Incipient Drought—a threat of drought is present and calls for an increase of monitoring activities.

Moderate Drought—an increasing threat of drought is present and statements must be released to the news media and monitoring activities accelerated.

Severe Drought—a drought has increased to severe levels. It requires official declaration and water restrictions.

Extreme Drought—a drought has increased to extreme levels. Water restrictions are imposed (South Carolina Department of Natural Resources Drought Planning Response*)*.

3.6.1 Past drought events

Three databases were used to collect information regarding past instances of drought events in Pickens County. As drought occurs over a widespread area, county data is the same as jurisdiction data. No jurisdiction specific information is available. The National Climatic Data Center (NCDC) is a large archive of weather data maintained by the National Oceanic and Atmospheric Administration (NOAA). Its record for drought events includes data from 1993 until the present. The Spatial Hazard Events and Losses Database for the United States (SHELDUS), from the Hazards and Vulnerability

Research Institute (HVRI) at the University of South Carolina, contains events that caused a loss or fatality between 1960 and 1979, and from 1995 through 2008. Data from 1980 through 1994 only has events that caused a death or property or crop damage greater than $50,000, so there is the possibility of additional, unrecorded drought events (University of South Carolina). The final source used to collect past drought events data was the South Carolina State Climatology Office, which had detailed information from 1998 to the present. There were a total of 51 drought instances in Pickens County in 40 years of record with severities ranging between incipient to extreme. As drought occurs across wide areas, all jurisdictions are susceptible to droughts from incipient to extreme. These instances are listed individually in Table 11.

Table 11: Drought Events, 1977-2016, as listed in the SHELDUS, NCDC, or SCO databases.

Date	Severity	Source
7/1/1977*	Unspecified	SHELDUS
4/1/1978*	Unspecified	SHELDUS
10/1/1978*	Unspecified	SHELDUS
6/1/1983*	Unspecified	SHELDUS
6/1/1984*	Unspecified	SHELDUS
5/1/1986*	Unspecified	SHELDUS
6/1/1986*	Unspecified	SHELDUS
7/1/1986*	Unspecified	SHELDUS
2/1/1988*	Unspecified	SHELDUS
6/1/1988*	Unspecified	SHELDUS
7/1/1988*	Unspecified	SHELDUS
8/1/1988*	Unspecified	SHELDUS
7/1/1993*	Unspecified	SHELDUS
10/1/1993*	Unspecified	NCDC
5/1/1994*	Unspecified	NCDC
5/1/1995*	Unspecified	NCDC
7/1/1998 - 7/13/1998	Incipient	SCO
7/14/1998 - 7/28/1998	Moderate	SCO
7/29/1998 - 8/19/1998	Mild - Moderate	SCO
8/19/1998 - 9/10/1998	Incipient	SCO
11/10/1998 - 1/28/1999	Incipient	SCO
4/20/1999 - 5/4/1999	Incipient	SCO
6/8/1999 - 8/11/1999	Incipient	SCO
8/11/1999 - 9/9/1999	Moderate	SCO
9/9/1999 - 10/21/1999	Severe	SCO
10/21/1999 - 5/21/2000	Incipient	SCO
5/21/2000 - 6/19/2002	Moderate	SCO
6/19/2000 - 7/24/2002	Severe	SCO
7/24/2002 - 9/24/2002	Extreme	SCO
9/24/2002 - 11/21/2002	Severe	SCO
11/21/2002 - 4/24/2003	Incipient	SCO
5/1/2004*	Unspecified	NCDC
6/8/2004 - 6/28/2004	Incipient	SCO
8/16/2006 - 9/20/2006	Incipient	SCO

Date	Severity	Source
9/20/2006 - 2/23/2007	Moderate	SCO
2/23/2007 - 6/6/2007	Incipient	SCO
6/6/2007 - 9/5/2007	Moderate	SCO
9/5/2007 - 6/30/2008	Severe	SCO
6/30/2008 - 4/15/2009	Extreme	SCO
4/15/2009 - 6/10/2009	Moderate	SCO
9/2/2009 - 9/24/2009	Incipient	SCO
7/9/2010 - 9/8/2011	Incipient	SCO
9/8/2011 - 11/8/2011	Moderate	SCO
11/8/2011 – 4/25/2012	Severe	SCO
4/25/2012 – 9/27/2012	Moderate	SCO
9/27/2012 – 12/11/2012	Severe	SCO
12/11/2012 – 4/24/2013	Moderate	SCO
11/20/2014 – 1/15/2015	Incipient	SCO
7/16/2016 – 10/5/2015	Incipient	SCO
7/8/2016 – 10/26/2016	Moderate	SCO
10/26/2016†	Severe	SCO

* Duration of drought is unspecified, † Drought is ongoing as of publication (December 2016).

3.6.2 Explanation of potential future drought events

The period of 1977 through November 2016 gives a 40 year record for drought events, resulting in a recurrence interval of 0.78 years, based on 51 drought events. This means that Pickens County and its jurisdictions have a 128% chance of experiencing a drought in any given year, making it a likely hazard. As drought is a widespread phenomenon, all jurisdictions are equally susceptible. Figure 13 is the most recent U.S. Drought Monitor for South Carolina. It was released November 23, 2016. Pickens County has two different drought classifications present; D3 (extreme drought) along the border with North Carolina and D4 (exceptional drought) covering the vast majority of the county. Each of the municipalities in Pickens County are located within the exceptional drought area. The U.S. Drought Monitor is updated seasonally and annually, and should be consulted for current conditions (U.S. Drought Monitor). Droughts are widespread phenomena, and as seen in Figure 13, have the potential to occur countywide. The current status of drought within the county ranges from abnormally dry to severe drought according to the U.S. Drought Monitor; the State Climatology Office classifies the drought for Pickens County as severe, as of October 26, 2016.

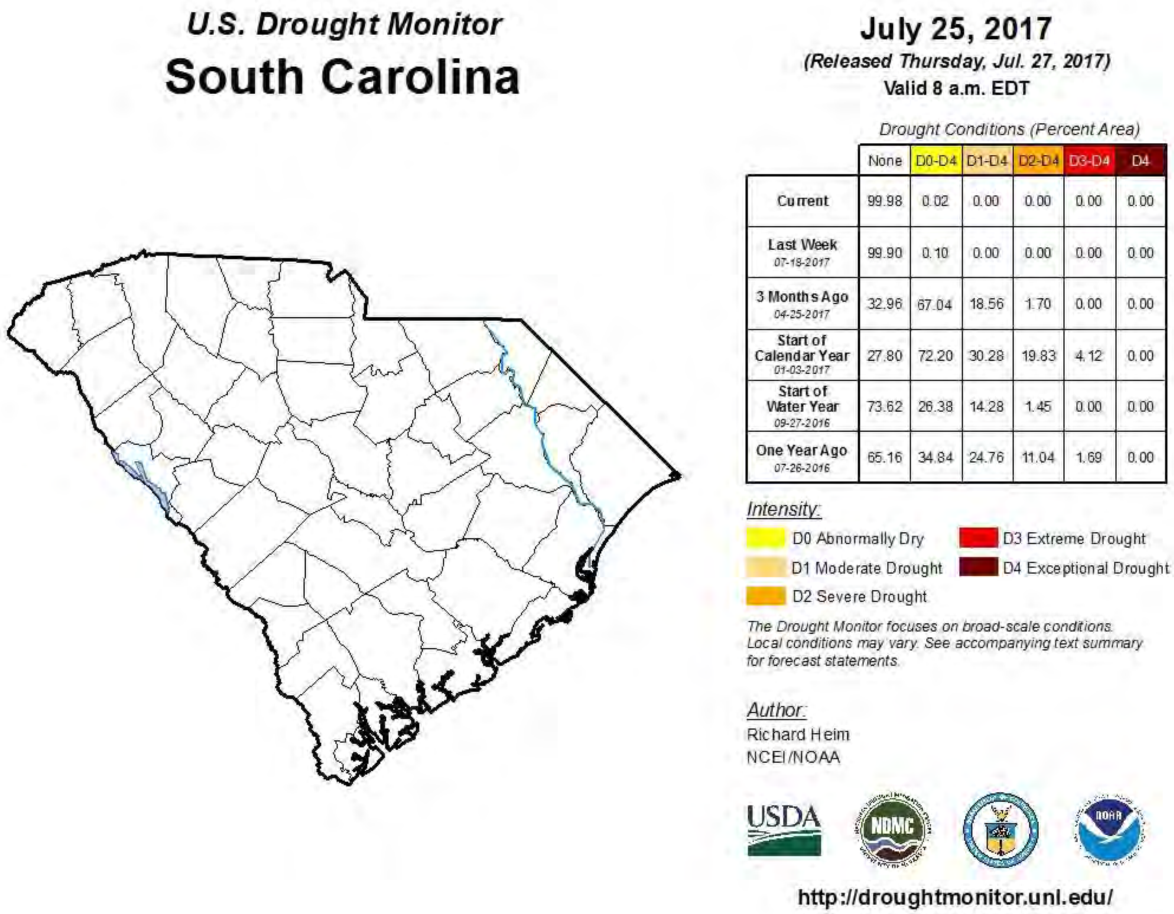


Figure 13: U.S. Drought Monitor for South Carolina (U.S. Drought Monitor)

If a drought were to occur, it could have serious agricultural, economic, and environmental consequences. Drought affects agriculture by limiting plant growth, which can decrease crop yield or decrease the quantity of food available for livestock. As of 2007, Pickens County has 12,662 acres of harvested cropland, only 779 of which are irrigated, and an estimated $8,247,000 total market value of agricultural production (South Carolina Emergency Management Division *South Carolina Hazard Mitigation Plan 2010*). In a case of a drought where there is inadequate water for irrigation, the farmers in the county could potentially lose that production value in failed crops and unhealthy livestock. Other economic consequences of drought include lost revenue from industrial users and recreational venues which experience water shortages. Electricity production may diminish too if water flowing through hydroelectric facilities decreases. Drought can also lead to erosion, further limiting the ability to grow crops. Environmentally, habitats can be destroyed as the ecology of the land may change completely during sustained droughts, and the risk of wildfires increases during dry conditions. Water quality can also degrade as a result of drought (Types of Drought).

3.7 Earthquake

An earthquake happens when the energy stored within the Earth's crust is released suddenly due to the breaking and movement of stressed rocks. The amount of ground shaking is dependent on the magnitude of the earthquake, which is measured on a logarithmic scale. The most commonly known scale is the Richter magnitude scale. Table 12 shows the frequency of earthquakes at various magnitudes, and the associated energy release.

Table 12: Frequency of Earthquakes of Various Magnitudes (Montgomery, p. 74)

Descriptor	Magnitude	Number per Year	Approximate Energy Released (ergs)
great	8 and over	1 to 2	over 5.8×10^{23}
major	7-7.9	18	$2\text{-}42 \times 10^{22}$
strong	6-6.9	120	$8\text{-}150 \times 10^{20}$
moderate	5-5.9	800	$3\text{-}55 \times 10^{19}$
light	4-4.9	6200	$1\text{-}20 \times 10^{18}$
minor	3-3.9	49,000	$4\text{-}72 \times 10^{16}$
very minor	2-2.9 <2	1000/day 8000/day	below $4\text{x}10^{16}$

Another way of describing the severity of an earthquake is by the effects it has on society. The Modified Mercalli Scale describes the intensity of an earthquake by relating it to the effects it has on people and structures, however, damage a particular earthquake may cause can vary from region to region depending on the population, building codes and materials, and proximity to the epicenter. Table 13 shows the Modified Mercalli Scale.

Earthquakes have the potential to cause destruction resulting from intense ground shaking, aftershocks, liquefaction, landslides, tsunamis, and fault ruptures. Ground shaking is usually the first indication that an earthquake is occurring; the degree of which depends on the ground material. Bedrock results in less shaking than softer sediment. Scientists describe the amount of shaking as a proportion of the acceleration due to gravity (g). If the vertical acceleration is greater than 1 g, objects overcome the effects of gravity, and are thrown into the air. In many places in the United States, homes can be damaged by as little as 0.1 g, which is equivalent to VII on the Modified Mercalli Scale. Pickens County was in the VII Mercalli intensity zone for the Charleston, South Carolina, earthquake of 1886. For comparison, the 6.7 magnitude Northridge earthquake in California in 1994 produced a maximum vertical acceleration of 0.93 g. Following an earthquake, other smaller earthquake events called aftershocks may cause the ground to shake as well.

Table 13: Modified Mercalli Scale for Earthquake Measurement (McConnell et al., p. 130)

Index	Effects of earthquake on people and structures
I	Not felt by people.
II	Felt by people at rest on upper floors of buildings.
III	May be felt by people indoors. Vibrations similar to the passing of a truck. Hanging objects swing.
IV	Felt indoors by many, outdoors by few. Dishes, windows, doors rattle; walls make creaking sound. Sensation like heavy truck passing building.
V	Felt by nearly everyone; many awakened from sleep. Some dishes, windows broken; doors swing open or closed. Unstable objects overturned. Liquids slosh around in containers.
VI	Felt by all; many frightened. Windows, dishes, glassware broken. Books knocked off shelves. Some heavy furniture moved; a few instances of fallen plaster. Trees shaken. Damage slight.
VII	Difficult to stand. Drivers notice, large bells ring. Slight to moderate damage in ordinary structures; considerable damage in poorly built or badly designed structures. Some chimneys broken, falling plaster, bricks, tiles.
VIII	Difficult to steer vehicles. Branches broken from trees. Slight damage in buildings designed to withstand earthquakes; heavy damage in poorly constructed structures. Chimneys, columns, monuments, walls may fall.
IX	Considerable damage in specially designed structures. Damage great in substantial buildings; partial collapse. Buildings shifted off foundations, underground pipes broken, reservoirs damaged. General panic.
X	Some well-built wooden structures destroyed; most masonry and frame structures with foundations destroyed. Serious damage to dams and embankments; landslides.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly, underground pipelines out of service.
XII	Total damage, objects thrown into air, widespread rockslides and slope failure.

Earthquakes can also cause landslides in areas with steep slopes, which is common near mountain ranges. These landslides are a hazard themselves, but can also create air quality problems by releasing large quantities of dust into the air. In areas where the subsurface geology is weak or saturated with groundwater, liquefaction may occur during an earthquake. The violent shaking causes water to separate from sediment, significantly weakening the underlying geological units. If the water is expelled, the ground surface may collapse, lowering the elevation significantly. Additional elevation changes may result directly from earthquakes due to uplift or subsidence (McConnell et al. and Montgomery).

3.7.1 Past earthquake events

Three databases were used to research past earthquake events that occurred near or were felt in Pickens County. These databases were the Earthquake Intensity Database maintained by the National Geophysical Data Center (NGDC), which had records from 1634-1985 (U.S. Department of Commerce *National Geophysical Data Center*), the Hazards and Vulnerability Research Institute which had data from 1698-2008 (University of South Carolina) and both theSouth Carolina Geological Survey and the US Geological Survey, which have recent earthquake activity as well as some historical information. It appears more earthquakes have occurred in later years; however this is a result of more sensitive equipment and better record keeping. Figure 14 shows the location and magnitude of some of the earthquakes that occurred in and around Pickens County and the location of faults that run through the county.

This map shows nine earthquakes that occurred within Pickens County between 1776 and August 2017, only one of which occurred since the last plan update. However, large earthquakes can be felt far from where they originate, so a map only showing epicenters in Pickens County will not paint an accurate picture of previous earthquake activity. Additionally, discrepancies may arise from differing data collection methods. Table 14 shows earthquakes on record that either occurred in Pickens County, or were felt there. The table includes the magnitude or the maximum Modified Mercalli Intensity of the earthquakes when the data was available.

The most destructive earthquake in South Carolina occurred on August 31, 1886, in Charleston. This earthquake registered a magnitude 7.3 and intensity X near the epicenter, and was felt as far away as Boston, Milwaukee, and Havana, Cuba (South Carolina Emergency Management Division *South Carolina Hazard Mitigation Plan 2010* and U.S. Department of the Interior *South Carolina: Earthquake History*). The Charleston earthquake was felt in Pickens County with an intensity VI (U.S. Department of Commerce *National Geophysical Data Center*), although some literature estimates it was VII. At this level of intensity, earthquakes can cause slight to moderate damage (Montgomery).

The largest earthquake centered in Pickens County occurred on October 20, 1924, and was magnitude 4.4 and intensity V on the Modified Mercalli Scale. This earthquake was felt over 145,000 square kilometers, shaking most of South Carolina, and parts of North Carolina, Georgia, and Tennessee (U.S. Department of the Interior *South Carolina: Earthquake History*).

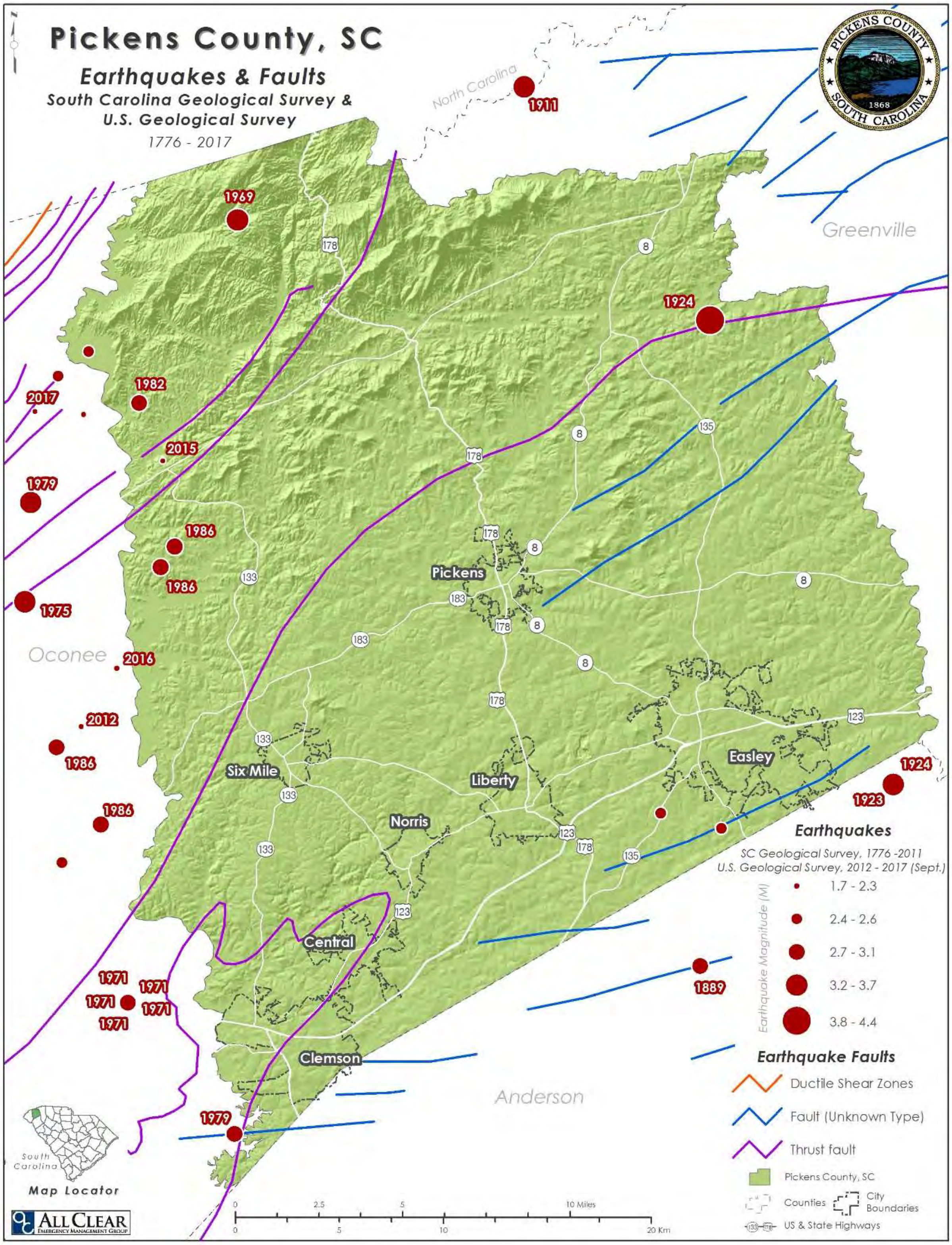


Figure 14: Previous Earthquakes near Pickens County, South Carolina

Table 14: Historical Record of Earthquakes Observed within Pickens County (U.S. Department of Commerce *National Geophysical Data Center* and University of South Carolina)

Date	Magnitude	Epicenter In/Near Pickens County	Maximum Modified Mercalli Intensity
September 1, 1886	7.3	No	VI
February 21, 1916	-	No	IV
January 1, 1924	3.3	Yes	-
October 20, 1924	4.4	Yes	V
November 3, 1928	-	No	IV
November 20, 1969	4.3	No	V
December 13, 1969	3.7	Yes	V
June 10, 1971	2.8	Yes	-
July 13, 1971	-	No	V
November 30, 1973	4.7	No	V
October 18, 1975	3.3	Yes	-
November 25, 1975	3.2	Yes	-
December 8, 1975	2.4	Yes	-
March 27, 1978	2.5	Yes	-
January 19, 1979	3.4	No	III
August 26, 1979	3.7	No	IV
February 13, 1986	2.5-3	Yes	III
September 25, 1989	1.8	Yes	-
March 5, 1999	<1	Yes	-
June 6, 2010	1.9	Yes	-
September 4, 2015	2.0	Yes	III

3.7.2 Explanation of potential future earthquake events

While individual earthquake events cannot be predicted, scientists have developed probabilistic ground motion maps which depict earthquake hazard as a probability of a certain amount of ground motion being exceeded in a 50-year period. Figure 15 shows the Peak Ground Acceleration Map for South Carolina that was created by the USGS National Seismic Hazard Mapping Project. This map is from 2014, and is updated from previous versions.

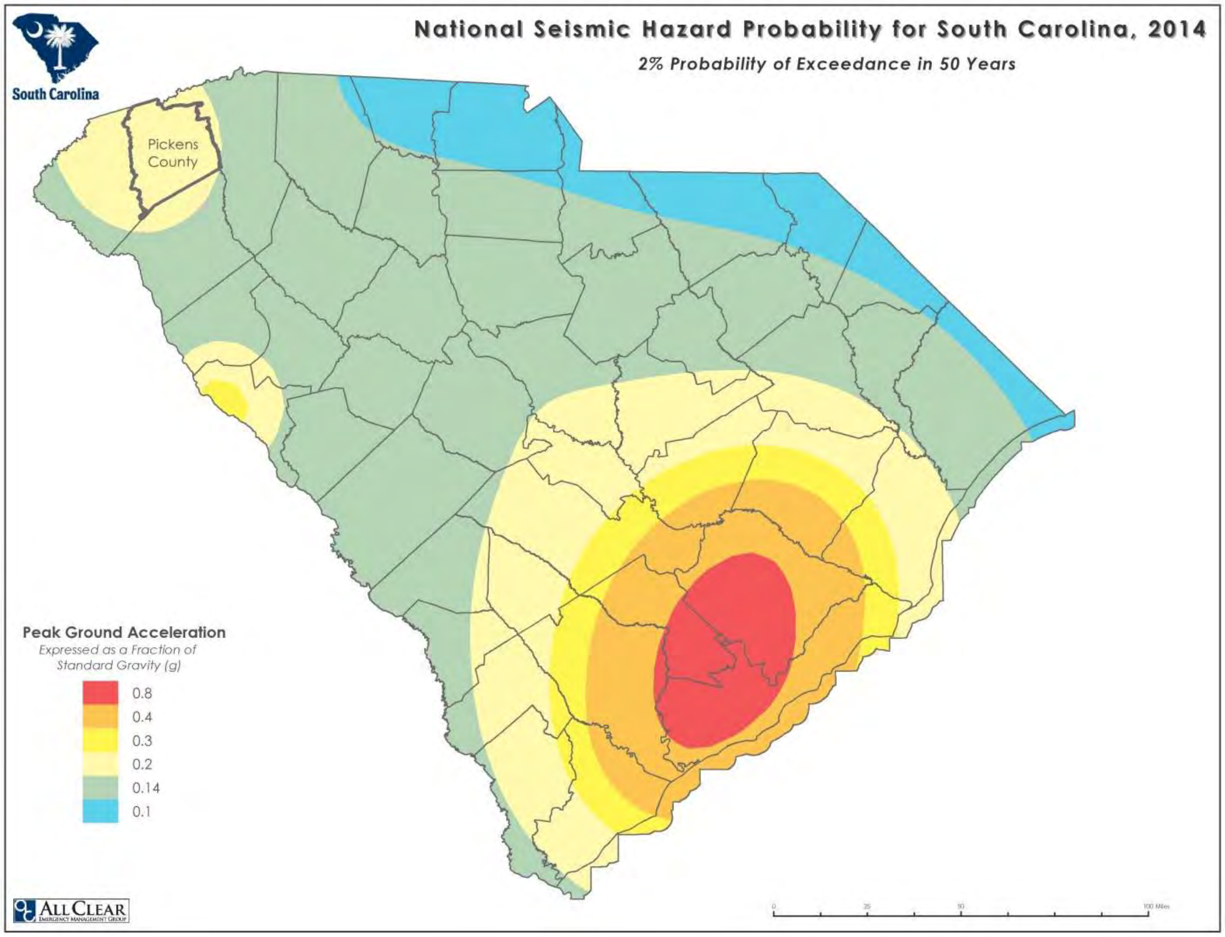


Figure 15: Peak ground acceleration (PGA) Map for South Carolina (Petersen, et al.).

This map shows that the earthquake peak ground acceleration (PGA) has a 2% chance of being exceeded in 50 years has a value between 20-30% g throughout Pickens County. This means that there is only a 2% chance that Pickens County will experience ground movement greater than 20-30% of the acceleration due to gravity in any 50 year period, which roughly corresponds to a Modified Mercalli Intensity of IV. The probability of an earthquake of this magnitude is the same throughout the entire county and therefore, each of the jurisdictions. Based on the number of earthquakes that have been documented as occurring or being felt in Pickens County over the past 382 years, there is a 5% chance per year of an earthquake of any magnitude affecting Pickens County.

According to the State of South Carolina Hazard Mitigation Plan for 2013 the Piedmont/Blue Ridge region, of which Pickens County is a part, has a low risk of experiencing an earthquake greater than 6M, but can experience smaller earthquakes with magnitudes less than 4. Some of the smaller earthquakes are associated with dams in the region, as can be expected with reservoirs. Some of the other earthquakes in the Piedmont/Blue Ridge region may be attributed to the uplift of the Appalachian Mountains. Because earthquakes in this region take place in large unbroken rock masses, the effects can be felt widely. At the same time, damage tends to be less in these areas than would be experienced in regions with softer sediment (South Carolina Emergency Management Division *South Carolina Hazard Mitigation Plan 2013)*.

For further analysis, the Federal Emergency Management Agency's program Hazus-MH was used to analyze two earthquake scenarios. The first was based on the historical Charleston earthquake. This is similar to the State's analysis, centered on an earthquake happening in Charleston. If the 1886 earthquake were to occur today, Hazus estimates there probably will be limited damage of significance in Pickens County and its jurisdictions. This scenario was modeled for the county and each jurisdiction, and the full reports are available in Appendix G. It should be noted that the previous version of Hazus used an assumption that the magnitude of the Charleston earthquake was 6.8. That has now been revised to the USGS estimate of 7.3, which represents more than a threefold difference in energy released.

<u>Pickens County</u>
827 buildings would sustain slight damage, 223 buildings would sustain moderate damage, 12 buildings would sustain extensive damage and one building would be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. In all, 10,000 tons of debris is expected to be generated, requiring 200 truckloads to remove. Few injuries can be expected within Pickens County, requiring medical attention, but not hospitalization. The economic loss associated with this earthquake scenario is $10,180,000.

<u>Central</u>
41 buildings would sustain slight damage, 11 buildings would sustain moderate damage, 1 building would sustain extensive damage and no buildings would be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that no debris will be generated and no injuries which require medical attention will occur. The economic loss associated with this earthquake scenario is $640,000.

<u>Clemson</u>
101 buildings would sustain slight damage, 26 buildings would sustain moderate damage, 2 buildings would sustain extensive damage and no buildings would be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that no debris will be generated and very few injuries, which require medical attention, will occur. The economic loss associated with this earthquake scenario is $2,400,000.

<u>Easley</u>

340 buildings would sustain slight damage, 92 buildings would sustain moderate damage, 5 buildings would sustain extensive damage and no buildings would be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that 80 truckloads would be required to remove debris generated by the earthquake. It also estimates that very few injuries, which require medical attention, will occur. The economic loss associated with this earthquake scenario is $4,960,000.

<u>Liberty</u>
82 buildings would sustain slight damage, 23 buildings would sustain moderate damage, 1 building would sustain extensive damage and no buildings would be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that no debris will be generated by the earthquake. It also estimates that no injuries, which require medical attention, will occur. The economic loss associated with this earthquake scenario is $720,000.

<u>Norris</u>
60 buildings would sustain slight damage, 16 buildings would sustain moderate damage, 1 building would sustain extensive damage and no buildings would be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that no debris will be generated by the earthquake. It also estimates that no injuries, which require medical attention, will occur. The economic loss associated with this earthquake scenario is $610,000.

<u>Pickens</u>
72 buildings would sustain slight damage, 19 buildings would sustain moderate damage, 1 building would sustain extensive damage and no buildings would be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that no debris will be generated by the earthquake. It also estimates that no injuries, which require medical attention, will occur. The economic loss associated with this earthquake scenario is $760,000.

<u>Six Mile</u>
37 buildings would sustain slight damage, 10 buildings would sustain moderate damage, and no buildings would receive extensive damage or be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that no debris will be generated by the earthquake. It also estimates that no injuries, which require medical

attention, will occur. The economic loss associated with this earthquake scenario is $230,000.

Due to limitations in creating study boundaries that align with the municipalities' borders within Hazus, reports may over estimate damage within the jurisdiction as most include some areas of other jurisdictions. This effect is more exaggerated in the smaller jurisdictions than the larger jurisdictions.

The second scenario modeled with Hazus is the annualized loss for a probabilistic earthquake. This scenario was also run with the county and each jurisdiction. The annualized loss is an estimate of loss due to risk in a given year. Hazus also looks at casualties, debris and shelter needs

Pickens County
660 buildings would sustain slight damage, 134 buildings would sustain moderate damage, and no buildings would sustain extensive damage or be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. In all, 10,000 tons of debris is expected to be generated, requiring 200 truckloads to remove. Hazus estimates that five households will be displaced, and that 4 individuals will seek temporary shelter in public shelters. Few injuries can be expected within Pickens County, requiring medical attention, but not hospitalization. The economic loss associated with this earthquake scenario is $1,850,000.

Central
26 buildings would sustain slight damage, 3 buildings would sustain moderate damage, and no buildings would sustain extensive damage or be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that no debris will be generated. Only one household is expected to be displaced, and no one is expected to take shelter in public shelters. No injuries which require medical attention will occur. The economic loss associated with this earthquake scenario is $130,000.

Clemson
59 buildings would sustain slight damage, 6 buildings would sustain moderate damage, and no buildings would sustain extensive damage or be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that 40 truckloads of debris will be generated. Two households are expected to be displaced and two people are expected at public shelters. No injuries, which require medical attention, are estimated to occur. The economic loss associated with this earthquake scenario is $390,000.

Easley

276 buildings would sustain slight damage, 59 buildings would sustain moderate damage and no buildings would sustain extensive damage or be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that 80 truckloads would be required to remove debris generated by the earthquake. Two households are expected to be displaced, and one person is expected to use public shelters. No injuries, which require medical attention, are expected. The economic loss associated with this earthquake scenario is $680,000.

Liberty

70 buildings would sustain slight damage, 16 buildings would sustain moderate damage and no buildings would sustain extensive damage or be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that no debris will be generated by the earthquake, nor will any households be displaced, requiring use of public shelters. It also estimates that no injuries, which require medical attention, will occur. The economic loss associated with this earthquake scenario is $180,000.

Norris

49 buildings would sustain slight damage, 11 buildings would sustain moderate damage and no buildings would sustain extensive damage or be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that no debris will be generated by the earthquake, and no households will be displaced. It also estimates that no injuries, which require medical attention, will occur. The economic loss associated with this earthquake scenario is $140,000.

Pickens

56 buildings would sustain slight damage, 9 buildings would sustain moderate damage and no buildings would sustain extensive damage or be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that no debris will be generated by the earthquake and no households will be displaced. It also estimates that no injuries, which require medical attention, will occur. The economic loss associated with this earthquake scenario is $170,000.

Six Mile

33 buildings would sustain slight damage, 7 buildings would sustain moderate damage and no buildings would receive extensive damage or be destroyed. The majority of the buildings damaged would be single family or other residential buildings. Critical facilities are not expected to have much damage and will have greater than 50% functionality immediately after the earthquake. Hazus estimates that no debris will be generated by

the earthquake and no households displaced. It also estimates that no injuries, which require medical attention, will occur. The economic loss associated with this earthquake scenario is $60,000.

Full reports can be found in Appendix H.

3.8 Economic Crisis

Beyond local hazards that can impact the local economy, national and global economies also affect the economy of Pickens County. This was evidenced during the late 2000s recession when the average monthly unemployment in the county went from 5.3% in 2007 to a peak of 10.6% in 2009 (U.S. Department of Labor).

A recession is a period of time, usually at least six months, when an entity's economy slows down or shrinks. This downturn is characterized with consumers purchasing fewer goods and services, industries producing fewer goods and services, unemployment rates increasing, and personal wealth decreasing. Some economists consider recession a normal part of the modern business cycle (The NBER's Recession Dating Procedure).

Depressions differ from recessions by lasting longer and having more severe consequences. Depressions are characterized by its duration, high unemployment, decreasing production, large number of bankruptcies, currency fluctuations, and less available credit. Financial crises and bank failures, as well as, price deflation may also accompany economic depressions (Dr. Econ: What is the Difference Between a Recession and a Depression?).

3.8.1 Past economic crisis events

No official record was found of various economic crises occurring in Pickens County aside from well documented national and global depressions and recessions. However, Figure 16 shows unemployment rates in Pickens County, as compared to the rates of the state as a whole. The state data is from 1976 through October 2016, whereas data for the County was only available from 1990 onwards (U.S. Department of Labor). This figure shows that unemployment rates in Pickens County closely mimics the unemployment rates of the state. Data for unemployment rates within each jurisdiction was not available, so it is assumed that County rates are similar for the rates for each municipality.

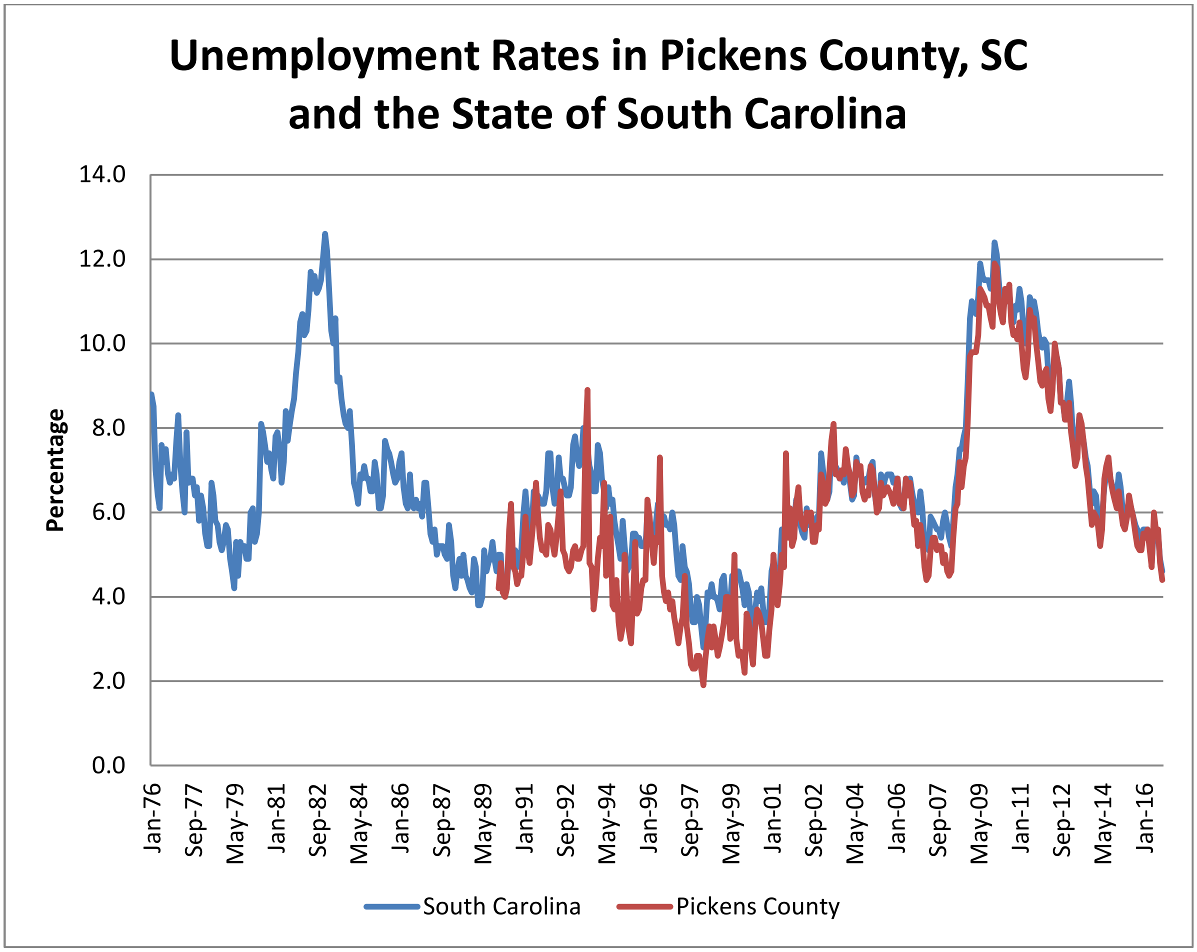


Figure 16: Unemployment rates in South Carolina and Pickens County, SC (U.S. Department of Labor)

Unemployment rates can also be used to gauge a locality's economic growth, as stronger growth leads to lower unemployment rates and vice-versa. However, rising unemployment rates lag behind economic downturns, so they can only be used to confirm changes in the economy; it can take up to five years after the economy starts to improve to see unemployment rates back to pre-crisis levels (The NBER's Recession Dating Procedure). The unemployment rate trends in Figure 10 illustrate the recessions that occurred in the early 1980s, early 1990s, early 2000, and late 2000s, with the first and last being more severe than the ones in the early 1990s and early 2000s.

3.8.2 Explanation of potential future economic crisis events

As of 2002, manufacturing was the main area of non-agricultural labor in the county, with about 28% of all employment (Pickens County *Economic Characteristics*). These manufacturing jobs primarily encompass metalworking and industrial equipment industries. Figure 17, compiled from data from the Appalachian Council of Governments, University of South Carolina GIS Department, and the Strom Thurmond Institute at Clemson University for the 2011 Hazard Mitigation Plan, shows the locations of many industrial areas in the county. Red circles indicate locations where industry is currently active, green circles indicate locations where industry is currently inactive, and yellow indicates unknown status (Strom Thurmond Institute). As can be seen, industry is primarily concentrated in the southern half of the county, preserving the rural nature of the northern half. Because the manufacturing industry plays such a vital role in the local economy of Pickens County it is critical that industries are made as hazard resistant as possible. Updated information was not available during this planning period.

Other major sectors of industry are retail, hospitality services, health care/social services, and construction, which hold 15%, 12%, 11%, and 8% of employment respectively (Pickens County *Economic Characteristics*). Additionally, Clemson University employs thousands of people and attracts new research and development industries to the area.

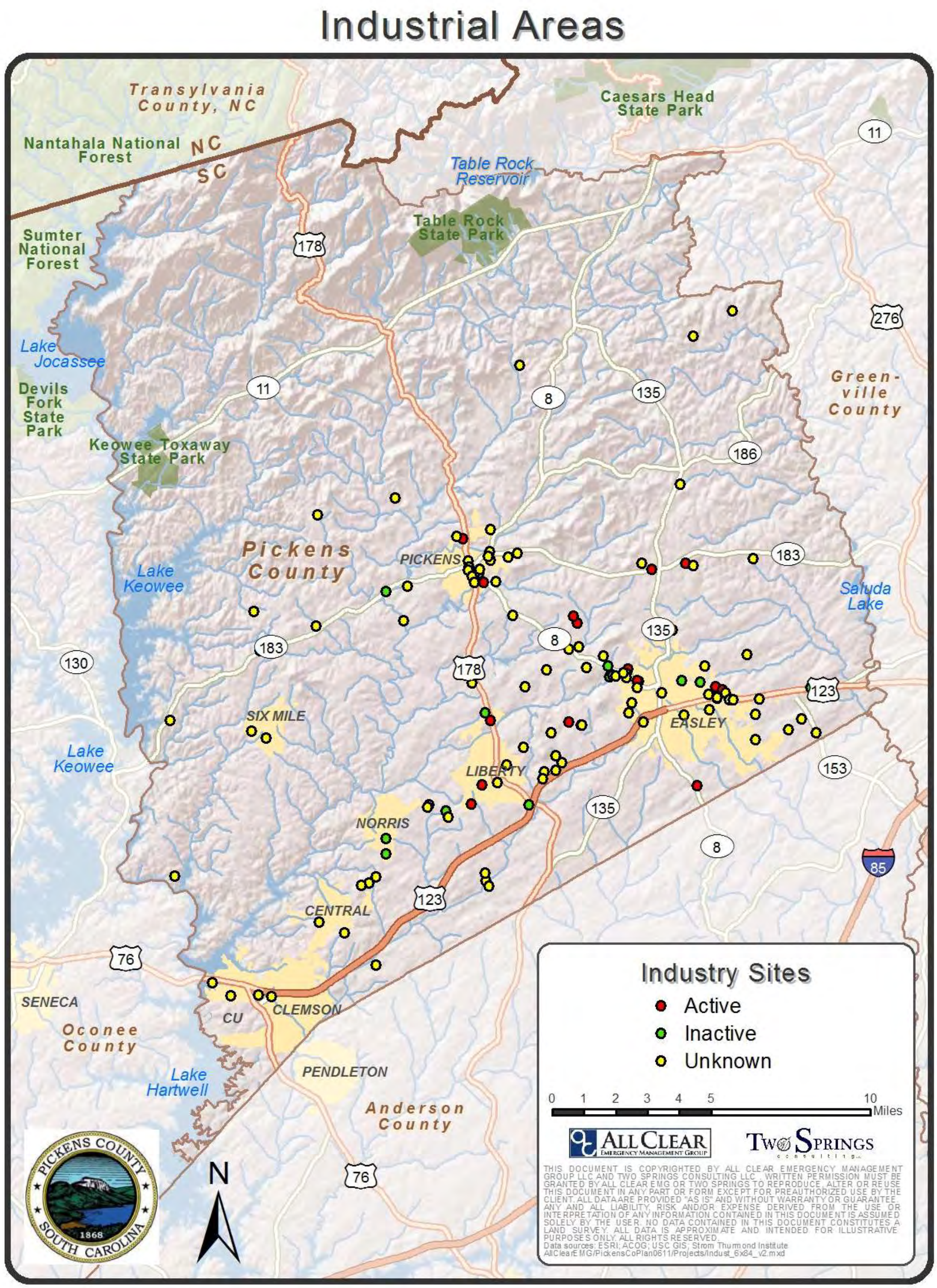


Figure 17: Industrial areas of Pickens County

(Note: Data compiled from the Appalachian Council of Government, University of South Carolina GIS Department, and the Strom Thurmond Institute at Clemson University. Updated data not available for the latest plan update.)

3.9 Flooding

A common hazard in the United States is flooding. Floods can vary by size, duration, and type. Flood sizes range from the small scale, where it might affect an individual's residence, or a business to the large scale, where significant portions of a country might be affected. An example of a large scale flood would be the Great Flood of 1993 along the Mississippi and Missouri rivers. This flood impacted 15 states and cost $15-20 billion in damages (U.S. Department of the Interior Missouri Water Science Center). Medium sized floods can affect a whole neighborhood, community, or drainage basin.

The time of onset and duration of floods vary as well. Some floods develop slowly, over a matter of days or even weeks. Others, such as flash floods or floods resulting from dam breeches, occur with little or no warning. Flash floods are over very quickly, but other flood events may last a week or more depending on the degree of inundation.

There are also different classifications of floods. **Riverine flooding** can be slow and caused by steady rainfall, rapid snow melt, or heavy rain from monsoons, hurricanes or tropical storms. If the rain or snow melt happens in a short enough amount of time, riverine floods may be classified as flash floods. **Flash floods** can also be caused by the sudden release of upstream water when a dam breaks or a landslide displaces impounded water. In urban areas with impervious surfaces, floods can arise when rain falls too fast to drain away quickly. A **catastrophic flood** occurs when another hazard, such as an earthquake, landslide, or dam failure, causes a flood. In areas where there is an abundance of loose sediment on the ground surface, as commonly found in agricultural fields, a muddy flood can occur. A **muddy flood** is the result of runoff collecting the sediment and transporting it as suspended matter. Occasionally, floods can have an anthropogenic cause as is the case when a water main breaks as a result of construction or repairs.

Floods can happen anywhere, but they are more common in low-lying areas or near waterways or drainages. Flood plains, the nearly flat area of land on either side of a stream or river, are particularly at risk of flooding during times of high streamflow (U.S. Department of Commerce *Flood Basics*).

3.9.1 Past flooding events

According to the NCDC there have been 48 flood events in Pickens County from 1993 through 2017, as listed in Table 15 (U.S. Department of Commerce *National Climatic Data Center*). The NCDC list of flood events is the most comprehensive dataset available regarding locations of historical floods in Pickens County and its jurisdictions. Not all jurisdictions were listed as having experienced a flood in the time period of 1993-May 2017. Better data for these jurisdictions is not available.

Table 15: Flood Events in Pickens County, 1993-2017 (NCDC)

Date	Type of Flood	Location	Property/Crop Damage
3/23/1993	Flash Flood	Pickens County	-
3/31/1993	Urban Flood	Pickens	$500,000

Date	Type of Flood	Location	Property/Crop Damage
3/27/1994	Flash Flood	North/Central Pickens County	-
7/27/1994	Flash Flood	Easley	-
7/27/1994	Flash Flood	Northeast Pickens County	-
7/27/1994	Flash Flood	Central	-
8/17/1994	Flood	Northeast Pickens County	$5,500,000
10/13/1994	Flash Flood	Pickens County	$2,008,000
10/13/1994	Flash Flood/Coastal Flood	South Carolina	$25,050,000
2/16/1995	Flash	Pickens	$1,000
8/27/1995	Flood	Easley	$25,000
1/27/1996	Flood	Pickens County	-
2/28/1997	Flash	Easley	-
10/26/1997	Flood	Central	-
10/26/1997	Flood	Easley	-
1/7/1998	Flash Flood	Pickens	$50,000
1/8/1998	Flood	Pumpkintown	-
6/16/1998	Urban Flood/Small Stream Flood	Easley	-
7/24/2000	Flash Flood	Easley	-
7/25/2001	Flash Flood	Clemson	-
9/15/2002	Flood	Pickens County	-
3/19/2003	Flash Flood	Southeast Pickens County	-
3/20/2003	Flood	Pickens County	$200,000
6/18/2003	Flash Flood	Clemson	-
6/18/2003	Flash Flood	Easley	-
7/17/2003	Flash Flood	Pickens	-
7/30/2003	Flash Flood	Easley	-
9/22/2003	Flash Flood	Pickens	-
9/7/2004	Flash Flood	Pickens County	-
9/7/2004	Flood	Pickens County	$6,300,000
9/9/2004	Flood	Pickens County	$100,000
9/16/2004	Flood	Pickens County	$116,000
12/9/2004	Flash Flood	Liberty	-
7/7/2005	Flash Flood	Pickens	$400,000
7/7/2005	Flood	Pickens County	-
8/23/2005	Flash Flood	Easley	-
6/26/2006	Flash Flood	Pickens	$50,000
6/26/2006	Flood	Central Pickens County	-
3/1/2007	Flood	Pickens	-
2/5/2010	Flood	Easley	-
7/13/2013	Flash Flood	Clemson	$200,000
8/6/2013	Flash Flood	Cateechee	$50,000
8/6/2013	Flash Flood	Six Mile	$100,000
8/6/2013	Flash Flood	Cateechee	$100,000
8/6/2013	Flash Flood	Crow Creek - Six Mile	-
8/7/2013	Flash Flood	Six Mile	-
8/10/2014	Flash Flood	Clemson	$100,000
10/1/2015	Flash Flood	Clemson - Central	$10,000

According to Table 15, Central has experienced three floods, Clemson has experienced five floods, Easley has experienced ten floods, Liberty has experienced one flood, Norris has experienced no floods, City of Pickens has experienced eight floods, Six Mile has experienced three floods and unincorporated Pickens County has experienced 20 floods. This history of flooding would give the following probabilities of a flood in any given year for each jurisdiction:

- Central – 12%
- Clemson – 20%
- Easley – 40%
- Liberty – 4%
- Norris – 0%
- Pickens (City) – 32%
- Six Mile – 12%
- Unincorporated Pickens County – 80%

The probability of flooding for Norris, as listed above is 0%. This should not be interpreted as Norris having no likelihood of experiencing flooding in the future. This is only because no records of flooding in Norris exist in the past 25 years.

There are five stream gauges in or near Pickens County which have historical crest data, according to the National Weather Service. The two gauges along the Seneca River are located at Jocassee Dam and Keowee Dam. The highest crests for these gauges were 100.82 feet and 100.48 feet, respectively, on August 17, 1994. This was considered Action Stage. Flood stage at Jocassee Dam is indicated at 102 feet, at which point some structures and businesses along the shoreline will begin to flood. At 105 feet, there will be moderate flooding. At 114.5 feet, bridges on Highway 11, east of Salem, Highway 183, US Highway 76, SR 37 and 27 may need to be closed. Flood stage at Keowee Dam is indicated at a gauge height of 102 feet, which would result in shoreline flooding. At 105 feet, a flash flood watch should be issued for possible downstream flooding. At 115 feet, bridges on Highway 186, US Highway 76, and Highway 93 2ould need to be closed. . Unincorporated Pickens County is most at risk due to flooding at Jocassee Dam, whereas the City of Clemson is most at risk due to flooding at Keowee Dam.

Twelvemile Creek, near Liberty had its highest crest on June 27, 2006, which was 14.78 feet. This was considered moderate flood stage. At 10 feet, the tributary to Twelvemile Creek will likely begin flooding parts of Concord Church Road. At 10.4 feet, the Pickens County Flea Market would be flooded, and at a gauge reading of 11.5 feet, the flea market would be flooded to a depth of 3 feet. At a gauge height of 13.5 feet, the flea market would be flooded to a depth of 5 feet. At 14 feet, Riggins Bridge Road (SSR 22) would be closed due to the bridge being flooded. At 15 feet, maw Bridge Road (SSR 337) would be closed because water would be running over the top of the bridge. Major flood stage is at 16 feet, and at 16.5 feet most of the bridges over Twelvemile Creek would be closed due to high water. Flooding of Twelvemile Creek will affect unincorporated Pickens County, and potentially areas of Liberty and Norris.

The Saluda River, near Greenville, north of Old Easley Road has been the only gauge to have recorded a major flood stage. The highest crest was 19.38 feet on October 7, 1949. This gauge has recorded major flood stages five other times, on October 5, 1964 with a height of 18.14 feet, on August 27, 1995 with a height of 15.59 feet, on June 23, 1961 with a height of 15.43 feet, on September 9, 2004 with a height of 15.07 feet and on January 23, 1954 with a height of 15.05ft. This gauge has recorded at least flood stage 25 times since 1942. No other stream gauges in Pickens County have recorded more flood or floods of major flood stage. Further details about the damage that occurred during each of these past floods could not be found, but the National Weather Service has a detailed list of potential flood impacts. At 8 feet, water will begin to approach homes on the Pickens County side of the river. At 9.5 feet, evacuations north and south of the Old Easley Bridge Road are likely to begin. Homes in the 3900 to 4100 block of Old Easley Bridge Road and in the Shady Acres subdivision along Ron Lane are threatened. At 10.5 feet, evacuations in the shady acres trailer park near Fish Trap Road and along Old Easley Bridge Road near Highway 123 would begin. At 12.5 feet, homes between the Old Easley Bridge Road and the river will be flooded and business off of Floyd Circle, near the river, will begin to flood. At 13 feet, back water on Georges Creek will cause water to approach homes in Quail Haven Subdivision. At 14 feet homes along Old Easley Bridge Road and along Fish Trap Road and Shady Acres areas will be flooded. Flooding at this location would primarily affect the communities east of Easley along the river, and west of Greenville, in Greenville County on the east side of the river.

Pickens County participates in the National Flood Insurance Program (NFIP) and NFIP's Community Rating System (CRS). As of September 2017 the municipalities of Central, Clemson, Easley, Liberty, Pickens and Six Mile all participate in the NFIP, however, the April 2017 FEMA NFIP Policy Statistics reports there was only 1 policy in effect in Central, 38 in Clemson, 35 in Easley, 2 in the City of Pickens, and 49 in unincorporated Pickens County. The Town of Norris does not participate in the National Flood Insurance Program. Their non-participatory status may be due to miscommunication. Until recently, the Town of Norris was neither listed as participating, nor listed as not participating in the National Flood Insurance Program Community Status Book. Because of this discrepancy, both Town of Norris officials and Pickens County staff reported that Norris was included in Pickens County's participation. Because Norris relies on the County for administration, planning and services including floodplain management ordinances, stormwater management plans it was believed that Norris was not considered a separate jurisdiction for the purposes of the NFIP. While floods are a recurring problem in the county, there have only been 28 NFIP claims since 1978, totaling $35,8187.91. Easley has had a total of seven claims totaling $120,991.83, the City of Pickens has had two claims totaling $27,219.04 with the remaining 19 claiming being in unincorporated Pickens County, and totaling $209,977.04.

Three of those claims are for the county's only repetitive loss property (RLP), which is defined as any property that has had two or more claims of $1,000 or more within a ten year period. This RLP is a residential property which had claims on 8/16/1994, 10/8/1998, and 9/5/2004. As of October 26, 2011, this property has been resolved with the Federal Emergency Management Agency, and is no longer considered a repetitive loss property (Wilbanks). Pickens County and the jurisdictions within are committed to managing flood risk through adoption of appropriate NFIP requirements and incorporation into existing floodplain ordinances. Those communities with current CRS ratings will continue to work to ensure the regulations are in place to improve rating scores as they are able.

3.9.2 Explanation of potential future flooding events

The recurrence interval, given the NCDC data above, is 0.49 years, which means that Pickens County has a 205% probability of experiencing a flood of any size every year. However, flood risk is not based solely upon historical record; many factors must be considered, such as topography, river flow, land cover, and human interventions. One standard way of discussing floods is based on the probability of a flood of a certain size occurring in any given year. Frequently, the terms 100 year or 500 year floodplain are used. The 100 year or 500 year refers to the recurrence interval, but this does not mean such a flood only occurs every 100 or 500 years. It is more appropriate to discuss these floods based on the probability of occurrence in any given year. In that way, the 100 year flood has a 1/100, or 1% chance of occurring and the 500 year flood has a 1/500, or 0.2% chance. While unlikely, 100 year floods could therefore take place in consecutive years. Figure 18 shows a map, based on Pickens County's DFIRM, of the 100 year floodplain in Pickens County. This map should be used with caution as floods can, and do, occur outside of these identified areas, as floodplain maps are specifically for riverine flood events, and do not indicate areas vulnerable to other types of flooding, such as flash flooding. Any low-lying area within the county or jurisdictions is at risk for flash floods that follow a heavy rain event, either locally, or upstream in the watershed

Flood Insurance Studies (FIS) have been conducted previously in Pickens County with the latest one being the Pickens County FIS 2008. These studies resulted in a series of Digital Flood Insurance Rate Maps (DFIRMs) that show the extent of flooding along rivers, streams, creeks, tributaries, and other waterways in Pickens County. In order to produce the FIRMs, a FIS thoroughly analyzes the waterways in a region that are likely to flood and determines, among other characteristics, base flood elevations (BFEs) for a 100 year flood at many cross sections along a channel and the discharge of such a flood, in cubic feet per second.

To estimate the number of people potentially affected by riverine floods in Pickens County, the areas that lie within the 100 year floodplain, or downstream from a levee or impoundment were intersected with the 2009 and 2014 American Community Survey census block level population data. This method then estimated 10,251 people were within a flood hazard area. However, this method is only an approximation which is based on population densities of each census block and the assumption of an even distribution of that population. This is most likely an incorrect assumption as development usually does not occur on the floodplain; however, because there is not a

GIS inventory of individual buildings and residences in the county, there is no readily available alternative. Figure 19 shows the population densities in the flood prone areas, as estimated from this method.

Hazus was used to estimate losses from a 100 year flood event in each jurisdiction. As streams for the municipalities were not readily available within Hazus, they were built using a two square meter search radius with a one meter resolution Digital Elevation Model (DEM) downloaded and made available from the United States Geological Survey. Stream discharges were obtained from the 2008 Pickens County FIS, which were then used to delineate the 100 year floodplain which was used in the flood model's analysis to determine losses. The following table summarizes the discharges for the streams within each jurisdiction that was used in the flood analysis model of Hazus.

Table 16: Streams and Discharges Used in Flood Model Analysis

Jurisdiction	Creek	Discharge (cfs)
Pickens County	Adams Creek	1,327
	Burdine Creek	2,046
	Burgess Creek	2,146
	Carpenter Creek	2,112
	Carrick Creek	1,489
	Deddies Creek	1,549
	Eighteenmile Creek	5,238
	Georges Creek	4,483
	Gowens Creek	822
	Hamiton Creek	1,214
	Little Georges Creek	1,382
	Machine Creek	1,000
	Oolenoy River	5,762
	Peters Creek	1,003
	Praters Creek	1,609
	Rices Creek	2,838
	Saluda River	12,930
	Shoal Creek	2,320
	Town Creek	2,320
	Twelvemile Creek	11,130
	Weaver Creek	2,146
	Wolf Creek	2,832
Six Mile	Four Mile Creek	1,609
	Praters Creek	1,609
	Shoal Creek	1,681
	Twelvemile Creek	11,130
	Gregory Creek	1,404
Clemson	Eighteenmile Creek	5,328
	Fifteenmile Creek	1,780
	Twelvemile Creek	11,130
	Sixmile Creek	4,633
	Fourmile Creek	1,609
Central	Golden Creek	2,835
	Fifteenmile Creek	1,780
	Eighteenmile Creek	5,328
Norris	Eighteenmile Creek	5,328

Jurisdiction	Creek	Discharge (cfs)
	Fifteenmile Creek	1,780
	Twelvemile Creek	11,130
Liberty	Eighteenmile Creek	5,328
	Fifteenmile Creek	1,780
	Twelvemile Creek	11,130
	Golden Creek	2,835
	Rices Creek	2,838
	Twelvemile Creek	11,130
	Shoal Creek	1,681
	Rices Creek	2,838
	Praters Creek	1,609
	Town Creek	2,320
	Wolf Creek	2,832
Easley	Burdine Creek	2,046
	Georges Creek	4,483
	Little Georges Creek	1,382
	South Saluda River	14,520
	Hamilton Creek	1,214
	Brushy Creek	1,844
	Eighteenmile Creek	5,328
	Golden Creek	2,835
	Three and Twenty Creek	1,628

Pickens County

Within Pickens County, Hazus' Flood Analysis determined that at least 33 buildings will be at least moderately damaged in a 100 year flood event, and 22 of those will be completely destroyed. One of those buildings is a fire station that will sustain at least moderate damage, and will be lost from use for a time. It is estimated that 6,712 tons of debris will be generated by the 100 year flood event, and it will require 268 truckloads to remove. 530 households will be displaced due to the flooding, and approximately 360 individuals will seek temporary shelter in public shelters. The total economic loss estimated for the flood is $101,090,000, which represents 5.06% of the total replacement value of the scenario buildings.

Central

Within Central SC, Hazus' Flood Analysis estimated that no buildings will sustain any damage. It is estimated that 73 tons of debris will be generated by the 100 year flood event, and it will require three truckloads to remove. Eight households will be displaced due to the flooding, but no individuals will seek temporary shelter in public shelters. The total economic loss estimated for the flood is $2,230,000, which represents 2.34% of the total replacement value of the scenario buildings.

Clemson

Within Clemson, SC, Hazus' Flood Analysis estimated that about 61 buildings will sustain at least moderate damage, and that 13 of those buildings will be completely destroyed. One police station is estimated to sustain at least moderate damage and will be lost from use for a time. It is estimated that 936 tons of debris will be generated by the 100 year flood event, and it will require 37 truckloads to remove. 89 households will be displaced due to the flooding, and 150 individuals will seek temporary shelter in public shelters. The total economic loss estimated for the flood is $22,200,000, which represents 3.24% of the total replacement value of the scenario buildings. Figure 19 shows that Clemson has the highest population within a flood hazard zone within Pickens County.

Easley

Within Easley, SC, Hazus' Flood Analysis estimated that 22 buildings will sustain at least moderate damage and 5 of those will be completely destroyed. It is estimated that 1,222 tons of debris will be generated by the 100 year flood event, and it will require 49 truckloads to remove. 160 households will be displaced due to the flooding, and 182 individuals will seek temporary shelter in public shelters. The total economic loss estimated for the flood is $22,190,000, which represents 2.89% of the total replacement value of the scenario buildings.

Liberty

Within Liberty, SC, Hazus' Flood Analysis estimated that one building will be completely destroyed. It is estimated that 259 tons of debris will be generated by the 100 year flood event, and it will require 10 truckloads to remove. 46 households will be displaced due to the flooding, and 26 individuals will seek temporary shelter in public shelters. The total economic loss estimated for the flood is $4,800,000, which represents 2.35% of the total replacement value of the scenario buildings.

Norris

Within Norris, SC, Hazus' Flood Analysis estimated that no buildings will be sustain at least moderate damage. It is estimated that 119 tons to debris will be generated by the 100 year flood event, and it will require five truck loads to remove. 11 households will be displaced due to flooding and only one individual will seek temporary shelter in public shelters. The total economic loss estimated for the flood is $1,760,000, which represents 1.78% of the total replacement value of the scenario buildings. It should be noted, however, due to the small size of Norris, and the limitations of Hazus' flood analysis, the scenario covers a portion of the county larger than just the town's limits, which may overestimate the damage sustained within the Town of Norris during a 100 year flood event.

Pickens

Within the City of Pickens, SC, Hazus' Flood Analysis estimated that 2 buildings will sustain at least moderate damage but none will be completely destroyed. It is estimated that 903 tons of debris will be generated by the 100 year flood event, and it will require 36 truckloads to remove. 81 households will be displaced due to the flooding, and 22 individuals will seek temporary shelter in public shelters. The total economic loss estimated for the flood is $22,660,000, which represents 6.34% of the total replacement value of the scenario buildings.

Six Mile

Within Six Mile, SC, Hazus' Flood Analysis estimated that no buildings will be sustain at least moderate damage. It is estimated that 70 tons to debris will be generated by the 100 year flood event, and it will require three truck loads to remove. 10 households will be displaced due to flooding and only two individuals will seek temporary shelter in public shelters. The total economic loss estimated for the flood is $840,000, which represents 0.75% of the total replacement value of the scenario buildings. It should be noted, however, due to the small size of Six Mile, and the limitations of Hazus' flood analysis, the scenario covers a portion of the county larger than just the town's limits, which may overestimate the damage sustained within the Town of Norris during a 100 year flood event.

Table 15 shows that the most expensive flood on record in Pickens County was about $25 million.

Pickens County and it's municipalities do not have comprehensive data regarding areas of flash flooding, therefore, observational data from respondents of the public survey is needed to supplement the DFIRM and Hazus data.

Pickens County

In unincorporated Pickens County, residents indicated several areas that were subject to flooding after heavy rains. These areas included Pike Road, near Hartwell Lake, North Martin and Hunts Bridge Road, and the Hagood Mill area. Others expressed concerns regarding back roads and secondary roads, which have been known to washout during heavy rain. One individual indicated that the highway and road flooding within Pickens County was due to clogged drainage ditches. No magnitude for these flooding events was provided.

Central

Street flooding has been reported in Central, particularly after severe storms. The specific streets and areas subjected to the flooding were not indicated, nor was the magnitude of the flooding.

Clemson

Residents of Clemson have indicated that minor street flooding occurs after storms. The specific streets and areas subjected to flooding was not indicated.

Easley

The residents of Easley have reported many areas of concern that experience flooding after heavy rain. These include Fleetwood Drive, Highway 135, approximately a half mile east of Baptist Easley Hospital, Popefield Road, near the bridge, unspecified low-lying areas, and residential yard flooding along Pineview Drive. The resident indicated the flooding near Pineview Drive was possibly due to storm drains being clogged and too few in number. The magnitude of the flooding in these areas was not specified.

Liberty

One resident of Liberty indicated that after heavy rains, yards would flood in the Liberty Hills area because of all the runoff from the roads. Another indicated that there is a road cut along Terrapin Crossing Road near Stancil Road, made of loose soil, and during rainstorms, it erodes, and fills the ditches with mud, so that the rainwater cannot drain off the road, creating flooding for 100-170 feet.

Norris
Residents did not indicate any areas of concern regarding flooding.

City of Pickens
In the City of Pickens it is reported that street flooding occurs on Highway 8 in front of Owt and on Ann Street close to the bridge, during severe rains. The Pickens Jockey lot and recreational fields are also reported to flood during heavy rain. No magnitude was indicated with these reports.

Six Mile
In Six Mile, residents report that Main Street floods after heavy rain due to improper drainage control, and areas near North Main Street and Aaron Drive can have several inches of rain on the roadways after a heavy rain. This hazard is compounded with the addition of slippery red clay that is washed on to the road. Berms that have been installed in these areas are of limited use. Additionally, Camp Creek has overrun its banks and has flooded Silver Creek Road, off of Norris Highway. Other than the several inches of rain on the roads near North Main Street and Aaron Drive, no magnitude was specified for the other flooding areas of concern.

A flood can physically damage any structure, such as, bridges, houses, cars, wastewater systems, or other buildings. But floods can also have secondary effects or even some long lasting ones as well. If a flood destroys a critical bridge, it takes away an important link, either as an evacuation route, or as a path for emergency responders. Water supplies may become contaminated and scarce, resulting in unhygienic conditions, spreading water-borne illnesses. Crops may be damaged, potentially impacting the availability of food. Trees may also die, leaving the land susceptible to erosion after the flood. Floods can also have long term negative effects on the economy, either from the cost of rebuilding, decreased revenue from tourism, or price increase of food due to a shortage (U.S. Department of Health and Human Services).

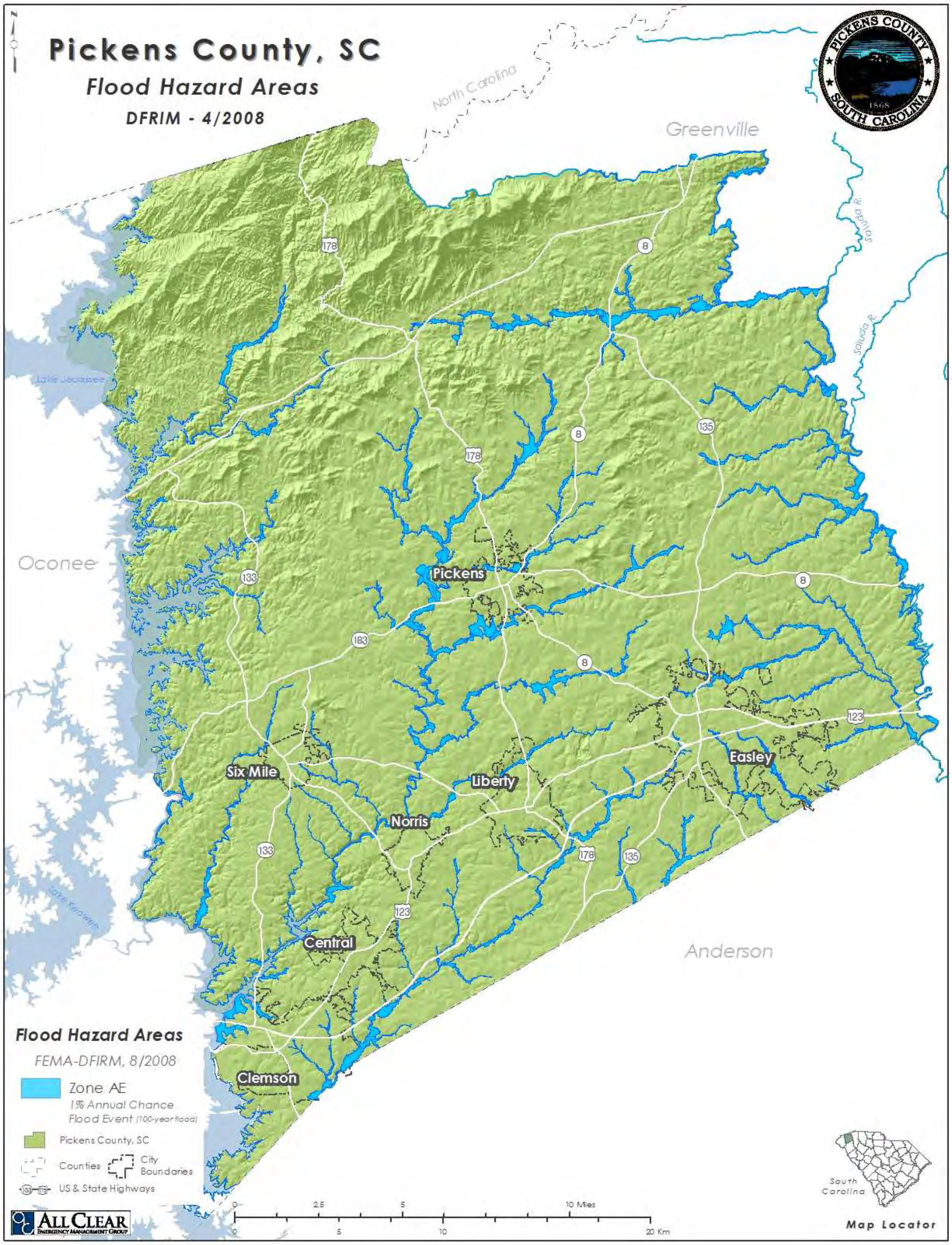


Figure 18: Zone AE Representing the 1% Annual Chance of a Flood Event (100 Year Flood) for Pickens County, SC

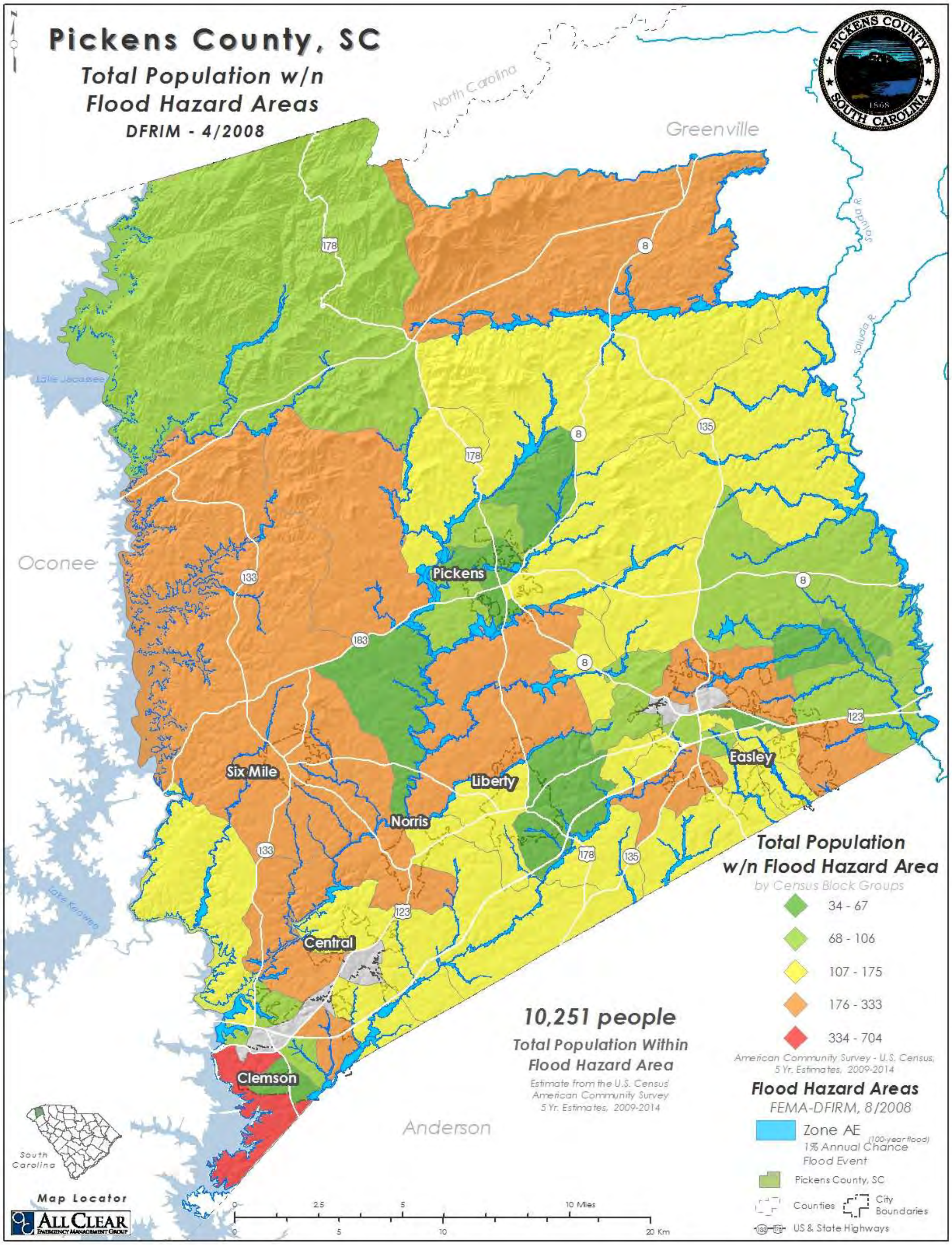


Figure 19: Population within Flood Hazard Areas in Pickens County, SC

3.10 Hazardous Materials

Hazardous materials, often called HazMat, are chemicals that pose a danger to the life and health of individuals and the environment, and may be classified as allergenic, asphyxiating, biohazardous, corrosive, explosive, flammable, oxidizing, pathogenic, radioactive, or toxic. These chemicals have a variety of purposes and can be found nearly everywhere, including manufacturing plants, hospitals, research labs, and even people's homes.

Hazardous material incidents may occur during production, storage, transportation, use, or disposal, and are usually classified as a transportation incident or a fixed facility incident. Different standards apply to the transportation of hazardous materials, than the storage, use or disposal of hazardous materials at a fixed facility, primarily because the inherent risks are very different. Most incidents stem from transportation accidents or accidental chemical spills at plants (U.S. Department of Homeland Security *Hazardous Materials*).

3.10.1 Past hazardous material events

A search of the National Response Center database, which is the sole U.S. Government entity where all biological, chemical, oil, or radiological releases are reported, showed a total of 86 hazardous material incidents in Pickens County between 1990 and 2010. Since the last plan update, there have been an additional 15 incidents reported in the National Response Center database. Four of these instances have occurred in Easley, two each in Central, Liberty, the City of Pickens, and unincorporated Pickens County, and one each in Clemson and Norris.

One of the most notable incidents in Pickens County was the train derailment near Liberty, SC, on June 10, 2010. The derailment involved 24 cars, including tankers from which ethylene glycol and isopropyl alcohol leaked. Another tanker involved with the derailment carried toluene diisocyanate, which did not leak. The hazmat response team cleaned up the scene under the supervision of the Environmental Protection Agency and the Department of Health and Environmental Control (Kwiatek). This incident caused approximately 436 households to be evacuated immediately following the derailment. Most of those residents were allowed to return the next day. A few residents were evacuated a second time as a precaution during site cleanup.

3.10.2 Explanation of potential future hazardous material events

Pickens County is home to many fixed facilities which store, use, or dispose of hazardous materials. These facilities include hazardous waste treatment and disposal facilities, Superfund and Comprehensive Environmental Response Compensation Liability Act (CERCLA) sites, municipal landfills, hazardous waste generators, and sites identified through the EPA's Biennial Reporting System (BRS) or the Toxic Release Inventory (TRI), the locations of which can be seen on Figure 20. It should be noted that the two radiological waste generators in the county are not located on this map. They are discussed separately from other hazardous materials in the radiological section of this report. In addition to these fixed hazardous material facilities, Pickens

County is home to extensive transportation system networks, and on any given day, hazardous materials are transported through the county on one of these networks. Any of these locations has the potential to be the source of a hazardous materials incident.

The recurrence interval for hazardous material incidences in Pickens County is 0.27, as determined from the NRC data from 1990-2016. This means that on average, there are about four incidents a year involving the release or spills of hazardous materials in the county, representing a 374% chance of occurring.

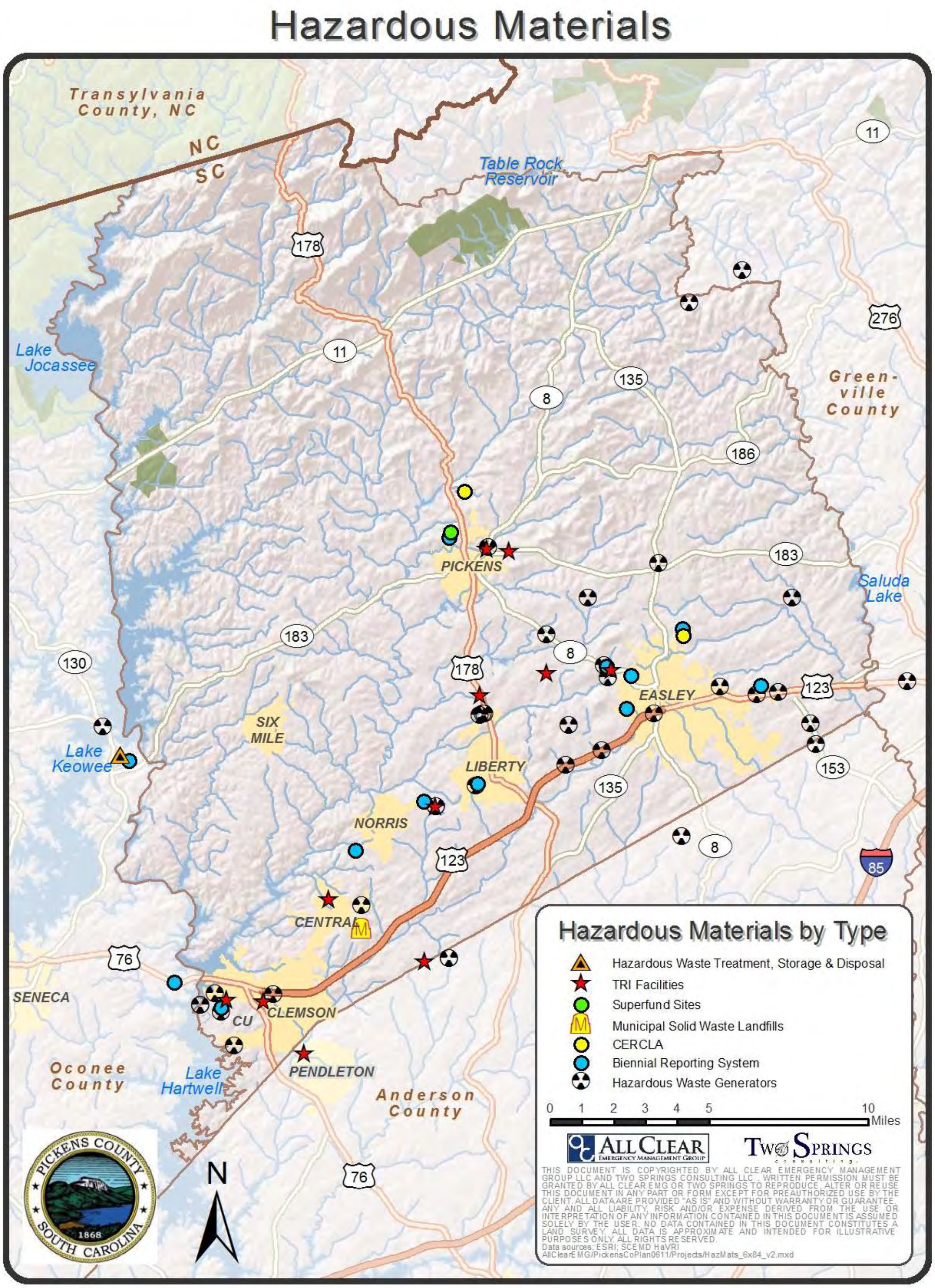


Figure 20: Fixed Hazardous Material Facilities
(Note: Updated GIS data not available for the latest plan update)

3.11 Hurricane/Tropical Storm

Tropical cyclones are storm systems that are characterized by low pressure, high winds, numerous thunderstorms and heavy rain. These storms are hazards that can produce widespread destruction that has the potential for lasting effects. Tropical cyclones are divided into categories based on their intensity; these categories are hurricanes, tropical storms, and tropical depressions. Occasionally the prefixes extra-, sub-, or post- are attached to the categories of tropical cyclones indicating that the storm no longer has tropical characteristics, and is driven by temperature contrasts, has characteristics of both tropical cyclones and extra-tropical cyclones, and has lost its tropical characteristics (can be either remnant lows or extra-tropical), respectively (U.S. Department of Commerce *Frequently Asked Questions*).

In 1969 the Saffir-Simpson Scale was developed to estimate the amount of damage hurricanes of different intensity would cause. This scale originally included storm surge levels and pressure readings, but since 2010, the National Hurricane Center has been using the experimental Saffir-Simpson Wind Scale due to proven inaccuracies with the other two measurements (U.S. Department of Commerce *Saffir-Simpson*). Table 17shows this revised Saffir-Simpson Scale in addition to other classifications.

Table 17: Saffir-Simpson Wind Scale and Damage Estimates

Saffir-Simpson Hurricane Scale		
Category	**Winds (mph)**	**Effects**
5	> 155	Catastrophic damage will occur
4	131-155	Catastrophic damage will occur
3	111-130	Devastating damage will occur
2	96-110	Extremely dangerous winds will cause extensive damage
1	74-95	Very dangerous winds will produce some damage
Non-Hurricane Classifications		
Tropical Storm	39-73	Wind and rainfall may produce limited damage
Tropical Depression	0-38	Minimal damage may occur

A tropical depression is described as an organized system of thunderstorms with a maximum sustained wind speed of 38 miles-per-hour or less. In contrast, the next more powerful storm category is tropical storm. These have sustained wind speeds between 39 and 73 miles-per-hour and begin to take on the spiral shape. More intense storms are classified as hurricanes, and further divided into categories 1 through 5, with a Category 5 storm being the most powerful.

Category 1 hurricanes have sustained wind speeds 74-95 mph which are very dangerous and can produce some damage. Hurricanes that reach Category 2 storms have winds 96-110 mph, which cause extensive damage. Category 3 hurricanes are the first to be classified as a major hurricane. These storms have sustained winds of 111-130mph, and it is likely that devastating damage will occur, with a high risk of death and injury. Category 4 hurricanes are also major hurricanes, and they have sustained winds 131-155mph. These hurricanes cause catastrophic damage and pose a very high risk of injury and death. The last category of hurricanes is Category 5 hurricanes. These are the most powerful of all, and have maximum sustained winds greater than 155 mph. These catastrophic hurricanes have a very high potential to cause death and injury from falling or flying debris.

In an average year, approximately ten tropical storms will develop in the Atlantic Basin, which includes the Atlantic Ocean, the Gulf of Mexico, and the Caribbean Sea. Of these storms, only about six become strong enough to be classified as hurricanes; and while most remain over the ocean, a few do make landfall along the United States coastline, with the average being about five hurricanes every three years. Only two of the five hurricanes that strike the US, will be major hurricanes. These storms can cost millions or billions of dollars in damages.

However, as far inland as Pickens County is, the worst effects of hurricanes are unlikely to be felt in the immediate area. As tropical cyclones pass over land, they weaken because they need both moisture and warmth from the ocean to sustain their energy. However, tropical cyclones can still produce large quantities of rain and severe storm-like conditions inland, so the risk of flooding and wind damage is high (U.S. Department of Commerce *Frequently Asked Questions*).

3.11.1 Past hurricane/tropical storm events

Since 1851, 33 tropical or extratropical cyclones have passed over or near Pickens County according to the National Hurricane Center. Figure 21 shows the tracks of the storms that passed directly over Pickens County from 1851 until 2016. Since 2008, there has been no recorded tropical cyclone that has passed within the vicinity of Pickens County. There have been no storms stronger than a Tropical Storm near Pickens County. The most recent event was Hurricane Cindy in 2005, which was an extratropical cyclone by the time it passed near the county (U.S. Department of Commerce *Historical Hurricane*). Table 17 summarizes the storms whose tracks are seen in Figure 22 as well as additional storms whose tracks which passed near Pickens County. Specific data for each municipality is not available. As the effects of tropical storms and hurricanes are felt by a broad region, the data for Pickens County is accurate for each of the jurisdictions. This means that for the 166 years of record, there is nearly a 20% chance of Pickens County and its jurisdictions experiencing the effects of a hurricane or tropical storm each year.

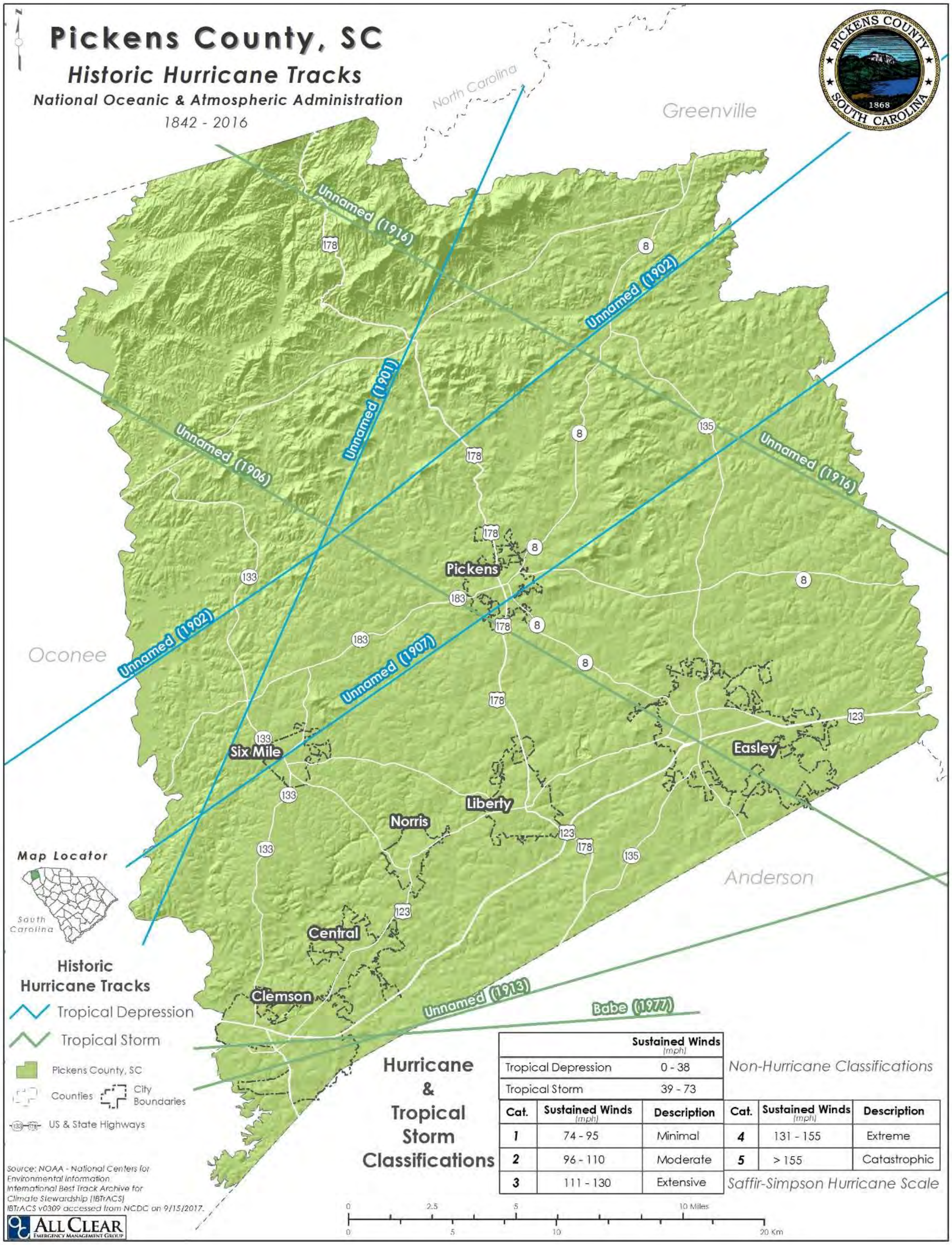


Figure 21: Historic Hurricane Tracks, 1851-2016

Table 18: Tropical Cyclone Tracks, 1851-May 2017

Date	Name	Maximum Category*	Strength Near Pickens County†
9/17/1859	Not Named 1859	H1	TS
9/11/1882	Not Named 1882	H3	TS
6/22/1886	Not Named 1886	H2	TS
9/24/1889	Not Named 1889	H2	TS
10/4/1893	Not Named 1893	H4	TS
7/8/1896	Not Named 1896	H2	TD
9/15/1900	Not Named 1900	TS	TD
9/28/1901	Not Named 1901	TS	ET
10/11/1902	Not Named 1902	H2	ET
9/18/1906	Not Named 1906	H1	TS
9/23/1907	Not Named 1907	TS	ET
8/30/1911	Not Named 1911	H2	ET
6/14/1912	Not Named 1912	TS	ET
9/4/1913	Not Named 1913	H1	TD
7/16/1916	Not Named 1916	H3	TS
8/3/1928	Not Named 1928	H2	TD/ET
9/7/1933	Not Named 1933	H4	TD
5/30/1934	Not Named 1934	TS	TD
8/18/1939	Not Named 1939	H1	TD
8/28/1949	Not Named 1949	H4	TS
6/2/1959	Arlene	TS	TD
8/30/1964	Cleo	H5	TD
6/8/1968	Abby	H1	TD
9/8/1977	Babe	H1	TD
8/18/1985	Danny	H1	TD
8/17/1994	Beryl	TS	TD
8/27/1995	Jerry	TS	TD
7/24/1997	Danny	H1	TD
7/2/2003	Bill	TS	TD
9/8/2004	Frances	H4	TD
9/17/2004	Ivan	H5	TD
9/28/2004	Jeanne	H3	TD
7/7/2005	Cindy	H1	ET

*Maximum Category refers to highest intensity achieved by each storm.
†ET: extratropical cyclone, TD: tropical, TS: tropical storm or subtropical storm, H1: Category 1 hurricane, H2: Category 2 hurricane, H3: Category 3 hurricane.

3.11.2 Explanation of potential future hurricane/tropical storm events

During hurricanes or other tropical cyclones, homes, other buildings and infrastructure may be damaged or destroyed by the various component hazards that go along with such storms. High winds can send debris through the air, tear roofs off of buildings, knock down walls, and rip power poles and trees up. Heavy rain can cause flash flooding which can wash away roads and bridges, and flood homes and buildings. Tornadoes can spring up well away from the center of the hurricane and wreak havoc.

However, the most dangerous component of tropical cyclones is the associated storm surge (U.S. Department of Commerce *Frequently Asked Questions*).

As mentioned previously, future storm damage from hurricanes, tropical storms, and tropical depressions is most likely from flooding and wind damage; each hazard is discussed separately in this report. However, Hazus was used to simulate conditions of previous hurricanes that have passed near Pickens County to determine a damage estimate. None of the standard hurricanes that come with the program produced any damage within Pickens County, so a series of probabilistic hurricane models were simulated for each jurisdiction, with return periods of 10, 20, 50, 100, 200, 500 and 1000 years. No buildings in any of the jurisdictions are estimated to sustain at least moderate damage until a hurricane is stronger than the 100 year return period storm. Of the probabilistic scenarios, buildings in Central, Clemson, Easley and the County of Pickens start to sustain moderate damage during the 200 year storm simulation where as it is not until the 500 year storm simulations which buildings in Liberty, Norris, City of Pickens and Six Mile begin to sustain at least moderate damage. Copies of each of these simulations for each of the jurisdictions can be found in Appendices J-P.

<u>Pickens County</u>
In Pickens County, Hazus estimates that five buildings will sustain at least moderate damage in a 200 year probabilistic hurricane. None of the essential facilities are expected to be lost for more than one day after the hurricane. An estimated 12,563 tons of debris is expected to be generated, 77% of which comes from trees. No households are expected to be displaced and no one will seek shelter in public shelters. A storm of this size is estimated to cost $12,600,000, which includes property damage and business interruption losses.

<u>Central</u>
In Central, SC, Hazus estimated that one building will sustain at least moderate damage in a 200 year probabilistic hurricane. None of the essential facilities are expected to be lost for more than one day after the hurricane. An estimated 1,063 tons of debris is expected to be generated, 77% of which will come from trees. No households are expected to be displaced and no one will seek shelter in public shelters. A storm of this size is estimated to cost $800,000, which includes property damage and business interruption losses.

<u>Clemson</u>
In Clemson, SC, Hazus estimated that two buildings will sustain at least moderate damage in a 200 year probabilistic hurricane. None of the essential facilities are expected to be lost for more than one day after the hurricane. An estimated 1,748 tons of debris is expected to be generated, 70% of which will come from trees. No households are expected to be displaced and no one will seek shelter in public shelters. A storm of this size is estimated to cost $2,400,000, which includes property damage and business interruption losses.

<u>Easley</u>

In Easley, SC, Hazus estimated that two buildings will sustain at least moderate damage in a 200 year probabilistic hurricane. None of the essential facilities are expected to be lost for more than one day after the hurricane. An estimated 3,065 tons of debris is expected to be generated, 62% of which will come from trees. No households are expected to be displaced and no one will seek shelter in public shelters. A storm of this size is estimated to cost $5,200,000, which includes property damage and business interruption losses.

Liberty

In Liberty, SC, Hazus estimated that two buildings will sustain at least moderate damage in a 500 year probabilistic hurricane. None of the essential facilities are expected to be lost for more than one day after the hurricane. An estimated 4,326 tons of debris is expected to be generated, 78% of which will come from trees. No households are expected to be displaced and no one will seek shelter in public shelters. A storm of this size is estimated to cost $2,500,000, which includes property damage and business interruption losses.

Norris

In Norris, SC, Hazus estimated that two buildings will sustain at least moderate damage in a 500 year probabilistic hurricane. None of the essential facilities are expected to be lost for more than one day after the hurricane. An estimated 3,398 tons of debris is expected to be generated, 77% of which will come from trees. No households are expected to be displaced and no one will seek shelter in public shelters. A storm of this size is estimated to cost $2,700,000, which includes property damage and business interruption losses. As with the other Hazus models for earthquake and flood, the small size of Norris and the limitation of the software likely overestimate the damage within the town's limits.

City of Pickens

In the City of Pickens, SC, Hazus estimated that three buildings will sustain at least moderate damage in a 500 year probabilistic hurricane. None of the essential facilities are expected to be lost for more than one day after the hurricane. An estimated 3,609 tons of debris is expected to be generated, 80% of which will come from trees. No households are expected to be displaced and no one will seek shelter in public shelters. A storm of this size is estimated to cost $2,900,000, which includes property damage and business interruption losses.

Six Mile

In Six Mile, SC, Hazus estimated that one building will sustain at least moderate damage in a 500 year probabilistic hurricane. None of the essential facilities are expected to be lost for more than one day after the hurricane. An estimated 2,717 tons of debris is expected to be generated, 86% of which will come from trees. No households are expected to be displaced and no one will seek shelter in public shelters. A storm of this size is estimated to cost $1,600,000, which includes property damage and business interruption losses. As with the other Hazus models for earthquake and flood, the small size of Six Mile and the limitation of the software, likely overestimate the damage within the town's limits.

The probability, based on historical frequency data, of a tropical cyclone's track coming near Pickens County is 20%. That recurrence interval is much more frequent than the size of the probabilistic storms which would cause at least moderate damage in Pickens County or its jurisdictions. The strongest storm that has ever passed near Pickens County has had the strength of a tropical storm, much weaker than the 200 or 500 year hurricanes.

3.12 Public Health Threat

Public health threats can stem from a variety of sources that can include disease outbreaks, natural or manmade disasters resulting in mass casualties, terrorism, large scale incidents of food and water contamination, prolonged water and wastewater utility outages, and widespread chronic conditions. Public health emergencies have the potential to negatively impact a significant number of people; however, they may also just affect a few individuals. Likewise, the scale of such events can vary from local to global levels, an example of which would be an influenza pandemic.

The impact of a public health threat can vary greatly. During a public health emergency there most likely is a disruption of normal social, economic, school, and family routines. Under specific conditions, the number of fatalities can reach into the thousands, and recovery on an economic and social level would take an extremely long time (South Carolina Department of Health and Environmental Control *South Carolina Public Health*).

3.12.1 Past public health threat events

No detailed record of all the past public health emergencies in South Carolina, or Pickens County specifically was located. However, some instances have been well documented. For example, the rapid spread of the H1N1 influenza virus in 2009 was deemed a pandemic by the World Health Organization. The first human case appeared in South Carolina in April 2009, and within five months, thousands of other South Carolinians had been infected, requiring some to be hospitalized and causing the death of a few. Most of those who died were in the high risk categories of young adults 18-24 years old, children from birth to 18 years old, adults 25-64 with underlying medical conditions, and pregnant women. These high risk groups differ from normal seasonal flu greatly, posing a threat to young people's lives at a much higher rate (South Carolina Department of Health and Environmental Control *Flu*).

More recently, the World Health Organization declared the Zika virus a global public health emergency. This virus is spread through mosquitoes, blood transfusion, sexual contact and from a pregnant mother to her unborn child. Zika has been linked to microcephaly in children born to mothers who were infected with Zika during pregnancy and to Guillain-Barre syndrome. While the 2015-2016 Zika outbreak was primarily tied to South America, have been at least 43 cases of travel-associated Zika cased in South

Carolina, with one of those being diagnosed in Pickens County. As of August 30, 2016 there have been no known locally acquired vector-borne cases. (Waters, 2016).

3.12.2 Explanation of potential future public health threat events

In 2000, the South Carolina Department of Health and Environmental Control published a Public Health Hazards and Vulnerability Analysis. This assessment analyzed, on a county by county basis, the vulnerabilities to various events. Many of the public health emergencies analyzed also correspond to terrorist events, and will also be discussed in that section. It is appropriate for these events to be discussed in both sections because in public health the means of occurrence are not as important as the effects, as many occurrences can also happen as a result of accidents, and terrorism is focused more on the causes. The following is a summary of the Hazards and Vulnerability Analysis for Pickens County.

10-kiloton Improvised Nuclear Device: moderate vulnerability for Pickens County; based on inventory of high potential targets. No previous events have occurred in the United States. The results could be locally devastating, massive destruction within 1-3 mile radius, contamination within 30-50 miles.

Biological Attack-Aerosol Anthrax: limited vulnerability for Pickens County; based on population density, major transportation hubs, and large sports venues. No previous events have occurred in the United States. An attack of this nature would require the identification of all exposed individuals, the issuance of prophylaxis medications, and the monitoring and care of those infected.

Biological Disease Outbreak-Pandemic Influenza: high vulnerability for Pickens County; based on most hospital facilities located in the most populous counties, Hazus estimates that Pickens County only has 151 hospital beds available. In the last 100 years, there have been three pandemics of Influenza A in the United States. In addition, there was the H1N1 pandemic in 2009. Based on an attack rate of 15-35%, Pickens County could see 17,833-41,728 cases during peak transmission time, based on 2010 population figures. Also, extrapolated from statewide estimates, 230-537 people from the county will require hospitalization, and there will be 70-160 deaths. The State Hazard Mitigation Plan of 2013 indicated that Pandemic Influenza was the greatest threat to human health.

Biological Attack-Pneumonic Plague: severe vulnerability; based on population centers, large sports venues, pedestrian traffic, and tourist centers. No known incidences of deliberate plague attacks in the United States, however, there have been naturally occurring outbreaks. Because the incubation period is 1-6 days, a person and travel widely and spread the disease to many others before noticing symptoms.

Chemical Attack-Blister Agent: severe vulnerability; based primarily on outdoor venues, such as sports stadiums. There are no known past events. An aerial spray release could potentially affect 70,000 individuals, overwhelming the medical facilities of

South Carolina. This type of attack could require the evacuation of 100,000 and shelter would need to be arranged for 15,000 contaminated victims.

Chemical Attack-Toxic Industrial Chemicals: limited vulnerability in Pickens County; based on volume of industrial chemicals used throughout the state. There are no reported intentional attacks, but there have been some accidental releases in the state. Severity of such an attack depends on the specific type of chemicals, location, and population nearby.

Chemical Attack-Nerve Agent: severe vulnerability in Pickens County; based on the number of multi-story buildings, indoor shopping areas, large schools and universities, and sporting venues, all of which could be potential targets. There are no documented cases of nerve agent attacks in South Carolina. Training for first responders, equipment, and pharmaceuticals are available in South Carolina, but a release of any size would overwhelm the response capability.

Chemical Attack-Chlorine Tank Explosion: moderate vulnerability in Pickens County; based on facilities that store more than 100 lbs. of chlorine. There have been no intentional releases in South Carolina, but there remains a potential for accidental ones, especially during transportation. Chlorine is extremely corrosive and may damage buildings. It can injure or kill people. When spilled, it stays low to the ground, displacing breathable air.

Natural Disaster-Earthquake: high vulnerability in Pickens County. Most earthquakes in the state are below 3.0M and are not felt by people. 70% of all earthquakes in the state take place near the Middleton Place-Summersville Seismic Zone, the location of the 1886 Charleston earthquake. The impacts of such an event are discussed in the earthquake section of this report.

Natural Disaster-Major Hurricane: moderate vulnerability in Pickens County; inland areas assessment based on wind and rain effects. From 1975-1996, there were 19 hurricanes or tropical storms that passed within 100 miles of the cost of South Carolina. The effects of a major hurricane are discussed in the hurricane/tropical storm section of this report.

Radiological Attack-Radiological Dispersal Devices: severe vulnerability in Pickens County; based on high population density, major airports, large sports venues, and indoor and outdoor shopping malls. There have been no intentional dispersal attacks, but some cases of theft of radioactive sources have been reported. Contaminated steel from the accidental smelting of industrial gauges has been recovered in the state. The severity of the attack varies. Locally, it would be intense and life threatening, but the level of severity decreases as distances from the center increases. However, if the attack were dispersive, the effects would be widespread, exposing many to radiation, although it may not be detected for days or weeks.

Explosives Attack-Bombing Using Improvised Explosive Devices: severe vulnerability; based on high population/high revenue generating tourist destinations. No instances have been recorded in South Carolina, but other events in the United States have occurred, such as the Atlanta Olympics bombing and the Oklahoma City bombing. Damage and severity depend on the size and power of the IED. It can range from limited damage/impact to widespread devastation.

Biological Attack-Food Contamination: high vulnerability in Pickens County and all counties in South Carolina; primarily in food preparation facilities. There are no known intentional acts of food contamination; however, there have been outbreaks of naturally occurring pathogens when food-safety guidelines have not been followed. The severity of such an attack could impact hundreds to thousands in South Carolina and neighboring states. Because South Carolina is home to a facility which processes Meals Ready to Eat (MREs), the impact of an intentional food contamination event could spread worldwide.

Biological Attack-Foreign Animal Disease (Foot and Mouth Disease): moderate vulnerability in Pickens County; based on number of beef, swine, turkey, chicken, and dairy farms. Outbreaks of Foot and Mouth Disease in the United States are not as common as they are in some countries in Africa, South America, and the Middle East. The secondary effects of Foot and Mouth Disease are important to assess the severity of an outbreak, as the disease does not cause human illness. However quarantine and disposal of infected animals is deleterious to the mental health of farmers and animal disease control professionals. An outbreak could lead to significant economic loss, which in turn would prevent some individuals from seeking the health care they require.

Cyber Attack: high vulnerability in Pickens County and all other counties in South Carolina; based on hospital systems, clinics, other health care providers, and emergency management and emergency communication infrastructure all relying on networks of computer systems, including internet based information sharing. The frequency of cyber attacks is moderate to high. The effects such an attack would have would be in terms of disruption. The speed and efficiency of public health activities would dramatically decrease, allowing fewer people to receive the help they need (South Carolina Department of Health and Environmental Control *South Carolina Public Health*).

3.13 Radiological

When there is an unintentional exposure to materials that emit ionizing radiation, it is a radiological hazard. Radiological hazards are most often associated with nuclear power plant emergencies, but other places such as university and medical laboratories and medical treatment facilities also contain radio nuclides. In addition, the U.S. Department of Energy occasionally transports radioactive material through the United States on railways or over roads. Any of these sources has the potential to become a radiological hazard.

Nuclear power plants produce approximately 20% of the electrical power in the United States. They do so by using heat generated from controlled nuclear fission to convert water into steam to drive the generators which create the electricity. Each facility is closely regulated and monitored, but the potential for accidents or acts of terrorism still exist. For that reason, electric utilities, and local, state, and federal governments have emergency response plans in case there were to be a radiological incident. These plans use two “emergency planning zones”, one within a 10 mile radius of the nuclear power plant, the other usually within a 50 mile radius. Within the first zone, it is possible that people will become ill or develop diseases from direct radiation exposure. The second zone defines the limit of where radioactive materials could contaminate water, food crops, or livestock.

The health effects are the primary concern with radiological hazards. The radiation, the frequency and duration of exposure, and the penetrating power of the radiation (Gamma rays have more penetrating power than Alpha or Beta particles). Whether the exposure was from a direct source or radiation or an indirect source (when radiation interacts with water or food sources, which are then ingested) can also play a role in the degree and type of harm radiation causes. Acute exposure to high amounts of ionizing radiation can cause severe radiation sickness or even death in a few days to months. Exposure to radiation has also caused certain types of cancers, tumors, and malformations (U.S. Department of Homeland Security *Nuclear Power Plant Emergency* and St. Louis County, Minnesota).

3.13.1 Past radiological events

No record of nuclear power plant emergencies that occurred in South Carolina was found. These types of incidents are extremely rare. However there are some global incidents of note. In 1979 the Three Mile Island nuclear power plant in Pennsylvania experienced a core meltdown. This incident was never conclusively proven to have had negative health consequences on the population surrounding the plant (The Report of the President’s Commission). In 1986 a fire and explosion at the Chernobyl Nuclear Power Plant in Ukraine released large quantities of radiation into the atmosphere, when then spread over much of western Europe. This disaster resulted in 64 confirmed deaths as of 2008, however estimates from various groups predict between 4,000 and 985,000 cancer deaths will be attributed to the radiological emergency (Chernobyl: The True Scale of the Accident and Yablokov et al.). More recently was the Fukushima Daiichi nuclear disaster which followed a 9.0M earthquake and subsequent tsunami on March 11, 2011 (Fukushima Nuclear Accident Update Log). The effects of this disaster are not yet known, as the emergency is still ongoing.

On October 16, 1999, there was a hazardous materials incident that may have been a radiological incident as well. Two five-gallon buckets with radioactive and toxic waste placards were found in Clemson. The full report was not available, but the description of the incident from the National Response Center indicated that the material within the buckets appeared to be mud (National Response Center).

3.13.2 Explanation of potential future radiological events

Due to the fact that there have been no radiological events in Pickens County, no future probability of a radiological hazard event can be calculated.

There are no nuclear power facilities within Pickens County; however the Oconee Nuclear Station is located on the western side of Lake Keowee in Oconee County. Figure 22 shows the 10 mile radius buffer around this station. It should be noted that the entire county lies within the 50 mile buffer. In addition to this nuclear station, there are two radiological waste generators within Pickens County. The map in Figure 19 shows the locations of these facilities. Each of these locations can be a potential source of a radiological hazard.

The number of people within the 10 mile radius buffer was estimated in the same way as the number of people in the flood plain was estimated. That is, the buffer area was intersected with the 2010 U.S. Census block level population data. This estimates that 37,366 people in Pickens County are living within 10 miles of the Oconee Nuclear Station. Population densities within the 10 mile buffer zone are seen in Figure 23.

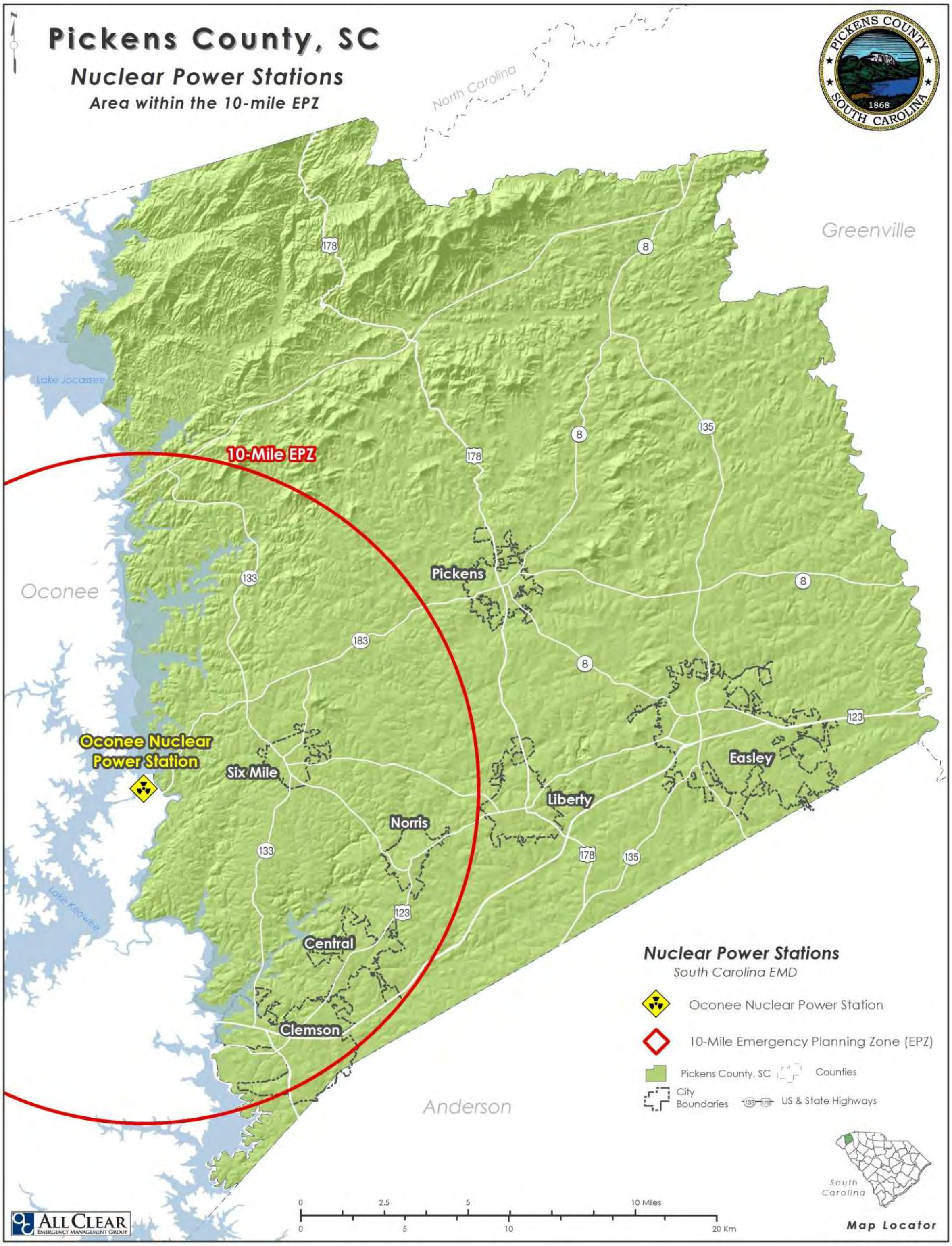


Figure 22: 10-Mile Radius Buffer around Oconee Nuclear Station

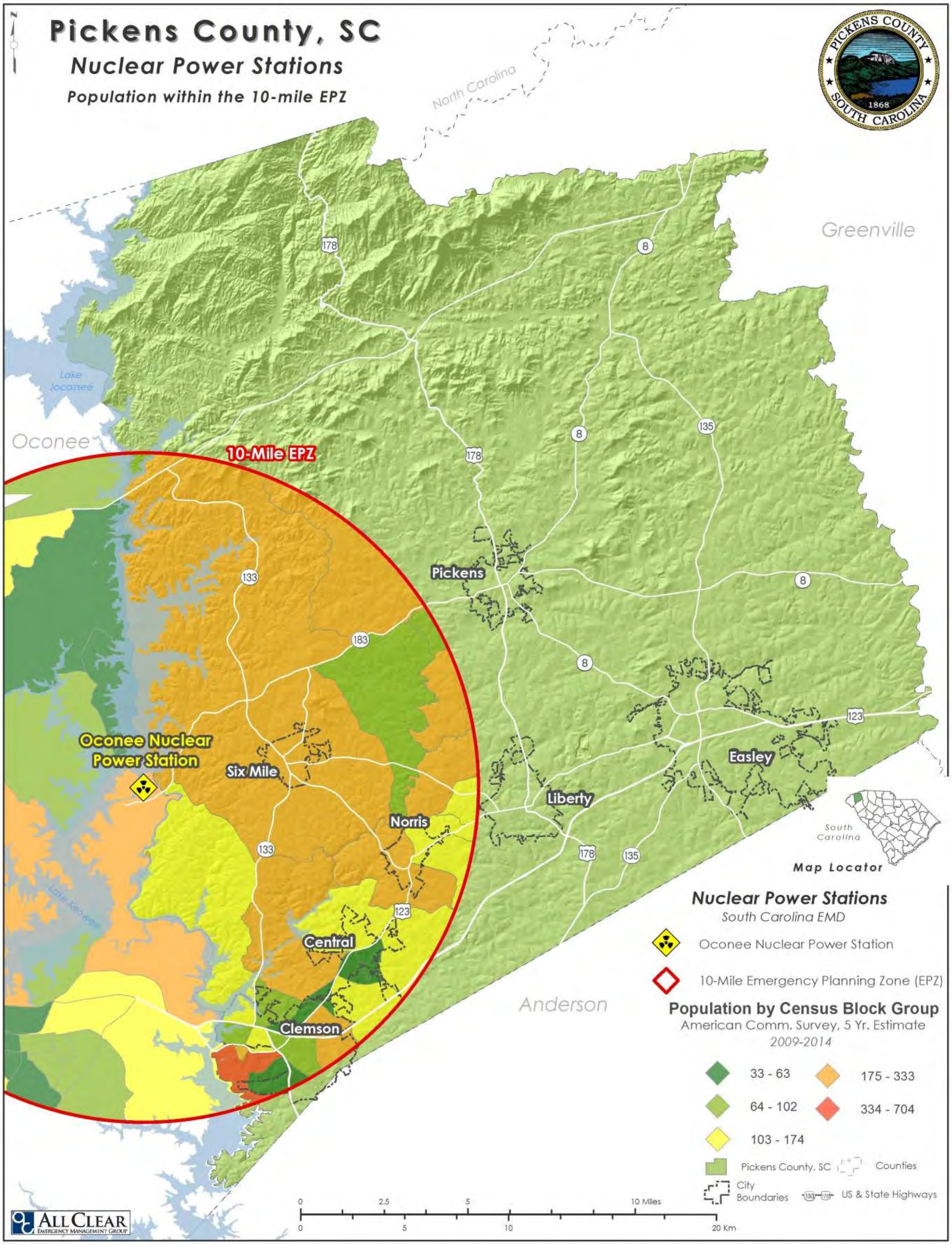


Figure 23: Population Densities within the 10-Mile Buffer Zone

3.14 Severe Storm

Severe storm is a generic term for a dangerous thunderstorm which may or may not include heavy rain, hail, and dangerous winds. A thunderstorm is classified as severe if it produces hail at least ¾ inch in diameter, winds greater than 58 mph, or a tornado; only 10% of all thunderstorms are severe. When compared to a hurricane or tropical storm, a severe thunderstorm is much smaller in size and duration. A typical thunderstorm only lasts approximately 30 minutes and is about 15 miles in diameter. Severe storms may occur as an isolated event, or there may be many grouped together or in a line. The most favorable conditions for thunderstorms to develop are warm air and high humidity.

All thunderstorms, not just the severe ones, are dangerous, but the most damage producing severe thunderstorms occur when they stall over a particular area for an extended time. Lightning injures over 300 people and kills about 80 every year in the United States. Severe thunderstorms can also produce strong winds or tornadoes which can cause injury or death as well as structural damage to buildings. Hail also contributes to property and crop destruction. Another danger associated with all thunderstorms is flash flooding due to heavy rains. This is particularly a threat in urban areas where runoff is high and low lying areas where runoff collects. Every year, approximately 140 people are killed in the U.S. by flash floods. Dry thunderstorms, which are those that do not produce rain, may even cause wildfires when lightning strikes the ground (U.S. Department of Homeland Security *Thunderstorm*).

3.14.1 Past severe storm events

Pickens County has experienced many severe storm events in the past. Information regarding the occurrences of hail, lightning, and thunderstorm-wind events was compiled from both the NCDC and SHELDUS databases. The combination of these databases allows for a record encompassing longer periods of time, and therefore makes frequency and probability estimates more reliable. In this case records for hail and thunderstorm-wind events are from 1955-May 2017, and lightning records are from 1962-May 2017. In these time period there were 184 occurrences of hail, 49 occurrences of lightning, and 317 occurrences of thunderstorm-wind events (U.S. Department of Commerce *National Climatic Data Center* and University of South Carolina). These events are summarized in Table 19. While there have not been any additional reports of lightning events since the last plan update that does not mean that there haven’t been instances in Pickens County. It is likely that the lightning occurrences in Pickens County have not been severe enough to cause damage, and therefore did not meet the reporting requirements for the Storm Event Database. Data is not available at a jurisdiction specific level, so County data is the best available. Severe storms typically affect a broad area, so County wide data is appropriate to use.

Table 19: Total Number of Severe Storm Events by Decade in Pickens County

Decade	Thunderstorm/ Wind Events	Hail Events	Lightning Events
1960-1969	22	10	8
1970-1979	38	25	29

1980-1989	39	14	5
1990-1999	72	37	3
2000-2009	72	51	3
2010-May 2017	74	47	1
Total	**317**	**184**	**49**

Figure 24 shows the tracks and locations of hail events within Pickens County from 1955-2016. The thicker the line or the dot indicates a larger magnitude of hail.

3.14.2 Explanation of potential future severe storm events

Severe storms are common in Pickens County, South Carolina, and they can occur anywhere in the county. The recurrence intervals for hail, lightning, and thunderstorm wind events are 0.33, 1.13 and 0.20 years respectively. This means there is a 295% chance of a hail event, 88% chance of a lightning event, and a 508% chance of a thunderstorm-wind event in Pickens County and the jurisdictions every year.

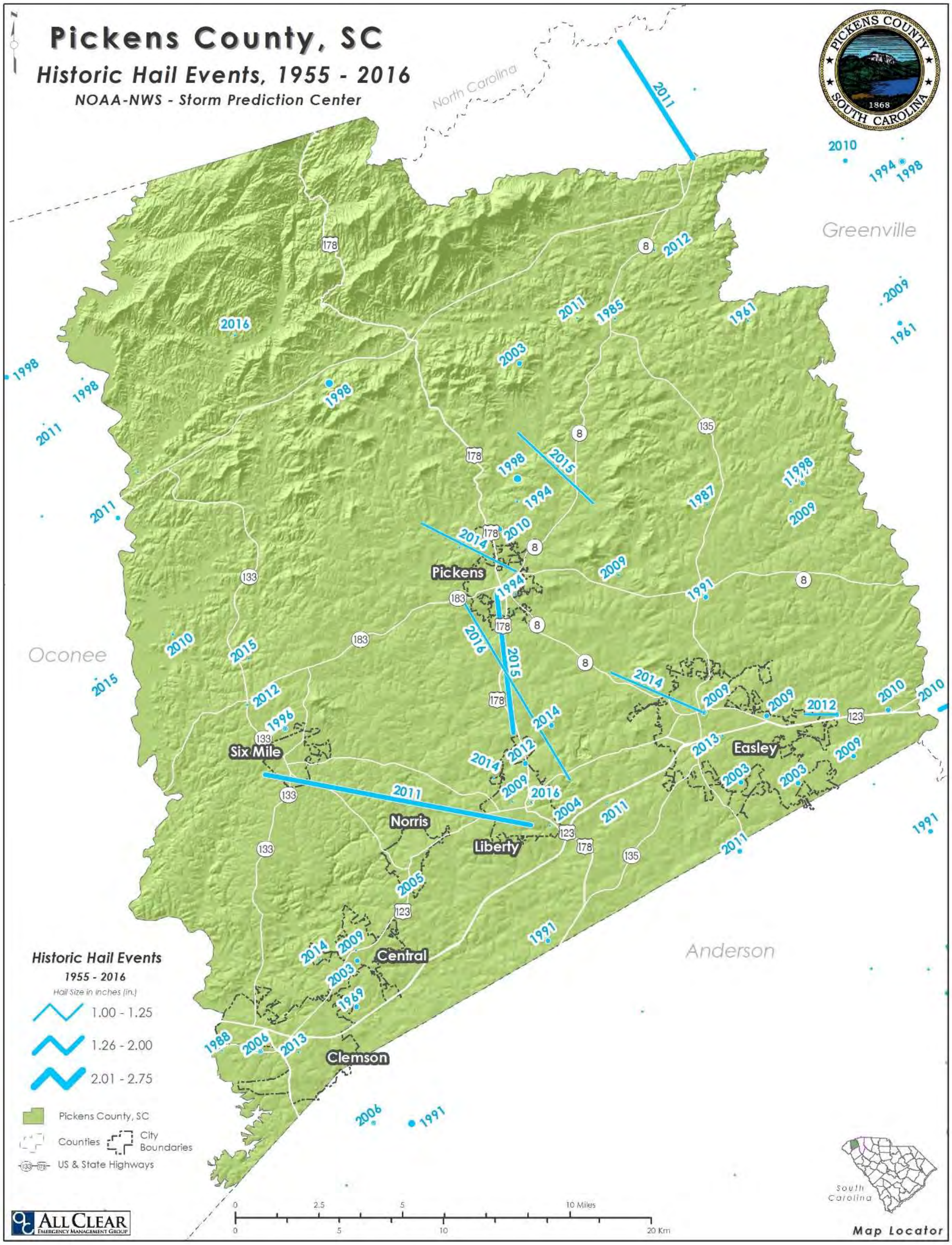
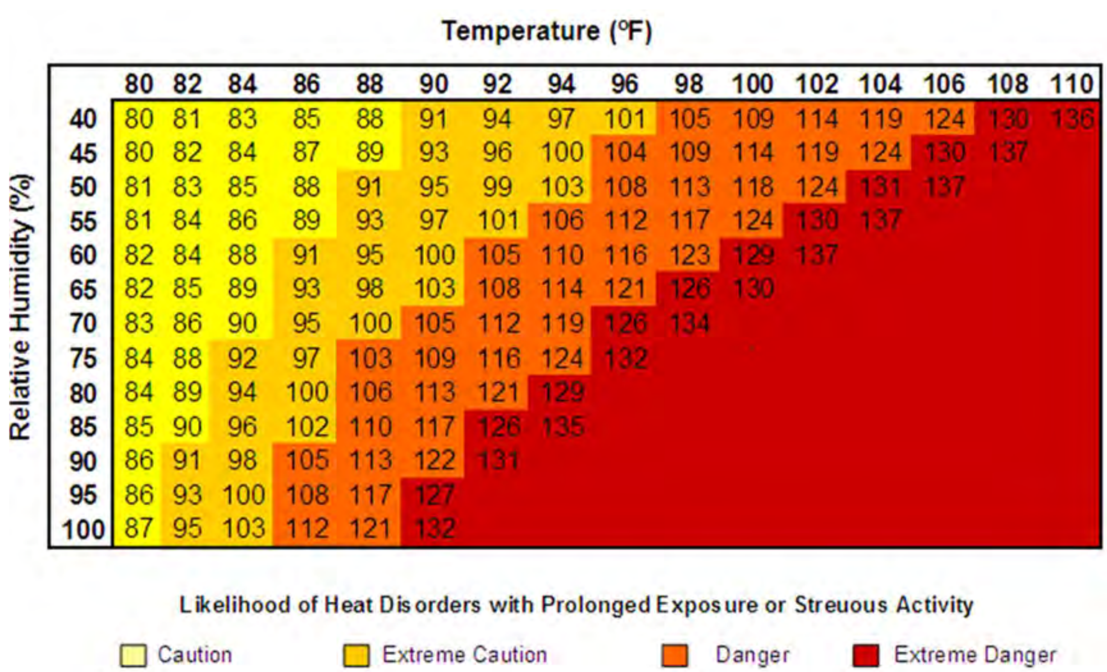


Figure 24: Previous Hail Locations

3.15 Temperature Extremes

Temperature extremes are hazards that encompass extreme heat and extreme cold; both of which can have a significant impact on a local as well as national scale. Not only do these hazards pose a risk to the life and wellbeing of individuals, they can have enormous economic costs in terms of agriculture, energy, infrastructure, production, and transportation. Often extreme heat is incorporated into drought, but it is important to consider them separately because heat acts on a shorter period of time. A drought may not pose a risk to the health of individuals for days, weeks, or even months, but extreme heat has an impact immediately. Because extreme cold acts on a longer time scale than extreme heat, and is more comparable to winter weather, the impacts from these hazards could be assessed together; however for this report, they will be considered separate hazards.

The National Weather Service Forecast Office issues excessive heat outlooks, watches, and warning/advisories based the heat index, rather than by temperature alone. The heat index combines air temperature and relative humidity in an effort to measure how hot it ‘feels’. Figure 25 is a chart issued by the National Weather Service that shows the heat index for a range of temperatures and relative humidity. It is color coded to show the degree of danger for developing heat related health effects. It shows caution is warranted for heat indices less than 105°F, but when it is greater than 105°F, prolonged exposure is dangerous (U.S. Department of Commerce NOAA NWS *Extreme Heat*).



	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	126	130					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Figure 25: NWS Heat Index Chart (U.S. Department of Commerce NOAA NWS Excessive Heat)

Extreme heat has serious, negative, health consequences. It can cause sunburn, heat cramps, heat exhaustion, and heat stroke. In severe cases, it can also cause death. The Center for Disease Control and Prevention (CDC) estimates that on average 384 people were killed by heat each year in the period of 1979-1992. This is more than the number of reported deaths annually from hurricanes, floods, tornadoes, and lightning combined. The elderly who live in urban areas and do not have access to an air conditioned environment for several hours a day are most at risk for heat related death. As most research focuses only on fatal instances, there is no reliable data regarding less severe heat related illnesses. Table 20 summarizes the different ranges of heat indices and their potential health hazards.

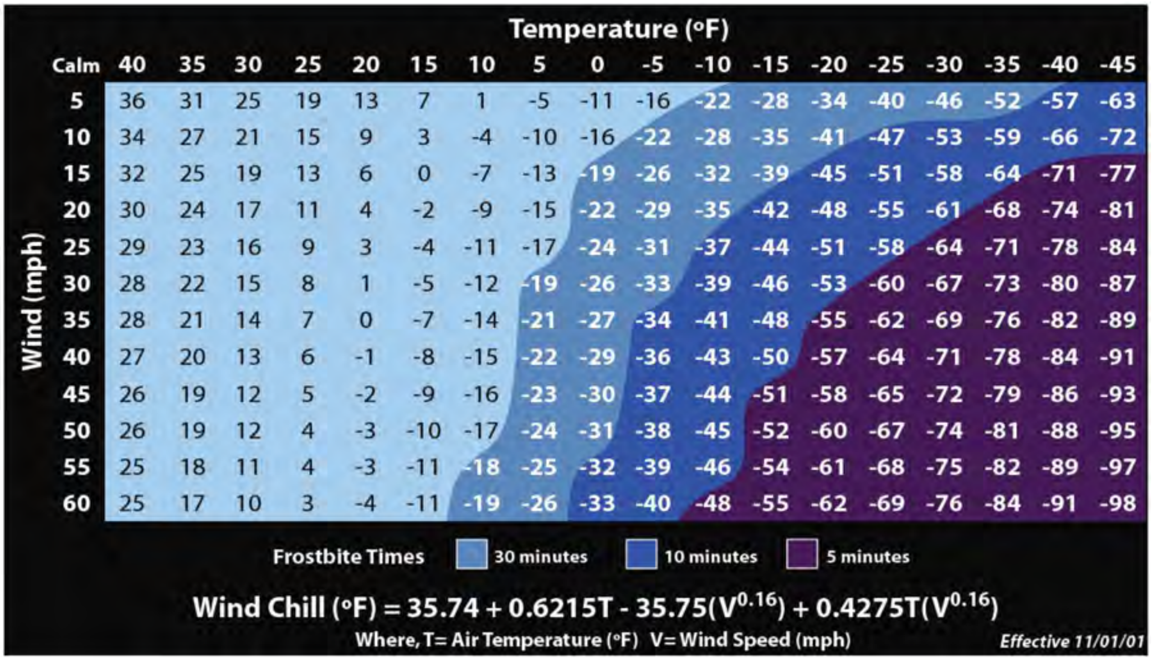
Table 20: Health Hazards Associated with different Heat Indices (New York)

Category	Heat Index	Health Hazards
Extreme Danger	**130°F - Higher**	**Heat stroke or sunstroke highly likely with continued exposure.**
Danger	**105°F - 129°F Higher**	**Sunstroke, muscle cramps, and/or heat exhaustion likely with prolonged exposure and/or physical activity.**
Extreme Caution	**90°F - 105°F**	**Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.**
Caution	**80°F - 90°F**	**Fatigue possible with prolonged exposure and/or physical activity.**

Extreme heat also has negative economic consequences across several sectors. Agricultural communities face the loss of livestock, especially birds, during heat waves. Milk production can decrease, and crop yields can be reduced significantly if the heat wave occurs during key plant developmental stages. Energy demand increases during heat waves; sometimes exceeding the supply, and forcing utilities to implement rolling blackouts.

The National Weather Service also uses the wind chill index to describe the perceived air temperature on exposed skin due to the wind. It is based on the actual air temperature and the wind speed, and can be used to estimate the time it would take to exposed skin to develop frostbite. Figure 26 shows the wind chill temperature index and the approximate times to develop frostbite, as calculated by the NWS. When the wind chill is below -18°F, frostbite can develop in as little as 30 minutes; however when the wind chill is about -50°F and below, frostbite can develop in only five minutes (U.S. Department of Commerce NOAA NWS *NWS Windchill Chart*). Hyperthermia, a state where a person's body temperature drops below 95°F, is also health hazard attributed to cold temperatures. However, this potentially fatal condition does not need wind chill temperatures as low as frostbite does to begin to affect a person. For this reason, many communities, particularly in the Southern United States where air temperatures are normally warm, define extreme cold as near freezing (32°F) temperatures or below (New York).

Extreme cold is not as dangerous in the short term as extreme heat is, but has a higher mortality rate associated with chronic longer-term exposure. Approximately 770 deaths can be attributed to cold every year in the United States. Those at highest risk are those who spend time outdoors or the elderly who are chronically exposed to colder indoor temperatures.



Temperature (°F)

Wind (mph)	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes, 10 minutes, 5 minutes

Wind Chill (°F) = $35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$

Where, T= Air Temperature (°F) V= Wind Speed (mph) *Effective 11/01/01*

Figure 26: NWS Wind Chill Index (U.S. Department of Commerce, NOAA, NWS, NWS Windchill Chart)

Similar to extreme heat, extreme cold can have economic consequences. Crops can fail or yield less if there is a frost or freeze advisory during the growing season. Livestock can suffer cold related injuries or death if not protected from long lasting cold snaps. Consumers use significantly more energy to heat their homes and businesses during very cold weather. Very cold temperatures can cause water mains or pipes to burst, flooding the area with water which soon turns to ice. Schools, governments, and businesses may close if the temperatures decrease too far (Adams).

3.15.1 Past temperature extreme events

Unlike other weather related hazards, temperature extremes do not have a readily agreed upon definition of what constitutes extreme heat or extreme cold, so record keeping is fairly subjective. The SHELDUS database only had a record of extreme heat events. The database showed nine occurrences in Pickens County in the years 1976-1993. Because these events were concurrent with drought, the economic costs of property and crop damage cannot be solely attributed to extreme heat (University of South Carolina). Unlike the SHELDUS database, the NCDC database only had records for cold events. In the years 1993-May 2017, there were nine instances of extreme cold in the county (U.S. Department of Commerce *National Climatic Data Center*). These extreme temperature events are summarized in Table 21. Jurisdiction specific information was not available for historic temperature extremes, but as extreme temperatures affect a large scale, the County data also applies to each of the jurisdictions.

Table 21: List of Extreme Temperature Events in Pickens County

Date	Event	Source
2/1/1976	Heat	SHELDUS
7/1/1977	Heat	SHELDUS
10/1/1978	Heat	SHELDUS
6/1/1983	Heat	SHELDUS
6/1/1985	Heat	SHELDUS
7/9/1986	Heat	SHELDUS
6/1/1993	Heat	SHELDUS
7/1/1993	Heat	SHELDUS
7/10/1993	Heat	SHELDUS
1/15/1994	Cold	NCDC
3/8/1996	Extreme Cold	NCDC
4/1/1997	Cold	NCDC
12/1/2000	Extreme Cold	NCDC
6/29/2012	Heat	NCDC
7/1/2012	Heat	NCDC
1/6/2014	Cold/Wind Chill	NCDC
1/7/2015	Cold/Wind Chill	NCDC
2/18/2015	Cold/Wind Chill	NCDC
2/19/2015	Cold/Wind Chill	NCDC
3/16/2017	Cold/Wind Chill	NCDC

It should be noted that the average high temperature in Pickens County is 70.6°F; the average low temperature is 48.7°F. The highest maximum temperature was 105°F, recorded on August 21, 1983, in Pickens, and the lowest minimum temperature was -6°F, recorded on January 21, 1985, in Pickens (South Carolina DNR SCO *Pickens County*). Jurisdiction specific records are not available for the municipalities in Pickens County. However, as temperature extremes occur across wide areas, all jurisdictions are susceptible.

3.15.2 Explanation of potential future temperature extreme events

Because temperature patterns are not localized phenomena, extreme temperature events can affect the entire county. And, as discussed previously, extreme temperature hazards have severe consequences to not only life, but high economic costs as well. For example, the heat wave that struck the country in 1980 was directly responsible for at least 1700 deaths and cost $15-$19 billion in 1980 dollars (Adams). This is $39-$50 billion in 2010 dollars. Based on recurrence intervals, Pickens County and the jurisdictions have a 27% probability of experiencing an extreme heat event and a 36.9% probability of experiencing an extreme cold event every year. As temperature extremes occur across wide areas, all jurisdictions are susceptible.

3.16 Terrorism

Terrorism is a manmade intentional hazard. As stated previously, terrorism is a crime, but is discussed in a separate section as the motivation for terrorism is quite different from the motivation for crime. Additionally, terrorism tends to be much larger in scale with more dramatic acts and consequences. There is no generally agreed upon definition of terrorism but FEMA defines it as “the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom” (U.S. Department of Homeland Security *Terrorism*). Acts of terrorism can include agroterrorism, armed attacks, arson, assassinations, biological agents, chemical agents, conventional bombs/improvised explosive devices, cyberterrorism, hijackings, intentional hazardous materials releases, kidnappings, nuclear bombs, and radiological agents.

As acts of terror are manmade hazards that are governed by the actions of individuals, the locations where terrorist attacks will occur cannot be known with certainty. However, there are certain characteristics that make a particular location a high risk target. These characteristics can include military and government facilities, especially those of strategic or cultural importance, sources of food or water supplies, utilities, sites which host large public gatherings, large cities, and large transportation hubs, such as ports or airports (U.S. Department of Homeland Security *Terrorism*).

3.16.1 Past terrorism events

There are no known occurrences of past terrorism events in South Carolina. However, there have been notable terrorist attacks in the United States. For instance, the 1996 Atlanta Olympic bombings, the Alfred P. Murrah Federal Building bombing in Oklahoma City in 1995, and the terror attacks of September 11, 2001.

3.16.2 Explanation of potential future terrorism events

Many of the possible terrorism hazards were addressed in the Public Health Hazard section previously in this report. This included the vulnerability of Pickens County to these different hazards. Table 22 comes from FEMA’s *State and Local Mitigation Planning How-to Guide: Integrating Manmade Hazards*. It describes four factors for each type of terrorism hazard. The application mode explains what is necessary for the hazard to occur. The hazard duration describes how long the hazard might pose a threat at its location. The extent of effects; static/dynamic column explains the hazard’s tendency to change with respect to time, magnitude, and space. For example, a conventional bomb has particular energy that is expended at one time, causing a certain amount of damage in one location. This is compared to a radiological dispersal event where wind currents may spread the radioactive nuclides away from the location they were released. Also, health effects from radiation exposure may take days, months, or even years to become apparent. The final factor that characterizes each terrorism hazard is mitigating and exacerbating conditions. This describes characteristics of the physical environment that ameliorate or enhance the effects of the hazard. A mitigating condition may be an effective sprinkler system to prevent total destruction in the case of arson. An exacerbating condition might be inadequate security, which would allow a suspect to plant a bomb in a public venue (U.S. Department of Homeland Security *Integrating Manmade Hazards*). Cyber security is an area identified by the planning committee as a particular concern for the jurisdictions of Pickens County.

Table 22: Event Profiles for Terrorism and Technological Hazards (U.S. Department of Homeland Security *Integrating Manmade Hazards* p.2-5)

Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
Conventional Bomb/ Improvised Explosive Device	Detonation of explosive device on or near target; delivery via person, vehicle, or projectile.	Instantaneous; additional "secondary devices" may be used, lengthening the time duration of the hazard until the attack site is determined to be clear.	Extent of damage is determined by type and quantity of explosive. Effects generally static other than cascading consequences, incremental structural failure, etc.	Overpressure at a given standoff is inversely proportional to the cube of the distance from the blast; thus, each additional increment of standoff provides progressively more protection. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting energy and debris. Exacerbating conditions include ease of access to target; lack of barriers/shielding; poor construction; and ease of concealment of device.
Chemical Agent *	Liquid/aerosol contaminants can be dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles/ containers; or munitions.	Chemical agents may pose viable threats for hours to weeks depending on the agent and the conditions in which it exists.	Contamination can be carried out of the initial target area by persons, vehicles, water and wind. Chemicals may be corrosive or otherwise damaging over time if not remediated.	Air temperature can affect evaporation of aerosols. Ground temperature affects evaporation of liquids. Humidity can enlarge aerosol particles, reducing inhalation hazard. Precipitation can dilute and disperse agents but can spread contamination. Wind can disperse vapors but also cause target area to be dynamic. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects.
Arson/ Incendiary Attack	Initiation of fire or explosion on or near target via direct contact or remotely via projectile.	Generally minutes to hours.	Extent of damage is determined by type and quantity of device/accelerant and materials present at or near target. Effects generally static other than cascading consequences, incremental structural failure, etc.	Mitigation factors include built-in fire detection and protection systems and fire-resistive construction techniques. Inadequate security can allow easy access to target, easy concealment of an incendiary device and undetected initiation of a fire. Non-compliance with fire and building codes as well as failure to maintain existing fire protection systems can substantially increase the effectiveness of a fire weapon.
Armed Attack	Tactical assault or sniping from remote location.	Generally minutes to days.	Varies based upon the perpetrators' intent and capabilities.	Inadequate security can allow easy access to target, easy concealment of weapons and undetected initiation of an attack.
Biological Agent *	Liquid or solid contaminants can be dispersed using sprayers/aerosol generators or by point or line sources such as munitions, covert deposits and moving sprayers.	Biological agents may pose viable threats for hours to years depending on the agent and the conditions in which it exists.	Depending on the agent used and the effectiveness with which it is deployed, contamination can be spread via wind and water. Infection can be spread via human or animal vectors.	Altitude of release above ground can affect dispersion; sunlight is destructive to many bacteria and viruses; light to moderate wind will disperse agents but higher winds can break up aerosol clouds; the micro-meteorological effects of buildings and terrain can influence aerosolization and travel of agents.

Event Profiles for Terrorism and Technological Hazards

Hazard	Application Mode	Hazard Duration	Extent of Effects; Static/Dynamic	Mitigating and Exacerbating Conditions
Cyber-terrorism	Electronic attack using one computer system against another.	Minutes to days.	Generally no direct effects on built environment.	Inadequate security can facilitate access to critical computer systems, allowing them to be used to conduct attacks.
Agriterrorism	Direct, generally covert contamination of food supplies or introduction of pests and/or disease agents to crops and livestock.	Days to months.	Varies by type of incident. Food contamination events may be limited to discrete distribution sites, whereas pests and diseases may spread widely. Generally no effects on built environment.	Inadequate security can facilitate adulteration of food and introduction of pests and disease agents to crops and livestock.
Radiological Agent **	Radioactive contaminants can be dispersed using sprayers/aerosol generators, or by point or line sources such as munitions, covert deposits and moving sprayers.	Contaminants may remain hazardous for seconds to years depending on material used.	Initial effects will be localized to site of attack; depending on meteorological conditions, subsequent behavior of radioactive contaminants may be dynamic.	Duration of exposure, distance from source of radiation, and the amount of shielding between source and target determine exposure to radiation.
Nuclear Bomb **	Detonation of nuclear device underground, at the surface, in the air or at high altitude.	Light/heat flash and blast/shock wave last for seconds; nuclear radiation and fallout hazards can persist for years. Electromagnetic pulse from a high-altitude detonation lasts for seconds and affects only unprotected electronic systems.	Initial light, heat and blast effects of a subsurface, ground or air burst are static and are determined by the device's characteristics and employment; fallout of radioactive contaminants may be dynamic, depending on meteorological conditions.	Harmful effects of radiation can be reduced by minimizing the time of exposure. Light, heat and blast energy decrease logarithmically as a function of distance from seat of blast. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting radiation and radioactive contaminants.
Hazardous Material Release (fixed facility or trans-portation)	Solid, liquid and/or gaseous contaminants may be released from fixed or mobile containers.	Hours to days.	Chemicals may be corrosive or otherwise damaging over time. Explosion and/or fire may be subsequent. Contamination may be carried out of the incident area by persons, vehicles, water and wind.	As with chemical weapons, weather conditions will directly affect how the hazard develops. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. Non-compliance with fire and building codes as well as failure to maintain existing fire protection and containment features can substantially increase the damage from a hazardous materials release.

* Source: *Jane's Chem-Bio Handbook*
** Source: FEMA, *Radiological Emergency Management* Independent Study Course

3.17 Tornado/Windstorm

Tornadoes and windstorms are destructive natural hazards. A tornado is a violent rotating column of air that extends from a cumulonimbus cloud to the ground. Most tornadoes have wind speeds less than 110 mph and travel only a few miles on the ground before dissipating. However, the largest, most destructive tornadoes can have winds in excess of 300 mph, and they can travel more than 50 miles. Windstorms are simply storms characterized by strong, fast wind and little or no precipitation. They differ from tornadoes primarily because they lack rotational motion.

Tornadoes can occur anywhere in the world, but are most prevalent in the United States in the so-called “Tornado Alley”, which is an area that covers portions of Texas, Oklahoma, Arkansas, Missouri, and Kansas. Windstorms, however, do not have a geographical bias, and occur anywhere. Windstorms are sometimes caused by thunderstorms, but may occur as isolated events. Tornadoes however, are most frequently spun off from severe thunderstorms, hurricanes, or tropical storms (U.S. Department of Commerce Tornadoes…Nature’s Most Violent Storms).

From 1971 until February 2007, tornadoes were ranked by intensity on the Fujita scale (F-scale) on the basis of how much damage was done on human-built structures and vegetation. This scale, shown in Table 23, ranks tornadoes from F0-F5 (U.S. Department of Commerce *Fujita Tornado Damage Scale*).

After the Fujita scale was implemented several shortfalls were discovered. First, tornado wind speeds required to inflict the specified level of damage could be much lower than those listed on the F-scale. Additionally, the scale generalized the type of damage that could occur, but did not take into consideration other factors, such as strength of construction, that may cause a building to sustain more or less damage from winds of a certain speed. To address these problems, the Enhanced Fujita Scale (EF-scale) was introduced in February 2007. This intensity scale is still based on damage, but is less subjective with 28 damage indicators that are used along with degrees of damage, to describe the effects a tornado has. This scale can now account for different amounts of damage that occurs to many different types of manmade and natural structures. It is thought that the wind estimates are more realistic too. Table 24 shows the comparison between the Fujita Scale and the Enhanced Fujita Scale (U.S. Department of Commerce *Enhanced F-Scale*).

Table 23: Fujita Scale for Tornado Intensity Estimation

Scale	Estimated wind speed (mph)	Relative frequency	Average damage path width (m)	Potential damage
F0	40-72	38.90%	10-50	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112	35.60%	30-150	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157	19.40%	110-250	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F3	158-206	4.90%	200-500	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260	1.10%	400-900	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F5	261-318	<0.1%	1100~	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters; trees debarked; incredible phenomena will occur.

Table 24: Enhanced Fujita Scale for tornado Intensity Estimation

Fujita Scale			Derived EF-Scale		Operational EF-Scale	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85	0	65-85
1	73-112	79-117	1	86-109	1	86-110
2	113-157	118-161	2	110-137	2	111-135
3	158-207	162-209	3	138-167	3	136-165
4	208-260	210-261	4	168-199	4	166-200
5	261-318	261-317	5	200-234	5	Over 200

Like tornadoes, windstorms can cause fatalities and extensive damage. Strong winds can fell trees and cause debris to fly through the air, resulting in significant damage and possibly deaths. Windstorms can cause widespread power and communication outages due to damage to utility poles and transmission lines. Buildings have the potential to sustain significant structural damage or may even collapse due to violent windstorms (U.S. Department of Commerce NOAA WRH).

3.17.1 Past tornado/windstorm events

Information regarding the occurrences of past tornado or windstorm events was compiled from both the NCDC and SHELDUS databases. Between 1950 and May 2017, there were 25 tornadoes listed in the NCDC database as having occurred in Pickens County (U.S. Department of Commerce *National Climatic Data Center*). Only 14 of those storms were also listed in the SHELDUS database, however, discrepancies between the two databases are fairly common (University of South Carolina). There were four F2 tornadoes in Pickens County between 1950 and June 2016. These took place on March 31, 1973, May 27, 1973, January 7, 1998, and August 26, 2008. Since the last plan update, there have been two EF0 tornados, both on April 3, 2017. No injuries or deaths were reported from those minor tornados. Table 25 lists each recorded tornado, its strength, and the monetary value of damage it caused when available. Figure 27 shows locations and magnitudes of tornadoes near Pickens County from 1950-2016. Table 26 summarizes the windstorms listed in the SHELDUS (University of South Carolina).and NCDC databases for the years 1960-May 2017, arranged by decade. These storms are also shown in Figure 28.

Table 25: Tornadoes in Pickens County, 1955-May 2017.

Date	Location	Magnitude	Property/Crop Damage
8/18/1961	Pickens County	F1	$3,000
3/31/1973	Pickens County	F2	$25,000
5/27/1973	Pickens County	F2	$25,000
3/24/1975	Pickens County	F1	-
12/5/1977	Pickens County	F1	$250,000
11/10/1987	Pickens County	F1	$25,000
2/10/1990	Pickens County	F1	$250,000
2/10/1990	Pickens County	F1	$250,000
2/14/1991	Pickens County	F1	$25,000
3/31/1993	Easley	F0	-
6/27/1994	Salem to Pickens	F1	$500,000
5/1/1995	Pickens County	F0	$5,000
1/7/1998	Easley	F2	$3,000,000
4/3/2000	Clemson	F1	-
5/2/2003	Easley	F1	$250,000
7/13/2003	Liberty	F1	$200,000
7/13/2003	Liberty	F1	$200,000
4/22/2005	Pickens	F1	$15,000
1/5/2007	Liberty	F1	$50,000
8/26/2008	Clemson	F1	-
8/26/2008	Six Mile	F0	-
8/26/2008	Clemson	F2	-
11/30/2010	Easley	F1	$1,500,000
4/3/2017	Central	EF0	-
4/3/2017	Latham	EF0	$30,000

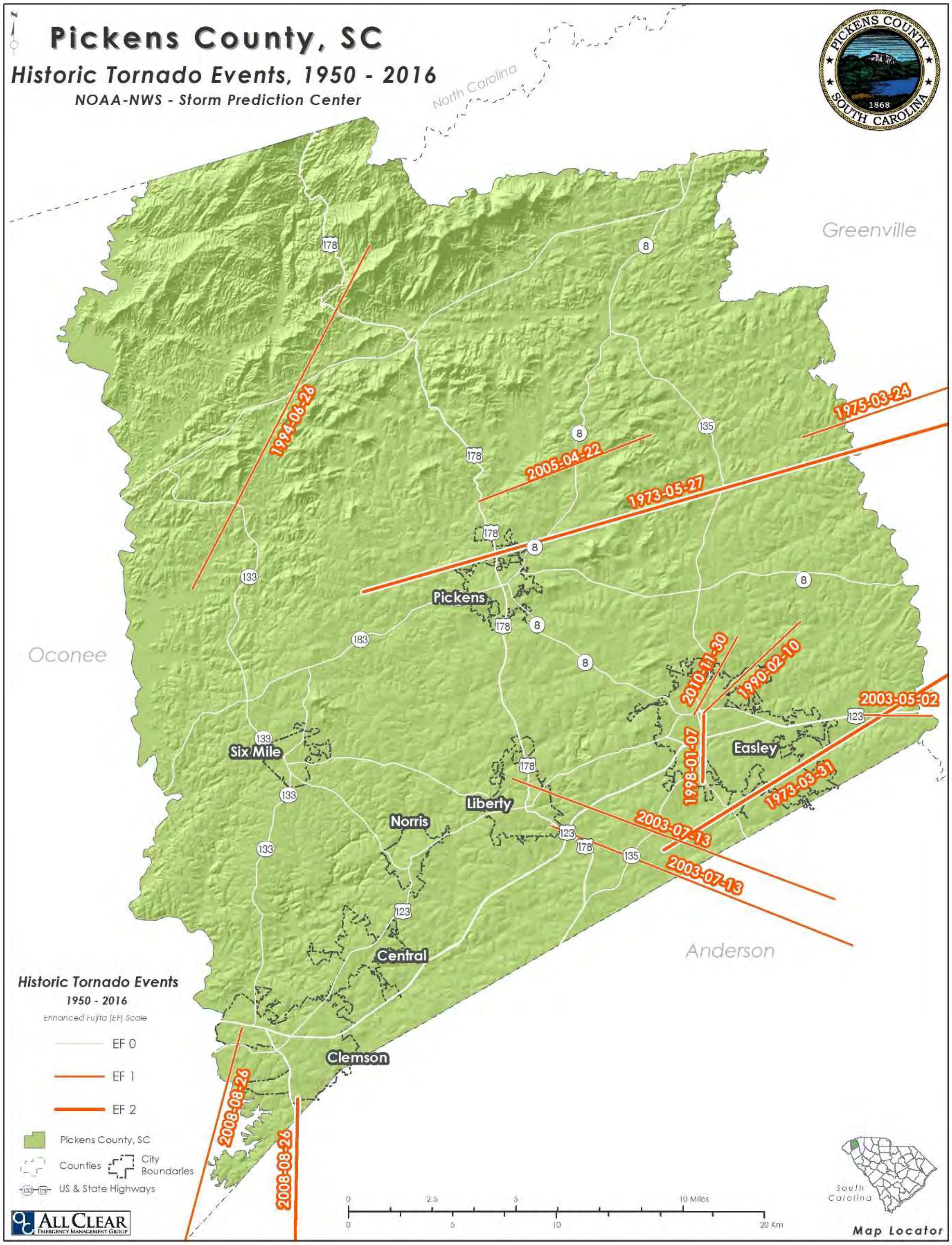


Figure 27: Tornado Locations and Magnitude, 1950-2016

Table 26: Windstorms in Pickens County, by Decade,1960-2017

Decade	Number of Wind Events	Property/Crop Damage
1960-1969	13	$12,110
1970-1979	41	$217,652
1980-1989	23	$643,596
1990-1999	15	$794,292
2000-2009	26	$509,576
2010-May 2017	73	$252,000

3.17.2 Explanation of potential future tornado/windstorm events

Tornadoes and windstorms can occur anywhere in the county and are a threat to the lives and well-being of individuals, pets, and livestock. They can also cause widespread damage to buildings and infrastructures. This damage can be very costly if one of these storms hits populated areas. The tornado that struck Easley in 2010 was a minor tornado, but still caused an estimated $1.5 million in property damage (DiBagno). An earlier F2 tornado that hit Easley in 1998 caused approximately $3 million in damage. The damage a tornado or other windstorm causes can vary greatly building to building (South Carolina State Climatology Office). At highest risk are manufactured housing and other older buildings that do not meet current building codes or were not constructed to meet the design wind speed of 200 mph (U.S. Department of Commerce Tornadoes…Nature's Most Violent Storms). The frequency data estimates Pickens County has about a 37% chance of experiencing a tornado any given year and a 333% chance of a windstorm.

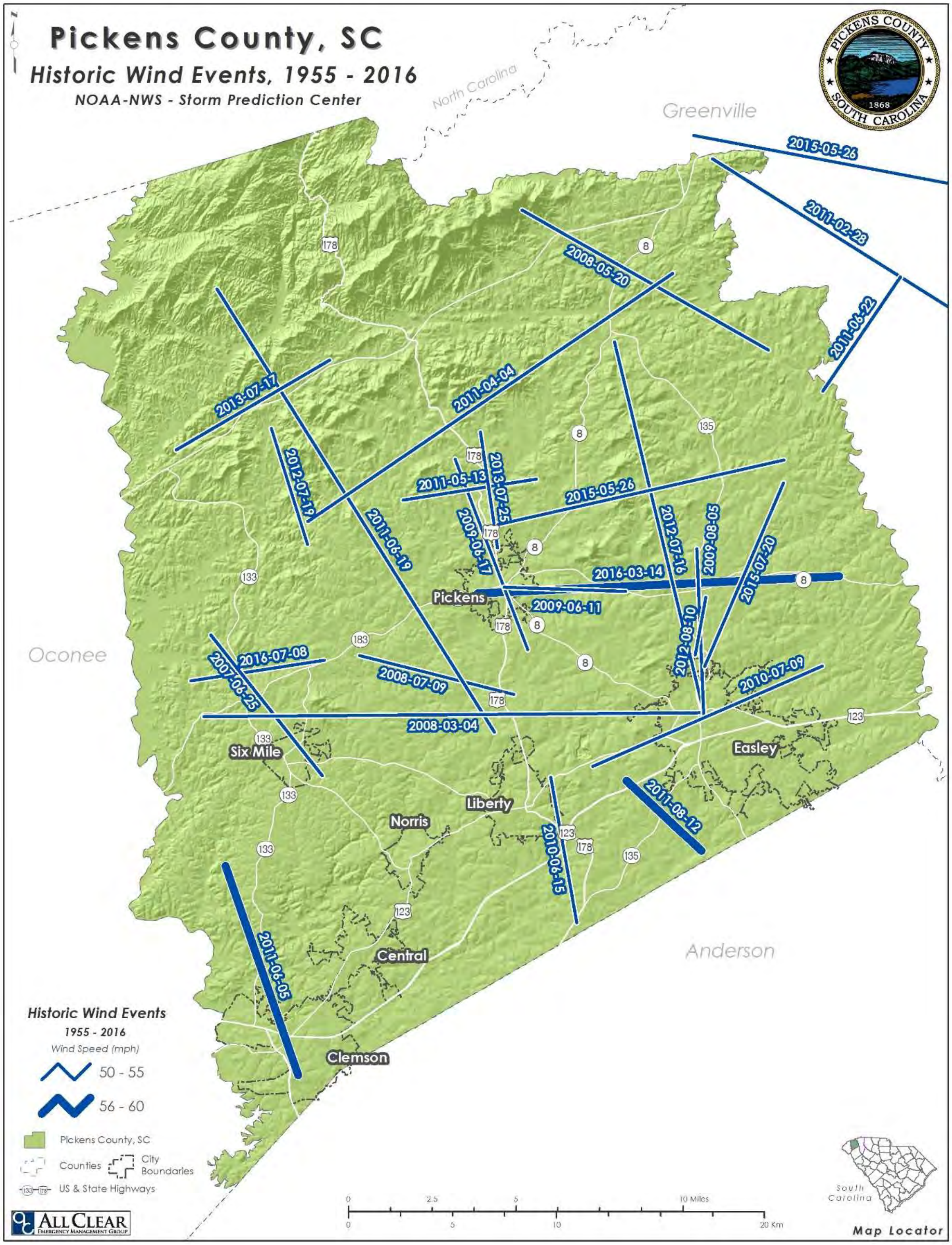


Figure 28: Windstorms, 1955-2016

3.18 Urban Fire

Urban fires are similar to crime hazards; that is, while the hazard is fairly common, its impacts are fairly limited. For example, a fire in a single family home typically only affects the individuals living there, whereas a hazard like a tropical storm could affect the whole county simultaneously. Urban fires may be vehicular fires, such as in aircraft, recreational vehicles, or motor vehicles, or they can be structural fires, and take place in a single family dwelling, mobile home, apartment, duplex, business, church, motel, hotel, or a shed. Occasionally, an urban fire will take place in an open area; however those can be classified as wildfires as well.

The South Carolina Office of State Fire Marshal lists several common causes of urban fires. Vehicle accidents such as a traffic accident or a plane crash can result in a fire. Hazards within and near homes are also frequent causes of fires. These hazards can include the burning of trash, candles, children playing with matches or lighters, smoking, heating systems, electrical systems, Christmas trees, fireplace inserts, cooking, and smoking. Industrial accidents, lightning, earthquakes, and other natural hazards may cause urban fires. Fires can also be lit intentionally as acts of arson, murder, or suicide (South Carolina Department of Labor, Licensing, and Regulation *Be Fire Safe*).

3.18.1 Past urban fire events

The South Carolina Fire Incident Reporting System (SCFIRS) is used to collect information submitted by local fire departments regarding emergency responses. This information is then analyzed and used to determine characteristics of fire problem areas. In 2010, Pickens County had ten fire departments participating in SCFIRS. These were the Central VFD, Dacusville Rural FD, Norris FD, Six Mile Town FD, Vineyards FD, Clemson University F&R, Easley FD, Liberty FD, Keowee Springs FD, and Pickens City FD. In that year, these fire departments reported 3,932 fires, two of which caused fatalities (South Carolina Department of Labor, Licensing, and Regulation *Monthly Incident Counts*).

During the 1980s South Carolina was one of the states with the most fire related fatalities in the United States. Some of the factors that contributed to this were the large rural areas served by volunteer fire departments and low educational levels combined with high poverty rates of the populace. To combat the high number of fire fatalities a statewide public education campaign was launched. Figure 29 shows how the number of fire deaths decreased after these initiatives were enacted (South Carolina Department of Labor, Licensing, and Regulation *Be Fire Safe*).

One recent urban fire example was the Cateechee Mill fire on July 6, 2017. This fire near Norris required several fire departments to work together to extinguish.

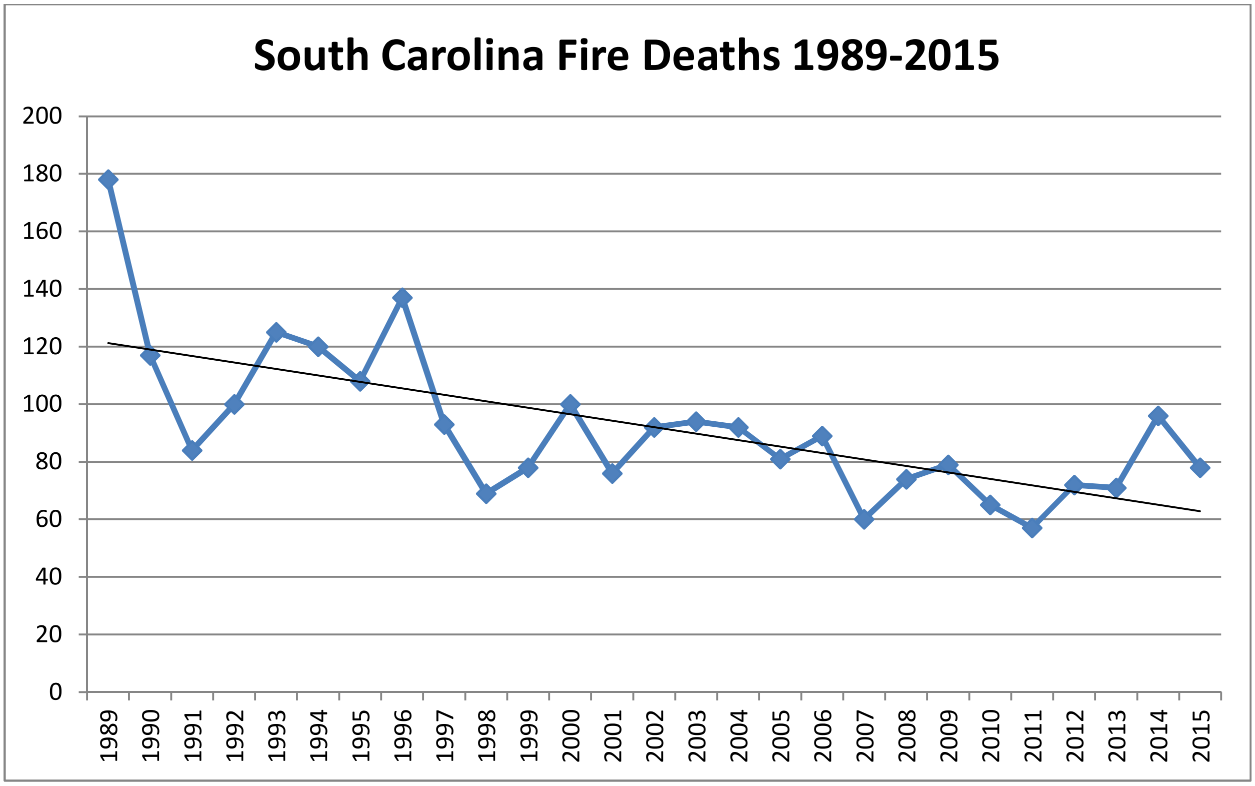


Figure 29: Fire related fatalities in South Carolina 1989-2015

3.18.2 Explanation of potential future urban fire events

With only one year of data available, it is inappropriate to calculate a recurrence interval or probability for urban fires. However, that year of data shows that urban fires are a common occurrence in Pickens County, particularly within the municipalities. On average, there were over 10 fires a day in 2010. Each urban fire has the potential to cause serious injury or death, and may cause damage costing several thousand to a few million dollars.

3.19 Wildfire

Wildfires differ from urban fires in that they are uncontrolled fires in that take place outdoors in scrubland, grassland, and woodland. Wildfires are natural phenomena that can be caused by lightning, volcanic eruptions, sparks from falling rocks, and spontaneous combustion (U.S. Department of Agriculture *Wildfire Prevention*). However, it is estimated that more than 80% of wildfires in the United States are caused by human activities. Humans can cause fires through arson, improperly disposed cigarettes, sparks from equipment, trash or camp fires that burn out of control, or fireworks (Krock).

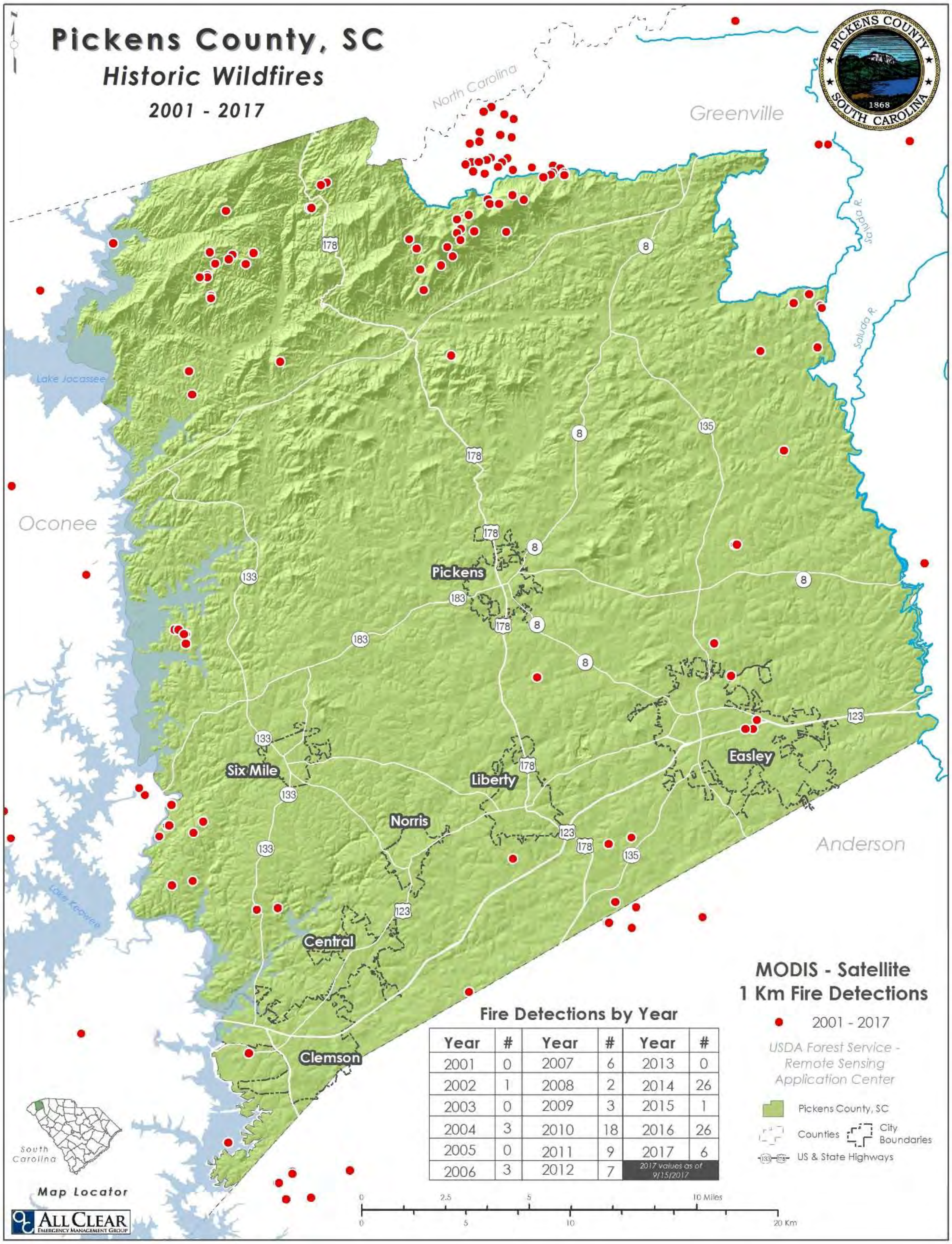
Fires require fuel, heat, and oxygen to burn, forming what is called the fire triangle. Without any one component, fires will collapse. Wildfires can also occur at any time during the year in which conditions are favorable. The combination of low humidity, high winds, below-normal precipitation, and high temperature is called fire weather. It is under these conditions that wildfires become likely (U.S. Department of Agriculture *Fire Behavior*).

As stated previously, wildfires are natural phenomena, can even have ecological benefits. However, wildfires, which can move 6.7-14mph, can pose a threat to life and property (State Government Victoria). This is particularly true where developed and undeveloped land meet along the wildland-urban interface. Wildfires frequently have secondary effects, which may pose even greater danger than the fires did. Wildfires can increase erosion which then leads to water quality problems, facilitate landslides, or enable the introduction of invasive species.

3.19.1 Past wildfire events

According to the South Carolina Forestry Commission, Pickens County experienced 3,647 wildfires in 71 seasons. This encompasses the period between FY1946 – FY2017. These 3,647 wildfires burned a total of 24,366.3 acres. This data is aggregated for the whole county, so no data is available to show how many fires were in each jurisdiction in that 71 year period, nor how many total acres were burned in each jurisdiction. Figure 30 does show that vast majority of the fires from 2001 to 2017 have occurred in unincorporated Pickens County, with a few in Easley, and one near Clemson. The other jurisdictions have had no wildfires within their boundaries since 2001. This gives a probability of wildfires occurring in unincorporated Pickens County at 649% every year, in Easley at 18% and in Clemson of 6%. As no fires have occurred within the boundaries of the other municipalities since 2001, no probability can be calculated.

On average, there were about 51 wildfires a year, and about 343 acres were burned each year. The largest number of fires occurred during the 1980-81 season when 145 fires burned 435 acres. This data is for the County as a whole, as jurisdiction specific information is not available. Until 2016, the largest number of acres burned in a single season was 905.5, which came from 24 fires during the 1955-56 season (South Carolina Forestry Commission). On November 9, 2016 the Pinnacle Mountain Fire began around 8:30am in Table Rock State Park, which is approximately 10.5 miles north of the City of Pickens, SC. The fire burned a total of 10,623 acres before it was fully contained on December 5, 2016 and cost approximately $5,000,000. Figure 30 shows wildfires in and near Pickens County from 2001 through 2015. As can be seen from this map, wildfires are a danger throughout the county, but the risk is greatest in the northern part of the County, outside of the municipalities. Table 27 lists the number of fires that occurred in each fire season and the total number of acres burned.



Year	#	Year	#	Year	#
2001	0	2007	6	2013	0
2002	1	2008	2	2014	26
2003	0	2009	3	2015	1
2004	3	2010	18	2016	26
2005	0	2011	9	2017	6
2006	3	2012	7	2017 values as of 9/15/2017	

Figure 30: Wildfires, 2001-June 2017

Table 27: Wildfires in Pickens County, FY1946-FY2017

Year	Number of Fires	Acres	Year	Number of Fires	Acres Burned
1946-47	121	417.5	1982-83	19	40
1947-48	37	83.6	1983-84	48	107.4
1948-49	44	240	1984-85	94	231.5
1949-50	35	89.5	1985-86	95	173.5
1950-51	75	508.9	1986-87	64	140.7
1951-52	34	56.9	1987-88	84	191.4
1952-53	61	205.7	1988-89	41	100.6
1953-54	52	141.3	1989-90	35	71.9
1954-55	90	463.7	1990-91	43	143.2
1955-56	24	905.5	1991-92	41	119.4
1956-57	19	40.3	1992-93	37	53.4
1957-58	33	96.2	1993-94	67	153.7
1958-59	85	457	1994-95	54	124.8
1959-60	43	84.4	1995-96	75	503.3
1960-61	27	107.2	1996-97	40	157.7
1961-62	52	128.1	1997-98	46	84.9
1962-63	97	440.5	1998-99	79	288.2
1963-64	54	88.9	1999-2000	81	318.1
1964-65	50	138.7	2000-01	76	159.5
1965-66	67	374.1	2001-02	71	166.2
1966-67	42	376.9	2002-03	36	67.7
1967-68	86	462.8	2003-04	56	306.1
1968-69	49	250.2	2004-05	39	88.4
1969-70	58	167.4	2005-06	58	142.2
1970-71	51	132.1	2006-07	72	494.5
1971-72	22	38.4	2007-08	58	146.9
1972-73	21	27.6	2008-09	30	43.3
1973-74	45	64.5	2009-10	21	51
1974-75	41	60.3	2010-11	36	62.6
1975-76	41	86.7	2011-12	13	11.9
1976-77	57	101.9	2012-13	17	38.8
1977-78	43	551.4	2013-14	20	606.1
1978-79	31	37.5	2014-15	19	46.2
1979-80	53	159.3	2015-16	7	6.0
1980-81	145	435	2016-17	36	10,718
1981-82	54	187.2			

3.19.2 Explanation of potential future wildfire events

Figures 31, 32, 33 and 34 are sourced from LANDFIRE, the Landscape Fire and Resource Management Planning Tools, which is a shared program between the U.S. Department of Agriculture Forest Service and U.S. Department of the Interior. Figure 31 shows the existing vegetation cover for Pickens County. It can be seen that the vast majority of the vegetation within the county is closed tree canopy, followed by no dominant lifeform, which is typical of urban and residential areas.

Figure 32 shows the presumed historical fire regimes within landscapes, which are based on interactions between vegetation dynamics, fire spread, fire effects and spatial context. Of the two burnable regimes within Pickens County, the majority of the County is classified Fire Regime Group I, which indicates a return interval of less than or equal to 35 years, with a low and mixed severity. The jurisdictions are also mostly classified Fire Regime Group I. The other burnable classification is Fire Regime Group III, which indicates a 35-200 year return interval, with low and mixed severity.

Figure 33 shows the mean fire return interval, which further quantifies the average period between fires under the presumed historical fire regime. Most of the municipalities' land is classified as having a mean fire return interval of 0-5 years, which would indicate that fires are very likely to occur in any given year. The more northern part of the county, around the Jocassee Gorges Wilderness Area and Table Rock State Park have return intervals mostly 11-15 years, indicating that fires would be slightly less likely in these areas than the other parts of the County. However, the mean fire return interval map cannot be used directly to estimate the likelihood of wildfires in any given region of Pickens County. As ground vegetation may change, Figure 34 also needs to be considered.

Figure 34 shows the Vegetation Class of Pickens County, which shows how far the actual ground cover differs from the historical vegetation. It is clear from this figure that current conditions are much closer to their historical counterparts in the northern part of the County, than towards the southern part, where the majority of the population of the County is concentrated, as would be expected as the northern part of Pickens County is not as developed as the part where the municipalities are located. Together, Figures 33 and 35 suggest that the mean fire return interval for the northern part of the county is 11-15 years as current conditions do not vary greatly from the conditions assumed during the calculation of the interval. However, as conditions depart more severely from the assumed conditions of the fire interval map for the developed areas, it would suggest that while the mean fire return interval of the southern portion of the County is indicated as 0-5 years, the actual return interval is more likely to be larger, due to the urbanization around the cities and residential areas, which creates more unburnable areas.

That being said, as there were at least 3,568 wildfires over the past 67 seasons, this indicated that wildfires are a very likely hazard in Pickens County, and the County and its jurisdictions should expect a few fires each year, but most would be expected to be smaller than 2016's Pinnacle Mountain Fire. Historically, most wildfires occur in the northern portion of the county, in unincorporated Pickens County, so this area is at highest risk to experience more frequent fires. However, the municipalities are susceptible to more costly effects of wildfires, specifically along the urban-wildland interface. While the municipalities might experience fewer wildfires, they have a higher vulnerability due to the concentration of homes and businesses.

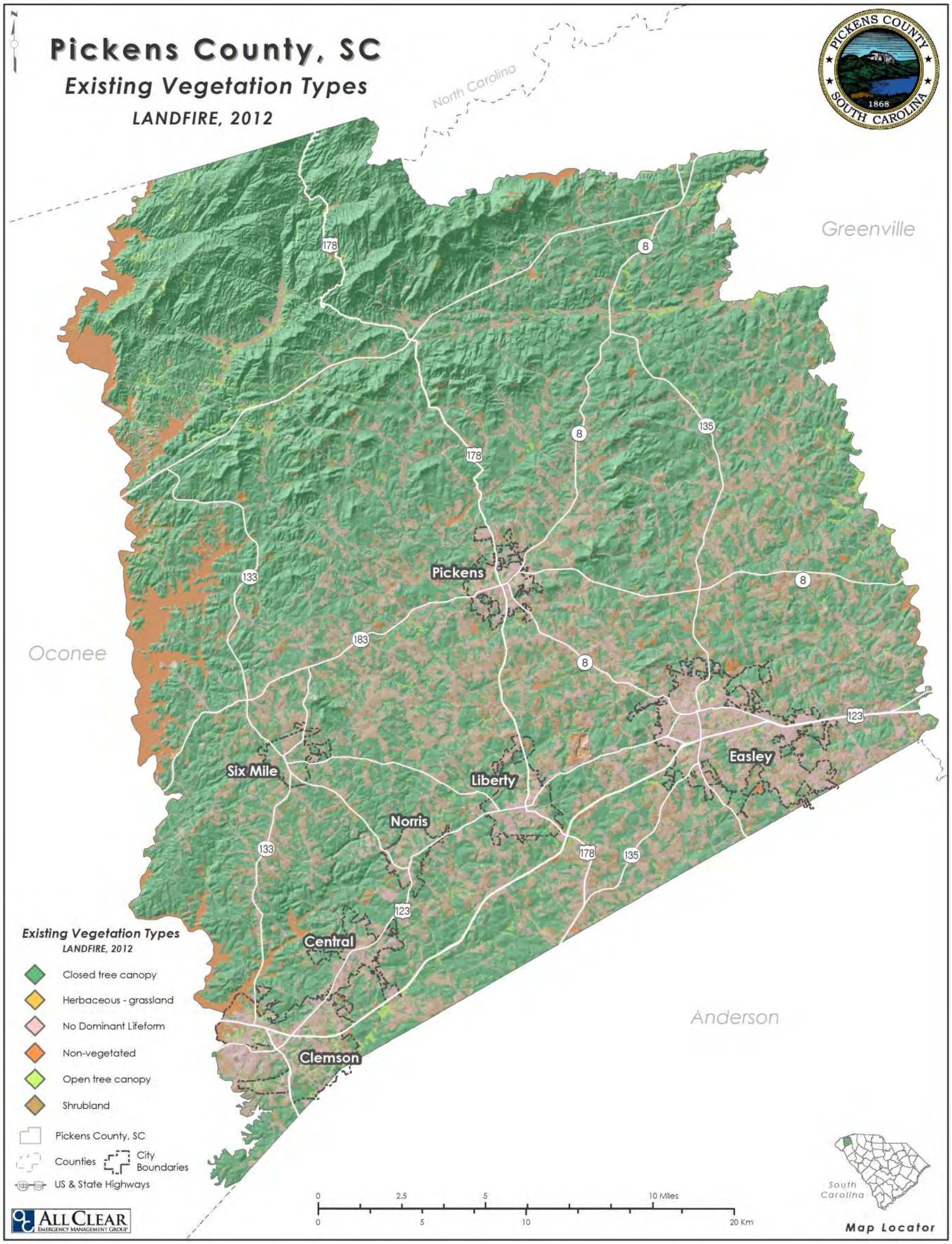


Figure 31: Existing Vegetation Types, 2012, Pickens County, SC

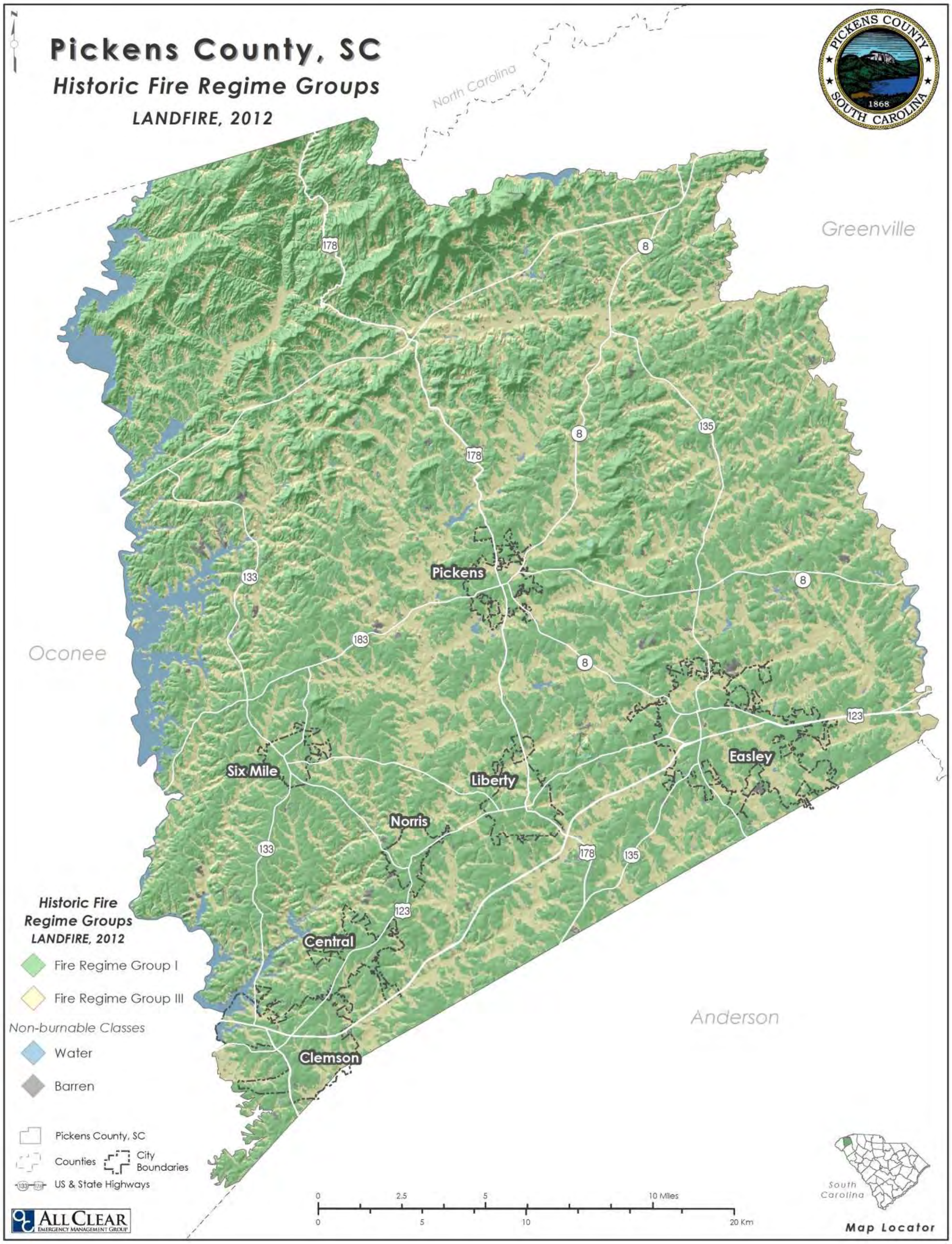


Figure 32: Fire Regime Groups of Pickens County, SC

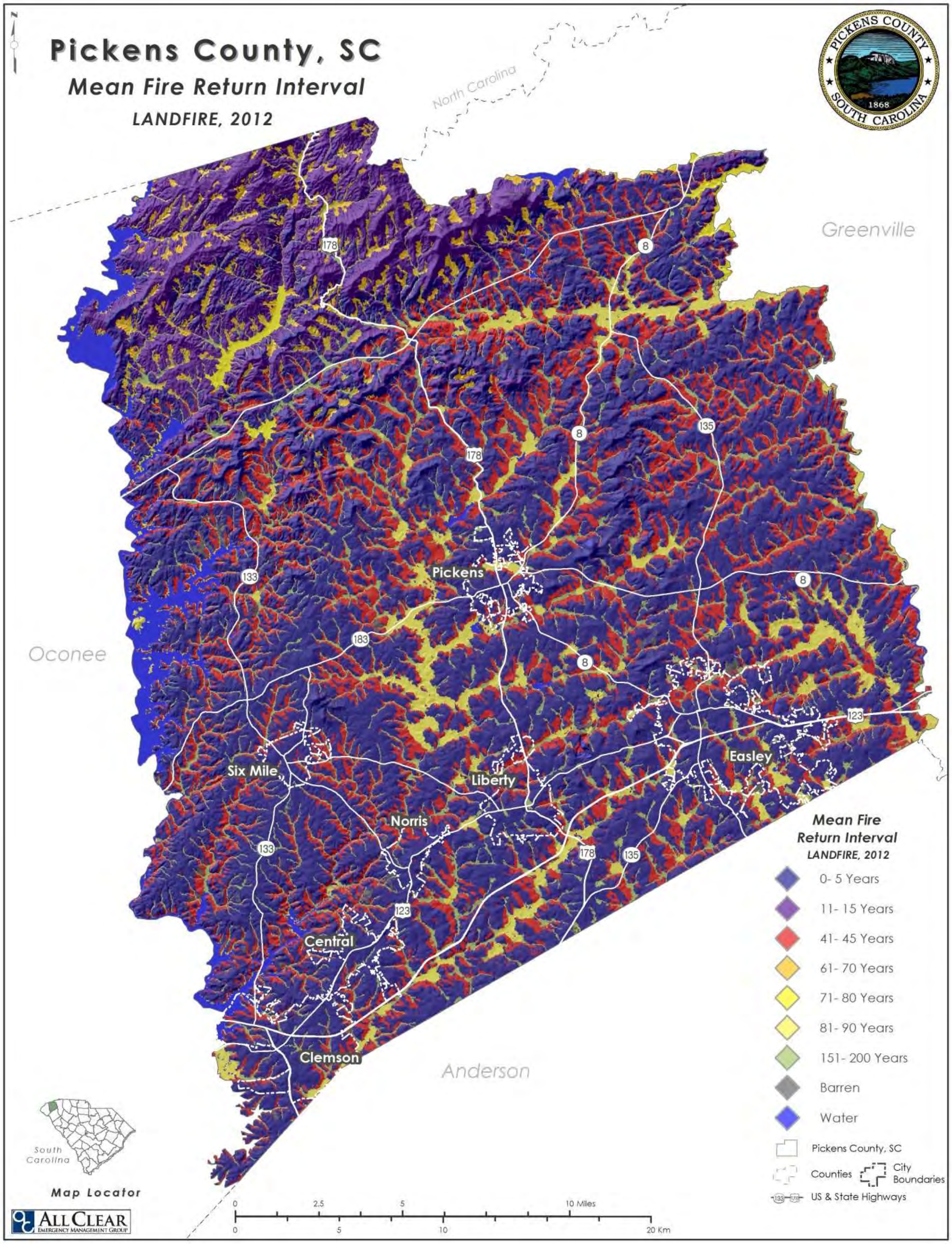


Figure 33: Mean Fire Return Interval for Pickens County, SC

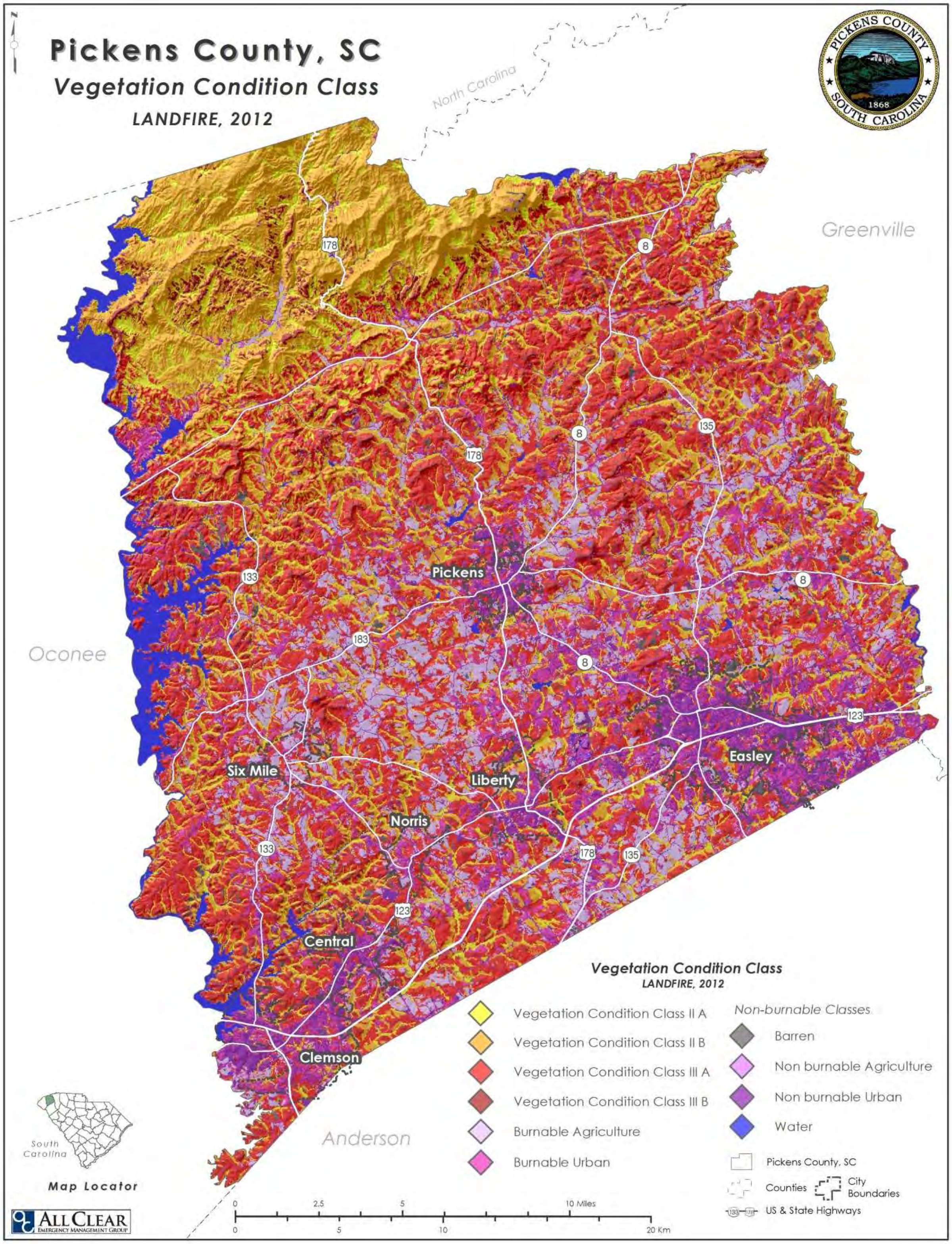


Figure 34: Vegetation Condition Class for Pickens County, SC

3.20 Winter/Ice Storm

Severe winter storms are characterized by cold temperatures, heavy snow, ice, or freezing rain, and sometimes high winds. These storms can last for several days and have the potential to cause a variety of problems. The hazards associated with extreme cold events were discussed in the extreme temperature section of this report, so this section will focus primarily on the effects that heavy snow, ice, freezing rain and high winds have.

Heavy snow can make travel impossible, as roads become blocked and airports shut down. This can disrupt the supply of goods, hinder emergency response personnel, isolate homes and farms, and trap people in their cars. Heavy snow can also cause roofs to collapse, and power lines and trees to be knocked down. Avalanches also may occur in mountainous terrain. Blizzard, which happen when high winds accompany heavy snow; can further hinder travel by reducing visibility considerably.

Ice can also be a component of a severe winter storm. Similar to heavy snow accumulations, ice buildup can also knock down trees and utility poles and towers. Ice can be extremely hazardous on roads, as 70% of all injuries due to winter storms are a result of vehicle accidents. Pedestrians may also experience injuries that stem from slipping on the ice.

The aftermath of a severe winter storm event can have a lasting effect on a community for days, weeks, or even month. For example, there can be severe economic losses due to these storms. Businesses may have to remain closed during these events, livestock can be lost, and whole crops may fail if the storm is early or late in the growing season. Also there are high costs for snow removal and damage repairs (U.S. Department of Commerce *Winter Storms*).

3.20.1 Past winter/ice storm events

Pickens County receives an average of 4-8 inches of snow annually. The largest snowfall in a 24 hour period measured at 14.1 inches in Clemson on December 17, 1930 (South Carolina DNR SCO *Pickens County*). In the period 1960- May 2017, there were 178 winter or ice storm instances. One example of a severe winter storm in Pickens County was previously mentioned in the transportation system disruption section of this report (U.S. Department of Commerce *National Climatic Data Center* and University of South Carolina). This was the winter storm that occurred over a two day period in January 2011. This storm produced nine inches of snow, which, in combination with icy roads, created extremely dangerous driving conditions (South Carolina Emergency Management Division *News Releases* and *Situation Reports*).

Another example of a severe ice storm event occurred on December 15-16, 2005. Not only did this storm create treacherous driving conditions, it also caused widespread power outages. In some locations, utility companies were not able to restore service for over a week following the storm. This storm was declared a major disaster, allowing Pickens County to be eligible for federal funds, the sum of which was $386,718 (U.S. Department of Homeland Security *South Carolina Severe Ice Storm*).

Table 28 shows the number of winter weather events in Pickens County, between 1960 and May 2017, broken down into decades. It also lists the cost of property and crop damage. The monetary values for 1990-1999 and 2000-2009 are significantly larger than the previous decades. This is in part due to the incorporation of data from the National Climatic Data Center which was from 1993 through May 2017. This database uses different sources for obtaining storm information and damage estimates, however the specific jurisdiction each of those storms impacted is not available. But, as winter weather impacts a broad area, County data can be used for the other jurisdictions as well.

Table 28: Winter Weather Events, per Decade, 1960-May 2017

Decade	Number of Events	Property/Crop Damage
1960-1969	13	$1,519,707
1970-1979	20	$548,736
1980-1989	33	$2,789,925
1990-1999	35	$37,285,550*
2000-2009	41	$100,333,333*
2010-May 2017	36	-

3.20.2 Explanation of potential future winter/ice storm events

Winter weather and ice storms have the potential to impact the entire county. Each occurrence has the possibility of becoming severe and threatening the life and health of the residents of Pickens County and causing negative economic consequences. There is a 310% probability of a winter storm or ice event to occur each year in the County and the municipalities, as winter storms and ice events are regional hazards that affect large areas.

3.21 Composite Hazards

Figure 35 shows a map showing the previous hazard events which were included as individual hazards in Section 3 – Hazard Identification and Risk Assessment. Figure 36 shows the potential future hazard events in the County and the jurisdictions, as appropriate for mapping. Both of these maps also show the critical facilities within the municipalities and the County.

3.22 Risk Assessment

The Pickens County Planning Committee undertook a simple risk analysis process to determine which hazards posed the greatest threat to the county as a whole based on three factors. This risk analysis was based on how much of the community was vulnerable to any particular hazard (Vulnerability data from Section 4 of this plan was utilized to inform this ranking), the severity of the consequences (Section 3 was used to inform these rankings), and the frequency at which a hazard occurs (frequency was determined by the historical record of each specific hazard type found in Section 3, when available). These factors were evaluated by a cadre of subject matter experts in Pickens County. Data from the plan as well as the experience of the subject matter experts was considered when ranking the hazards according to the criteria below.

The following are the criteria used to calculate the risk faced from all identified hazards in Pickens County:

Vulnerability

High	Affects 75-100% of county
Medium	Affects 26-74% of the county
Low	Affects 25% of the county or less

Consequence

High	Major damage and losses
Medium	Extensive damage and losses
Low	No or very little damage or loss

Frequency

High	Occurs, on average, at least once a year
Medium	Occurs, on average, once every 1-10 years
Low	Occurs, on average, fewer than once every 10 or more years

Priority

High	Composite score of 7 or higher
Medium	Composite score of 5 or 6
Low	Composite score of 4 or lower

To calculate the final score, high rankings in each category were given a score of 3, medium rankings were given a score of 2, and low rankings were given a score of 1, and a composite score was obtained from the three categories. This composite score was used to determine the overall priority for each hazard. This process was used in Section 6 of this plan to prioritize the action items identified for Pickens County.

Table 29: Risk Assessment of Hazards for Mitigation Action Prioritization

Hazard	Vulnerability	Consequence	Frequency	Priority
Civil Disturbance/Crime	High	Medium	High	High
Dam/ Levee Failure	Medium	Low	Low	Low
Disruption of Transportation Systems	Low	Low	Medium**	Low
Disruption of Utility Services	High	Medium	Low**	Medium
Drought	Low	Medium	High	Medium
Earthquake	Low	Low	Low	Low
Economic Crisis	Medium	High	Medium	High
Flooding	Low	Low	High	Medium

Hazard	Vulnerability	Consequence	Frequency	Priority
Hazardous Materials	Low	Medium	High	Medium
Hurricane/ Tropical Storm	Low	Low	Medium	Low
Public Health Threat	Low	Medium	Medium**	Medium
Radiological	Low	High	Low	Medium
Severe Storm	High	Low	High	High
Temperature Extremes	High	Low	Medium	Medium
Terrorism	Low	High	Low	Medium
Tornado	Low	Medium	Medium	Medium
Windstorm	Low	Medium	High	Medium
Urban Fire	Medium	Low	High	Medium
Wildfire	Low	Low	High	Medium
Winter/ Ice Storm	High	High	High	High

**Comprehensive list of historical occurrences of hazards was not available, so frequency was based on the knowledge and experience of the planning committee.

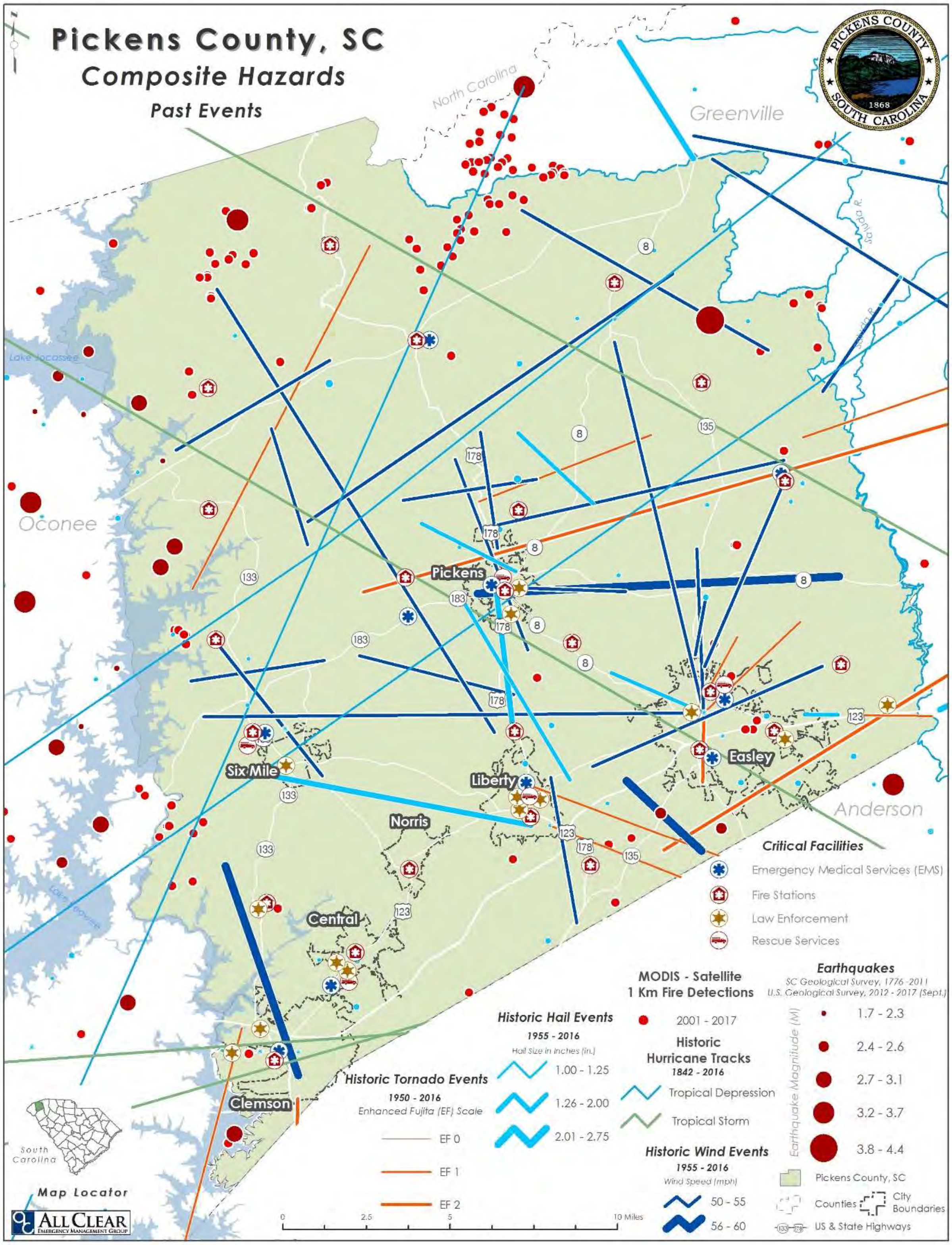


Figure 35: Composite Map of Previous Hazard Events

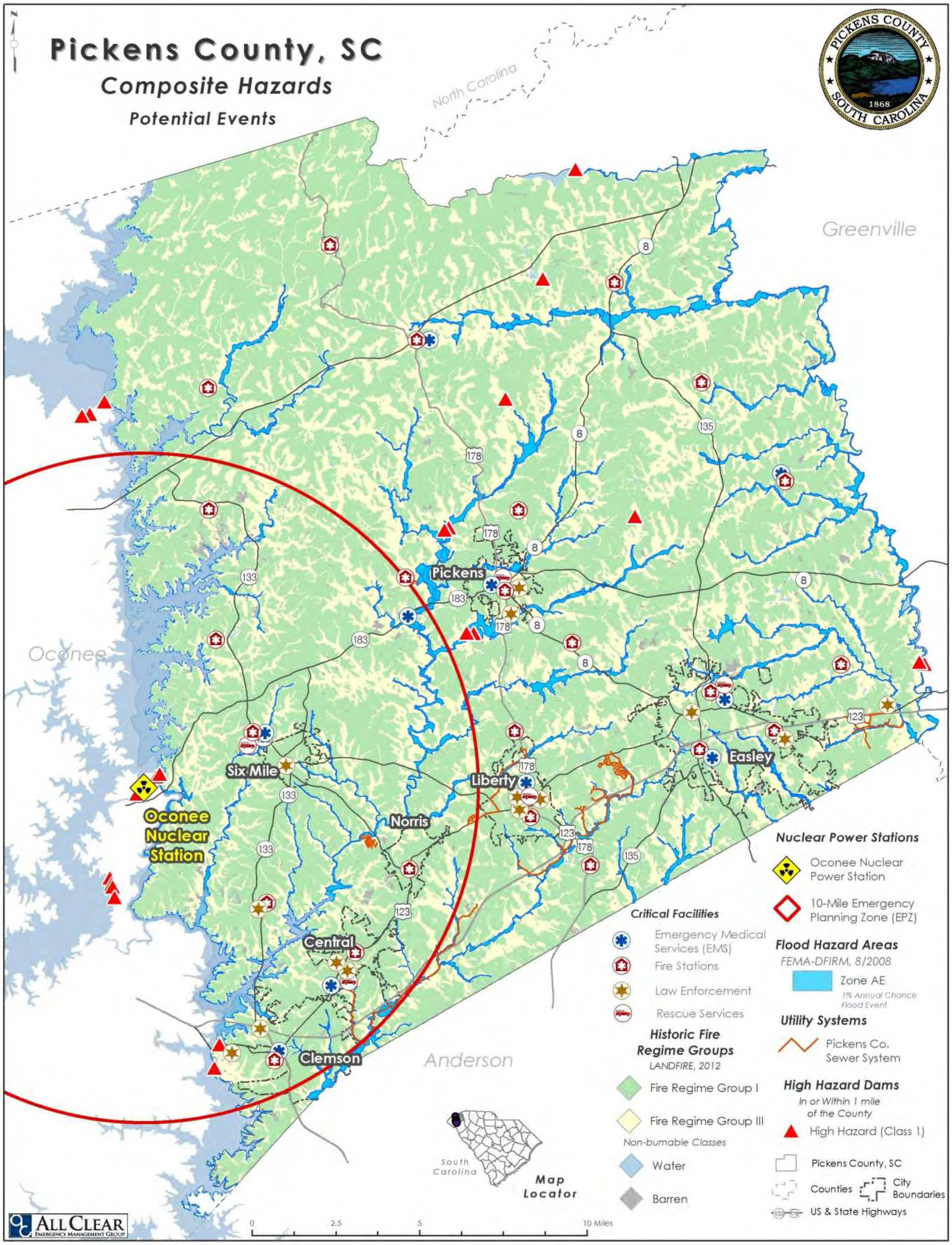


Figure 36: Map of Potential Future Hazards

4. Vulnerability Assessment

Pickens County's vulnerabilities to specific hazards were discussed in general terms in the hazard identification and analysis section, describing the danger to the population, and potential damage each hazard could cause in as much detail as possible. Except for the basic analysis capabilities of Hazus for flooding, earthquake, and hurricane hazards, detailed analysis could not be performed due to a lack of available data, such as an inventory of buildings that contains information regarding age, construction type, etc. However, other factors need to be considered to assess the overall vulnerability of a community.

4.1 Social Vulnerability

Population density can indicate more vulnerable areas in a community, because where the population is higher, a larger number of individuals may be affected by a hazard event. As noted before, the majority of the population is concentrated in the southern portion of the county, primarily in the municipalities. Easley, Clemson, and their surrounding areas have the highest population densities. While higher densities usually mean that more people are at risk for some hazards, higher densities may also mean that there is lower risk for other hazards. For example, utility systems in highly populated areas are more likely to have built-in redundancies that can help carry the load in the event of an outage affecting a portion of the system.

Another way of utilizing demographics in assessing risk is through social vulnerability, which is a measure of a community's ability to prepare and recover from a hazard event. While there is no standard method to determine a community's social vulnerability, socioeconomic status, number of elderly and children, and housing density are common indicators. The following figures in this section will show five different demographics for Pickens County, including population over 65 years old, arranged by census blocks, population under 5 years old, arranged by census block, number of households under the poverty line, the number of households who have received food stamps in the past 12 months, and the number of households with limited English speaking ability. These factors are important because they identify several things about a population. The number of children and elderly indicates the proportion of the population who may be dependent, more sensitive to inhaled toxins, and need more assistance during a hazard event. Poorer and proportions of the population which have limited English language abilities have been correlated to having fewer resources and less influence, which may indicate a lower ability to cope with a hazard event. These populations all may have less ability to recover after an emergency.

Figure 37 shows that elderly populations are highest in certain neighborhoods of Easley, in Liberty, in parts of Clemson, in Six Mile and along Lake Keowee and in the northeast corner of the County. Areas where the population is under 5 years old are shown in Figure 38. There are fewer very young children in Pickens County than there are the elderly, and they are most highly concentrated in parts of Clemson, parts of Easley, and along the east side of the County, within Highway 8 and Highway 135. Figure 39 shows the number of households in Pickens County whose income is below the poverty line. There is a higher concentration of these households near Clemson and Central, and then there are fewer near Liberty and Easley, along Lake Keowee and on the eastern side of the County. Along with number of households below the poverty line, the number of households who have received food stamp benefits in the past 12 months, as shown on Figure 40, and also give an indication of an area's vulnerability. While the highest concentration of households below the poverty line was near Clemson, the highest concentration of households receiving food stamps is near Liberty and Easley. One explanation for that discrepancy might be that there may be a high concentration of college students living within that particular census block. While their income might be below the poverty line, many students do not need or do not use food stamp benefits. Finally, Figure 41 shows the number of limited English speaking households in Pickens County. If a household is not able to communicate effectively in English, it may be difficult for them to know how to prepare for an emergency, to follow instructions during an emergency, or seek help during or after. This figure shows that the vast majority of households in Pickens County do have some degree of English communication, but there are parts of the County in Easley and near Liberty with high concentrations of households with limited English.

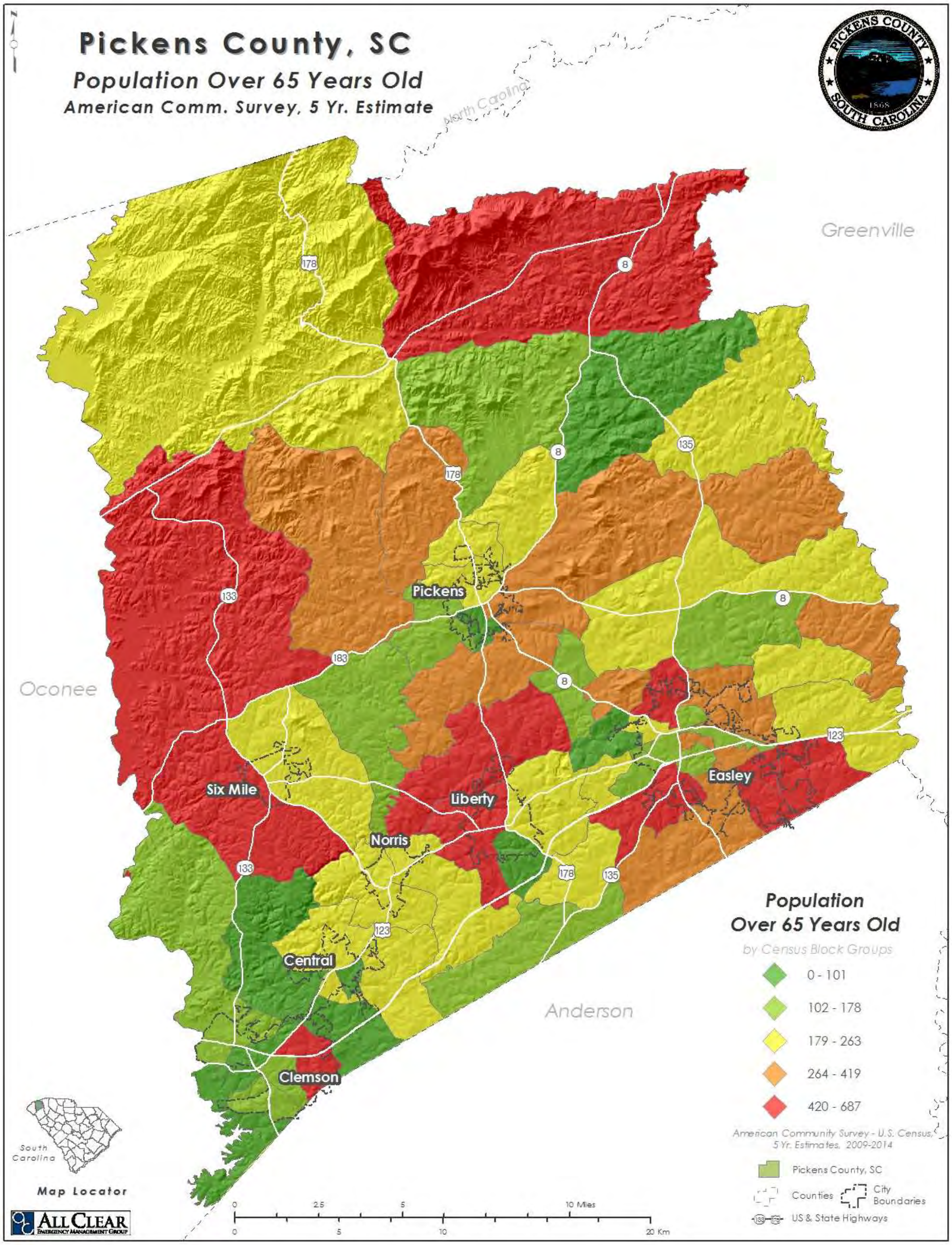


Figure 37: Population Over 65 Years Old

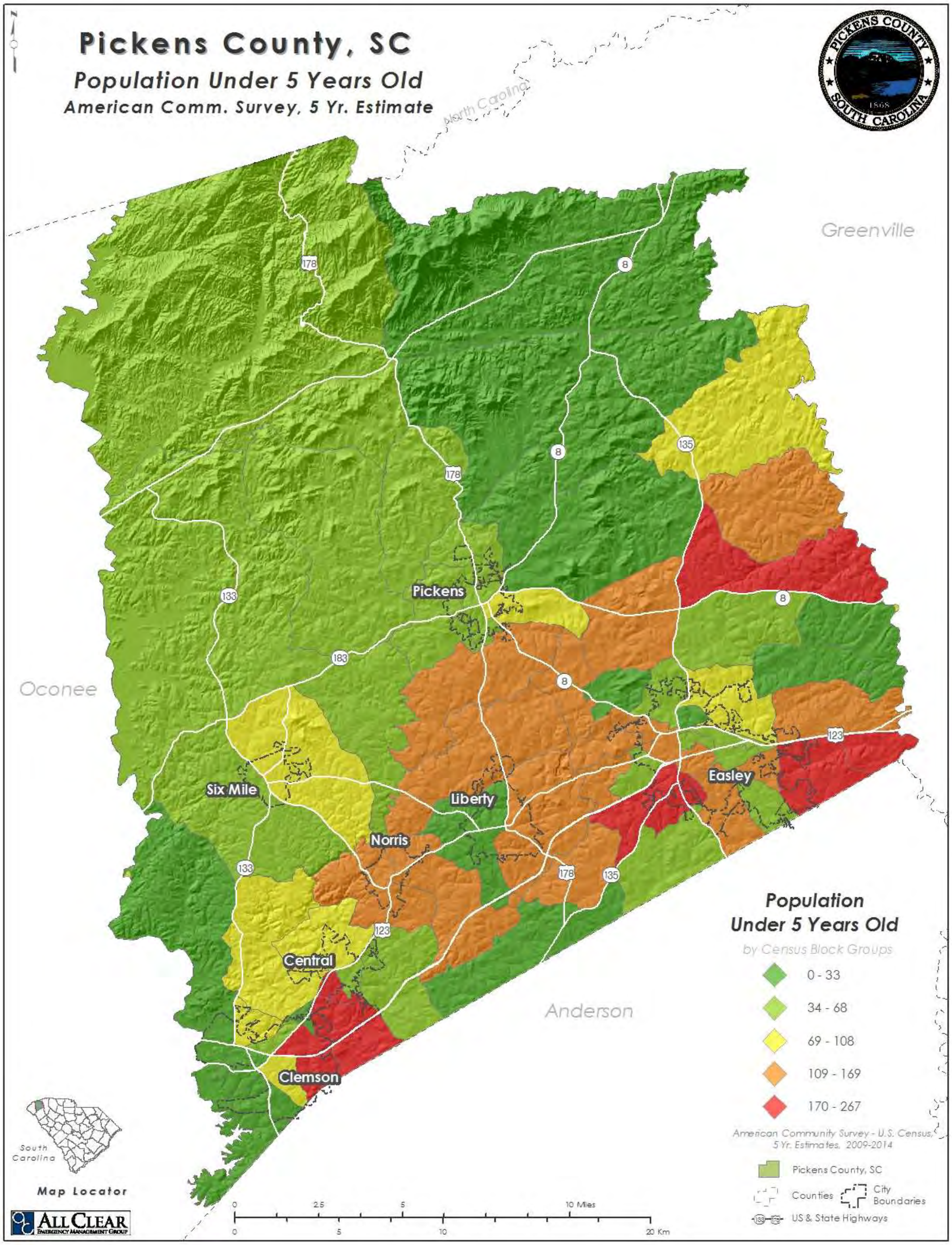


Figure 38: Population Under 5 Years Old

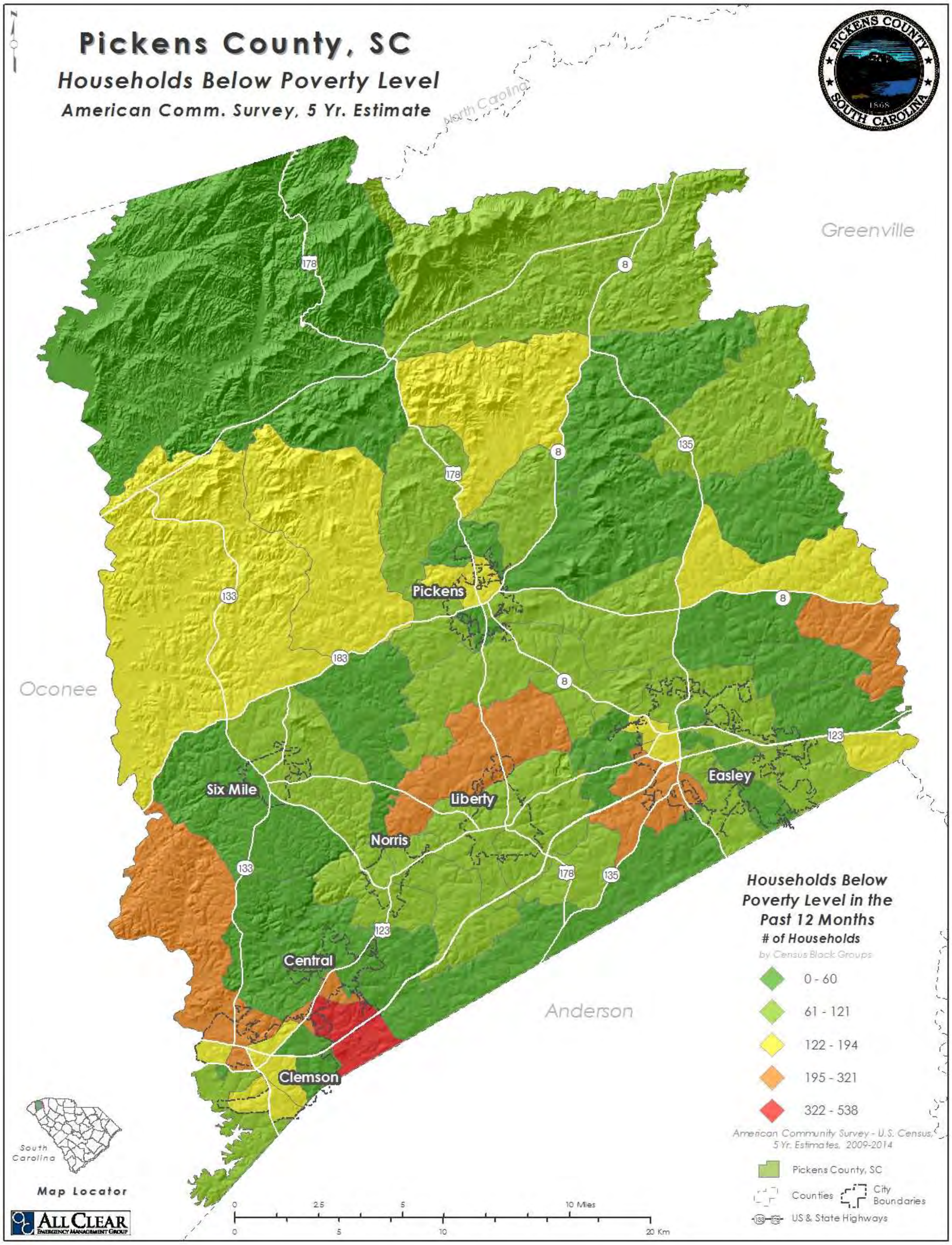


Figure 39: Number of Households Below Poverty Line

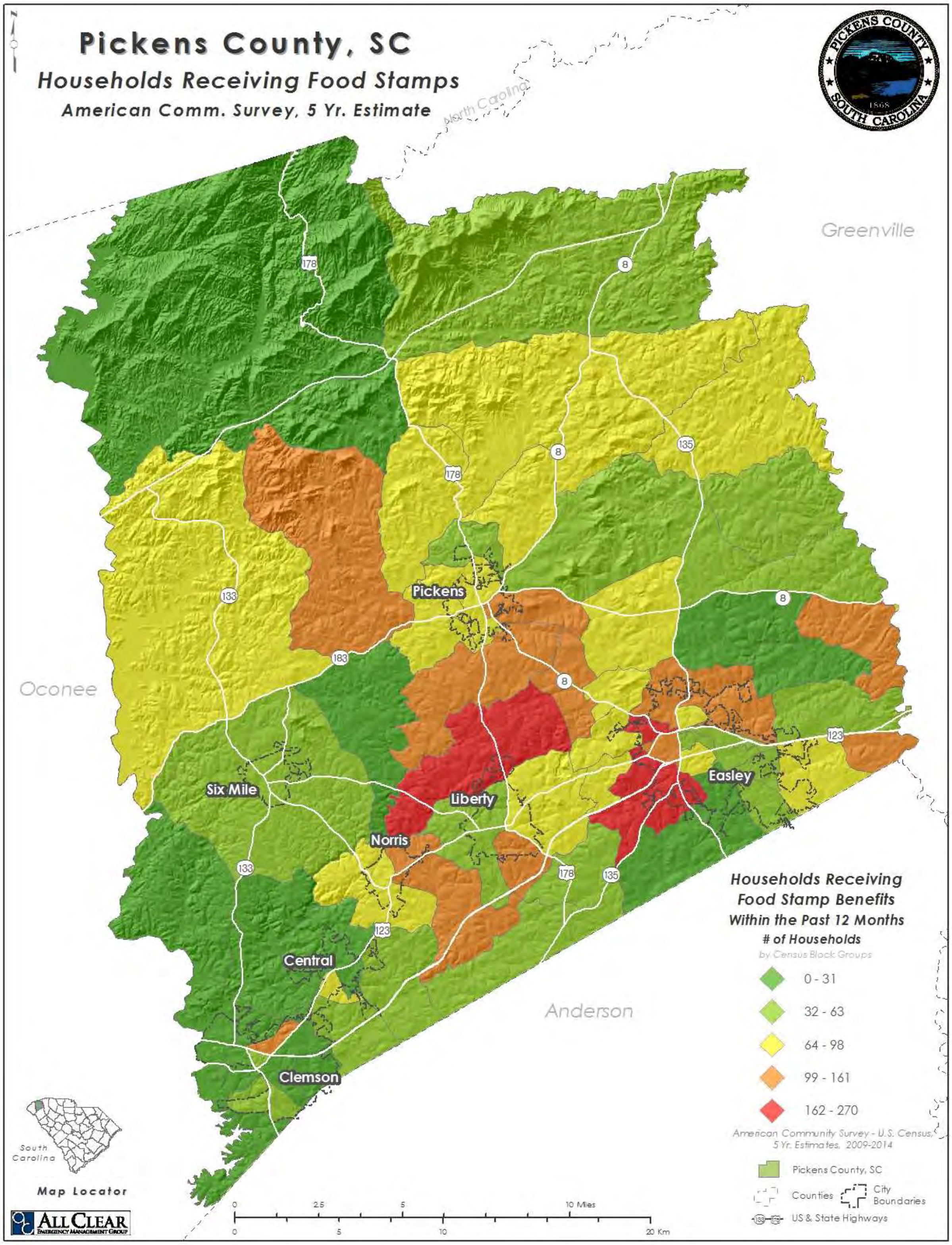


Figure 40: Number of Households by Census Block Groups Receiving Food Stamps

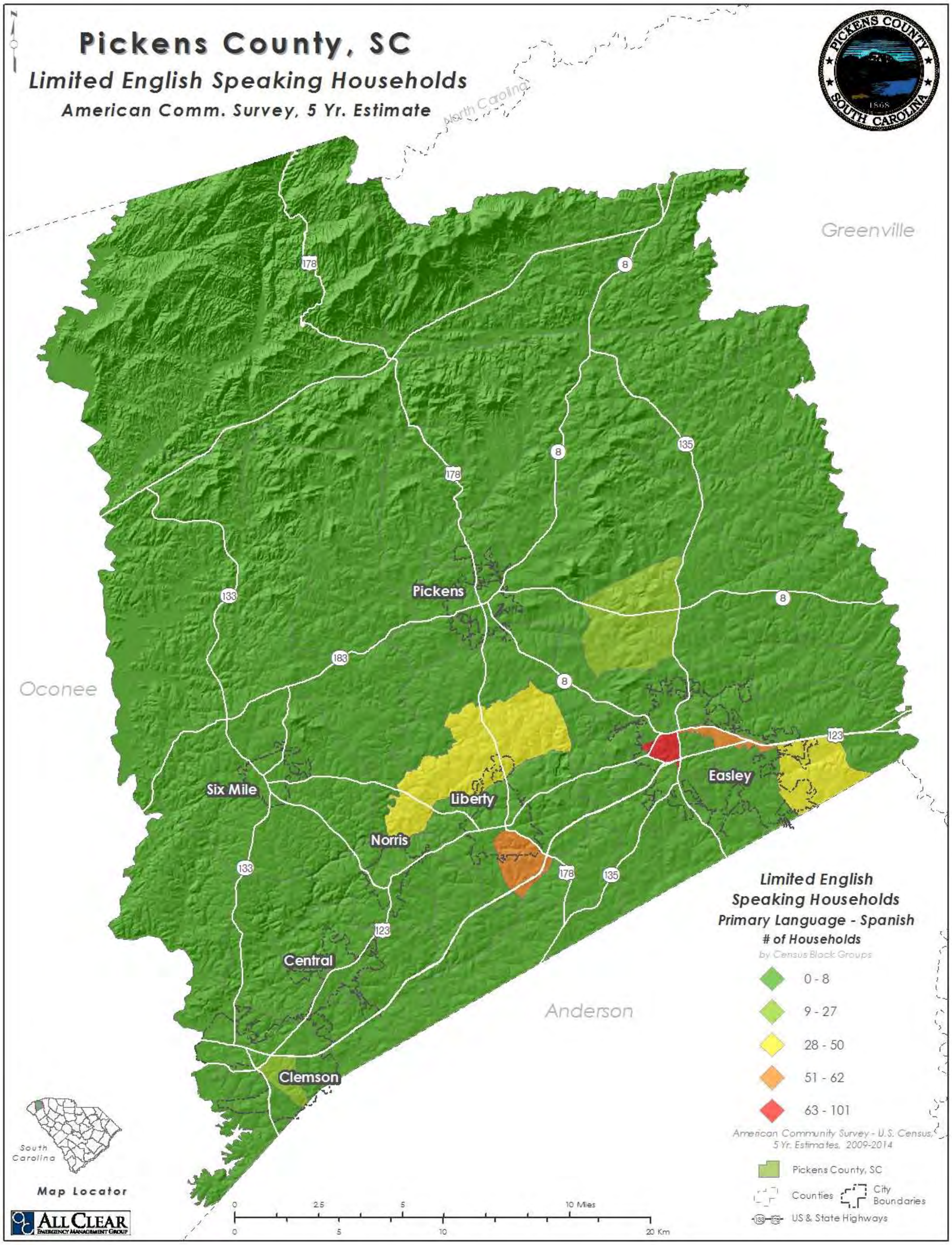


Figure 41: Number of Households with Limited English Speaking

4.2 Development Trends

Hazard mitigation plans focus on reducing risk from hazard events in the future, and as such, development trends need to be considered in addition to the current status of the built environment. Incorporating development trends into mitigation planning not only strengthens the disaster resistance of the county, but will prolong the validity of the mitigation plan as well.

In 2010, the population of Pickens County was 119,224, representing a 7.6% increase from 2000. However growth trends dating back to 1970 show that the population of the county has more than doubled in those 40 years. In order to meet the demand of the growing population, Pickens County will need to experience a considerable amount of residential, commercial, and infrastructure development in the future. Figure 42, obtained from data from the Strom Thurmond Institute at Clemson University, shows the projected development of the county through 2030 (Strom Thurmond Institute). The projected growth is concentrated primarily northeast of Easley, and surrounding the communities of Six Mile, Norris, Central, and Liberty.

Pickens County

In Pickens County, development is expected to continue along the Highway 123 corridor, SC 153 corridor, and in the North and South Pickens area, and along Lake Keowee. The highway corridors primarily have commercial development, with some industry east of Liberty. The development in North and South Pickens is primarily residential with limited commercial development. The Lake Keowee area is primarily residential. The development in the Lake Keowee area will lead to an increase in population of County residents who are within dam hazard areas, potential flood hazard areas, and within the 10-mile radiation buffer from the nuclear power station.

Central

Development in Central is expected to continue along the city limits, in the areas proximate to Clemson University and Southern Wesleyan University, with mostly new apartment building being constructed to house faculty, staff and students of the Universities. This development will increase the strain on the utilities, particularly sewer and water systems, potentially leading to outages, if there is less reserve capacity. Additionally, it will increase the population within the 10-mile radiation buffer zone.

Clemson

Development is expected to continue in downtown Clemson and near Clemson University, primarily consisting of mixed use areas of commercial and residential. This is expected to increase vulnerability to radiological hazards due to the increase in population as well as hazards which are impacted by population density, such as crime, urban fire, transportation system disruption and utility disruption. The City is in the early stages of upgrading their waste water treatment facility to meet this expected demand.

Easley

Development in Easley is concentrated on apartment complexes and commercial areas along Highway 123 within the city. Similar to the other jurisdictions of Pickens County, the increase in population and population density is likely to increase the risk of certain hazards such as transportation and utility system disruptions, urban fire, and crime. Even with restrictions on new construction in a floodplain, new development along Highway 123, near the Saluda River, maybe impacted by flooding. During a major flood stage development not in the flood plain may still experience flooding or access routes to the newly developed areas may be threatened.

Liberty

There currently is no clear plan to guide development in Liberty. However, a 40 unit 55+ community was recently constructed, and the city expects to have more residential growth due to the proximity to Clemson University, Southern Wesleyan University and Greenville. This growth is expected to be primarily off of Highway 178 towards the City of Pickens. Of greatest concern to City administration is that without clear guidance from the City, the development will exceed current waste water treatment facility which may impact public health. Other hazards such as crime, urban fire, transportation system disruption and utility disruption may increase due to the increase in population.

Norris

There has been no recent development in Norris, nor is any expected in the near future, therefore the vulnerability to hazards is not expected to change.

Pickens

The City of Pickens is currently not experiencing or expecting new development. The City is concentrating on the beautification of their downtown areas, with the goal of attracting new businesses. If new commercial enterprises begin to operate from downtown Pickens, an increase in traffic and population could be expected to follow, and as such, the capacity of the transportation system and utilities will need to be examined so that redundant capcity is adequate.

Six Mile

There has been no recent development in Six Mile, nor is any expected in the near future, therefore the vulnerability to hazards is not expected to change.

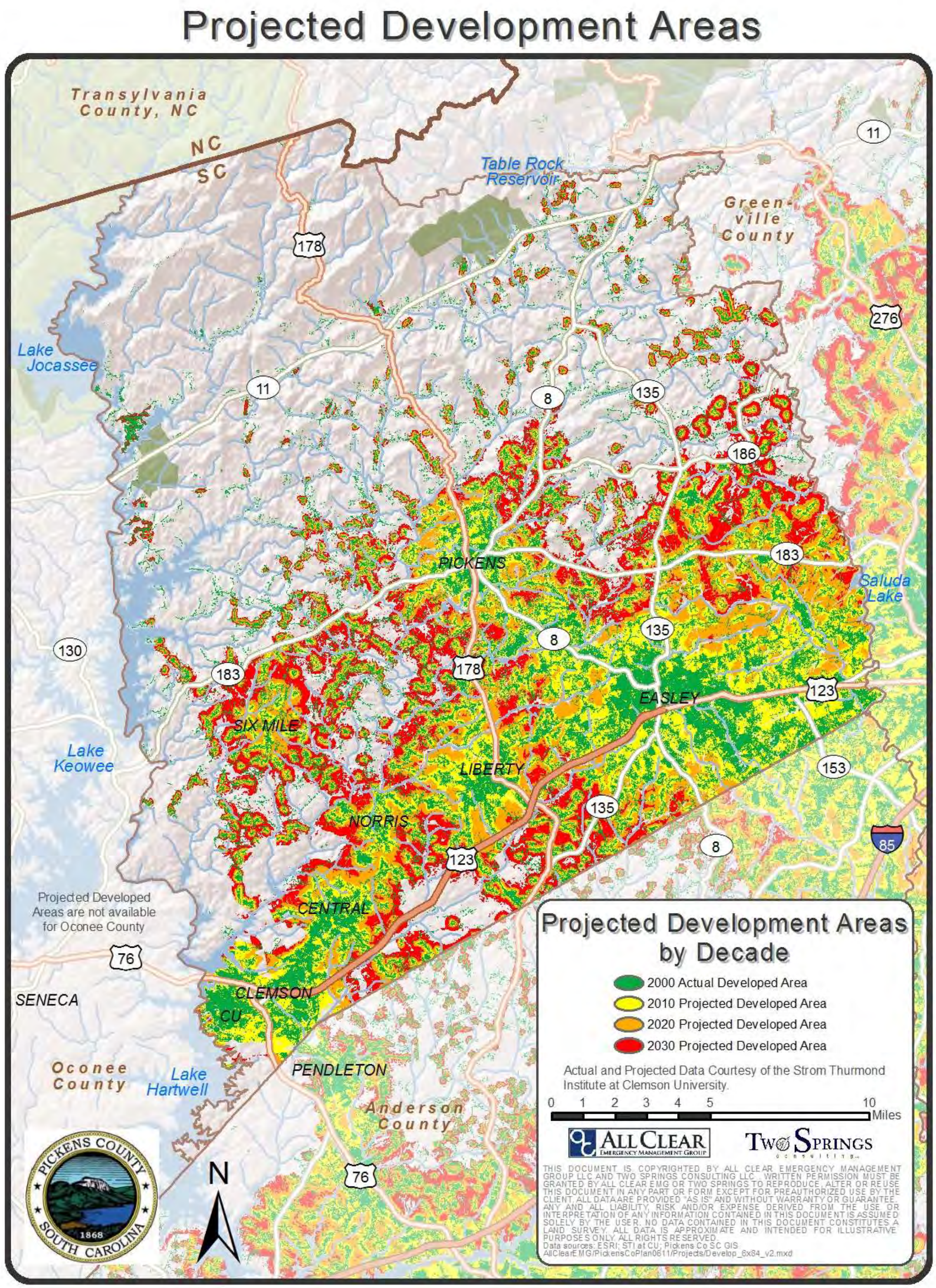


Figure 42: Projected Areas of Development in Pickens County
(Note: Data originally courtesy of the Strom Thurmond Institute at Clemson University. Updated GIS data not available for the latest plan update.)

4.3 Inventory Information

An inventory of a community's structures and critical facilities is also important in assessing the vulnerability of a community.

4.3.1 Structure Inventory

Pickens County does not maintain a building inventory, so the following figures, Figure 43 and Figure 44, were obtained from Hazus estimates, and show total number of buildings per census block and replacement value of those buildings, respectively. Hazus estimates a total of 48,394 buildings within the county. Of those buildings 45,054 are residential structures, 2,070 are commercial structures, 713 are used in industry, 123 are used in agriculture, 268 are religious structures, 62 are governmental buildings, and 104 are for education (U.S. Department of Homeland Security *Hazus-MH*). The value of these buildings is also important to know when planning mitigation actions, because some buildings can be very costly to repair or replace. For example, a census block that contains many research laboratories at Clemson University is going to be full of specialized equipment, and will cost more to repair or replace than a subdivision. However, a census block that is primarily residential is not going to have a lot of replacement value, but the need for temporary shelter could be higher. Table 30 lists the total exposure (value) of buildings in Pickens County in thousands of dollars.

Table 30: Total Value of Buildings in Pickens County

Type	Exposure (in thousands of dollars)
Residential	$9,101224
Commercial	$1,427,396
Industrial	$484,852
Agricultural	$25,871
Religious	$183,914
Government	$38,722
Educational	$227,970
Total	**$11,489,949**

Like Figures 43 and 44, Figures 45-58 show the number of buildings per census block and the total estimated building value for those census blocks for each of the jurisdictions of Central, Clemson, Easley, Liberty, Norris, City of Pickens and Six Mile. Table 31 lists the total number of buildings by occupancy type and the value of those buildings for the municipalities of Central, Clemson, Easley, Liberty and Pickens. These values were derived from Hazus. Counts and values for the buildings in Norris and Six Mile were not able to be obtained from Hazus due to their small size and the limitations of the software, and were thus not included in this table.

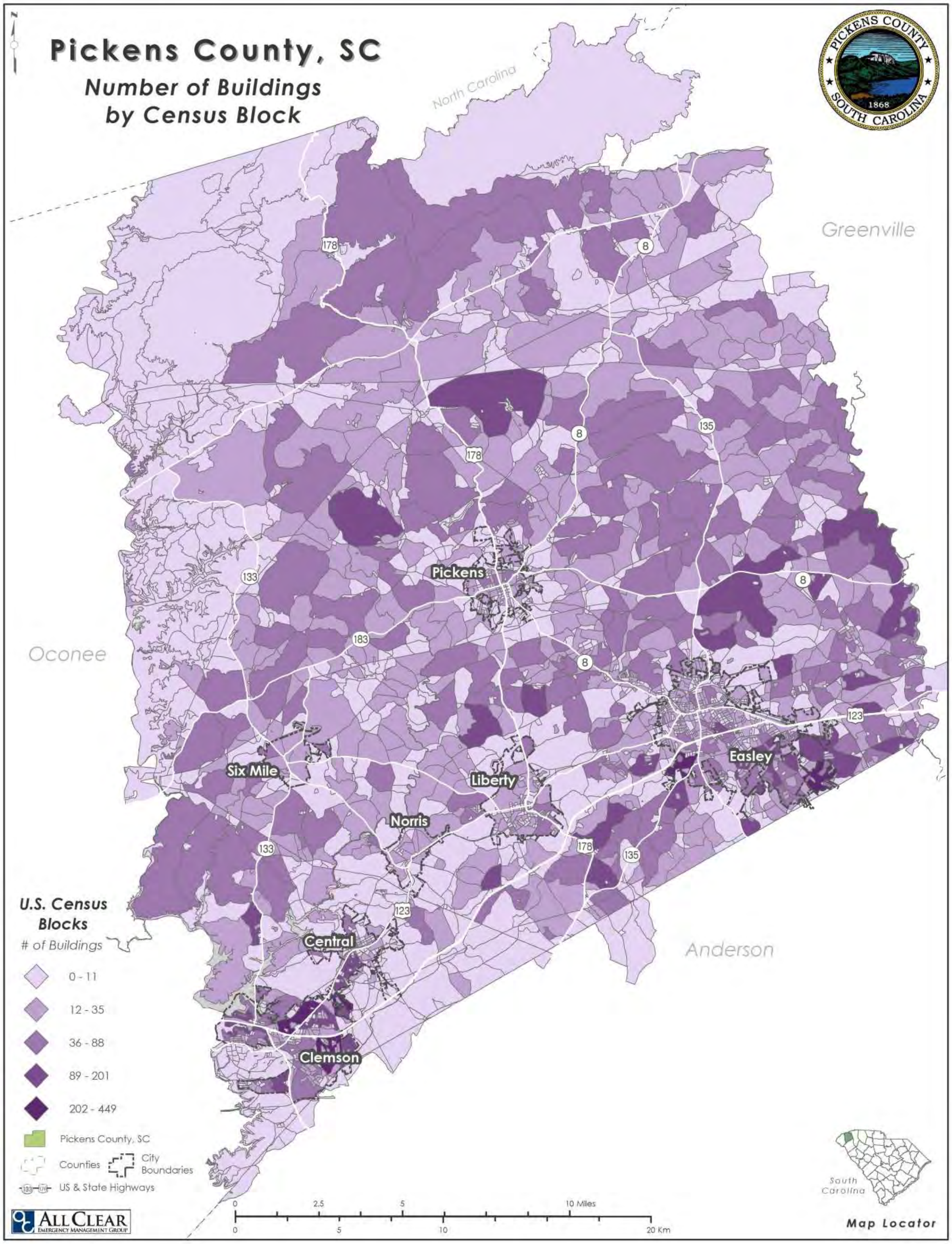


Figure 43: Total Buildings per Census Block in Pickens County

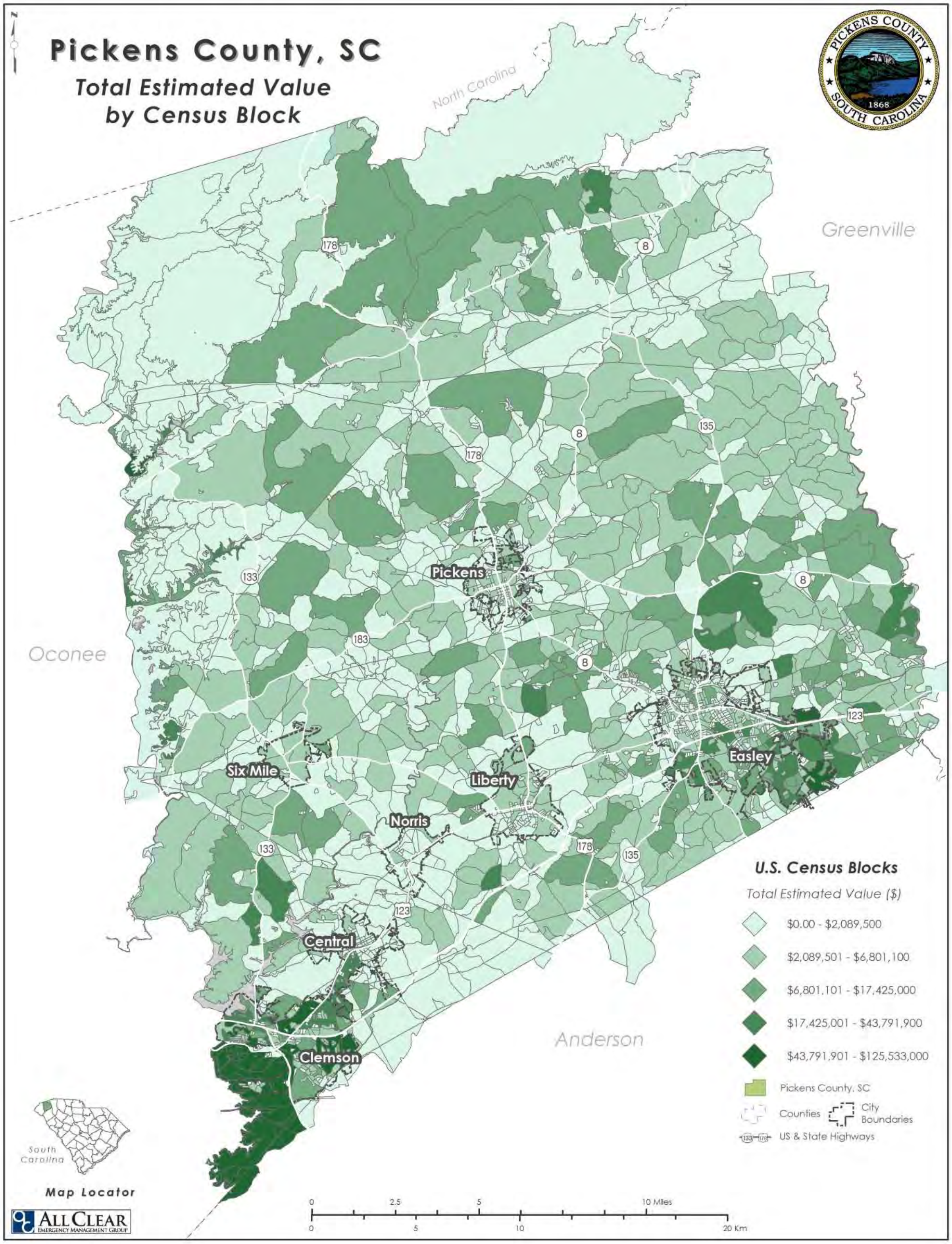


Figure 44: Estimated Total Building Value within Each Census Block in Pickens County

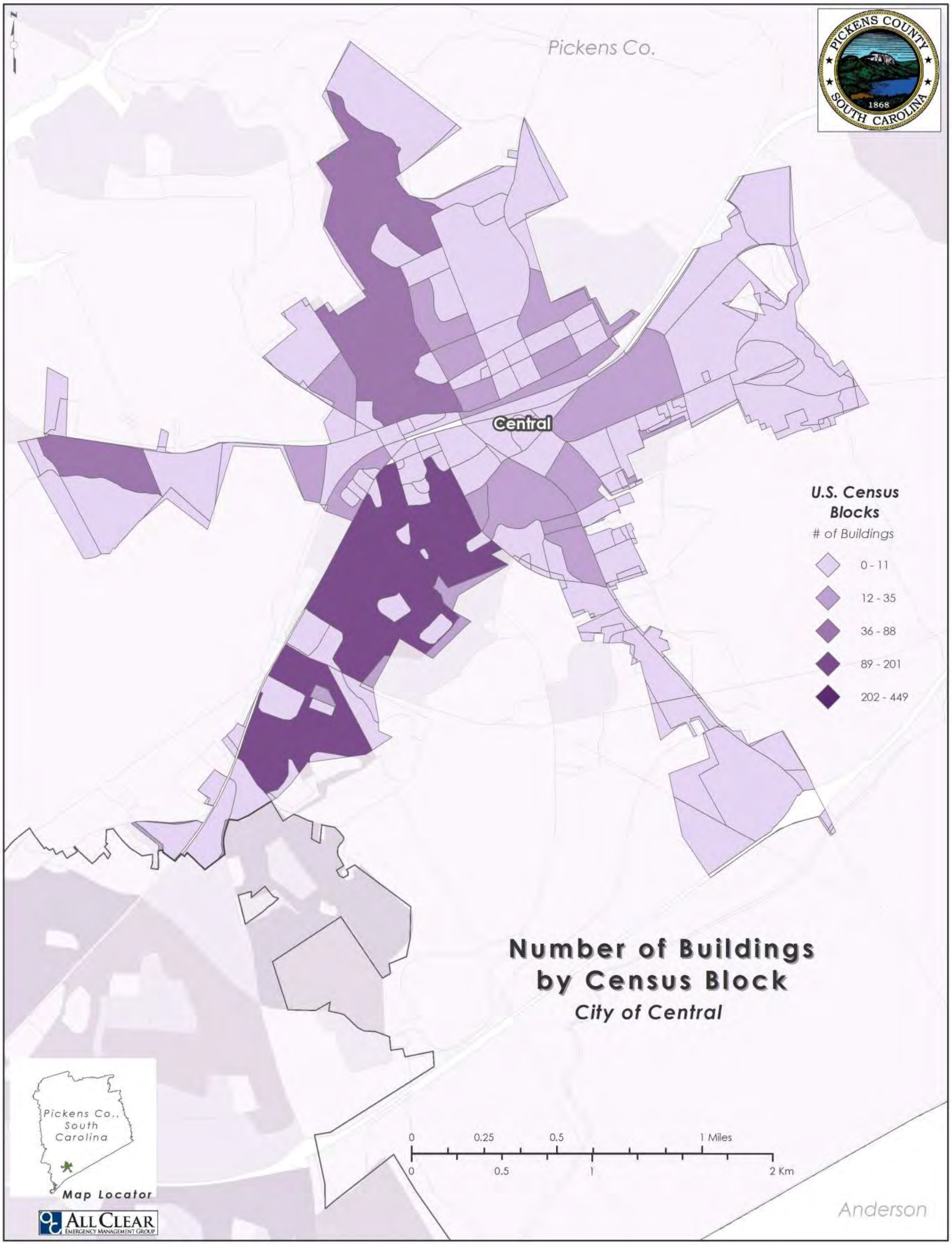


Figure 45: Total Buildings per Census Block in Central, SC

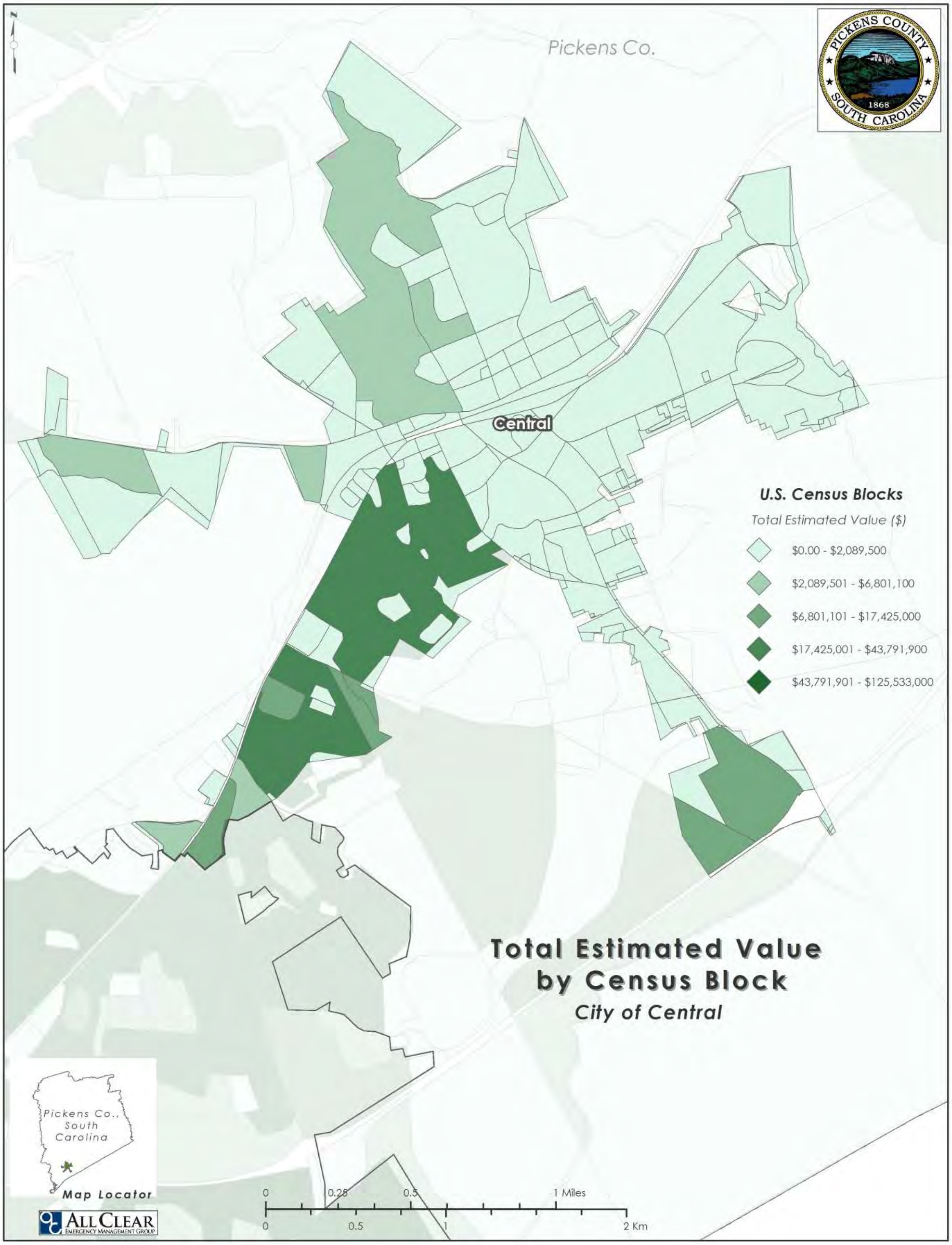


Figure 46: Estimated Total Building Value within Each Census Block in Central, SC

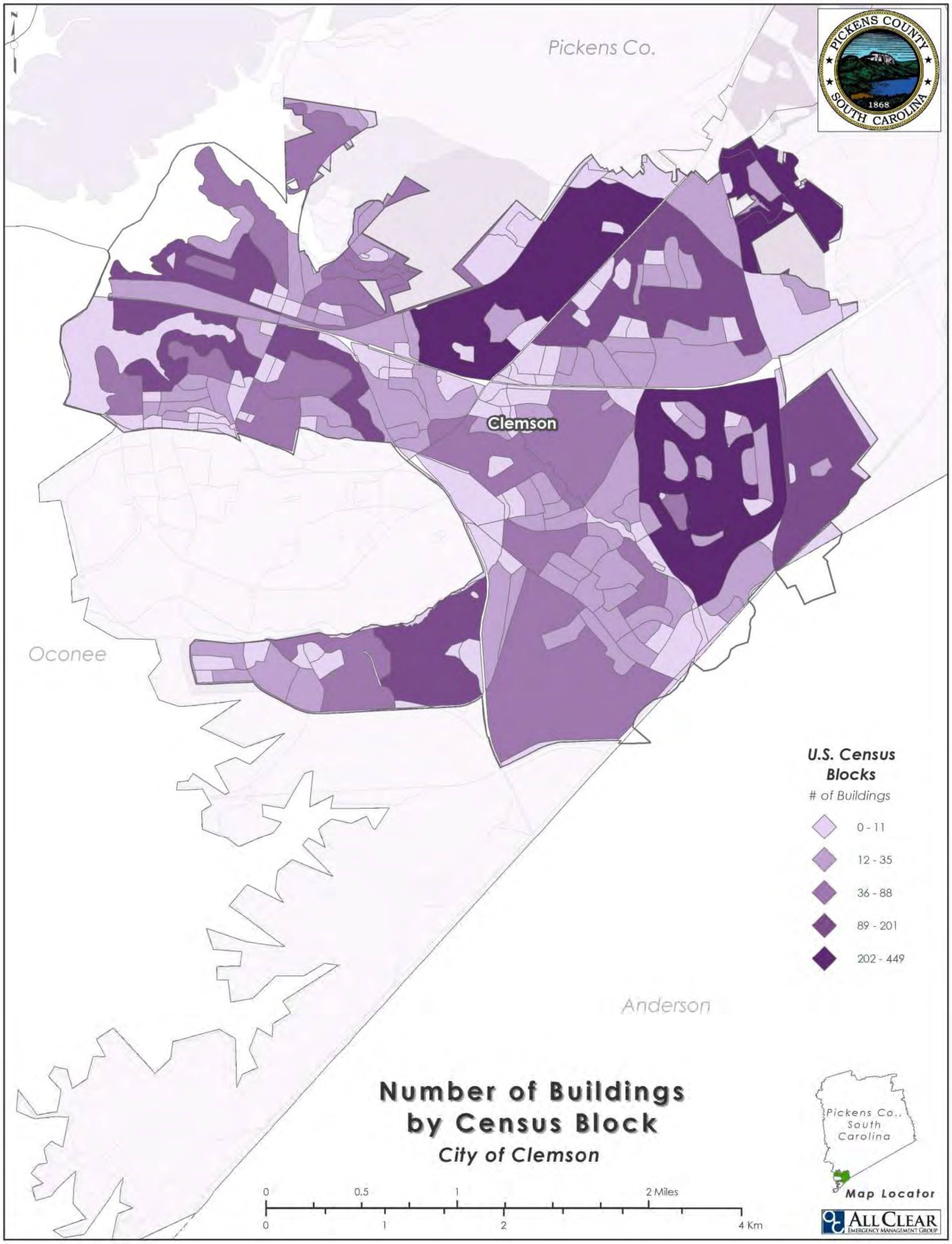


Figure 47: Total Buildings per Census Block in Clemson, SC

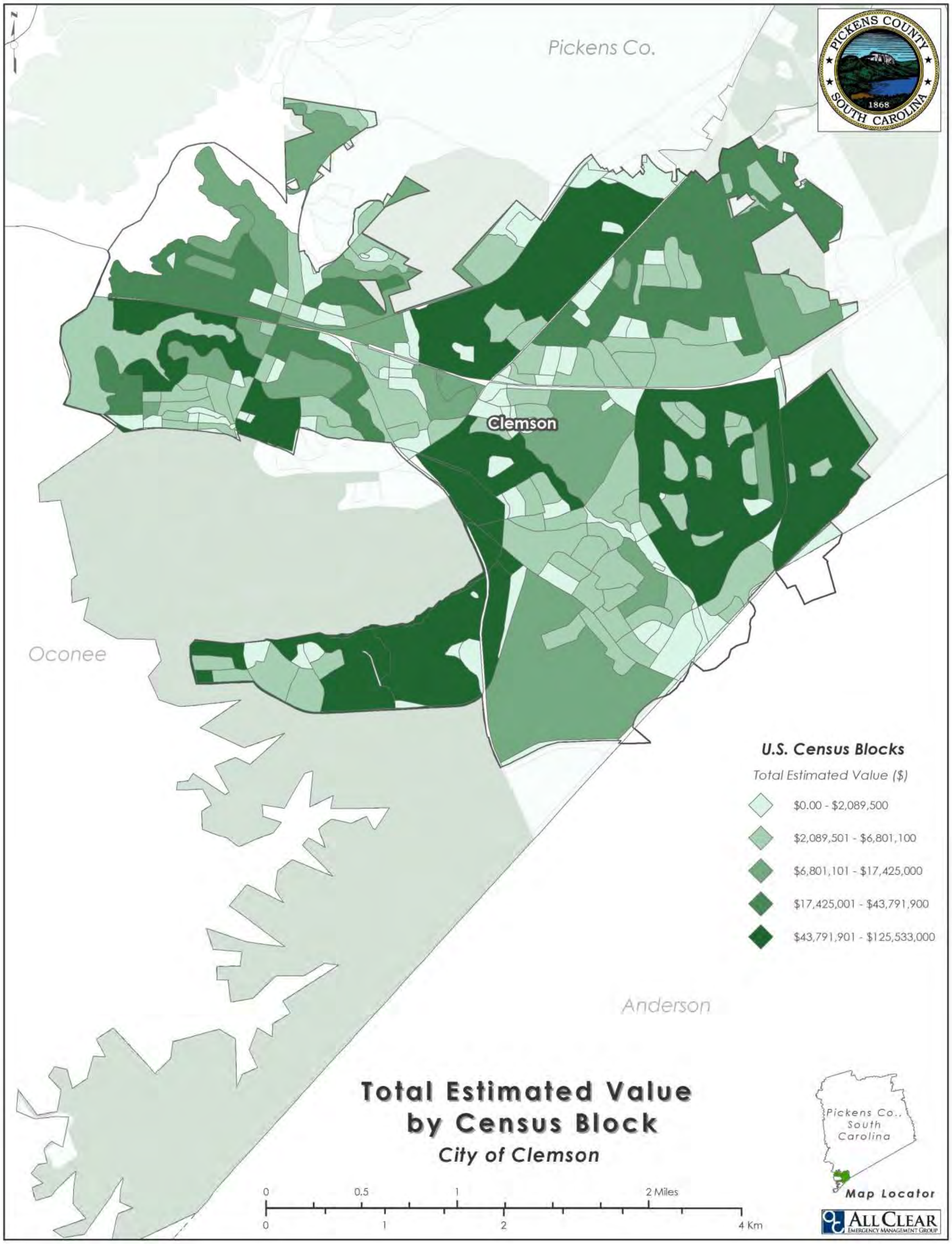


Figure 48: Estimated Total Building Value within Each Census Block in Clemson, SC

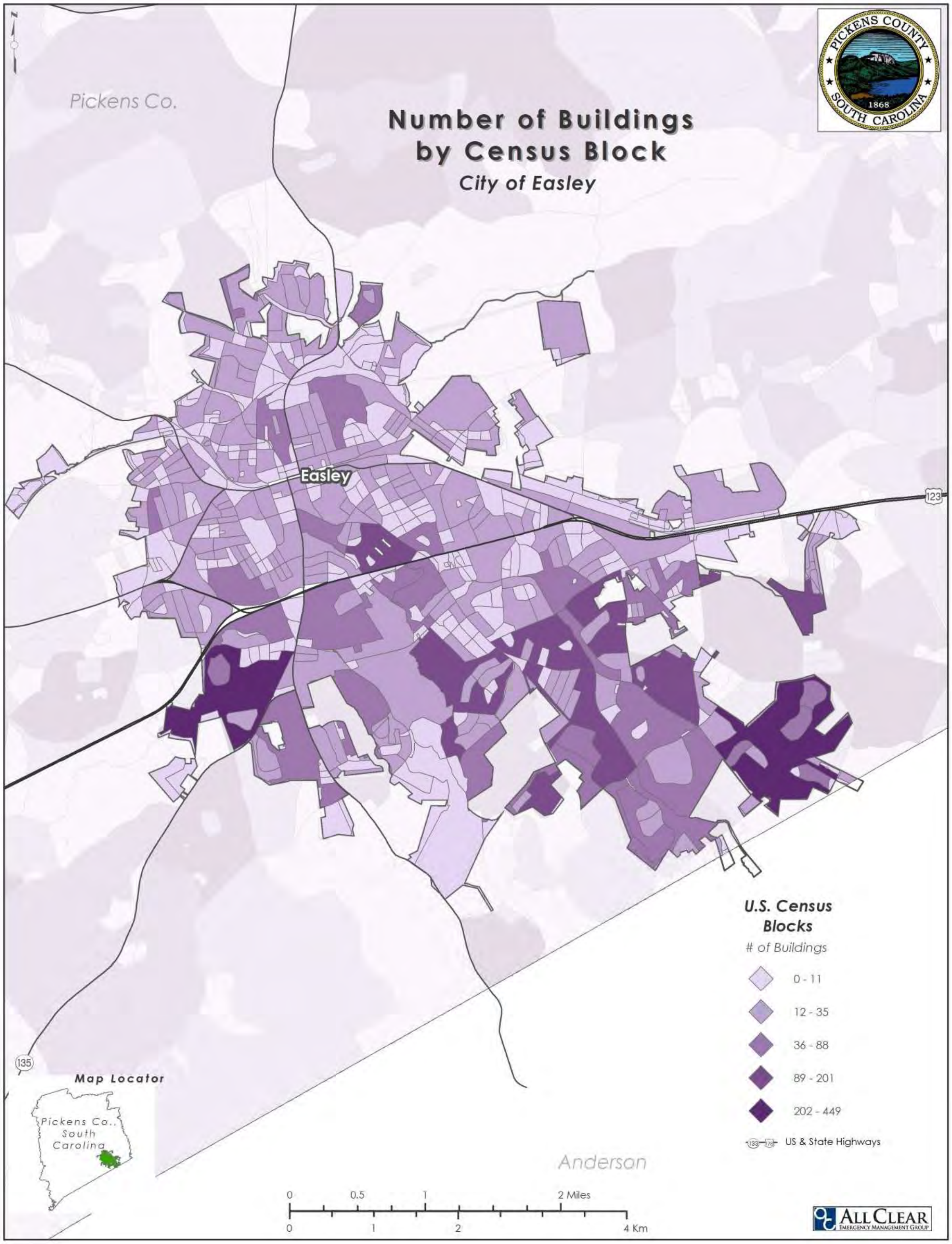


Figure 49: Total Buildings per Census Block in Easley, SC

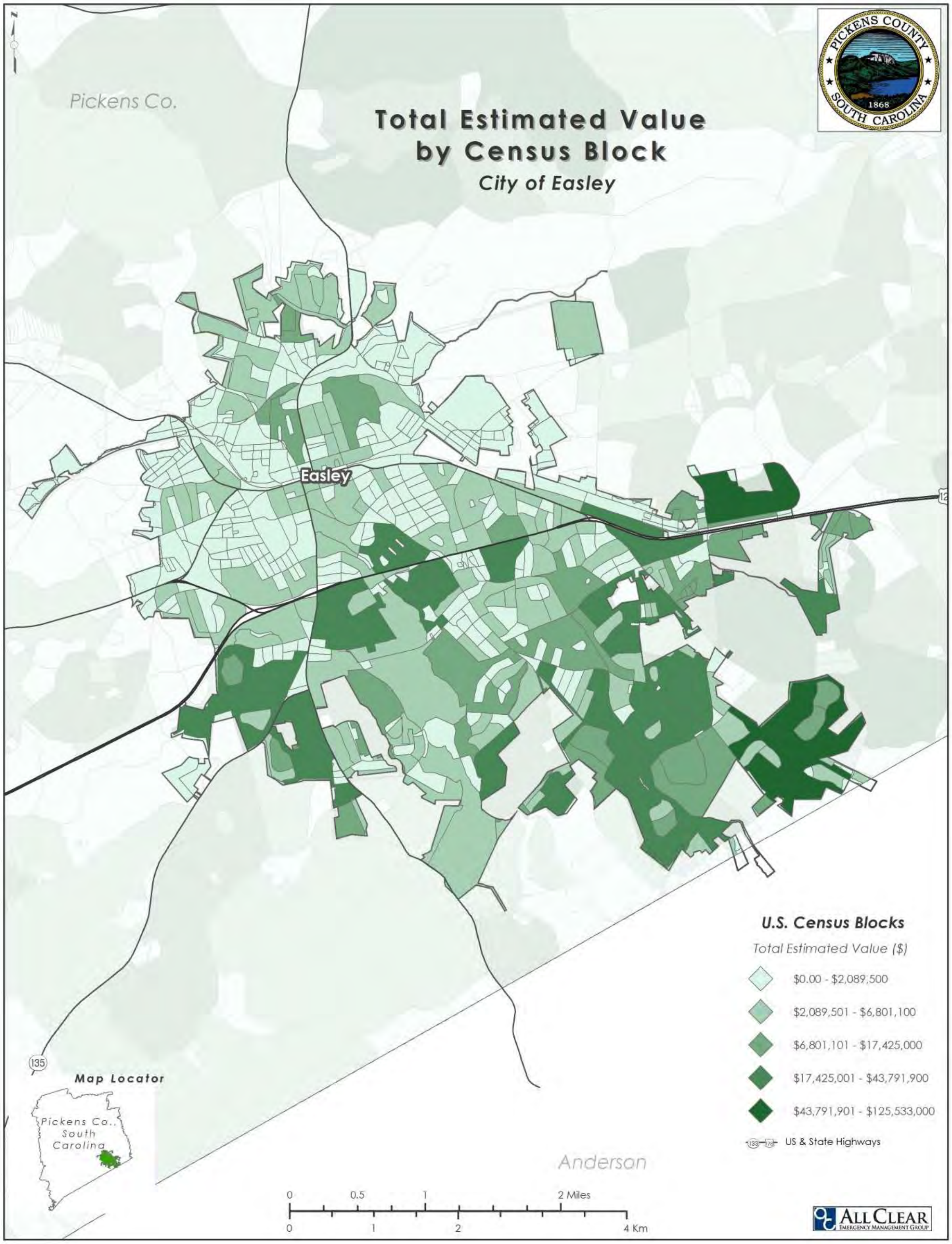


Figure 50: Estimated Total Building Value within Each Census Block in Easley, SC

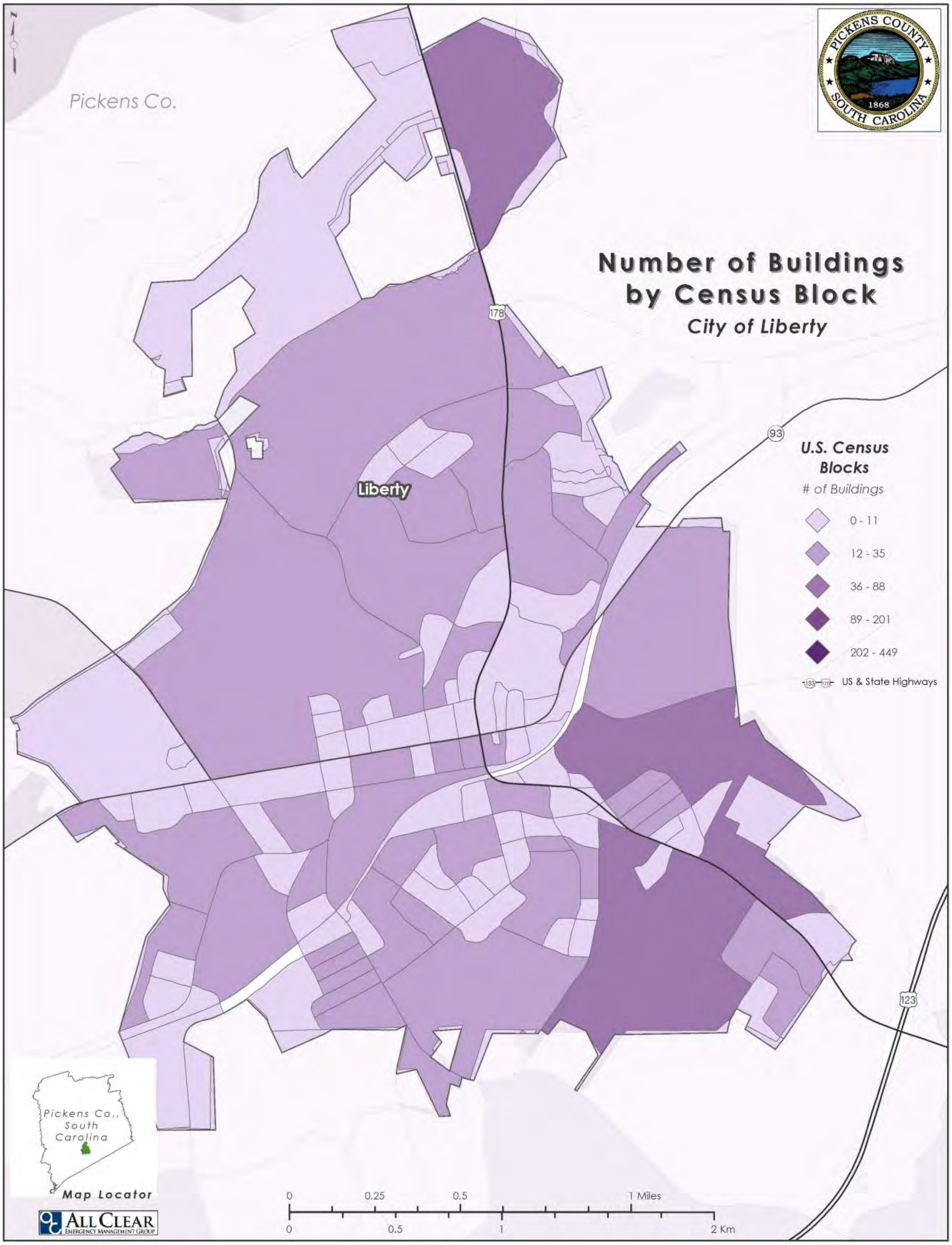


Figure 51: Total Buildings per Census Block in Liberty, SC

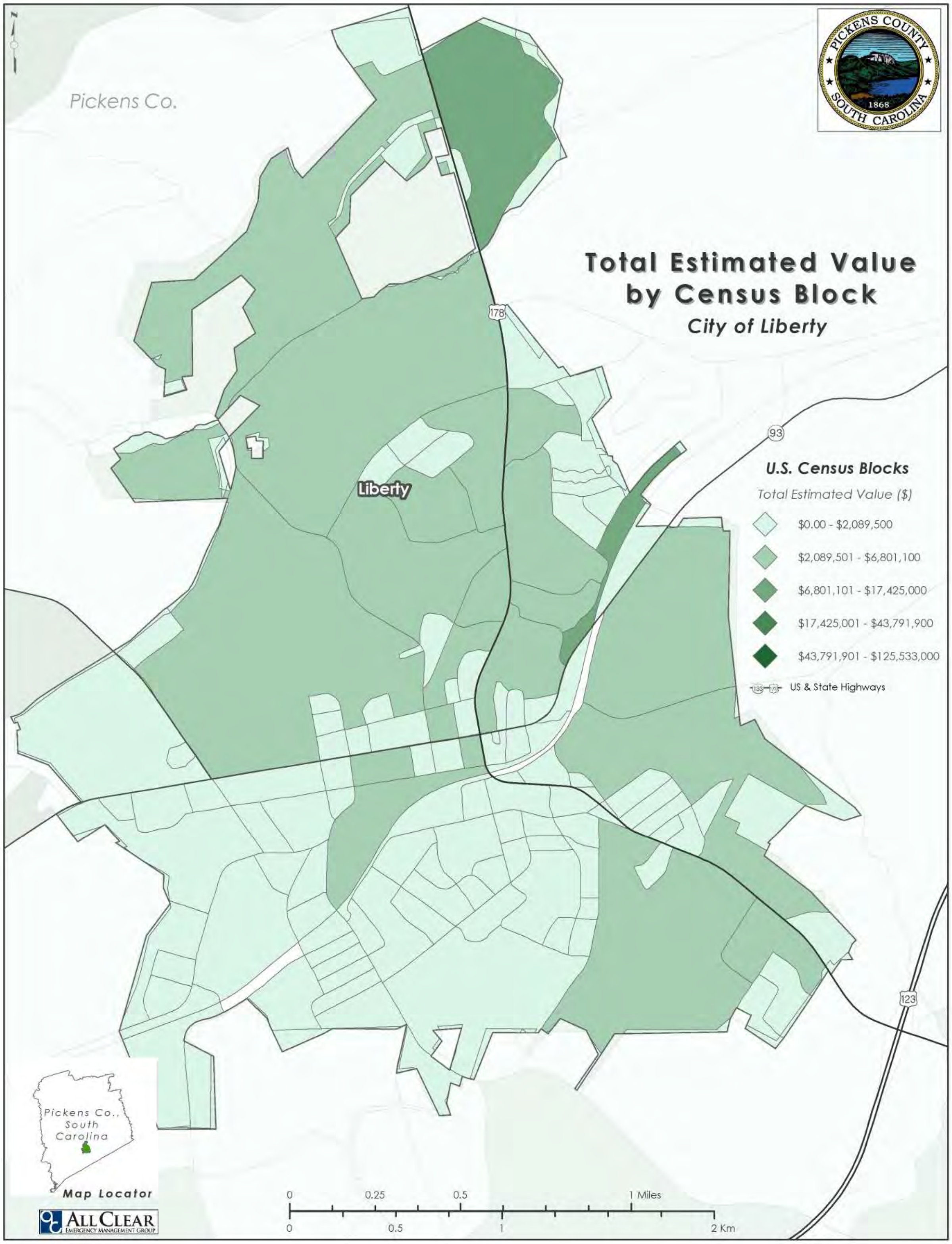


Figure 52: Estimated Total Building Value within Each Census Block in Liberty, SC

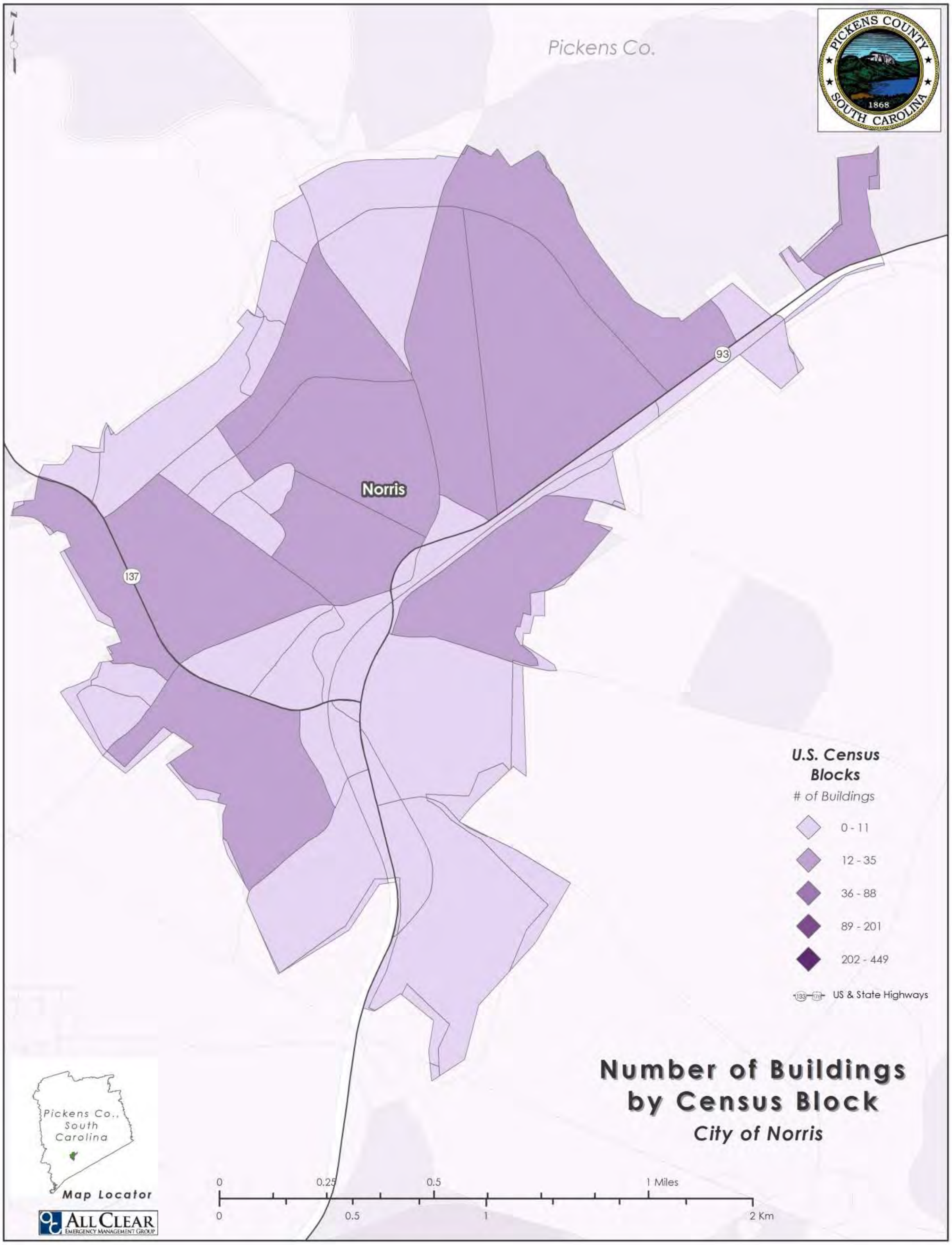


Figure 53: Total Buildings per Census Block in Norris, SC

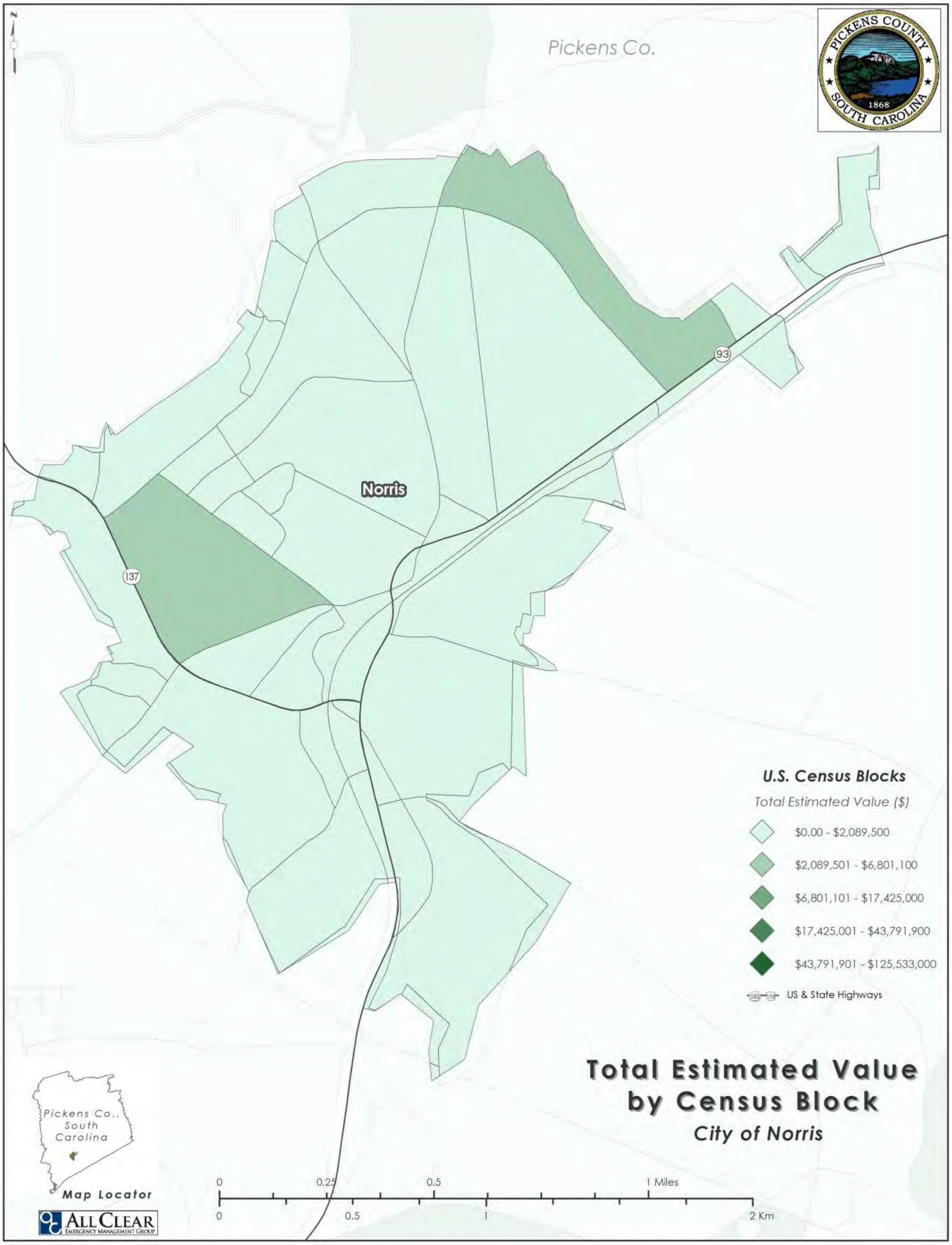


Figure 54: Estimated Total Building Value within Each Census Block in Norris, SC

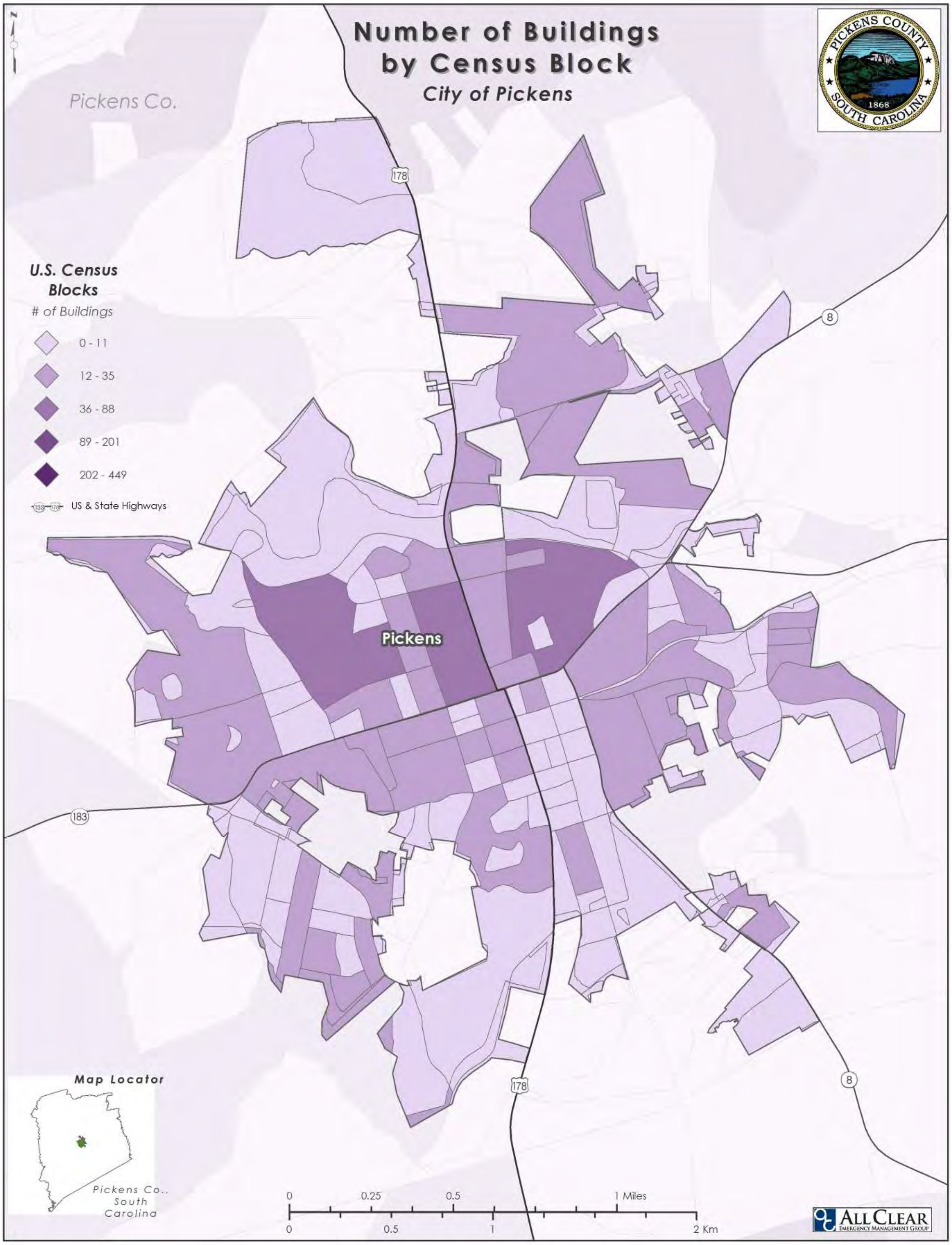


Figure 55: Total Buildings per Census Block in Pickens, SC

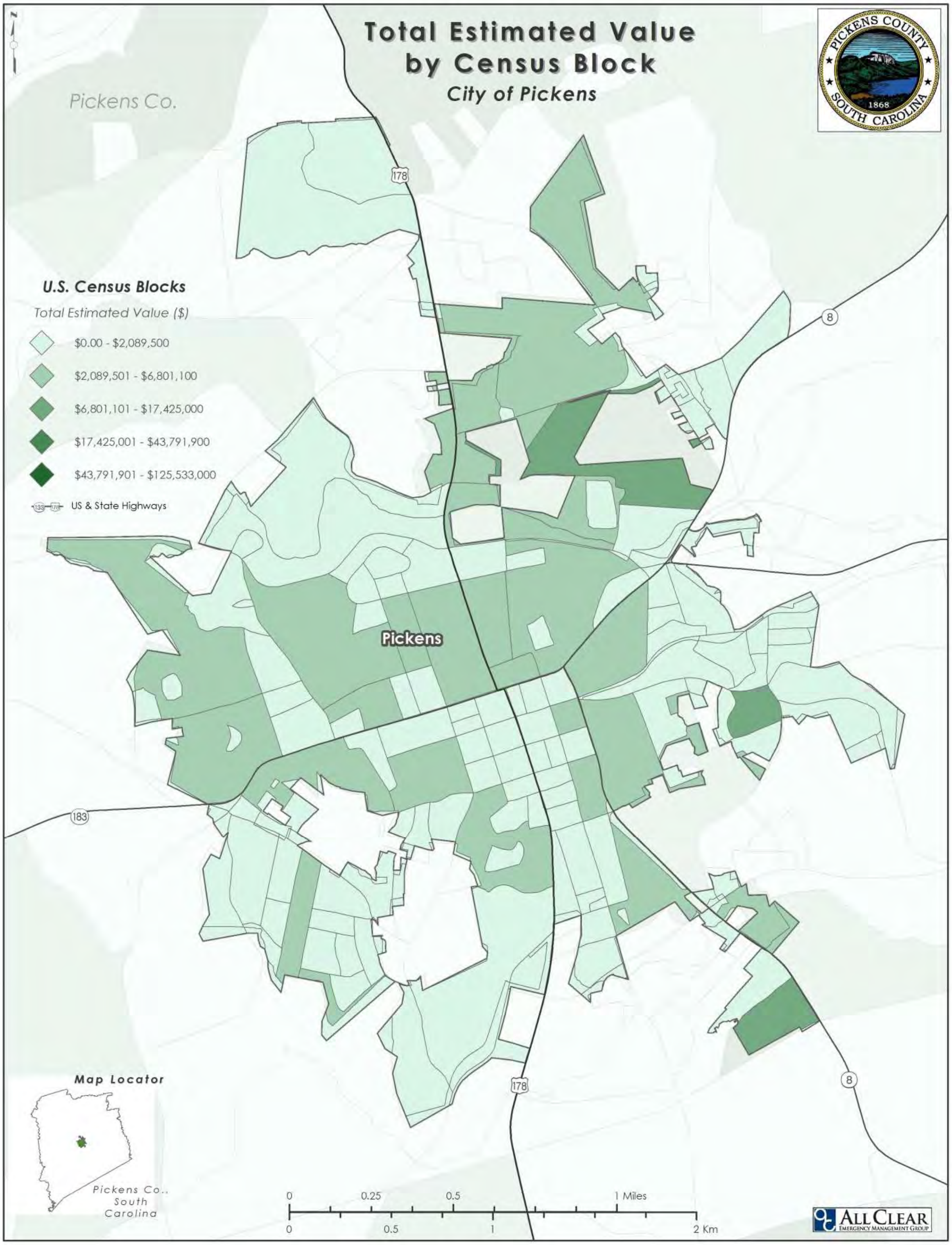


Figure 56: Estimated Total Building Value within Each Census Block in Pickens, SC

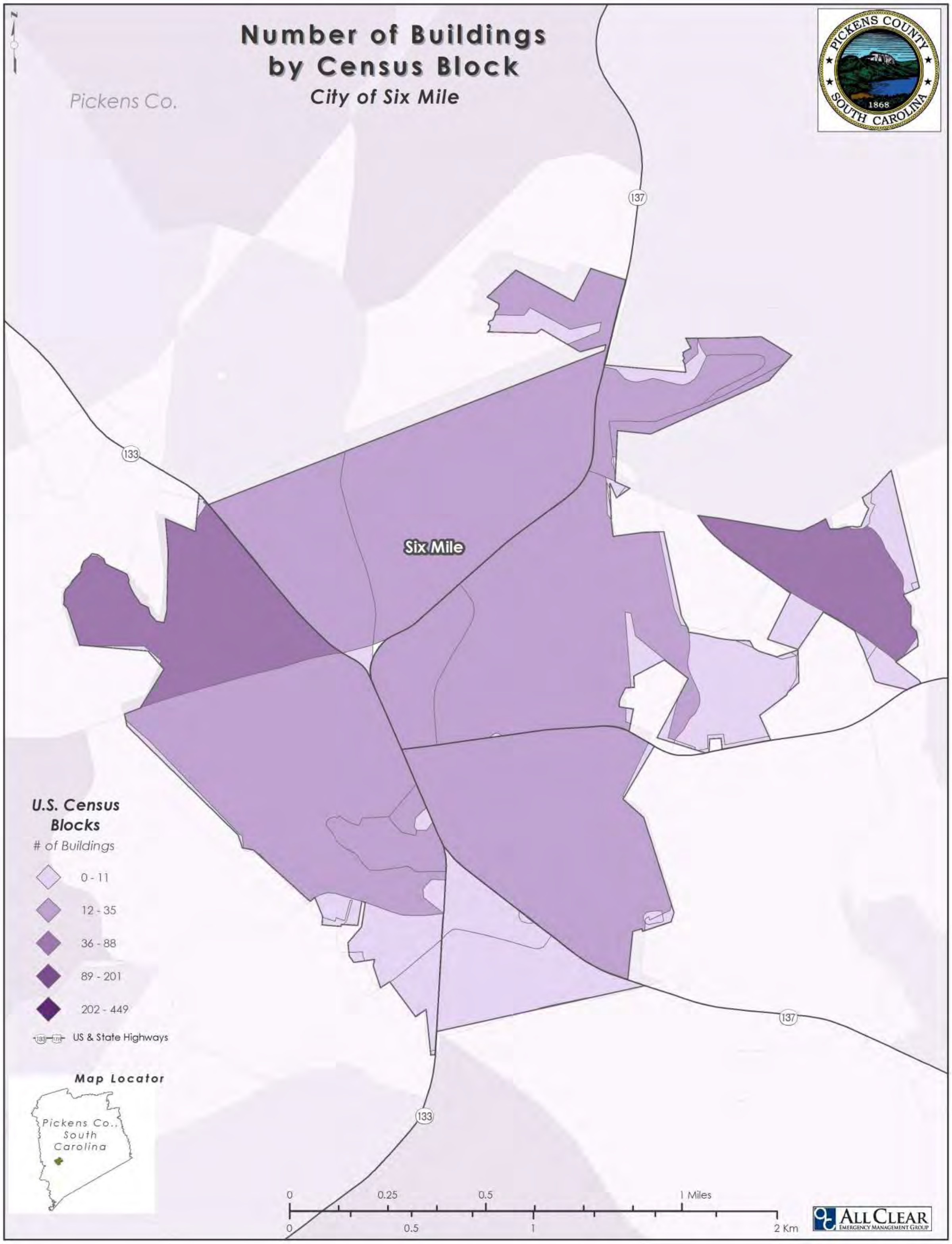


Figure 57: Total Buildings per Census Block in Six Mile, SC

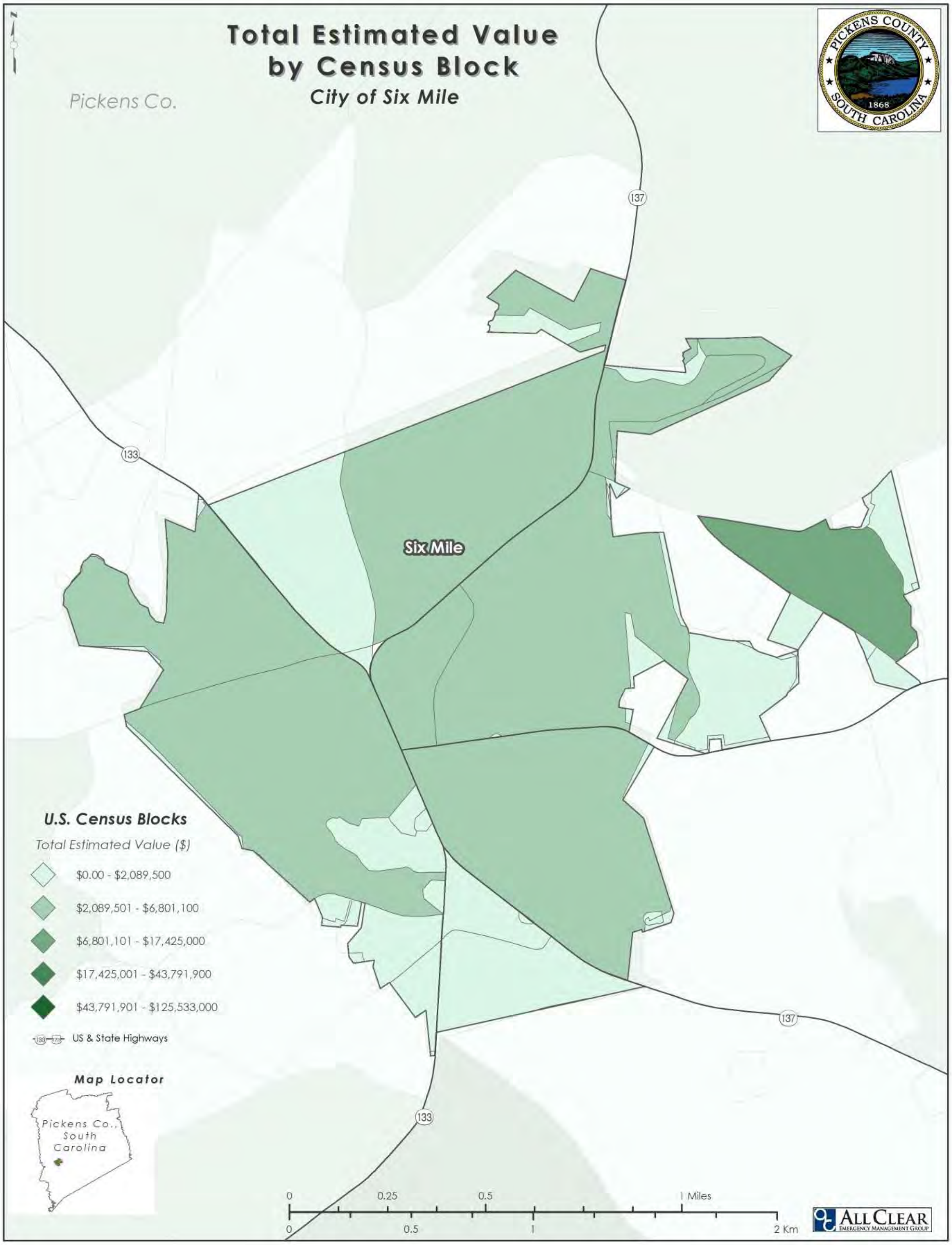


Figure 58: Estimated Total Building Value within Each Census Block in Six Mile, SC

Table 31: Total Number and Value of Buildings in the Municipalities of Pickens County, SC*

Jurisdiction	Type	Number of Buildings	Exposure (in thousands of dollars)
Central	Residential	2,534	$680,645
	Commercial	126	$51,780
	Industrial	45	$69,035
	Agricultural	4	$712
	Religious	23	$13,896
	Government	10	$3,972
	Educational	12	$16,483
	Total	**2,754**	**$836,523**
Clemson	Residential	6,928	$2,315,585
	Commercial	436	$261,825
	Industrial	95	$117,480
	Agricultural	15	$2,609
	Religious	61	$43,851
	Government	24	$11,788
	Educational	53	$159,143
	Total	**7,612**	**$2,912,281**
Easley	Residential	15,613	$3,147,479
	Commercial	875	$843,002
	Industrial	265	$155,783
	Agricultural	42	$9,131
	Religious	67	$45,620
	Government	8	$6,425
	Educational	20	$21,593
	Total	**16,890**	**$4,229,033**
Liberty	Residential	4,112	$625,081
	Commercial	140	$60,906
	Industrial	83	$90,197
	Agricultural	11	$4,186
	Religious	24	$15,405
	Government	5	$2,133
	Educational	8	$21,055
	Total	**4,383**	**$818,963**
City of Pickens	Residential	4,547	$799,600
	Commercial	234	$141,278
	Industrial	75	$37,549
	Agricultural	16	$3,101
	Religious	32	$26,651
	Government	16	$11,211
	Educational	10	$14,545
	Total	**4,930**	**$1,033,935**

*Due to limitations of Hazus, the building inventory for the small towns of Norris and Six Mile cannot be accurately estimated.

4.3.2 Critical Facilities

Critical facilities can be divided into two categories, those that need extra consideration in preparing for hazard events, or those which are vitally important during and after an emergency to help protect and maintain human life and health and the community's wellbeing. These critical facilities are shown on Figure 59. Hazus considered schools, hospitals, police stations, fire stations, and emergency operations centers as critical facilities, but as part of their ongoing mitigation work, Pickens County has expanded their definition of critical facility. The following is the definition of Critical Facilities for the County

Pickens County Critical Facilities Definition:

A facility, whether publicly or privately owned, that includes infrastructure that is vital to the ability to provide essential services (i.e. life safety, property and environmental protection) in the Pickens County Planning Area. Facilities if damaged could cause short or long term loss of such infrastructure would likely result in a severe health and welfare, life sustainment, economic, or other catastrophic impact.

Critical facilities can be grouped into three categories:

- Facilities that are essential to the ability to respond to, mitigate from the impacts of natural hazards.
- Facilities that need early warning to enable them to prepare for respond to and recover from the impacts of natural hazards.
- Facilities that, by nature of their operations, manufacture or store materials that creates an exposure to secondary hazards of concern.

Critical Facilities profiled in this Plan:

- 8 EMS Stations
- 6 Police Stations 1 County Sheriff's Office and 5 Municipal Police Departments
- 911 Dispatch Centers
- 15 Fire Stations
- 5 Rescue Squads
- 24 Schools to include 1 private School
- 1 Emergency Operations Center and 1 Alternate Emergency Operations Center
- Clemson University
- 20 Nursing Homes
- 39 Day Cares
- 2 Hospitals
- Government Buildings (Administration and Courthouse)
- Historical Sites
- Hazardous Materials Fixed Facilities

Some of the jurisdictions also provided specific lists of the critical facilities in their communities.

City of Central

- EMS/Rescue Facility
- Fire Department
- Rural Fire Station
- Town Hall

City of Clemson
- AT&T Hub
- Clemson Area Transit facility
- Police Department/City Hall
- Public Works
- Waste Water Treatment Plant
- Water Towers

City of Liberty
- Assisted Living Facility
- City Gym
- City Hall
- Fire Department
- Liberty Active Daycare
- Liberty Elementary School
- Liberty High School
- Liberty Middle School
- Magistrate Office
- Meals on Wheels Facility
- PC Auditorium
- PC Board of Disabilities
- Playhouse Pals
- Playhouse Pals #2
- Police Department

Six Mile
- Six Mile Elementary School

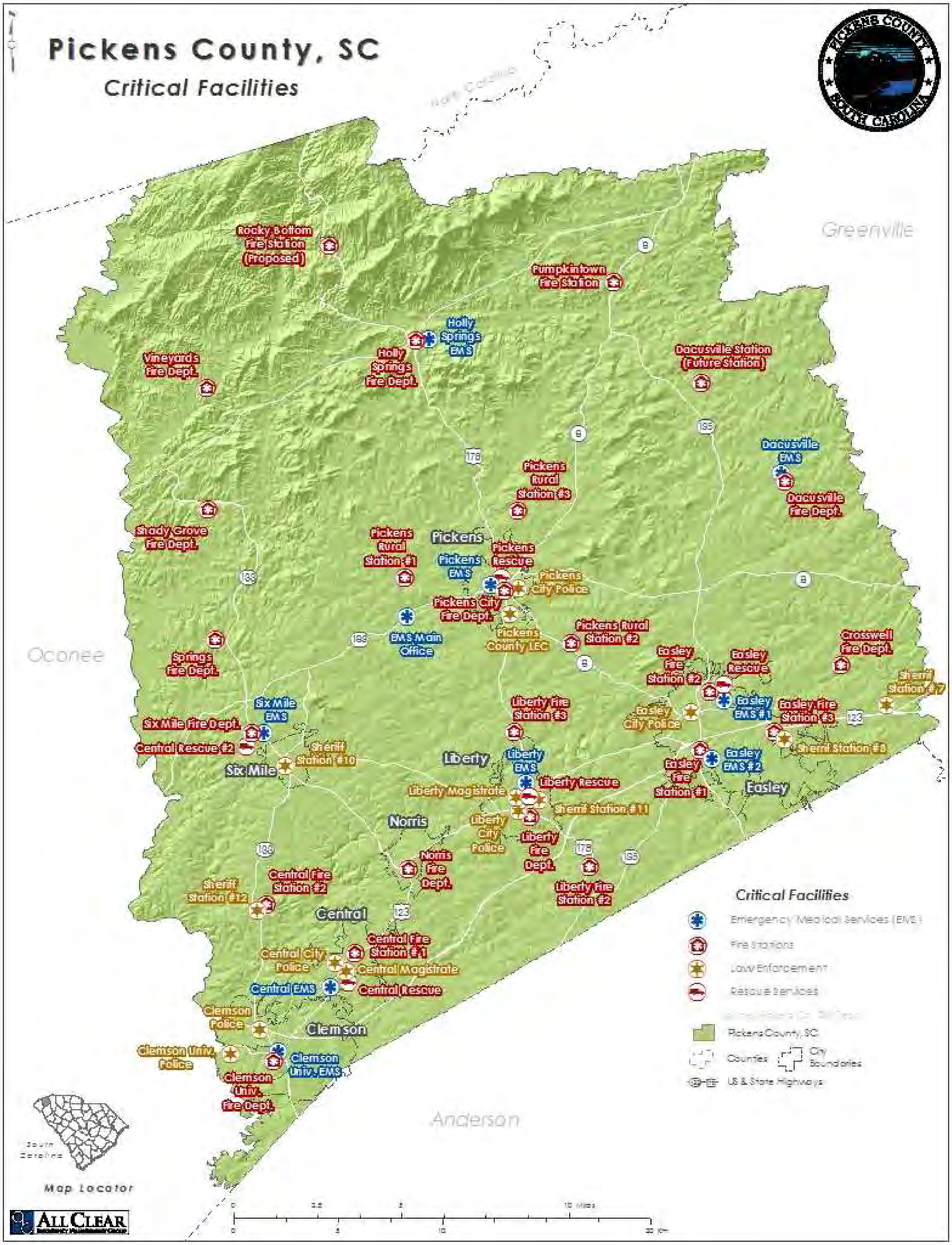


Figure 59: Critical Facilities as Defined by Hazus

4.4 Historical or Cultural Assets

The preservation of cultural heritage and natural resources is also an important consideration in mitigation. Figure 60 shows the location of these areas and includes historic features, cultural features, mills, natural resource regions, and other important areas, along with national forest land, state and county parks, and other state owned land. While the parks and forest lands are concentrated in the northern portion of the county, there appears to be a relatively even distribution of historic sites and other cultural resources. This even distribution corresponds to a large, but sparse hazard risk area (Pickens County Unpublished Raw Data).

The National Register of Historic Places is the official list of historic places in the United States that are worthy of preservation. Pickens County has 25 properties and districts listed on the National Register, which include one National Historic Landmark, Fort Hill, also known as the John C. Calhoun House, located in Clemson. More information about these sites can be found in the National Register of Historic Places and the Pickens County Comprehensive Plan, which provides a thorough overview of the resources in Pickens County (Pickens County *Comprehensive Plan*).

4.5 Jurisdiction Specific Vulnerability

Pickens County

Unincorporated Pickens County has unique vulnerabilities when compared to the municipalities. There are a high percentage of residents who are either under 5 years old or older than 65 years old. These populations are more vulnerable to extreme temperatures, and tend to need more assistance during other hazard events and afterwards. Additionally, Pickens County has higher reliance upon agriculture than the municipalities, and thus would be more affected by hazards such as drought. Pickens County also has large areas dedicated to recreation, which can be impacted economically, by hazards such as wildfire. Pickens County has specific vulnerability to dam failure, drought, floods, hazardous materials (due to proximity of the rail corridor and highways), radiological events as it is within the 10 mile Emergency Planning Zone, temperature extremes, and wildfires.

Central

The City of Central has a high percentage of college age students living there, who have unique needs and vulnerabilities. Many college students may rely on public transportation, and would need assistance during hazard events which require evacuation. Additionally, college students are often in institutionalized living quarters, such as dorms, which can result in spreading diseases such as influenza quickly, impacting public health. Central also has a high replacement value for industrial buildings. This would mean that a hazard which would impact Central could have economic impacts if those industrial buildings sustained damage. Central also has a very high percentage of historical places, which could be damaged in a hazard event. Central has specific vulnerability to hazardous materials (due to proximity of the rail

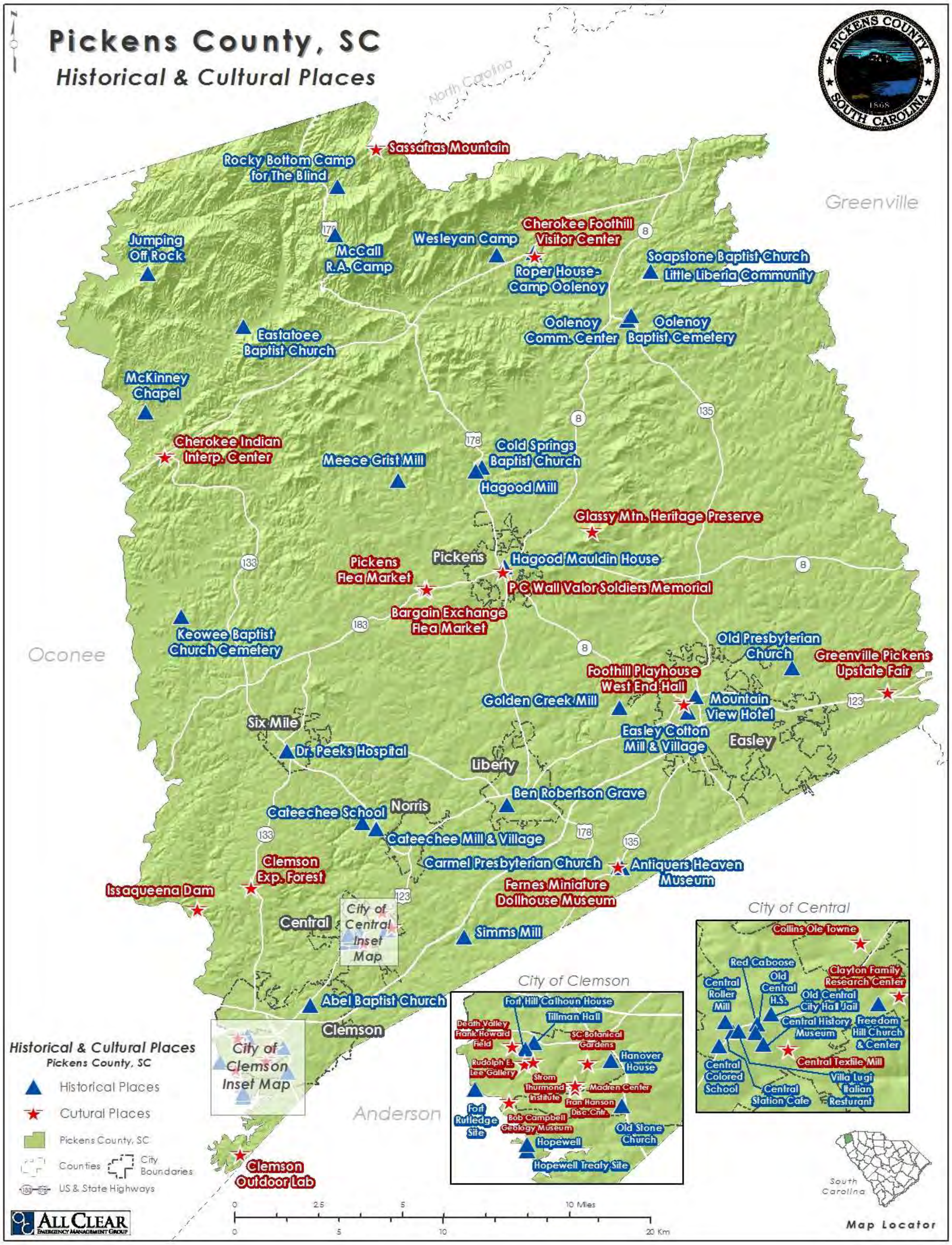


Figure 60: Historical, Cultural, and Natural Resource Areas

corridor and highways) as well as radiological events as it is within the 10 mile Emergency Planning Zone.

Clemson

Of the jurisdictions in Pickens County, Clemson has some of the most complex vulnerabilities. There is a high percentage of residents who are under 5 years old. This population is more vulnerable to extreme temperatures, and tends to need more assistance during other hazard events and afterwards. Additionally, Clemson has a high percentage of college aged students. Many college students may rely on public transportation, and would need assistance during hazard events which require evacuation. Additionally, college students are often in institutionalized living quarters, such as dorms, which can result in spreading diseases such as influenza quickly, impacting public health. Clemson University adds to the vulnerabilities of the City of Clemson, because of the high replacement value of the University's research labs, and the attraction of the University's athletic venues. For example, Memorial Stadium, home to the Clemson Tiger football team, has a capacity of over 80,000 people, and is vulnerable to public health threats, severe weather, and terrorism. The City of Clemson also has many historical and cultural sites, including a National Historic Landmark. Clemson has specific vulnerability to dam failure, floods, hazardous materials (due to proximity of the rail corridor and highways), radiological events as it is within the 10 mile Emergency Planning Zone, temperature extremes and terrorism.

Easley

Easley has a high social vulnerability with a high percentage of residents who are either under 5 years old or older than 65 years old. These populations are more vulnerable to extreme temperatures, and tend to need more assistance during other hazard events and afterwards. Easley also has a higher percentage of residents who receive food stamps, as compared to the County and the other jurisdictions. This indicates there are more people who are economically disadvantaged, and would require more assistance in recovering from a hazard event. Additionally, Easley has a significant population of individuals whose primary language is not English. As the largest city in the County, Easley has a high replacement value for buildings and a high percentage of commercial properties. This means the City could be more vulnerable to economic disruptions caused by a hazard or other causes, such as a recession. Easley has specific vulnerability to flooding, hazardous materials (due to proximity of the rail corridor and highways) and temperature extremes.

Liberty

Liberty has a high social vulnerability with a high percentage of residents who are older than 65 years old. This population is more vulnerable to extreme temperatures, and may need more assistance during other hazard events and afterwards. Liberty also has a higher percentage of residents who receive food stamps, as compared to the County and the other jurisdictions. This indicates there are more people who are economically disadvantaged, and would require more assistance in recovering from a hazard event. Additionally, Liberty has a significant population of individuals whose primary language is not English. Liberty also faces a lack of resources, which limits the City's capacity and capability. They have recently taken steps to address this particular vulnerability, but it will take time to build up their resiliency. Liberty has specific vulnerability to hazardous materials (due to proximity of the rail corridor and highways) and temperature extremes.

Norris

Norris does not have as high of social vulnerability as other jurisdictions in the County, which means its citizens are more likely to be able to respond and recover from hazard events. However, the Town does not possess many resources, and has very little capacity and capability of providing services to its residents, during normal operations, and is therefore reliant upon the County for nearly all services. This can make the Town more vulnerable, as they will need to share resources with the rest of the County. Norris has specific vulnerability to hazardous materials (due to proximity of the rail corridor and highways) as well as radiological events as it is within the 10 mile Emergency Planning Zone.

Pickens

The City of Pickens is the County Seat, and as such has a higher percentage of government buildings and critical facilities, which means critical services for the city and County could be interrupted if damaged by a hazard event. There are also a high number of commercial buildings in the city, which makes Pickens vulnerable to economic disruptions. The City of Pickens has specific vulnerability to flooding.

Six Mile

Six Mile has social vulnerability with a high percentage of residents who are older than 65 years old. This population is more vulnerable to extreme temperatures, and may need more assistance during other hazard events and afterwards. Six Mile is primarily a residential community, so the residents could be impacted economically if there are economic downturns in the surrounding communities. Six Mile has specific vulnerability to radiological events, as it is within the 10 mile Emergency Planning Zone and temperature extremes.

5. Mitigation Capability Assessment

An important step in the mitigation planning process is understanding which plans, policies, ordinances, or other mechanisms are already in place within the community which may have risk reduction capabilities, even though they are not stand alone mitigation plans.

5.1 Pickens County Capabilities

Pickens County has a comprehensive plan and three ordinances in place which are capable of including limited mitigation actions for specific hazards. These are the Pickens County Comprehensive Plan, the Unified Development Standards Ordinance, the Pickens County Stormwater Ordinance, and the Flood Damage Prevention Ordinance. Pickens County did include principles of hazard mitigation into this plan and the ordinances, but they could be strengthened, particularly the Comprehensive Plan. It is strongly recommend that the Director of Pickens County Emergency Management serve of the commission during the Comprehensive Plan update and review, in order to assert stronger and more thorough mitigation incorporation.

5.1.1 Comprehensive Plan

The current Comprehensive Plan was adopted in 2011. The purpose of this plan was to guide future decisions regarding the growth of Pickens County while balancing disparate interest in determining proper, informed planning decisions. The goals outlined in the plan are:

- Encourage population growth in areas which have the necessary supporting infrastructure and community facilities; preserving both a rural lifestyle and personal property rights;
- Provide strategically located and high quality sewer, water, solid waste, fire, emergency services, and public safety, along with cultural/educational community facilities, to meet the needs of residents of Pickens County;
- Honor, preserve, and promote the unique heritage of Pickens county through cultural and recreational opportunities that serve our diverse residents and visitors;
- Promote the development of a broad range of housing to meet the diverse needs of our residents;
- Continue our heritage of stewardship and to ensure the integrity of our natural assets by promoting, protecting, and enhancing the quality of our air, water, and land resources that support the quality of life in Pickens County;
- Improve and maintain transportation networks for the purpose of traffic safety, efficiency, and pedestrian accommodations; and to plan a self-sustaining local and regional public transportation system;

- Mitigate the impact of development by encouraging the conservation of the agricultural character and natural resources of Pickens County, while protecting the rights of land owners;
- Foster coordination and cooperation among all of Pickens County's local governments in prioritizing the investment of public funds in our county.

The Comprehensive Plan focuses on "Character Areas" instead of traditional future land use categories. It is used to identify places and areas that show a common style, development and land use pattern. Character Areas designations indicate the types of land uses that are compatible with the area and the infrastructure existing and expected to support that type of development. Hazard mitigation planning was incorporated into the Comprehensive Plan primarily in the fifth listed goal of stewardship of natural resources with policies and actions which support hazard mitigation planning.

5.1.2 Unified Development Standards Ordinance

The Unified Development Standards Ordinance (UDSO) was first adopted in 1992, and then last revised in 2015, and is applicable in all unincorporated areas of Pickens County. The purposes of this ordinance are:

- To implement the recommendations of Pickens County's Comprehensive Plan;
- To protect land values through sound and responsible development practices;
- To conserve and ensure access to the county's natural and scenic resources for future generations to enjoy;
- To secure the safety of residents from the hazards of development not in harmony with existing and planned improvements;
- To enhance the development process and improve the siting of new development; and
- To protect and preserve the character of existing neighborhoods and subdivisions. (Pickens County *Unified Development Standards Ordinance* p. 1-1, 1-2)

To meet these goals the UDSO dictates a variety of standards, such as lot and building standards, use standards, subdivision standards, performance standards, and buffers (Pickens County *Unified Development Standards Ordinance*).

5.1.3 Pickens County Stormwater Ordinance # 392

The Pickens County Stormwater Ordinance # 392 was adopted in 2007, and applies throughout unincorporated Pickens County. This plan's purpose is:

> Protect, maintain, and enhance the environment of Pickens County and the public health, safety and the general welfare by establishing minimum requirements and procedures to control the adverse effects of increased

> stormwater runoff associated with both future land development and existing developed land within the County. Proper management of stormwater runoff will minimize damage to public and private property, ensure a functional drainage system, reduce the effects of development on land and stream channel erosion, assist in the attainment and maintenance of water quality standards, enhance the local environment associated with the drainage system, reduce local flooding, maintain as nearly as possible the pre-developed runoff characteristics of the area, and facilitate economic development while mitigating associated flooding and drainage impacts. (Pickens County *Pickens County Stormwater Ordinance* p. 9)

This ordinance covers a variety of requirements, including land disturbance permits, stormwater management plans, and sediment and erosion control plans (Pickens County *Pickens County Stormwater Ordinance*).

5.1.4 Flood Damage Prevention Ordinance #399

The Flood Damage Prevention Ordinance # 399 was adopted in 2008 and applies to all regions within the jurisdiction of Pickens County in the special flood hazard area, as identified by FEMA. The purpose of this ordinance is:

> To protect human life and health, minimize property damage, and encourage appropriate construction practices to minimize public and private losses due to flood conditions by requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction. Uses of the floodplain which are dangerous to health, safety, and property due to water or erosion hazards, or which increase flood heights, velocities, or erosion are restricted or prohibited. These provisions attempt to control the alteration of natural floodplains, stream channels, and natural protective barriers which are involved in the accommodation of flood waters, and control filling, grading, dredging and other development which may increase flood damage or erosion. Additionally, the ordinance prevents or regulates the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands. (Pickens County *Pickens County Flood Damage Ordinance* p. 3)

The Flood Damage Prevention Ordinance gives both general and specific standards for different types of constructions and facilities, as well as for different flooding hazards (Pickens County *Pickens County Flood Damage Ordinance*).

5.2 Community Capability Matrix

As part of the planning process, each community was asked to fill out a survey regarding what plans and mechanisms were in place that facilitated a reduction of risk. Table 32 summarizes the survey responses for the county and each municipality which participated. No entry indicates the question was not answered by the representative. The matrix provides a summary for the different capabilities of each jurisdiction. The documents, policies, plans and ordinances found in the table below were reviewed and considered during plan development. These policies and programs will continue to expand as time, funding, and legal requirements allow.

5.3 Municipality Capabilities

Central

Central has a Mayor and a City Council. The Planning & Zoning commission, made up of five residents of Central and one Council representative, is responsible for Planning in the City. Central's Comprehensive Plan is due for another update in 2018, which provides an opportunity to incorporate more hazard mitigation planning than the existing one, especially as this is the first specific hazard mitigation plan project Central has been involved in. Central's primary means of hazard mitigation implementation has been through its Code of Ordinances, which address drought, flood, and urban fire primarily. It is recommended that ordinances be revised to include additional hazard regulations.

Clemson

The City of Clemson has a Mayor and a City Council. In addition there are many City departments including the Planning and Codes Department which develops a long – range plan for the City and manages ongoing and current planning needs. Clemson most recently adopted their Comprehensive Plan in 2014, which includes many important elements such as a land use plan, and cultural and natural resource elements. However it does not include hazard mitigation. It is strongly recommended that during the next Comprehensive Plan update cycle in 2023 that hazard mitigation be made a priority and incorporated into the Comprehensive Plan. The City of Clemson also uses its City Ordinance and Zoning Ordinance to implement hazard mitigation activities. The current ordinances address building codes, erosion, flooding, and urban fire. The City is also currently in the process of rewriting Land Development Regulations which addresses flood hazards with regulations addressing development in Flood Hazard Areas, drainage ditches, and includes regulations regarding the mitigation of vegetation associated with both private and public streets, which may impact public safety, utility disruptions, transportation disruptions, flooding and other hazards.

Easley

Easley is governed by a Mayor and an elected City Council. They are responsible for adopting any new ordinances or passing resolutions. The City's Planning and Development department is in charge of maintaining and implementing the City's long range plans. While it is strongly recommended that Easley incorporate hazard mitigation into their next Comprehensive Plan update, the City has a robust series of Codes and Ordinances which contribute to hazard mitigation activities and actions. They have adopted and enforce the 2015 International Building Code, 2015 International Residential Code, 2015 International Fire Code, 2015 International Plumbing code, 2015 International Mechanical Code, 2015 International Fuel Gas Code, 2019 Energy conservation Code, 2015 International Property Maintenance code, 2011 National Electrical Code, 2006 American National Standards Institute, Accessibility Guidelines, the City of Easley Zoning Ordinances, City of Easley Code of Ordinances, Easley Land Development Regulations Ordinance, and a Stormwater Ordinance. The Codes and Ordinances together address earthquake, erosion, expansive soils, flooding, tornado and windstorms, urban fire, and wildfire. More regulations can be added to address additional hazards, such as drought.

Liberty

Liberty is governed by a mayor and City Council. They are responsible for adopting any new ordinances or passing resolutions. The City also has a city administrator. The Planning Commission of the City of Liberty has the responsibility to develop and implement the City's long-term planning projects and rule on Planning and Zoning issues. Liberty's Comprehensive Plan briefly mentions flood hazards and erosion, but not other hazards. It is strongly recommended that hazard mitigation be made a priority during the next revision so that mitigation will be one of the principles guiding the future of Liberty. Liberty also has zoning ordinances and land development regulations. While the land development regulations briefly address flood hazards, both the zoning ordinance and land development regulations should adopt stronger regulations for other hazard types.

Norris

Norris has an elected Mayor and Town Council who focus primarily on meeting the needs of the residents, including planning the annual Christmas Parade, organizing little league baseball games, and beautification projects. The Town of Norris does not have a Comprehensive Plan, nor does it have independent ordinances. The ordinances governing unincorporated Pickens County apply in the Town of Norris. Similarly, the Pickens County Comprehensive Plan guides the development of the Town of Norris, as it does for unincorporated Pickens County. The Town of Norris determined that it does not have the resources necessary to fully implement a comprehensive mitigation plan on their own. Together with Pickens County, it was determined that Norris would be included in the County's participation, as the County provides nearly all the other services and regulations for the Town. While Norris currently is unable to fully support and implement Hazard Mitigation Actions, it is recommended that the Town build its capacity and capabilities during the next mitigation planning cycle. They can accomplish this by providing training for staff about hazard mitigation, begin to incorporate hazard mitigation into long term planning, and re-allocate other resources to hazard mitigation. Because of the limitations of available resources currently, it is understood that this process may take an extended time to fully implement.

Pickens

Pickens is governed by a Mayor and City Council. They are responsible for adopting any new ordinances or passing resolutions. The City's Planning Commission is in charge of maintaining and implementing the City's long range plans. It is strongly recommended that the City of Pickens make hazard mitigation a priority the next time it updates their Comprehensive Plan so that mitigation will be one of the guiding principles as the City of Pickens grows. The City of Pickens has also adopted all provisions and requirements of the general laws of Pickens County regarding building codes. These codes and other ordinances that the City of Pickens enforces address earthquake, erosion, expansive soils, flooding, tornado and windstorms, urban fire and wildfire.

Six Mile

Six Mile is governed by an elected Mayor and a Town Council, and has some committees dedicated to municipal matters. Like Norris, the Town of Six Mile relies heavily on Pickens County to provide services to the town and its residents. The Town of Six Mile determined that it does not have the resources necessary to fully implement a comprehensive mitigation plan on their own. Together with Pickens County, it was determined that Six Mile would be included in the County's participation, as the County provides nearly all the other services for the Town. While Six Mile currently is unable to fully support and implement Hazard Mitigation Actions, it is recommended that the Town build its capacity and capabilities during the next mitigation planning cycle by re-allocating resources. They can accomplish this by providing training for staff about hazard mitigation, begin to incorporate hazard mitigation into long term planning, and re-allocate other resources to hazard mitigation. Because of the limitations of available resources currently, it is understood that this process may take an extended time to fully implement.

Table 32: Community Capability Matrix from Self-Reporting Community Survey

	Pickens County	Central	City of Clemson	Clemson University	Easley	Liberty	Norris	Pickens	Six Mile
Comprehensive plan?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Land Use Plan?	No (2010 Comp. Plan has "Character Areas")	Yes (Zoning Ordinance)	Yes (Zoning Districts)	Yes (Clemson University Master Plan)	Yes	Yes	No	Yes	Yes
Subdivision Ordinance?	Yes (Unified Development Standards Ordinance)	Yes (Zoning Ordinance)	Yes (Zoning Ordinance and Land Dev. Reg.)	Yes	Yes	Yes	No	Yes	Yes
Zoning Ordinance?	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Hazard Mitigation Plan?	Yes	No		No	Not Sure	No	No	No	No
Floodplain Management Ordinance?	Yes	Yes	Yes		Yes	Yes	No	Yes	Yes
- Subs. Damage/ Improvements?	Yes	No	Yes			No	No	Yes	No
- Administrator?	Yes	Yes	Yes		Yes	Yes	No	Yes	Yes
- # buildings in floodplain?	255	0	No			No	1	Unsure	20
- # NFIP policies?	65	N/A				No	0	Unsure	
- # Repetitive loss buildings?	0	N/A	No		0	No	0	Unsure	No
CRS rating?	8	Yes	Yes		No		N/A	Unsure	
Storm Water Management Program?	Yes	No (not required yet)	Yes	Yes	Yes	Yes	Yes under County	Yes	Yes under County

Table 32: Community Capability Matrix from Self-Reporting Community Survey (continued)

	Pickens County	Central	City of Clemson	Clemson University	Easley	Liberty	Norris	Pickens	Six Mile
Building Code									
- Building official?	Yes	Yes	Yes	Yes	Yes	Yes	Yes (Rep. by County Official)	Yes (Rep. by County Official)	Yes (Rep. by County Official)
- Inspections?	Yes	Yes	Yes	Yes	Yes	Yes	Fire Inspector (by County)	Yes (Rep. by County Official)	Yes (Rep. by County Official)
- BCEGS rating?	9	3	4	Yes	No			3	No
LEOP?	Yes	Yes	Yes	Yes	Yes	Yes		No	No
Warning System?	Yes	Yes		Yes	No	Yes		Yes	No
- Sirens?	Yes (10 mile EPZ of Oconee Nuclear Station)	Yes (10 mile EPZ of Oconee Nuclear Station)			No		Yes (10 mile EPZ of Oconee Nuclear Station)	No	
- NOAA W. Radio?					Yes			No	
- Cable Override?	Yes				No			No	
- Reverse 911?	Yes				Yes			Yes	
- Other?								Call System	
- Lead time?	15 min.	N/A						5 Minutes	
- Storm Ready County(Storm Warn Trained Volunteers)	Yes								
Structural Protection Projects?	Yes (retention ponds and the Clemson diversion dams)	No	No	Yes	No	Yes	No	Several Detention Ponds	No

Table 32: Community Capability Matrix from Self-Reporting Community Survey (continued)

	Pickens County	Central	City of Clemson	Clemson University	Easley	Liberty	Norris	Pickens	Six Mile
Property Protection Projects?	Previously	No	No	Yes	No	No	No	No	No
Critical Facility Protection?	Yes (through redundancy)	No	Directed through local procedures and disaster plan		No	No	No	No	No
Cultural or Natural Resource Inventory?	Yes	No	No	Yes	No		No	We have design guidelines for our downtown "overlay" districts. We are interested in establishing a historic district.	In process of building design guidelines for our downtown "overlay" districts.
Erosion/Sediment Control?	Yes (Stormwater program)	Yes	Yes		Yes	Yes	Yes (Stormwater Program via County)	Only what is covered in under our MS4 stormwater permit	Yes (via County)
Public Info/ Educational Program?	Yes	No	No	Yes	Yes	No	No	No	No

6. Mitigation

This section of the Pickens County Hazard Mitigation Plan describes the process which was used to establish goals, objectives, and actions aimed at reducing risk in the county. It also describes how the mitigation actions were prioritized, and how this plan will be monitored, evaluated, and updated. Because the communities of Norris and Six Mile rely almost exclusively on the services of the County, the County's mitigation goals, objectives and actions will also be applied to the two jurisdictions.

6.1 Status of Previous Plans Mitigation

Prior to the development of its own Hazard Mitigation Plan, Pickens County completed several of the mitigation actions listed in the Appalachian Council of Government's multi-jurisdictional Hazard Mitigation Plan, of which they were a previous jurisdictional participant. That mitigation plan was a regional plan, whose official participants included Anderson County, Cherokee County, Oconee County, Pickens County and Spartanburg County. The individual municipalities of Pickens County were invited to participate, but chose not to. Municipalities in the other Counties also chose not to participate. Table 33 lists the mitigation activities that Pickens County completed and the corresponding actions listed in the 2005 mitigation plan.

Table 33: Mitigation Actions Prior to 2011 Mitigation Plan

COG Mitigation Plan 2005	Mitigation Actions Present
Provide emergency back-up power to critical facilities: emergency generators, secondary feeds, etc.	The new Pickens County High School has been hard wired with an emergency generator switch terminal box. If the school was ever to be used as a shelter a generator could immediately be connected.
Update communication equipment especially the E-911 Center as needed and funding is available	E-911 Department has purchased a portable PSAP (Portable Safety Answering Points) to be used if a dispatch center within the County loses power or fails. Also, a portable repeater and additional antenna for better communication for dispatch centers.
Provide generators to all existing critical facilities to prevent lengthy power outages.	Generators were not provided to all existing critical facilities, but Pickens County Administration did purchase two generators to be used if critical infrastructures do lose power.
Establish procedures and location for setting up an operations center for local government in the event a natural disaster forces the evacuation of Local government buildings.	No procedure has been established, but Pickens County Emergency Management at 1509 Walhalla Hwy has established an Alternate EOC at the Administration Building at 222 McDaniel Avenue
Provide information to residents about the community warning systems and how to respond in case of a disaster.	On the Pickens County website, residents can register their phone number for emergency notifications. They can register land lines and cell phones. This method is referred to as reverse 911(example evacuation of certain areas: i.e. Train derailment)

In addition to actions detailed in Table 33 Pickens County also participated in hazard scenario exercises as mitigation activities since the last mitigation plan was adopted. Personnel from Emergency Management participated in committees and other planning teams in order to incorporate the hazard mitigation plan, the emergency operations plan, and the floodplain management plan into other countywide planning activities.

The 2005 hazard mitigation plan included several other mitigation actions which have not been completed for a variety of reasons. Some have been deferred, due to funding, staffing, or other restrictions, and are included in this updated plan. Other actions were later deemed not beneficial, not purposeful, or not appropriate after further cost-benefit review, and are not included in this plan. Hazard mitigation planning is a continuous activity, and it is to be expected that some mitigation actions will be deemed no longer warranted during the ongoing planning process.

Progress towards mitigation goals and actions established in the 2011 version of the plan can be found in the “Status/Notes” column of each of the tables in Section 6.3. Newly added mitigation actions do not have a ‘status’ listed. Each of the mitigation actions listed in the tables in Section 6.4-6.8 are new, as the jurisdictions of Central, Clemson, Easley, Liberty, Norris, Pickens and Six Mile have not previously participated in a Hazard Mitigation Plan, thus do not have previously established mitigation actions. Additionally, as they have not previously participated in a Hazard Mitigation Plan, there have been no change in priorities for the municipalities of Pickens County.

6.2 Mitigation Process

After the hazard and vulnerability assessments were completed, the actual mitigation strategies to reduce risk in Pickens County were formulated through a process involving establishing goals, objectives, and actions to achieve those goals.

6.2.1 Goal and Objective Development

Analysis of the hazard and community vulnerabilities, the existing loss-prevention mechanisms, the results of the public and industry surveys, and the capabilities and resources of Pickens County led to the identification of perceived problems, which were then formulated into the following problem statements:

1. Socially vulnerable populations are not as prepared for emergencies as the general public, nor do they have the resources to recover from hazard events as readily or as quickly. Modern emergency management plans seek to achieve the greatest impact on the bulk of the population which may result in smaller, more vulnerable, groups being missed. Emergency management relies on not only operating the emergency management system but understanding the internal and external influences on the system at any given time in order to forecast challenges in a proactive manner. Understanding and addressing socially vulnerable populations minimizes the greater attention and support potentially required by this population during an emergency (Poplin).

2. Better, more detailed hazard analysis could not be performed because data does not exist or it is not readily accessible.

3. Emergency response and management is vital during emergencies. The county needs to ensure emergency managers and responders are equipped and capable of performing their duties.

4. The citizens of Pickens County face a number of hazards, and although they may have the financial resources to recover from a hazard, many are not aware of the risks hazards pose, or how to prepare their household for such events.

5. Pickens County has extremely limited resources, in terms of funding, time, and staff, with which to undertake mitigation activities.

These problem statements became the basis of the overarching long-term mitigation goals developed. Each goal was created to address issues identified in the problem statements. Objectives, which define strategies or implementation steps to attain the identified goals, were then developed. To be consistent with community values, the results of the community survey were considered when formulating these objectives. Each long-term goal has long-term and short-term objectives and actions designed to close the gap identified in the problem statements.

6.2.2 Actions Development

Mitigation actions are the specific activities that help achieve goals and objectives. Potential mitigation actions were identified and were evaluated to determine whether they fulfilled the goals and objectives defined previously. It was important that these actions were practical for use in Pickens County, so a benefit cost review was done to eliminate actions that were not pragmatic and help guide the prioritization rankings. The final feasibility ranking (High, Medium, Low) for each action was completed based on the criteria found below. Additional prioritization was completed through the hazard rankings as identified in Section 6 of this plan.

The finals feasibility rankings can be found in the charts below. The following criteria was used to assess the benefits and costs of the identified mitigation actions:

High - Highly cost-effective, administratively feasible and politically feasible policies.

Medium - Policies that have at least two of the following characteristics (but not all three):

- Highly cost-effective; or
- Administratively feasible, given current levels of staffing and resources; or
- Are politically popular and supportable given the current environment.

Low - Policies that have at least one of the following characteristics (but not two or three):

- Highly cost-effective; or

- Administratively feasible, given current levels of staffing and resources; or
- Are politically popular and supportable given the current environment.

6.2.3 Prioritizing Actions

The Hazard Identification and Risk Assessment completed by the Pickens County Planning Committee (found in Section 3 of this plan) determined which hazards posed the greatest threat to the county as a whole based on three factors. This risk analysis was based on how much of the community was vulnerable to any particular hazard, the severity of the consequences, and the frequency at which a hazard occurs. Each hazard received a final ranking of High, Medium, or Low. These rankings were used to inform the priority given to each mitigation action identified. For example, the committee felt that action items addressing Severe Storms (high priority according to the established methodology) should be prioritized over action items addressing Dam /Levee Failure (Low priority according to the established methodology). Action items addressing multiple hazards were considered based on the priorities of the hazards addressed. Within each category (High, Medium, Low), the action items were prioritized according to their Feasibility Ranking (Benefit Cost Review). Thus, all actions impacting a hazard ranked as “High” are given “High” priority. Within those actions, Highly feasible actions are given a higher priority than actions with a low feasibility ranking.

Long-term goals and their associated objectives and actions are listed in the following sections.

Some of the municipalities have conducted further risk assessments with additional anthropogenic hazards which helped guide their mitigation action development and prioritization. Each municipality is the truly best determiner of their priorities, so they were given full authority to prioritize as they felt best, and these priorities are reflected in listing of actions in Sections 6.3-6.8.This methodology represents a new prioritization method from the 2011 planning process. This new process allowed all jurisdictions in Pickens County to have a voice in the prioritization of actions as well as input from the public surveys, to reduce risk versus the single-jurisdiction method used in the previous version. Previously, the hazard mitigation actions were prioritized based solely upon only the County’s Officials’ perspective. With additional perspective, bias is reduced.

6.3 Pickens County Hazard Mitigation Actions – Including Norris and Six Mile

The following sections include Mitigation Actions for Pickens County, Norris and Six Mile. The towns of Norris and Six Mile are being included in the County's mitigation actions because each town lacks the necessary resources to accomplish hazard mitigation goals individually. As these communities are reliant on the County to provide most of the other services in the towns, including but not limited to stormwater management, building inspections, public safety/law enforcement, public works and long range planning, it follows that the County provide hazard mitigation services, too. The Town of Norris and the Town of Six Mile will formally adopt the Hazard Mitigation Plan, noting that the Pickens County Hazard Mitigation Actions will be applied to those jurisdictions.

6.3.1 Long Term Goal: Reduce impact of hazards on the most vulnerable populations

- Identify vulnerable populations based on factors such as age, class or income level, race and ethnicity, or disability.
- Provide education to vulnerable populations to increase preparedness and response to hazards
- Provide equipment to vulnerable populations to increase preparedness and response to hazards

Action	Responsible Party	Time Frame	Priority	Feasibility	Hazards Addressed	Funding Source	Status/Notes
Identify vulnerable populations	Primary: Director of Pickens County Emergency Management 864-898-5945 Director of Pickens County EMS 864-898-5334	Long-term (longer than 12 months)	High	High	All hazards	General Fund Duke Energy	In-Progress. Pickens County has completed the initial identification of vulnerable populations within 10 miles of the Oconee Nuclear Plant through mail outs from Duke Energy and have been reaching out through events. This activity will be ongoing as populations and needs change.
Work through schools, volunteer groups, senior groups, or home health organizations to provide information to vulnerable populations regarding household and personal hazard preparedness.	Direct or Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	High	All hazards	Local Emergency Management Performance Grant	Completed. Volunteer groups attend events around the County and hand out brochures, educate Residents
Work through schools, volunteer groups, senior groups, or home health organizations to provide information to vulnerable populations regarding resources available during hazard events.	Direct or Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	High	All hazards	County General Fund	Deferred – Insufficient staffing resources

Coordinate with schools, volunteer groups, senior groups, or home health organizations to provide first aid training to vulnerable populations.	Direct or Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	High	All hazards	County General Fund	Deferred – Insufficient staffing resources
Expand established programs or organizations to provide weather radios to vulnerable households.	Direct or Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	Medium	Floods, hurricanes, severe storms, temperature extremes, tornadoes, windstorms, winter/ice storms	Local Emergency Management Performance Grant	Completed. Pickens County received a grant to purchase weather radios and reached out to the fire departments in the County to distribute to vulnerable households in their Fire District.
Expand established programs or organizations to provide first aid kits to vulnerable households.	Direct or Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	Medium	All hazards	Local Emergency Management Performance Grant	Deferred – funding was not secured
Coordinate with established programs or organizations to provide smoke detectors to vulnerable households.	Primary: Direct or Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222 Fire Departments 864-639-5608 864-855-2452 864-855-4241 864-859-8950 864-878-5000 864-868-2330 864-843-2321 864-639-2032 864-878-2610 864-898-5954 864-878-3473 864-868-0368 864-868-0733 864-868-6767 864-878-5000	Long-term (longer than 12 months)	Medium	Medium	Urban fire	Red Cross Funds	In progress. Since the 2011 plan, the Red Cross and Pickens County Fire Departments partnered and installed smoke detectors in vulnerable households throughout the County. Continuing into the next planning cycle, vulnerable households can also contact their local fire department and they will install the smoke detectors for the residents

Create public education campaign targeting at risk populations relative to the illicit drug epidemic targeted at reducing the number of users and overdoses.	Pickens County Sheriff 864-898-5500	Long-term (longer than 12 months)	High	High	Crime	General fund	New
Outreach to vulnerable populations about locations of heating and cooling centers during extreme temperature events.	Primary: Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Cold, Extreme Heat	General Fund/Red Cross Funds	New
Establish a planning committee of social service organizations to identify and respond to at risk populations during extreme temperature events.	Primary: Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222 Salvation Army 864-235-4803	Immediate (less than 6 months)	Medium	Medium	Extreme Cold, Extreme Heat	General Fund/Red Cross/Salvation Army/ Other nonprofit organizations	New
Create educational materials on hot weather tips for vulnerable populations and awareness of resources available to them.	Primary: Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Heat	General Fund	New

6.3.2 Long Term Goal: Future mitigation and response plans will have the ability to include more specific mitigation actions or address more specifically the existing hazards.

- Hazard analysis will be more comprehensive and precise.
- County data will be readily available for use in hazard mitigation planning or other planning activities.

Action	Responsible Party	Time Frame	Priority	Feasibility	Hazards Addressed	Funding Source	Status/Notes
Develop and maintain a building inventory that contains information regarding location, type of structure, construction material, date of construction and modification, whether the building is consistent with current building codes, and other pertinent information.	Pickens County GIS Director 864-898-5876	Long-term (longer than 12 months)	High	Medium	Dam failures, earthquakes, floods, hurricanes, severe storms, tornadoes, windstorms, urban fires, wildfires, winter/ice storms	General Fund	Deferred – Insufficient staffing resources
Establish specific mitigation strategies for extremely vulnerable structures identified during the development of the building inventory.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	High	Dam failures, earthquakes, floods, hurricanes, severe storms, tornadoes, windstorms, urban fires, wildfires, winter/ice storms	Hazard Mitigation Grant	Deferred – Insufficient staffing resources
Develop a standardized, integrated database of utility distribution systems, utility facilities, critical facilities, county facilities, roads, streams/rivers, and other data deemed necessary.	Pickens County GIS Director 864-898-5876	Ongoing	High	High	All hazards	General Fund	Deferred – Insufficient staffing resources
Conduct a feasibility study to determine if a zoning ordinance would promote community safety and hazard mitigation with regards to new development.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	High	Crimes, civil disturbances, dam failures, earthquakes, floods, urban fires, wild fires	General Fund	Deferred – Insufficient funding and staff resources
Use DHEC's dam failure inundation tool and the EAP of each dam to develop a county-wide database of high hazard dams	Primary: Director of Pickens County Emergency Management 864-898-5945	Immediate (less than 6 months)	Low	High	Dam/Levee Failure	General Fund	New

	Dam Owners						
Assess frequently flooded roadways throughout all jurisdictions of the county for roadway and drainage improvement projects.	Director of Pickens County Building Codes and Stormwater Department 864-898-5789	Long-term (longer than 12 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund	New
Study and assess areas vulnerable to wildfire and causative factors.	South Carolina Forestry Department State Forester 803-896-8800	Long-term (longer than 12 months)	Medium	Low	Wildfire	TBD, possibly PDM	New

6.3.3 Long Term Goal: The community will have the capability to initiate and sustain emergency response operations during and after a hazard event.

- Critical facilities will be functional during hazards.
- Response functions will be coordinated.
- Emergency managers and responders will have the ability to respond effectively to hazard events.

Action	Responsible Party	Time Frame	Priority	Feasibility	Hazards Addressed	Funding Source	Status/Notes
Develop a specific definition of 'critical facilities'.	Director of Pickens County Emergency Management 864-898-5945	Completed	High	High	All hazards	General Fund	Completed
Complete a hazard and vulnerability assessment and mitigation strategy for each critical facility.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	High	All hazards	General Fund	In progress - The next phase is to work with County Administration to build out a COOP plan to better understand the vulnerabilities and build out a mitigation strategy for each
Develop an inventory of response assets and capabilities.	Director of Pickens County Emergency Management 864-898-5945	Started	High	Medium	All hazards	General Fund	In progress - In the early stages of developing inventory lists
Increase training and capability of response teams and communication/ integration with mutual aid assets.	Director of Pickens County Emergency Management 864-898-5945	Started	High	High	All hazards	General Fund	In progress - This is a continuous effort of training and integrating communication assets with mutual aid requests
Work with home health and other private entities to educate special needs individuals regarding self-sustaining practices or whom to communicate with during emergencies.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	Medium	All hazards	General Fund	Deferred – Insufficient staffing resources
Increase training and capabilities by organizing and running training exercises to cover a variety of hazards (dam failure, hazmat, hurricane, winter storm, etc.).	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	High	All hazards	General Fund	Completed exercises in 2016 and 2017. Planning for more.

6.3.4 Long Term Goal: Reduce the impact of hazards on the general public and community

- Educate the general public on personal/household preparedness.
- Perform preventative actions which reduce the impacts of hazard events.

Action	Responsible Party	Time Frame	Priority	Feasibility	Hazards Addressed	Funding Source	Status/Notes
Educate public about wildfire dangers, and open burning safety, cigarette litter, and campfire safety.	Primary: Director of Pickens County Emergency Management 864-898-5945 Fire Chiefs, Pickens County Fire Departments 864-639-5608 864-855-2452 864-855-4241 864-859-8950 864-878-5000 864-868-2330 864-843-2321 864-639-2032 864-878-2610 864-898-5954 864-878-3473 864-868-0368 864-868-0733 864-868-6767 Other Emergency Services	Long-term (longer than 12 months)	Medium	High	Wildfire	General Fund	In Progress - Pickens County fire departments have been educating Citizens about wildfire safety and handing out Fire Wise Tool Kits
Create buffer zones around structures in wildland-urban interface areas.	Primary: Director of Pickens County Parks and Recreation 864-868-2196 Private Landowners	Long-term (longer than 12 months)	Medium	Medium	Wildfire	General Fund and Private Funds	Deferred - Insufficient funding and staff resources
Develop a more effective fire condition notification system plan.	Director of Pickens County Emergency Services Director 864-898-5945	Completed	Medium	High	Wildfire	General Fund	Completed - The County Fire Departments have a Countywide Mutual Aid agreement which allows other fire departments to respond and offer mutual aid

Identify safe storm shelters in communities and educate residents as to where to seek shelter.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	High	Hurricanes, severe storms, tornadoes, windstorms	General Fund	Deferred - Insufficient staffing resources
Educate public about the importance of weather radios and where to obtain them.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	High	Floods, hurricanes, severe storms, temperature extremes, tornadoes, windstorms, winter/ice storms	General Fund	Deferred - Insufficient staffing resources
Consider the feasibility of adopting FireWise throughout the county.	Director of Pickens County Emergency Services 864-898-5945	Immediate (less than 6 months)	Medium	High	Wildfire	SC Firefighters Association	New - Is currently being implemented in some areas
Remove dead trees or trim large branches located near structures.	Primary: Director of Pickens County Emergency Management 864-898-5945 Private Landowners	Immediate (less than 6 months)	High	Moderate	Hurricanes, severe storms, tornadoes, windstorms, winter/ice storms	General Fund and Private Funds	Deferred - Deferred for County owned structures due to insufficient funding. Private landowners have been encouraged to do so on their own properties
Conduct a commodity flow study on major roadways in the county.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Medium	Moderate	Disruption of transportation, hazardous materials	General Fund	Deferred - Insufficient funding and staff resources
Coordinate between law enforcement agencies and railroad companies to increase notification and safety where statistics or assessment indicates a dangerous intersection of railroad and roadway.	Primary: Pickens County Sheriff 864-898-5500 Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Medium	Moderate	Disruption of transportation, hazardous materials	General Fund	Deferred - Insufficient funding and staff resources
Institute a standard warning system for dam failure.	Director of Pickens County Emergency Management 864-898-5945	Short Term	Low	Moderate	Dam failure	911 Funds	In progress - SCDHEC and Pickens County Emergency Management have been working with dam owners throughout the county to develop Emergency Action Plans for their dams; once residents are pre-identified they will be registered in the CODE RED System which is a notification system used throughout the County

Coordinate with the USACE on EAP for Dams in Pickens County	Primary: Director of Pickens County Emergency Management 864-898-5945 US Army Corps of Engineers	Long-term (longer than 12 months)	Low	High	Dam failure	USACE	New - Pickens County Emergency Management, USACE and Clemson University are coordinating regarding Clemson Diversion Dams and yearly updates of the EAP along with TTX
Serve as a repository for dam failure plans.	Primary: Director of Pickens County Emergency Management 864-898-5945 US Army Corps of Engineers	Long-term (longer than 12 months)	Low	High	Dam failure	General Fund	Deferred - Insufficient staffing resources
Provide information to the public regarding procedures to follow in the event of a dam failure.	Director of Pickens County Emergency Management 864-898-5945 E-911 Coordinator 864-898-5960	Long-term (longer than 12 months)	Low	High	Dam failure	911 Funds	In progress - This is ongoing once the Emergency Action Plans are completed and Exercise will be done using the CODE RED notification system to alert residents downstream of dams
Educate about and encourage participation in the National Flood Insurance Program.	Building Official, Pickens County Building Codes 654-898-5950	Long-term (longer than 12 months)	Medium	High	Dam failure, flooding	General Fund	Deferred - Insufficient staffing resources
Work with homeowner of the repetitive loss property to relocate, abandon, or demolish structure.	Building Official, Pickens County Building Codes 654-898-5950	Complete	Medium	Moderate	Flooding	FMA	Completed
Partner with utility companies to remove dead trees or trim large branches located near utilities.	Chiefs of the Pickens County Fire Departments 864-639-5608 864-855-2452 864-855-4241 864-859-8950 864-878-5000 864-868-2330 864-843-2321 864-639-2032 864-878-2610 864-898-5954 864-878-3473 864-868-0368 864-868-0733 864-868-6767	Immediate (less than 6 months)	High	High	Utility disruption, hurricane/tropical storm, severe storm, tornado/windstorm, severe winter weather	Utility Company Funds	Deferred - Insufficient staffing resources

Educate public about personal/household preparedness.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	High	All hazards	Local Emergency Management Performance Grant	Completed - Pamphlets have been handed out to residents at public meetings regarding personal preparedness. This effort will continue.
Training and equipment for the Swiftwater Rescue Team	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Medium	High	Dam failure, flooding	General Fund	New
Create a FEMA Approved Debris Removal Plan to prepare Pickens County Public Works in planning and preparing for natural disasters.	Primary: Director of Pickens County Emergency Management 864-898-5945 Director of Pickens County Public Works 864-898-5934	Long-term (longer than 12 months)	High	High	All hazards	General Fund	New
Training and equipment for the Technical Rescue Team to respond to confined space and structural stability calls	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	High	All hazards	General Fund	New
Educate public about severe weather and safety strategies	Primary: Director of Pickens County Emergency Management 864-898-5945 Mayor of Town of Norris 864-639-2033 Mayor of Town of Six Mile 864-868-2653	Long-term (longer than 12 months)	High	High	Flooding, hurricane/tropical storm, severe storm, extreme temperatures, tornado/windstorm	General Fund	New
Strengthen the efforts of trained volunteers within the Storm Ready County program	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	High	Flooding, hurricane/tropical storm, severe storm tornado/windstorm	Local Emergency Management Performance Grant	New
Conduct a public education specifically targeting the communities at highest risk of dam failure regarding dam failure notification and evacuation routes.	Director of Pickens County Emergency Management 864-898-5945 Dam Owners	Long-term (longer than 12 months)	Low	High	Dam/Levee Failure	General Fund	New

Increase permeable surfaces and retention basins to encourage groundwater recharge	Director of Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	Medium	Medium	Drought	General Fund	New
Update landscaping around public lands and along roadways to include shade-providing and drought resistant vegetation which serves as a windbreak, while maintaining proper buffers against wildfire.	Director of Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	Medium	Medium	Drought	General Fund	New
Adopt and enforce building code provisions for earthquake construction to reduce risk.	Building Official, Pickens County Building Codes 654-898-5950	Long-term (longer than 12 months)	Low	Medium	Earthquake	General Fund	New
Conduct a study of seismic zone earthquake risk and soil investigation to determine level of risk to existing buildings and new construction.	Building Official, Pickens County Building Codes 654-898-5950	Long-term (longer than 12 months)	Low	Medium	Earthquake	General Fund	New
Encourage financial resiliency planning for local residents.	Development Board of WorkLink Workforce 864-656-1515	Long-term (longer than 12 months)	High	Low	Economic Crisis	Private Grants	New
Create educational materials on cold weather tips for property owners.	Primary: Direct or Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Cold	General Fund	New
Continue to implement and enforce floodplain development regulations.	Primary: Director of Pickens County Planning Department 864-898-5945 Director of the Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund	New
Encourage at risk owners to purchase flood insurance.	Building Official, Pickens County Building Codes 654-898-5950	Immediate (less than 6 months)	High	Medium	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund	New

Retrofit existing infrastructure susceptible to flooding to a flood resistant level.	Director of Pickens County Roads and Bridges 864-989-5934	Long-term (longer than 12 months)	High	Low	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund	New
Implement and maintain a drainage ditch inspection and cleanup program to reduce roadway flooding and washout.	Director of the Pickens County Stormwater Department 864-898-5789	Immediate (less than 6 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund	New
Encourage hail resistant building construction for property owners	Building Official, Pickens County Building Codes 654-898-5950	Immediate (less than 6 months)	High	Low	Hail, Severe Storm	General Fund and Private Funds	New
Implement a public campaign regarding hail danger and safety tips.	Director of Pickens County Planning Department 864-898-5956 Building Official, Pickens County Building Codes 654-898-5950	Immediate (less than 6 months)	High	High	Hail, Severe Storm	General Fund	New
Continue to enforce and adopt, as necessary, new regulations on fixed facilities.	Director of Pickens County Emergency Management 864-898-5945 EPCRA	Long-term (longer than 12 months)	Medium	High	Hazardous Materials	General Fund	New
Continue to enforce and adopt, as necessary, new regulations for transportation agencies.	Director of Pickens County Emergency Management 864-898-5945 EPCRA	Long-term (longer than 12 months)	Medium	High	Hazardous Materials, Transportation System Disruption	Hazard Materials Emergency Preparedness Grant	New
Conduct a public education campaign regarding hazardous material accident safety covering shelter-in-place and evacuation.	Director of Pickens County Emergency Management 864-898-5945	Immediate (less than 6 months)	Medium	High	Hazardous Materials, Transportation System Disruption	Hazard Materials Emergency Preparedness Grant	New
Establish an awareness campaign on utility shutoff, food safety during power outages, related to utility disruptions.	Director of Pickens County Emergency Management 864-898-5945 Fire Chiefs of: Central Rural Fire District Clemson University Rural Fire District	Long-term (longer than 12 months)	High	Medium	Hurricane/Tropical Storm, Lightning, Severe Storm, Tornado, Utility System Disruptions, Windstorm, Winter Storm	Operating Budget	New

	Crosswell Rural Fire District Dacusville Rural Fire District Easley Rural Fire District Holly Springs Rural Fire District Liberty Rural Fire District Pickens Rural Fire District Pumpkintown Rural Fire District Rocky Bottom Rural Fire District Shady Grove Rural Fire District Six Mile Rural Fire District, Springs Rural Fire District Vineyards Rural Fire District Emergency Services Director						
Install lightning detection system in outdoor areas and other areas of frequent outdoor recreation and the public high school athletic fields.	Primary: Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	High	High	Lightning	General Fund	New
Establish an awareness campaign of the dangers of lightning and safety precautions to take.	Director of Pickens County Emergency Management 864-898-5945	Immediate (less than 6 months)	High	High	Lightning	General Fund	New
Develop an education and outreach program to teach students about radiological hazards and safety measures	Primary: Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	Medium	High	Radiological	Duke Energy	New

Conduct a public education campaign for the public within the 50 mile buffer zone around the Oconee Nuclear Station to inform the public of the radiological hazards, what steps might be needed in the event of an emergency and where to obtain the latest information during an emergency.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Medium	Medium	Radiological	Duke Energy	New
Ensure public venues have proper plans in place to mitigate and respond to threats of terrorism	Pickens County Sheriff 864-898-5500	Long-term (longer than 12 months)	Medium	High	Terrorism	General Fund	New
Establish a See Something, Say Something educational campaign to encourage residents to be vigilant and report suspicious activity	Pickens County Sheriff 864-898-5500	Immediate (less than 6 months)	High	High	Crime/Terrorism	Department of Homeland Security Partnership	New
Implement and enforce building codes and standards appropriate for areas receiving high wind.	Primary: Director of Pickens County Planning Department 864-898-5945 Building Official, Pickens County Building Codes 654-898-5950	Long-term (longer than 12 months)	High	High	Hurricane/Tropical Storm, Severe Storm Tornado, Windstorm	General Fund	New
Ensure electric and other utility lines are maintained, including the removal of dead trees and overhanging branches.	Primary: Director of Pickens County Roads and Bridges 864-989-5934 SCDOT.	Immediate (less than 6 months)	High	High	Hurricane/Tropical Storm, Severe Storm, Tornado, Utility System Disruption, Windstorm, Winter Storm	General Fund	New
Conduct an educational campaign about the dangers of tornados and safety tips	Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Immediate (less than 6 months)	Medium	High	Tornado	General Fund	New
Establish a routine inspection program of urban/suburban fire vulnerable areas and perform routine maintenance to mitigate fire risk (e.g. remove/reduce accumulation of materials that could cause/contribute to urban/suburban fire, maintain access for firetrucks to high	Fire Chiefs of: Central Rural Fire District Clemson University Rural Fire District Crosswell Rural Fire District	Long-term (longer than 12 months)	Medium	Medium	Urban Fire	Operating Budget	New

risk areas, maintain/remove abandoned buildings, etc.).	Dacusville Rural Fire District Easley Rural Fire District Holly Springs Rural Fire District Liberty Rural Fire District Pickens Rural Fire District Pumpkintown Rural Fire District Rocky Bottom Rural Fire District Shady Grove Rural Fire District Six Mile Rural Fire District Springs Rural Fire District Vineyards Rural Fire District Emergency Services Director 864-898-5945						
Establish a routine inspection program of wildfire vulnerable areas and perform routine maintenance to mitigate wildfire (e.g. remove/reduce accumulation of materials that could cause/contribute to wildfire, maintain access for firetrucks to high risk areas, maintain/remove abandoned buildings, etc.).	Fire Chiefs of: Central Rural Fire District Clemson University Rural Fire District Crosswell Rural Fire District Dacusville Rural Fire District Easley Rural Fire District Holly Springs Rural Fire District Liberty Rural Fire District Pickens Rural Fire District Pumpkintown Rural Fire District Rocky Bottom Rural Fire District Shady Grove Rural Fire District Six Mile Rural Fire	Long-term (longer than 12 months)	Medium	Medium	Wildfire	Operating Budget	New

	District Springs Rural Fire District Vineyards Rural Fire District Emergency Services Director 864-898-5945						
Encourage residents to purchase appropriate and adequate insurance for hazards in their area.	Primary: Director of Pickens County Emergency Management 864-898-5945	Immediate (less than 6 months)	High	High	Dam/Levee Failure, Drought, Earthquake, Extreme Cold, Extreme Heat, Flooding, Hail, Hurricane/Tropical Storm, Lightning, Severe Storm Tornado, Urban Fire, Wildfire, Windstorm, Winter Storm	General Fund	New
Enroll the Town of Norris in the National Flood Insurance Program	Primary: Director of Pickens County Emergency Management 864-898-5945 Mayor of Town of Norris 864-639-2033	Immediate (less than 6 months)	High	High	Flooding	General Fund	New

6.3.5 Long Term Goal: Develop partnerships with organizations, resources, etc. within the community to compensate for limited resources, with the purpose of reducing risk in the community

- Programs developed with Clemson University could benefit the community, university, and students, providing valuable "real-world" experience.
- Community groups have resources and experience which can benefit the community

Action	Responsible Party	Time Frame	Priority	Feasibility	Hazards Addressed		Status/Notes
Create an internship position at Pickens County Emergency Management.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	Moderate	All hazards	General Fund	Deferred - funding not secured
Partner with Clemson University to create experiential or service learning opportunities to meet identified needs within the community.	Primary: Director of Pickens County Emergency Management 864-898-5945 Clemson University, EM Director 864-658-2222	Long-term (longer than 12 months)	High	Moderate	All hazards	General Fund	Deferred - insufficient staffing resources
Partner with community groups (Rotary, CERT, Red Cross, etc.) to meet identified needs within the community.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	Moderate	All hazards	Local Emergency Management Performance Grant	Deferred - insufficient staffing resources
Seek grant funding for local police department and sheriff's department for early intervention programs in schools including school resource officers	Primary: Director of Pickens County Emergency Management 864-898-5945 Pickens County Sheriff 864-898-5500	Immediate (less than 6 months)	High	High	Crime	Private Grants	New
Implement community education programs geared towards fostering positive relationships between law enforcement and the community including programs for youth, such as Explorers	Pickens County Sheriff's Department Primary: Pickens County Sheriff 864-898-5500	Immediate (less than 6 months)	High	High	Crime	Private Grants	New

Establish a close working relationship with owners of dams that are regulated by DHEC, USACE, and FERC.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Low	High	Dam/Levee Failure	General Fund	New
Develop stormwater committee which regularly assesses existing stormwater plans, new development, recommend projects	Primary: Director of Pickens County Emergency Management 864-898-5945	Immediate (less than 6 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund	New
Establish close working relationship with utility providers to prioritize reestablishing power to critical infrastructure and vulnerable populations	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	Medium	Hurricane/Tropical Storm, Lightning, Severe Storm, Tornado, Utility System Disruptions, Windstorm, Winter Storm	General Fund	New
Establish a working relationship with public health, hospitals and local healthcare agencies on emerging pathogens.	Director of Pickens County EMS 864-898-5334	Long-term (longer than 12 months)	Medium	High	Public Health Threat	DHEC Grants	New
Work with local epidemiologists and healthcare agencies on identifying health and disease trends.	Primary: Director of Pickens County Emergency Management 864-898-5945 Director of Pickens County EMS 864-898-5334	Long-term (longer than 12 months)	Medium	High	Public Health Threat	DHEC Grants	New
Establish a close working relationship with Oconee Nuclear Station to review safety and hazard information which the Nuclear Station distributes within the 10 mile buffer zone, to ensure consistent messages.	Primary: Director of Pickens County Emergency Management 864-898-5945 Duke Energy (Oconee Nuclear Station)	Long-term (longer than 12 months)	Medium	Medium	Radiological	Duke Energy	New
Establish a close working relationship with local, state and federal law enforcement agencies with regard to terrorist threats	Pickens County Sheriff's Department Primary: Pickens County Sheriff 864-898-5500	Long-term (longer than 12 months)	Medium	Medium	Terrorism	General Funds	New
Establish agreement with neighboring jurisdictions to share resources during winter storm events	Director of Pickens County Emergency Management 864-898-5945	Immediate (less than 6 months)	High	Medium	Transportation System Disruption, Winter Storm	General Fund	New

Encourage employers to adopt alternate scheduling options during winter storm events	Director of Pickens County Emergency Management 864-898-5945	Immediate (less than 6 months)	High	Medium	Transportation System Disruption, Winter Storm	General Fund	New

6.4 Central Hazard Mitigation Actions

The Responsible Party listed for each jurisdiction's actions is the individual responsible for oversight of that action for that jurisdiction. At times, a County level authority will be responsible for a mitigation action within a jurisdiction due to the resources available to each municipality.

Action	Responsible Party	Time Frame	Priority	Feasibility	Hazards Addressed	Funding Source	Status/Notes
Seek grant funding for local police department and sheriff's department for early intervention programs in schools including school resource officers	Primary: Director of Pickens County Emergency Management 864-898-5945 Pickens County Sheriff 864-898-5500 Superintendent of Pickens County School District 864-397-1000	Immediate (less than 6 months)	High	High	Crime	Private Grants	New
Implement community education programs geared towards fostering positive relationships between law enforcement and the community including programs for youth, such as Explorers	Chief of Police, Central Police Department 864-639-4020	Immediate (less than 6 months)	High	High	Crime	No Cost On Going	New
Create public education campaign targeting at risk populations relative to the illicit drug epidemic targeted at reducing the number of users and overdoses.	Chief of Police, Central Police Department 864-639-4020	Long-term (longer than 12 months)	High	High	Crime	As funding becomes available	New
Establish a close working relationship with owners of dams that are regulated by DHEC, USACE, and FERC.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Low	High	Dam/Levee Failure	Pickens County General Fund	New
Use DHEC's dam failure inundation tool and the EAP of each dam to develop a county-wide database of high hazard dams	Primary: Director of Pickens County Emergency Management 864-898-5945 Dam Owners	Immediate (less than 6 months)	Low	High	Dam/Levee Failure	Pickens County General Fund	New
Conduct a public education specifically targeting the communities at highest risk of dam failure regarding dam failure notification and evacuation routes.	Primary: Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Low	High	Dam/Levee Failure	Pickens County General Fund	New

	Dam Owners						
Increase permeable surfaces and retention basins to encourage groundwater recharge	Director of Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	Medium	Medium	Drought	Pickens County General Fund	New
Update landscaping around public lands and along roadways to include shade-providing and drought resistant vegetation which serves as a windbreak, while maintaining proper buffers against wildfire.	Director of Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	Medium	Medium	Drought	Pickens County General Fund	New
Adopt and enforce building code provisions for earthquake construction to reduce risk.	Director of Central Building Permits & Inspections 864-639-6381	Long-term (longer than 12 months)	Low	Medium	Earthquake	General Fund	New
Conduct a study of seismic zone earthquake risk and soil investigation to determine level of risk to existing buildings and new construction.	Building Official, Pickens County Building Codes 654-898-5950	Long-term (longer than 12 months)	Low	Medium	Earthquake	Pickens County General Fund	New
Encourage financial resiliency planning for local residents.	Development Board of WorkLink Workforce 864-656-1515	Long-term (longer than 12 months)	High	Low	Economic Crisis	Private Grants	New
Implement an early intervention program in schools to foster financial literacy	Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	High	Medium	Economic Crisis	Private Grants	New
Outreach to vulnerable populations about locations of heating and cooling centers during extreme temperature events.	Primary: Fire Chief, Central Fire Department 864-639-6262 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Cold, Extreme Heat	General Fund	New
Establish a planning committee of social service organizations to identify and respond to at risk populations during extreme temperature events.	Primary: Mayor of Central 864-639-6381 Director of Pickens County Emergency Management 864-898-5945 Upstate South	Immediate (less than 6 months)	Medium	Medium	Extreme Cold, Extreme Heat	General Fund/Red Cross/Salvation Army/ Other nonprofit organizations	New

	Carolina Chapter of the Red Cross 864-271-8222 Salvation Army 864-235-4803						
Create educational materials on cold weather tips for property owners.	Primary: Fire Chief, Central Fire Department 864-639-6262 Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Cold	General Fund, Pickens County General Fund	New
Create educational materials on hot weather tips for vulnerable populations and awareness of resources available to them.	Primary: Fire Chief, Central Fire Department 864-639-6262 Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Heat	General Fund/Pickens County General Fund	New
Develop stormwater committee which regularly assesses existing stormwater plans, new development, recommend projects	Primary: Director of Pickens County Emergency Management 864-898-5945 Council Representative of the Planning Commission of the City of Central 864-639-6381	Immediate (less than 6 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	Pickens County General Fund/General Fund	New
Continue to implement and enforce floodplain development regulations.	Primary: Council Representative of the Planning Commission of the City of Central	Long-term (longer than 12 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund/Pickens County General Fund	New

	864-639-6381 Director of Pickens County Planning Department 864-898-5945 Director of the Pickens County Stormwater Department 864-898-5789						
Encourage at risk owners to purchase flood insurance.	Director of Central Building Permits & Inspections 864-639-6381	Immediate (less than 6 months)	High	Medium	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund	New
Retrofit existing infrastructure susceptible to flooding to a flood resistant level.	Director of Pickens County Roads and Bridges 864-989-5934	Long-term (longer than 12 months)	High	Low	Flooding, Hurricane/Tropical Storm, Severe Storm	Pickens County General Fund	New
Assess frequently flooded roadways throughout the City of Central for roadway and drainage improvement projects.	Primary: Mayor of Central 864-639-6381 Director of Pickens County Roads and Bridges 864-989-5934 Director of the Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund/Pickens County General Fund	New
Implement and maintain a drainage ditch inspection and cleanup program to reduce roadway flooding and washout.	Primary: Mayor of Central 864-639-6381 Director of the Pickens County Stormwater Department 864-898-5789	Immediate (less than 6 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund/Pickens County General Fund	New
Encourage hail resistant building construction for property owners	Director of Central Building Permits & Inspections 864-639-6381	Immediate (less than 6 months)	High	Low	Hail, Severe Storm	General Fund and Private Funds	New

Implement a public campaign regarding hail danger and safety tips.	Director of Central Building Permits & Inspections 864-639-6381	Immediate (less than 6 months)	High	High	Hail, Severe Storm	General Fund	New
Continue to enforce and adopt, as necessary, new regulations on fixed facilities.	Primary: Mayor of Central 864-639-6381 Director of Pickens County Emergency Management 864-898-5945 EPCRA	Long-term (longer than 12 months)	Medium	High	Hazardous Materials	General Fund/Pickens County General Fund	New
Continue to enforce and adopt, as necessary, new regulations for transportation agencies.	Primary: Mayor of Central 864-639-6381 Director of Pickens County Emergency Management 864-898-5945 EPCRA	Long-term (longer than 12 months)	Medium	High	Hazardous Materials, Transportation System Disruption	General Fund/Pickens County General Fund	New
Conduct a public education campaign regarding hazardous material accident safety covering shelter-in-place and evacuation.	Primary: Fire Chief, Central Fire Department 864-639-6262 Director of Pickens County Emergency Management 864-898-5945	Immediate (less than 6 months)	Medium	High	Hazardous Materials, Transportation System Disruption	General Fund/Pickens County General Fund	New
Establish close working relationship with utility providers to prioritize reestablishing power to critical infrastructure and vulnerable populations	Primary: Fire Chief, Central Fire Department 864-639-6262 Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	Medium	Hurricane/Tropical Storm, Lightning, Severe Storm, Tornado, Utility System Disruptions, Windstorm, Winter Storm	General Fund/Pickens County General Fund	New
Establish an awareness campaign on utility shutoff, food safety during power outages, related to utility disruptions.	Fire Chief, Central Fire Department 864-639-6262	Long-term (longer than 12 months)	High	Medium	Hurricane/Tropical Storm, Lightning, Severe Storm, Tornado, Utility System Disruptions, Windstorm, Winter Storm	No Cost On-Going	New

Install lightning detection system in outdoor areas and other areas of frequent outdoor recreation and the public high school athletic fields.	Primary: Director of Central Parks and Recreation 864-639-6381 Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	High	High	Lightning	General Fund/Pickens County General Fund	New
Establish an awareness campaign of the dangers of lightning and safety precautions to take.	Fire Chief, Central Fire Department 864-639-6262	Immediate (less than 6 months)	High	High	Lightning	General Fund	New
Establish a working relationship with public health, hospitals and local healthcare agencies on emerging pathogens.	Director of Pickens County EMS 864-898-5334	Long-term (longer than 12 months)	Medium	High	Public Health Threat	DHEC Grants	New
Work with local epidemiologists and healthcare agencies on identifying health and disease trends.	Primary: Director of Pickens County Emergency Management 864-898-5945 Director of Pickens County EMS 864-898-5334	Long-term (longer than 12 months)	Medium	High	Public Health Threat	DHEC Grants	New
Develop an education and outreach program to teach students about radiological hazards and safety measures	Primary: Fire Chief, Central Fire Department 864-639-6262 Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	Medium	High	Radiological	Duke Energy	New
Establish a close working relationship with Oconee Nuclear Station to review safety and hazard information which the Nuclear Station distributes within the 10 mile buffer zone, to ensure consistent messages.	Primary: Chief, Central Police Department 864-639-4020	Long-term (longer than 12 months)	Medium	Medium	Radiological	Duke Energy	New

	Director of Pickens County Emergency Management 864-898-5945 Duke Energy (Oconee Nuclear Station)						
Conduct a public education campaign for the public within the 50 mile buffer zone around the Oconee Nuclear Station to inform the public of the radiological hazards, what steps might be needed in the event of an emergency and where to obtain the latest information during an emergency.	Primary: Chief, Central Police Department 864-639-4020 Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Medium	Medium	Radiological	Duke Energy	New
Establish a close working relationship with local, state and federal law enforcement agencies with regard to terrorist threats	Chief, Central Police Department 864-639-4020	Long-term (longer than 12 months)	Medium	Medium	Terrorism	General Fund	New
Ensure public venues have proper plans in place to mitigate and respond to threats of terrorism	Chief, Central Police Department 864-639-4020	Long-term (longer than 12 months)	Medium	High	Terrorism	General Fund	New
Establish a See Something, Say Something educational campaign to encourage residents to be vigilant and report suspicious activity	Chief, Central Police Department 864-639-4020	Immediate (less than 6 months)	High	High	Crime/Terrorism	Department of Homeland Security Partnership	New
Implement and enforce building codes and standards appropriate for areas receiving high wind.	Director of Central Building Permits & Inspections 864-639-6381	Long-term (longer than 12 months)	High	High	Hurricane/Tropical Storm, Severe Storm Tornado, Windstorm	General Fund	New
Ensure electric and other utility lines are maintained, including the removal of dead trees and overhanging branches.	Primary: Director of Pickens County Roads and Bridges 864-989-5934 SCDOT.	Immediate (less than 6 months)	High	High	Hurricane/Tropical Storm, Severe Storm, Tornado, Utility System Disruption, Windstorm, Winter Storm	General Fund	New
Conduct an educational campaign about the dangers of tornados and safety tips	Primary: Fire Chief, Central Fire Department 864-639-6262 Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County	Immediate (less than 6 months)	Medium	High	Tornado	General Fund	New

	School District 864-397-1000						
Establish a routine inspection program of urban/suburban fire vulnerable areas and perform routine maintenance to mitigate fire risk (e.g. remove/reduce accumulation of materials that could cause/contribute to urban/suburban fire, maintain access for firetrucks to high risk areas, maintain/remove abandoned buildings, etc.).	Fire Chief, Central Fire Department 864-639-6262	Long-term (longer than 12 months)	Medium	Medium	Urban Fire	Operating Budget - No additional cost	New
Study and assess areas vulnerable to wildfire and causative factors.	Primary: Director of Central Parks and Recreation 864-639-6381 South Carolina Forestry Department State Forester 803-896-8800	Long-term (longer than 12 months)	Medium	Low	Wildfire	TBD, possibly PDM	New
Establish a routine inspection program of wildfire vulnerable areas and perform routine maintenance to mitigate wildfire (e.g. remove/reduce accumulation of materials that could cause/contribute to wildfire, maintain access for firetrucks to high risk areas, maintain/remove abandoned buildings, etc.).	Primary: Director of Central Parks and Recreation 864-639-6381 South Carolina Forestry Department State Forester 803-896-8800	Long-term (longer than 12 months)	Medium	Medium	Wildfire	No Cost On-Going Community Effort	New
Establish agreement with neighboring jurisdictions to share resources during winter storm events	Primary: Mayor of Central 864-639-6381 Fire Chief, Central Fire Department 864-639-6262 Chief, Central Police Department 864-639-4020	Immediate (less than 6 months)	High	Medium	Transportation System Disruption, Winter Storm	General Fund	New
Encourage employers to adopt alternate scheduling options during winter storm events	Mayor of Central 864-639-6381	Immediate (less than 6 months)	High	Medium	Transportation System Disruption, Winter Storm	No Cost	New
Encourage residents to purchase appropriate and adequate insurance for hazards in their area.	Director of Central Building Permits & Inspections 864-639-6381	Immediate (less than 6 months)	High	High	Dam/Levee Failure, Drought, Earthquake, Extreme Cold, Extreme Heat, Flooding, Hail,	General Fund	New

					Hurricane/Tropical Storm, Lightning, Severe Storm Tornado, Urban Fire, Wildfire, Windstorm, Winter Storm		
Implement an early intervention program in schools to foster financial literacy	Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	High	Medium	Economic Crisis	School District of Pickens County Budget	New

6.5 *Clemson Hazard Mitigation Actions*

The Responsible Party listed for each jurisdiction's actions is the individual responsible for oversight of that action for that jurisdiction. At times, a County level authority will be responsible for a mitigation action within a jurisdiction due to the resources available to each municipality.

Action	Responsible Party	Time Frame	Priority	Feasibility	Hazards Addressed		Status/Notes
Mulch and establish riparian zone within City Parks to protect against park sedimentation	City of Clemson Parks and Recreation	Short-term (6-12 months)	Low	Medium	Erosion, water quality		Estimated cost $100,000, but would reduce constant labor and improve water quality.
Remove or trim trees and other vegetation from around roadways, powerlines, and neighborhood entrances. Relocated powerlines underground.	City of Clemson Police, Fire, Public Works, Engineering and Horticulture	Long-term (longer than 12 months)	High	High	Disruption of transportation, disruption of utilities, hurricane/tropical storm, severe storms, tornado/windstorm, severe winter weather, wildfire		Estimated cost $50,000 for removal of vegetation. Improve emergency service access, less on-call work time, improve general life/safety, and reduce property damage
Enlarge culverts in flood prone areas and assist residents with cost of replacing culverts	City of Clemson Engineering and Stormwater	Long-term (longer than 12 months)	Medium	High	Flood		Estimated cost $500,000. Would benefit property access, improve drainage, and update infrastructure.
Identify homes in the floodplain and purchase and/or retrofit	City of Clemson Engineering, Parks and Recreation, Planning and Codes, and Stormwater	Long-term (longer than 12 months)	Medium	Medium	Flood		Estimated cost $1,500,000 and would reduce loss of life, loss of property, restabilize the floodplain and protect it, reduce debris during a flood event.
Seek grant funding for local police department and sheriff's department for early intervention programs in schools including school resource officers	Pickens County School District and Pickens County Sheriff's Office	Immediate (less than 6 months)	High	High	Crime		New
Implement community education programs geared towards fostering positive relationships between law enforcement and the community including programs for youth, such as Explorers	Clemson Police Department	Immediate (less than 6 months)	High	High	Crime		New
Create public education campaign targeting at risk populations relative to the illicit drug epidemic targeted at reducing the number of users and	Clemson Police Department	Long-term (longer than 12 months)	High	High	Crime		New

overdoses.							
Establish a close working relationship with owners of dams that are regulated by DHEC, USACE, and FERC.	Pickens County Emergency Management	Long-term (longer than 12 months)	Low	High	Dam/Levee Failure		New
Use DHEC's dam failure inundation tool and the EAP of each dam to develop a county-wide database of high hazard dams	Pickens County Emergency Management and Dam Owners	Immediate (less than 6 months)	Low	High	Dam/Levee Failure		New
Conduct a public education specifically targeting the communities at highest risk of dam failure regarding dam failure notification and evacuation routes.	Pickens County Emergency Management and Dam Owners	Long-term (longer than 12 months)	Low	High	Dam/Levee Failure		New
Increase permeable surfaces and retention basins to encourage groundwater recharge	Pickens County Stormwater Department	Long-term (longer than 12 months)	Medium	Medium	Drought		New
Update landscaping around public lands and along roadways to include shade-providing and drought resistant vegetation which serves as a windbreak, while maintaining proper buffers against wildfire.	Pickens County Stormwater Department	Long-term (longer than 12 months)	Medium	Medium	Drought		New
Adopt and enforce building code provisions for earthquake construction to reduce risk.	Pickens County Building Codes	Long-term (longer than 12 months)	Low	Medium	Earthquake		New
Conduct a study of seismic zone earthquake risk and soil investigation to determine level of risk to existing buildings and new construction.	Pickens County Building Codes	Long-term (longer than 12 months)	Low	Medium	Earthquake		New
Encourage financial resiliency planning for local residents.	WorkLink Workforce Development Board	Long-term (longer than 12 months)	High	Low	Economic Crisis		New
Implement an early intervention program in schools to foster financial literacy	Pickens County School District	Long-term (longer than 12 months)	High	Medium	Economic Crisis		New
Outreach to vulnerable populations about locations of heating and cooling centers during extreme temperature events.	Pickens County Emergency Management, American Red Cross	Immediate (less than 6 months)	Medium	High	Extreme Cold, Extreme Heat		New
Establish a planning committee of social service organizations to identify and respond to at risk populations during	Pickens County Emergency Management,	Immediate (less than 6 months)	Medium	Medium	Extreme Cold, Extreme Heat		New

extreme temperature events.	American Red Cross						
Create educational materials on cold weather tips for property owners.	Pickens County Emergency Management, American Red Cross	Immediate (less than 6 months)	Medium	High	Extreme Cold		New
Create educational materials on hot weather tips for vulnerable populations and awareness of resources available to them.	Pickens County Emergency Management, American Red Cross	Immediate (less than 6 months)	Medium	High	Extreme Heat		New
Develop stormwater committee which regularly assesses existing stormwater plans, new development, recommend projects	Pickens County Emergency Management, American Red Cross	Immediate (less than 6 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm		New
Continue to implement and enforce floodplain development regulations.	Pickens County Planning Department and Stormwater Department	Long-term (longer than 12 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm		New
Encourage at risk owners to purchase flood insurance.	Pickens County Building Codes	Immediate (less than 6 months)	High	Medium	Flooding, Hurricane/Tropical Storm, Severe Storm		New
Retrofit existing infrastructure susceptible to flooding to a flood resistant level.	Pickens County Roads and Bridges	Long-term (longer than 12 months)	High	Low	Flooding, Hurricane/Tropical Storm, Severe Storm		New
Assess frequently flooded roadways throughout all jurisdictions of the county for roadway and drainage improvement projects.	Pickens County Building Codes and Stormwater Department	Long-term (longer than 12 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm		New
Implement and maintain a drainage ditch inspection and cleanup program to reduce roadway flooding and washout.	Pickens County Stormwater Department	Immediate (less than 6 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm		New
Encourage hail resistant building construction for property owners	Pickens County Building Codes	Immediate (less than 6 months)	High	Low	Hail, Severe Storm		New
Implement a public campaign regarding hail danger and safety tips.	Pickens County Planning Department and Building Codes	Immediate (less than 6 months)	High	High	Hail, Severe Storm		New

Continue to enforce and adopt, as necessary, new regulations on fixed facilities.	Pickens County Emergency Management, EPCRA	Long-term (longer than 12 months)	Medium	High	Hazardous Materials		New
Continue to enforce and adopt, as necessary, new regulations for transportation agencies.	Pickens County Emergency Management, EPCRA	Long-term (longer than 12 months)	Medium	High	Hazardous Materials, Transportation System Disruption		New
Conduct a public education campaign regarding hazardous material accident safety covering shelter-in-place and evacuation.	Pickens County Emergency Management	Immediate (less than 6 months)	Medium	High	Hazardous Materials, Transportation System Disruption		New
Establish close working relationship with utility providers to prioritize reestablishing power to critical infrastructure and vulnerable populations	Pickens County Emergency Management	Long-term (longer than 12 months)	High	Medium	Hurricane/Tropical Storm, Lightning, Severe Storm, Tornado, Utility System Disruptions, Windstorm, Winter Storm		New
Establish an awareness campaign on utility shutoff, food safety during power outages, related to utility disruptions.	Clemson Fire & EMS	Long-term (longer than 12 months)	High	Medium	Hurricane/Tropical Storm, Lightning, Severe Storm, Tornado, Utility System Disruptions, Windstorm, Winter Storm		New
Install lightning detection system in outdoor areas and other areas of frequent outdoor recreation and the public high school athletic fields.	Pickens County Emergency Management and Pickens County School District	Long-term (longer than 12 months)	High	High	Lightning		New
Establish an awareness campaign of the dangers of lightning and safety precautions to take.	Pickens County Emergency Management	Immediate (less than 6 months)	High	High	Lightning		New
Establish a working relationship with public health, hospitals and local healthcare agencies on emerging pathogens.	Pickens County EMS	Long-term (longer than 12 months)	Medium	High	Public Health Threat		New
Work with local epidemiologists and healthcare agencies on identifying health and disease trends.	Pickens County Emergency Management, Pickens County EMS	Long-term (longer than 12 months)	Medium	High	Public Health Threat		New
Develop an education and outreach program to teach students about radiological hazards and safety measures	Pickens County Emergency Management and Pickens County School District	Long-term (longer than 12 months)	Medium	High	Radiological		New

Establish a close working relationship with Oconee Nuclear Station to review safety and hazard information which the Nuclear Station distributes within the 10 mile buffer zone, to ensure consistent messages.	Pickens County Emergency Management and Oconee Nuclear Station	Long-term (longer than 12 months)	Medium	Medium	Radiological		New
Conduct a public education campaign for the public within the 50 mile buffer zone around the Oconee Nuclear Station to inform the public of the radiological hazards, what steps might be needed in the event of an emergency and where to obtain the latest information during an emergency.	Pickens County Emergency Management	Long-term (longer than 12 months)	Medium	Medium	Radiological		New
Establish a close working relationship with local, state and federal law enforcement agencies with regard to terrorist threats	Pickens County Sheriff's Office	Long-term (longer than 12 months)	Medium	Medium	Terrorism		New
Ensure public venues have proper plans in place to mitigate and respond to threats of terrorism	Pickens County Sherriff's Office	Long-term (longer than 12 months)	Medium	High	Terrorism		New
Establish a See Something, Say Something educational campaign to encourage residents to be vigilant and report suspicious activity	Pickens County Sheriff's Office	Immediate (less than 6 months)	High	High	Crime/Terrorism		New
Implement and enforce building codes and standards appropriate for areas receiving high wind.	Pickens County Planning Department and Building Codes	Long-term (longer than 12 months)	High	High	Hurricane/Tropical Storm, Severe Storm Tornado, Windstorm		New
Ensure electric and other utility lines are maintained, including the removal of dead trees and overhanging branches.	Pickens County Roads and Bridges, and SCDOT	Immediate (less than 6 months)	High	High	Hurricane/Tropical Storm, Severe Storm, Tornado, Utility System Disruption, Windstorm, Winter Storm		New
Conduct an educational campaign about the dangers of tornados and safety tips	Pickens County Emergency Management and School District	Immediate (less than 6 months)	Medium	High	Tornado		New
Establish a routine inspection program of urban/suburban fire vulnerable areas and perform routine maintenance to mitigate fire risk (e.g. remove/reduce accumulation of materials that could cause/contribute to urban/suburban fire, maintain access for firetrucks to high risk areas, maintain/remove abandoned	Clemson Fire & EMS	Long-term (longer than 12 months)	Medium	Medium	Urban Fire		New

buildings, etc.).							
Study and assess areas vulnerable to wildfire and causative factors.	South Carolina Forestry Department	Long-term (longer than 12 months)	Medium	Low	Wildfire		New
Establish a routine inspection program of wildfire vulnerable areas and perform routine maintenance to mitigate wildfire (e.g. remove/reduce accumulation of materials that could cause/contribute to wildfire, maintain access for firetrucks to New high risk areas, maintain/remove abandoned buildings, etc.).	Clemson Fire & EMS and South Carolina Forestry Department	Long-term (longer than 12 months)	Medium	Medium	Wildfire		New
Establish agreement with neighboring jurisdictions to share resources during winter storm events	Pickens County Emergency Management	Immediate (less than 6 months)	High	Medium	Transportation System Disruption, Winter Storm		New
Encourage employers to adopt alternate scheduling options during winter storm events	Pickens County Emergency Management and City of Clemson	Immediate (less than 6 months)	High	Medium	Transportation System Disruption, Winter Storm		New
Encourage residents to purchase appropriate and adequate insurance for hazards in their area.	Pickens County Planning Department and City of Clemson	Immediate (less than 6 months)	High	High	Dam/Levee Failure, Drought, Earthquake, Extreme Cold, Extreme Heat, Flooding, Hail, Hurricane/Tropical Storm, Lightning, Severe Storm Tornado, Urban Fire, Wildfire, Windstorm, Winter Storm		New

6.6 Easley Hazard Mitigation Actions

The Responsible Party listed for each jurisdiction's actions is the individual responsible for oversight of that action for that jurisdiction. At times, a County level authority will be responsible for a mitigation action within a jurisdiction due to the resources available to each municipality.

Action	Responsible Party	Time Frame	Priority	Feasibility	Hazards Addressed	Funding Source	Status/Notes
Provide training to first responders regarding train safety, so that they have better understanding of what materials are transported through the city, how to communicate in the event of an incident, what resources are available to them, and how to respond to incidents.	City of Easley Fire Department- Fire Chief 864-859-8950	Immediate (less than 6 months)	Medium	High	Disruption of transportation, hazmat	General Fund	New
Educate the public and local business owners on train safety so that they understand the risks and what to do if they observe a potential hazard (e.g. malfunctioning railroad crossings, loose rails, etc.)	City of Easley Fire Department- Fire Chief 864-859-8950	Immediate (less than 6 months)	Medium	High	Disruption of transportation, hazmat	General Fund	New
Conduct risk assessment to more closely identify areas of cyber vulnerabilities within the city which may cause hazard events (e.g. communication, water , sewage outages)	City of Easley and Easley Combined Utilities- General Manager 864-859-4013	Long-term (longer than 12 months)	High	Moderate	All Hazards	General Fund	New
Seek grant funding for local police department and sheriff's department for early intervention programs in schools including school resource officers	Primary: Supervisor to School Resource Officers, Easley Police Department 864-859-4025 Director of Pickens County Emergency Management 864-898-5945 Pickens County Sheriff 864-898-5500 Superintendent of Pickens County School District 864-397-1000	Immediate (less than 6 months)	High	High	Crime	Police Budget	New In-progress: Currently offering ALICE training

Implement community education programs geared towards fostering positive relationships between law enforcement and the community including programs for youth, such as Explorers	Easley Police Department- Police Chief 864-859-4025	Immediate (less than 6 months)	High	High	Crime	General Fund	New
Create public education campaign targeting at risk populations relative to the illicit drug epidemic targeted at reducing the number of users and overdoses.	Easley Police Department- Police Chief 864-859-4025	Long-term (longer than 12 months)	High	High	Crime	General Fund	New
Establish a close working relationship with owners of dams that are regulated by DHEC, USACE, and FERC.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Low	High	Dam/Levee Failure	Pickens County General Fund	New
Use DHEC's dam failure inundation tool and the EAP of each dam to develop a county-wide database of high hazard dams	Director of Pickens County Emergency Management 864-898-5945 Dam Owners	Immediate (less than 6 months)	Low	High	Dam/Levee Failure	Pickens County General Fund/ Private Funds	New
Conduct a public education specifically targeting the communities at highest risk of dam failure regarding dam failure notification and evacuation routes.	Director of Pickens County Emergency Management 864-898-5945 Dam Owners	Long-term (longer than 12 months)	Low	High	Dam/Levee Failure	Pickens County General Fund/ Private Funds	New
Increase permeable surfaces and retention basins to encourage groundwater recharge	Director of Public Works, City of Easley 864-855-7916 Pickens Storm Water Director 864-855--7916	Long-term (longer than 12 months)	Medium	Medium	Drought	General Fund	New
Update landscaping around public lands and along roadways to include shade-providing and drought resistant vegetation which serves as a windbreak, while maintaining proper buffers against wildfire.	Director of Public Works, City of Easley 864-855-7916 Pickens Storm Water Director 864-855--7916	Long-term (longer than 12 months)	Medium	Medium	Drought	General Fund	New
Adopt and enforce building code provisions for earthquake construction to reduce risk.	Easley Building Official 864-855-7908	Long-term (longer than 12 months)	Low	Medium	Earthquake	General Fund	New

Conduct a study of seismic zone earthquake risk and soil investigation to determine level of risk to existing buildings and new construction.	Building Official, Pickens County Building Codes 654-898-5950	Long-term (longer than 12 months)	Low	Medium	Earthquake	Pickens County General Fund	New
Encourage financial resiliency planning for local residents.	Development Board of WorkLink Workforce 864-656-1515	Long-term (longer than 12 months)	High	Low	Economic Crisis	Private Grants	New
Implement an early intervention program in schools to foster financial literacy	Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	High	Medium	Economic Crisis	Private Grants	New
Outreach to vulnerable populations about locations of heating and cooling centers during extreme temperature events.	Primary: Fire Chief, Easley Fire Department 864-859-8950 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Cold, Extreme Heat	General Fund	New
Establish a planning committee of social service organizations to identify and respond to at risk populations during extreme temperature events.	Primary: Mayor of Easley 864-855-7900 Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222 Salvation Army 864-235-4803	Immediate (less than 6 months)	Medium	Medium	Extreme Cold, Extreme Heat	General Fund	New
Create educational materials on cold weather tips for property owners.	Primary: Fire Chief, Easley Fire Department 864-859-8950 Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of	Immediate (less than 6 months)	Medium	High	Extreme Cold	General Funds	New

	the Red Cross 864-271-8222						
Create educational materials on hot weather tips for vulnerable populations and awareness of resources available to them.	Primary: Fire Chief, Easley Fire Department 864-859-8950 Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Heat	General Fund	New
Develop stormwater committee which regularly assesses existing stormwater plans, new development, recommend projects	Primary: Director of Pickens County Emergency Management 864-898-5945 Pickens Storm Water Director 864-855--7916	Immediate (less than 6 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	Pickens County General Fund	New
Continue to implement and enforce floodplain development regulations.	Easley Planning and Projects Manager 864-855-7908 Easley Zoning Officer 864-855-7908 Easley Storm Water Director 864-855--7916	Long-term (longer than 12 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund	New
Encourage at risk owners to purchase flood insurance.	Easley Building Official 864-855-7908	Immediate (less than 6 months)	High	Medium	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund	New
Retrofit existing infrastructure susceptible to flooding to a flood resistant level.	Director of Public Works, City of Easley 864-855-7916	Long-term (longer than 12 months)	High	Low	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund	New
Assess frequently flooded roadways throughout all jurisdictions of the county for roadway and drainage improvement projects.	Primary: Director of Public Works, City of Easley 864-855-7916	Long-term (longer than 12 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund	New

	Easley Storm Water Director 864-855-7916						
Implement and maintain a drainage ditch inspection and cleanup program to reduce roadway flooding and washout.	Primary: Director of Public Works, City of Easley 864-855-7916 Easley Storm Water Director 864-855-7916	Immediate (less than 6 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund	New
Encourage hail resistant building construction for property owners	Easley Building Official 864-855-7908	Immediate (less than 6 months)	High	Low	Hail, Severe Storm	General Fund	New
Implement a public campaign regarding hail danger and safety tips.	Easley Building Official 864-855-7908	Immediate (less than 6 months)	High	High	Hail, Severe Storm	General Fund	New
Continue to enforce and adopt, as necessary, new regulations on fixed facilities.	Primary: Planning and Projects Manager 864-855-7908 Director of Pickens County Emergency Management 864-898-5945 EPCRA	Long-term (longer than 12 months)	Medium	High	Hazardous Materials	General Fund/ County General Fund	New
Continue to enforce and adopt, as necessary, new regulations for transportation agencies.	Primary: Planning and Projects Manager 864-855-7908 Director of Pickens County Emergency Management 864-898-5945 EPCRA	Long-term (longer than 12 months)	Medium	High	Hazardous Materials, Transportation System Disruption	General Fund/ County General Fund	New
Conduct a public education campaign regarding hazardous material accident safety covering shelter-in-place and evacuation.	Primary: Fire Chief, Easley Fire Department 864-859-8950 Director of Pickens County Emergency Management	Immediate (less than 6 months)	Medium	High	Hazardous Materials, Transportation System Disruption	General Fund/ County General Fund	New

	864-898-5945						
Establish close working relationship with utility providers to prioritize reestablishing power to critical infrastructure and vulnerable populations	Primary: Fire Chief, Easley Fire Department 864-859-8950 Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	Medium	Hurricane/Tropical Storm, Lightning, Severe Storm, Tornado, Utility System Disruptions, Windstorm, Winter Storm	General Fund/ County General Fund	New
Establish an awareness campaign on utility shutoff, food safety during power outages, related to utility disruptions.	Fire Chief, Easley Fire Department 864-859-8950	Long-term (longer than 12 months)	High	Medium	Hurricane/Tropical Storm, Lightning, Severe Storm, Tornado, Utility System Disruptions, Windstorm, Winter Storm	General Fund	New
Install lightning detection system in outdoor areas and other areas of frequent outdoor recreation and the public high school athletic fields.	Primary: Director of Easley Park and Recreation Department 864-855-7933 Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	High	High	Lightning	General Fund/ County General Fund	New
Establish an awareness campaign of the dangers of lightning and safety precautions to take.	Fire Chief, Easley Fire Department 864-859-8950	Immediate (less than 6 months)	High	High	Lightning	General Fund	New
Establish a working relationship with public health, hospitals and local healthcare agencies on emerging pathogens.	Director of Pickens County EMS 864-898-5334	Long-term (longer than 12 months)	Medium	High	Public Health Threat	DHEC Grants	New
Work with local epidemiologists and healthcare agencies on identifying health and disease trends.	Primary: Director of Pickens County Emergency Management 864-898-5945 Director of Pickens	Long-term (longer than 12 months)	Medium	High	Public Health Threat	DHEC Grants	New

	County EMS 864-898-5334						
Develop an education and outreach program to teach students about radiological hazards and safety measures	Primary: Fire Chief, Easley Fire Department 864-859-8950 Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	Medium	High	Radiological	Duke Energy	New
Establish a close working relationship with Oconee Nuclear Station to review safety and hazard information which the Nuclear Station distributes within the 10 mile buffer zone, to ensure consistent messages.	Primary: Police Department- Police Chief 864-859-4025 Director of Pickens County Emergency Management 864-898-5945 Duke Energy (Oconee Nuclear Station)	Long-term (longer than 12 months)	Medium	Medium	Radiological	Duke Energy	New
Conduct a public education campaign for the public within the 50 mile buffer zone around the Oconee Nuclear Station to inform the public of the radiological hazards, what steps might be needed in the event of an emergency and where to obtain the latest information during an emergency.	Primary: Police Department- Police Chief 864-859-4025 Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Medium	Medium	Radiological	Duke Energy	New
Establish a close working relationship with local, state and federal law enforcement agencies with regard to terrorist threats	Police Department-Police Chief 864-859-4025	Long-term (longer than 12 months)	Medium	Medium	Terrorism	General Fund	New
Ensure public venues have proper plans in place to mitigate and respond to threats of terrorism	Police Department-Police Chief 864-859-4025	Long-term (longer than 12 months)	Medium	High	Terrorism	General Fund	New

Establish a See Something, Say Something educational campaign to encourage residents to be vigilant and report suspicious activity	Police Department-Police Chief 864-859-4025	Immediate (less than 6 months)	High	High	Crime/Terrorism	DHS Partnership	New
Implement and enforce building codes and standards appropriate for areas receiving high wind.	Easley Building Official 864-855-7908	Long-term (longer than 12 months)	High	High	Hurricane/Tropical Storm, Severe Storm Tornado, Windstorm	General Fund	New
Ensure electric and other utility lines are maintained, including the removal of dead trees and overhanging branches.	Primary: Director of Public Works, City of Easley 864-855-7916 Director of Pickens County Roads and Bridges 864-989-5934 SCDOT	Immediate (less than 6 months)	High	High	Hurricane/Tropical Storm, Severe Storm, Tornado, Utility System Disruption, Windstorm, Winter Storm	General Fund/County General Fund	New
Conduct an educational campaign about the dangers of tornados and safety tips	Primary: Fire Chief, Easley Fire Department 864-859-8950 Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Immediate (less than 6 months)	Medium	High	Tornado	General Fund/ County General Fund	New
Establish a routine inspection program of urban/suburban fire vulnerable areas and perform routine maintenance to mitigate fire risk (e.g. remove/reduce accumulation of materials that could cause/contribute to urban/suburban fire, maintain access for firetrucks to high risk areas, maintain/remove abandoned buildings, etc.).	Fire Chief, Easley Fire Department 864-859-8950	Long-term (longer than 12 months)	Medium	Medium	Urban Fire	General Fund	New
Study and assess areas vulnerable to wildfire and causative factors.	Primary: Fire Chief, Easley Fire Department 864-859-8950 South Carolina Forestry Department	Long-term (longer than 12 months)	Medium	Low	Wildfire	TBD, possibly PDM	New

	State Forester 803-896-8800						
Establish a routine inspection program of wildfire vulnerable areas and perform routine maintenance to mitigate wildfire (e.g. remove/reduce accumulation of materials that could cause/contribute to wildfire, maintain access for firetrucks to high risk areas, maintain/remove abandoned buildings, etc.).	Primary: Fire Chief, Easley Fire Department 864-859-8950 South Carolina Forestry Department State Forester 803-896-8800	Long-term (longer than 12 months)	Medium	Medium	Wildfire	General Fund	New
Establish agreement with neighboring jurisdictions to share resources during winter storm events	Fire Chief, Easley Fire Department 864-859-8950 Police Department-Police Chief 864-859-4025	Immediate (less than 6 months)	High	Medium	Transportation System Disruption, Winter Storm	General Funds	New
Encourage residents to purchase appropriate and adequate insurance for hazards in their area.	Primary: Planning and Projects Manager 864-855-7908 Easley Building Official 864-855-7908	Immediate (less than 6 months)	High	High	Dam/Levee Failure, Drought, Earthquake, Extreme Cold, Extreme Heat, Flooding, Hail, Hurricane/Tropical Storm, Lightning, Severe Storm Tornado, Urban Fire, Wildfire, Windstorm, Winter Storm	General Fund	New

6.7 Liberty Hazard Mitigation Actions

The Responsible Party listed for each jurisdiction's actions is the individual responsible for oversight of that action for that jurisdiction. At times, a County level authority will be responsible for a mitigation action within a jurisdiction due to the resources available to each municipality.

Action	Responsible Party	Time Frame	Priority	Feasibility	Hazards Addressed	Funding Source	Status/Notes
Seek grant funding for local police department and sheriff's department for early intervention programs in schools including school resource officers	Primary: Chief of Police, Liberty Police Department 864-843-3956 Pickens County Sheriff 864-898-5500 Superintendent of Pickens County School District 864-397-1000	Immediate (less than 6 months)	High	High	Crime	General Budget	New
Implement community education programs geared towards fostering positive relationships between law enforcement and the community including programs for youth, such as Explorers	Primary: Chief of Police, Liberty Police Department 864-843-3956	Immediate (less than 6 months)	High	High	Crime	No Cost	New
Create public education campaign targeting at risk populations relative to the illicit drug epidemic targeted at reducing the number of users and overdoses.	Primary: Chief of Police, Liberty Police Department 864-843-3956	Long-term (longer than 12 months)	High	High	Crime	General Budget	New
Establish a close working relationship with owners of dams that are regulated by DHEC, USACE, and FERC.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Low	High	Dam/Levee Failure	Pickens County General Fund	New
Use DHEC's dam failure inundation tool and the EAP of each dam to develop a county-wide database of high hazard dams	Primary: Director of Pickens County Emergency Management 864-898-5945 Dam Owners	Immediate (less than 6 months)	Low	High	Dam/Levee Failure	Pickens County General Fund	New
Conduct a public education specifically targeting the communities at highest risk of dam failure regarding dam failure	Primary: Director of Pickens County Emergency	Long-term (longer than 12 months)	Low	High	Dam/Levee Failure	Pickens County General Fund	New

notification and evacuation routes.	Management 864-898-5945 Dam Owners						
Increase permeable surfaces and retention basins to encourage groundwater recharge	Director of Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	Medium	Medium	Drought	Pickens County General Fund	New
Update landscaping around public lands and along roadways to include shade-providing and drought resistant vegetation which serves as a windbreak, while maintaining proper buffers against wildfire.	Director of Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	Medium	Medium	Drought	Pickens County General Fund	New
Adopt and enforce building code provisions for earthquake construction to reduce risk.	Primary: Mayor of Liberty 864-843-3177 Building Official, Pickens County Building Codes 654-898-5950	Long-term (longer than 12 months)	Low	Medium	Earthquake	General Fund	New
Conduct a study of seismic zone earthquake risk and soil investigation to determine level of risk to existing buildings and new construction.	Building Official, Pickens County Building Codes 654-898-5950	Long-term (longer than 12 months)	Low	Medium	Earthquake	Pickens County General Fund	New
Encourage financial resiliency planning for local residents.	Development Board of WorkLink Workforce 864-656-1515	Long-term (longer than 12 months)	High	Low	Economic Crisis	Private Grants	New
Implement an early intervention program in schools to foster financial literacy	Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	High	Medium	Economic Crisis	Private Grants	New
Outreach to vulnerable populations about locations of heating and cooling centers during extreme temperature events.	Primary: Fire Chief, Liberty Fire Department 864-843-2321 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Cold, Extreme Heat	General Budget	New
Establish a planning committee of social service organizations to identify and respond to at risk populations during extreme temperature events.	Primary: Mayor of Liberty 864-843-3177 Director of Pickens	Immediate (less than 6 months)	Medium	Medium	Extreme Cold, Extreme Heat	General Budget/ Red Cross/ Salvation Army/ Other nonprofit organizations	New

	County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222 Salvation Army 864-235-4803						
Create educational materials on cold weather tips for property owners.	Primary: Fire Chief, Liberty Fire Department 864-843-2321 Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Cold	General Budget, Pickens County General Fund	New
Create educational materials on hot weather tips for vulnerable populations and awareness of resources available to them.	Primary: Fire Chief, Liberty Fire Department 864-843-2321 Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Heat	General Budget/ Pickens County General Fund	New
Develop stormwater committee which regularly assesses existing stormwater plans, new development, recommend projects	Primary: Director of Pickens County Emergency Management 864-898-5945 Mayor of Liberty 864-843-3177	Immediate (less than 6 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	Pickens County General Fund	New

Continue to implement and enforce floodplain development regulations.	Primary: Mayor of Liberty 864-843-3177 Director of Pickens County Planning Department 864-898-5945 Director of the Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Budget/ Pickens County General Fund	New
Encourage at risk owners to purchase flood insurance.	Building Official, Pickens County Building Codes 654-898-5950	Immediate (less than 6 months)	High	Medium	Flooding, Hurricane/Tropical Storm, Severe Storm	Pickens County General Fund	New
Retrofit existing infrastructure susceptible to flooding to a flood resistant level.	Director of Pickens County Roads and Bridges 864-989-5934	Long-term (longer than 12 months)	High	Low	Flooding, Hurricane/Tropical Storm, Severe Storm	Pickens County General Fund	New
Assess frequently flooded roadways throughout all jurisdictions of the county for roadway and drainage improvement projects.	Primary: Mayor of Liberty 864-843-3177 Director of Pickens County Roads and Bridges 864-989-5934 Director of Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Budget/ Pickens County General Fund	New
Implement and maintain a drainage ditch inspection and cleanup program to reduce roadway flooding and washout.	Primary: Mayor of Liberty 864-843-3177 Director of Pickens County Stormwater Department 864-898-5789	Immediate (less than 6 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Budget/ Pickens County General Fund	New
Encourage hail resistant building construction for property owners	Building Official, Pickens County Building Codes 654-898-5950	Immediate (less than 6 months)	High	Low	Hail, Severe Storm	Pickens County General Fund	New

Implement a public campaign regarding hail danger and safety tips.	Building Official, Pickens County Building Codes 654-898-5950	Immediate (less than 6 months)	High	High	Hail, Severe Storm	Pickens County General Fund	New
Continue to enforce and adopt, as necessary, new regulations on fixed facilities.	Primary: Mayor of Liberty 864-843-3177 Director of Pickens County Emergency Management 864-898-5945 EPCRA	Long-term (longer than 12 months)	Medium	High	Hazardous Materials	General Budget/ Pickens County General Fund	New
Continue to enforce and adopt, as necessary, new regulations for transportation agencies.	Primary: Mayor of Liberty 864-843-3177 Director of Pickens County Emergency Management 864-898-5945 EPCRA	Long-term (longer than 12 months)	Medium	High	Hazardous Materials, Transportation System Disruption	General Budget/ Pickens County General Fund	New
Conduct a public education campaign regarding hazardous material accident safety covering shelter-in-place and evacuation.	Primary: Fire Chief, Liberty Fire Department 864-843-2321 Director of Pickens County Emergency Management 864-898-5945	Immediate (less than 6 months)	Medium	High	Hazardous Materials, Transportation System Disruption	General Budget/ Pickens County General Fund	New
Establish close working relationship with utility providers to prioritize reestablishing power to critical infrastructure and vulnerable populations	Primary: Fire Chief, Liberty Fire Department 864-843-2321 Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	Medium	Hurricane/Tropical Storm, Lightning, Severe Storm, Tornado, Utility System Disruptions, Windstorm, Winter Storm	General Budget/ Pickens County General Fund	New
Establish an awareness campaign on utility shutoff, food safety during power outages, related to utility disruptions.	Fire Chief, Liberty Fire Department 864-843-2321	Long-term (longer than 12 months)	High	Medium	Hurricane/Tropical Storm, Lightning, Severe Storm, Tornado, Utility System Disruptions, Windstorm, Winter Storm	General Budget	New

Install lightning detection system in outdoor areas and other areas of frequent outdoor recreation and the public high school athletic fields.	Primary: Director of Liberty Recreation Department 864-843-7360 Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	High	High	Lightning	General Budget/ Pickens County General Fund	New
Establish an awareness campaign of the dangers of lightning and safety precautions to take.	Fire Chief, Liberty Fire Department 864-843-2321	Immediate (less than 6 months)	High	High	Lightning	General Budget	New
Establish a working relationship with public health, hospitals and local healthcare agencies on emerging pathogens.	Director of Pickens County EMS 864-898-5334	Long-term (longer than 12 months)	Medium	High	Public Health Threat	DHEC Grants	New
Work with local epidemiologists and healthcare agencies on identifying health and disease trends.	Primary: Director of Pickens County Emergency Management 864-898-5945 Director of Pickens County EMS 864-898-5334	Long-term (longer than 12 months)	Medium	High	Public Health Threat	DHEC Grants	New
Develop an education and outreach program to teach students about radiological hazards and safety measures	Primary: Fire Chief, Liberty Fire Department 864-843-2321 Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	Medium	High	Radiological	Duke Energy	New
Establish a close working relationship with Oconee Nuclear Station to review safety and hazard information which the Nuclear Station distributes within the 10	Primary: Chief of Police, Liberty Police Department 864-843-3956	Long-term (longer than 12 months)	Medium	Medium	Radiological	Duke Energy	New

mile buffer zone, to ensure consistent messages.	Director of Pickens County Emergency Management 864-898-5945 Duke Energy (Oconee Nuclear Station)						
Conduct a public education campaign for the public within the 50 mile buffer zone around the Oconee Nuclear Station to inform the public of the radiological hazards, what steps might be needed in the event of an emergency and where to obtain the latest information during an emergency.	Primary: Chief of Police, Liberty Police Department 864-843-3956 Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Medium	Medium	Radiological	Duke Energy	New
Establish a close working relationship with local, state and federal law enforcement agencies with regard to terrorist threats	Chief of Police, Liberty Police Department 864-843-3956	Long-term (longer than 12 months)	Medium	Medium	Terrorism	General Budget	New
Ensure public venues have proper plans in place to mitigate and respond to threats of terrorism	Chief of Police, Liberty Police Department 864-843-3956	Long-term (longer than 12 months)	Medium	High	Terrorism	General Budget	New
Establish a See Something, Say Something educational campaign to encourage residents to be vigilant and report suspicious activity	Chief of Police, Liberty Police Department 864-843-3956	Immediate (less than 6 months)	High	High	Crime/Terrorism	Department of Homeland Security Partnership	New
Implement and enforce building codes and standards appropriate for areas receiving high wind.	Primary: Mayor of Liberty 864-843-3177 Building Official, Pickens County Building Codes 654-898-5950	Long-term (longer than 12 months)	High	High	Hurricane/Tropical Storm, Severe Storm Tornado, Windstorm	General Budget/ Pickens County General Fund	New
Ensure electric and other utility lines are maintained, including the removal of dead trees and overhanging branches.	Primary: Director of Pickens County Roads and Bridges 864-989-5934 SCDOT.	Immediate (less than 6 months)	High	High	Hurricane/Tropical Storm, Severe Storm, Tornado, Utility System Disruption, Windstorm, Winter Storm	Pickens County General Fund	New
Conduct an educational campaign about the dangers of tornados and safety tips	Primary: Fire Chief, Liberty Fire Department 864-843-2321	Immediate (less than 6 months)	Medium	High	Tornado	General Budget/ Pickens County General Fund	New

	Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000						
Establish a routine inspection program of urban/suburban fire vulnerable areas and perform routine maintenance to mitigate fire risk (e.g. remove/reduce accumulation of materials that could cause/contribute to urban/suburban fire, maintain access for firetrucks to high risk areas, maintain/remove abandoned buildings, etc.).	Fire Chief, Liberty Fire Department 864-843-2321	Long-term (longer than 12 months)	Medium	Medium	Urban Fire	General Budget	New
Study and assess areas vulnerable to wildfire and causative factors.	Primary: Director of Liberty Recreation Department 864-843-7360 South Carolina Forestry Department State Forester 803-896-8800	Long-term (longer than 12 months)	Medium	Low	Wildfire	TBD, possibly PDM	New
Establish a routine inspection program of wildfire vulnerable areas and perform routine maintenance to mitigate wildfire (e.g. remove/reduce accumulation of materials that could cause/contribute to wildfire, maintain access for firetrucks to high risk areas, maintain/remove abandoned buildings, etc.).	Primary: Fire Chief, Liberty Fire Department 864-843-2321 South Carolina Forestry Department State Forester 803-896-8800	Long-term (longer than 12 months)	Medium	Medium	Wildfire	General Budget	New
Establish agreement with neighboring jurisdictions to share resources during winter storm events	Primary: Mayor of Liberty 864-843-3177 Fire Chief, Liberty Fire Department 864-843-2321 Chief of Police, Liberty Police Department 864-843-3956	Immediate (less than 6 months)	High	Medium	Transportation System Disruption, Winter Storm	General Budget	New

Encourage employers to adopt alternate scheduling options during winter storm events	Mayor of Liberty 864-843-3177	Immediate (less than 6 months)	High	Medium	Transportation System Disruption, Winter Storm	No Cost	New
Encourage residents to purchase appropriate and adequate insurance for hazards in their area.	Director of Pickens County Emergency Management 864-898-5945	Immediate (less than 6 months)	High	High	Dam/Levee Failure, Drought, Earthquake, Extreme Cold, Extreme Heat, Flooding, Hail, Hurricane/Tropical Storm, Lightning, Severe Storm Tornado, Urban Fire, Wildfire, Windstorm, Winter Storm	Pickens County General Fund	New

6.8 Pickens Hazard Mitigation Actions

The Responsible Party listed for each jurisdiction's actions is the individual responsible for oversight of that action for that jurisdiction. At times, a County level authority will be responsible for a mitigation action within a jurisdiction due to the resources available to each municipality.

Action	Responsible Party	Time Frame	Priority	Feasibility	Hazards Addressed	Funding Source	Status/Notes
Purchase a small bucket truck to trim limbs overhanging city streets. Purchase a new tractor and ditch bank cutting equipment. Implement a new vegetation removal policy	Public Utilities Director, City of Pickens 864-898-8149	Long-term (longer than 12 months)	High	Medium	Disruption of transportation, flooding, hail, hurricane/tropical storm, severe storm, tornado/windstorm, severe winter weather	General Fund	New Estimated cost $50,000
Purchase unfilled sand bags. Store those bags at the public works facility and have them ready for distribution in the event of an emergency.	Public Utilities Director, City of Pickens 864-898-8149	Long-term (longer than 12 months)	Medium	High	Dam failure, flooding	General Fund	New Estimated cost $500, would reduce property losses
Purchase standby diesel generator for the City of Pickens Water Plant	Public Utilities Director, City of Pickens 864-898-8149	Long-term (longer than 12 months)	Medium	Low	Disruption of utilities	HMGP	New Estimated cost $250,000
Purchase standby diesel generator for the City of Pickens water pump stations	Public Utilities Director, City of Pickens 864-898-8149	Long-term (longer than 12 months)	Medium	Low	Disruption of utilities	HMGP	New Estimated cost $250,000
Purchase one mobile standby diesel generator for the City of Pickens sewer lift stations and electrical upgrades at these stations to allow connection to standby power	Public Utilities Director, City of Pickens 864-898-8149	Long-term (longer than 12 months)	Medium	Low	Disruption of utilities	HMGP	New Estimated cost $100,000, would mitigate sanitary sewer overflows to utility power outage, prevent contamination in creeks and streams
Buy out all downstream homes in the inundation zone.	Public Utilities Director, City of Pickens 864-898-8149	Long-term (longer than 12 months)	Low	Low	Dam failure	HMGP/General Fund	New Estimated cost $500,000, would prevent loss of property and loss of life
Purchase a crime scene investigation robot	Chief of Police, Pickens Police Department 864-878-6366	Long-term (longer than 12 months)	High	Medium	Crime, terrorism	General Fund, Private Grant	New Estimated cost $10,000, reduce threat to health and life of City of Pickens Police Officers

Purchase a canine police officer	Chief of Police, Pickens Police Department 864-878-6366	Long-term (longer than 12 months)	High	Medium	Crime, terrorism	General Fund, Private Grants	Estimated cost $12,000, reduce threat to health and life of City of Pickens Police Officers
Purchase a ladder truck	Fire Chief, Pickens Fire Department 864-898-8172	Long-term (longer than 12 months)	Medium	Low	Urban fire	General Fund, Private Grants	Estimated cost $500,000, improve the City's ability to fight a multi-story building fire
Seek grant funding for local police department and sheriff's department for early intervention programs in schools including school resource officers	Primary: Chief of Police, Pickens Police Department 864-878-6366 Director of Pickens County Emergency Management 864-898-5945 Pickens County Sheriff 864-898-5500 Superintendent of Pickens County School District 864-397-1000	Immediate (less than 6 months)	High	High	Crime	Private Grants	New
Implement community education programs geared towards fostering positive relationships between law enforcement and the community including programs for youth, such as Explorers	Chief of Police, Pickens Police Department 864-878-6366	Immediate (less than 6 months)	High	High	Crime	General Fund	New
Create public education campaign targeting at risk populations relative to the illicit drug epidemic targeted at reducing the number of users and overdoses.	Chief of Police, Pickens Police Department 864-878-6366	Long-term (longer than 12 months)	High	High	Crime	General Fund	New
Establish a close working relationship with owners of dams that are regulated by DHEC, USACE, and FERC.	Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Low	High	Dam/Levee Failure	Pickens County General Fund	New
Use DHEC's dam failure inundation tool and the EAP of each dam to develop a county-wide database of high hazard dams	Primary: Director of Pickens County Emergency Management 864-898-5945	Immediate (less than 6 months)	Low	High	Dam/Levee Failure	Pickens County General Fund	New

	Dam Owners						
Conduct a public education specifically targeting the communities at highest risk of dam failure regarding dam failure notification and evacuation routes.	Primary: Director of Pickens County Emergency Management 864-898-5945 Dam Owners	Long-term (longer than 12 months)	Low	High	Dam/Levee Failure	Pickens County General Fund	New
Increase permeable surfaces and retention basins to encourage groundwater recharge	Primary: Public Utilities Director, City of Pickens 864-898-8149 Director of Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	Medium	Medium	Drought	General Fund/ Pickens County General Fund	New
Update landscaping around public lands and along roadways to include shade-providing and drought resistant vegetation which serves as a windbreak, while maintaining proper buffers against wildfire.	Primary: Superintendent of City of Pickens Grounds Department 864-898-8142 Director of Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	Medium	Medium	Drought	General Fund	New
Adopt and enforce building code provisions for earthquake construction to reduce risk.	Building Official, Pickens County Building Codes 654-898-5950	Long-term (longer than 12 months)	Low	Medium	Earthquake	Pickens County General Fund	New
Conduct a study of seismic zone earthquake risk and soil investigation to determine level of risk to existing buildings and new construction.	Building Official, Pickens County Building Codes 654-898-5950	Long-term (longer than 12 months)	Low	Medium	Earthquake	Pickens County General Fund	New
Encourage financial resiliency planning for local residents.	Development Board of WorkLink Workforce 864-656-1515	Long-term (longer than 12 months)	High	Low	Economic Crisis	Private Grants	New
Implement an early intervention program in schools to foster financial literacy	Superintendent of Pickens County School District	Long-term (longer than 12 months)	High	Medium	Economic Crisis	Private Grants	New

	864-397-1000						
Outreach to vulnerable populations about locations of heating and cooling centers during extreme temperature events.	Primary: Fire Chief, Pickens Fire Department 864-898-8172 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Cold, Extreme Heat	General Funds	New
Establish a planning committee of social service organizations to identify and respond to at risk populations during extreme temperature events.	Primary: Mayor of Pickens 864-878-6421 Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222 Salvation Army 864-235-4803	Immediate (less than 6 months)	Medium	Medium	Extreme Cold, Extreme Heat	General Fund/Red Cross/Salvation Army/ Other nonprofit organizations	New
Create educational materials on cold weather tips for property owners.	Primary: Fire Chief, Pickens Fire Department 864-898-8172 Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222	Immediate (less than 6 months)	Medium	High	Extreme Cold	General Fund/ Pickens County General Fund	New
Create educational materials on hot weather tips for vulnerable populations and awareness of resources available to them.	Primary: Fire Chief, Pickens Fire Department 864-898-8172	Immediate (less than 6 months)	Medium	High	Extreme Heat	General Fund/ Pickens County General Fund	New

	Director of Pickens County Emergency Management 864-898-5945 Upstate South Carolina Chapter of the Red Cross 864-271-8222						
Develop stormwater committee which regularly assesses existing stormwater plans, new development, recommend projects	Primary: Director of Pickens County Emergency Management 864-898-5945 Public Utilities Director, City of Pickens 864-898-8149	Immediate (less than 6 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	Pickens County General Fund/ General Fund	New
Continue to implement and enforce floodplain development regulations.	Primary: Public Utilities Director, City of Pickens 864-898-8149 Director of Pickens County Planning Department 864-898-5945 Director of the Pickens County Stormwater Department 864-898-5789	Long-term (longer than 12 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund/ Pickens County General Fund	New
Encourage at risk owners to purchase flood insurance.	Building Official, Pickens County Building Codes 654-898-5950	Immediate (less than 6 months)	High	Medium	Flooding, Hurricane/Tropical Storm, Severe Storm	Pickens County General Fund	New
Retrofit existing infrastructure susceptible to flooding to a flood resistant level.	Director of Pickens County Roads and Bridges 864-989-5934	Long-term (longer than 12 months)	High	Low	Flooding, Hurricane/Tropical Storm, Severe Storm	Pickens County General Fund	New
Assess frequently flooded roadways throughout all jurisdictions of the county for roadway and drainage improvement projects.	Primary: Public Utilities Director, City of Pickens 864-898-8149	Long-term (longer than 12 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund/ Pickens County General Fund	New

	Director of Pickens County Roads and Bridges 864-989-5934 Director of the Pickens County Stormwater Department 864-898-5789						
Implement and maintain a drainage ditch inspection and cleanup program to reduce roadway flooding and washout.	Primary: Public Utilities Director, City of Pickens 864-898-8149 Director of the Pickens County Stormwater Department 864-898-5789	Immediate (less than 6 months)	High	High	Flooding, Hurricane/Tropical Storm, Severe Storm	General Fund/ Pickens County General Fund	New
Encourage hail resistant building construction for property owners	Building Official, Pickens County Building Codes 654-898-5950	Immediate (less than 6 months)	High	Low	Hail, Severe Storm	Pickens County General Fund	New
Implement a public campaign regarding hail danger and safety tips.	Building Official, Pickens County Building Codes 654-898-5950	Immediate (less than 6 months)	High	High	Hail, Severe Storm	Pickens County General Fund	New
Continue to enforce and adopt, as necessary, new regulations on fixed facilities.	Primary: Mayor of Pickens 864-878-6421 Director of Pickens County Emergency Management 864-898-5945 EPCRA	Long-term (longer than 12 months)	Medium	High	Hazardous Materials	General Fund/ Pickens County General Fund	New
Continue to enforce and adopt, as necessary, new regulations for transportation agencies.	Primary: Mayor of Pickens 864-878-6421 Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	Medium	High	Hazardous Materials, Transportation System Disruption	General Fund/ Pickens County General Fund	New

	EPCRA						
Conduct a public education campaign regarding hazardous material accident safety covering shelter-in-place and evacuation.	Primary: Fire Chief, Pickens Fire Department 864-898-8172 Director of Pickens County Emergency Management 864-898-5945	Immediate (less than 6 months)	Medium	High	Hazardous Materials, Transportation System Disruption	General Fund/ Pickens County General Fund	New
Establish close working relationship with utility providers to prioritize reestablishing power to critical infrastructure and vulnerable populations	Primary: Fire Chief, Pickens Fire Department 864-898-8172 Director of Pickens County Emergency Management 864-898-5945	Long-term (longer than 12 months)	High	Medium	Hurricane/Tropical Storm, Lightning, Severe Storm, Tornado, Utility System Disruptions, Windstorm, Winter Storm	General Fund/ Pickens County General Fund	New
Establish an awareness campaign on utility shutoff, food safety during power outages, related to utility disruptions.	Fire Chief, Pickens Fire Department 864-898-8172	Long-term (longer than 12 months)	High	Medium	Hurricane/Tropical Storm, Lightning, Severe Storm, Tornado, Utility System Disruptions, Windstorm, Winter Storm	General Fund	New
Install lightning detection system in outdoor areas and other areas of frequent outdoor recreation and the public high school athletic fields.	Primary: Director of Recreation, City of Pickens 864-878-2296 Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	High	High	Lightning	General Fund/ Pickens County General Fund	New
Establish an awareness campaign of the dangers of lightning and safety precautions to take.	Fire Chief, Pickens Fire Department	Immediate (less than 6 months)	High	High	Lightning	General Fund	New

	864-898-8172						
Establish a working relationship with public health, hospitals and local healthcare agencies on emerging pathogens.	Director of Pickens County EMS 864-898-5334	Long-term (longer than 12 months)	Medium	High	Public Health Threat	DHEC Grants	New
Work with local epidemiologists and healthcare agencies on identifying health and disease trends.	Primary: Director of Pickens County Emergency Management 864-898-5945 Director of Pickens County EMS 864-898-5334	Long-term (longer than 12 months)	Medium	High	Public Health Threat	DHEC Grants	New
Develop an education and outreach program to teach students about radiological hazards and safety measures	Primary: Fire Chief, Pickens Fire Department 864-898-8172 County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Long-term (longer than 12 months)	Medium	High	Radiological	Duke Energy	New
Establish a close working relationship with Oconee Nuclear Station to review safety and hazard information which the Nuclear Station distributes within the 10 mile buffer zone, to ensure consistent messages.	Primary: Chief of Police, Pickens Police Department 864-878-6366 Director of Pickens County Emergency Management 864-898-5945 Duke Energy (Oconee Nuclear Station)	Long-term (longer than 12 months)	Medium	Medium	Radiological	Duke Energy	New
Conduct a public education campaign for the public within the 50 mile buffer zone around the Oconee Nuclear Station to	Primary: Chief of Police, Pickens Police Department	Long-term (longer than 12 months)	Medium	Medium	Radiological	Duke Energy	New

inform the public of the radiological hazards, what steps might be needed in the event of an emergency and where to obtain the latest information during an emergency.	864-878-6366 Director of Pickens County Emergency Management 864-898-5945						
Establish a close working relationship with local, state and federal law enforcement agencies with regard to terrorist threats	Chief of Police, Pickens Police Department 864-878-6366	Long-term (longer than 12 months)	Medium	Medium	Terrorism	General Fund	New
Ensure public venues have proper plans in place to mitigate and respond to threats of terrorism	Chief of Police, Pickens Police Department 864-878-6366	Long-term (longer than 12 months)	Medium	High	Terrorism	General Fund	New
Establish a See Something, Say Something educational campaign to encourage residents to be vigilant and report suspicious activity	Chief of Police, Pickens Police Department 864-878-6366	Immediate (less than 6 months)	High	High	Crime/Terrorism	Department of Homeland Security Partnership	New
Implement and enforce building codes and standards appropriate for areas receiving high wind.	Building Official, Pickens County Building Codes 654-898-5950	Long-term (longer than 12 months)	High	High	Hurricane/Tropical Storm, Severe Storm Tornado, Windstorm	Pickens County General Fund	New
Ensure electric and other utility lines are maintained, including the removal of dead trees and overhanging branches.	Primary: Director of Pickens County Roads and Bridges 864-989-5934 SCDOT	Immediate (less than 6 months)	High	High	Hurricane/Tropical Storm, Severe Storm, Tornado, Utility System Disruption, Windstorm, Winter Storm	Pickens County General Fund	New
Conduct an educational campaign about the dangers of tornados and safety tips	Primary: Fire Chief, Pickens Fire Department 864-898-8172 Director of Pickens County Emergency Management 864-898-5945 Superintendent of Pickens County School District 864-397-1000	Immediate (less than 6 months)	Medium	High	Tornado	General Fund	New
Establish a routine inspection program of urban/suburban fire vulnerable areas and perform routine maintenance to mitigate fire risk (e.g. remove/reduce	Fire Chief, Pickens Fire Department 864-898-8172	Long-term (longer than 12 months)	Medium	Medium	Urban Fire	General Fund	New

accumulation of materials that could cause/contribute to urban/suburban fire, maintain access for firetrucks to high risk areas, maintain/remove abandoned buildings, etc.).							
Study and assess areas vulnerable to wildfire and causative factors.	Primary: Fire Chief, Pickens Fire Department 864-898-8172 Director of Recreation, City of Pickens 864-878-2296 Superintendent of City of Pickens Grounds Department 864-898-8142 South Carolina Forestry Department State Forester 803-896-8800	Long-term (longer than 12 months)	Medium	Low	Wildfire	TBD, possibly PDM	New
Establish a routine inspection program of wildfire vulnerable areas and perform routine maintenance to mitigate wildfire (e.g. remove/reduce accumulation of materials that could cause/contribute to wildfire, maintain access for firetrucks to high risk areas, maintain/remove abandoned buildings, etc.).	Primary: Fire Chief, Pickens Fire Department 864-898-8172 Director of Recreation, City of Pickens 864-878-2296 Superintendent of City of Pickens Grounds Department 864-898-8142 South Carolina Forestry Department State Forester 803-896-8800	Long-term (longer than 12 months)	Medium	Medium	Wildfire	General Fund	New

Establish agreement with neighboring jurisdictions to share resources during winter storm events	Primary: Mayor of Pickens 864-878-6421 Fire Chief, Pickens Fire Department 864-898-8172 Chief of Police, Pickens Police Department 864-878-6366	Immediate (less than 6 months)	High	Medium	Transportation System Disruption, Winter Storm	General Fund	New
Encourage employers to adopt alternate scheduling options during winter storm events	Primary: Mayor of Pickens 864-878-6421	Immediate (less than 6 months)	High	Medium	Transportation System Disruption, Winter Storm	General Fund	New
Encourage residents to purchase appropriate and adequate insurance for hazards in their area.	Primary: Mayor of Pickens 864-878-6421 Building Official, Pickens County Building Codes 654-898-5950	Immediate (less than 6 months)	High	High	Dam/Levee Failure, Drought, Earthquake, Extreme Cold, Extreme Heat, Flooding, Hail, Hurricane/Tropical Storm, Lightning, Severe Storm Tornado, Urban Fire, Wildfire, Windstorm, Winter Storm	Pickens County General Fund	New

6.9 Funding

For County led projects, the mitigation actions will be funded primarily through the Pickens County General Fund. In the event that additional funding is necessary, the county's Contingency Fund can be utilized. Other potential sources of funding for specific actions are listed in the mitigation action tables in Sections 6.3-6.8.

6.10 Monitoring, Evaluating, and Updating Mitigation Plan

DMA2K specifies that local mitigation plans be updated every five years. However, to monitor the progress of mitigation and to ensure that the plan continues to be a practical document for the county, the Hazard Mitigation Planning Committee (HMPC) will meet on an annual basis to monitor, evaluate, and update, as needed, the Hazard Mitigation Plan. The conclusions reached by the committee annually will be made available to the public for comment, which will then be incorporated into the plan as necessary. The following is the proposed schedule by which progress will be judged.

Year One

- High priority and immediate time frame actions should be completed
- High priority and 1-2 year time frame actions should be initiated
- High priority and long-term time frame actions should be evaluated to determine if they are still relevant. If they are, the HMPC will develop an implementation plan for each specific mitigation action. If they are not relevant, the action will be adapted or eliminated.

Year Two

- Check the status of completed/initiated activities. High priority and 1-2 year time frame actions should be complete or nearly complete.
- Long-term time frame actions should be evaluated to determine if they are still relevant. If they are, the HMPC will develop an implementation plan for each specific mitigation action. If they are not relevant, the action will be adopted or eliminated.
- Low to moderate priority and ongoing actions should be evaluated to determine if they are still relevant. If they are, the HMPC will develop an implementation plan for each specific mitigation action. If they are not relevant, the action will be adopted or eliminated.

Year Three

- Check the status of completed/initiated activities. Most actions should have been initiated if not completed by this time.
- Any action not yet started should be evaluated to determine if they are still relevant. If they are, the HMPC will develop an implementation plan for each specific mitigation action. If they are not relevant, the action will be adopted or eliminated.
- Evaluate the effectiveness of completed and ongoing actions. Have the goals and objectives been met? Have there been any lessons learned from these activities?

Year Four

- Review the status and evaluate the ongoing effectiveness of mitigation actions
- Determine whether to include other jurisdictions in the hazard mitigation plan update process
- Begin to collect hazard date for the next updated plan

Year Five

- Develop and submit the updated hazard mitigation plan
- Begin initiating the new hazard mitigation actions

Ongoing

- Members of the Hazard Mitigation Planning Committee and personnel from Emergency Management will continue to serve on committees and planning teams for the county in order to ensure the hazard mitigation plan is considered during all relevant county planning activities and incorporated whenever feasible.

6.11 Implementation through Existing Programs, Communities and Organizations

Planning is conducted at the municipal level for the jurisdictions within Pickens County. Pickens County provides planning services for the unincorporated areas of the County. Each jurisdiction has agreed to be signatories to this plan, thus providing a mechanism for mitigation to be included in future planning processes in each area. The Pickens County Multi-Jurisdictional Hazard Mitigation Plan includes recommendations that can be accomplished by including mitigation activities into current and future local as well as regional planning initiatives.

<u>Pickens County</u>

In Pickens County, planning is primarily the responsibility of the County Planning Commission and County staff. The Commission will ensure that hazard mitigation actions are incorporated into their next revision of the Comprehensive Plan, in their ordinances, and in the Stormwater management plan, which are the primary mechanisms the County uses to regulate activities. The floodplain ordinance is currently being updated based on SCDNR recommendations. The Commission will issue each planning committee and County Department a copy of the adopted hazard mitigation plan, and the Director of Emergency Management for Pickens County will explain to each planning committee the importance of incorporating hazard mitigation into every facet of planning. Furthermore, as the County maintains responsibility for the Town of Norris' and the Town of Six Mile's mitigation efforts, the Mayor or their designee will participate in the County's planning efforts by being a member of the committee or attending public meetings, with the responsibility of ensuring that mitigation actions directly affecting their Towns are incorporated into the planning efforts. The Mayors or their designees will then report back to the Town Councils' the progress that has been made. For example, the building codes that are in force in

Pickens County could be strengthened beyond what is currently required. The County Council could vote to enforce more stringent codes which can mitigate against damage from high winds or earthquakes.

Central
In Central, planning is primarily the responsibility of a committee comprised of Department Heads, Fire Chief, Police Chief, and a representative for the County. While the City maintains a Master Plan and local ordinances, floodplain management plans are maintained at the County level. The committee will be responsible to ensure that hazard mitigation actions will be incorporated in their next Master Plan revision and ordinance updates. The committee will also work with the Parks and Recreation Department, to incorporate hazard mitigation into their less formal planning activities. In Central, the representative to the HMPC, the Chief of Police, will be responsible for ensuring that each City department and committee receive a copy of the hazard mitigation plan and instructions that mitigation actions should be incorporated into the plans.

Clemson
In the City of Clemson, the City Council and the Planning and Codes department are responsible to maintaining and updating the City's plans and ordinances. By participating in each of the planning meetings or designating an alternate, the Director of Planning and Codes will ensure that future revisions of the City's Comprehensive Plan, Land Development Regulations, Zoning Ordinances, Stormwater Management Plan, and the Floodplain Management Ordinances. The City's Director of Planning and Codes will also work closely with officials from Clemson University to ensure their Master Plan fully incorporates hazard mitigation actions. The Director of Planning will be responsible for ensuring that each City department and committee receives a copy of the hazard mitigation plan and for instructing each department and committee that mitigation actions should be incorporated into each plan, whenever possible. The City can review their other, more informal plans, and identify areas where mitigation can be incorporated, such as parks and recreation plans. Hazards such as drought and wildfire can be mitigated with simple and routine maintenance.

Easley
Easley has a Comprehensive Plan, a Parks and Recreation Plan, a Landscaping Plans, and local ordinances covering building codes, land regulation, floodplain development and stormwater management. Each of these plans is the responsibility of different City entities. The Planning Commission will work to ensure that hazard mitigation actions are incorporated into the next revision of the Comprehensive Plans and Land Development Regulations. The Director of the Recreation Department will be responsible for incorporating hazard mitigation actions into the City's Recreation Plans. The Director of Community Development will ensure that hazard mitigation actions, such as drought resistant landscaping, will be incorporated into the City's Landscaping Plans. And Easley's Building Official will be responsible for ensuring that building codes, stormwater management plans and floodplain management plans meet current standards and incorporate additional hazard mitigation actions as appropriate. The

Planning Commission will be responsible for ensuring that each City Department and Committee receives a copy of the hazard mitigation plan immediately following its adoption, and will instruct those committees and departments that mitigation should be incorporated wherever possible. For example, the parks and recreation plans can incorporate drought tolerate species of trees and shrubbery when doing new landscaping. The City of Easley can easily incorporate hazard mitigation planning into their prioritization of public work repairs. For streets that are often flooded, the City can prioritize those repairs over areas that do not pose as much of a risk. They can determine whether new storm drains need to be installed or whether those streets should be repaired in a way that drains water away from nearby structures.

Liberty

Due to recent financial constraints, the City of Liberty has not had adequate resources for keeping up-to-date with planning for the City. A new Planning Commission is set to be appointed in 2018. Liberty's Administrator will ensure the new Planning Commission, once formed, will incorporate hazard mitigation actions and concepts into the new Comprehensive Plan, which will be developed in conjunction with the Planning Commission and the Appalachian Council of Governments. The Planning Commission will then review the City's Land Use Plan and subdivision, zoning and floodplain ordinances to ensure they are up-to-date and incorporate hazard mitigation. The Planning Commission is charged with ensuring each City department and committee receives a copy of the Hazard Mitigation Plan immediately following its adoption and will provide a detailed explanation as to how mitigation principles can be incorporated into other planning mechanisms. For example, the Comprehensive Plan can encourage City growth and development away from known hazards such as the floodplain.

Norris

The Town of Norris is dependent upon the County for their plans and ordinances. Please see the Pickens County section above. Because the County has the responsibility to oversee mitigation actions in the Town of Norris, the Mayor of Norris or his designee will participate in the Countywide planning activities, including participation on committees and attendance at public meetings. The Mayor will begin this role immediately following the adoption of this Hazard Mitigation Plan. The Mayor or the designee will then report back to the Town Council progress that has been made. One particular area the Mayor of Norris can achieve quickly is to work with Pickens County Emergency Management to ensure the Town enrolls in the NFIP as soon as possible.

Pickens

In the City of Pickens, planning is the responsibility of the Planning Commission, City Departments, and Pickens County Departments. The Planning Commission will be responsible for incorporating hazard mitigation ideas into the next revision of the City's Comprehensive Plan, Zoning Ordinances, and the Subdivision and Development regulations. The Planning Commission will also maintain primary responsibility for the Hazard Mitigation Plan for the City of Pickens. The Planning Commission will ensure each department and planning committee receives a copy of the hazard mitigation plan as soon as it is adopted, with the instructions to incorporate it into the planning efforts.

The Director of the Recreation Department will be responsible for incorporating mitigation activities into the Parks and Recreation Plan and the Director of the Grounds Department will be responsible for ensuring that hazard mitigation ideas are incorporated into the City's Landscape Plans. Other areas of regulation are handled by the County for the City. This includes Buildings and Codes, Stormwater Management and Floodplain Management regulations. Pickens County officials will be responsible for incorporating hazard mitigation activities into these plans and regulations as described previously.

Six Mile

The Town of Six Mile is dependent upon the County for many of their services. Please see the Pickens County section above. Because the County has the responsibility to oversee mitigation actions in the Town of Six Mile, the Mayor of Six Mile or his designee will participate in the Countywide planning activities, including participation on committees and attendance at public meetings. The Mayor will begin this role immediately following the adoption of this Hazard Mitigation Plan. The Mayor or the designee will then report back to the Town Council progress that has been made. One of the ways Six Mile can participate is to join one of the many Boards and Commissions the County has with vacant positions. For example, a representative from Six Mile can join the Fire District Board for Six Mile, and promote mitigation for the Town through that.

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Pickens County Multi-Jurisdictional Hazard Mitigation Plan Appendix

Prepared for:
Pickens County
222 McDaniel Avenue
Pickens, SC 29671

FINAL
March 31, 2018

Prepared by:
All Clear Emergency Management Group, LLC
3434 Edwards Mill Road, Suite 112-162
Raleigh, NC 27612

Pickens County Multi-Jurisdictional Hazard Mitigation Plan Appendix

Prepared for

Pickens County
Emergency Management Office
1509 Walhalla Highway
Pickens, SC 29671

Prepared by

All Clear Emergency Management Group, LLC
3434 Edwards Mill Road, Suite 112-162
Raleigh, NC 27612

FINAL
March 31, 2018

Table of Contents

Appendix A: Local Authority's Adoption of the Plan

STATE OF SOUTH CAROLINA)
) RESOLUTION # 2018-12
COUNTY OF PICKENS)

A RESOLUTION AUTHORIZING THE ADOPTION OF THE PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.

Whereas, Pickens County, South Carolina, recognizes the threat that natural hazards pose to people and property; and

Whereas, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

Whereas, an adoption of a hazards mitigation plan is required as a condition of future grant funding of mitigation projects; and

Whereas, Pickens County, South Carolina, participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Jurisdictional Hazard Mitigation Plan; and

Whereas, Pickens County, South Carolina, is aware that revision and updating of the plan is critical for active and effective Hazard Mitigation Planning.

Now, therefore, be it resolved, that the Council for the County of Pickens, South Carolina, hereby adopts the Pickens County Multi-Jurisdictional Hazard Mitigation Plan as an official plan; and

Be it further resolved, that Pickens County, South Carolina, submit the adoption of the Multi-Jurisdictional Hazard Mitigation Plan to the Federal Emergency Management Agency officials for final approval.

Passed and approved, this 4th day of June, 2018.

COUNTY COUNCIL OF PICKENS COUNTY

R. B. Costner III

Roy B. Costner, III, Chairman, County Council of
Pickens County, South Carolina

(SEAL)

Attest:

Lisa H Bryant

Clerk to County Council of
Pickens County, South Carolina

TOWN OF CENTRAL)
COUNTY OF PICKENS)
STATE OF SOUTH CAROLINA)

RESOLUTION #08-13-18
Multi- Jurisdictional Hazard Mitigation Plan

A RESOLUTION ADOPTING THE
2018 PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Town of Central participated in the preparation of a multi-jurisdictional plan, 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, the Town of central is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, the Town of Central has reviewed the Plan and affirms that the Plan be updated no less than every five years.

NOW THEREFORE, BE IT RESOLVED BY the Central Town Council that the Town of Central adopts the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan as this jurisdiction's Multi-Hazard Mitigation Plan, and resolves to execute the actions in the plan.

ADOPTED this 13th day of August, 2018 at a duly called meeting of the Central Town Council.

Town of Central
Pickens County, SC

Clyde J. Martin

Mayor Clyde J. Martin, Jr.

ATTEST:

Susan A. Brewer

Town Clerk Susan A. Brewer

R-2018-007

A RESOLUTION ADOPTING THE
2018 PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the City of Clemson, SC recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, the City of Clemson participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, adoption of a hazard mitigation plan is required as a condition of future grant funding of mitigation projects.

Now, therefore, it be resolved, that the City of Clemson, SC hereby adopts the Pickens County Multi-Jurisdictional Hazard Mitigation Plan and resolves to take official action as may be reasonably necessary to carry out the strategies outlined in the Plan.

Passed and approved, this 4th day of September, 2018

J.C. Cook III

J.C. Cook, III, Mayor

Beverly A Coleman

Attest: Beverly A. Coleman, City Clerk

Resolution 2018-19

A RESOLUTION ADOPTING THE

2018 PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the 2018 Pickens County Multi-Jurisdictional Hazard mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the City of Easley, participated in the preparation of a multi-jurisdictional plan, 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, the City of Easley, is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, the City of Easley, has reviewed the Plan and affirms that the Plan be updated no less than every five years.

NOW, THEREFORE, BE IT RESOLVED. I, Larry Bagwell, Mayor of the City of Easley along with the Easley City Council, adopts the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan as this jurisdiction's Multi-Hazard Mitigation Plan, and resolved to execute the actions in the plan.

Adopted this 13th day of August, 2018 at a regular monthly meeting of the Easley City Council.

Larry Bagwell

Mayor

ATTEST:

Lisa Chapman

City Clerk

STATE OF SOUTH CAROLINA)
) **RESOLUTION 18-3**
COUNTY OF PICKENS)
)
CITY OF LIBERTY)

A RESOLUTION ADOPTING THE 2018 PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the City of Liberty participated in the preparation of the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, the City of Liberty has reviewed the Plan and affirms that the Plan be updated no less than every five years.

THEREFORE, be it **RESOLVED** that the Liberty City Council hereby adopts the *2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan* as the official plan of the City of Liberty.

ADOPTED this 10th day of December, 2018 at a duly called meeting of the Liberty City Council

Brian Petersen
Mayor, City of Liberty

ATTEST:

Bruce Evilsizor, Administrator

Town of NORRIS
On The Right Track
Since 1907

RESOLUTION No. 08132018

A RESOLUTION ADOPTING THE 2018 PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, Norris, participated in the preparation of a multi-jurisdictional plan, 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, Norris, is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, Norris, has reviewed the Plan and affirms that the Plan be updated no less than every five years.

NOW THEREFORE, BE IT RESOLVED BY Norris Town Council that Norris adopts the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan as this jurisdiction's Multi-Hazard Mitigation Plan, and resolves to execute the actions in the plan.

ADOPTED this 13th day of August, 2018 at a duly called meeting of the Norris Town Council.

Odell Williams

Odell Williams, Mayor

State of South Carolina **Resolution 2018-06**
County of Pickens
City of Pickens

A RESOLUTION ADOPTING THE PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within the City of Pickens are subject to the effects of natural hazards and manmade hazard events that pose threats to lives and cause damages to property, and with the knowledge and experience that certain areas, i.e., flood hazard areas, are particularly susceptible to flood hazard events; and

WHEREAS, the City desires to seek ways to mitigation situations that may aggravate such circumstances; and

WHEREAS, the Legislature of the State of South Carolina have delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety and general welfare of its citizenry; and

WHEREAS, the City of Pickens has been charged by the Federal Emergency Management Agency and the State of South Carolina with the responsibility of developing a hazard mitigation plan aimed at reducing the community's vulnerability to natural hazards; and

WHEREAS, it is the intent of the City Council of the City of Pickens to fulfill this obligation in order that the City of Pickens will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the City; and

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to receive future Hazard Mitigation Grant Program Funds; and

NOW, THEREFORE, be it resolved that the City Council of the City of Pickens hereby adopts the Pickens County Multi-Jurisdictional Hazard Mitigation Plan as the City of Pickens' Hazard Mitigation Plan and resolves to take official action as may be reasonably necessary to carry out the strategies outlined within the Plan

PASSED, ADOPTED and APPROVED by the Council of the City on 1st day of October, 2018.

Mayor

Council Member | Council Member

Council Member | Council Member

Council Member | Council Member

ATTEST:

Brittany Chapman, Clerk to Council

Resolution #07272018

A RESOLUTION ADOPTING THE 2018 PICKENS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

Whereas, the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

Whereas, Six Mile participated in the preparation of a multi-jurisdictional plan, 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan; and

Whereas, Six Mile is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

Whereas, Six Mile has reviewed the Plan and affirms that the Plan be updated no less than every five years; and

NOW THEREFORE, BE IT RESOLVED BY Six Mile Town Council that Six Mile adopts the 2018 Pickens County Multi-Jurisdictional Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the plan.

Adopted this 27th Day of July, 2018

Roy C Stoddard

Mayor

Appendix B: Invitation to Participate

JoAnne Huie

Subject: FW: Mitigation Plan Draft

From: Denise M. Kwiatek
Sent: Monday, July 10, 2017 11:11 AM
To: Scott Krein; dbaker@andersonsheriff.com; Hubber, Damon (thubber@greenvillecounty.org)
Subject: Mitigation Plan Draft

Dear County Directors,

Pickens County Emergency Management has been awarded a planning grant through the Federal Emergency Management Agency to update the Pickens County Natural Hazards Mitigation Plan.

The Multi-Jurisdictional Hazard Mitigation Draft Plan is on the Pickens County Website. Please feel free to visit the website and review the Multi-Jurisdictional Mitigation Draft Plan. The website can be found by accessing the Pickens County Emergency Management website at: https://sites.google.com/a/allclearemg.com/pickensco-hazard-mitigation/home.

The completed plan will also be available on this website at the conclusion of the project.

Please feel free to contact me with any questions at dkwiatek@co.pickens.sc.us or via phone at 864-898-5362.

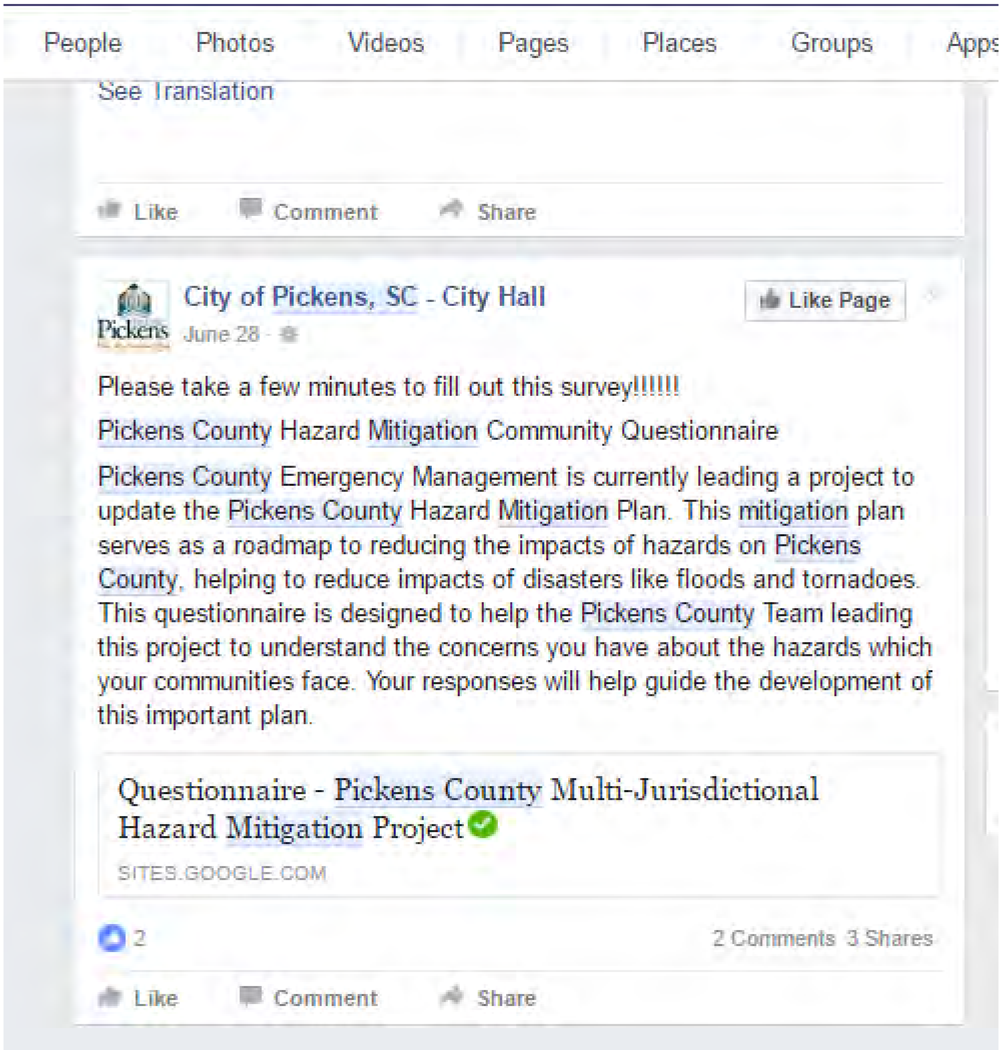
Thank you

Denise Kwiatek SC CEM
Director
Pickens County
Emergency Management
1509 Walhalla Hwy
Pickens, SC 29671
864-898-5362

1

Appendix C: Public Outreach Documentation


People
Photos
Videos
Pages
Places
Groups
Pickens County, SC
August 23
Like Page
Please take a survey for Emergency Management. All are encouraged to participate. Once you click the link, click on "Questionnaire" on the left side of the page and follow the instructions.
https://sites.google.com/a/…/pickensco-hazard-mitigati…/home
Pickens County Multi-Jurisdictional Hazard Mitigation Project
SITES.GOOGLE.COM


People Photos Videos Pages Places Groups Apps

See Translation

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City of Pickens, SC - City Hall

June 28

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Please take a few minutes to fill out this survey!!!!!!

Pickens County Hazard Mitigation Community Questionnaire

Pickens County Emergency Management is currently leading a project to update the Pickens County Hazard Mitigation Plan. This mitigation plan serves as a roadmap to reducing the impacts of hazards on Pickens County, helping to reduce impacts of disasters like floods and tornadoes. This questionnaire is designed to help the Pickens County Team leading this project to understand the concerns you have about the hazards which your communities face. Your responses will help guide the development of this important plan.

Questionnaire - Pickens County Multi-Jurisdictional Hazard Mitigation Project

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1

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City of Pickens, SC - City Hall

August 3

Like Page

Pickens County Emergency Management is currently leading a project to update the Pickens County Hazard Mitigation Plan. This mitigation plan serves as a roadmap to reducing the impacts of hazards on Pickens County, helping to reduce impacts of disasters like floods and tornadoes. This questionnaire is designed to help the Pickens County Team leading this project to understand the concerns you have about the hazards which your communities face. Your responses will help guide the development of this important plan.

Please note survey responses are kept confidential. Participation in this survey is voluntary and your completed questionnaire indicates your willingness to participate in the survey. Thank you for taking the time to help your community with the preparation of our mitigation plan! This survey can also be completed online at

https://sites.google.com/…/pickensco-hazard-mitigati…/survey

Questionnaire - Pickens County Multi-Jurisdictional Hazard Mitigation Project

https://sites.google.com/a/allclearemg.com/pickensco-hazard-mitigation/survey

SITES.GOOGLE.COM

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16A || SUNDAY, 05.21.17 | GREENVILLEONLINE.COM

PICKENS COUNTY
EMERGENCY MANAGEMENT

Pickens County residents are being asked to review the Multi-Jurisdictional Hazard Mitigation Plan. This plan is a requirement of the Disaster Mitigation Act of 2000 and is required by FEMA to be updated every 5 years. This plan identifies potential man-made and natural disasters within the County.

Each jurisdiction in Pickens County will have available for review the Multi-Jurisdictional Hazard Mitigation Draft Plan at each City Hall and/or Town Hall during business hours for two weeks with a start date of May 22nd until June 5th.

The plan is also available by accessing the Pickens County Emergency Management website at: **https://sites.google.com/a/allclearemg.com/pickensco-hazard-mitigation/home.** Please contact JoAnne Huie at joanneh@allclearemg.com to share your thoughts about Pickens County Multi-Jurisdictional Hazard Mitigation Plan or to suggest additional mitigation actions for your community.

The Greenville News

AFFIDAVIT OF PUBLICATION

I, Susan Mullinax being the Advertising Agent for *The Greenville News*, do hereby testify that the attached advertisement was published in *The Greenville News* on these dates:

7/23/17

PICKENS COUNTY EMERGENCY MANAGEMENT

A Public Hearing to review the Multi-Jurisdictional Mitigation Draft Plan for Pickens County will be July 27th at 10:00 am, at the Pickens County Emergency Management Office, 1300 Walhalla Highway, Pickens.

This draft plan identifies potential Natural & Man made hazards within the County and each jurisdiction. This plan is a requirement of the Disaster Mitigation Act of 2000 & required by FEMA to be updated every 5 years.

If you have any questions contact Denise Kwiesek at 864-898-5362.

Susan Mullinax

Sales Agent

Nikole Lark

NIKOLE LARK
Notary Public-State of South Carolina
My Commission Expires May 4, 2026

NIKOLE LARK
Notary Public-State of South Carolina
My Commission Expires
May 04, 2026

The Greenville News Media Group • 305 S. Main Street •Greenville, SC 29601

Pickens County Emergency Management

1509 Walhalla Highway
Pickens, SC 29671

Director: Denise Kwiatek

dkwiatek@co.pickens.sc.us

Phone: 864-898-5945

The essential steps in hazard mitigation are:

1. Identify the hazards in your community.
2. Determine how vulnerable you are to the hazards you face.
3. Define which actions your community can take to reduce the impact from your hazards.
4. Implement your plan of action.

Pickens County Hazard Mitigation Fact Sheet

What is Hazard Mitigation?

What is Mitigation? Hazard mitigation – such as flood insurance and protective building standards – is a targeted effort to reduce the risk of loss of life and property by lessening the impact of hazards such as hurricanes and flooding.

- Mitigation is any effort taken to reduce loss of life and property by lessening the impact of disasters.
- Mitigation is taking action now—before the next disaster— to reduce human and financial consequences later.
- Example: Elevating a house onto stilts to mitigate against damage from flooding.

What is a mitigation plan?

- A Hazard Mitigation Plan is designed to serve as a guide for efforts to mitigate the loss of life and property from hazards.
- Contains details on hazards and possible strategies to reduce their impacts.
- Details jurisdiction-specific mitigation projects individualized to the needs of each municipality to reduce the impact of the hazards present in each area.

Why is hazard mitigation important?

- Identifies cost effective actions for risk reduction that are agreed upon by stakeholders and the public.
- Builds partnerships by involving the government, public, non-governmental organizations, and private businesses.
- Increases education and awareness of hazards and risk for a particular area.
- Allows individuals to minimize post-flood disaster disruptions and recover more rapidly.
- Focuses resources on the greatest risks and vulnerabilities.
- Aligns risk reduction with other community objectives.

What can you do to help?

Residents of Pickens County are being asked to actively engage with Pickens County Emergency Management to help to update the Pickens County Hazard Mitigation Plan.

Residents are asked to complete an online survey regarding your opinions on mitigation at: https://goo.gl/vjQ0Yr

Is there a financial benefit?

The Federal Emergency Management Agency requires local governments to approve and implement a mitigation plan that details specific goals and appropriate response actions to mitigate natural hazards in order to be eligible to receive federal funding for local hazard mitigation projects.

Who is participating?

Each of the municipalities in Pickens County is in support of this plan and is working with Pickens County Emergency Management during development.

Visit https://goo.gl/HdjBts for the status of the project.

For more information please contact Pickens County Emergency Management at 864-898-5945.

GREENVILLEONLINE.COM | SUNDAY, JUNE 24, 2018 | 13E

EMERGENCY MANAGEMENT
PICKENS COUNTY
SOUTH CAROLINA

PICKENS COUNTY EMERGENCY MANAGEMENT

Pickens County residents are being asked to review the Multi-Jurisdictional Hazard Mitigation Plan. This plan is a requirement of the Disaster Mitigation Act of 2000 and is required by FEMA to be updated every 5 years. This plan identifies potential man-made and natural disasters within the County.

The public is invited to join Denise Kwiatek, Director of Pickens County Emergency Management for a final public meeting discussing the Hazard Mitigation Plan, June 26, 2018 from 9:00 am – 12:00 pm at Pickens County EOC – 1509 Walhalla Hwy., Pickens, SC 29671.

The plan is also available by accessing the Pickens County Emergency Management website at: https://sites.google.com/a/allclearemg.com/pickensco-hazard-mitigation/. Please contact Denise Kwiatek at dkwiatek@co.pickens.sc.us to share your thoughts about Pickens County Multi-Jurisdictional Hazard Mitigation Plan.


75% 2:59 PM
Tweet
Pickens County EM
@PickensCountyEM
Join our Director Denise Kwiatek tomorrow from 9am to 12pm at our Emergency Operations Center to review the Multi-Jurisdictional Hazard Mitigation Plan. Click the image to see details below.
PICKENS COUNTY
EMERGENCY MANAGEMENT
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Final Public Meeting
Multi-Jurisdictional Hazard Mitigation Plan
June 26, 2018

PRINT NAME	SIGNATURE
Barbara James	Barbara James
Terry S. Roy	Terry A Roy
April Keeler	April Keeler
John M Sims Jr. "Sonny"	[illegible]

Appendix D: Public Survey Sample

Pickens County
Emergency Management

Pickens County Hazard Mitigation Community Questionnaire

Pickens County Emergency Management is currently leading a project to update the Pickens County Hazard Mitigation Plan. This mitigation plan serves as a roadmap to reducing the impacts of hazards on Pickens County, helping to reduce impacts of disasters like floods and tornadoes. This questionnaire is designed to help the Pickens County Team leading this project to understand the concerns you have about the hazards which your communities face. Your responses will help guide the development of this important plan.

Please note survey responses are kept confidential. Participation in this survey is voluntary and your completed questionnaire indicates your willingness to participate in the survey. Thank you for taking the time to help your community with the preparation of our mitigation plan! This survey can also be completed online at
https://sites.google.com/a/allclearemg.com/pickensco-hazard-mitigation/survey.

Please send completed questionnaires to Denise Kwiatek at dkwiatek@co.pickens.sc.us or via US Mail to 1509 Walhalla Highway Pickens, SC 29671. Thank you!

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1. In which community do you live?

2. Do you have flood insurance?
   - ☐ Yes
   - ☐ No, too expensive
   - ☐ No, not necessary
   - ☐ No, deductible is too high
   - ☐ No, never considered it
   - ☐ No, other:_______________

3. Would you be willing to make your home more resistant to disasters?
   - ☐ I would be willing to spend a lot of time and/or money
   - ☐ I would be willing to spend a moderate amount of time and/or money
   - ☐ I would be willing to spend little or no time and/or money
   - ☐ Not sure
   - ☐ No

4. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?
   - ☐ Newspaper
   - ☐ Television
   - ☐ Radio
   - ☐ Internet
   - ☐ Mail
   - ☐ Public workshops/meetings
   - ☐ School meetings
   - ☐ Other:_________________

5. How informed do you feel about the hazards facing Pickens County?
   - ☐ Very Informed
   - ☐ Somewhat Informed
   - ☐ I have little to no knowledge about the hazards in Pickens County

6. Please check the box that indicates how concerned you are about the following hazards affecting your community.

Hazard	Extremely Concerned	Very Concerned	Concerned	Somewhat Concerned	Not Concerned
Civil Disturbance/Crime	☐	☐	☐	☐	☐
Dam/Levee Failure	☐	☐	☐	☐	☐
Disruption of Transportation Systems	☐	☐	☐	☐	☐
Disruption of Utility Services	☐	☐	☐	☐	☐
Drought	☐	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐	☐
Economic Crisis	☐	☐	☐	☐	☐
Flooding	☐	☐	☐	☐	☐
Hazardous Materials	☐	☐	☐	☐	☐
Hurricane/Tropical Storm	☐	☐	☐	☐	☐
Landslide/Erosion	☐	☐	☐	☐	☐
Public Health Threat	☐	☐	☐	☐	☐
Radiological	☐	☐	☐	☐	☐
Severe Storm	☐	☐	☐	☐	☐
Temperature Extremes	☐	☐	☐	☐	☐
Terrorism	☐	☐	☐	☐	☐
Tornado/Windstorm	☐	☐	☐	☐	☐
Urban Fire	☐	☐	☐	☐	☐
Wildfire	☐	☐	☐	☐	☐
Winter/Ice Storm	☐	☐	☐	☐	☐

7. Are there hazards you are concerned about that are not listed above? If so, please list them below.

8. What types of hazards have you personally experienced in Pickens County? *(example, flooding at my home, tornado at my place of work, winter storms…)*

9. Are there places in your community that are impacted, or could be impacted by specific hazards? (e.g. Main Street floods after heavy rain) If so, please describe the hazard and the specific location.

10. In your opinion, what are some actions your local government could take to reduce the risk of future hazard damages to your neighborhood?

11. A variety of approaches can be used to reduce the risk that hazards pose to lives and property. Please share your opinion of the following mitigation strategies by checking the box that most closely corresponds to your point-of-view.

Community-wide Strategies	Very Important	Somewhat Important	Not Important
Prevention Strategies Actions taken to keep a problem from getting worse. (Examples include regulating building in the floodplain and building codes designed to withstand known risks)	☐	☐	☐
Property Protection Strategies Actions taken to lessen the risk of damage to property. (Examples include removing homes from the floodplain and floodproofing structures)	☐	☐	☐
Public Education and Awareness Strategies Actions takes to inform the public about hazardous areas and the actions necessary to avoid potential injury or damage. (Examples include outreach programs, notices to residents and property owners, and mass mailings.)	☐	☐	☐
Natural Resource Protection Strategies Actions intended to protect the environment. (Examples include erosion and sediment control, wetlands protection, and stream restoration.)	☐	☐	☐
Critical Facility Protection Actions taken to protect critical facilities that are vital to response efforts, such as police stations, fire stations and hospitals. Can also include activities to protect facilities which house vulnerable populations, such as nursing homes, or facilities which may create secondary hazards, such as factories which store hazardous materials.	☐	☐	☐
Structural Project Strategies Actions which directly protect people and property through the construction of manmade structures. (Examples include dams, reservoirs, levees, channel modifications, storm sewers and elevated roadways.)	☐	☐	☐

12. Do you have any other comments, concerns or suggestions about hazard mitigation planning in your community?

Appendix E: Public Survey Summary

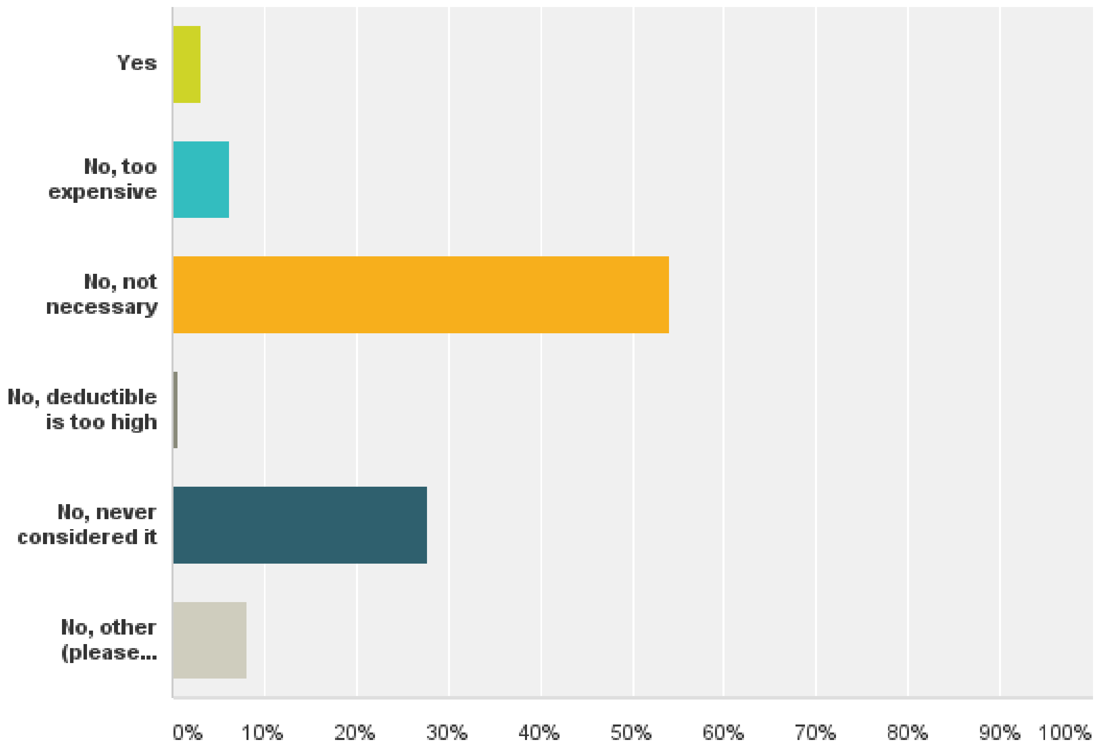
The following pages summarize the results of the public survey, which was available online from April 20, 2016 - June 27, 2017. Hardcopies of the survey were also distributed by the jurisdictions in accordance to the public outreach strategy agreeded upon by the HMPC.

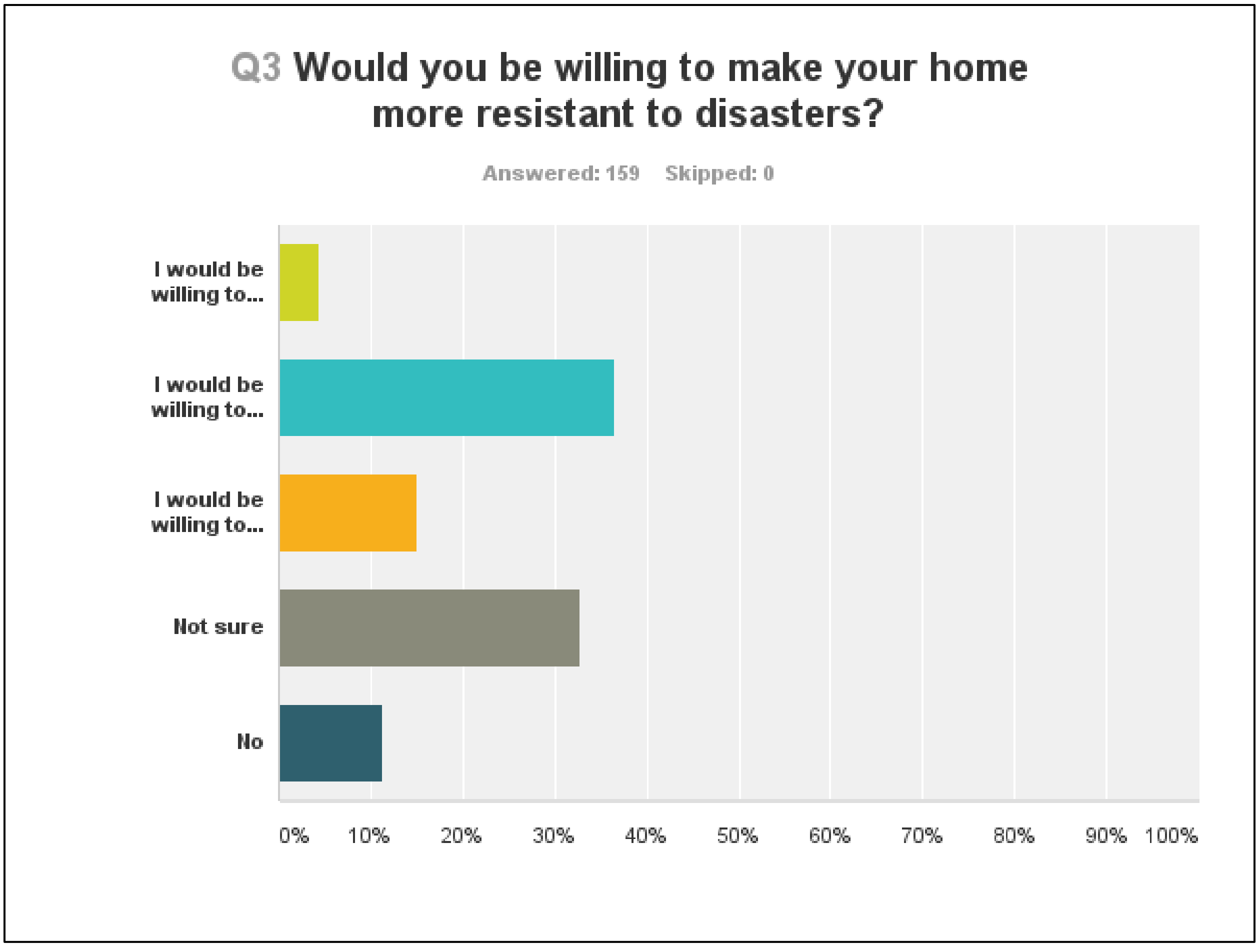
Question 1: In which community do you live?

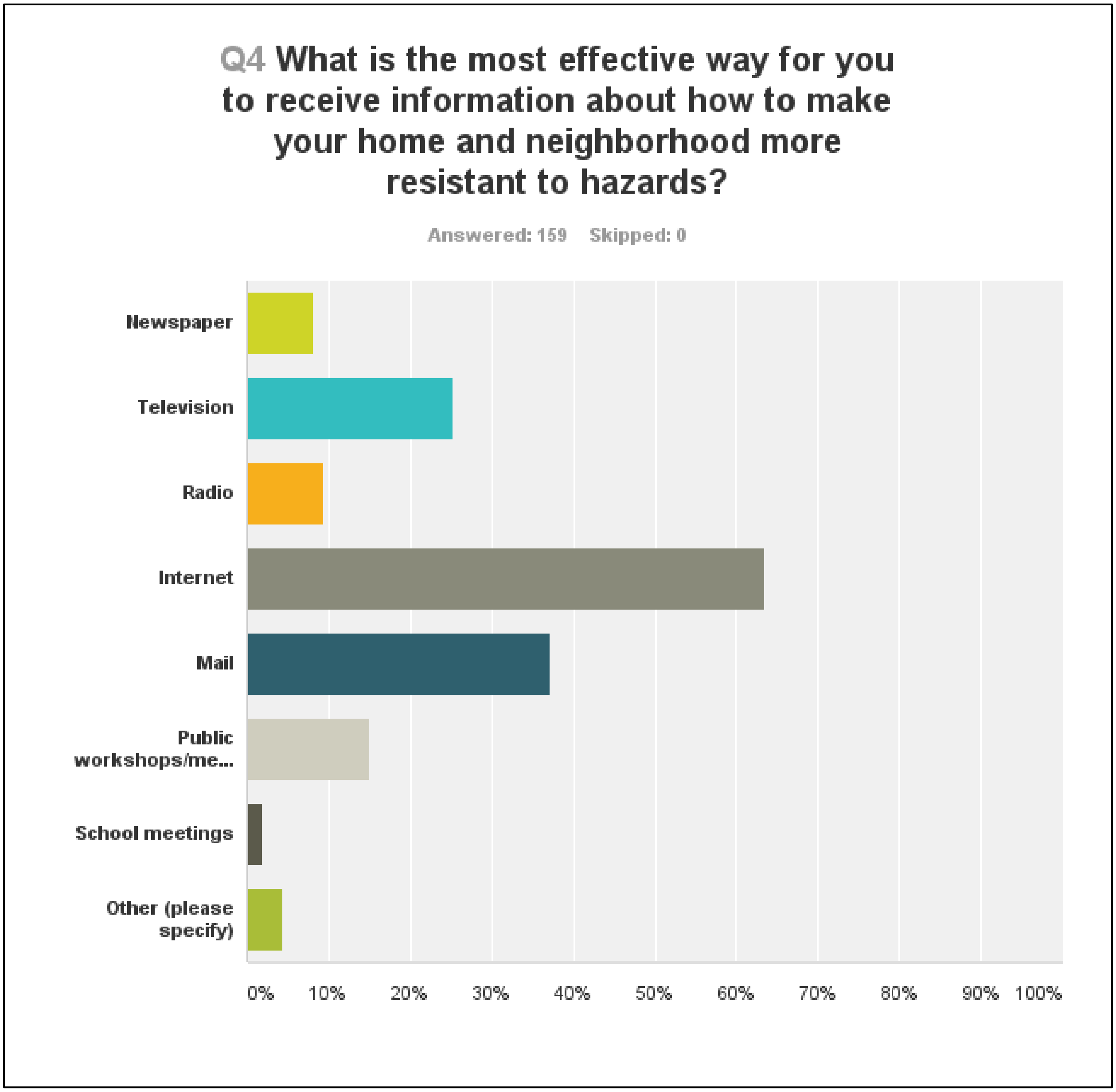
Community	Count
Easley	42
Pickens	26
Liberty	16
Central	14
Dacusville	12
Six Mile	11
Clemson	3
Unspecified	3
Crosswell	2
Holly Springs	2
Midway	2
Anderson County	1
AR Lewis Elementary	1
Arial	1
Between Easley and Liberty	1
Centralized	1
Central-Six Mile	1
Cliff's At Keeowee	1
Dalton Flats	1
Downtown	1
Fox Squirrel Ridge	1
Griffin	1
Hagood Mill	1
Hood Estates	1
Mauldin Lake	1
Mill	1
Norris	1
Pickens County	1
Pleasant Hill	1
Powderville	1
Pumpkintown	1
Shady Grove	1
Sunset	1
The Reserve at Lake Keowee	1
Vinland	1
Zion School	1

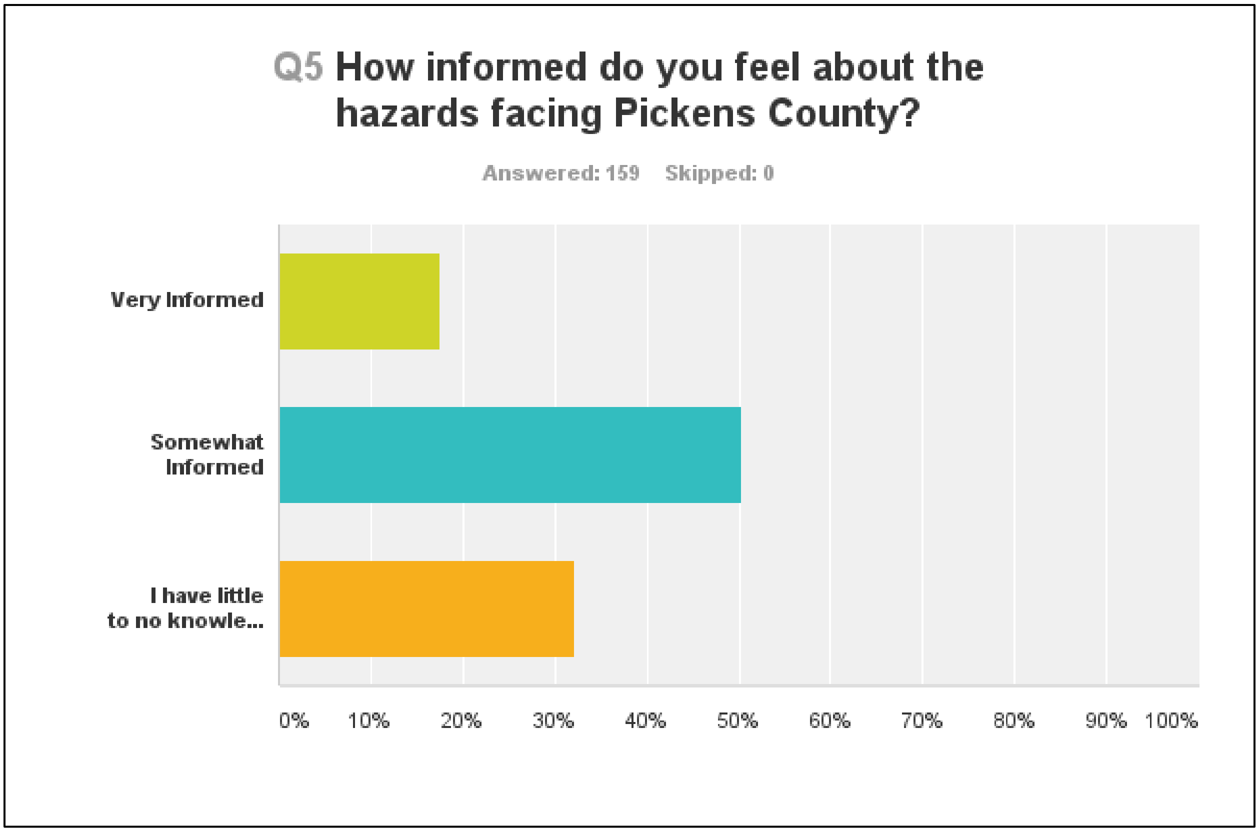
Q2 Do you have flood insurance?

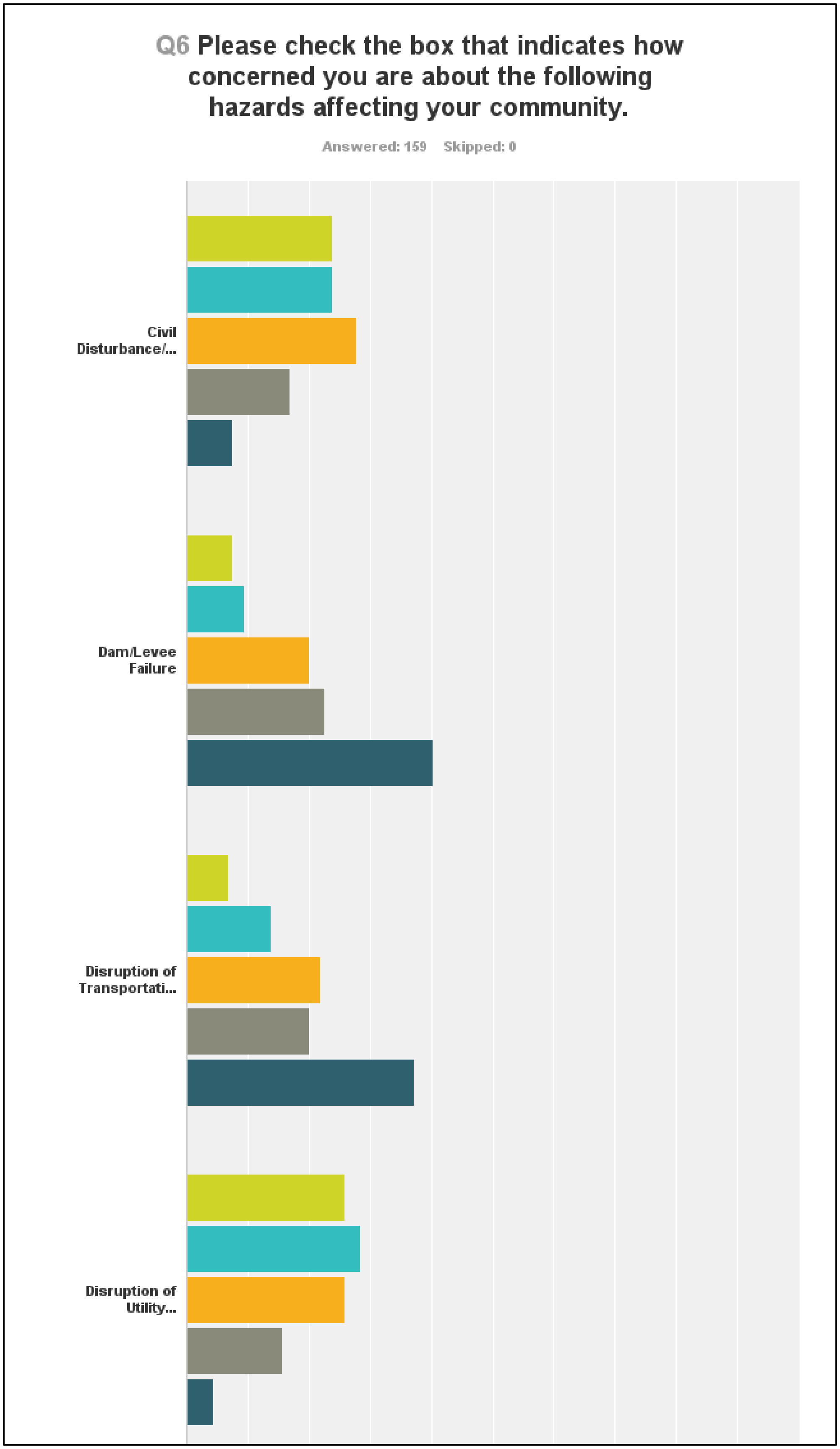
Answered: 159 Skipped: 0

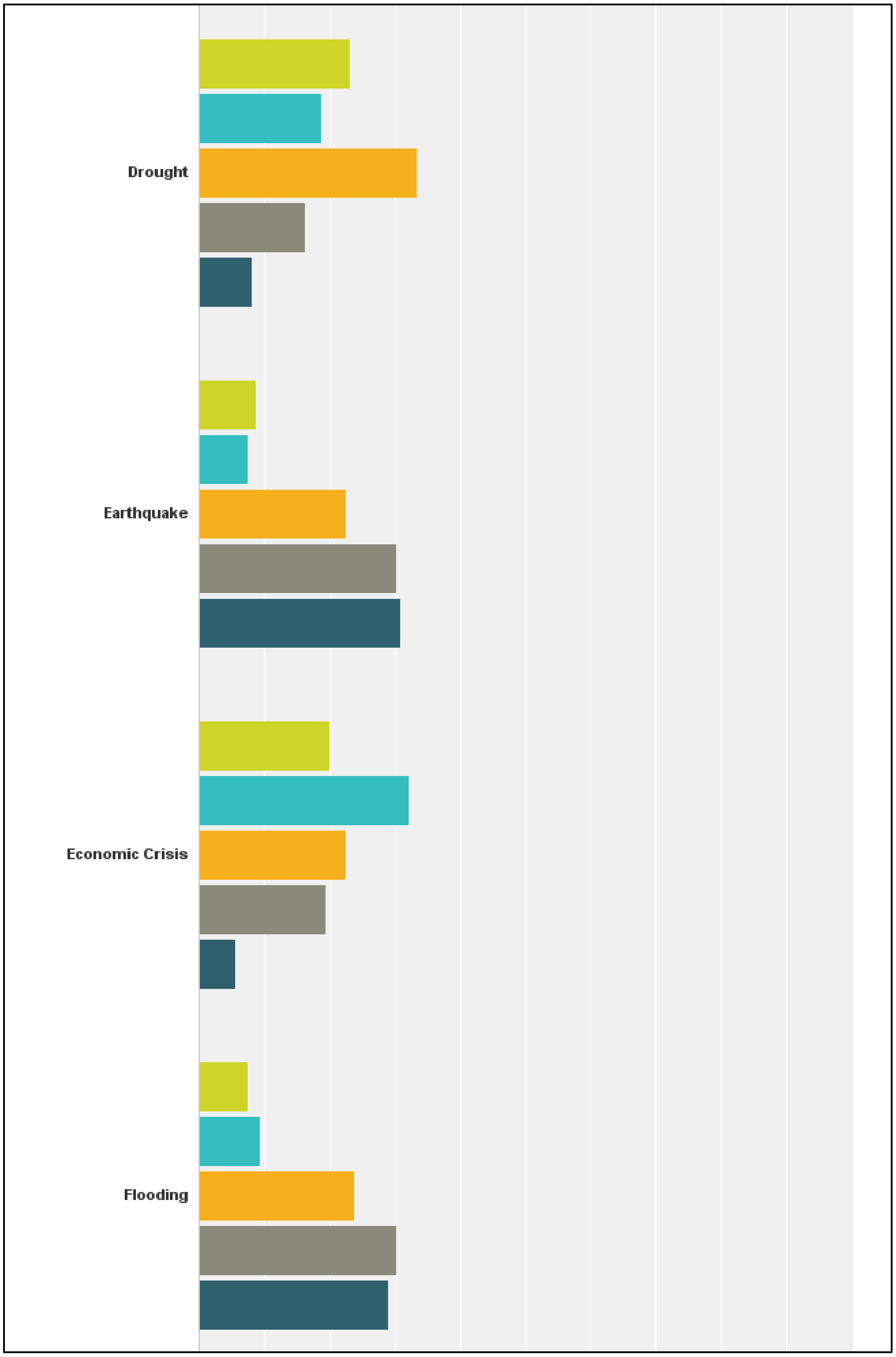


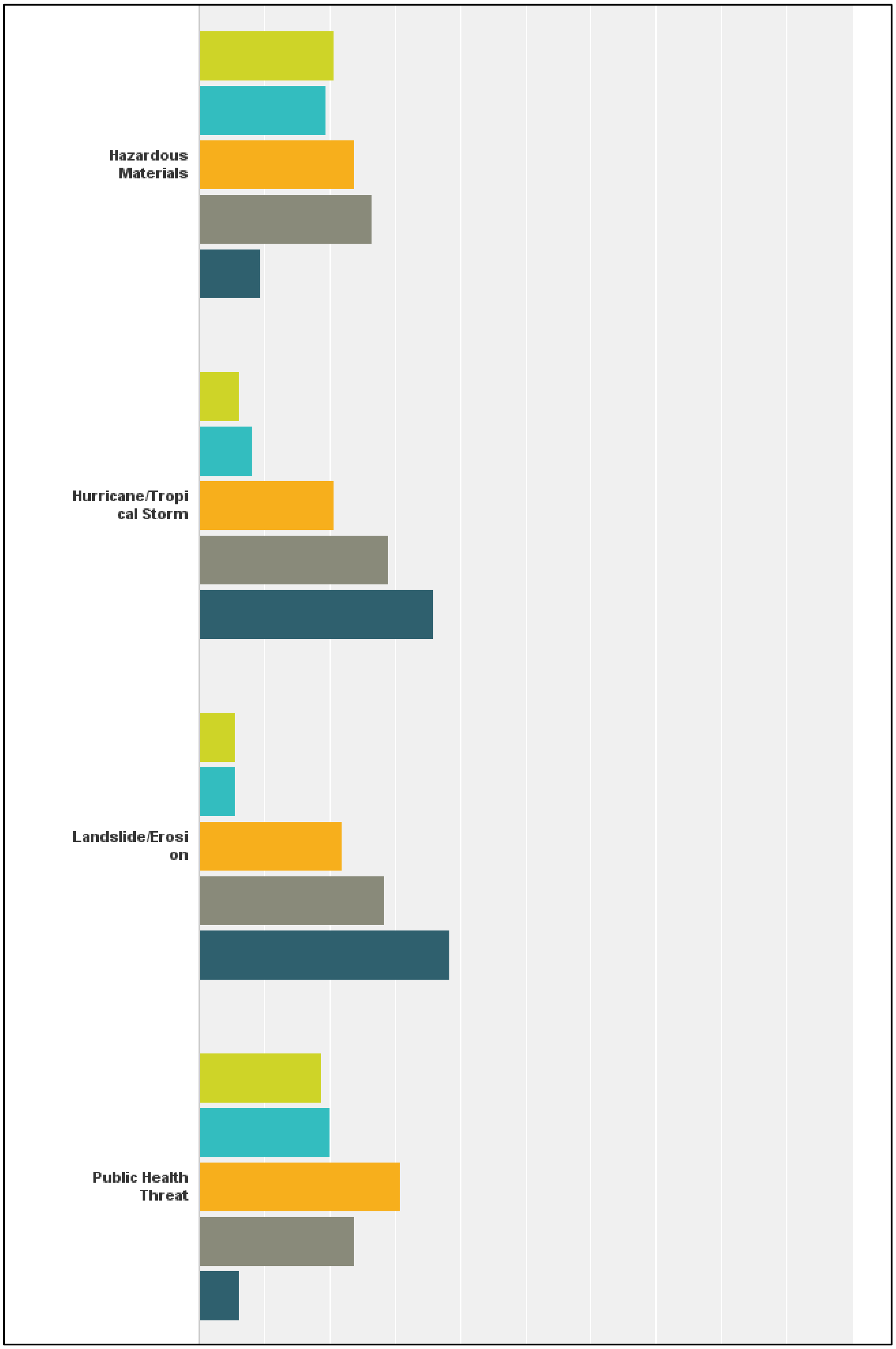

Q3 Would you be willing to make your home more resistant to disasters?
Answered: 159 Skipped: 0
I would be willing to...
I would be willing to...
I would be willing to...
Not sure
No
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

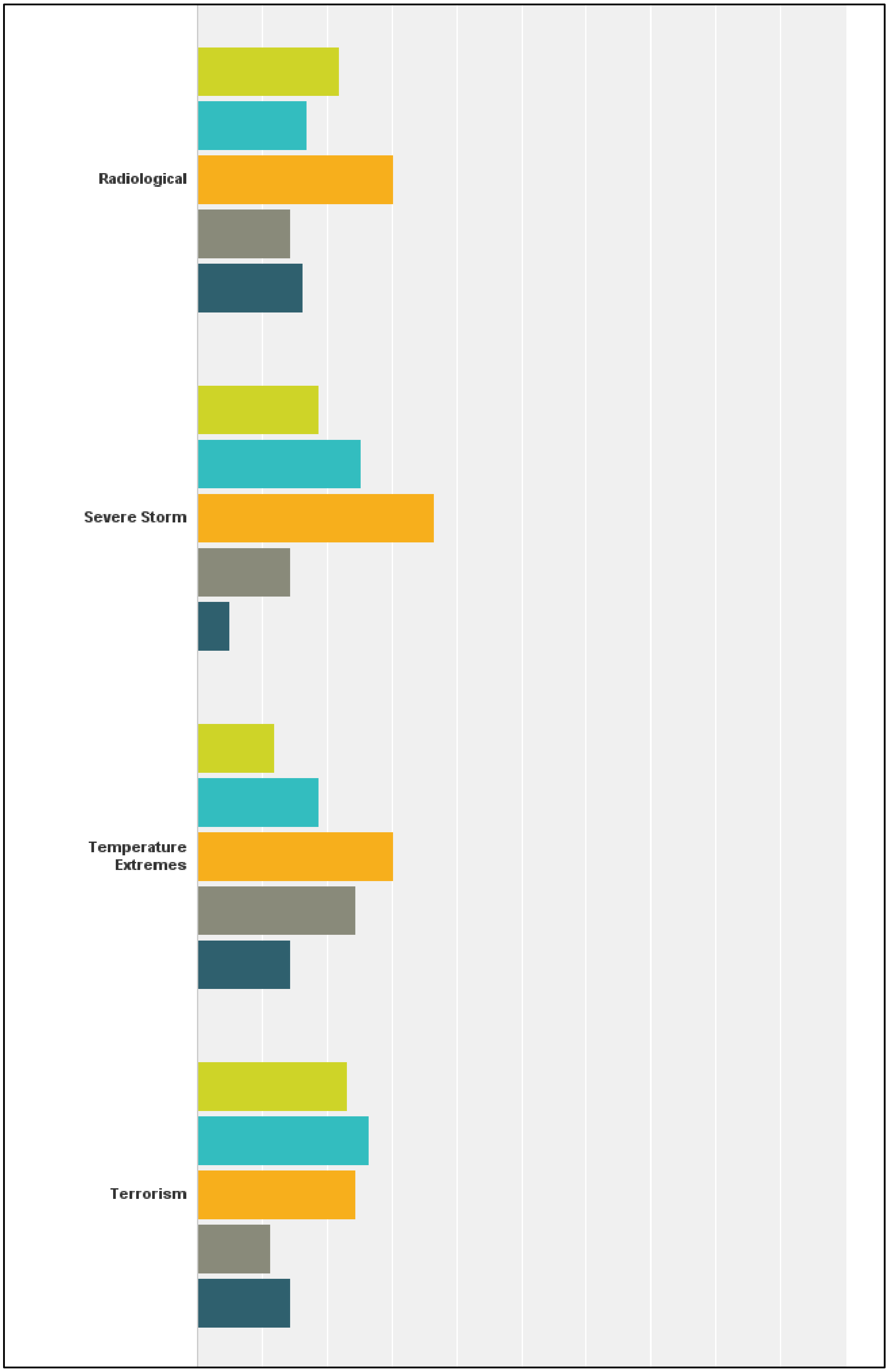

Q4 What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?
Answered: 159 Skipped: 0
Newspaper
Television
Radio
Internet
Mail
Public workshops/me...
School meetings
Other (please specify)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

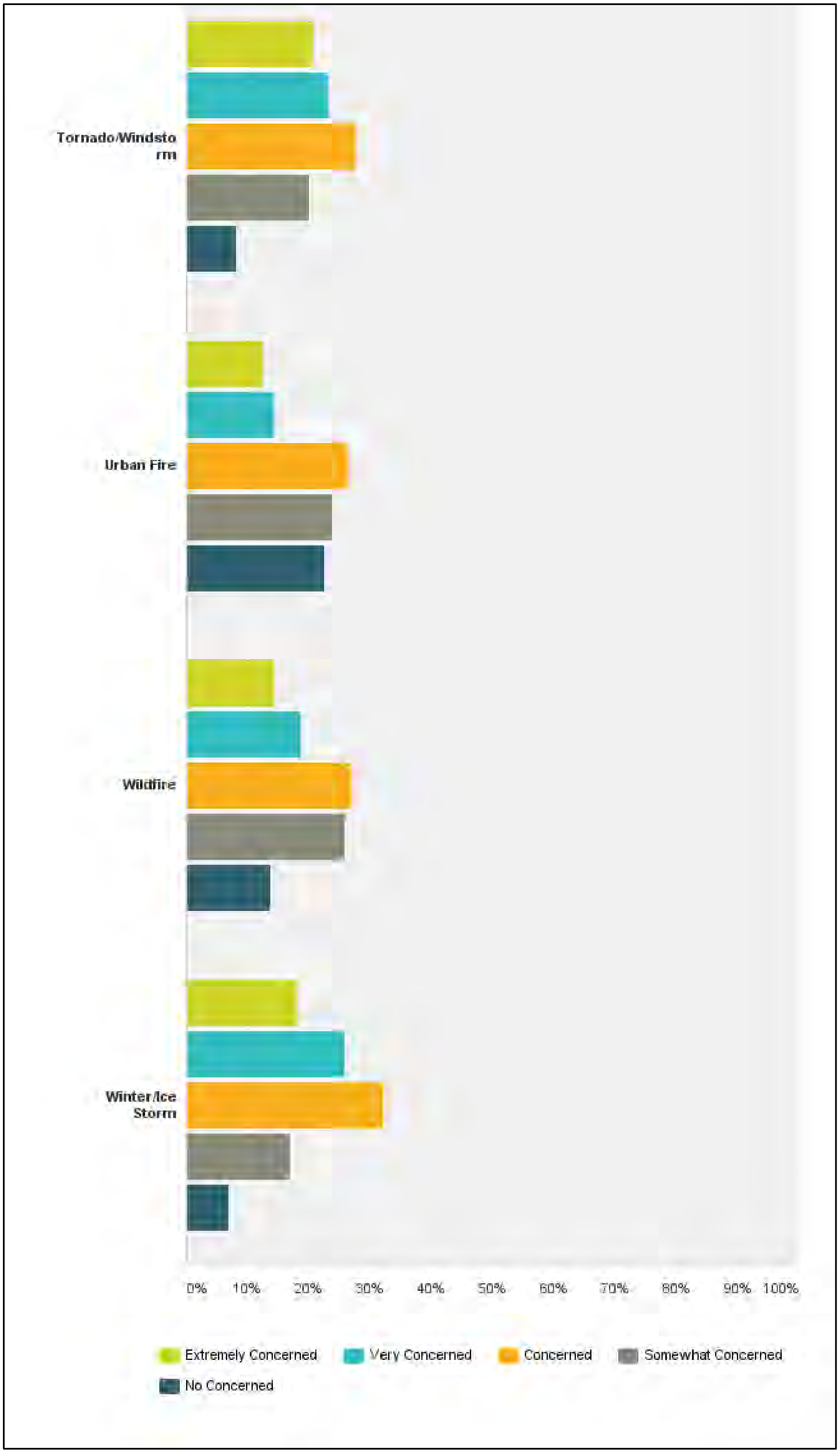

Q5 How informed do you feel about the hazards facing Pickens County?
Answered: 159 Skipped: 0
Very Informed
Somewhat Informed
I have little to no knowle...
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

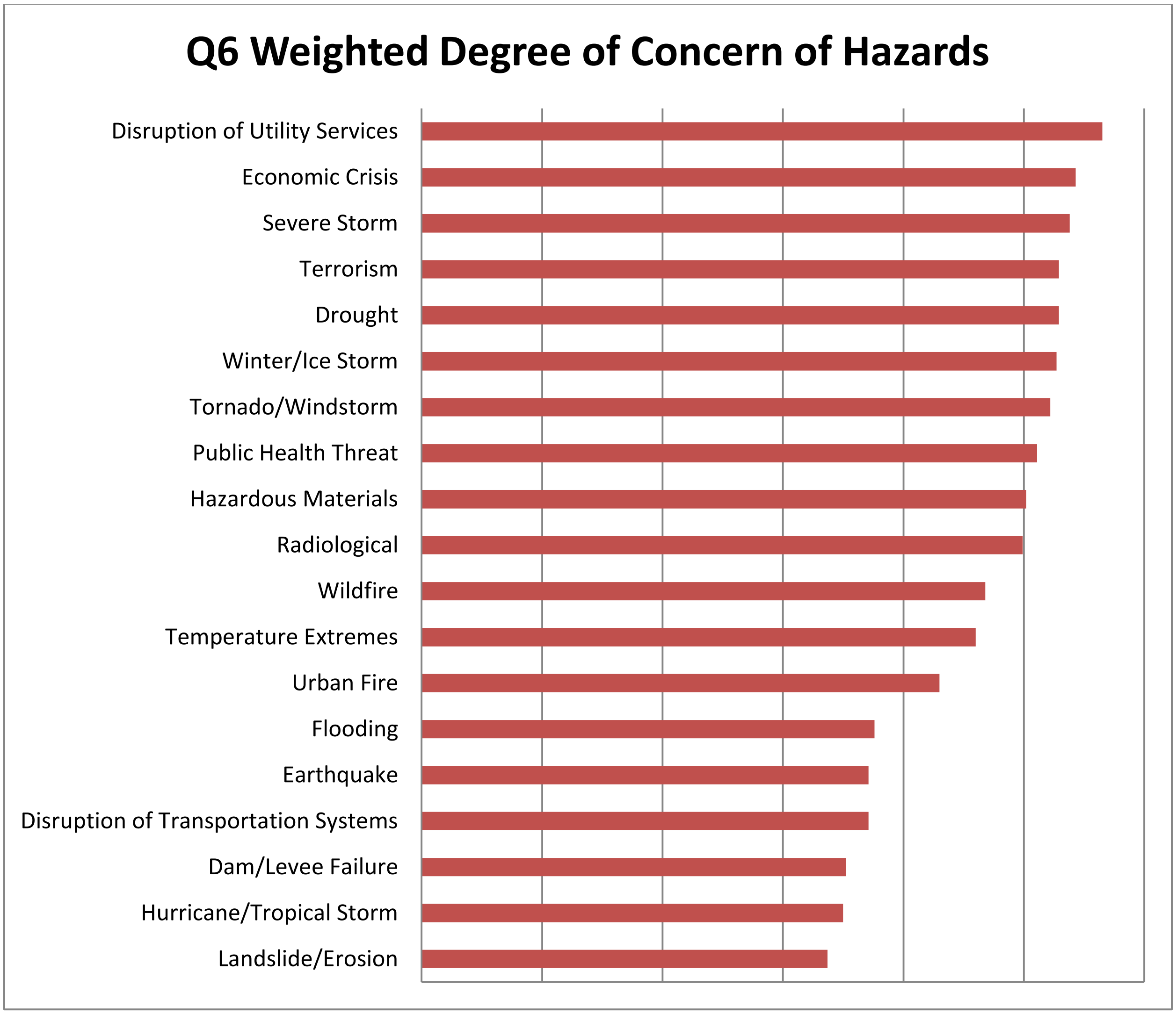

Q6 Please check the box that indicates how concerned you are about the following hazards affecting your community.
Answered: 159 Skipped: 0
Civil Disturbance/...
Dam/Levee Failure
Disruption of Transportati...
Disruption of Utility...


Drought
Earthquake
Economic Crisis
Flooding


Hazardous Materials
Hurricane/Tropical Storm
Landslide/Erosion
Public Health Threat


Radiological
Severe Storm
Temperature Extremes
Terrorism


Tornado/Windsto
rm
Urban Fire
Wildfire
Winter/Ice
Storm
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Extremely Concerned
Very Concerned
Concerned
Somewhat Concerned
No Concerned


Q6 Weighted Degree of Concern of Hazards
Disruption of Utility Services
Economic Crisis
Severe Storm
Terrorism
Drought
Winter/Ice Storm
Tornado/Windstorm
Public Health Threat
Hazardous Materials
Radiological
Wildfire
Temperature Extremes
Urban Fire
Flooding
Earthquake
Disruption of Transportation Systems
Dam/Levee Failure
Hurricane/Tropical Storm
Landslide/Erosion

Question 7: Are there other hazards that you are concerned about?

Hazards Listed By Questionnaire Respondents
Yes, hazards from the trains that go by. We have no idea what hazardous materials these trains carry on a daily basis nor what to do if there is a wreck or spill.
Lake Safety, Would like to see more patrols of law Enforcement on pickens County lakes
MAKING SURE MOBILITY IMPAIRED ARE SAFE AND CK ON
Guns and the people who use them. Drinking water safety.
soil....chemical use past..... farmers
A train derailment.
Communications (Internet, telephone, and other) infrastructure outage
President of the US
Ice storm at home Tornado while driving
Politicians looking out for their own interests instead of the good of the people
There's no reason to be concerned about natural disasters.. Being concerned doesn't make them less likely to happen. I feel very uninformed about crime statistics in Pickens County. A GIS crime map like Greenville County has is needed. It provides real-time updates to crimes happening in the community.
Lot of crime....stealing...
E.M.P.
Current road conditions/repair.
Public services and upkeep not being met because of lack of taxes...
Medical outbreaks
Yes, hazards from the trains that go by. We have no idea what hazardous materials these trains carry on a daily basis nor what to do if there is a wreck or spill.

Question 8: What types of hazards have you personally experienced in Pickens County? (example: flooding at my home, tornado at my place of work, winter storms, etc.)

Hazard	Count
Winter Storms	82
Tornado	38
Utility Outage/Power Outage	29
Ice Storm	24
Flooding/Flash Flooding	17
Severe Storms	14
Drought	8
Hail	8
Wildfire	7
Wind Storm	5
Civil/Crime	4
Fires	4
High Wind	3
Extreme Temperatures	2
Public Health Threat	2
Rain Downpours	2
Unusual Weather Events	2
All of them	1
Earthquake	1
Gun Accidents	1
Microburst	1
Road Closures	1
Tree Down	1
Urban Fire	1
Wrecks causing power outage	1

Question 9: Are there places in your community that are impacted, or could be impacted, by specific hazards? (e.g. Main Street floods after heavy rain.) If so, please describe the hazard and the specific location.

Places Impacted by Specific Hazards
Icy road conditions in more mountainous regions
The whole town of Central would be effected by a hazardous spill from a train derailment.
Back roads are often flooded after storms, trees are down during windy storms, back roads often do not thaw for several days after winter storms
I have seen flooding of roads in Easley, Clemson, and Central. I've seen tornado damage in Easley and liberty.
Flooding near hartwell lake on pike road.
Pickens Jockey lot, other places in county in flood zones along river
Gun ranges within three miles of residences.
Creeks in Clemson Flood durning large rain events Trees near overhead power lines are a potential for utility disruption
Clemson Ave-Flooding Issaquena Trail/Berekely Dr. - Flooding Clarendon Dr, Rock Creek Rd. - Flooding Ashley Rd, Shaftsbury Rd - Flooding Old Jewel Bridge Rd - Flooded during winter water movement
Secondary roads flood and wash out
Creeks overflowing
N. Martin/Hunts Bridge Rd floods often around the river.
Hwy/road flooding due to clogged drainage ditches.
Holly Springs Pumpkintown communities severe ice when there is a winter storm.
flooding
flooding of popefield road near bridge
tornadoes, hazmat, flooding, winter storm, etc.
tornados, winter storms, hazmat, railroad
main street, power outages, crime
down trees
Fleetwood Dr.
Flooding
If a train derails in Easley, everyone is screwed.
Fleetwood Dr after heavy rains
Western county residents near nuclear.
The Saluda Dam is an important piece of infrastructure. If it were to be damaged due to extreme weather or malicious attack a lot of people would be adversely affected.
low lying areas
Yes, columbia
floods - tornado
Yes around my neighborhood (Hagood Mill), when we get a lot of rain
Elderly citizens being without power and having no means of communication due to

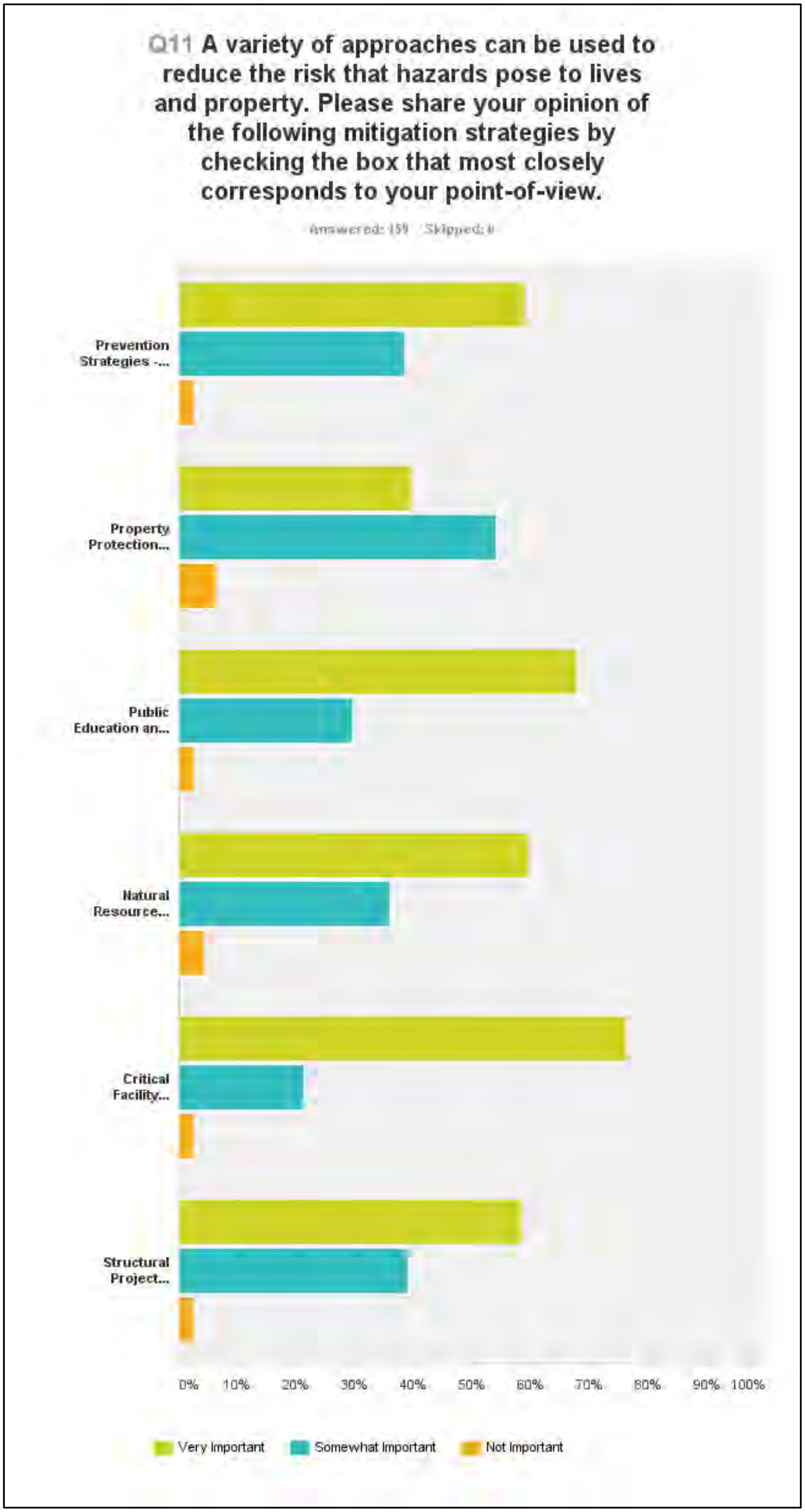
Places Impacted by Specific Hazards
outage.
The wall of dirt along the Herd's property on Terrapin Crossing Road, erodes and fills up the ditches at 1002 terrapin crossing with mud and sends all the rain water across the road creating a stream of moving water crossing the road for 100 to 170 feet toward 1005 terrapin crossing road. Some type of cover is needed over that wall of dirt.
chemical spills or hazards at the railroad going though my city
Lots of water after a heavy rain running down the street in my yard....Streets should be better to take care of water run off problems
floods after heavy rain
water system & electrical system from winter storms
flooding of recreational fields
Back roads have heavy water after extreme rain
Hospitals, roadway travel
Ann street, Pickens floods some close to bridge
Flooding of road hwy 8 in front of OWT during severe rains, no guard rail on John St in curve before Missionary Ind Baptist Church.
unsure of which roads have low spots that could flood to the point of being unsafe....
Roads and bridges, power lines
Creek overruns the road during flooding. Silver Creek Rd. off Norris Hwy.
During heavy rains, North Main Street drains thru my neighbors yards and properties on Aaron Drive and causes damage.
Oconee Nuclear, Degrading Bridges in Various Locations, Various Flood Zones
Main Street flooding due too improper drainage control...building permits issued without concern of damage to surrounding properties during storms etc...such as drainage control of run off water during storms, melting snow etc.
Work in city of Pickens - street flooding, town creek flooding, creek flooding in front of cannon hospital, storm water system not able to handle major rainfall. Brush control after high wind/ice storm events, city wide event.
Wildfire could be a problem
Icy road conditions in more mountainous regions
The whole town of Central would be effected by a hazardous spill from a train derailment.
Back roads are often flooded after storms, trees are down during windy storms, back roads often do not thaw for several days after winter storms
I have seen flooding of roads in Easley, Clemson, and Central. I've seen tornado damage in Easley and liberty.
Flooding near hartwell lake on pike road.
Pickens Jockey lot, other places in county in flood zones along river

Question 10: In your opinion, what are some actions your local government could take to reduce the risk of future hazard damages to your neighborhoods?

Actions for Local Governments to Reduce Risk
Strengthen the infrastructure in threatened areas and conduct routine exercises to respond to future hazards
More police and full time fire department. Also more security at the elementary schools.
Providing information
better roads departments to up keep storm water engineering controls to reduce flooding of roads. also would help with trees blocking roads, and utility power lines if we had a better roads department
KNOWING A STORM IS COMING I WOULD SUGGEST TRYING TO GET TO SOME OF THE BACK ROADS SOONER RATHER THAN LATER // ALSO UTILITY COMPANIES SHOULD BEGIN EARLIER THAN FALL CHECKING LINE RIGHT OF WAYS TO CLEAR OUT TREES THAT MAY HAVE GROWN UP NEAR THE LINES WHICH COULD CAUSE POWER OUTAGE IN THE EVENT OF A STORM
Inform by any means necessary
Traffic concerns in the am at the trundle bridge going to the school only one way in and out when there is a train.
Education to public on how to respond
Sensible laws about gun ownership. Clear out neighborhood drainage gullies and trenches in Highland Estates to prevent flooding. Stop building dense construction that have too many impermeable surfaces and too much water run off.
Trim Trees Repair dated storm water systems or make contractors upgrade before construction
Higher detention standards for new development (either look at previous developed areas as constant (woodland/grassland) and require new developments which flow to areas known to flood to be designed to accept higher storm sizes. Purchasing properties which are pron to flooding and could be used as parks/undisturbed flood plains. Also because waste disposal fees are so high I am in support of creating a more local landfill which would only accept trash from supporting municipalities. Also more transparency from Duke Energy concerning the repairs required by NRC or others of Dam Safety. Relating storm events to flood events
At this point local Gov't should know the areas of concern and maintain them. Do not wait until it is broke to fix. Be a little proactive.
Enforcement of roads and bridges. Potholes and roads are in terrible shape.
meetings in local community soil testing for chemical resdue....after years of cotton fields are gone
Salt trucks for those of us that have to work or be on the road in winter, including school children..
More work taking down dead trees.
pre-planning
pre-plan
more money in preoapredness

pre-plan
not sure other than pre-planning
more crime watch
Community [illegible]
mitigation
reducing flood areas
Public education
Reroute excess water which might include inspecting the slope of the road
Both the City and the County need to work together to solve issues affecting our community. Community awareness and training are key to a resilient community. One such idea would be to work with all public safety entities to begin community outreach to combat community specific threats, but on a County level.
More communication
Make sand bags available to those with creeks and river beds on their property
More Info if Needed!
Provide more road service following ice storms.
pre-plan
notify public and dispatch apporate personel
Looking at the flood proj areas
Public education on the hazards and risks
Better road drainage system and wider county roads
We need more police visibility
Cutting back the trees from power lines
Education
cutting trees that are close to roads so roads will not be impacted by wind and winter storms. Checking storm drains for clogs to keep flooding down.
A GIS crime map like Greenville County has is needed. It provides real-time updates to crimes happening in the community.
Build a better drainage system for our streets....
take civil complaints more seriously
Keep ditches cleaned
run actual drills with fire and rescue
more info with public
redundant standby cisnezasors at water pump stations
Inform the community faster and better
Bury power lines
road travel improvement, cutting trees back from road ways and power lines before crisis
Inform those in flood areas of hazards and recommend insurance.
Awareness prior to something actually happening of what to do
Keep roads cleared and remove ice from bridges
Develop a pre-incident plan for the known hazards (flooding, wildfire, etc.) and make the plan available to public as well as first responders.

information
Improved road drainage
Community Preparedness Campaigns, Mail Outs, Increased Community Awareness of Hazards
The town does not have the necessary equipment nor manpower to fix potential hazards. We can and do, however, recognize the possible hazards and notify appropriate agents and residents.
Awareness pure & simple...
Education and awareness more effective building codes/enforcement land use planning
good planning
Fix the bridges in the area
Better road maintenance and improved communications between law enforcement and emergency services.


Q11 A variety of approaches can be used to reduce the risk that hazards pose to lives and property. Please share your opinion of the following mitigation strategies by checking the box that most closely corresponds to your point-of-view.
Answered: 159 Skipped: 0
Prevention Strategies -...
Property Protection...
Public Education an...
Natural Resource...
Critical Facility...
Structural Project...
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Very Important
Somewhat Important
Not Important

Question 12: Do you have any other comments, concerns or suggestions about hazard mitigation planning in your community?

Other Comments
I know several fire fighters in Pickens County and they want more swiftwater training for when flooding happens here.
WHAT ABOUT THE RESIDENTS WHO HAVE FARMS AND ANIMALS BOTH LARGE AND SMALL -- IS THERE ANYTHING IN PLACE -- ANY EMERGENCY TRANSPORT VOLUNTEERS TO ASSIST IN RELOCATING THOSE PEOPLE AND THEIR ANIMALS.
Rely on information to allow citizens to make their own decisions with minimal governmental control
Slow down the pace of construction. University and downtown have sirens about approaching severe weather. Perhaps those could be broadcast in neighborhoods? Thank you. Design roads and bike paths for safer driving and pedestrian access.
Review of land-use regulations...update based on current development---growth
We all want to be prepared and safe in these conditions but many of us can't make appropriate preparations. However keeping roads safe in the winter is something our local government can do.
Whatever is planned should not result in extra costs for property owners. If it will require upgrades to personal property, grants that would allow anyone to apply should be offered. There are wonderful opportunities for low socio-economic families, but the middle class families don't qualify many times and are hit hard with expensive upgrades that are a strain on finances.
Vote Trump!
Consolidated dispatch and communications throughout the county. Also build backup communication network
Vote Trump
None, look out for one another as a community
I lived in an area hit by Hurricane Hugo in 1989. It was about 175 inland but we still had major damage. It can happen here
Public service announcements about the progress of the mitigation plan
Please sponsor an abti- radiation pill distribution. Have a practice run evacuating the handicapped. You do not have to take them anywhere. Just the reassurance of knocking at our doors to let us know you know where we are.
STOP PLANS TO DUMP COAL ASH IN OUR AREA
More transparent information on crimes
Need to do a lot more to keep our streets in better conditions instead of patching them up to get by
Pickens county is not ready for ANY type of disaster.
Prevention is the key. If a potential disaster then utilize resources to decrease the effect before it happens.
Public information and evacuation routing communication if something happens at Duke Power nuclear station since we are in red zone. Heard about this all the time as a kid but nothing in the last 20 years or so.

All critical facilities should be inspected by a third party contractor annually to insure that the facilities and equipment meet and or exceed regulated working conditions (OSHA, NFPA, etc. DONT JUST RELY ON ISO INSPECTIONS). All fire, rescue and EMS stations should be audited quarterly by Pickens County Administration to ensure that the facilities and equipment are clean and serviced properly. At this time it is up to the Station Chief and/or assigned personnel to complete these task with no follow-up on the status or progress. There is a lot of money put into the facilities and equipment more attention should be given to the conditions of both.
Look forward to seeing the mitigation plan updated for Pickens County
Increased Awareness and Preparedness Campaigns
Please help in raising the residential housing standards
More relief places need to be provided in the Pickens and Dacusville area like food pantry and shelters

Appendix F: Meeting Agendas and Minutes

Pickens County Hazard Mitigation Planning Meeting

April 5, 2016
2:00-3:00pm
Minutes

Present: JoAnne Huie, Will Moorhead, Jamie Stout, Denise Kwiatek, Pickens County Special Project Coordinator, and representatives from the School District, Clemson, Central, Six Mile, Pickens County EMS, Pickens County Facilities
Absent: Representatives from Easley, Pickens, Liberty and Norris.

1) Introductions
   a) All Clear Emergency Management Group – Contractors for project
      i) Will Moorhead – President
      ii) Jamie Stout – Planner
      iii) JoAnne Huie – Planner
   b) Pickens County Emergency Management
      i) Denise Kwiatek – Director
2) Mitigation Overview
   a) Identify and assess risks
      i) Man-made
      ii) Natural hazards
   b) Develop policies, strategies and priorities
   c) Provide eligibility to participating jurisdictions for future funds
      i) Funds are available
      ii) Must have a plan in place
   d) Give the community a comprehensive guide
      i) Multijurisdictional – benefits, as the community finds the specific ways to deal with the hazards that are specific to that jurisdiction
   e) Form the foundation for a community's long term strategy
   f) Create a framework for risk-based decisions
      i) If not full funding, make decisions
3) Why should you participate?
   a) Life, safety, property stabilization
   b) Each jurisdiction can apply and receive mitigation funds – not just at a county level, and a county priority
   c) Keeps each jurisdiction from having to develop their own plan
4) Outreach strategy
   a) Three groups of people
      i) Core Group
      ii) Stakeholders
      iii) Residents

b) Need to ensure that the Stakeholders/Residents are informed and get their feedback
c) FEMA requires we involve the public
    i) Outreach strategy should include
        (1) Goals
            (a) Encourage public involvement and buy-in
            (b) Solicit and incorporate stakeholder and public input into mitigation objectives, goals and action items
            (c) Facilitate stakeholder and public input into assessment and mitigation of risks facing Pickens County
                (i) Make sure that the risks that people view in their communities are incorporated into their plans
            (d) To allow public stakeholder review and comment of the draft plan
        (2) Need to talk about how to involve the other communities – need to start having public meetings
        (3) Targets of Outreach
            (a) Members of public
            (b) Neighboring communities
                (i) Letters via Denise inviting to participate
            (c) Local and regional agencies
            (d) Agencies that have authority
            (e) Businesses
            (f) Academia
            (g) Other private and non-profit interests
            (h) Faith-based institutions
        (4) Methods of Outreach
            (a) Community Events
            (b) Interviews
                (i) Talking to the stakeholders
            (c) News Media
                (i) Online calendars
                (ii) Newspapers
            (d) Presentations to Governing Bodies
            (e) Questionnaires/Surveys
            (f) Public meetings
                (i) Existing meetings, Public Health, LEPC
            (g) Social Media
                (i) Promoting to get feedback
            (h) Area-specific meetings
            (i) Website
            (j) Letter to Adjacent Counties

(k) Faith Based Outreach
(l) Business/Private Sector
(5) Project Websites – designed to keep people informed, and see where the project is going
(a) Introduction
(b) Hazard Mitigation Planning Process
(c) Planning Documents
(d) Suggest Mitigation Actions
(e) Questionnaire
(6) Community Survey
(a) Draft – will send to the group for comment
(b) What does the group think about the revised survey –
(i) Last time people didn't understand what mitigation was – explaining what that is will help.
ii) Local Jurisdiction Outreach
(1) Promoting website
(2) Distribute survey
(3) Advertise public meetings
(4) Distribute planning materials
(5) Utilize social media, flyers
(6) Other things the group wants to ad? – Festivals coming up great. Every Saturday ____
(7) All Clear will get Flyers to the group in the next week or so
iii) Timing of the Outreach
(1) During Hazard Id and Risk Assessment, will do survey distribution
(2) During mitigation action item development
(3) Once a draft/final plan is complete – want to use all methods possible to distribution
5) Hazard Identification
a) Natural Hazards
b) Man-made Hazards
c) Only natural hazards are eligible for mitigation funding, and evaluated by FEMA
d) Hazards listed in 2011 Plan
i) Radiological – transportation is the primary concern
ii) Public Health – Zika virus is on people's mind
iii) Cyber Security
iv) Chemical Spill – tractor trailer accident (Clemson)
v) Hazardous Materials – the citizens don't necessarily know what that means. Maybe change to chemical so public understands
vi) Water contamination – Drinking Water (Flint, MI)

6) Capability Assessment
    a) Looks at the existing things in a community to determine what resources the community has to achieve long-term risk
        i) Planning and Regulatory
        ii) Administrative and Technical
        iii) Financial
        iv) Education and Outreach
    b) Matrix for each jurisdiction to assess their capabilities
        i) Get a sense of resources and capabilities of each jurisdiction?
7) Next Steps
    a) Implement the outreach strategy
    b) Risk Assessment Process
    c) Next Core Group Meeting
    d) Geographic Information Systems POC identification
        i) Do any other jurisdictions have GIS information or capabilities?
8) Contact information
    a) Send any information to All Clear or to Denise

Pickens County Hazard Mitigation Core Group Meeting Summary
October 24th, 2016

Meeting Facilitators: William Moorhead and Jamie Stout- All Clear Emergency Management Group

Attendees: See sign-in sheet

Meeting Agenda and Discussion:

1. Outreach Strategy
    a. The final public outreach strategy was presented to the committee for approval. The committee approved and continue to implement the actions points contained within.
2. Mitigation Factsheet
    a. The Pickens County Mitigation Factsheet was distributed for use by all jurisdictions in conjunction with activities identified in the public outreach strategy.
3. Mitigation Survey
    a. Results of the mitigation survey were discussed throughout the meeting. The survey remains active and committee members were asked to continue to promote the survey, particularly in jurisdictions largely unrepresented in the results.
4. Individualized Community Profile
    a. Individual community profiles were discussed and information gaps were identified and will be filled by committee representatives as needed.
5. Community Capability Matrix
    a. A jurisdiction specific matrix listing the community capabilities needed for the plan was provided to each community. The committee was provided time in the meeting to complete or update the matrix as necessary.
6. Remaining Questions
    a. Each jurisdiction was provided a unique packet of information requesting information needed for completion of the plan. Time was provided in the meeting to complete the remaining pieces of information as requested.
7. Community Assets

   a. A hazard and vulnerability assessment was completed by examining the assets present in the community and the risks faced individually by jurisdiction as well as countywide. The process was as follows: hazard identification, asset identification, risk analysis, and vulnerability summary. Each hazard was ranked during the meeting based on a vulnerability and consequence formula.

8. Problem Statements
   a. The committee was provided with existing problem statements to update as well as a procedure for creating any new problem statements necessary.
9. Existing Mitigation Goals and Mitigation Actions
   a. Committee reviewed the current mitigation strategy and was asked to make any improvements and additions necessary to meet the needs of the community. The Mitigation Goals, Mitigation Actions, and Action Plan were all reviewed and discussed.
   b. A benefit cost review was also conducted during this session.
10. Future Mitigation Action Items
   a. The committee was asked to consider additional mitigation actions items for inclusion in the plan as well as incorporate feedback received from the public through the survey and public meetings.

Conclusion: Each committee member with outstanding pieces of information necessary for plan completion was requested to submit the information within 30 days.

Pickens County Hazard Mitigation Planning Team
October 24,2016

Name	Title	Agency/ Organization	Email
WENDELL MELTON	COUNCILMAN	NORRIS	
SAMUEL BYERS	LIETENANT	PICKENS PD	sbyers@pickenscity.com
JAMES HAYS	Zoning Administrator	SIX MILE SC	
DAVID CHILDRESS		PCEMS	
BILL BOX	FIRE MARSHAL	CITY OF CLEMSON	bbox@cityofclemson.org
Khristy Justice	Chief of Police	Central P.D.	kjustice@cityofcentral.org
Cory Cox	PUBLIC WORKS DIRECTOR	CITY OF PICKENS	CCOX@PICKENSCITY.COM
Chris Eland	Fire Chief	City of Pickens	chriseland@pickenscity.com
LANE Wood	TRAINING OFFICER	PCEMS	lanew@co.pickens.sc.us
LYNN D. FISHER	CLEMSON UNIV. EMERG. MAN	CLEMSON	lynnf@clemson.edu

Pickens County Hazard Mitigation Planning Team
October 24,2016

ALL CLEAR
EMERGENCY MANAGEMENT GROUP

Name	Title	Agency/ Organization	Email
Scottie Ferguson	Stormwater Manager	Pickens County	scottief@co.pickens.sc.us
R. Stoddard	Mayor	Six Mile	
[illegible]	Mayor	Norris	
Aaron Boyles	Director Transportation	SDPC	aaronboyles@pickens.k12.sc.us
Tommy Holcombe Sr	Planning & Devlp	Easley	THolcombe@cityofEasley.com
Butch Womack	Fire Chief	Easley	efdwomack@easleyfd.net
Kandy Kelley	Coroner	PCCO	kandyk@co.pickens.sc.us

Agenda, Six Mile Council Meeting
Tuesday, November 1, 2016, 7:00 PM
106 South Main Street

1) **Welcome and Call to Order (Mayor Stoddard)**
2) **Invocation**
3) **Pledge of Allegiance**
4) **Public Session**
   Emily DeRoberts- Duke Energy
   Diane Bowen – update on Christmas Parade
   Scout Gabe Boggs – Food Pantry
   Presentation by Denise Kwiatek, Director, Pickens County Emergency Management
5) **Approval of Minutes** (Oct 4)
6) **Committee Reporting/Discussion**
   a) Safety — Chairman Yongue
   b) Recreation — Chairman Crosby
   c) Administration — Chairman Bedenbaugh
   d) Budget — Chairman Atkinson
   e) Mayor's Report
7) **Action Item: Consider amending the first reading of a motion from last meeting to transfer $4500 from the Town of Six Mile Fund Balance into the Town of Six Mile 2016-17-FY operating budget for the purpose of repairing the stadium lights at Ponderosa Park to $5800. This amendment constitutes a first reading to transfer funding**
8) **Action Item: Consider a motion to adopt a Resolution in recognition of the many contributions and years of dedicated service that Senator Larry A. Martin provided to the citizens of Six Mile and the surrounding community**
9) **Action Item: Consider First Reading of a motion to update the Business License Ordinance**
10) **Action Item: Consider a motion to adopt a Resolution honoring the Six Mile Cubs 8 and Under Coaches Pitch Baseball Team**
11) **Action Item: Consider a motion to retain McKinley Cooper as the Town's Auditor for the FY17**
12) **Executive Session: Personnel Matter re SC State Code Section 30-4-70(a)(1)**
    Legal Matter re SC State Code Section 30-4-70(a)(2)
13) **Executive Session Motions if necessary**
14) **Adjourn**

Regular Council Meeting

Tuesday, November 1, 2016

The regular Six Mile Town Council meeting was held Tuesday, November 1, 2016 starting at 7 pm at 106 South Main Street, Six Mile, SC. Members in attendance were Mayor Roy Stoddard, presiding; Council: James Atkinson, Dan Crosby and Tommy Yongue. The agenda was emailed to the Pickens Courier, the Pickens Sentinel, the Greenville News, the Seneca/Clemson Journal and the Anderson Independent on October 31, 2016.

Welcome and Call to Order:
Mayor Stoddard welcomed everyone and called the meeting to order.

Invocation and Pledge
The Mayor asked Councilman Crosby to provide the invocation and then he asked Boy Scout, Gabe Boggs to come forward and lead the Pledge of Allegiance.

Public Session
Mayor Stoddard asked Amy Goodin and Kayla Seaborn to tell Council about the success of the second annual Trick or Treat in downtown Six Mile.
Emily DeRoberts then came forward to present the Town with a $7000 check for the Park project through an Environmental Education Grant from Duke Energy.
Diane Bowen came forward to update Council on the progress of the Christmas Parade.
Mayor Stoddard then asked Gabe Boggs to update Council on his Eagle Scout project of a Little Food Pantry. His project is progressing nicely and he will keep them updated.
Mayor Stoddard asked consent from Council to move Action Item #8 up next. After getting consent, Councilman Atkinson made a motion to adopt a Resolution honoring the Six Mile Cubs 8 and Under Coaches Pitch Baseball Team, Councilman Crosby made the second and Council voted unanimously to adopt the Resolution.

Denise Kwiatek, Director of the Pickens County Emergency Management came forward to speak to Council about the Pickens County Hazard Mitigation Plan.
FEMA Grants that used to only be available to the County are now available to cities.
Pat Street told Council that he would like for them to try to get a grant to help the issue of flooding on Aaron Drive.

Approval of Minutes
Councilman Atkinson, made a motion to accept the minutes for October 4, 2016; Council Member Yongue seconded and the vote to accept the minutes as written was unanimous.

Safety Committee
Mayor Stoddard asked Councilman Yongue to give the statistics report from the Sheriff's Office for the Month of October.

Recreation Committee
Mayor Stoddard asked Dan Crosby for an update on Recreation. Everything is wrapped up for the fall. The banquet and the football campout was last Saturday. Councilman Crosby mentioned that the officials need to get together and get spring sports' registration organized. Tim Friar mentioned that he plans to send registration forms to the schools in early December and again in January. The Board wants to stick with a deadline for signups so ordering uniforms is not such a burden.

Budget
Mayor Stoddard asked Councilman Atkinson for an update on the budget. Council members Crosby and Atkinson want to meet with Recreation Officials and" clean up" their budget.
He mentioned that the Town of Six Mile lost its 9th mayor, Homer LeRoy Stewart passed away Thursday, October 27.

Page 1 of 2

Regular Council Meeting

Tuesday, November 1, 2016

Mayor's Report
Mayor Stoddard bragged on the success of the Halloween Trick or Treat last night and the tremendous effort put forth by the committee.

Action Item:
Councilman Atkinson made a motion to Consider amending the first reading of a motion from last meeting to transfer $4500 from the Town of Six Mile Fund Balance into the Town of Six Mile 2016-17-FY operating budget for the purpose of repairing the stadium lights at Ponderosa Park to $5800. This amendment constitutes a first reading to transfer funding. The original estimate was lower because they had to do more splices than they originally thought. Councilman Yongue made the second and the vote was Unanimous.

Mayor Stoddard made a motion to adopt a Resolution in recognition of the many contributions and years of dedicated service that Senator Larry A. Martin provided to the citizens of Six Mile and the surrounding community. Councilman Atkinson made the second and the vote was unanimous.

Mayor Stoddard made a motion to update (no changes) the Business License Ordinance Councilman Atkinson made a second and the vote was unanimous.

Councilman Atkinson made a motion to retain McKinley Cooper as the Town's Auditor for the FY17 year. Councilman Yongue made the second and the vote was unanimous.

Councilman Atkinson made a motion to go into Executive Session for a personnel matter and a legal matter at 7:56. Councilman Crosby made the second and the vote to go into Executive Session was unanimous.
There were no motions from Executive Session.

Adjourn
Mayor Stoddard adjourned the meeting at 8:36

Respectfully Submitted

Rita Martin

Rita Martin, Clerk/Treasurer

Approved:

by: Roy C. Stoddard

Date: 12-6-16

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City of Pickens
Where the Mountains Begin.

219 Pendleton Street
Pickens, SC 29671
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AGENDA
PICKENS CITY COUNCIL
SPECIAL CALLED SESSION

May 15, 2017 – City Hall Council Chambers – 6:00 P.M.

1. Invocation
2. Call Special Called Session to Order
3. Public Hearing for the Community Needs Assessment for the Community Development Block Grant Program
4. Present Pickens County Multijurisdictional Mitigation Plan (Denise Kwiatek, Pickens County EMA)
5. Review City Lake Policy 2012-02
6. Reports from Council Committees:
   a. Parks & Recreation (Chair Carlton Holley, Members Donnie McKinney & Lois Porter)
   b. Planning/PRA (Chair Patrick Lark, Members Carlton Holley & Fletcher Perry)
   c. Finance (Chair Lois Porter, Members Patrick Lark & Patti Welborn)
   d. Public Works & Utilities (Chair Patti Welborn, Members Fletcher Perry & Patrick Lark)
   e. Police/Fire (Chair Fletcher Perry, Members Patti Welborn & Donnie McKinney)
   f. Pickens Senior Citizens (Chair Donnie McKinney, Members Carlton Holley & Lois Porter)
7. Unscheduled/Miscellaneous Business for Discussion
8. Motion to enter Executive Session for the Purpose of Discussing Personnel (Admin)
9. Motion to Adjourn Executive Session
10. Motion to Adjourn Special Called Session

Appendix G: Hazus Earthquake Report Charleston Earthquake Scenario

Hazus-MH: Earthquake Event Report

Region Name: City_Central_EQFLU

Earthquake Scenario: Charleston EQ 7.3M

Print Date: October 11, 2016

Table of Contents

General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 24.00 square miles and contains 2 census tracts. There are over 3 thousand households in the region which has a total population of 9,731 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 836 (millions of dollars). Approximately 92.00 % of the buildings (and 81.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,037 and 404 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 2 thousand buildings in the region which have an aggregate total replacement value of 836 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 70% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of 0 beds. There are 3 schools, 0 fire stations, 1 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 30 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,441.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 13 bridges, 1,245 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	13	11.30
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**978.20**
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**59.30**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,037.50**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	7.40
	Facilities	0	0.00
	Pipelines	1,542	176.60
		Subtotal	**184.00**
Waste Water	Distribution Lines	NA	4.40
	Facilities	7	0.50
	Pipelines	2,084	191.20
		Subtotal	**196.10**
Natural Gas	Distribution Lines	NA	2.90
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**2.90**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	3	36.10
		Subtotal	**36.10**
Communication	Facilities	0	0.00
		Subtotal	**0.00**
		Total	**419.10**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	Charleston EQ 7.3M
Type of Earthquake	Historical
Fault Name	NA
Historical Epicenter ID #	4694
Probabilistic Return Period	NA
Longitude of Epicenter	-80.00
Latitude of Epicenter	32.90
Earthquake Magnitude	7.30
Depth (Km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Building Damage

Hazus estimates that about 11 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	4	0.14	0	0.22	0	0.22	0	0.36	0	0.23
Commercial	122	4.51	3	7.35	1	8.55	0	14.60	0	12.79
Education	12	0.43	0	0.62	0	0.70	0	1.12	0	1.09
Government	10	0.36	0	0.55	0	0.63	0	1.00	0	0.75
Industrial	44	1.62	1	2.34	0	2.69	0	4.21	0	2.68
Other Residential	701	25.94	21	50.38	6	60.01	0	39.37	0	30.51
Religion	22	0.82	1	1.26	0	1.66	0	3.06	0	3.69
Single Family	1,788	66.17	15	37.27	3	25.55	0	36.27	0	48.25
Total	**2,702**		**41**		**11**		**1**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	1,920	71.05	12	29.12	1	8.36	0	0.00	0	0.00
Steel	105	3.88	2	4.81	1	4.75	0	5.50	0	0.00
Concrete	30	1.11	1	1.38	0	1.21	0	0.75	0	0.00
Precast	8	0.28	0	0.58	0	1.20	0	2.63	0	0.00
RM	52	1.91	1	2.10	0	3.46	0	5.61	0	0.00
URM	258	9.54	10	25.62	4	36.43	1	72.05	0	100.00
MH	330	12.22	15	36.39	5	44.59	0	13.46	0	0.00
Total	**2,702**		**41**		**11**		**1**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 0 hospital beds available for use. On the day of the earthquake, the model estimates that only 0 hospital beds (0.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 0.00% of the beds will be back in service. By 30 days, 0.00% will be operational.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**At Least Moderate Damage > 50%**	**Complete Damage > 50%**	**With Functionality > 50% on day 1**
Hospitals	0	0	0	0
Schools	3	0	0	3
EOCs	0	0	0	0
PoliceStations	1	0	0	1
FireStations	0	0	0	0

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	0	0
	Bridges	13	0	0	13	13
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	12	12
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	7	0	0	7	7
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	3	0	0	2	2
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	1e+028	5e+028
Waste Water	481	3e+028	1e+029
Natural Gas	147	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	3,840	3,840	3,840	3,840	3,840	3,840
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 76.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 9,731) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

· Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
· Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
· Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
· Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.64 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.60 (millions of dollars); 30 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 65 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.02	0.00	0.01	0.03
	Capital-Related	0.00	0.00	0.02	0.00	0.00	0.02
	Rental	0.01	0.03	0.01	0.00	0.00	0.05
	Relocation	0.02	0.03	0.01	0.00	0.01	0.08
	Subtotal	**0.03**	**0.06**	**0.06**	**0.01**	**0.02**	**0.18**
Capital Stock Losses							
	Structural	0.04	0.05	0.02	0.02	0.01	0.13
	Non_Structural	0.09	0.11	0.02	0.02	0.02	0.25
	Content	0.01	0.01	0.00	0.01	0.00	0.04
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.13**	**0.18**	**0.04**	**0.04**	**0.03**	**0.42**
	Total	**0.16**	**0.24**	**0.10**	**0.05**	**0.05**	**0.60**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	11.26	$0.02	0.16
	Tunnels	0.00	$0.00	0.00
	Subtotal	**978.20**	**0.00**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**59.30**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1037.50**	**0.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	7.40	$0.01	0.13
	Subtotal	**183.99**	**$0.01**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	0.50	$0.00	0.00
	Distribution Lines	4.40	$0.01	0.15
	Subtotal	**196.07**	**$0.01**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	2.90	$0.00	0.06
	Subtotal	**2.94**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	36.10	$0.00	0.00
	Subtotal	**36.08**	**$0.00**	
Communication	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
	Total	**419.08**	**$0.02**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina					
	Pickens	9,731	680	155	836
Total State		**9,731**	**680**	**155**	**836**
Total Region		**9,731**	**680**	**155**	**836**

Hazus-MH: Earthquake Event Report

Region Name: City_Clemson_EQFLH

Earthquake Scenario: Charleston EQ 7.3M

Print Date: October 11, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 51.61 square miles and contains 6 census tracts. There are over 9 thousand households in the region which has a total population of 29,484 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 2,912 (millions of dollars). Approximately 91.00 % of the buildings (and 80.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,053 and 407 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 7 thousand buildings in the region which have an aggregate total replacement value of 2,912 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 72% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of 0 beds. There are 6 schools, 1 fire stations, 5 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 87 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,460.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 29 bridges, 1,543 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	29	24.00
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**990.90**
Railways	Bridges	0	0.00
	Facilities	1	2.70
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**62.00**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	1	0.90
		Subtotal	**0.90**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,053.80**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	22.20
	Facilities	3	2.10
	Pipelines	1,542	176.60
		Subtotal	**201.00**
Waste Water	Distribution Lines	NA	13.30
	Facilities	26	1.90
	Pipelines	2,084	191.20
		Subtotal	**206.40**
Natural Gas	Distribution Lines	NA	8.90
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**8.90**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	3	36.10
		Subtotal	**36.10**
Communication	Facilities	0	0.00
		Subtotal	**0.00**
		Total	**452.30**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	Charleston EQ 7.3M
Type of Earthquake	Historical
Fault Name	NA
Historical Epicenter ID #	4694
Probabilistic Return Period	NA
Longitude of Epicenter	-80.00
Latitude of Epicenter	32.90
Earthquake Magnitude	7.30
Depth (Km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Building Damage

Hazus estimates that about 27 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	15	0.20	0	0.31	0	0.31	0	0.46	0	0.29
Commercial	423	5.65	10	9.66	3	11.37	0	17.35	0	13.87
Education	52	0.69	1	1.09	0	1.28	0	1.85	0	1.71
Government	23	0.31	0	0.49	0	0.56	0	0.78	0	0.52
Industrial	92	1.23	2	1.98	1	2.35	0	3.33	0	2.09
Other Residential	1,706	22.79	44	43.58	13	52.78	1	35.60	0	28.11
Religion	59	0.79	1	1.30	0	1.74	0	2.88	0	3.27
Single Family	5,114	68.33	42	41.59	8	29.61	1	37.74	0	50.15
Total	**7,484**		**101**		**26**		**2**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	5,444	72.74	32	31.74	2	9.53	0	0.00	0	0.00
Steel	335	4.47	6	5.90	1	5.88	0	6.05	0	0.00
Concrete	107	1.43	2	1.83	0	1.62	0	1.04	0	0.00
Precast	35	0.47	1	0.97	1	2.03	0	3.86	0	0.00
RM	150	2.01	2	2.32	1	3.86	0	5.61	0	0.00
URM	746	9.97	29	28.85	11	41.81	1	74.23	0	100.00
MH	666	8.90	29	28.39	9	35.28	0	9.21	0	0.00
Total	**7,484**		**101**		**26**		**2**		**0**	

*Note:

RM	Reinforced Masonry
URM	Unreinforced Masonry
MH	Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 0 hospital beds available for use. On the day of the earthquake, the model estimates that only 0 hospital beds (0.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 0.00% of the beds will be back in service. By 30 days, 0.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	6	0	0	6
EOCs	0	0	0	0
PoliceStations	5	0	0	5
FireStations	1	0	0	1

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	41	41
	Bridges	29	0	0	29	29
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	12	12
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	1	0	0	1	1
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	1	0	0	1	1
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	3	0	0	3	3
Waste Water	26	0	0	26	26
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	3	0	0	2	2
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	4e+027	1e+028
Waste Water	481	6e+027	3e+028
Natural Gas	444	1	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	9,788	9,788	9,788	9,788	9,788	9,788
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 74.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 40 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2 households to be displaced due to the earthquake. Of these, 2 people (out of a total population of 29,484) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	1	0	0	0
	Single Family	0	0	0	0
	Total	**1**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	1	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**1**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**1**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 2.40 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 2.31 (millions of dollars); 34 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 62 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.02	0.10	0.01	0.03	0.15
	Capital-Related	0.00	0.01	0.10	0.00	0.01	0.12
	Rental	0.02	0.14	0.05	0.00	0.01	0.22
	Relocation	0.06	0.08	0.06	0.01	0.08	0.28
	Subtotal	**0.08**	**0.25**	**0.31**	**0.02**	**0.12**	**0.78**
Capital Stock Losses							
	Structural	0.11	0.25	0.07	0.03	0.04	0.50
	Non_Structural	0.25	0.43	0.09	0.03	0.10	0.90
	Content	0.03	0.04	0.02	0.01	0.02	0.12
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.39**	**0.72**	**0.19**	**0.07**	**0.17**	**1.53**
	Total	**0.47**	**0.96**	**0.50**	**0.09**	**0.29**	**2.31**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	24.00	$0.04	0.16
	Tunnels	0.00	$0.00	0.00
	Subtotal	**990.90**	**0.00**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	2.66	$0.01	0.19
	Subtotal	**62.00**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.89	$0.00	0.19
	Subtotal	**0.90**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1053.80**	**0.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	2.10	$0.00	0.00
	Distribution Lines	22.20	$0.03	0.12
	Subtotal	**200.99**	**$0.03**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	1.90	$0.00	0.01
	Distribution Lines	13.30	$0.02	0.14
	Subtotal	**206.37**	**$0.02**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	8.90	$0.01	0.06
	Subtotal	**8.89**	**$0.01**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	36.10	$0.00	0.00
	Subtotal	**36.08**	**$0.00**	
Communication	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
	Total	**452.33**	**$0.05**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina	Pickens	29,484	2,315	596	2,912
Total State		**29,484**	**2,315**	**596**	**2,912**
Total Region		**29,484**	**2,315**	**596**	**2,912**

Hazus-MH: Earthquake Event Report

Region Name: City_Easley_EQFLHU

Earthquake Scenario: Charleston EQ 7.3M

Print Date: October 11, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 59.59 square miles and contains 8 census tracts. There are over 15 thousand households in the region which has a total population of 39,735 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 4,229 (millions of dollars). Approximately 92.00 % of the buildings (and 74.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,059 and 441 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 16 thousand buildings in the region which have an aggregate total replacement value of 4,229 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 70% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 96 beds. There are 10 schools, 1 fire stations, 4 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 102 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,500.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 56 bridges, 1,695 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	56	33.20
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**1,000.10**
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**59.30**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,059.50**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	29.80
	Facilities	7	31.60
	Pipelines	1,542	176.60
		Subtotal	**238.10**
Waste Water	Distribution Lines	NA	17.90
	Facilities	12	1.60
	Pipelines	2,084	191.20
		Subtotal	**210.60**
Natural Gas	Distribution Lines	NA	11.90
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**11.90**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	4	36.10
		Subtotal	**36.10**
Communication	Facilities	1	4.50
		Subtotal	**4.50**
		Total	**501.20**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	Charleston EQ 7.3M
Type of Earthquake	Historical
Fault Name	NA
Historical Epicenter ID #	4694
Probabilistic Return Period	NA
Longitude of Epicenter	-80.00
Latitude of Epicenter	32.90
Earthquake Magnitude	7.30
Depth (Km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Building Damage

Hazus estimates that about 97 buildings will be at least moderately damaged. This is over 1.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	40	0.25	1	0.35	0	0.35	0	0.72	0	0.46
Commercial	840	5.10	26	7.66	8	9.06	1	18.73	0	16.12
Education	19	0.12	1	0.16	0	0.18	0	0.36	0	0.38
Government	8	0.05	0	0.06	0	0.06	0	0.12	0	0.09
Industrial	255	1.55	8	2.23	2	2.66	0	5.13	0	3.67
Other Residential	3,046	18.51	155	45.49	53	57.71	1	26.01	0	5.97
Religion	64	0.39	2	0.55	1	0.72	0	1.63	0	1.96
Single Family	12,180	74.03	148	43.50	27	29.25	3	47.32	0	71.35
Total	**16,452**		**340**		**92**		**5**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	11,717	71.22	108	31.84	9	10.21	0	0.00	0	0.00
Steel	574	3.49	15	4.35	4	4.69	0	7.18	0	0.87
Concrete	94	0.57	2	0.64	1	0.59	0	0.46	0	0.00
Precast	38	0.23	1	0.43	1	0.93	0	2.57	0	0.00
RM	128	0.78	3	0.85	1	1.45	0	2.98	0	0.00
URM	1,237	7.52	63	18.62	25	26.88	4	65.77	0	99.13
MH	2,664	16.19	147	43.26	51	55.24	1	21.04	0	0.00
Total	**16,452**		**340**		**92**		**5**		**0**	

*Note:

RM Reinforced Masonry

URM Unreinforced Masonry

MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 96 hospital beds available for use. On the day of the earthquake, the model estimates that only 87 hospital beds (92.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 97.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	0	0	1
Schools	10	0	0	10
EOCs	0	0	0	0
PoliceStations	4	0	0	4
FireStations	1	0	0	1

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	25	25
	Bridges	56	0	0	56	56
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	10	10
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	7	0	0	7	7
Waste Water	12	0	0	12	12
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	4	0	0	4	4
Communication	1	0	0	1	1

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	2e+028	7e+028
Waste Water	481	3e+028	1e+029
Natural Gas	597	2	1
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	15,767	15,767	15,767	15,767	15,767	15,767
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 75.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 80 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2 households to be displaced due to the earthquake. Of these, 1 people (out of a total population of 39,735) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

· Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
· Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
· Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
· Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	1	0	0	0
	Single Family	1	0	0	0
	Total	**1**	**0**	**0**	**0**
2 PM	Commercial	1	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**2**	**0**	**0**	**0**
5 PM	Commercial	1	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**1**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 4.96 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 4.80 (millions of dollars); 36 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 52 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.07	0.39	0.01	0.01	0.48
	Capital-Related	0.00	0.03	0.26	0.01	0.00	0.30
	Rental	0.06	0.06	0.14	0.01	0.00	0.28
	Relocation	0.21	0.11	0.28	0.02	0.04	0.65
	Subtotal	**0.27**	**0.27**	**1.07**	**0.05**	**0.06**	**1.71**
Capital Stock Losses							
	Structural	0.38	0.16	0.29	0.05	0.04	0.92
	Non_Structural	0.98	0.30	0.45	0.06	0.05	1.84
	Content	0.12	0.02	0.13	0.03	0.01	0.31
	Inventory	0.00	0.00	0.00	0.01	0.00	0.01
	Subtotal	**1.48**	**0.48**	**0.88**	**0.16**	**0.10**	**3.09**
	Total	**1.75**	**0.75**	**1.94**	**0.20**	**0.15**	**4.80**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	33.23	$0.06	0.17
	Tunnels	0.00	$0.00	0.00
	Subtotal	**1000.10**	**0.10**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**59.30**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1059.50**	**0.10**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	31.60	$0.00	0.02
	Distribution Lines	29.80	$0.05	0.17
	Subtotal	**238.08**	**$0.06**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	1.60	$0.00	0.01
	Distribution Lines	17.90	$0.04	0.20
	Subtotal	**210.64**	**$0.04**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	11.90	$0.01	0.09
	Subtotal	**11.93**	**$0.01**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	36.10	$0.00	0.00
	Subtotal	**36.08**	**$0.00**	
Communication	Facilities	4.50	$0.00	0.01
	Subtotal	**4.47**	**$0.00**	
	Total	**501.20**	**$0.10**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina					
	Pickens	39,735	3,147	1,081	4,229
Total State		**39,735**	**3,147**	**1,081**	**4,229**
Total Region		**39,735**	**3,147**	**1,081**	**4,229**

Hazus-MH: Earthquake Event Report

Region Name: City_Liberty_EQFLH

Earthquake Scenario: Charleston EQ 7.3M

Print Date: October 11, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 32.00 square miles and contains 2 census tracts. There are over 3 thousand households in the region which has a total population of 9,684 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 818 (millions of dollars). Approximately 94.00 % of the buildings (and 76.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,093 and 407 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 4 thousand buildings in the region which have an aggregate total replacement value of 818 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 64% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of 0 beds. There are 4 schools, 1 fire stations, 1 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 45 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,500.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 31 bridges, 1,245 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	31	18.80
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**985.70**
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**59.30**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	1	10.70
	Runways	1	38.00
		Subtotal	**48.60**
		Total	**1,093.70**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	7.30
	Facilities	5	30.20
	Pipelines	1,542	176.60
		Subtotal	**214.20**
Waste Water	Distribution Lines	NA	4.40
	Facilities	9	0.90
	Pipelines	2,084	191.20
		Subtotal	**196.50**
Natural Gas	Distribution Lines	NA	2.90
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**2.90**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	1	9.00
		Subtotal	**9.00**
Communication	Facilities	0	0.00
		Subtotal	**0.00**
		Total	**422.60**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	Charleston EQ 7.3M
Type of Earthquake	Historical
Fault Name	NA
Historical Epicenter ID #	4694
Probabilistic Return Period	NA
Longitude of Epicenter	-80.00
Latitude of Epicenter	32.90
Earthquake Magnitude	7.30
Depth (Km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Building Damage

Building Damage

Hazus estimates that about 23 buildings will be at least moderately damaged. This is over 1.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	11	0.25	0	0.31	0	0.29	0	0.75	0	0.56
Commercial	135	3.16	4	4.30	1	4.82	0	12.45	0	12.46
Education	8	0.18	0	0.22	0	0.24	0	0.58	0	0.73
Government	5	0.11	0	0.13	0	0.14	0	0.31	0	0.25
Industrial	80	1.88	2	2.35	1	2.62	0	6.26	0	4.93
Other Residential	1,076	25.16	48	58.56	15	68.58	0	30.65	0	2.23
Religion	23	0.54	1	0.69	0	0.87	0	2.43	0	3.39
Single Family	2,939	68.71	28	33.44	5	22.45	0	46.57	0	75.45
Total	**4,277**		**82**		**23**		**1**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	2,783	65.06	19	23.04	2	7.17	0	0.00	0	0.00
Steel	120	2.80	3	3.06	1	3.02	0	5.76	0	0.00
Concrete	18	0.41	0	0.40	0	0.34	0	0.28	0	0.00
Precast	8	0.19	0	0.32	0	0.65	0	2.13	0	0.00
RM	23	0.54	0	0.55	0	0.88	0	2.30	0	0.00
URM	282	6.59	12	14.71	5	20.05	1	60.61	0	100.00
MH	1,044	24.40	48	57.92	15	67.90	0	28.92	0	0.00
Total	**4,277**		**82**		**23**		**1**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 0 hospital beds available for use. On the day of the earthquake, the model estimates that only 0 hospital beds (0.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 0.00% of the beds will be back in service. By 30 days, 0.00% will be operational.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**At Least Moderate Damage > 50%**	**Complete Damage > 50%**	**With Functionality > 50% on day 1**
Hospitals	0	0	0	0
Schools	4	0	0	4
EOCs	0	0	0	0
PoliceStations	1	0	0	1
FireStations	1	0	0	1

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	13	13
	Bridges	31	0	0	31	31
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	12	12
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	0	0	1	1
	Runways	1	0	0	1	1

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	5	0	0	5	5
Waste Water	9	0	0	9	9
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	1	1
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	2e+028	7e+028
Waste Water	481	3e+028	1e+029
Natural Gas	147	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	3,797	3,797	3,797	3,797	3,797	3,797
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 75.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 9,684) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.72 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.64 (millions of dollars); 30 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 58 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.02	0.01	0.00	0.03
	Capital-Related	0.00	0.00	0.02	0.00	0.00	0.02
	Rental	0.01	0.00	0.01	0.00	0.00	0.03
	Relocation	0.04	0.02	0.02	0.01	0.01	0.10
	Subtotal	**0.05**	**0.03**	**0.07**	**0.02**	**0.02**	**0.19**
Capital Stock Losses							
	Structural	0.06	0.03	0.02	0.02	0.01	0.15
	Non_Structural	0.14	0.04	0.03	0.02	0.02	0.25
	Content	0.02	0.00	0.01	0.01	0.00	0.04
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.22**	**0.07**	**0.05**	**0.06**	**0.04**	**0.45**
	Total	**0.27**	**0.10**	**0.13**	**0.09**	**0.06**	**0.64**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	18.85	$0.04	0.20
	Tunnels	0.00	$0.00	0.00
	Subtotal	**985.70**	**0.00**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**59.30**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	10.65	$0.02	0.23
	Runways	37.96	$0.00	0.00
	Subtotal	**48.60**	**0.00**	
	Total	**1093.70**	**0.10**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	30.20	$0.00	0.01
	Distribution Lines	7.30	$0.01	0.13
	Subtotal	**214.15**	**$0.01**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	0.90	$0.00	0.01
	Distribution Lines	4.40	$0.01	0.16
	Subtotal	**196.45**	**$0.01**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	2.90	$0.00	0.07
	Subtotal	**2.94**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	9.00	$0.00	0.00
	Subtotal	**9.02**	**$0.00**	
Communication	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
	Total	**422.56**	**$0.02**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina					
	Pickens	9,684	625	193	818
Total State		**9,684**	**625**	**193**	**818**
Total Region		**9,684**	**625**	**193**	**818**

Hazus-MH: Earthquake Event Report

Region Name: City_Norris_EQFLHU

Earthquake Scenario: Charleston EQ 7.3M

Print Date: October 11, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.97 square miles and contains 2 census tracts. There are over 3 thousand households in the region which has a total population of 7,678 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 740 (millions of dollars). Approximately 93.00 % of the buildings (and 79.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,045 and 437 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 3 thousand buildings in the region which have an aggregate total replacement value of 740 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 70% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of 0 beds. There are 3 schools, 2 fire stations, 1 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 43 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,482.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 30 bridges, 1,226 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	30	19.30
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**986.10**
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**59.30**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,045.50**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	6.40
	Facilities	9	59.70
	Pipelines	1,542	176.60
		Subtotal	**242.70**
Waste Water	Distribution Lines	NA	3.80
	Facilities	9	0.90
	Pipelines	2,084	191.20
		Subtotal	**195.90**
Natural Gas	Distribution Lines	NA	2.60
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**2.60**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	1	9.00
		Subtotal	**9.00**
Communication	Facilities	0	0.00
		Subtotal	**0.00**
		Total	**450.10**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	Charleston EQ 7.3M
Type of Earthquake	Historical
Fault Name	NA
Historical Epicenter ID #	4694
Probabilistic Return Period	NA
Longitude of Epicenter	-80.00
Latitude of Epicenter	32.90
Earthquake Magnitude	7.30
Depth (Km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Building Damage

Building Damage

Hazus estimates that about 16 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	8	0.22	0	0.31	0	0.31	0	0.67	0	0.45
Commercial	132	3.73	3	5.73	1	6.67	0	14.68	0	13.32
Education	5	0.14	0	0.19	0	0.22	0	0.45	0	0.50
Government	4	0.11	0	0.15	0	0.16	0	0.32	0	0.25
Industrial	64	1.80	2	2.51	0	2.85	0	5.71	0	4.07
Other Residential	657	18.52	30	48.95	10	59.79	0	24.34	0	2.46
Religion	24	0.68	1	0.97	0	1.26	0	3.01	0	3.89
Single Family	2,653	74.80	25	41.18	5	28.73	0	50.80	0	75.05
Total	**3,547**		**60**		**16**		**1**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	2,515	70.90	17	28.40	1	9.26	0	0.00	0	0.00
Steel	108	3.04	2	3.74	1	3.81	0	6.11	0	0.00
Concrete	16	0.45	0	0.49	0	0.43	0	0.31	0	0.00
Precast	7	0.20	0	0.39	0	0.82	0	2.33	0	0.00
RM	21	0.60	0	0.69	0	1.14	0	2.55	0	0.00
URM	256	7.21	11	18.21	4	25.70	1	66.45	0	100.00
MH	624	17.60	29	48.08	9	58.83	0	22.26	0	0.00
Total	**3,547**		**60**		**16**		**1**		**0**	

*Note:
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 0 hospital beds available for use. On the day of the earthquake, the model estimates that only 0 hospital beds (0.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 0.00% of the beds will be back in service. By 30 days, 0.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	3	0	0	3
EOCs	0	0	0	0
PoliceStations	1	0	0	1
FireStations	2	0	0	2

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	13	13
	Bridges	30	0	0	30	30
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	12	12
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	9	0	0	9	9
Waste Water	9	0	0	9	9
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	1	1
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	2e+018	9e+018
Waste Water	481	4e+018	2e+019
Natural Gas	128	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	3,100	3,100	3,100	3,100	3,100	3,100
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 76.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 7,678) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.61 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.55 (millions of dollars); 30 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 58 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.02	0.00	0.00	0.03
	Capital-Related	0.00	0.00	0.02	0.00	0.00	0.02
	Rental	0.01	0.00	0.01	0.00	0.00	0.03
	Relocation	0.03	0.02	0.02	0.00	0.01	0.08
	Subtotal	**0.04**	**0.02**	**0.07**	**0.01**	**0.02**	**0.17**
Capital Stock Losses							
	Structural	0.06	0.02	0.02	0.02	0.01	0.13
	Non_Structural	0.14	0.03	0.02	0.02	0.02	0.22
	Content	0.02	0.00	0.01	0.01	0.00	0.03
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.21**	**0.05**	**0.05**	**0.04**	**0.03**	**0.38**
	Total	**0.26**	**0.06**	**0.12**	**0.06**	**0.05**	**0.55**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	19.26	$0.04	0.20
	Tunnels	0.00	$0.00	0.00
	Subtotal	**986.10**	**0.00**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**59.30**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1045.50**	**0.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	59.70	$0.00	0.01
	Distribution Lines	6.40	$0.01	0.13
	Subtotal	**242.67**	**$0.01**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	0.90	$0.00	0.01
	Distribution Lines	3.80	$0.01	0.16
	Subtotal	**195.88**	**$0.01**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	2.60	$0.00	0.07
	Subtotal	**2.55**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	9.00	$0.00	0.00
	Subtotal	**9.02**	**$0.00**	
Communication	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
	Total	**450.12**	**$0.02**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina					
	Pickens	7,678	584	156	740
Total State		**7,678**	**584**	**156**	**740**
Total Region		**7,678**	**584**	**156**	**740**

Hazus-MH: Earthquake Event Report

Region Name: City_Pickens_EQFLH

Earthquake Scenario: Charleston EQ 7.3M

Print Date: October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 42.44 square miles and contains 3 census tracts. There are over 4 thousand households in the region which has a total population of 10,803 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 1,033 (millions of dollars). Approximately 92.00 % of the buildings (and 77.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,035 and 668 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 4 thousand buildings in the region which have an aggregate total replacement value of 1,033 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 68% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 55 beds. There are 5 schools, 1 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 55 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,703.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 33 bridges, 1,283 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	33	9.00
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**975.90**
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**59.30**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,035.20**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	9.20
	Facilities	6	30.90
	Pipelines	1,542	176.60
		Subtotal	**216.80**
Waste Water	Distribution Lines	NA	5.50
	Facilities	7	1.40
	Pipelines	2,084	191.20
		Subtotal	**198.10**
Natural Gas	Distribution Lines	NA	3.70
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**3.70**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	7	268.70
		Subtotal	**268.70**
Communication	Facilities	1	0.10
		Subtotal	**0.10**
		Total	**687.30**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	Charleston EQ 7.3M
Type of Earthquake	Historical
Fault Name	NA
Historical Epicenter ID #	4694
Probabilistic Return Period	NA
Longitude of Epicenter	-80.00
Latitude of Epicenter	32.90
Earthquake Magnitude	7.30
Depth (Km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Building Damage

Building Damage

Hazus estimates that about 20 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	16	0.32	0	0.44	0	0.42	0	0.90	0	0.63
Commercial	227	4.70	5	6.94	1	7.85	0	16.85	0	15.78
Education	10	0.20	0	0.27	0	0.30	0	0.62	0	0.69
Government	16	0.32	0	0.42	0	0.45	0	0.88	0	0.66
Industrial	73	1.51	2	2.09	0	2.34	0	4.66	0	3.55
Other Residential	1,001	20.70	38	52.21	12	61.83	0	26.80	0	6.53
Religion	31	0.64	1	0.89	0	1.15	0	2.69	0	3.49
Single Family	3,464	71.61	27	36.73	5	25.65	0	46.61	0	68.68
Total	**4,838**		**72**		**19**		**1**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	3,347	69.18	18	25.11	1	7.60	0	0.00	0	0.00
Steel	174	3.60	3	4.24	1	4.12	0	6.28	0	0.00
Concrete	29	0.60	0	0.64	0	0.54	0	0.45	0	0.00
Precast	12	0.24	0	0.47	0	0.95	0	2.67	0	0.00
RM	41	0.84	1	0.91	0	1.45	0	3.07	0	0.00
URM	366	7.56	14	18.89	5	26.21	1	66.58	0	100.00
MH	870	17.97	36	49.76	11	59.12	0	20.96	0	0.00
Total	**4,838**		**72**		**19**		**1**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 55 hospital beds available for use. On the day of the earthquake, the model estimates that only 51 hospital beds (93.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 98.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**At Least Moderate Damage > 50%**	**Complete Damage > 50%**	**With Functionality > 50% on day 1**
Hospitals	1	0	0	1
Schools	5	0	0	5
EOCs	1	0	0	1
PoliceStations	2	0	0	2
FireStations	1	0	0	1

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	32	32
	Bridges	33	0	0	33	33
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	20	20
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	6	0	0	6	6
Waste Water	7	0	0	7	7
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	7	0	0	3	3
Communication	1	0	0	1	1

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	2	1
Waste Water	481	4	1
Natural Gas	185	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	4,288	0	0	0	0	0
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 77.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 10,803) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.76 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.71 (millions of dollars); 35 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 55 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.01	0.04	0.00	0.01	0.06
	Capital-Related	0.00	0.00	0.03	0.00	0.00	0.04
	Rental	0.01	0.01	0.02	0.00	0.00	0.05
	Relocation	0.04	0.02	0.03	0.00	0.02	0.11
	Subtotal	**0.05**	**0.04**	**0.13**	**0.01**	**0.03**	**0.25**
Capital Stock Losses							
	Structural	0.06	0.03	0.04	0.01	0.02	0.16
	Non_Structural	0.14	0.05	0.05	0.01	0.02	0.26
	Content	0.01	0.00	0.01	0.00	0.00	0.04
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.21**	**0.09**	**0.10**	**0.02**	**0.04**	**0.46**
	Total	**0.26**	**0.13**	**0.23**	**0.03**	**0.07**	**0.71**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	9.01	$0.01	0.10
	Tunnels	0.00	$0.00	0.00
	Subtotal	**975.90**	**0.00**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**59.30**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1035.20**	**0.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.01	0.00
	Facilities	30.90	$0.00	0.00
	Distribution Lines	9.20	$0.01	0.11
	Subtotal	**216.76**	**$0.02**	
Waste Water	Pipelines	191.20	$0.01	0.01
	Facilities	1.40	$0.00	0.01
	Distribution Lines	5.50	$0.01	0.14
	Subtotal	**198.10**	**$0.02**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	3.70	$0.00	0.06
	Subtotal	**3.69**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	268.70	$0.00	0.00
	Subtotal	**268.72**	**$0.00**	
Communication	Facilities	0.10	$0.00	0.00
	Subtotal	**0.08**	**$0.00**	
	Total	**687.35**	**$0.04**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina	Pickens	10,803	799	234	1,033
Total State		**10,803**	**799**	**234**	**1,033**
Total Region		**10,803**	**799**	**234**	**1,033**

Hazus-MH: Earthquake Event Report

Region Name: City_SixMile_EQFLH

Earthquake Scenario: Charleston EQ 7.3M

Print Date: October 11, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 35.29 square miles and contains 1 census tracts. There are over 2 thousand households in the region which has a total population of 5,669 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 474 (millions of dollars). Approximately 95.00 % of the buildings (and 90.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,034 and 377 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 2 thousand buildings in the region which have an aggregate total replacement value of 474 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 65% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of 0 beds. There are 1 schools, 1 fire stations, 0 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 5 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,411.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 22 bridges, 1,179 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	22	8.10
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**975.00**
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**59.30**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,034.40**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	4.10
	Facilities	0	0.00
	Pipelines	1,542	176.60
		Subtotal	**180.70**
Waste Water	Distribution Lines	NA	2.40
	Facilities	1	1.10
	Pipelines	2,084	191.20
		Subtotal	**194.70**
Natural Gas	Distribution Lines	NA	1.60
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**1.60**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	1	9.00
		Subtotal	**9.00**
Communication	Facilities	0	0.00
		Subtotal	**0.00**
		Total	**386.00**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	Charleston EQ 7.3M
Type of Earthquake	Historical
Fault Name	NA
Historical Epicenter ID #	4694
Probabilistic Return Period	NA
Longitude of Epicenter	-80.00
Latitude of Epicenter	32.90
Earthquake Magnitude	7.30
Depth (Km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Building Damage

Hazus estimates that about 10 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	4	0.15	0	0.19	0	0.18	0	0.45	0	0.36
Commercial	69	2.72	1	3.69	0	4.19	0	10.67	0	11.51
Education	2	0.08	0	0.09	0	0.10	0	0.25	0	0.32
Government	1	0.04	0	0.05	0	0.05	0	0.10	0	0.09
Industrial	32	1.27	1	1.56	0	1.73	0	3.99	0	3.35
Other Residential	649	25.46	23	62.37	7	71.30	0	32.63	0	1.20
Religion	15	0.57	0	0.73	0	0.93	0	2.60	0	3.70
Single Family	1,776	69.71	12	31.32	2	21.52	0	49.29	0	79.48
Total	**2,547**		**37**		**10**		**0**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	1,669	65.54	8	20.09	1	5.24	0	0.00	0	0.00
Steel	53	2.08	1	2.21	0	2.14	0	3.62	0	0.00
Concrete	8	0.30	0	0.28	0	0.23	0	0.23	0	0.00
Precast	4	0.14	0	0.26	0	0.52	0	1.68	0	0.00
RM	11	0.42	0	0.43	0	0.69	0	1.70	0	0.00
URM	164	6.45	6	14.70	2	20.24	0	61.05	0	100.00
MH	639	25.08	23	62.04	7	70.94	0	31.72	0	0.00
Total	**2,547**		**37**		**10**		**0**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 0 hospital beds available for use. On the day of the earthquake, the model estimates that only 0 hospital beds (0.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 0.00% of the beds will be back in service. By 30 days, 0.00% will be operational.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**At Least Moderate Damage > 50%**	**Complete Damage > 50%**	**With Functionality > 50% on day 1**
Hospitals	0	0	0	0
Schools	1	0	0	1
EOCs	0	0	0	0
PoliceStations	0	0	0	0
FireStations	1	0	0	1

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	0	0
	Bridges	22	0	0	22	22
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	1	1
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	1	1
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	0	0
Waste Water	481	2e+025	7e+025
Natural Gas	81	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	2,203	0	0	0	0	0
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 81.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 5,669) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.23 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.22 (millions of dollars); 26 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 78 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.00	0.00	0.00	0.01
	Capital-Related	0.00	0.00	0.00	0.00	0.00	0.01
	Rental	0.00	0.00	0.00	0.00	0.00	0.01
	Relocation	0.02	0.01	0.00	0.00	0.00	0.03
	Subtotal	**0.02**	**0.01**	**0.02**	**0.00**	**0.00**	**0.06**
Capital Stock Losses							
	Structural	0.03	0.01	0.01	0.00	0.00	0.05
	Non_Structural	0.07	0.02	0.01	0.00	0.00	0.10
	Content	0.01	0.00	0.00	0.00	0.00	0.01
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.10**	**0.03**	**0.01**	**0.01**	**0.01**	**0.16**
	Total	**0.13**	**0.04**	**0.03**	**0.01**	**0.01**	**0.22**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	8.13	$0.01	0.10
	Tunnels	0.00	$0.00	0.00
	Subtotal	**975.00**	**0.00**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**59.30**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1034.40**	**0.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	4.10	$0.00	0.10
	Subtotal	**180.69**	**$0.00**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	1.10	$0.00	0.00
	Distribution Lines	2.40	$0.00	0.12
	Subtotal	**194.67**	**$0.00**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	1.60	$0.00	0.05
	Subtotal	**1.63**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	9.00	$0.00	0.00
	Subtotal	**9.02**	**$0.00**	
Communication	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
	Total	**386.00**	**$0.01**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina					
	Pickens	5,669	428	45	474
Total State		**5,669**	**428**	**45**	**474**
Total Region		**5,669**	**428**	**45**	**474**

Hazus-MH: Earthquake Event Report

Region Name: PickensCoHMP_EQFLH

Earthquake Scenario: Charleston EQ 7.3M

Print Date: October 09, 2016

Disclaimer:

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Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 511.89 square miles and contains 28 census tracts. There are over 45 thousand households in the region which has a total population of 119,224 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 48 thousand buildings in the region with a total building replacement value (excluding contents) of 11,489 (millions of dollars). Approximately 93.00 % of the buildings (and 79.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,210 and 894 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 48 thousand buildings in the region which have an aggregate total replacement value of 11,489 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 67% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 151 beds. There are 35 schools, 10 fire stations, 12 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 349 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,104.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 285 bridges, 2,996 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	285	132.60
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**1,099.50**
Railways	Bridges	0	0.00
	Facilities	1	2.70
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**62.00**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	1	0.90
		Subtotal	**0.90**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	1	10.70
	Runways	1	38.00
		Subtotal	**48.60**
		Total	**1,211.00**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	94.90
	Facilities	32	156.00
	Pipelines	1,542	176.60
		Subtotal	**427.50**
Waste Water	Distribution Lines	NA	56.90
	Facilities	56	6.80
	Pipelines	2,084	191.20
		Subtotal	**254.90**
Natural Gas	Distribution Lines	NA	38.00
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**38.00**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	16	358.90
		Subtotal	**358.90**
Communication	Facilities	3	4.60
		Subtotal	**4.60**
		Total	**1,083.90**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	Charleston EQ 7.3M
Type of Earthquake	Historical
Fault Name	NA
Historical Epicenter ID #	4694
Probabilistic Return Period	NA
Longitude of Epicenter	-80.00
Latitude of Epicenter	32.90
Earthquake Magnitude	7.30
Depth (Km)	10.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	Central & East US (CEUS 2008)

Building Damage

Building Damage

Hazus estimates that about 235 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	119	0.25	3	0.34	1	0.33	0	0.72	0	0.49
Commercial	2,001	4.23	51	6.22	16	7.15	2	15.91	0	14.63
Education	101	0.21	2	0.27	1	0.29	0	0.61	0	0.63
Government	60	0.13	1	0.14	0	0.15	0	0.30	0	0.21
Industrial	691	1.46	17	2.01	5	2.30	1	4.75	0	3.54
Other Residential	11,019	23.28	441	53.32	142	63.91	4	30.81	0	8.47
Religion	260	0.55	6	0.72	2	0.91	0	2.19	0	2.75
Single Family	33,081	69.89	306	36.99	56	24.96	5	44.71	1	69.27
Total	**47,331**		**827**		**223**		**12**		**1**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	32,116	67.85	219	26.43	18	8.16	0	0.00	0	0.00
Steel	1,513	3.20	31	3.76	9	3.82	1	6.15	0	0.45
Concrete	294	0.62	5	0.65	1	0.57	0	0.49	0	0.00
Precast	114	0.24	4	0.43	2	0.89	0	2.55	0	0.00
RM	401	0.85	7	0.87	3	1.41	0	3.07	0	0.00
URM	3,508	7.41	146	17.62	55	24.60	8	64.19	1	99.55
MH	9,386	19.83	416	50.24	135	60.55	3	23.54	0	0.00
Total	**47,331**		**827**		**223**		**12**		**1**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 151 hospital beds available for use. On the day of the earthquake, the model estimates that only 139 hospital beds (92.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 97.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**At Least Moderate Damage > 50%**	**Complete Damage > 50%**	**With Functionality > 50% on day 1**
Hospitals	2	0	0	2
Schools	35	0	0	35
EOCs	1	0	0	1
PoliceStations	12	0	0	12
FireStations	10	0	0	10

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	41	41
	Bridges	285	0	0	285	285
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	20	20
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	1	0	0	1	1
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	1	0	0	1	1
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	0	0	1	1
	Runways	1	0	0	1	1

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	32	0	0	32	32
Waste Water	56	0	0	56	56
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	16	0	0	11	11
Communication	3	0	0	3	3

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	8e+036	3e+037
Waste Water	481	1e+037	6e+037
Natural Gas	1,898	6	1
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	45,228	45,228	45,228	45,228	45,228	45,228
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.01 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 75.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 200 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 5 households to be displaced due to the earthquake. Of these, 4 people (out of a total population of 119,224) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	2	0	0	0
	Single Family	1	0	0	0
	Total	**3**	**0**	**0**	**0**
2 PM	Commercial	2	0	0	0
	Commuting	0	0	0	0
	Educational	1	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**4**	**0**	**0**	**0**
5 PM	Commercial	1	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	1	0	0	0
	Single Family	0	0	0	0
	Total	**3**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 10.18 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 9.71 (millions of dollars); 34 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 58 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.10	0.58	0.03	0.05	0.76
	Capital-Related	0.00	0.04	0.43	0.02	0.02	0.51
	Rental	0.13	0.23	0.25	0.01	0.02	0.64
	Relocation	0.42	0.30	0.41	0.05	0.17	1.36
	Subtotal	**0.55**	**0.67**	**1.67**	**0.11**	**0.26**	**3.27**
Capital Stock Losses							
	Structural	0.75	0.56	0.45	0.13	0.13	2.03
	Non_Structural	1.85	0.95	0.66	0.14	0.21	3.80
	Content	0.22	0.07	0.17	0.07	0.05	0.58
	Inventory	0.00	0.00	0.00	0.02	0.00	0.02
	Subtotal	**2.82**	**1.58**	**1.29**	**0.36**	**0.39**	**6.43**
	Total	**3.36**	**2.25**	**2.96**	**0.47**	**0.65**	**9.71**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	132.58	$0.19	0.14
	Tunnels	0.00	$0.00	0.00
	Subtotal	**1099.50**	**0.20**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	2.66	$0.01	0.19
	Subtotal	**62.00**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.89	$0.00	0.19
	Subtotal	**0.90**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	10.65	$0.02	0.23
	Runways	37.96	$0.00	0.00
	Subtotal	**48.60**	**0.00**	
	Total	**1211.00**	**0.20**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	156.00	$0.01	0.01
	Distribution Lines	94.90	$0.13	0.13
	Subtotal	**427.50**	**$0.14**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	6.80	$0.00	0.01
	Distribution Lines	56.90	$0.09	0.16
	Subtotal	**254.93**	**$0.09**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	38.00	$0.03	0.07
	Subtotal	**37.96**	**$0.03**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	358.90	$0.00	0.00
	Subtotal	**358.92**	**$0.00**	
Communication	Facilities	4.60	$0.00	0.01
	Subtotal	**4.63**	**$0.00**	
	Total	**1,083.94**	**$0.26**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina	Pickens	119,224	9,101	2,388	11,489
Total State		**119,224**	**9,101**	**2,388**	**11,489**
Total Region		**119,224**	**9,101**	**2,388**	**11,489**

Appendix H: Hazus Earthquake Reports Annualized Loss Scenario

Hazus-MH: Earthquake Event Report

Region Name: City_Central_EQFLU

Earthquake Scenario: CentralAnnualizedLoss

Print Date: October 11, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 24.00 square miles and contains 2 census tracts. There are over 3 thousand households in the region which has a total population of 9,731 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 836 (millions of dollars). Approximately 92.00 % of the buildings (and 81.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,037 and 404 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 2 thousand buildings in the region which have an aggregate total replacement value of 836 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 70% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of 0 beds. There are 3 schools, 0 fire stations, 1 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 30 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,441.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 13 bridges, 1,245 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	13	11.30
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**978.20**
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**59.30**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,037.50**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	7.40
	Facilities	0	0.00
	Pipelines	1,542	176.60
		Subtotal	**184.00**
Waste Water	Distribution Lines	NA	4.40
	Facilities	7	0.50
	Pipelines	2,084	191.20
		Subtotal	**196.10**
Natural Gas	Distribution Lines	NA	2.90
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**2.90**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	3	36.10
		Subtotal	**36.10**
Communication	Facilities	0	0.00
		Subtotal	**0.00**
		Total	**419.10**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	CentralAnnualizedLoss
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	Annualized
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	NA
Depth (Km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Building Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1	0.04	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	47	1.87	0	0.00	0	0.00	0	0.00	0	0.00
Education	1	0.04	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	10	0.40	0	0.00	0	0.00	0	0.00	0	0.00
Other Residential	661	26.24	14	53.85	3	100.00	0	0.00	0	0.00
Religion	13	0.52	0	0.00	0	0.00	0	0.00	0	0.00
Single Family	1,786	70.90	12	46.15	0	0.00	0	0.00	0	0.00
Total	**2,519**		**26**		**3**		**0**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	1,897	75.31	9	34.62	0	0.00	0	0.00	0	0.00
Steel	33	1.31	0	0.00	0	0.00	0	0.00	0	0.00
Concrete	8	0.32	0	0.00	0	0.00	0	0.00	0	0.00
Precast	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
RM	23	0.91	0	0.00	0	0.00	0	0.00	0	0.00
URM	229	9.09	3	11.54	0	0.00	0	0.00	0	0.00
MH	329	13.06	14	53.85	3	100.00	0	0.00	0	0.00
Total	**2,519**		**26**		**3**		**0**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 0 hospital beds available for use. On the day of the earthquake, the model estimates that only 0 hospital beds (0.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 0.00% of the beds will be back in service. By 30 days, 0.00% will be operational.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**At Least Moderate Damage > 50%**	**Complete Damage > 50%**	**With Functionality > 50% on day 1**
Hospitals	0	0	0	0
Schools	3	0	0	3
EOCs	0	0	0	0
PoliceStations	1	0	0	1
FireStations	0	0	0	0

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	0	0
	Bridges	13	0	0	13	13
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	12	12
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	7	0	0	7	7
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	3	0	0	2	2
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	1e+028	5e+028
Waste Water	481	3e+028	1e+029
Natural Gas	147	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	3,840	3,840	3,840	3,840	3,840	3,840
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 76.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 9,731) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.13 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.09 (millions of dollars); 18 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 61 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.00	0.00	0.00	0.00
	Capital-Related	0.00	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00	0.01
	Subtotal	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.02**
Capital Stock Losses							
	Structural	0.00	0.00	0.00	0.00	0.00	0.01
	Non_Structural	0.01	0.02	0.00	0.01	0.00	0.05
	Content	0.01	0.00	0.00	0.00	0.00	0.02
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.02**	**0.03**	**0.01**	**0.01**	**0.01**	**0.08**
	Total	**0.03**	**0.03**	**0.01**	**0.02**	**0.01**	**0.09**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	11.26	$0.02	0.16
	Tunnels	0.00	$0.00	0.00
	Subtotal	**978.20**	**0.00**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**59.30**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1037.50**	**0.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	7.40	$0.01	0.13
	Subtotal	**183.99**	**$0.01**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	0.50	$0.00	0.00
	Distribution Lines	4.40	$0.01	0.15
	Subtotal	**196.07**	**$0.01**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	2.90	$0.00	0.06
	Subtotal	**2.94**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	36.10	$0.00	0.00
	Subtotal	**36.08**	**$0.00**	
Communication	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
	Total	**419.08**	**$0.02**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina					
	Pickens	9,731	680	155	836
Total State		**9,731**	**680**	**155**	**836**
Total Region		**9,731**	**680**	**155**	**836**

Hazus-MH: Earthquake Event Report

Region Name: City_Clemson_EQFLH

Earthquake Scenario: ClemsonAnnualizedLoss

Print Date: October 11, 2016

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General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 51.61 square miles and contains 6 census tracts. There are over 9 thousand households in the region which has a total population of 29,484 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 2,912 (millions of dollars). Approximately 91.00 % of the buildings (and 80.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,053 and 407 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 7 thousand buildings in the region which have an aggregate total replacement value of 2,912 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 72% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of 0 beds. There are 6 schools, 1 fire stations, 5 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 87 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,460.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 29 bridges, 1,543 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	29	24.00
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**990.90**
Railways	Bridges	0	0.00
	Facilities	1	2.70
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**62.00**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	1	0.90
		Subtotal	**0.90**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,053.80**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	22.20
	Facilities	3	2.10
	Pipelines	1,542	176.60
		Subtotal	**201.00**
Waste Water	Distribution Lines	NA	13.30
	Facilities	26	1.90
	Pipelines	2,084	191.20
		Subtotal	**206.40**
Natural Gas	Distribution Lines	NA	8.90
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**8.90**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	3	36.10
		Subtotal	**36.10**
Communication	Facilities	0	0.00
		Subtotal	**0.00**
		Total	**452.30**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	ClemsonAnnualizedLoss
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	Annualized
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	NA
Depth (Km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Building Damage

Building Damage

Hazus estimates that about 6 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	4	0.06	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	200	2.88	0	0.00	0	0.00	0	0.00	0	0.00
Education	9	0.13	0	0.00	0	0.00	0	0.00	0	0.00
Government	1	0.01	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	13	0.19	0	0.00	0	0.00	0	0.00	0	0.00
Other Residential	1,568	22.61	25	42.37	5	83.33	0	0.00	0	0.00
Religion	34	0.49	0	0.00	0	0.00	0	0.00	0	0.00
Single Family	5,105	73.62	34	57.63	1	16.67	0	0.00	0	0.00
Total	**6,934**		**59**		**6**		**0**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	5,374	77.50	24	40.68	0	0.00	0	0.00	0	0.00
Steel	131	1.89	0	0.00	0	0.00	0	0.00	0	0.00
Concrete	42	0.61	0	0.00	0	0.00	0	0.00	0	0.00
Precast	11	0.16	0	0.00	0	0.00	0	0.00	0	0.00
RM	58	0.84	0	0.00	0	0.00	0	0.00	0	0.00
URM	656	9.46	10	16.95	1	16.67	0	0.00	0	0.00
MH	662	9.55	25	42.37	5	83.33	0	0.00	0	0.00
Total	**6,934**		**59**		**6**		**0**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 0 hospital beds available for use. On the day of the earthquake, the model estimates that only 0 hospital beds (0.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 0.00% of the beds will be back in service. By 30 days, 0.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	6	0	0	6
EOCs	0	0	0	0
PoliceStations	5	0	0	5
FireStations	1	0	0	1

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	41	41
	Bridges	29	0	0	29	29
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	12	12
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	1	0	0	1	1
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	1	0	0	1	1
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	3	0	0	3	3
Waste Water	26	0	0	26	26
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	3	0	0	2	2
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	4e+027	1e+028
Waste Water	481	6e+027	3e+028
Natural Gas	444	1	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	9,788	9,788	9,788	9,788	9,788	9,788
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 74.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 40 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2 households to be displaced due to the earthquake. Of these, 2 people (out of a total population of 29,484) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.48 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.39 (millions of dollars); 22 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 60 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.01	0.00	0.00	0.02
	Capital-Related	0.00	0.00	0.01	0.00	0.00	0.01
	Rental	0.00	0.01	0.00	0.00	0.00	0.02
	Relocation	0.01	0.01	0.01	0.00	0.01	0.03
	Subtotal	**0.01**	**0.03**	**0.04**	**0.00**	**0.01**	**0.09**
Capital Stock Losses							
	Structural	0.01	0.02	0.01	0.00	0.01	0.05
	Non_Structural	0.04	0.08	0.02	0.01	0.02	0.18
	Content	0.02	0.02	0.01	0.01	0.01	0.07
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.07**	**0.13**	**0.04**	**0.02**	**0.04**	**0.30**
	Total	**0.08**	**0.15**	**0.08**	**0.03**	**0.05**	**0.39**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	24.00	$0.04	0.16
	Tunnels	0.00	$0.00	0.00
	Subtotal	**990.90**	**0.00**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	2.66	$0.01	0.19
	Subtotal	**62.00**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.89	$0.00	0.19
	Subtotal	**0.90**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1053.80**	**0.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	2.10	$0.00	0.00
	Distribution Lines	22.20	$0.03	0.12
	Subtotal	**200.99**	**$0.03**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	1.90	$0.00	0.01
	Distribution Lines	13.30	$0.02	0.14
	Subtotal	**206.37**	**$0.02**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	8.90	$0.01	0.06
	Subtotal	**8.89**	**$0.01**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	36.10	$0.00	0.00
	Subtotal	**36.08**	**$0.00**	
Communication	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
	Total	**452.33**	**$0.05**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina	Pickens	29,484	2,315	596	2,912
Total State		**29,484**	**2,315**	**596**	**2,912**
Total Region		**29,484** **2,912**	**2,315**	**596**	**2,912**

Hazus-MH: Earthquake Event Report

Region Name: City_Easley_EQFLHU

Earthquake Scenario: EasleyAnnualizedLoss

Print Date: October 11, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 59.59 square miles and contains 8 census tracts. There are over 15 thousand households in the region which has a total population of 39,735 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 4,229 (millions of dollars). Approximately 92.00 % of the buildings (and 74.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,059 and 441 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 16 thousand buildings in the region which have an aggregate total replacement value of 4,229 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 70% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 96 beds. There are 10 schools, 1 fire stations, 4 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 102 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,500.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 56 bridges, 1,695 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	56	33.20
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**1,000.10**
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**59.30**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,059.50**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	29.80
	Facilities	7	31.60
	Pipelines	1,542	176.60
		Subtotal	**238.10**
Waste Water	Distribution Lines	NA	17.90
	Facilities	12	1.60
	Pipelines	2,084	191.20
		Subtotal	**210.60**
Natural Gas	Distribution Lines	NA	11.90
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**11.90**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	4	36.10
		Subtotal	**36.10**
Communication	Facilities	1	4.50
		Subtotal	**4.50**
		Total	**501.20**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	EasleyAnnualizedLoss
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	Annualized
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	NA
Depth (Km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Building Damage

Hazus estimates that about 59 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	13	0.08	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	415	2.65	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	1	0.01	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	92	0.59	0	0.00	0	0.00	0	0.00	0	0.00
Other Residential	2,913	18.63	140	50.72	44	74.58	0	0.00	0	0.00
Religion	35	0.22	0	0.00	0	0.00	0	0.00	0	0.00
Single Family	12,169	77.82	136	49.28	15	25.42	0	0.00	0	0.00
Total	**15,638**		**276**		**59**		**0**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	11,614	74.27	98	35.51	5	8.47	0	0.00	0	0.00
Steel	252	1.61	0	0.00	0	0.00	0	0.00	0	0.00
Concrete	3	0.02	0	0.00	0	0.00	0	0.00	0	0.00
Precast	1	0.01	0	0.00	0	0.00	0	0.00	0	0.00
RM	6	0.04	0	0.00	0	0.00	0	0.00	0	0.00
URM	1,106	7.07	38	13.77	10	16.95	0	0.00	0	0.00
MH	2,656	16.98	140	50.72	44	74.58	0	0.00	0	0.00
Total	**15,638**		**276**		**59**		**0**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 96 hospital beds available for use. On the day of the earthquake, the model estimates that only 87 hospital beds (92.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 97.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	0	0	1
Schools	10	0	0	10
EOCs	0	0	0	0
PoliceStations	4	0	0	4
FireStations	1	0	0	1

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	25	25
	Bridges	56	0	0	56	56
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	10	10
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	7	0	0	7	7
Waste Water	12	0	0	12	12
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	4	0	0	4	4
Communication	1	0	0	1	1

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	2e+028	7e+028
Waste Water	481	3e+028	1e+029
Natural Gas	597	2	1
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	15,767	15,767	15,767	15,767	15,767	15,767
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 75.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 80 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2 households to be displaced due to the earthquake. Of these, 1 people (out of a total population of 39,735) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

· Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
· Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
· Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
· Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.68 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.51 (millions of dollars); 27 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 46 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.01	0.04	0.00	0.00	0.05
	Capital-Related	0.00	0.00	0.02	0.00	0.00	0.03
	Rental	0.00	0.00	0.01	0.00	0.00	0.02
	Relocation	0.01	0.01	0.03	0.00	0.00	0.05
	Subtotal	**0.02**	**0.02**	**0.10**	**0.00**	**0.00**	**0.14**
Capital Stock Losses							
	Structural	0.02	0.01	0.03	0.00	0.00	0.06
	Non_Structural	0.09	0.03	0.07	0.01	0.01	0.21
	Content	0.04	0.01	0.04	0.01	0.00	0.09
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.15**	**0.05**	**0.14**	**0.03**	**0.01**	**0.37**
	Total	**0.16**	**0.07**	**0.23**	**0.03**	**0.01**	**0.51**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	33.23	$0.06	0.17
	Tunnels	0.00	$0.00	0.00
	Subtotal	**1000.10**	**0.10**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**59.30**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1059.50**	**0.10**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	31.60	$0.00	0.02
	Distribution Lines	29.80	$0.05	0.17
	Subtotal	**238.08**	**$0.06**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	1.60	$0.00	0.01
	Distribution Lines	17.90	$0.04	0.20
	Subtotal	**210.64**	**$0.04**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	11.90	$0.01	0.09
	Subtotal	**11.93**	**$0.01**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	36.10	$0.00	0.00
	Subtotal	**36.08**	**$0.00**	
Communication	Facilities	4.50	$0.00	0.01
	Subtotal	**4.47**	**$0.00**	
	Total	**501.20**	**$0.10**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina					
	Pickens	39,735	3,147	1,081	4,229
Total State		**39,735**	**3,147**	**1,081**	**4,229**
Total Region		**39,735**	**3,147**	**1,081**	**4,229**

Hazus-MH: Earthquake Event Report

Region Name: City_Liberty_EQFLH

Earthquake Scenario: LibertyAnnualizedLoss

Print Date: October 11, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 32.00 square miles and contains 2 census tracts. There are over 3 thousand households in the region which has a total population of 9,684 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 818 (millions of dollars). Approximately 94.00 % of the buildings (and 76.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,093 and 407 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 4 thousand buildings in the region which have an aggregate total replacement value of 818 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 64% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of 0 beds. There are 4 schools, 1 fire stations, 1 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 45 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,500.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 31 bridges, 1,245 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	31	18.80
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**985.70**
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**59.30**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	1	10.70
	Runways	1	38.00
		Subtotal	**48.60**
		Total	**1,093.70**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	7.30
	Facilities	5	30.20
	Pipelines	1,542	176.60
		Subtotal	**214.20**
Waste Water	Distribution Lines	NA	4.40
	Facilities	9	0.90
	Pipelines	2,084	191.20
		Subtotal	**196.50**
Natural Gas	Distribution Lines	NA	2.90
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**2.90**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	1	9.00
		Subtotal	**9.00**
Communication	Facilities	0	0.00
		Subtotal	**0.00**
		Total	**422.60**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	LibertyAnnualizedLoss
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	Annualized
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	NA
Depth (Km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Building Damage

Building Damage

Hazus estimates that about 16 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	3	0.07	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	59	1.44	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	32	0.78	0	0.00	0	0.00	0	0.00	0	0.00
Other Residential	1,064	25.89	46	65.71	13	81.25	0	0.00	0	0.00
Religion	14	0.34	0	0.00	0	0.00	0	0.00	0	0.00
Single Family	2,937	71.48	24	34.29	3	18.75	0	0.00	0	0.00
Total	**4,109**		**70**		**16**		**0**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	2,761	67.19	17	24.29	1	6.25	0	0.00	0	0.00
Steel	49	1.19	0	0.00	0	0.00	0	0.00	0	0.00
Concrete	1	0.02	0	0.00	0	0.00	0	0.00	0	0.00
Precast	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
RM	1	0.02	0	0.00	0	0.00	0	0.00	0	0.00
URM	255	6.21	7	10.00	2	12.50	0	0.00	0	0.00
MH	1,042	25.36	46	65.71	13	81.25	0	0.00	0	0.00
Total	**4,109**		**70**		**16**		**0**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 0 hospital beds available for use. On the day of the earthquake, the model estimates that only 0 hospital beds (0.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 0.00% of the beds will be back in service. By 30 days, 0.00% will be operational.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**At Least Moderate Damage > 50%**	**Complete Damage > 50%**	**With Functionality > 50% on day 1**
Hospitals	0	0	0	0
Schools	4	0	0	4
EOCs	0	0	0	0
PoliceStations	1	0	0	1
FireStations	1	0	0	1

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	13	13
	Bridges	31	0	0	31	31
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	12	12
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	0	0	1	1
	Runways	1	0	0	1	1

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	5	0	0	5	5
Waste Water	9	0	0	9	9
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	1	1
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	2e+028	7e+028
Waste Water	481	3e+028	1e+029
Natural Gas	147	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	3,797	3,797	3,797	3,797	3,797	3,797
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 75.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 9,684) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

· Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
· Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
· Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
· Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.18 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.09 (millions of dollars); 18 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 53 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.00	0.00	0.00	0.00
	Capital-Related	0.00	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00	0.01
	Subtotal	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.02**
Capital Stock Losses							
	Structural	0.00	0.00	0.00	0.00	0.00	0.01
	Non_Structural	0.02	0.01	0.01	0.01	0.00	0.04
	Content	0.01	0.00	0.00	0.01	0.00	0.02
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.03**	**0.01**	**0.01**	**0.02**	**0.01**	**0.08**
	Total	**0.04**	**0.01**	**0.02**	**0.02**	**0.01**	**0.09**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	18.85	$0.04	0.20
	Tunnels	0.00	$0.00	0.00
	Subtotal	**985.70**	**0.00**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**59.30**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	10.65	$0.02	0.23
	Runways	37.96	$0.00	0.00
	Subtotal	**48.60**	**0.00**	
	Total	**1093.70**	**0.10**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	30.20	$0.00	0.01
	Distribution Lines	7.30	$0.01	0.13
	Subtotal	**214.15**	**$0.01**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	0.90	$0.00	0.01
	Distribution Lines	4.40	$0.01	0.16
	Subtotal	**196.45**	**$0.01**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	2.90	$0.00	0.07
	Subtotal	**2.94**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	9.00	$0.00	0.00
	Subtotal	**9.02**	**$0.00**	
Communication	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
	Total	**422.56**	**$0.02**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina					
	Pickens	9,684	625	193	818
Total State		**9,684**	**625**	**193**	**818**
Total State		**9,684**	**625**	**193**	**818**

Hazus-MH: Earthquake Event Report

Region Name: City_Norris_EQFLHU

Earthquake Scenario: NorrisAnnualizedLoss

Print Date: October 11, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 26.97 square miles and contains 2 census tracts. There are over 3 thousand households in the region which has a total population of 7,678 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 740 (millions of dollars). Approximately 93.00 % of the buildings (and 79.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,045 and 437 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 3 thousand buildings in the region which have an aggregate total replacement value of 740 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 70% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of 0 beds. There are 3 schools, 2 fire stations, 1 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 43 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,482.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 30 bridges, 1,226 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	30	19.30
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**986.10**
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**59.30**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,045.50**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	6.40
	Facilities	9	59.70
	Pipelines	1,542	176.60
		Subtotal	**242.70**
Waste Water	Distribution Lines	NA	3.80
	Facilities	9	0.90
	Pipelines	2,084	191.20
		Subtotal	**195.90**
Natural Gas	Distribution Lines	NA	2.60
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**2.60**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	1	9.00
		Subtotal	**9.00**
Communication	Facilities	0	0.00
		Subtotal	**0.00**
		Total	**450.10**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	NorrisAnnualizedLoss
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	Annualized
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	NA
Depth (Km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Building Damage

Hazus estimates that about 11 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	2	0.06	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	58	1.71	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	28	0.82	0	0.00	0	0.00	0	0.00	0	0.00
Other Residential	645	18.98	27	55.10	8	72.73	0	0.00	0	0.00
Religion	14	0.41	0	0.00	0	0.00	0	0.00	0	0.00
Single Family	2,651	78.02	22	44.90	3	27.27	0	0.00	0	0.00
Total	**3,398**		**49**		**11**		**0**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	2,496	73.45	15	30.61	1	9.09	0	0.00	0	0.00
Steel	46	1.35	0	0.00	0	0.00	0	0.00	0	0.00
Concrete	1	0.03	0	0.00	0	0.00	0	0.00	0	0.00
Precast	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
RM	1	0.03	0	0.00	0	0.00	0	0.00	0	0.00
URM	231	6.80	7	14.29	2	18.18	0	0.00	0	0.00
MH	623	18.33	27	55.10	8	72.73	0	0.00	0	0.00
Total	**3,398**		**49**		**11**		**0**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 0 hospital beds available for use. On the day of the earthquake, the model estimates that only 0 hospital beds (0.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 0.00% of the beds will be back in service. By 30 days, 0.00% will be operational.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**At Least Moderate Damage > 50%**	**Complete Damage > 50%**	**With Functionality > 50% on day 1**
Hospitals	0	0	0	0
Schools	3	0	0	3
EOCs	0	0	0	0
PoliceStations	1	0	0	1
FireStations	2	0	0	2

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	13	13
	Bridges	30	0	0	30	30
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	12	12
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	9	0	0	9	9
Waste Water	9	0	0	9	9
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	1	1
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	2e+018	9e+018
Waste Water	481	4e+018	2e+019
Natural Gas	128	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	3,100	3,100	3,100	3,100	3,100	3,100
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 76.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 7,678) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.14 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.08 (millions of dollars); 18 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 55 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.00	0.00	0.00	0.00
	Capital-Related	0.00	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00	0.01
	Subtotal	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.01**
Capital Stock Losses							
	Structural	0.00	0.00	0.00	0.00	0.00	0.01
	Non_Structural	0.02	0.00	0.01	0.01	0.00	0.04
	Content	0.01	0.00	0.00	0.00	0.00	0.02
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.03**	**0.01**	**0.01**	**0.01**	**0.01**	**0.07**
	Total	**0.04**	**0.01**	**0.02**	**0.01**	**0.01**	**0.08**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	19.26	$0.04	0.20
	Tunnels	0.00	$0.00	0.00
	Subtotal	**986.10**	**0.00**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**59.30**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1045.50**	**0.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	59.70	$0.00	0.01
	Distribution Lines	6.40	$0.01	0.13
	Subtotal	**242.67**	**$0.01**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	0.90	$0.00	0.01
	Distribution Lines	3.80	$0.01	0.16
	Subtotal	**195.88**	**$0.01**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	2.60	$0.00	0.07
	Subtotal	**2.55**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	9.00	$0.00	0.00
	Subtotal	**9.02**	**$0.00**	
Communication	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
	Total	**450.12**	**$0.02**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina					
	Pickens	7,678	584	156	740
Total State		**7,678**	**584**	**156**	**740**
Total Region		**7,678**	**584**	**156**	**740**

Hazus-MH: Earthquake Event Report

Region Name: City_Pickens_EQFLH

Earthquake Scenario: PickensAnnualizedLoss

Print Date: October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 42.44 square miles and contains 3 census tracts. There are over 4 thousand households in the region which has a total population of 10,803 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 1,033 (millions of dollars). Approximately 92.00 % of the buildings (and 77.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,035 and 668 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 4 thousand buildings in the region which have an aggregate total replacement value of 1,033 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 68% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 55 beds. There are 5 schools, 1 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 55 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,703.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 33 bridges, 1,283 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	33	9.00
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**975.90**
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**59.30**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,035.20**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	9.20
	Facilities	6	30.90
	Pipelines	1,542	176.60
		Subtotal	**216.80**
Waste Water	Distribution Lines	NA	5.50
	Facilities	7	1.40
	Pipelines	2,084	191.20
		Subtotal	**198.10**
Natural Gas	Distribution Lines	NA	3.70
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**3.70**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	7	268.70
		Subtotal	**268.70**
Communication	Facilities	1	0.10
		Subtotal	**0.10**
		Total	**687.30**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	PickensAnnualizedLoss
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	Annualized
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	NA
Depth (Km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Building Damage

Building Damage

Hazus estimates that about 9 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	6	0.13	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	92	2.02	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	3	0.07	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	20	0.44	0	0.00	0	0.00	0	0.00	0	0.00
Other Residential	966	21.17	34	60.71	8	88.89	0	0.00	0	0.00
Religion	17	0.37	0	0.00	0	0.00	0	0.00	0	0.00
Single Family	3,459	75.81	22	39.29	1	11.11	0	0.00	0	0.00
Total	**4,563**		**56**		**9**		**0**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	3,311	72.56	15	26.79	0	0.00	0	0.00	0	0.00
Steel	61	1.34	0	0.00	0	0.00	0	0.00	0	0.00
Concrete	2	0.04	0	0.00	0	0.00	0	0.00	0	0.00
Precast	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
RM	5	0.11	0	0.00	0	0.00	0	0.00	0	0.00
URM	318	6.97	7	12.50	1	11.11	0	0.00	0	0.00
MH	866	18.98	34	60.71	8	88.89	0	0.00	0	0.00
Total	**4,563**		**56**		**9**		**0**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 55 hospital beds available for use. On the day of the earthquake, the model estimates that only 51 hospital beds (93.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 98.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**At Least Moderate Damage > 50%**	**Complete Damage > 50%**	**With Functionality > 50% on day 1**
Hospitals	1	0	0	1
Schools	5	0	0	5
EOCs	1	0	0	1
PoliceStations	2	0	0	2
FireStations	1	0	0	1

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	32	32
	Bridges	33	0	0	33	33
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	20	20
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	6	0	0	6	6
Waste Water	7	0	0	7	7
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	7	0	0	3	3
Communication	1	0	0	1	1

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	2	1
Waste Water	481	4	1
Natural Gas	185	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	4,288	0	0	0	0	0
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 77.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 10,803) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.17 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.13 (millions of dollars); 23 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 53 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.00	0.00	0.00	0.01
	Capital-Related	0.00	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00	0.01
	Subtotal	**0.00**	**0.01**	**0.02**	**0.00**	**0.00**	**0.03**
Capital Stock Losses							
	Structural	0.01	0.00	0.01	0.00	0.00	0.02
	Non_Structural	0.03	0.01	0.01	0.00	0.00	0.06
	Content	0.01	0.00	0.01	0.00	0.00	0.02
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.04**	**0.01**	**0.02**	**0.01**	**0.01**	**0.10**
	Total	**0.05**	**0.02**	**0.04**	**0.01**	**0.01**	**0.13**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	9.01	$0.01	0.10
	Tunnels	0.00	$0.00	0.00
	Subtotal	**975.90**	**0.00**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**59.30**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1035.20**	**0.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.01	0.00
	Facilities	30.90	$0.00	0.00
	Distribution Lines	9.20	$0.01	0.11
	Subtotal	**216.76**	**$0.02**	
Waste Water	Pipelines	191.20	$0.01	0.01
	Facilities	1.40	$0.00	0.01
	Distribution Lines	5.50	$0.01	0.14
	Subtotal	**198.10**	**$0.02**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	3.70	$0.00	0.06
	Subtotal	**3.69**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	268.70	$0.00	0.00
	Subtotal	**268.72**	**$0.00**	
Communication	Facilities	0.10	$0.00	0.00
	Subtotal	**0.08**	**$0.00**	
	Total	**687.35**	**$0.04**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina	Pickens	10,803	799	234	1,033
Total State		**10,803**	**799**	**234**	**1,033**
Total Region		**10,803**	**799**	**234**	**1,033**

Hazus-MH: Earthquake Event Report

Region Name: City_SixMile_EQFLH

Earthquake Scenario: SixMileAnnualizedLoss

Print Date: October 11, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 35.29 square miles and contains 1 census tracts. There are over 2 thousand households in the region which has a total population of 5,669 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 474 (millions of dollars). Approximately 95.00 % of the buildings (and 90.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,034 and 377 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 2 thousand buildings in the region which have an aggregate total replacement value of 474 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 65% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of 0 beds. There are 1 schools, 1 fire stations, 0 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 5 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,411.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 22 bridges, 1,179 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	22	8.10
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**975.00**
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**59.30**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,034.40**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	4.10
	Facilities	0	0.00
	Pipelines	1,542	176.60
		Subtotal	**180.70**
Waste Water	Distribution Lines	NA	2.40
	Facilities	1	1.10
	Pipelines	2,084	191.20
		Subtotal	**194.70**
Natural Gas	Distribution Lines	NA	1.60
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**1.60**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	1	9.00
		Subtotal	**9.00**
Communication	Facilities	0	0.00
		Subtotal	**0.00**
		Total	**386.00**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	SixMileAnnualizedLoss
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	Annualized
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	NA
Depth (Km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Building Damage

Building Damage

Hazus estimates that about 7 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1	0.04	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	30	1.22	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	10	0.41	0	0.00	0	0.00	0	0.00	0	0.00
Other Residential	642	26.02	22	66.67	6	85.71	0	0.00	0	0.00
Religion	9	0.36	0	0.00	0	0.00	0	0.00	0	0.00
Single Family	1,775	71.95	11	33.33	1	14.29	0	0.00	0	0.00
Total	**2,467**		**33**		**7**		**0**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	1,659	67.25	7	21.21	0	0.00	0	0.00	0	0.00
Steel	18	0.73	0	0.00	0	0.00	0	0.00	0	0.00
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Precast	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
RM	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
URM	152	6.16	4	12.12	1	14.29	0	0.00	0	0.00
MH	638	25.86	22	66.67	6	85.71	0	0.00	0	0.00
Total	**2,467**		**33**		**7**		**0**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 0 hospital beds available for use. On the day of the earthquake, the model estimates that only 0 hospital beds (0.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 0.00% of the beds will be back in service. By 30 days, 0.00% will be operational.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**At Least Moderate Damage > 50%**	**Complete Damage > 50%**	**With Functionality > 50% on day 1**
Hospitals	0	0	0	0
Schools	1	0	0	1
EOCs	0	0	0	0
PoliceStations	0	0	0	0
FireStations	1	0	0	1

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	0	0
	Bridges	22	0	0	22	22
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	1	0	0	1	1
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	1	1
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	0	0
Waste Water	481	2e+025	7e+025
Natural Gas	81	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	2,203	0	0	0	0	0
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 81.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 5,669) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

· Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
· Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
· Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
· Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.06 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.05 (millions of dollars); 15 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 78 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.00	0.00	0.00	0.00
	Capital-Related	0.00	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**
Capital Stock Losses							
	Structural	0.00	0.00	0.00	0.00	0.00	0.01
	Non_Structural	0.02	0.00	0.00	0.00	0.00	0.02
	Content	0.01	0.00	0.00	0.00	0.00	0.01
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.03**	**0.01**	**0.00**	**0.00**	**0.00**	**0.04**
	Total	**0.03**	**0.01**	**0.01**	**0.00**	**0.00**	**0.05**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	8.13	$0.01	0.10
	Tunnels	0.00	$0.00	0.00
	Subtotal	**975.00**	**0.00**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**59.30**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1034.40**	**0.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	4.10	$0.00	0.10
	Subtotal	**180.69**	**$0.00**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	1.10	$0.00	0.00
	Distribution Lines	2.40	$0.00	0.12
	Subtotal	**194.67**	**$0.00**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	1.60	$0.00	0.05
	Subtotal	**1.63**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	9.00	$0.00	0.00
	Subtotal	**9.02**	**$0.00**	
Communication	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
	Total	**386.00**	**$0.01**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina	Pickens	5,669	428	45	474
Total State		**5,669**	**428**	**45**	**474**
Total Region		**5,669**	**428**	**45**	**474**

Hazus-MH: Earthquake Event Report

Region Name: PickensCoHMP_EQFLH

Earthquake Scenario: PickensCo Annualized Loss

Print Date: October 09, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 511.89 square miles and contains 28 census tracts. There are over 45 thousand households in the region which has a total population of 119,224 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 48 thousand buildings in the region with a total building replacement value (excluding contents) of 11,489 (millions of dollars). Approximately 93.00 % of the buildings (and 79.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,210 and 894 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 48 thousand buildings in the region which have an aggregate total replacement value of 11,489 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 67% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 151 beds. There are 35 schools, 10 fire stations, 12 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 0 dams identified within the region. Of these, 0 of the dams are classified as 'high hazard'. The inventory also includes 349 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,104.00 (millions of dollars). This inventory includes over 231 kilometers of highways, 285 bridges, 2,996 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System		# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	285	132.60
	Segments	41	966.90
	Tunnels	0	0.00
		Subtotal	**1,099.50**
Railways	Bridges	0	0.00
	Facilities	1	2.70
	Segments	20	59.30
	Tunnels	0	0.00
		Subtotal	**62.00**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	1	0.90
		Subtotal	**0.90**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	1	10.70
	Runways	1	38.00
		Subtotal	**48.60**
		Total	**1,211.00**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	94.90
	Facilities	32	156.00
	Pipelines	1,542	176.60
		Subtotal	**427.50**
Waste Water	Distribution Lines	NA	56.90
	Facilities	56	6.80
	Pipelines	2,084	191.20
		Subtotal	**254.90**
Natural Gas	Distribution Lines	NA	38.00
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**38.00**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	16	358.90
		Subtotal	**358.90**
Communication	Facilities	3	4.60
		Subtotal	**4.60**
		Total	**1,083.90**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	PickensCo Annualized Loss
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	Annualized
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	NA
Depth (Km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Building Damage

Building Damage

Hazus estimates that about 134 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	36	0.08	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	883	1.96	0	0.00	0	0.00	0	0.00	0	0.00
Education	9	0.02	0	0.00	0	0.00	0	0.00	0	0.00
Government	5	0.01	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	215	0.48	0	0.00	0	0.00	0	0.00	0	0.00
Other Residential	10,667	23.70	393	59.55	112	83.58	0	0.00	0	0.00
Religion	145	0.32	0	0.00	0	0.00	0	0.00	0	0.00
Single Family	33,040	73.42	267	40.45	22	16.42	0	0.00	0	0.00
Total	**45,000**		**660**		**134**		**0**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	31,812	70.69	190	28.79	6	4.48	0	0.00	0	0.00
Steel	576	1.28	0	0.00	0	0.00	0	0.00	0	0.00
Concrete	48	0.11	0	0.00	0	0.00	0	0.00	0	0.00
Precast	12	0.03	0	0.00	0	0.00	0	0.00	0	0.00
RM	70	0.16	0	0.00	0	0.00	0	0.00	0	0.00
URM	3,122	6.94	77	11.67	16	11.94	0	0.00	0	0.00
MH	9,360	20.80	393	59.55	112	83.58	0	0.00	0	0.00
Total	**45,000**		**660**		**134**		**0**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 151 hospital beds available for use. On the day of the earthquake, the model estimates that only 139 hospital beds (92.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 97.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**At Least Moderate Damage > 50%**	**Complete Damage > 50%**	**With Functionality > 50% on day 1**
Hospitals	2	0	0	2
Schools	35	0	0	35
EOCs	1	0	0	1
PoliceStations	12	0	0	12
FireStations	10	0	0	10

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	41	0	0	41	41
	Bridges	285	0	0	285	285
	Tunnels	0	0	0	0	0
Railways	Segments	20	0	0	20	20
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	1	0	0	1	1
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	1	0	0	1	1
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	0	0	1	1
	Runways	1	0	0	1	1

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	32	0	0	32	32
Waste Water	56	0	0	56	56
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	16	0	0	11	11
Communication	3	0	0	3	3

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	618	8e+036	3e+037
Waste Water	481	1e+037	6e+037
Natural Gas	1,898	6	1
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	45,228	45,228	45,228	45,228	45,228	45,228
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.01 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 75.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 200 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 5 households to be displaced due to the earthquake. Of these, 4 people (out of a total population of 119,224) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**1**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 1.85 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 1.37 (millions of dollars); 23 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 56 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.01	0.06	0.00	0.01	0.08
	Capital-Related	0.00	0.01	0.05	0.00	0.00	0.05
	Rental	0.01	0.02	0.02	0.00	0.00	0.05
	Relocation	0.03	0.03	0.04	0.01	0.02	0.13
	Subtotal	**0.04**	**0.07**	**0.17**	**0.01**	**0.03**	**0.32**
Capital Stock Losses							
	Structural	0.06	0.05	0.05	0.01	0.01	0.18
	Non_Structural	0.26	0.15	0.12	0.04	0.04	0.62
	Content	0.10	0.03	0.07	0.03	0.02	0.25
	Inventory	0.00	0.00	0.00	0.01	0.00	0.01
	Subtotal	**0.42**	**0.24**	**0.23**	**0.09**	**0.08**	**1.06**
	Total	**0.46**	**0.30**	**0.40**	**0.10**	**0.10**	**1.37**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	966.89	$0.00	0.00
	Bridges	132.58	$0.19	0.14
	Tunnels	0.00	$0.00	0.00
	Subtotal	**1099.50**	**0.20**	
Railways	Segments	59.34	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	2.66	$0.01	0.19
	Subtotal	**62.00**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.89	$0.00	0.19
	Subtotal	**0.90**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	10.65	$0.02	0.23
	Runways	37.96	$0.00	0.00
	Subtotal	**48.60**	**0.00**	
	Total	**1211.00**	**0.20**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	176.60	$0.00	0.00
	Facilities	156.00	$0.01	0.01
	Distribution Lines	94.90	$0.13	0.13
	Subtotal	**427.50**	**$0.14**	
Waste Water	Pipelines	191.20	$0.00	0.00
	Facilities	6.80	$0.00	0.01
	Distribution Lines	56.90	$0.09	0.16
	Subtotal	**254.93**	**$0.09**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	38.00	$0.03	0.07
	Subtotal	**37.96**	**$0.03**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	358.90	$0.00	0.00
	Subtotal	**358.92**	**$0.00**	
Communication	Facilities	4.60	$0.00	0.01
	Subtotal	**4.63**	**$0.00**	
	Total	**1,083.94**	**$0.26**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Pickens,SC

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
South Carolina	Pickens	119,224	9,101	2,388	11,489
Total State		**119,224**	**9,101**	**2,388**	**11,489**
Total Region		**119,224**	**9,101**	**2,388**	**11,489**

Appendix I: Hazus 100 Year Flood Scenario

Hazus-MH: Flood Event Report

Region Name: City_Central_EQFLU

Flood Scenario: 100YrDischarges

Print Date: Friday, October 14, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 24 square miles and contains 390 census blocks. The region contains over 4 thousand households and has a total population of 9,731 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 2,754 buildings in the region with a total building replacement value (excluding contents) of 837 million dollars (2010 dollars). Approximately 92.01% of the buildings (and 81.37% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,754 buildings in the region which have an aggregate total replacement value of 837 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	680,645	81.4%
Commercial	51,780	6.2%
Industrial	69,035	8.3%
Agricultural	712	0.1%
Religion	13,896	1.7%
Government	3,972	0.5%
Education	16,483	2.0%
Total	**836,523**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	83,722	88.0%
Commercial	7,371	7.7%
Industrial	1,123	1.2%
Agricultural	435	0.5%
Religion	0	0.0%
Government	529	0.6%
Education	1,940	2.0%
Total	**95,120**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 3 schools, no fire stations, 1 police station and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	City_Central_EQFLU
Scenario Name:	100YrDischarges
Return Period Analyzed:	Mix0
Analysis Options Analyzed:	No What-Ifs

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**0**		**0**		**0**		**0**		**0**		**0**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	0	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	3	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 73 tons of debris will be generated. Of the total amount, Finishes comprises 30% of the total, Structure comprises 31% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 3 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 8 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 0 people (out of a total population of 9,731) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 2.23 million dollars, which represents 2.34 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 2.21 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 31.58% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.48	0.36	0.02	0.09	0.94
	Content	0.23	0.58	0.03	0.41	1.25
	Inventory	0.00	0.00	0.00	0.02	0.02
	Subtotal	**0.70**	**0.94**	**0.05**	**0.52**	**2.21**
Business Interruption						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental Income	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.01	0.01
	Subtotal	**0.00**	**0.01**	**0.00**	**0.01**	**0.01**
ALL	**Total**	**0.70**	**0.95**	**0.05**	**0.52**	**2.23**

Appendix A: County Listing for the Region

South Carolina

- Pickens

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars) Residential	Non-Residential	Total
South Carolina				
Pickens	9,731	680,645	155,878	836,523
Total	**9,731**	**680,645**	**155,878**	**836,523**
Total Study Region	**9,731**	**680,645**	**155,878**	**836,523**

Hazus-MH: Flood Event Report

Region Name: City_Clemson_EQFLH

Flood Scenario: 100YearFISDischarges

Print Date: Friday, October 14, 2016

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 52 square miles and contains 820 census blocks. The region contains over 10 thousand households and has a total population of 29,484 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 7,612 buildings in the region with a total building replacement value (excluding contents) of 2,912 million dollars (2010 dollars). Approximately 91.01% of the buildings (and 79.51% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 7,612 buildings in the region which have an aggregate total replacement value of 2,912 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,315,585	79.5%
Commercial	261,825	9.0%
Industrial	117,480	4.0%
Agricultural	2,609	0.1%
Religion	43,851	1.5%
Government	11,788	0.4%
Education	159,143	5.5%
Total	**2,912,281**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	560,399	81.8%
Commercial	69,422	10.1%
Industrial	3,321	0.5%
Agricultural	855	0.1%
Religion	5,825	0.8%
Government	2,948	0.4%
Education	42,715	6.2%
Total	**685,485**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 6 schools, 1 fire station, 5 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	City_Clemson_EQFLH
Scenario Name:	100YearFISDischarges
Return Period Analyzed:	Mix0
Analysis Options Analyzed:	No What-Ifs

Building Damage

General Building Stock Damage

Hazus estimates that about 61 buildings will be at least moderately damaged. This is over 56% of the total number of buildings in the scenario. There are an estimated 13 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	9	12.86	20	28.57	12	17.14	12	17.14	4	5.71	13	18.57
Total	**9**		**20**		**12**		**12**		**4**		**13**	

Table 4: Expected Building Damage by Building Type

Building	1-10		11-20		21-30		31-40		41-50		Substantially	
Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	1	20.00	2	40.00	1	20.00	1	20.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	8	12.31	18	27.69	11	16.92	11	16.92	4	6.15	13	20.00

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	5	1	0	1
Schools	6	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 936 tons of debris will be generated. Of the total amount, Finishes comprises 43% of the total, Structure comprises 27% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 37 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 89 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 150 people (out of a total population of 29,484) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 22.20 million dollars, which represents 3.24 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 22.14 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 79.45% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	11.66	0.96	0.02	0.49	13.12
	Content	5.96	1.64	0.03	1.35	8.98
	Inventory	0.00	0.01	0.00	0.03	0.04
	Subtotal	**17.62**	**2.61**	**0.05**	**1.86**	**22.14**
Business Interruption						
	Income	0.00	0.01	0.00	0.00	0.01
	Relocation	0.02	0.00	0.00	0.00	0.02
	Rental Income	0.01	0.00	0.00	0.00	0.01
	Wage	0.00	0.01	0.00	0.02	0.03
	Subtotal	**0.02**	**0.02**	**0.00**	**0.02**	**0.06**
ALL	**Total**	**17.64**	**2.63**	**0.05**	**1.89**	**22.20**

Appendix A: County Listing for the Region

South Carolina

- Pickens

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	29,484	2,315,585	596,696	2,912,281
Total	**29,484**	**2,315,585**	**596,696**	**2,912,281**
Total Study Region	**29,484**	**2,315,585**	**596,696**	**2,912,281**

Hazus-MH: Flood Event Report

Region Name: City_Easley_EQFLHU

Flood Scenario: 100YrFloodDischarges

Print Date: Friday, October 14, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 60 square miles and contains 1,175 census blocks. The region contains over 16 thousand households and has a total population of 39,735 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 16,890 buildings in the region with a total building replacement value (excluding contents) of 4,229 million dollars (2010 dollars). Approximately 92.44% of the buildings (and 74.43% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 16,890 buildings in the region which have an aggregate total replacement value of 4,229 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	3,147,479	74.4%
Commercial	843,002	19.9%
Industrial	155,783	3.7%
Agricultural	9,131	0.2%
Religion	45,620	1.1%
Government	6,425	0.2%
Education	21,593	0.5%
Total	**4,229,033**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	639,425	83.2%
Commercial	89,676	11.7%
Industrial	27,732	3.6%
Agricultural	2,533	0.3%
Religion	8,717	1.1%
Government	0	0.0%
Education	348	0.0%
Total	**768,431**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 96 beds.
There are 10 schools, 1 fire station, 4 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	City_Easley_EQFLHU
Scenario Name:	100YrFloodDischarges
Return Period Analyzed:	Mix0
Analysis Options Analyzed:	No What-Ifs

Building Damage

General Building Stock Damage

Hazus estimates that about 22 buildings will be at least moderately damaged. This is over 38% of the total number of buildings in the scenario. There are an estimated 5 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	1	4.35	4	17.39	4	17.39	4	17.39	5	21.74	5	21.74
Total	**1**		**4**		**4**		**4**		**5**		**5**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	1	4.76	4	19.05	4	19.05	4	19.05	5	23.81	3	14.29

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 96 hospital beds available for use. On the day of the scenario flood event, the model estimates that 96 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	1	0	0	0
Hospitals	1	0	0	0
Police Stations	4	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,222 tons of debris will be generated. Of the total amount, Finishes comprises 38% of the total, Structure comprises 27% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 49 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 160 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 182 people (out of a total population of 39,735) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 22.19 million dollars, which represents 2.89 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 22.16 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 74.11% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	10.96	1.27	0.26	0.12	12.61
	Content	5.48	3.00	0.54	0.37	9.39
	Inventory	0.00	0.07	0.08	0.01	0.15
	Subtotal	**16.44**	**4.34**	**0.88**	**0.50**	**22.16**
Business Interruption						
	Income	0.00	0.01	0.00	0.00	0.01
	Relocation	0.01	0.00	0.00	0.00	0.01
	Rental Income	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.01	0.00	0.00	0.01
	Subtotal	**0.01**	**0.02**	**0.00**	**0.00**	**0.03**
ALL	**Total**	**16.44**	**4.36**	**0.88**	**0.50**	**22.19**

Appendix A: County Listing for the Region

South Carolina

- Pickens

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars) Residential	Non-Residential	Total
South Carolina				
Pickens	39,735	3,147,479	1,081,554	4,229,033
Total	**39,735**	**3,147,479**	**1,081,554**	**4,229,033**
Total Study Region	**39,735**	**3,147,479**	**1,081,554**	**4,229,033**

Hazus-MH: Flood Event Report

Region Name: City_Liberty_EQFLH

Flood Scenario: 100YrDischarges

Print Date: Friday, October 14, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 32 square miles and contains 358 census blocks. The region contains over 4 thousand households and has a total population of 9,684 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 4,383 buildings in the region with a total building replacement value (excluding contents) of 819 million dollars (2010 dollars). Approximately 93.82% of the buildings (and 76.33% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,383 buildings in the region which have an aggregate total replacement value of 819 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	625,081	76.3%
Commercial	60,906	7.4%
Industrial	90,197	11.0%
Agricultural	4,186	0.5%
Religion	15,405	1.9%
Government	2,133	0.3%
Education	21,055	2.6%
Total	**818,963**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	172,613	84.7%
Commercial	11,194	5.5%
Industrial	9,879	4.8%
Agricultural	791	0.4%
Religion	2,577	1.3%
Government	511	0.3%
Education	6,320	3.1%
Total	**203,885**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 1 fire station, 1 police station and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	City_Liberty_EQFLH
Scenario Name:	100YrDischarges
Return Period Analyzed:	Mix0
Analysis Options Analyzed:	No What-Ifs

Building Damage

General Building Stock Damage

Hazus estimates that about 1 building will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Total	**0**		**0**		**0**		**0**		**0**		**1**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 259 tons of debris will be generated. Of the total amount, Finishes comprises 39% of the total, Structure comprises 23% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 10 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 46 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 26 people (out of a total population of 9,684) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 4.80 million dollars, which represents 2.35 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 4.80 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 70.79% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2.30	0.12	0.18	0.04	2.64
	Content	1.10	0.43	0.31	0.25	2.08
	Inventory	0.00	0.02	0.06	0.00	0.07
	Subtotal	**3.40**	**0.57**	**0.54**	**0.29**	**4.80**
Business Interruption						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental Income	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
ALL	**Total**	**3.40**	**0.57**	**0.54**	**0.29**	**4.80**

Appendix A: County Listing for the Region

South Carolina

- Pickens

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,684	625,081	193,882	818,963
Total	**9,684**	**625,081**	**193,882**	**818,963**
Total Study Region	**9,684**	**625,081**	**193,882**	**818,963**

Hazus-MH: Flood Event Report

Region Name: City_Norris_EQFLHU

Flood Scenario: 100YrFISDischarges

Print Date: Friday, October 14, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 27 square miles and contains 371 census blocks. The region contains over 3 thousand households and has a total population of 7,678 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 3,624 buildings in the region with a total building replacement value (excluding contents) of 741 million dollars (2010 dollars). Approximately 93.24% of the buildings (and 78.93% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 3,624 buildings in the region which have an aggregate total replacement value of 741 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	584,740	78.9%
Commercial	57,607	7.8%
Industrial	61,630	8.3%
Agricultural	3,805	0.5%
Religion	14,693	2.0%
Government	3,192	0.4%
Education	15,132	2.0%
Total	**740,799**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	84,343	85.3%
Commercial	6,472	6.5%
Industrial	6,606	6.7%
Agricultural	602	0.6%
Religion	455	0.5%
Government	0	0.0%
Education	397	0.4%
Total	**98,875**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 3 schools, 2 fire stations, 1 police station and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	City_Norris_EQFLHU
Scenario Name:	100YrFISDischarges
Return Period Analyzed:	Mix0
Analysis Options Analyzed:	No What-Ifs

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**0**		**0**		**0**		**0**		**0**		**0**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	2	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	3	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 119 tons of debris will be generated. Of the total amount, Finishes comprises 42% of the total, Structure comprises 24% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 5 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 11 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1 people (out of a total population of 7,678) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 1.76 million dollars, which represents 1.78 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 1.76 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 58.71% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.70	0.10	0.08	0.01	0.88
	Content	0.34	0.32	0.14	0.05	0.84
	Inventory	0.00	0.01	0.03	0.00	0.04
	Subtotal	**1.04**	**0.43**	**0.24**	**0.05**	**1.76**
Business Interruption						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental Income	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
ALL	**Total**	**1.04**	**0.43**	**0.24**	**0.05**	**1.76**

Appendix A: County Listing for the Region

South Carolina

- Pickens

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	7,678	584,740	156,059	740,799
Total	**7,678**	**584,740**	**156,059**	**740,799**
Total Study Region	**7,678**	**584,740**	**156,059**	**740,799**

Hazus-MH: Flood Event Report

Region Name: City_Pickens_EQFLH

Flood Scenario: 100YrFloodDischarges

Print Date: Friday, October 14, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 42 square miles and contains 482 census blocks. The region contains over 4 thousand households and has a total population of 10,803 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 4,930 buildings in the region with a total building replacement value (excluding contents) of 1,034 million dollars (2010 dollars). Approximately 92.23% of the buildings (and 77.34% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,930 buildings in the region which have an aggregate total replacement value of 1,034 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	799,600	77.3%
Commercial	141,278	13.7%
Industrial	37,549	3.6%
Agricultural	3,101	0.3%
Religion	26,651	2.6%
Government	11,211	1.1%
Education	14,545	1.4%
Total	**1,033,935**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	292,460	81.8%
Commercial	33,652	9.4%
Industrial	20,484	5.7%
Agricultural	1,272	0.4%
Religion	6,900	1.9%
Government	314	0.1%
Education	2,440	0.7%
Total	**357,522**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 55 beds.
There are 5 schools, 1 fire station, 2 police stations and 1 emergency operation center.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	City_Pickens_EQFLH
Scenario Name:	100YrFloodDischarges
Return Period Analyzed:	Mix0
Analysis Options Analyzed:	No What-Ifs

Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 100% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**0**		**2**		**0**		**0**		**0**		**0**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 55 hospital beds available for use. On the day of the scenario flood event, the model estimates that 55 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	1	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	5	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 903 tons of debris will be generated. Of the total amount, Finishes comprises 42% of the total, Structure comprises 25% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 36 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 81 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 22 people (out of a total population of 10,803) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 22.66 million dollars, which represents 6.34 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 22.55 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 35.95% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.43	2.93	0.15	0.16	8.66
	Content	2.72	9.08	0.39	0.79	12.97
	Inventory	0.00	0.79	0.10	0.04	0.93
	Subtotal	**8.15**	**12.79**	**0.63**	**0.99**	**22.55**
Business Interruption						
	Income	0.00	0.01	0.00	0.00	0.01
	Relocation	0.00	0.03	0.00	0.00	0.03
	Rental Income	0.00	0.02	0.00	0.00	0.02
	Wage	0.00	0.04	0.00	0.01	0.04
	Subtotal	**0.00**	**0.10**	**0.00**	**0.01**	**0.10**
ALL	**Total**	**8.15**	**12.89**	**0.63**	**0.99**	**22.66**

Appendix A: County Listing for the Region

South Carolina

- Pickens

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
South Carolina				
Pickens	10,803	799,600	234,335	1,033,935
Total	**10,803**	**799,600**	**234,335**	**1,033,935**
Total Study Region	**10,803**	**799,600**	**234,335**	**1,033,935**

Hazus-MH: Flood Event Report

Region Name: City_SixMile_EQFLH

Flood Scenario: 100yearFISDischarges

Print Date: Thursday, October 13, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 35 square miles and contains 253 census blocks. The region contains over 2 thousand households and has a total population of 5,669 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 2,595 buildings in the region with a total building replacement value (excluding contents) of 474 million dollars (2010 dollars). Approximately 95.14% of the buildings (and 90.44% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 2,595 buildings in the region which have an aggregate total replacement value of 474 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	428,877	90.4%
Commercial	22,293	4.7%
Industrial	12,958	2.7%
Agricultural	480	0.1%
Religion	6,793	1.4%
Government	211	0.0%
Education	2,587	0.5%
Total	**474,199**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	100,774	89.6%
Commercial	5,251	4.7%
Industrial	5,455	4.8%
Agricultural	0	0.0%
Religion	1,016	0.9%
Government	0	0.0%
Education	0	0.0%
Total	**112,496**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 1 school, 1 fire station, no police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	City_SixMile_EQFLH
Scenario Name:	100yearFISDischarges
Return Period Analyzed:	Mix0
Analysis Options Analyzed:	No What-Ifs

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**0**		**0**		**0**		**0**		**0**		**0**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	0	0	0	0
Schools	1	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 70 tons of debris will be generated. Of the total amount, Finishes comprises 39% of the total, Structure comprises 24% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 3 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 10 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 2 people (out of a total population of 5,669) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 0.84 million dollars, which represents 0.75 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 0.84 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 93.35% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.54	0.01	0.01	0.00	0.55
	Content	0.25	0.01	0.02	0.01	0.29
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.79**	**0.02**	**0.03**	**0.01**	**0.84**
Business Interruption						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental Income	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
ALL	**Total**	**0.79**	**0.02**	**0.03**	**0.01**	**0.84**

Appendix A: County Listing for the Region

South Carolina

- Pickens

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
South Carolina				
Pickens	5,669	428,877	45,322	474,199
Total	**5,669**	**428,877**	**45,322**	**474,199**
Total Study Region	**5,669**	**428,877**	**45,322**	**474,199**

Hazus-MH: Flood Event Report

Region Name: PickensCoHMP_EQFLH

Flood Scenario: 100YearFlood_PickensCo

Print Date: Monday, October 10, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 512 square miles and contains 4,394 census blocks. The region contains over 45 thousand households and has a total population of 119 ,224 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 48,394 buildings in the region with a total building replacement value (excluding contents) of 11,490 million dollars (2010 dollars). Approximately 93.10% of the buildings (and 79.21% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 48,394 buildings in the region which have an aggregate total replacement value of 11,490 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	9,101,224	79.2%
Commercial	1,427,396	12.4%
Industrial	484,852	4.2%
Agricultural	25,871	0.2%
Religion	183,914	1.6%
Government	38,722	0.3%
Education	227,970	2.0%
Total	**11,489,949**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	1,702,043	85.2%
Commercial	140,967	7.1%
Industrial	94,335	4.7%
Agricultural	5,846	0.3%
Religion	31,217	1.6%
Government	3,218	0.2%
Education	19,576	1.0%
Total	**1,997,202**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 151 beds.
There are 35 schools, 10 fire stations, 12 police stations and 1 emergency operation center.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	PickensCoHMP_EQFLH
Scenario Name:	100YearFlood_PickensCo
Return Period Analyzed:	Mix0
Analysis Options Analyzed:	No What-Ifs

Building Damage

General Building Stock Damage

Hazus estimates that about 33 buildings will be at least moderately damaged. This is over 18% of the total number of buildings in the scenario. There are an estimated 22 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	3	9.09	3	9.09	1	3.03	4	12.12	22	66.67
Total	**0**		**3**		**3**		**1**		**4**		**22**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	10	100.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	3	13.04	3	13.04	1	4.35	4	17.39	12	52.17

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 151 hospital beds available for use. On the day of the scenario flood event, the model estimates that 151 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	10	1	0	1
Hospitals	2	0	0	0
Police Stations	12	0	0	0
Schools	35	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 6,712 tons of debris will be generated. Of the total amount, Finishes comprises 29% of the total, Structure comprises 32% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 268 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 530 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 360 people (out of a total population of 119,224) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 101.09 million dollars, which represents 5.06 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 100.94 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 60.89% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	41.25	4.16	5.29	0.83	51.53
	Content	20.30	10.42	13.16	3.26	47.14
	Inventory	0.00	0.55	1.67	0.06	2.27
	Subtotal	**61.54**	**15.13**	**20.12**	**4.15**	**100.94**
Business Interruption						
	Income	0.00	0.02	0.00	0.00	0.03
	Relocation	0.01	0.02	0.00	0.00	0.03
	Rental Income	0.00	0.02	0.00	0.00	0.02
	Wage	0.00	0.04	0.00	0.04	0.08
	Subtotal	**0.01**	**0.09**	**0.00**	**0.05**	**0.15**
ALL	**Total**	**61.55**	**15.22**	**20.12**	**4.19**	**101.09**

Appendix A: County Listing for the Region

South Carolina

- Pickens

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
South Carolina				
Pickens	119,224	9,101,224	2,388,725	11,489,949
Total	**119,224**	**9,101,224**	**2,388,725**	**11,489,949**
Total Study Region	**119,224**	**9,101,224**	**2,388,725**	**11,489,949**

Appendix J: Hazus Hurricane Reports 10 Year Return Period

Hazus-MH: Hurricane Event Report

Region Name: City_Central_EQFLU

Hurricane Scenario: Probabilistic 10-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 24.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,731 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 837 million dollars (2010 dollars). Approximately 92% of the buildings (and 81% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,754 buildings in the region which have an aggregate total replacement value of 837 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	680,645	81.4%
Commercial	51,780	6.2%
Industrial	69,035	8.3%
Agricultural	712	0.1%
Religious	13,896	1.7%
Government	3,972	0.5%
Education	16,483	2.0%
Total	**836,523**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, no fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	126	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	12	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	10	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	45	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	23	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	2,534	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**2,754**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	17	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	219	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	349	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	74	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	1,895	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,731) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,731	680,645	155,878	836,523
Total	**9,731**	**680,645**	**155,878**	**836,523**

Hazus-MH: Hurricane Event Report

Region Name: City_Clemson_EQFLH

Hurricane Scenario: Probabilistic 10-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 51.62 square miles and contains 6 census tracts. There are over 9 thousand households in the region and has a total population of 29,484 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 2,912 million dollars (2010 dollars). Approximately 91% of the buildings (and 80% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 7,612 buildings in the region which have an aggregate total replacement value of 2,912 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,315,585	79.5%
Commercial	261,825	9.0%
Industrial	117,480	4.0%
Agricultural	2,609	0.1%
Religious	43,851	1.5%
Government	11,788	0.4%
Education	159,143	5.5%
Total	**2,912,281**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 6 schools, 1 fire stations, 5 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	15	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	436	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	53	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	24	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	95	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	61	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	6,928	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**7,612**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building	None		Minor		Moderate		Severe		Destruction	
Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	87	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	708	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	704	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	262	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	5,389	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	5	0	0	5
Schools	6	0	0	6

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 29,484) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	29,484	2,315,585	596,696	2,912,281
Total	**29,484**	**2,315,585**	**596,696**	**2,912,281**

Hazus-MH: Hurricane Event Report

Region Name: City_Easley_EQFLHU

Hurricane Scenario: Probabilistic 10-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 59.60 square miles and contains 8 census tracts. There are over 15 thousand households in the region and has a total population of 39,735 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 4,229 million dollars (2010 dollars). Approximately 92% of the buildings (and 74% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 16,890 buildings in the region which have an aggregate total replacement value of
4,229 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,147,479	74.4%
Commercial	843,002	19.9%
Industrial	155,783	3.7%
Agricultural	9,131	0.2%
Religious	45,620	1.1%
Government	6,425	0.2%
Education	21,593	0.5%
Total	**4,229,033**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 96 beds. There are 10 schools, 1 fire stations, 4 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	42	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	875	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	20	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	8	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	265	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	67	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	15,613	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**16,890**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	45	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	1,109	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	2,868	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	464	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	11,683	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 96 hospital beds available for use. On the day of the hurricane, the model estimates that 96 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	4	0	0	4
Schools	10	0	0	10

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 39,735) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina
- Pickens

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
South Carolina				
Pickens	39,735	3,147,479	1,081,554	4,229,033
Total	**39,735**	**3,147,479**	**1,081,554**	**4,229,033**

Hazus-MH: Hurricane Event Report

Region Name: City_Liberty_EQFLH

Hurricane Scenario: Probabilistic 10-year Return Period

Print Date: Wednesday, October 12, 2016

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 32.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,684 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 819 million dollars (2010 dollars). Approximately 94% of the buildings (and 76% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,383 buildings in the region which have an aggregate total replacement value of 819 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	625,081	76.3%
Commercial	60,906	7.4%
Industrial	90,197	11.0%
Agricultural	4,186	0.5%
Religious	15,405	1.9%
Government	2,133	0.3%
Education	21,055	2.6%
Total	**818,963**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	11	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	140	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	8	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	5	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	83	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	24	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	4,112	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**4,383**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	7	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	233	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	1,113	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	101	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	2,767	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	4

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,684) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,684	625,081	193,882	818,963
Total	**9,684**	**625,081**	**193,882**	**818,963**

Hazus-MH: Hurricane Event Report

Region Name:	City_Norris_EQFLHU
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 26.97 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 7,678 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 741 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 3,624 buildings in the region which have an aggregate total replacement value of 741 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	584,740	78.9%
Commercial	57,607	7.8%
Industrial	61,630	8.3%
Agricultural	3,805	0.5%
Religious	14,693	2.0%
Government	3,192	0.4%
Education	15,132	2.0%
Total	**740,799**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, 2 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	8	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	137	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	5	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	4	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	66	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	25	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	3,379	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**3,624**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	5	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	201	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	666	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	92	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	2,498	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 7,678) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	7,678	584,740	156,059	740,799
Total	**7,678**	**584,740**	**156,059**	**740,799**

Hazus-MH: Hurricane Event Report

Region Name: City_Pickens_EQFLH

Hurricane Scenario: Probabilistic 10-year Return Period

Print Date: Wednesday, October 12, 2016

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 42.45 square miles and contains 3 census tracts. There are over 4 thousand households in the region and has a total population of 10,803 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 1,034 million dollars (2010 dollars). Approximately 92% of the buildings (and 77% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,930 buildings in the region which have an aggregate total replacement value of 1,034 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	799,600	77.3%
Commercial	141,278	13.7%
Industrial	37,549	3.6%
Agricultural	3,101	0.3%
Religious	26,651	2.6%
Government	11,211	1.1%
Education	14,545	1.4%
Total	**1,033,935**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 55 beds. There are 5 schools, 1 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	16	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	234	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	10	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	16	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	75	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	32	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	4,547	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**4,930**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	10	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	287	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	921	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	138	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	3,312	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 55 hospital beds available for use. On the day of the hurricane, the model estimates that 55 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	5	0	0	5

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,803) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina

- Pickens

	Population	Building Value (thousands of dollars) Residential	Non-Residential	Total
South Carolina				
Pickens	10,803	799,600	234,335	1,033,935
Total	**10,803**	**799,600**	**234,335**	**1,033,935**

Hazus-MH: Hurricane Event Report

Region Name:	City_SixMile_EQFLH
Hurricane Scenario:	Probabilistic 10-year Return Period
Print Date:	Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 35.30 square miles and contains 1 census tracts. There are over 2 thousand households in the region and has a total population of 5,669 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 474 million dollars (2010 dollars). Approximately 95% of the buildings (and 90% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,595 buildings in the region which have an aggregate total replacement value of 474 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	428,877	90.4%
Commercial	22,293	4.7%
Industrial	12,958	2.7%
Agricultural	480	0.1%
Religious	6,793	1.4%
Government	211	0.0%
Education	2,587	0.5%
Total	**474,199**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	71	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	33	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	15	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	2,469	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**2,595**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	**None**		**Minor**		**Moderate**		**Severe**		**Destruction**	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	132	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	666	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	37	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	1,661	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Schools	1	0	0	1

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,669) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina

- Pickens

	Population	Building Value (thousands of dollars) Residential	Non-Residential	Total
South Carolina				
Pickens	5,669	428,877	45,322	474,199
Total	**5,669**	**428,877**	**45,322**	**474,199**

Hazus-MH: Hurricane Event Report

Region Name: PickensCoHMP_EQFLH

Hurricane Scenario: Probabilistic 10-year Return Period

Print Date: Sunday, October 09, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 512.03 square miles and contains 28 census tracts. There are over 45 thousand households in the region and has a total population of 119 ,224 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 48 thousand buildings in the region with a total building replacement value (excluding contents) of 11,490 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 48,394 buildings in the region which have an aggregate total replacement value of
11,490 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	9,101,224	79.2%
Commercial	1,427,396	12.4%
Industrial	484,852	4.2%
Agricultural	25,871	0.2%
Religious	183,914	1.6%
Government	38,722	0.3%
Education	227,970	2.0%
Total	**11,489,949**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 151 beds. There are 35 schools, 10 fire stations, 12 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 10 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	123	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	2,070	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	104	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	62	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	713	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	268	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	45,054	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**48,394**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 10 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	155	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	3,025	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	9,946	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,218	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	31,949	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 151 hospital beds available for use. On the day of the hurricane, the model estimates that 151 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	10	0	0	10
Hospitals	2	0	0	2
Police Stations	12	0	0	12
Schools	35	0	0	35

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 119,224) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina
- Pickens

	Population	Building Value (thousands of dollars) Residential	Non-Residential	Total
South Carolina				
Pickens	119,224	9,101,224	2,388,725	11,489,949
Total	**119,224**	**9,101,224**	**2,388,725**	**11,489,949**

Appendix K: Hazus Hurricane Reports 20 Year Return Period

Hazus-MH: Hurricane Event Report

Region Name: City_Central_EQFLU

Hurricane Scenario: Probabilistic 20-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 24.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,731 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 837 million dollars (2010 dollars). Approximately 92% of the buildings (and 81% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,754 buildings in the region which have an aggregate total replacement value of 837 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	680,645	81.4%
Commercial	51,780	6.2%
Industrial	69,035	8.3%
Agricultural	712	0.1%
Religious	13,896	1.7%
Government	3,972	0.5%
Education	16,483	2.0%
Total	**836,523**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, no fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	126	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	12	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	10	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	45	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	23	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	2,534	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**2,754**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	17	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	219	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	349	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	74	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	1,895	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,731) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,731	680,645	155,878	836,523
Total	**9,731**	**680,645**	**155,878**	**836,523**

Hazus-MH: Hurricane Event Report

Region Name: City_Clemson_EQFLH

Hurricane Scenario: Probabilistic 20-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 51.62 square miles and contains 6 census tracts. There are over 9 thousand households in the region and has a total population of 29,484 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 2,912 million dollars (2010 dollars). Approximately 91% of the buildings (and 80% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 7,612 buildings in the region which have an aggregate total replacement value of 2,912 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,315,585	79.5%
Commercial	261,825	9.0%
Industrial	117,480	4.0%
Agricultural	2,609	0.1%
Religious	43,851	1.5%
Government	11,788	0.4%
Education	159,143	5.5%
Total	**2,912,281**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 6 schools, 1 fire stations, 5 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	15	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	436	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	53	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	24	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	95	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	61	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	6,928	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**7,612**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	87	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	708	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	704	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	262	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	5,389	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	5	0	0	5
Schools	6	0	0	6

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 29,484) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina

- Pickens

	Population	Building Value (thousands of dollars) Residential	Non-Residential	Total
South Carolina				
Pickens	29,484	2,315,585	596,696	2,912,281
Total	**29,484**	**2,315,585**	**596,696**	**2,912,281**

Hazus-MH: Hurricane Event Report

Region Name: City_Easley_EQFLHU

Hurricane Scenario: Probabilistic 20-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 59.60 square miles and contains 8 census tracts. There are over 15 thousand households in the region and has a total population of 39,735 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 4,229 million dollars (2010 dollars). Approximately 92% of the buildings (and 74% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 16,890 buildings in the region which have an aggregate total replacement value of
4,229 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,147,479	74.4%
Commercial	843,002	19.9%
Industrial	155,783	3.7%
Agricultural	9,131	0.2%
Religious	45,620	1.1%
Government	6,425	0.2%
Education	21,593	0.5%
Total	**4,229,033**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 96 beds. There are 10 schools, 1 fire stations, 4 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	42	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	875	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	20	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	8	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	265	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	67	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	15,613	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**16,890**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building	None		Minor		Moderate		Severe		Destruction	
Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	45	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	1,109	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	2,868	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	464	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	11,683	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 96 hospital beds available for use. On the day of the hurricane, the model estimates that 96 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	4	0	0	4
Schools	10	0	0	10

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 39,735) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region’s buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	39,735	3,147,479	1,081,554	4,229,033
Total	**39,735**	**3,147,479**	**1,081,554**	**4,229,033**

Hazus-MH: Hurricane Event Report

Region Name: City_Liberty_EQFLH

Hurricane Scenario: Probabilistic 20-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 32.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,684 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 819 million dollars (2010 dollars). Approximately 94% of the buildings (and 76% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,383 buildings in the region which have an aggregate total replacement value of 819 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	625,081	76.3%
Commercial	60,906	7.4%
Industrial	90,197	11.0%
Agricultural	4,186	0.5%
Religious	15,405	1.9%
Government	2,133	0.3%
Education	21,055	2.6%
Total	**818,963**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	11	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	140	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	8	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	5	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	83	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	24	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	4,112	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**4,383**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building	None		Minor		Moderate		Severe		Destruction	
Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	7	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	233	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	1,113	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	101	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	2,767	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	4

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,684) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,684	625,081	193,882	818,963
Total	**9,684**	**625,081**	**193,882**	**818,963**

Hazus-MH: Hurricane Event Report

Region Name: City_Norris_EQFLHU

Hurricane Scenario: Probabilistic 20-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 26.97 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 7,678 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 741 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 3,624 buildings in the region which have an aggregate total replacement value of 741 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	584,740	78.9%
Commercial	57,607	7.8%
Industrial	61,630	8.3%
Agricultural	3,805	0.5%
Religious	14,693	2.0%
Government	3,192	0.4%
Education	15,132	2.0%
Total	**740,799**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, 2 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	8	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	137	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	5	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	4	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	66	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	25	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	3,379	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**3,624**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	5	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	201	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	666	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	92	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	2,498	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 7,678) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina
- Pickens

	Population	Building Value (thousands of dollars) Residential	Non-Residential	Total
South Carolina				
Pickens	7,678	584,740	156,059	740,799
Total	**7,678**	**584,740**	**156,059**	**740,799**

Hazus-MH: Hurricane Event Report

Region Name: City_Pickens_EQFLH

Hurricane Scenario: Probabilistic 20-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 42.45 square miles and contains 3 census tracts. There are over 4 thousand households in the region and has a total population of 10,803 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 1,034 million dollars (2010 dollars). Approximately 92% of the buildings (and 77% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,930 buildings in the region which have an aggregate total replacement value of 1,034 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	799,600	77.3%
Commercial	141,278	13.7%
Industrial	37,549	3.6%
Agricultural	3,101	0.3%
Religious	26,651	2.6%
Government	11,211	1.1%
Education	14,545	1.4%
Total	**1,033,935**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 55 beds. There are 5 schools, 1 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	16	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	234	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	10	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	16	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	75	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	32	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	4,547	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**4,930**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	10	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	287	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	921	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	138	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	3,312	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 55 hospital beds available for use. On the day of the hurricane, the model estimates that 55 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	5	0	0	5

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,803) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	10,803	799,600	234,335	1,033,935
Total	**10,803**	**799,600**	**234,335**	**1,033,935**

Hazus-MH: Hurricane Event Report

Region Name: City_SixMile_EQFLH

Hurricane Scenario: Probabilistic 20-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 35.30 square miles and contains 1 census tracts. There are over 2 thousand households in the region and has a total population of 5,669 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 474 million dollars (2010 dollars). Approximately 95% of the buildings (and 90% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,595 buildings in the region which have an aggregate total replacement value of 474 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	428,877	90.4%
Commercial	22,293	4.7%
Industrial	12,958	2.7%
Agricultural	480	0.1%
Religious	6,793	1.4%
Government	211	0.0%
Education	2,587	0.5%
Total	**474,199**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	71	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	33	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	15	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	2,469	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**2,595**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	132	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	666	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	37	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	1,661	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service. By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Schools	1	0	0	1

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,669) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	**Residential**	**Non-Residential**	**Total**
South Carolina				
Pickens	5,669	428,877	45,322	474,199
Total	**5,669**	**428,877**	**45,322**	**474,199**

Hazus-MH: Hurricane Event Report

Region Name: PickensCoHMP_EQFLH

Hurricane Scenario: Probabilistic 20-year Return Period

Print Date: Sunday, October 09, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 512.03 square miles and contains 28 census tracts. There are over 45 thousand households in the region and has a total population of 119 ,224 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 48 thousand buildings in the region with a total building replacement value (excluding contents) of 11,490 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 48,394 buildings in the region which have an aggregate total replacement value of
11,490 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	9,101,224	79.2%
Commercial	1,427,396	12.4%
Industrial	484,852	4.2%
Agricultural	25,871	0.2%
Religious	183,914	1.6%
Government	38,722	0.3%
Education	227,970	2.0%
Total	**11,489,949**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 151 beds. There are 35 schools, 10 fire stations, 12 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 20 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	123	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	2,070	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	104	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	62	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	713	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	268	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	45,054	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**48,394**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 20 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	155	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	3,025	100.00	0	0.00	0	0.00	0	0.00	0	0.00
MH	9,946	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,218	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	31,949	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 151 hospital beds available for use. On the day of the hurricane, the model estimates that 151 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	10	0	0	10
Hospitals	2	0	0	2
Police Stations	12	0	0	12
Schools	35	0	0	35

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 119,224) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	0.00	0.00	0.00	0.00	0.00
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

South Carolina

- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	119,224	9,101,224	2,388,725	11,489,949
Total	**119,224**	**9,101,224**	**2,388,725**	**11,489,949**

Appendix L: Hazus Hurricane Reports 50 Year Return Period

Hazus-MH: Hurricane Event Report

Region Name: City_Central_EQFLU

Hurricane Scenario: Probabilistic 50-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 24.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,731 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 837 million dollars (2010 dollars). Approximately 92% of the buildings (and 81% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,754 buildings in the region which have an aggregate total replacement value of 837 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	680,645	81.4%
Commercial	51,780	6.2%
Industrial	69,035	8.3%
Agricultural	712	0.1%
Religious	13,896	1.7%
Government	3,972	0.5%
Education	16,483	2.0%
Total	**836,523**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, no fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4	99.81	0	0.19	0	0.00	0	0.00	0	0.00
Commercial	126	99.73	0	0.27	0	0.00	0	0.00	0	0.00
Education	12	99.75	0	0.25	0	0.00	0	0.00	0	0.00
Government	10	99.73	0	0.27	0	0.00	0	0.00	0	0.00
Industrial	45	99.74	0	0.26	0	0.00	0	0.00	0	0.00
Religion	23	99.79	0	0.21	0	0.00	0	0.00	0	0.00
Residential	2,532	99.94	2	0.06	0	0.00	0	0.00	0	0.00
Total	**2,752**		**2**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	17	99.63	0	0.37	0	0.00	0	0.00	0	0.00
Masonry	218	99.63	1	0.36	0	0.00	0	0.00	0	0.00
MH	349	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	74	99.70	0	0.30	0	0.00	0	0.00	0	0.00
Wood	1,895	99.99	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 15 tons of debris will be generated. Of the total amount, 12 tons (80%) is Other Tree Debris. Of the remaining 3 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,731) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	24.34	0.00	0.00	0.00	24.34
	Content	10.47	0.00	0.00	0.00	10.47
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**34.81**	**0.00**	**0.00**	**0.00**	**34.81**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**34.81**	**0.00**	**0.00**	**0.00**	**34.81**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,731	680,645	155,878	836,523
Total	**9,731**	**680,645**	**155,878**	**836,523**

Hazus-MH: Hurricane Event Report

Region Name: City_Clemson_EQFLH

Hurricane Scenario: Probabilistic 50-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 51.62 square miles and contains 6 census tracts. There are over 9 thousand households in the region and has a total population of 29,484 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 2,912 million dollars (2010 dollars). Approximately 91% of the buildings (and 80% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 7,612 buildings in the region which have an aggregate total replacement value of 2,912 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,315,585	79.5%
Commercial	261,825	9.0%
Industrial	117,480	4.0%
Agricultural	2,609	0.1%
Religious	43,851	1.5%
Government	11,788	0.4%
Education	159,143	5.5%
Total	**2,912,281**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 6 schools, 1 fire stations, 5 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	15	99.81	0	0.19	0	0.00	0	0.00	0	0.00
Commercial	435	99.73	1	0.27	0	0.00	0	0.00	0	0.00
Education	53	99.74	0	0.26	0	0.00	0	0.00	0	0.00
Government	24	99.73	0	0.27	0	0.00	0	0.00	0	0.00
Industrial	95	99.74	0	0.26	0	0.00	0	0.00	0	0.00
Religion	61	99.79	0	0.21	0	0.00	0	0.00	0	0.00
Residential	6,923	99.93	5	0.07	0	0.00	0	0.00	0	0.00
Total	**7,605**		**7**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	87	99.59	0	0.41	0	0.00	0	0.00	0	0.00
Masonry	706	99.65	2	0.35	0	0.00	0	0.00	0	0.00
MH	704	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	261	99.69	1	0.31	0	0.00	0	0.00	0	0.00
Wood	5,389	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service. By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	5	0	0	5
Schools	6	0	0	6

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 35 tons of debris will be generated. Of the total amount, 28 tons (80%) is Other Tree Debris. Of the remaining 7 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 7 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 29,484) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.1 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	48.61	0.00	0.00	0.00	48.61
	Content	27.59	0.00	0.00	0.00	27.59
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**76.20**	**0.00**	**0.00**	**0.00**	**76.20**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**76.20**	**0.00**	**0.00**	**0.00**	**76.20**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	29,484	2,315,585	596,696	2,912,281
Total	**29,484**	**2,315,585**	**596,696**	**2,912,281**

Hazus-MH: Hurricane Event Report

Region Name: City_Easley_EQFLHU

Hurricane Scenario: Probabilistic 50-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 59.60 square miles and contains 8 census tracts. There are over 15 thousand households in the region and has a total population of 39,735 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 4,229 million dollars (2010 dollars). Approximately 92% of the buildings (and 74% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 16,890 buildings in the region which have an aggregate total replacement value of
4,229 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,147,479	74.4%
Commercial	843,002	19.9%
Industrial	155,783	3.7%
Agricultural	9,131	0.2%
Religious	45,620	1.1%
Government	6,425	0.2%
Education	21,593	0.5%
Total	**4,229,033**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 96 beds. There are 10 schools, 1 fire stations, 4 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	42	99.81	0	0.19	0	0.00	0	0.00	0	0.00
Commercial	873	99.74	2	0.26	0	0.00	0	0.00	0	0.00
Education	20	99.74	0	0.26	0	0.00	0	0.00	0	0.00
Government	8	99.73	0	0.27	0	0.00	0	0.00	0	0.00
Industrial	264	99.73	1	0.27	0	0.00	0	0.00	0	0.00
Religion	67	99.79	0	0.21	0	0.00	0	0.00	0	0.00
Residential	15,610	99.98	3	0.02	0	0.00	0	0.00	0	0.00
Total	**16,884**		**6**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	45	99.67	0	0.33	0	0.00	0	0.00	0	0.00
Masonry	1,107	99.83	2	0.17	0	0.00	0	0.00	0	0.00
MH	2,868	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	463	99.71	1	0.29	0	0.00	0	0.00	0	0.00
Wood	11,682	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 96 hospital beds available for use. On the day of the hurricane, the model estimates that 96 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	4	0	0	4
Schools	10	0	0	10

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 36 tons of debris will be generated. Of the total amount, 21 tons (58%) is Other Tree Debris. Of the remaining 15 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 15 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 39,735) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.2 million dollars, which represents 0.01 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	178.88	0.00	0.00	0.00	178.88
	Content	47.12	0.00	0.00	0.00	47.12
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**226.00**	**0.00**	**0.00**	**0.00**	**226.00**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**226.00**	**0.00**	**0.00**	**0.00**	**226.00**

South Carolina
- Pickens

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
South Carolina				
Pickens	39,735	3,147,479	1,081,554	4,229,033
Total	**39,735**	**3,147,479**	**1,081,554**	**4,229,033**

Hazus-MH: Hurricane Event Report

Region Name: City_Liberty_EQFLH

Hurricane Scenario: Probabilistic 50-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 32.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,684 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 819 million dollars (2010 dollars). Approximately 94% of the buildings (and 76% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,383 buildings in the region which have an aggregate total replacement value of 819 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	625,081	76.3%
Commercial	60,906	7.4%
Industrial	90,197	11.0%
Agricultural	4,186	0.5%
Religious	15,405	1.9%
Government	2,133	0.3%
Education	21,055	2.6%
Total	**818,963**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	11	99.81	0	0.19	0	0.00	0	0.00	0	0.00
Commercial	140	99.75	0	0.25	0	0.00	0	0.00	0	0.00
Education	8	99.76	0	0.24	0	0.00	0	0.00	0	0.00
Government	5	99.74	0	0.26	0	0.00	0	0.00	0	0.00
Industrial	83	99.74	0	0.26	0	0.00	0	0.00	0	0.00
Religion	24	99.79	0	0.21	0	0.00	0	0.00	0	0.00
Residential	4,112	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**4,382**		**1**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	7	99.71	0	0.29	0	0.00	0	0.00	0	0.00
Masonry	233	99.90	0	0.10	0	0.00	0	0.00	0	0.00
MH	1,113	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	101	99.72	0	0.28	0	0.00	0	0.00	0	0.00
Wood	2,767	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	4

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 8 tons of debris will be generated. Of the total amount, 7 tons (88%) is Other Tree Debris. Of the remaining 1 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,684) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	9.67	0.00	0.00	0.00	9.67
	Content	10.76	0.00	0.00	0.00	10.76
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**20.43**	**0.00**	**0.00**	**0.00**	**20.43**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**20.43**	**0.00**	**0.00**	**0.00**	**20.43**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,684	625,081	193,882	818,963
Total	**9,684**	**625,081**	**193,882**	**818,963**

Hazus-MH: Hurricane Event Report

Region Name:	City_Norris_EQFLHU
Hurricane Scenario:	Probabilistic 50-year Return Period
Print Date:	Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 26.97 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 7,678 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 741 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 3,624 buildings in the region which have an aggregate total replacement value of 741 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	584,740	78.9%
Commercial	57,607	7.8%
Industrial	61,630	8.3%
Agricultural	3,805	0.5%
Religious	14,693	2.0%
Government	3,192	0.4%
Education	15,132	2.0%
Total	**740,799**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, 2 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	8	99.82	0	0.19	0	0.00	0	0.00	0	0.00
Commercial	137	99.76	0	0.24	0	0.00	0	0.00	0	0.00
Education	5	99.75	0	0.25	0	0.00	0	0.00	0	0.00
Government	4	99.74	0	0.26	0	0.00	0	0.00	0	0.00
Industrial	66	99.74	0	0.26	0	0.00	0	0.00	0	0.00
Religion	25	99.79	0	0.21	0	0.00	0	0.00	0	0.00
Residential	3,379	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**3,623**		**1**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	5	99.71	0	0.29	0	0.00	0	0.00	0	0.00
Masonry	201	99.90	0	0.10	0	0.00	0	0.00	0	0.00
MH	666	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	92	99.73	0	0.27	0	0.00	0	0.00	0	0.00
Wood	2,498	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 4 tons of debris will be generated. Of the total amount, 3 tons (75%) is Other Tree Debris. Of the remaining 1 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 7,678) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	8.82	0.00	0.00	0.00	8.82
	Content	9.59	0.00	0.00	0.00	9.59
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**18.40**	**0.00**	**0.00**	**0.00**	**18.40**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**18.40**	**0.00**	**0.00**	**0.00**	**18.40**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	7,678	584,740	156,059	740,799
Total	**7,678**	**584,740**	**156,059**	**740,799**

Hazus-MH: Hurricane Event Report

Region Name: City_Pickens_EQFLH

Hurricane Scenario: Probabilistic 50-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 42.45 square miles and contains 3 census tracts. There are over 4 thousand households in the region and has a total population of 10,803 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 1,034 million dollars (2010 dollars). Approximately 92% of the buildings (and 77% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,930 buildings in the region which have an aggregate total replacement value of 1,034 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	799,600	77.3%
Commercial	141,278	13.7%
Industrial	37,549	3.6%
Agricultural	3,101	0.3%
Religious	26,651	2.6%
Government	11,211	1.1%
Education	14,545	1.4%
Total	**1,033,935**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 55 beds. There are 5 schools, 1 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	16	99.81	0	0.19	0	0.00	0	0.00	0	0.00
Commercial	233	99.75	1	0.25	0	0.00	0	0.00	0	0.00
Education	10	99.75	0	0.25	0	0.00	0	0.00	0	0.00
Government	16	99.74	0	0.26	0	0.00	0	0.00	0	0.00
Industrial	75	99.74	0	0.26	0	0.00	0	0.00	0	0.00
Religion	32	99.79	0	0.21	0	0.00	0	0.00	0	0.00
Residential	4,546	99.99	1	0.01	0	0.00	0	0.00	0	0.00
Total	**4,929**		**1**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	10	99.67	0	0.33	0	0.00	0	0.00	0	0.00
Masonry	287	99.84	0	0.16	0	0.00	0	0.00	0	0.00
MH	921	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	138	99.71	0	0.28	0	0.00	0	0.00	0	0.00
Wood	3,312	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 55 hospital beds available for use. On the day of the hurricane, the model estimates that 55 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	5	0	0	5

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 7 tons of debris will be generated. Of the total amount, 6 tons (86%) is Other Tree Debris. Of the remaining 1 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,803) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	4.41	0.00	0.00	0.00	4.41
	Content	9.15	0.00	0.00	0.00	9.15
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**13.56**	**0.00**	**0.00**	**0.00**	**13.56**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**13.56**	**0.00**	**0.00**	**0.00**	**13.56**

South Carolina
- Pickens

	Population	Building Value (thousands of dollars) Residential	Non-Residential	Total
South Carolina				
Pickens	10,803	799,600	234,335	1,033,935
Total	**10,803**	**799,600**	**234,335**	**1,033,935**

Hazus-MH: Hurricane Event Report

Region Name: City_SixMile_EQFLH

Hurricane Scenario: Probabilistic 50-year Return Period

Print Date: Wednesday, October 12, 2016

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 35.30 square miles and contains 1 census tracts. There are over 2 thousand households in the region and has a total population of 5,669 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 474 million dollars (2010 dollars). Approximately 95% of the buildings (and 90% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,595 buildings in the region which have an aggregate total replacement value of 474 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	428,877	90.4%
Commercial	22,293	4.7%
Industrial	12,958	2.7%
Agricultural	480	0.1%
Religious	6,793	1.4%
Government	211	0.0%
Education	2,587	0.5%
Total	**474,199**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	4	99.81	0	0.19	0	0.00	0	0.00	0	0.00
Commercial	71	99.73	0	0.27	0	0.00	0	0.00	0	0.00
Education	2	99.71	0	0.29	0	0.00	0	0.00	0	0.00
Government	1	99.68	0	0.32	0	0.00	0	0.00	0	0.00
Industrial	33	99.75	0	0.25	0	0.00	0	0.00	0	0.00
Religion	15	99.79	0	0.21	0	0.00	0	0.00	0	0.00
Residential	2,469	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	**2,595**		**0**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building	None		Minor		Moderate		Severe		Destruction	
Type	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	132	99.93	0	0.07	0	0.00	0	0.00	0	0.00
MH	666	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	37	99.73	0	0.27	0	0.00	0	0.00	0	0.00
Wood	1,661	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Schools	1	0	0	1

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 4 tons of debris will be generated. Of the total amount, 4 tons (100%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,669) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	7.07	0.00	0.00	0.00	7.07
	Content	6.76	0.00	0.00	0.00	6.76
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**13.83**	**0.00**	**0.00**	**0.00**	**13.83**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**13.83**	**0.00**	**0.00**	**0.00**	**13.83**

South Carolina
- Pickens

	Population	Building Value (thousands of dollars) Residential	Non-Residential	Total
South Carolina				
Pickens	5,669	428,877	45,322	474,199
Total	**5,669**	**428,877**	**45,322**	**474,199**

Hazus-MH: Hurricane Event Report

Region Name: PickensCoHMP_EQFLH

Hurricane Scenario: Probabilistic 50-year Return Period

Print Date: Sunday, October 09, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 512.03 square miles and contains 28 census tracts. There are over 45 thousand households in the region and has a total population of 119 ,224 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 48 thousand buildings in the region with a total building replacement value (excluding contents) of 11,490 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 48,394 buildings in the region which have an aggregate total replacement value of
11,490 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	9,101,224	79.2%
Commercial	1,427,396	12.4%
Industrial	484,852	4.2%
Agricultural	25,871	0.2%
Religious	183,914	1.6%
Government	38,722	0.3%
Education	227,970	2.0%
Total	**11,489,949**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 151 beds. There are 35 schools, 10 fire stations, 12 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	123	99.81	0	0.19	0	0.00	0	0.00	0	0.00
Commercial	2,065	99.74	5	0.26	0	0.00	0	0.00	0	0.00
Education	104	99.75	0	0.25	0	0.00	0	0.00	0	0.00
Government	62	99.74	0	0.26	0	0.00	0	0.00	0	0.00
Industrial	711	99.74	2	0.26	0	0.00	0	0.00	0	0.00
Religion	267	99.79	1	0.21	0	0.00	0	0.00	0	0.00
Residential	45,046	99.98	8	0.02	0	0.00	0	0.00	0	0.00
Total	**48,377**		**17**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	154	99.63	1	0.37	0	0.00	0	0.00	0	0.00
Masonry	3,019	99.81	6	0.18	0	0.00	0	0.00	0	0.00
MH	9,946	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,214	99.71	4	0.29	0	0.00	0	0.00	0	0.00
Wood	31,948	100.00	1	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 151 hospital beds available for use. On the day of the hurricane, the model estimates that 151 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	10	0	0	10
Hospitals	2	0	0	2
Police Stations	12	0	0	12
Schools	35	0	0	35

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,096 tons of debris will be generated. Of the total amount, 942 tons (86%) is Other Tree Debris. Of the remaining 154 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 154 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 119,224) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.7 million dollars, which represents 0.01 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	507.31	0.00	0.00	0.00	507.31
	Content	153.35	0.00	0.00	0.00	153.35
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**660.66**	**0.00**	**0.00**	**0.00**	**660.66**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total						
	Total	**660.66**	**0.00**	**0.00**	**0.00**	**660.66**

South Carolina
- Pickens

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
South Carolina				
Pickens	119,224	9,101,224	2,388,725	11,489,949
Total	**119,224**	**9,101,224**	**2,388,725**	**11,489,949**

Appendix M: Hazus Hurricane Reports 100 Year Return Period

Hazus-MH: Hurricane Event Report

Region Name: City_Central_EQFLU

Hurricane Scenario: Probabilistic 100-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 24.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,731 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 837 million dollars (2010 dollars). Approximately 92% of the buildings (and 81% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,754 buildings in the region which have an aggregate total replacement value of 837 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	680,645	81.4%
Commercial	51,780	6.2%
Industrial	69,035	8.3%
Agricultural	712	0.1%
Religious	13,896	1.7%
Government	3,972	0.5%
Education	16,483	2.0%
Total	**836,523**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, no fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4	99.73	0	0.27	0	0.01	0	0.00	0	0.00
Commercial	126	99.61	0	0.38	0	0.00	0	0.00	0	0.00
Education	12	99.65	0	0.35	0	0.00	0	0.00	0	0.00
Government	10	99.64	0	0.37	0	0.00	0	0.00	0	0.00
Industrial	45	99.63	0	0.37	0	0.00	0	0.00	0	0.00
Religion	23	99.72	0	0.27	0	0.01	0	0.00	0	0.00
Residential	2,531	99.89	3	0.11	0	0.00	0	0.00	0	0.00
Total	**2,750**		**4**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building	None		Minor		Moderate		Severe		Destruction	
Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	17	99.49	0	0.51	0	0.00	0	0.00	0	0.00
Masonry	218	99.41	1	0.57	0	0.02	0	0.00	0	0.00
MH	349	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	74	99.59	0	0.41	0	0.00	0	0.00	0	0.00
Wood	1,894	99.97	0	0.03	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 506 tons of debris will be generated. Of the total amount, 411 tons (81%) is Other Tree Debris. Of the remaining 95 tons, Brick/Wood comprises 6% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 89 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,731) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.3 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	207.55	5.18	6.90	3.46	223.09
	Content	42.67	0.00	0.00	0.00	42.67
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**250.22**	**5.18**	**6.90**	**3.46**	**265.77**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.16	0.02	0.00	0.01	0.19
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.16**	**0.02**	**0.00**	**0.01**	**0.19**
Total						
	Total	**250.38**	**5.19**	**6.90**	**3.47**	**265.95**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,731	680,645	155,878	836,523
Total	**9,731**	**680,645**	**155,878**	**836,523**

Hazus-MH: Hurricane Event Report

Region Name: City_Clemson_EQFLH

Hurricane Scenario: Probabilistic 100-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 51.62 square miles and contains 6 census tracts. There are over 9 thousand households in the region and has a total population of 29,484 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 2,912 million dollars (2010 dollars). Approximately 91% of the buildings (and 80% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 7,612 buildings in the region which have an aggregate total replacement value of 2,912 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,315,585	79.5%
Commercial	261,825	9.0%
Industrial	117,480	4.0%
Agricultural	2,609	0.1%
Religious	43,851	1.5%
Government	11,788	0.4%
Education	159,143	5.5%
Total	**2,912,281**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 6 schools, 1 fire stations, 5 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	15	99.72	0	0.27	0	0.01	0	0.00	0	0.00
Commercial	434	99.61	2	0.39	0	0.00	0	0.00	0	0.00
Education	53	99.64	0	0.36	0	0.00	0	0.00	0	0.00
Government	24	99.64	0	0.36	0	0.00	0	0.00	0	0.00
Industrial	95	99.63	0	0.37	0	0.00	0	0.00	0	0.00
Religion	61	99.72	0	0.28	0	0.01	0	0.00	0	0.00
Residential	6,919	99.87	9	0.13	0	0.00	0	0.00	0	0.00
Total	**7,600**		**11**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building	None		Minor		Moderate		Severe		Destruction	
Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	86	99.39	1	0.61	0	0.00	0	0.00	0	0.00
Masonry	704	99.43	4	0.56	0	0.02	0	0.00	0	0.00
MH	704	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	261	99.55	1	0.45	0	0.00	0	0.00	0	0.00
Wood	5,388	99.97	1	0.03	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	5	0	0	5
Schools	6	0	0	6

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 980 tons of debris will be generated. Of the total amount, 759 tons (77%) is Other Tree Debris. Of the remaining 221 tons, Brick/Wood comprises 14% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 191 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 29,484) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.8 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 3% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 93% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	644.55	26.18	11.75	21.58	704.06
	Content	111.36	0.00	0.00	0.00	111.36
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**755.91**	**26.18**	**11.75**	**21.58**	**815.42**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.53	0.09	0.00	0.02	0.64
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.53**	**0.09**	**0.00**	**0.02**	**0.64**
Total						
	Total	**756.43**	**26.28**	**11.75**	**21.61**	**816.06**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	29,484	2,315,585	596,696	2,912,281
Total	**29,484**	**2,315,585**	**596,696**	**2,912,281**

Hazus-MH: Hurricane Event Report

Region Name: City_Easley_EQFLHU

Hurricane Scenario: Probabilistic 100-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 59.60 square miles and contains 8 census tracts. There are over 15 thousand households in the region and has a total population of 39,735 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 4,229 million dollars (2010 dollars). Approximately 92% of the buildings (and 74% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 16,890 buildings in the region which have an aggregate total replacement value of
4,229 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,147,479	74.4%
Commercial	843,002	19.9%
Industrial	155,783	3.7%
Agricultural	9,131	0.2%
Religious	45,620	1.1%
Government	6,425	0.2%
Education	21,593	0.5%
Total	**4,229,033**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 96 beds. There are 10 schools, 1 fire stations, 4 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	42	99.69	0	0.30	0	0.01	0	0.00	0	0.00
Commercial	871	99.59	4	0.40	0	0.01	0	0.00	0	0.00
Education	20	99.62	0	0.38	0	0.00	0	0.00	0	0.00
Government	8	99.57	0	0.43	0	0.00	0	0.00	0	0.00
Industrial	264	99.62	1	0.38	0	0.00	0	0.00	0	0.00
Religion	67	99.70	0	0.30	0	0.01	0	0.00	0	0.00
Residential	15,603	99.94	10	0.06	0	0.00	0	0.00	0	0.00
Total	**16,875**		**15**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	45	99.51	0	0.49	0	0.00	0	0.00	0	0.00
Masonry	1,106	99.70	3	0.29	0	0.01	0	0.00	0	0.00
MH	2,868	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	462	99.56	2	0.44	0	0.00	0	0.00	0	0.00
Wood	11,678	99.95	5	0.04	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 96 hospital beds available for use. On the day of the hurricane, the model estimates that 96 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	4	0	0	4
Schools	10	0	0	10

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,014 tons of debris will be generated. Of the total amount, 667 tons (66%) is Other Tree Debris. Of the remaining 347 tons, Brick/Wood comprises 3% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 338 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 39,735) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 1.8 million dollars, which represents 0.04 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,422.25	84.30	15.58	7.98	1,530.11
	Content	238.14	0.00	0.00	0.00	238.14
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,660.39**	**84.30**	**15.58**	**7.98**	**1,768.25**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.25	0.24	0.00	0.03	0.53
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.25**	**0.24**	**0.00**	**0.03**	**0.53**
Total						
	Total	**1,660.65**	**84.54**	**15.58**	**8.02**	**1,768.78**

South Carolina
- Pickens

	Population	Building Value (thousands of dollars) Residential	Non-Residential	Total
South Carolina				
Pickens	39,735	3,147,479	1,081,554	4,229,033
Total	**39,735**	**3,147,479**	**1,081,554**	**4,229,033**

Hazus-MH: Hurricane Event Report

Region Name: City_Liberty_EQFLH

Hurricane Scenario: Probabilistic 100-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 32.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,684 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 819 million dollars (2010 dollars). Approximately 94% of the buildings (and 76% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,383 buildings in the region which have an aggregate total replacement value of 819 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	625,081	76.3%
Commercial	60,906	7.4%
Industrial	90,197	11.0%
Agricultural	4,186	0.5%
Religious	15,405	1.9%
Government	2,133	0.3%
Education	21,055	2.6%
Total	**818,963**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	11	99.71	0	0.28	0	0.01	0	0.00	0	0.00
Commercial	139	99.63	1	0.37	0	0.00	0	0.00	0	0.00
Education	8	99.66	0	0.35	0	0.00	0	0.00	0	0.00
Government	5	99.64	0	0.36	0	0.00	0	0.00	0	0.00
Industrial	83	99.62	0	0.38	0	0.00	0	0.00	0	0.00
Religion	24	99.71	0	0.28	0	0.01	0	0.00	0	0.00
Residential	4,111	99.97	1	0.03	0	0.00	0	0.00	0	0.00
Total	**4,381**		**2**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	7	99.59	0	0.41	0	0.00	0	0.00	0	0.00
Masonry	233	99.84	0	0.16	0	0.00	0	0.00	0	0.00
MH	1,113	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	101	99.60	0	0.40	0	0.00	0	0.00	0	0.00
Wood	2,766	99.97	1	0.03	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	4

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 463 tons of debris will be generated. Of the total amount, 377 tons (81%) is Other Tree Debris. Of the remaining 86 tons, Brick/Wood comprises 1% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 85 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,684) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.4 million dollars, which represents 0.04 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	294.09	6.09	9.02	3.93	313.13
	Content	53.36	0.00	0.00	0.00	53.36
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**347.45**	**6.09**	**9.02**	**3.93**	**366.49**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.03	0.00	0.01	0.05
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.03**	**0.00**	**0.01**	**0.05**
Total						
	Total	**347.45**	**6.12**	**9.02**	**3.94**	**366.53**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,684	625,081	193,882	818,963
Total	**9,684**	**625,081**	**193,882**	**818,963**

Hazus-MH: Hurricane Event Report

Region Name: City_Norris_EQFLHU

Hurricane Scenario: Probabilistic 100-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 26.97 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 7,678 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 741 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 3,624 buildings in the region which have an aggregate total replacement value of 741 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	584,740	78.9%
Commercial	57,607	7.8%
Industrial	61,630	8.3%
Agricultural	3,805	0.5%
Religious	14,693	2.0%
Government	3,192	0.4%
Education	15,132	2.0%
Total	**740,799**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, 2 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	8	99.70	0	0.29	0	0.01	0	0.00	0	0.00
Commercial	136	99.63	0	0.36	0	0.00	0	0.00	0	0.00
Education	5	99.64	0	0.36	0	0.00	0	0.00	0	0.00
Government	4	99.62	0	0.38	0	0.00	0	0.00	0	0.00
Industrial	66	99.61	0	0.39	0	0.00	0	0.00	0	0.00
Religion	25	99.71	0	0.28	0	0.01	0	0.00	0	0.00
Residential	3,378	99.97	1	0.03	0	0.00	0	0.00	0	0.00
Total	**3,622**		**2**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	5	99.58	0	0.42	0	0.00	0	0.00	0	0.00
Masonry	201	99.84	0	0.16	0	0.00	0	0.00	0	0.00
MH	666	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	92	99.61	0	0.39	0	0.00	0	0.00	0	0.00
Wood	2,497	99.96	1	0.04	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 360 tons of debris will be generated. Of the total amount, 290 tons (81%) is Other Tree Debris. Of the remaining 70 tons, Brick/Wood comprises 1% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 69 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 7,678) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.3 million dollars, which represents 0.04 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	268.92	5.76	6.16	3.33	284.18
	Content	48.31	0.00	0.00	0.00	48.31
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**317.23**	**5.76**	**6.16**	**3.33**	**332.49**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.02	0.00	0.01	0.04
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.02**	**0.00**	**0.01**	**0.04**
Total						
	Total	**317.23**	**5.78**	**6.16**	**3.35**	**332.53**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	7,678	584,740	156,059	740,799
Total	**7,678**	**584,740**	**156,059**	**740,799**

Hazus-MH: Hurricane Event Report

Region Name: City_Pickens_EQFLH

Hurricane Scenario: Probabilistic 100-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
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Totals only reflect data for those census tracts/blocks included in the user's study region.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 42.45 square miles and contains 3 census tracts. There are over 4 thousand households in the region and has a total population of 10,803 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 1,034 million dollars (2010 dollars). Approximately 92% of the buildings (and 77% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,930 buildings in the region which have an aggregate total replacement value of 1,034 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	799,600	77.3%
Commercial	141,278	13.7%
Industrial	37,549	3.6%
Agricultural	3,101	0.3%
Religious	26,651	2.6%
Government	11,211	1.1%
Education	14,545	1.4%
Total	**1,033,935**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 55 beds. There are 5 schools, 1 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	16	99.71	0	0.28	0	0.01	0	0.00	0	0.00
Commercial	233	99.64	1	0.36	0	0.00	0	0.00	0	0.00
Education	10	99.65	0	0.35	0	0.00	0	0.00	0	0.00
Government	16	99.65	0	0.36	0	0.00	0	0.00	0	0.00
Industrial	75	99.63	0	0.37	0	0.00	0	0.00	0	0.00
Religion	32	99.72	0	0.27	0	0.01	0	0.00	0	0.00
Residential	4,545	99.96	2	0.04	0	0.00	0	0.00	0	0.00
Total	**4,927**		**3**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	10	99.54	0	0.46	0	0.00	0	0.00	0	0.00
Masonry	286	99.75	1	0.25	0	0.00	0	0.00	0	0.00
MH	921	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	137	99.60	1	0.40	0	0.00	0	0.00	0	0.00
Wood	3,311	99.97	1	0.03	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 55 hospital beds available for use. On the day of the hurricane, the model estimates that 55 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	5	0	0	5

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 429 tons of debris will be generated. Of the total amount, 359 tons (84%) is Other Tree Debris. Of the remaining 70 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 70 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,803) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.3 million dollars, which represents 0.03 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 93% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	289.38	14.13	3.75	5.43	312.70
	Content	35.83	0.00	0.00	0.00	35.83
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**325.21**	**14.13**	**3.75**	**5.43**	**348.53**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.04	0.04	0.00	0.01	0.09
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.04**	**0.04**	**0.00**	**0.01**	**0.09**
Total						
	Total	**325.25**	**14.17**	**3.75**	**5.45**	**348.62**

South Carolina
- Pickens

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
South Carolina				
Pickens	10,803	799,600	234,335	1,033,935
Total	**10,803**	**799,600**	**234,335**	**1,033,935**

Hazus-MH: Hurricane Event Report

Region Name: City_SixMile_EQFLH

Hurricane Scenario: Probabilistic 100-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 35.30 square miles and contains 1 census tracts. There are over 2 thousand households in the region and has a total population of 5,669 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 474 million dollars (2010 dollars). Approximately 95% of the buildings (and 90% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,595 buildings in the region which have an aggregate total replacement value of 474 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	428,877	90.4%
Commercial	22,293	4.7%
Industrial	12,958	2.7%
Agricultural	480	0.1%
Religious	6,793	1.4%
Government	211	0.0%
Education	2,587	0.5%
Total	**474,199**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4	99.72	0	0.27	0	0.01	0	0.00	0	0.00
Commercial	71	99.61	0	0.39	0	0.00	0	0.00	0	0.00
Education	2	99.59	0	0.41	0	0.00	0	0.00	0	0.00
Government	1	99.54	0	0.46	0	0.00	0	0.00	0	0.00
Industrial	33	99.65	0	0.35	0	0.00	0	0.00	0	0.00
Religion	15	99.73	0	0.27	0	0.01	0	0.00	0	0.00
Residential	2,468	99.98	1	0.02	0	0.00	0	0.00	0	0.00
Total	**2,594**		**1**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	132	99.89	0	0.11	0	0.00	0	0.00	0	0.00
MH	666	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	37	99.62	0	0.38	0	0.00	0	0.00	0	0.00
Wood	1,661	99.97	0	0.03	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service. By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Schools	1	0	0	1

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 424 tons of debris will be generated. Of the total amount, 376 tons (89%) is Other Tree Debris. Of the remaining 48 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 48 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,669) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.2 million dollars, which represents 0.04 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 98% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	155.91	2.23	1.30	0.99	160.42
	Content	21.59	0.00	0.00	0.00	21.59
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**177.51**	**2.23**	**1.30**	**0.99**	**182.02**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.01	0.00	0.00	0.01
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.01**	**0.00**	**0.00**	**0.01**
Total						
	Total	**177.51**	**2.24**	**1.30**	**0.99**	**182.03**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	5,669	428,877	45,322	474,199
Total	**5,669**	**428,877**	**45,322**	**474,199**

Hazus-MH: Hurricane Event Report

Region Name: PickensCoHMP_EQFLH

Hurricane Scenario: Probabilistic 100-year Return Period

Print Date: Sunday, October 09, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 512.03 square miles and contains 28 census tracts. There are over 45 thousand households in the region and has a total population of 119 ,224 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 48 thousand buildings in the region with a total building replacement value (excluding contents) of 11,490 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 48,394 buildings in the region which have an aggregate total replacement value of
11,490 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	9,101,224	79.2%
Commercial	1,427,396	12.4%
Industrial	484,852	4.2%
Agricultural	25,871	0.2%
Religious	183,914	1.6%
Government	38,722	0.3%
Education	227,970	2.0%
Total	**11,489,949**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 151 beds. There are 35 schools, 10 fire stations, 12 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	123	99.69	0	0.30	0	0.01	0	0.00	0	0.00
Commercial	2,062	99.60	8	0.39	0	0.01	0	0.00	0	0.00
Education	104	99.67	0	0.33	0	0.00	0	0.00	0	0.00
Government	62	99.66	0	0.34	0	0.00	0	0.00	0	0.00
Industrial	710	99.61	3	0.39	0	0.00	0	0.00	0	0.00
Religion	267	99.71	1	0.28	0	0.00	0	0.00	0	0.00
Residential	45,027	99.94	27	0.06	0	0.00	0	0.00	0	0.00
Total	**48,354**		**40**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	154	99.52	1	0.48	0	0.00	0	0.00	0	0.00
Masonry	3,016	99.71	9	0.29	0	0.01	0	0.00	0	0.00
MH	9,946	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,213	99.57	5	0.43	0	0.00	0	0.00	0	0.00
Wood	31,934	99.95	15	0.05	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 151 hospital beds available for use. On the day of the hurricane, the model estimates that 151 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	10	0	0	10
Hospitals	2	0	0	2
Police Stations	12	0	0	12
Schools	35	0	0	35

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 6,650 tons of debris will be generated. Of the total amount, 5,580 tons (84%) is Other Tree Debris. Of the remaining 1,070 tons, Brick/Wood comprises 2% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,044 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 119,224) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 4.5 million dollars, which represents 0.04 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 5 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	3,758.59	113.03	33.32	22.54	3,927.48
	Content	574.11	0.00	0.00	0.00	574.11
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**4,332.70**	**113.03**	**33.32**	**22.54**	**4,501.59**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.51	0.49	0.00	0.08	1.08
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.51**	**0.49**	**0.00**	**0.08**	**1.08**
Total						
	Total	**4,333.21**	**113.51**	**33.32**	**22.63**	**4,502.67**

South Carolina

- Pickens

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
South Carolina				
Pickens	119,224	9,101,224	2,388,725	11,489,949
Total	**119,224**	**9,101,224**	**2,388,725**	**11,489,949**

Appendix N: Hazus Hurricane Reports 200 Year Return Period

Hazus-MH: Hurricane Event Report

Region Name: City_Central_EQFLU

Hurricane Scenario: Probabilistic 200-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 24.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,731 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 837 million dollars (2010 dollars). Approximately 92% of the buildings (and 81% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,754 buildings in the region which have an aggregate total replacement value of 837 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	680,645	81.4%
Commercial	51,780	6.2%
Industrial	69,035	8.3%
Agricultural	712	0.1%
Religious	13,896	1.7%
Government	3,972	0.5%
Education	16,483	2.0%
Total	**836,523**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, no fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4	99.40	0	0.57	0	0.03	0	0.01	0	0.00
Commercial	125	99.19	1	0.77	0	0.04	0	0.00	0	0.00
Education	12	99.39	0	0.61	0	0.00	0	0.00	0	0.00
Government	10	99.32	0	0.68	0	0.00	0	0.00	0	0.00
Industrial	45	99.32	0	0.67	0	0.01	0	0.00	0	0.00
Religion	23	99.46	0	0.53	0	0.02	0	0.00	0	0.00
Residential	2,522	99.54	11	0.42	1	0.03	0	0.00	0	0.00
Total	**2,741**		**12**		**1**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	17	98.96	0	1.03	0	0.01	0	0.00	0	0.00
Masonry	216	98.43	3	1.40	0	0.17	0	0.00	0	0.00
MH	349	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	73	99.19	1	0.79	0	0.02	0	0.00	0	0.00
Wood	1,890	99.75	5	0.25	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,063 tons of debris will be generated. Of the total amount, 819 tons (77%) is Other Tree Debris. Of the remaining 244 tons, Brick/Wood comprises 23% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 189 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,731) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.8 million dollars, which represents 0.10 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	664.79	8.75	9.14	5.35	688.02
	Content	118.52	0.00	0.00	0.00	118.52
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**783.31**	**8.75**	**9.14**	**5.35**	**806.54**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	6.00	0.14	0.00	0.02	6.16
	Rental	0.69	0.00	0.00	0.00	0.69
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**6.69**	**0.14**	**0.00**	**0.02**	**6.84**
Total						
	Total	**789.99**	**8.89**	**9.14**	**5.37**	**813.39**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,731	680,645	155,878	836,523
Total	**9,731**	**680,645**	**155,878**	**836,523**

Hazus-MH: Hurricane Event Report

Region Name: City_Clemson_EQFLH

Hurricane Scenario: Probabilistic 200-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 51.62 square miles and contains 6 census tracts. There are over 9 thousand households in the region and has a total population of 29,484 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 2,912 million dollars (2010 dollars). Approximately 91% of the buildings (and 80% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 7,612 buildings in the region which have an aggregate total replacement value of 2,912 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,315,585	79.5%
Commercial	261,825	9.0%
Industrial	117,480	4.0%
Agricultural	2,609	0.1%
Religious	43,851	1.5%
Government	11,788	0.4%
Education	159,143	5.5%
Total	**2,912,281**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 6 schools, 1 fire stations, 5 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	15	99.43	0	0.54	0	0.02	0	0.00	0	0.00
Commercial	433	99.21	3	0.75	0	0.03	0	0.00	0	0.00
Education	53	99.38	0	0.61	0	0.00	0	0.00	0	0.00
Government	24	99.36	0	0.64	0	0.00	0	0.00	0	0.00
Industrial	94	99.31	1	0.68	0	0.01	0	0.00	0	0.00
Religion	61	99.46	0	0.52	0	0.02	0	0.00	0	0.00
Residential	6,896	99.53	31	0.44	2	0.03	0	0.00	0	0.00
Total	**7,575**		**35**		**2**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	86	98.77	1	1.22	0	0.01	0	0.00	0	0.00
Masonry	698	98.63	9	1.25	1	0.12	0	0.00	0	0.00
MH	704	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	260	99.13	2	0.85	0	0.02	0	0.00	0	0.00
Wood	5,375	99.74	14	0.26	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service. By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	5	0	0	5
Schools	6	0	0	6

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,748 tons of debris will be generated. Of the total amount, 1,227 tons (70%) is Other Tree Debris. Of the remaining 521 tons, Brick/Wood comprises 27% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 6 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 383 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 29,484) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 2.4 million dollars, which represents 0.08 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	2,019.21	37.06	15.80	23.03	2,095.10
	Content	292.91	0.00	0.00	0.00	292.91
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**2,312.13**	**37.06**	**15.80**	**23.03**	**2,388.01**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	5.68	0.61	0.00	0.06	6.35
	Rental	0.10	0.00	0.00	0.00	0.10
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**5.78**	**0.61**	**0.00**	**0.06**	**6.45**
Total						
	Total	**2,317.90**	**37.67**	**15.80**	**23.09**	**2,394.46**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	29,484	2,315,585	596,696	2,912,281
Total	**29,484**	**2,315,585**	**596,696**	**2,912,281**

Hazus-MH: Hurricane Event Report

Region Name: City_Easley_EQFLHU

Hurricane Scenario: Probabilistic 200-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 59.60 square miles and contains 8 census tracts. There are over 15 thousand households in the region and has a total population of 39,735 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 4,229 million dollars (2010 dollars). Approximately 92% of the buildings (and 74% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 16,890 buildings in the region which have an aggregate total replacement value of
4,229 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,147,479	74.4%
Commercial	843,002	19.9%
Industrial	155,783	3.7%
Agricultural	9,131	0.2%
Religious	45,620	1.1%
Government	6,425	0.2%
Education	21,593	0.5%
Total	**4,229,033**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 96 beds. There are 10 schools, 1 fire stations, 4 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	42	99.34	0	0.62	0	0.03	0	0.00	0	0.00
Commercial	868	99.19	7	0.77	0	0.04	0	0.00	0	0.00
Education	20	99.32	0	0.68	0	0.01	0	0.00	0	0.00
Government	8	99.26	0	0.74	0	0.00	0	0.00	0	0.00
Industrial	263	99.28	2	0.71	0	0.01	0	0.00	0	0.00
Religion	67	99.42	0	0.56	0	0.02	0	0.00	0	0.00
Residential	15,553	99.62	58	0.37	2	0.01	0	0.00	0	0.00
Total	**16,820**		**67**		**2**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	45	99.05	0	0.93	0	0.01	0	0.00	0	0.00
Masonry	1,101	99.25	8	0.70	1	0.05	0	0.00	0	0.00
MH	2,868	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	460	99.15	4	0.82	0	0.02	0	0.00	0	0.00
Wood	11,637	99.61	45	0.39	1	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 96 hospital beds available for use. On the day of the hurricane, the model estimates that 96 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	4	0	0	4
Schools	10	0	0	10

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 3,065 tons of debris will be generated. Of the total amount, 1,890 tons (62%) is Other Tree Debris. Of the remaining 1,175 tons, Brick/Wood comprises 17% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 8 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 971 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 39,735) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 5.2 million dollars, which represents 0.12 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 5 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	4,368.33	164.86	25.81	13.45	4,572.44
	Content	562.16	0.00	0.00	0.00	562.16
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**4,930.49**	**164.86**	**25.81**	**13.45**	**5,134.60**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	26.63	1.69	0.02	0.11	28.45
	Rental	4.25	0.00	0.00	0.00	4.25
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**30.88**	**1.69**	**0.02**	**0.11**	**32.71**
Total						
	Total	**4,961.37**	**166.55**	**25.83**	**13.55**	**5,167.31**

South Carolina

- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	39,735	3,147,479	1,081,554	4,229,033
Total	**39,735**	**3,147,479**	**1,081,554**	**4,229,033**

Hazus-MH: Hurricane Event Report

Region Name: City_Liberty_EQFLH

Hurricane Scenario: Probabilistic 200-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 32.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,684 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 819 million dollars (2010 dollars). Approximately 94% of the buildings (and 76% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,383 buildings in the region which have an aggregate total replacement value of 819 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	625,081	76.3%
Commercial	60,906	7.4%
Industrial	90,197	11.0%
Agricultural	4,186	0.5%
Religious	15,405	1.9%
Government	2,133	0.3%
Education	21,055	2.6%
Total	**818,963**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	11	99.39	0	0.58	0	0.03	0	0.00	0	0.00
Commercial	139	99.27	1	0.70	0	0.03	0	0.00	0	0.00
Education	8	99.38	0	0.62	0	0.00	0	0.00	0	0.00
Government	5	99.35	0	0.65	0	0.00	0	0.00	0	0.00
Industrial	82	99.30	1	0.70	0	0.01	0	0.00	0	0.00
Religion	24	99.47	0	0.52	0	0.02	0	0.00	0	0.00
Residential	4,101	99.73	11	0.27	0	0.00	0	0.00	0	0.00
Total	**4,370**		**13**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	7	99.26	0	0.74	0	0.01	0	0.00	0	0.00
Masonry	232	99.57	1	0.41	0	0.01	0	0.00	0	0.00
MH	1,113	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	100	99.26	1	0.73	0	0.01	0	0.00	0	0.00
Wood	2,757	99.65	10	0.35	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	4

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,177 tons of debris will be generated. Of the total amount, 945 tons (80%) is Other Tree Debris. Of the remaining 232 tons, Brick/Wood comprises 9% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 210 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,684) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 1.0 million dollars, which represents 0.13 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 98% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	885.27	9.41	11.80	4.44	910.92
	Content	120.45	0.00	0.00	0.00	120.45
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,005.72**	**9.41**	**11.80**	**4.44**	**1,031.37**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	5.54	0.17	0.00	0.03	5.74
	Rental	0.96	0.00	0.00	0.00	0.96
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**6.49**	**0.17**	**0.00**	**0.03**	**6.70**
Total						
	Total	**1,012.22**	**9.58**	**11.80**	**4.47**	**1,038.07**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,684	625,081	193,882	818,963
Total	**9,684**	**625,081**	**193,882**	**818,963**

Hazus-MH: Hurricane Event Report

Region Name: City_Norris_EQFLHU

Hurricane Scenario: Probabilistic 200-year Return Period

Print Date: Wednesday, October 12, 2016

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 26.97 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 7,678 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 741 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 3,624 buildings in the region which have an aggregate total replacement value of 741 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	584,740	78.9%
Commercial	57,607	7.8%
Industrial	61,630	8.3%
Agricultural	3,805	0.5%
Religious	14,693	2.0%
Government	3,192	0.4%
Education	15,132	2.0%
Total	**740,799**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, 2 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	8	99.43	0	0.55	0	0.03	0	0.00	0	0.00
Commercial	136	99.32	1	0.66	0	0.02	0	0.00	0	0.00
Education	5	99.39	0	0.61	0	0.00	0	0.00	0	0.00
Government	4	99.33	0	0.67	0	0.00	0	0.00	0	0.00
Industrial	66	99.30	0	0.69	0	0.01	0	0.00	0	0.00
Religion	25	99.47	0	0.52	0	0.02	0	0.00	0	0.00
Residential	3,369	99.71	10	0.29	0	0.00	0	0.00	0	0.00
Total	**3,613**		**11**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	5	99.27	0	0.72	0	0.01	0	0.00	0	0.00
Masonry	200	99.59	1	0.40	0	0.01	0	0.00	0	0.00
MH	666	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	91	99.30	1	0.69	0	0.01	0	0.00	0	0.00
Wood	2,489	99.66	8	0.34	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 855 tons of debris will be generated. Of the total amount, 681 tons (80%) is Other Tree Debris. Of the remaining 174 tons, Brick/Wood comprises 6% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 163 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 7,678) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.9 million dollars, which represents 0.13 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 98% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	800.77	8.29	6.34	4.06	819.46
	Content	108.22	0.00	0.00	0.00	108.22
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**908.99**	**8.29**	**6.34**	**4.06**	**927.68**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	1.02	0.12	0.00	0.03	1.17
	Rental	0.17	0.00	0.00	0.00	0.17
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1.19**	**0.12**	**0.00**	**0.03**	**1.34**
Total						
	Total	**910.18**	**8.41**	**6.34**	**4.09**	**929.02**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	7,678	584,740	156,059	740,799
Total	**7,678**	**584,740**	**156,059**	**740,799**

Hazus-MH: Hurricane Event Report

Region Name: City_Pickens_EQFLH

Hurricane Scenario: Probabilistic 200-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 42.45 square miles and contains 3 census tracts. There are over 4 thousand households in the region and has a total population of 10,803 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 1,034 million dollars (2010 dollars). Approximately 92% of the buildings (and 77% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,930 buildings in the region which have an aggregate total replacement value of 1,034 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	799,600	77.3%
Commercial	141,278	13.7%
Industrial	37,549	3.6%
Agricultural	3,101	0.3%
Religious	26,651	2.6%
Government	11,211	1.1%
Education	14,545	1.4%
Total	**1,033,935**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 55 beds. There are 5 schools, 1 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	16	99.38	0	0.59	0	0.03	0	0.00	0	0.00
Commercial	232	99.31	2	0.67	0	0.02	0	0.00	0	0.00
Education	10	99.38	0	0.62	0	0.00	0	0.00	0	0.00
Government	16	99.36	0	0.64	0	0.00	0	0.00	0	0.00
Industrial	75	99.33	0	0.66	0	0.01	0	0.00	0	0.00
Religion	32	99.48	0	0.51	0	0.01	0	0.00	0	0.00
Residential	4,534	99.72	13	0.28	0	0.00	0	0.00	0	0.00
Total	**4,915**		**15**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	10	99.11	0	0.88	0	0.01	0	0.00	0	0.00
Masonry	285	99.40	2	0.57	0	0.03	0	0.00	0	0.00
MH	921	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	137	99.25	1	0.73	0	0.01	0	0.00	0	0.00
Wood	3,302	99.70	10	0.30	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 55 hospital beds available for use. On the day of the hurricane, the model estimates that 55 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	5	0	0	5

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 929 tons of debris will be generated. Of the total amount, 762 tons (82%) is Other Tree Debris. Of the remaining 167 tons, Brick/Wood comprises 10% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 151 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,803) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 1.1 million dollars, which represents 0.10 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	953.62	17.85	3.75	5.55	980.78
	Content	85.59	0.00	0.00	0.00	85.59
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,039.21**	**17.85**	**3.75**	**5.55**	**1,066.37**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.28	0.27	0.00	0.03	0.58
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.28**	**0.27**	**0.00**	**0.03**	**0.58**
Total						
	Total	**1,039.49**	**18.12**	**3.76**	**5.58**	**1,066.95**

South Carolina
- Pickens

	Population	Building Value (thousands of dollars) Residential	Non-Residential	Total
South Carolina				
Pickens	10,803	799,600	234,335	1,033,935
Total	**10,803**	**799,600**	**234,335**	**1,033,935**

Hazus-MH: Hurricane Event Report

Region Name: City_SixMile_EQFLH

Hurricane Scenario: Probabilistic 200-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 35.30 square miles and contains 1 census tracts. There are over 2 thousand households in the region and has a total population of 5,669 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 474 million dollars (2010 dollars). Approximately 95% of the buildings (and 90% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,595 buildings in the region which have an aggregate total replacement value of 474 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	428,877	90.4%
Commercial	22,293	4.7%
Industrial	12,958	2.7%
Agricultural	480	0.1%
Religious	6,793	1.4%
Government	211	0.0%
Education	2,587	0.5%
Total	**474,199**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4	99.42	0	0.55	0	0.03	0	0.00	0	0.00
Commercial	70	99.23	1	0.74	0	0.03	0	0.00	0	0.00
Education	2	99.22	0	0.78	0	0.01	0	0.00	0	0.00
Government	1	99.07	0	0.92	0	0.01	0	0.00	0	0.00
Industrial	33	99.37	0	0.62	0	0.00	0	0.00	0	0.00
Religion	15	99.49	0	0.49	0	0.02	0	0.00	0	0.00
Residential	2,463	99.77	6	0.22	0	0.00	0	0.00	0	0.00
Total	**2,589**		**6**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	132	99.69	0	0.30	0	0.00	0	0.00	0	0.00
MH	666	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	37	99.31	0	0.68	0	0.01	0	0.00	0	0.00
Wood	1,656	99.71	5	0.29	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Schools	1	0	0	1

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 892 tons of debris will be generated. Of the total amount, 786 tons (88%) is Other Tree Debris. Of the remaining 106 tons, Brick/Wood comprises 5% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 101 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,669) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.6 million dollars, which represents 0.13 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 99% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	542.09	3.80	1.30	1.01	548.20
	Content	62.26	0.00	0.00	0.00	62.26
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**604.35**	**3.80**	**1.30**	**1.01**	**610.46**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.16	0.07	0.00	0.01	0.25
	Rental	0.03	0.00	0.00	0.00	0.03
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.19**	**0.07**	**0.00**	**0.01**	**0.28**
Total						
	Total	**604.54**	**3.88**	**1.30**	**1.02**	**610.74**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	5,669	428,877	45,322	474,199
Total	**5,669**	**428,877**	**45,322**	**474,199**

Hazus-MH: Hurricane Event Report

Region Name: PickensCoHMP_EQFLH

Hurricane Scenario: Probabilistic 200-year Return Period

Print Date: Sunday, October 09, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 512.03 square miles and contains 28 census tracts. There are over 45 thousand households in the region and has a total population of 119 ,224 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 48 thousand buildings in the region with a total building replacement value (excluding contents) of 11,490 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 48,394 buildings in the region which have an aggregate total replacement value of
11,490 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	9,101,224	79.2%
Commercial	1,427,396	12.4%
Industrial	484,852	4.2%
Agricultural	25,871	0.2%
Religious	183,914	1.6%
Government	38,722	0.3%
Education	227,970	2.0%
Total	**11,489,949**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 151 beds. There are 35 schools, 10 fire stations, 12 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 5 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	122	99.42	1	0.55	0	0.03	0	0.00	0	0.00
Commercial	2,054	99.23	15	0.74	1	0.03	0	0.00	0	0.00
Education	103	99.38	1	0.62	0	0.00	0	0.00	0	0.00
Government	62	99.40	0	0.60	0	0.00	0	0.00	0	0.00
Industrial	708	99.32	5	0.67	0	0.01	0	0.00	0	0.00
Religion	267	99.49	1	0.50	0	0.01	0	0.00	0	0.00
Residential	44,906	99.67	143	0.32	4	0.01	0	0.00	0	0.00
Total	**48,222**		**166**		**5**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	153	98.86	2	1.13	0	0.01	0	0.00	0	0.00
Masonry	3,001	99.20	22	0.74	2	0.06	0	0.00	0	0.00
MH	9,946	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	1,208	99.20	10	0.78	0	0.02	0	0.00	0	0.00
Wood	31,843	99.67	105	0.33	1	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 151 hospital beds available for use. On the day of the hurricane, the model estimates that 151 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	10	0	0	10
Hospitals	2	0	0	2
Police Stations	12	0	0	12
Schools	35	0	0	35

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 12,563 tons of debris will be generated. Of the total amount, 9,716 tons (77%) is Other Tree Debris. Of the remaining 2,847 tons, Brick/Wood comprises 17% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 19 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,377 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 119,224) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 12.6 million dollars, which represents 0.11 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 13 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	10,773.87	226.59	71.25	60.63	11,132.33
	Content	1,425.55	0.00	0.00	0.01	1,425.55
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**12,199.42**	**226.59**	**71.25**	**60.63**	**12,557.89**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	50.57	3.35	0.04	0.31	54.28
	Rental	8.23	0.00	0.00	0.00	8.23
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**58.81**	**3.35**	**0.04**	**0.31**	**62.51**
Total						
	Total	**12,258.22**	**229.94**	**71.29**	**60.94**	**12,620.40**

South Carolina

- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	119,224	9,101,224	2,388,725	11,489,949
Total	**119,224**	**9,101,224**	**2,388,725**	**11,489,949**

Appendix O: Hazus Hurricane Reports 500 Year Return Period

Hazus-MH: Hurricane Event Report

Region Name: City_Central_EQFLU

Hurricane Scenario: Probabilistic 500-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 24.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,731 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 837 million dollars (2010 dollars). Approximately 92% of the buildings (and 81% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,754 buildings in the region which have an aggregate total replacement value of 837 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	680,645	81.4%
Commercial	51,780	6.2%
Industrial	69,035	8.3%
Agricultural	712	0.1%
Religious	13,896	1.7%
Government	3,972	0.5%
Education	16,483	2.0%
Total	**836,523**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, no fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4	98.29	0	1.52	0	0.16	0	0.04	0	0.00
Commercial	124	98.02	2	1.77	0	0.20	0	0.00	0	0.00
Education	12	98.49	0	1.47	0	0.03	0	0.00	0	0.00
Government	10	98.49	0	1.48	0	0.03	0	0.00	0	0.00
Industrial	44	98.26	1	1.63	0	0.09	0	0.02	0	0.00
Religion	23	98.63	0	1.33	0	0.05	0	0.00	0	0.00
Residential	2,485	98.06	45	1.78	4	0.16	0	0.00	0	0.00
Total	**2,701**		**49**		**4**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building	None		Minor		Moderate		Severe		Destruction	
Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	17	97.70	0	2.24	0	0.06	0	0.00	0	0.00
Masonry	210	95.97	7	3.22	2	0.79	0	0.02	0	0.00
MH	349	99.99	0	0.01	0	0.00	0	0.00	0	0.00
Steel	73	98.17	1	1.72	0	0.11	0	0.00	0	0.00
Wood	1,863	98.32	31	1.64	1	0.04	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 3,067 tons of debris will be generated. Of the total amount, 2,388 tons (78%) is Other Tree Debris. Of the remaining 679 tons, Brick/Wood comprises 26% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 7 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 501 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,731) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 2.3 million dollars, which represents 0.27 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,768.73	20.40	33.20	8.50	1,830.82
	Content	287.87	1.48	7.83	0.06	297.24
	Inventory	0.00	0.00	1.81	0.01	1.81
	Subtotal	**2,056.61**	**21.88**	**42.83**	**8.56**	**2,129.88**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	94.24	0.71	0.02	0.11	95.08
	Rental	43.09	0.00	0.00	0.00	43.09
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**137.33**	**0.71**	**0.02**	**0.11**	**138.18**
Total						
	Total	**2,193.94**	**22.59**	**42.85**	**8.68**	**2,268.06**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,731	680,645	155,878	836,523
Total	**9,731**	**680,645**	**155,878**	**836,523**

Hazus-MH: Hurricane Event Report

Region Name: City_Clemson_EQFLH

Hurricane Scenario: Probabilistic 500-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 51.62 square miles and contains 6 census tracts. There are over 9 thousand households in the region and has a total population of 29,484 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 2,912 million dollars (2010 dollars). Approximately 91% of the buildings (and 80% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 7,612 buildings in the region which have an aggregate total replacement value of 2,912 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,315,585	79.5%
Commercial	261,825	9.0%
Industrial	117,480	4.0%
Agricultural	2,609	0.1%
Religious	43,851	1.5%
Government	11,788	0.4%
Education	159,143	5.5%
Total	**2,912,281**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 6 schools, 1 fire stations, 5 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 13 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	15	98.28	0	1.52	0	0.16	0	0.04	0	0.00
Commercial	427	98.00	8	1.80	1	0.20	0	0.00	0	0.00
Education	52	98.62	1	1.35	0	0.02	0	0.00	0	0.00
Government	24	98.51	0	1.46	0	0.03	0	0.00	0	0.00
Industrial	93	98.31	2	1.59	0	0.08	0	0.02	0	0.00
Religion	60	98.57	1	1.38	0	0.05	0	0.00	0	0.00
Residential	6,789	97.99	127	1.84	12	0.17	0	0.00	0	0.00
Total	**7,461**		**139**		**13**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building	None		Minor		Moderate		Severe		Destruction	
Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	84	97.10	2	2.80	0	0.10	0	0.00	0	0.00
Masonry	681	96.22	22	3.05	5	0.72	0	0.01	0	0.00
MH	704	99.99	0	0.01	0	0.00	0	0.00	0	0.00
Steel	257	97.95	5	1.90	0	0.14	0	0.00	0	0.00
Wood	5,300	98.35	87	1.61	2	0.04	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	5	0	0	5
Schools	6	0	0	6

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 6,348 tons of debris will be generated. Of the total amount, 4,519 tons (71%) is Other Tree Debris. Of the remaining 1,829 tons, Brick/Wood comprises 32% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 23 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,247 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 29,484) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 6.6 million dollars, which represents 0.23 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 7 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	5,221.89	107.85	53.64	49.66	5,433.03
	Content	750.38	8.17	16.50	0.31	775.37
	Inventory	0.00	0.00	3.81	0.02	3.84
	Subtotal	**5,972.27**	**116.02**	**73.95**	**49.99**	**6,212.24**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	266.94	3.74	0.05	0.48	271.21
	Rental	143.00	0.00	0.00	0.00	143.01
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**409.95**	**3.74**	**0.05**	**0.48**	**414.22**
Total						
	Total	**6,382.22**	**119.76**	**74.00**	**50.47**	**6,626.45**

South Carolina

- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	29,484	2,315,585	596,696	2,912,281
Total	**29,484**	**2,315,585**	**596,696**	**2,912,281**

Hazus-MH: Hurricane Event Report

Region Name: City_Easley_EQFLHU

Hurricane Scenario: Probabilistic 500-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 59.60 square miles and contains 8 census tracts. There are over 15 thousand households in the region and has a total population of 39,735 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 4,229 million dollars (2010 dollars). Approximately 92% of the buildings (and 74% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 16,890 buildings in the region which have an aggregate total replacement value of
4,229 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,147,479	74.4%
Commercial	843,002	19.9%
Industrial	155,783	3.7%
Agricultural	9,131	0.2%
Religious	45,620	1.1%
Government	6,425	0.2%
Education	21,593	0.5%
Total	**4,229,033**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 96 beds. There are 10 schools, 1 fire stations, 4 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 15 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	41	97.95	1	1.79	0	0.20	0	0.05	0	0.00
Commercial	857	97.99	16	1.81	2	0.19	0	0.00	0	0.00
Education	20	98.44	0	1.52	0	0.04	0	0.00	0	0.00
Government	8	98.66	0	1.32	0	0.02	0	0.00	0	0.00
Industrial	260	98.20	5	1.72	0	0.07	0	0.01	0	0.00
Religion	66	98.49	1	1.45	0	0.06	0	0.00	0	0.00
Residential	15,293	97.95	307	1.97	13	0.08	0	0.00	0	0.00
Total	**16,546**		**330**		**15**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	44	97.75	1	2.13	0	0.12	0	0.00	0	0.00
Masonry	1,083	97.61	23	2.10	3	0.28	0	0.01	0	0.00
MH	2,868	99.98	0	0.01	0	0.00	0	0.00	0	0.00
Steel	455	97.99	8	1.83	1	0.18	0	0.00	0	0.00
Wood	11,414	97.69	262	2.24	7	0.06	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 96 hospital beds available for use. On the day of the hurricane, the model estimates that 96 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	4	0	0	4
Schools	10	0	0	10

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 8,883 tons of debris will be generated. Of the total amount, 5,417 tons (61%) is Other Tree Debris. Of the remaining 3,466 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 33 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,632 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 39,735) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 13.3 million dollars, which represents 0.31 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 13 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	10,662.43	342.55	59.57	28.30	11,092.85
	Content	1,336.68	22.72	13.66	2.46	1,375.52
	Inventory	0.00	0.14	3.15	0.21	3.49
	Subtotal	**11,999.11**	**365.41**	**76.38**	**30.97**	**12,471.87**
Business Interruption Loss						
	Income	0.00	20.13	0.00	0.00	20.13
	Relocation	547.00	19.74	0.38	1.67	568.79
	Rental	189.62	7.94	0.00	0.06	197.61
	Wage	0.00	7.14	0.00	0.00	7.14
	Subtotal	**736.61**	**54.95**	**0.38**	**1.73**	**793.67**
Total						
	Total	**12,735.72**	**420.36**	**76.76**	**32.70**	**13,265.54**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	39,735	3,147,479	1,081,554	4,229,033
Total	**39,735**	**3,147,479**	**1,081,554**	**4,229,033**

Hazus-MH: Hurricane Event Report

Region Name: City_Liberty_EQFLH

Hurricane Scenario: Probabilistic 500-year Return Period

Print Date: Wednesday, October 12, 2016

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 32.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,684 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 819 million dollars (2010 dollars). Approximately 94% of the buildings (and 76% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,383 buildings in the region which have an aggregate total replacement value of 819 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	625,081	76.3%
Commercial	60,906	7.4%
Industrial	90,197	11.0%
Agricultural	4,186	0.5%
Religious	15,405	1.9%
Government	2,133	0.3%
Education	21,055	2.6%
Total	**818,963**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	11	98.05	0	1.71	0	0.19	0	0.05	0	0.00
Commercial	137	98.09	2	1.74	0	0.17	0	0.00	0	0.00
Education	8	98.48	0	1.49	0	0.03	0	0.00	0	0.00
Government	5	98.43	0	1.54	0	0.03	0	0.00	0	0.00
Industrial	81	98.19	1	1.71	0	0.08	0	0.02	0	0.00
Religion	24	98.54	0	1.40	0	0.06	0	0.00	0	0.00
Residential	4,041	98.28	69	1.67	2	0.05	0	0.00	0	0.00
Total	**4,307**		**73**		**2**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	7	98.25	0	1.69	0	0.05	0	0.00	0	0.00
Masonry	229	98.32	4	1.57	0	0.09	0	0.01	0	0.00
MH	1,113	99.98	0	0.01	0	0.00	0	0.00	0	0.00
Steel	99	98.21	2	1.68	0	0.11	0	0.00	0	0.00
Wood	2,706	97.79	60	2.15	2	0.05	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	4

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 4,326 tons of debris will be generated. Of the total amount, 3,389 tons (78%) is Other Tree Debris. Of the remaining 937 tons, Brick/Wood comprises 19% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 7 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 763 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,684) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 2.7 million dollars, which represents 0.33 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 3 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	2,201.84	28.44	35.67	11.36	2,277.30
	Content	284.84	2.19	7.39	0.30	294.72
	Inventory	0.00	0.00	1.70	0.03	1.73
	Subtotal	**2,486.68**	**30.63**	**44.76**	**11.69**	**2,573.76**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	128.98	1.12	0.18	0.20	130.48
	Rental	38.90	0.00	0.00	0.00	38.90
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**167.88**	**1.12**	**0.18**	**0.20**	**169.37**
Total						
	Total	**2,654.56**	**31.75**	**44.94**	**11.89**	**2,743.13**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,684	625,081	193,882	818,963
Total	**9,684**	**625,081**	**193,882**	**818,963**

Hazus-MH: Hurricane Event Report

Region Name: City_Norris_EQFLHU

Hurricane Scenario: Probabilistic 500-year Return Period

Print Date: Wednesday, October 12, 2016

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 26.97 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 7,678 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 741 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 3,624 buildings in the region which have an aggregate total replacement value of 741 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	584,740	78.9%
Commercial	57,607	7.8%
Industrial	61,630	8.3%
Agricultural	3,805	0.5%
Religious	14,693	2.0%
Government	3,192	0.4%
Education	15,132	2.0%
Total	**740,799**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, 2 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	8	98.22	0	1.57	0	0.17	0	0.05	0	0.00
Commercial	135	98.23	2	1.63	0	0.14	0	0.00	0	0.00
Education	5	98.48	0	1.49	0	0.03	0	0.00	0	0.00
Government	4	98.41	0	1.56	0	0.04	0	0.00	0	0.00
Industrial	65	98.23	1	1.67	0	0.09	0	0.02	0	0.00
Religion	25	98.54	0	1.40	0	0.06	0	0.00	0	0.00
Residential	3,318	98.20	59	1.75	2	0.05	0	0.00	0	0.00
Total	**3,559**		**63**		**2**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	5	98.30	0	1.64	0	0.05	0	0.00	0	0.00
Masonry	198	98.38	3	1.52	0	0.09	0	0.01	0	0.00
MH	666	99.98	0	0.01	0	0.00	0	0.00	0	0.00
Steel	90	98.35	1	1.57	0	0.08	0	0.00	0	0.00
Wood	2,445	97.86	52	2.09	1	0.05	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 3,398 tons of debris will be generated. Of the total amount, 2,628 tons (77%) is Other Tree Debris. Of the remaining 770 tons, Brick/Wood comprises 18% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 6 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 630 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 7,678) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 2.5 million dollars, which represents 0.34 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	2,014.92	23.84	26.98	10.16	2,075.90
	Content	260.91	1.38	7.23	0.24	269.76
	Inventory	0.00	0.00	1.67	0.02	1.69
	Subtotal	**2,275.83**	**25.22**	**35.89**	**10.41**	**2,347.35**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	111.25	0.83	0.05	0.17	112.30
	Rental	34.42	0.00	0.00	0.00	34.42
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**145.66**	**0.83**	**0.05**	**0.17**	**146.72**
Total						
	Total	**2,421.50**	**26.05**	**35.93**	**10.59**	**2,494.07**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	7,678	584,740	156,059	740,799
Total	**7,678**	**584,740**	**156,059**	**740,799**

Hazus-MH: Hurricane Event Report

Region Name: City_Pickens_EQFLH

Hurricane Scenario: Probabilistic 500-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 42.45 square miles and contains 3 census tracts. There are over 4 thousand households in the region and has a total population of 10,803 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 1,034 million dollars (2010 dollars). Approximately 92% of the buildings (and 77% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,930 buildings in the region which have an aggregate total replacement value of 1,034 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	799,600	77.3%
Commercial	141,278	13.7%
Industrial	37,549	3.6%
Agricultural	3,101	0.3%
Religious	26,651	2.6%
Government	11,211	1.1%
Education	14,545	1.4%
Total	**1,033,935**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 55 beds. There are 5 schools, 1 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	16	98.07	0	1.70	0	0.19	0	0.05	0	0.00
Commercial	230	98.27	4	1.59	0	0.14	0	0.00	0	0.00
Education	10	98.58	0	1.39	0	0.03	0	0.00	0	0.00
Government	16	98.60	0	1.38	0	0.02	0	0.00	0	0.00
Industrial	74	98.38	1	1.54	0	0.06	0	0.01	0	0.00
Religion	32	98.59	0	1.36	0	0.05	0	0.00	0	0.00
Residential	4,474	98.39	71	1.56	3	0.06	0	0.00	0	0.00
Total	**4,850**		**77**		**3**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	10	97.97	0	1.96	0	0.07	0	0.00	0	0.00
Masonry	281	98.08	5	1.71	1	0.20	0	0.00	0	0.00
MH	921	99.99	0	0.01	0	0.00	0	0.00	0	0.00
Steel	136	98.25	2	1.64	0	0.12	0	0.00	0	0.00
Wood	3,251	98.15	60	1.81	1	0.04	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 55 hospital beds available for use. On the day of the hurricane, the model estimates that 55 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	5	0	0	5

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 3,609 tons of debris will be generated. Of the total amount, 2,884 tons (80%) is Other Tree Debris. Of the remaining 725 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 7 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 548 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,803) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 2.9 million dollars, which represents 0.28 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 3 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 97% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	2,356.07	52.28	12.48	14.38	2,435.21
	Content	230.19	3.71	3.41	0.49	237.79
	Inventory	0.00	0.00	0.79	0.04	0.83
	Subtotal	**2,586.26**	**55.99**	**16.67**	**14.90**	**2,673.83**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	146.58	1.76	0.05	0.23	148.62
	Rental	47.45	0.00	0.00	0.00	47.45
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**194.04**	**1.76**	**0.05**	**0.23**	**196.07**
Total						
	Total	**2,780.30**	**57.75**	**16.72**	**15.14**	**2,869.90**

South Carolina

- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	10,803	799,600	234,335	1,033,935
Total	**10,803**	**799,600**	**234,335**	**1,033,935**

Hazus-MH: Hurricane Event Report

Region Name: City_SixMile_EQFLH

Hurricane Scenario: Probabilistic 500-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 35.30 square miles and contains 1 census tracts. There are over 2 thousand households in the region and has a total population of 5,669 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 474 million dollars (2010 dollars). Approximately 95% of the buildings (and 90% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,595 buildings in the region which have an aggregate total replacement value of 474 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	428,877	90.4%
Commercial	22,293	4.7%
Industrial	12,958	2.7%
Agricultural	480	0.1%
Religious	6,793	1.4%
Government	211	0.0%
Education	2,587	0.5%
Total	**474,199**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4	98.27	0	1.54	0	0.16	0	0.04	0	0.00
Commercial	70	98.02	1	1.77	0	0.20	0	0.00	0	0.00
Education	2	97.82	0	2.09	0	0.10	0	0.00	0	0.00
Government	1	97.29	0	2.56	0	0.15	0	0.00	0	0.00
Industrial	33	98.53	0	1.42	0	0.05	0	0.01	0	0.00
Religion	15	98.68	0	1.27	0	0.05	0	0.00	0	0.00
Residential	2,434	98.60	34	1.36	1	0.03	0	0.00	0	0.00
Total	**2,558**		**36**		**1**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	**None**		**Minor**		**Moderate**		**Severe**		**Destruction**	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	130	98.76	2	1.19	0	0.04	0	0.00	0	0.00
MH	666	99.99	0	0.01	0	0.00	0	0.00	0	0.00
Steel	36	98.40	1	1.51	0	0.08	0	0.00	0	0.00
Wood	1,631	98.20	29	1.76	1	0.04	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Schools	1	0	0	1

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,717 tons of debris will be generated. Of the total amount, 2,339 tons (86%) is Other Tree Debris. Of the remaining 378 tons, Brick/Wood comprises 21% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 3 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 300 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,669) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 1.6 million dollars, which represents 0.34 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 99% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,339.84	10.35	4.02	3.01	1,357.23
	Content	157.63	1.00	0.24	0.28	159.15
	Inventory	0.00	0.00	0.05	0.01	0.06
	Subtotal	**1,497.48**	**11.36**	**4.31**	**3.29**	**1,516.44**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	79.42	0.45	0.02	0.06	79.95
	Rental	24.35	0.00	0.00	0.00	24.35
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**103.77**	**0.45**	**0.02**	**0.06**	**104.30**
Total						
	Total	**1,601.24**	**11.81**	**4.33**	**3.35**	**1,620.74**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	5,669	428,877	45,322	474,199
Total	**5,669**	**428,877**	**45,322**	**474,199**

Hazus-MH: Hurricane Event Report

Region Name: PickensCoHMP_EQFLH

Hurricane Scenario: Probabilistic 500-year Return Period

Print Date: Sunday, October 09, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 512.03 square miles and contains 28 census tracts. There are over 45 thousand households in the region and has a total population of 119 ,224 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 48 thousand buildings in the region with a total building replacement value (excluding contents) of 11,490 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 48,394 buildings in the region which have an aggregate total replacement value of
11,490 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	9,101,224	79.2%
Commercial	1,427,396	12.4%
Industrial	484,852	4.2%
Agricultural	25,871	0.2%
Religious	183,914	1.6%
Government	38,722	0.3%
Education	227,970	2.0%
Total	**11,489,949**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 151 beds. There are 35 schools, 10 fire stations, 12 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 53 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	121	98.33	2	1.46	0	0.16	0	0.04	0	0.00
Commercial	2,028	97.99	37	1.79	4	0.21	0	0.00	0	0.00
Education	102	97.97	2	1.96	0	0.08	0	0.00	0	0.00
Government	61	98.08	1	1.85	0	0.07	0	0.00	0	0.00
Industrial	702	98.44	11	1.47	1	0.07	0	0.02	0	0.00
Religion	264	98.43	4	1.50	0	0.07	0	0.00	0	0.00
Residential	44,281	98.28	726	1.61	47	0.10	0	0.00	0	0.00
Total	**47,558**		**783**		**52**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	149	95.86	6	3.83	0	0.31	0	0.00	0	0.00
Masonry	2,941	97.23	68	2.24	16	0.52	0	0.01	0	0.00
MH	9,945	99.99	1	0.01	0	0.00	0	0.00	0	0.00
Steel	1,194	98.01	22	1.82	2	0.17	0	0.00	0	0.00
Wood	31,343	98.10	589	1.84	17	0.05	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 151 hospital beds available for use. On the day of the hurricane, the model estimates that 151 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	10	0	0	10
Hospitals	2	0	0	2
Police Stations	12	0	0	12
Schools	35	0	0	35

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 47,237 tons of debris will be generated. Of the total amount, 37,495 tons (79%) is Other Tree Debris. Of the remaining 9,742 tons, Brick/Wood comprises 24% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 93 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 7,410 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 119,224) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 33.3 million dollars, which represents 0.29 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 33 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	26,810.60	620.97	267.08	173.74	27,872.39
	Content	3,508.59	53.12	98.52	8.49	3,668.71
	Inventory	0.00	0.78	22.67	0.28	23.73
	Subtotal	**30,319.19**	**674.87**	**388.27**	**182.50**	**31,564.82**
Business Interruption Loss						
	Income	0.00	35.55	1.11	0.64	37.31
	Relocation	1,081.75	38.40	3.63	4.33	1,128.11
	Rental	520.29	14.56	0.97	0.10	535.92
	Wage	0.00	12.66	1.84	2.10	16.60
	Subtotal	**1,602.04**	**101.17**	**7.56**	**7.17**	**1,717.94**
Total						
	Total	**31,921.23**	**776.04**	**395.82**	**189.67**	**33,282.76**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	119,224	9,101,224	2,388,725	11,489,949
Total	**119,224**	**9,101,224**	**2,388,725**	**11,489,949**

Appendix P: Hazus Hurricane Reports 1000 Year Return Period

Hazus-MH: Hurricane Event Report

Region Name: City_Central_EQFLU

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 24.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,731 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 837 million dollars (2010 dollars). Approximately 92% of the buildings (and 81% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,754 buildings in the region which have an aggregate total replacement value of 837 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	680,645	81.4%
Commercial	51,780	6.2%
Industrial	69,035	8.3%
Agricultural	712	0.1%
Religious	13,896	1.7%
Government	3,972	0.5%
Education	16,483	2.0%
Total	**836,523**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, no fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 11 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	4	96.62	0	2.85	0	0.41	0	0.12	0	0.01
Commercial	122	96.49	4	3.02	1	0.48	0	0.01	0	0.00
Education	12	97.19	0	2.69	0	0.12	0	0.00	0	0.00
Government	10	97.34	0	2.56	0	0.10	0	0.00	0	0.00
Industrial	44	96.73	1	2.89	0	0.29	0	0.08	0	0.00
Religion	22	97.38	1	2.49	0	0.11	0	0.01	0	0.00
Residential	2,429	95.84	96	3.77	10	0.38	0	0.00	0	0.00
Total	**2,641**		**102**		**11**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	16	96.07	1	3.72	0	0.21	0	0.00	0	0.00
Masonry	204	93.02	11	5.19	4	1.72	0	0.06	0	0.00
MH	349	99.95	0	0.04	0	0.01	0	0.00	0	0.00
Steel	72	96.81	2	2.88	0	0.30	0	0.01	0	0.00
Wood	1,820	96.05	72	3.81	3	0.13	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 6,137 tons of debris will be generated. Of the total amount, 4,796 tons (78%) is Other Tree Debris. Of the remaining 1,341 tons, Brick/Wood comprises 26% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 14 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 987 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,731) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 3.8 million dollars, which represents 0.45 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 4 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	2,882.75	39.63	82.72	17.26	3,022.36
	Content	467.05	4.87	40.38	0.45	512.74
	Inventory	0.00	0.06	9.31	0.03	9.40
	Subtotal	**3,349.80**	**44.57**	**132.41**	**17.73**	**3,544.50**
Business Interruption Loss						
	Income	0.00	4.36	0.66	0.00	5.02
	Relocation	130.58	3.90	1.82	0.50	136.80
	Rental	70.84	1.75	0.57	0.01	73.17
	Wage	0.00	1.55	1.09	0.00	2.64
	Subtotal	**201.42**	**11.54**	**4.15**	**0.51**	**217.63**
Total						
	Total	**3,551.22**	**56.11**	**136.55**	**18.24**	**3,762.13**

South Carolina

- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,731	680,645	155,878	836,523
Total	**9,731**	**680,645**	**155,878**	**836,523**

Hazus-MH: Hurricane Event Report

Region Name: City_Clemson_EQFLH

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 51.62 square miles and contains 6 census tracts. There are over 9 thousand households in the region and has a total population of 29,484 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 2,912 million dollars (2010 dollars). Approximately 91% of the buildings (and 80% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 7,612 buildings in the region which have an aggregate total replacement value of 2,912 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,315,585	79.5%
Commercial	261,825	9.0%
Industrial	117,480	4.0%
Agricultural	2,609	0.1%
Religious	43,851	1.5%
Government	11,788	0.4%
Education	159,143	5.5%
Total	**2,912,281**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 6 schools, 1 fire stations, 5 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 32 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	14	96.49	0	2.94	0	0.43	0	0.14	0	0.01
Commercial	420	96.38	14	3.11	2	0.49	0	0.01	0	0.00
Education	52	97.60	1	2.31	0	0.08	0	0.00	0	0.00
Government	23	97.24	1	2.64	0	0.12	0	0.00	0	0.00
Industrial	92	96.88	3	2.81	0	0.24	0	0.06	0	0.00
Religion	59	97.18	2	2.67	0	0.14	0	0.01	0	0.00
Residential	6,627	95.66	271	3.91	30	0.43	0	0.00	0	0.00
Total	**7,288**		**291**		**32**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building	None		Minor		Moderate		Severe		Destruction	
Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	83	95.35	4	4.37	0	0.28	0	0.00	0	0.00
Masonry	660	93.28	36	5.02	12	1.67	0	0.03	0	0.00
MH	704	99.94	0	0.05	0	0.01	0	0.00	0	0.00
Steel	253	96.50	8	3.12	1	0.38	0	0.01	0	0.00
Wood	5,178	96.08	204	3.79	7	0.13	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	5	0	0	5
Schools	6	0	0	6

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 12,809 tons of debris will be generated. Of the total amount, 9,262 tons (72%) is Other Tree Debris. Of the remaining 3,547 tons, Brick/Wood comprises 31% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 44 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,441 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 29,484) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 11.2 million dollars, which represents 0.38 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 11 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	8,654.72	212.65	132.84	92.13	9,092.34
	Content	1,213.55	30.22	63.97	3.35	1,311.09
	Inventory	0.00	0.55	14.75	0.12	15.42
	Subtotal	**9,868.26**	**243.42**	**211.56**	**95.61**	**10,418.85**
Business Interruption Loss						
	Income	0.00	20.61	0.58	0.14	21.33
	Relocation	388.00	19.49	1.70	2.00	411.19
	Rental	283.61	8.39	0.50	0.03	292.53
	Wage	0.00	7.36	0.96	0.32	8.64
	Subtotal	**671.61**	**55.85**	**3.74**	**2.48**	**733.68**
Total						
	Total	**10,539.88**	**299.27**	**215.30**	**98.09**	**11,152.53**

South Carolina
- Pickens

	Population	Building Value (thousands of dollars) Residential	Non-Residential	Total
South Carolina				
Pickens	29,484	2,315,585	596,696	2,912,281
Total	**29,484**	**2,315,585**	**596,696**	**2,912,281**

Hazus-MH: Hurricane Event Report

Region Name: City_Easley_EQFLHU

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 59.60 square miles and contains 8 census tracts. There are over 15 thousand households in the region and has a total population of 39,735 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 4,229 million dollars (2010 dollars). Approximately 92% of the buildings (and 74% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 16,890 buildings in the region which have an aggregate total replacement value of
4,229 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	3,147,479	74.4%
Commercial	843,002	19.9%
Industrial	155,783	3.7%
Agricultural	9,131	0.2%
Religious	45,620	1.1%
Government	6,425	0.2%
Education	21,593	0.5%
Total	**4,229,033**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 96 beds. There are 10 schools, 1 fire stations, 4 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 44 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	40	95.74	1	3.52	0	0.55	0	0.18	0	0.01
Commercial	842	96.17	29	3.31	4	0.50	0	0.02	0	0.00
Education	19	96.95	1	2.90	0	0.15	0	0.00	0	0.00
Government	8	97.12	0	2.75	0	0.13	0	0.00	0	0.00
Industrial	256	96.63	8	3.09	1	0.24	0	0.04	0	0.00
Religion	65	96.95	2	2.88	0	0.15	0	0.01	0	0.00
Residential	14,900	95.43	675	4.32	38	0.24	0	0.00	0	0.00
Total	**16,130**		**716**		**43**		**1**		**0**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	43	95.91	2	3.74	0	0.36	0	0.00	0	0.00
Masonry	1,056	95.25	45	4.04	8	0.69	0	0.02	0	0.00
MH	2,866	99.94	1	0.05	0	0.01	0	0.00	0	0.00
Steel	447	96.32	15	3.18	2	0.49	0	0.02	0	0.00
Wood	11,075	94.80	584	5.00	24	0.21	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 96 hospital beds available for use. On the day of the hurricane, the model estimates that 96 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	4	0	0	4
Schools	10	0	0	10

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 15,542 tons of debris will be generated. Of the total amount, 9,418 tons (61%) is Other Tree Debris. Of the remaining 6,124 tons, Brick/Wood comprises 27% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 67 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 4,451 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 39,735) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 20.6 million dollars, which represents 0.49 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 21 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	16,327.77	686.48	137.21	58.15	17,209.60
	Content	2,081.08	73.65	49.14	8.60	2,212.47
	Inventory	0.00	1.62	11.09	0.69	13.40
	Subtotal	**18,408.85**	**761.74**	**197.44**	**67.44**	**19,435.48**
Business Interruption Loss						
	Income	0.00	64.60	0.55	0.00	65.15
	Relocation	728.37	60.57	3.09	3.89	795.91
	Rental	253.62	26.39	0.48	0.12	280.60
	Wage	0.00	22.92	0.91	0.00	23.83
	Subtotal	**981.99**	**174.47**	**5.03**	**4.01**	**1,165.50**
Total						
	Total	**19,390.84**	**936.21**	**202.47**	**71.46**	**20,600.97**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	39,735	3,147,479	1,081,554	4,229,033
Total	**39,735**	**3,147,479**	**1,081,554**	**4,229,033**

Hazus-MH: Hurricane Event Report

Region Name: City_Liberty_EQFLH

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 32.01 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 9,684 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 819 million dollars (2010 dollars). Approximately 94% of the buildings (and 76% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,383 buildings in the region which have an aggregate total replacement value of 819 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	625,081	76.3%
Commercial	60,906	7.4%
Industrial	90,197	11.0%
Agricultural	4,186	0.5%
Religious	15,405	1.9%
Government	2,133	0.3%
Education	21,055	2.6%
Total	**818,963**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 4 schools, 1 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 7 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	11	96.20	0	3.17	0	0.47	0	0.16	0	0.00
Commercial	135	96.53	4	3.04	1	0.42	0	0.01	0	0.00
Education	8	97.31	0	2.57	0	0.11	0	0.00	0	0.00
Government	5	97.25	0	2.63	0	0.12	0	0.00	0	0.00
Industrial	80	96.73	2	2.94	0	0.26	0	0.06	0	0.00
Religion	23	97.17	1	2.68	0	0.14	0	0.01	0	0.00
Residential	3,958	96.25	148	3.60	6	0.15	0	0.00	0	0.00
Total	**4,220**		**156**		**7**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Building Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	7	96.99	0	2.83	0	0.18	0	0.00	0	0.00
Masonry	225	96.54	7	3.16	1	0.26	0	0.04	0	0.00
MH	1,112	99.94	1	0.05	0	0.01	0	0.00	0	0.00
Steel	98	96.89	3	2.81	0	0.29	0	0.01	0	0.00
Wood	2,635	95.21	127	4.60	5	0.18	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Police Stations	1	0	0	1
Schools	4	0	0	4

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 7,798 tons of debris will be generated. Of the total amount, 6,088 tons (78%) is Other Tree Debris. Of the remaining 1,710 tons, Brick/Wood comprises 19% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 13 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,378 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 9,684) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 4.1 million dollars, which represents 0.50 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 4 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	3,277.78	55.80	79.83	25.45	3,438.86
	Content	440.49	8.66	30.13	2.04	481.33
	Inventory	0.00	0.14	6.95	0.17	7.26
	Subtotal	**3,718.27**	**64.60**	**116.91**	**27.66**	**3,927.45**
Business Interruption Loss						
	Income	0.00	5.41	0.00	0.00	5.41
	Relocation	146.23	5.44	0.66	0.83	153.16
	Rental	41.95	2.19	0.00	0.01	44.15
	Wage	0.00	1.92	0.00	0.00	1.92
	Subtotal	**188.18**	**14.96**	**0.66**	**0.84**	**204.64**
Total						
	Total	**3,906.45**	**79.56**	**117.58**	**28.50**	**4,132.09**

South Carolina

- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	9,684	625,081	193,882	818,963
Total	**9,684**	**625,081**	**193,882**	**818,963**

Hazus-MH: Hurricane Event Report

Region Name: City_Norris_EQFLHU

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Wednesday, October 12, 2016

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 26.97 square miles and contains 2 census tracts. There are over 3 thousand households in the region and has a total population of 7,678 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 3 thousand buildings in the region with a total building replacement value (excluding contents) of 741 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 3,624 buildings in the region which have an aggregate total replacement value of 741 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	584,740	78.9%
Commercial	57,607	7.8%
Industrial	61,630	8.3%
Agricultural	3,805	0.5%
Religious	14,693	2.0%
Government	3,192	0.4%
Education	15,132	2.0%
Total	**740,799**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 3 schools, 2 fire stations, 1 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 6 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	8	96.53	0	2.91	0	0.42	0	0.14	0	0.00
Commercial	133	96.73	4	2.91	0	0.35	0	0.01	0	0.00
Education	5	97.29	0	2.60	0	0.11	0	0.00	0	0.00
Government	4	97.02	0	2.84	0	0.14	0	0.00	0	0.00
Industrial	64	96.74	2	2.92	0	0.27	0	0.07	0	0.00
Religion	24	97.15	1	2.70	0	0.14	0	0.01	0	0.00
Residential	3,241	95.93	132	3.91	5	0.16	0	0.00	0	0.00
Total	**3,478**		**139**		**6**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	5	97.10	0	2.73	0	0.17	0	0.00	0	0.00
Masonry	194	96.55	6	3.16	1	0.25	0	0.03	0	0.00
MH	666	99.94	0	0.05	0	0.01	0	0.00	0	0.00
Steel	89	97.06	2	2.70	0	0.23	0	0.01	0	0.00
Wood	2,378	95.18	116	4.64	5	0.18	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service. By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	2	0	0	2
Police Stations	1	0	0	1
Schools	3	0	0	3

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 6,178 tons of debris will be generated. Of the total amount, 4,760 tons (77%) is Other Tree Debris. Of the remaining 1,418 tons, Brick/Wood comprises 20% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 11 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,137 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 7,678) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 3.8 million dollars, which represents 0.52 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 4 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	3,050.90	46.62	64.67	19.79	3,181.98
	Content	413.36	5.54	28.22	2.13	449.25
	Inventory	0.00	0.12	6.51	0.15	6.77
	Subtotal	**3,464.26**	**52.28**	**99.39**	**22.07**	**3,638.01**
Business Interruption Loss						
	Income	0.00	4.26	0.02	0.00	4.28
	Relocation	131.47	4.21	0.24	0.63	136.56
	Rental	38.98	1.72	0.02	0.01	40.72
	Wage	0.00	1.51	0.03	0.00	1.54
	Subtotal	**170.45**	**11.70**	**0.31**	**0.64**	**183.09**
Total						
	Total	**3,634.71**	**63.98**	**99.70**	**22.71**	**3,821.10**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	7,678	584,740	156,059	740,799
Total	**7,678**	**584,740**	**156,059**	**740,799**

Hazus-MH: Hurricane Event Report

Region Name: City_Pickens_EQFLH

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Wednesday, October 12, 2016

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 42.45 square miles and contains 3 census tracts. There are over 4 thousand households in the region and has a total population of 10,803 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 1,034 million dollars (2010 dollars). Approximately 92% of the buildings (and 77% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 4,930 buildings in the region which have an aggregate total replacement value of 1,034 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	799,600	77.3%
Commercial	141,278	13.7%
Industrial	37,549	3.6%
Agricultural	3,101	0.3%
Religious	26,651	2.6%
Government	11,211	1.1%
Education	14,545	1.4%
Total	**1,033,935**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 55 beds. There are 5 schools, 1 fire stations, 2 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 10 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	15	95.81	1	3.47	0	0.53	0	0.18	0	0.01
Commercial	226	96.53	7	3.05	1	0.41	0	0.01	0	0.00
Education	10	97.19	0	2.69	0	0.12	0	0.00	0	0.00
Government	16	97.26	0	2.62	0	0.12	0	0.00	0	0.00
Industrial	72	96.62	2	3.05	0	0.27	0	0.06	0	0.00
Religion	31	97.09	1	2.75	0	0.15	0	0.01	0	0.00
Residential	4,364	95.98	174	3.83	9	0.19	0	0.00	0	0.00
Total	**4,734**		**185**		**10**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	10	96.17	0	3.57	0	0.27	0	0.00	0	0.00
Masonry	275	95.91	10	3.53	2	0.54	0	0.02	0	0.00
MH	920	99.94	0	0.05	0	0.01	0	0.00	0	0.00
Steel	133	96.56	4	3.04	1	0.38	0	0.01	0	0.00
Wood	3,158	95.34	148	4.48	6	0.17	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 55 hospital beds available for use. On the day of the hurricane, the model estimates that 55 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	1	0	0	1
Hospitals	1	0	0	1
Police Stations	2	0	0	2
Schools	5	0	0	5

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 9,068 tons of debris will be generated. Of the total amount, 7,263 tons (80%) is Other Tree Debris. Of the remaining 1,805 tons, Brick/Wood comprises 23% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 17 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 1,387 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 10,803) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 4.7 million dollars, which represents 0.45 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 5 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	3,800.39	117.60	42.63	32.72	3,993.33
	Content	391.90	14.74	19.08	2.24	427.96
	Inventory	0.00	0.40	4.40	0.19	4.99
	Subtotal	**4,192.28**	**132.74**	**66.11**	**35.14**	**4,426.28**
Business Interruption Loss						
	Income	0.00	7.13	0.00	0.00	7.13
	Relocation	168.49	8.84	0.24	1.43	179.00
	Rental	55.68	2.88	0.00	0.03	58.60
	Wage	0.00	2.53	0.00	0.00	2.53
	Subtotal	**224.17**	**21.38**	**0.24**	**1.46**	**247.26**
Total						
	Total	**4,416.45**	**154.13**	**66.36**	**36.60**	**4,673.54**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	**Residential**	**Non-Residential**	**Total**
South Carolina				
Pickens	10,803	799,600	234,335	1,033,935
Total	**10,803**	**799,600**	**234,335**	**1,033,935**

Hazus-MH: Hurricane Event Report

Region Name: City_SixMile_EQFLH

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Wednesday, October 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 35.30 square miles and contains 1 census tracts. There are over 2 thousand households in the region and has a total population of 5,669 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 2 thousand buildings in the region with a total building replacement value (excluding contents) of 474 million dollars (2010 dollars). Approximately 95% of the buildings (and 90% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 2,595 buildings in the region which have an aggregate total replacement value of 474 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	428,877	90.4%
Commercial	22,293	4.7%
Industrial	12,958	2.7%
Agricultural	480	0.1%
Religious	6,793	1.4%
Government	211	0.0%
Education	2,587	0.5%
Total	**474,199**	**100.0%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 1 schools, 1 fire stations, no police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	4	96.40	0	3.01	0	0.44	0	0.14	0	0.01
Commercial	68	96.31	2	3.14	0	0.53	0	0.01	0	0.00
Education	2	95.60	0	4.02	0	0.38	0	0.01	0	0.00
Government	1	94.41	0	4.93	0	0.64	0	0.02	0	0.00
Industrial	32	97.27	1	2.54	0	0.16	0	0.03	0	0.00
Religion	15	97.38	0	2.48	0	0.13	0	0.01	0	0.00
Residential	2,386	96.65	80	3.23	3	0.12	0	0.00	0	0.00
Total	**2,508**		**83**		**3**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	128	97.18	4	2.67	0	0.14	0	0.01	0	0.00
MH	666	99.95	0	0.04	0	0.01	0	0.00	0	0.00
Steel	36	97.10	1	2.64	0	0.25	0	0.01	0	0.00
Wood	1,590	95.74	68	4.11	2	0.15	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (0%) are available for use. After one week, none of the beds will be in service . By 30 days, none will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	1	0	0	1
Schools	1	0	0	1

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 6,742 tons of debris will be generated. Of the total amount, 5,819 tons (86%) is Other Tree Debris. Of the remaining 923 tons, Brick/Wood comprises 19% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 7 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 745 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 5,669) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 2.5 million dollars, which represents 0.53 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 3 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 98% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	2,106.32	21.37	9.47	6.99	2,144.16
	Content	256.85	3.00	2.59	0.76	263.20
	Inventory	0.00	0.03	0.60	0.03	0.65
	Subtotal	**2,363.18**	**24.40**	**12.65**	**7.77**	**2,408.01**
Business Interruption Loss						
	Income	0.00	2.31	0.00	0.50	2.81
	Relocation	89.27	2.31	0.08	0.88	92.54
	Rental	25.80	0.93	0.00	0.06	26.79
	Wage	0.00	0.82	0.00	1.77	2.59
	Subtotal	**115.07**	**6.36**	**0.08**	**3.21**	**124.72**
Total						
	Total	**2,478.25**	**30.76**	**12.73**	**10.98**	**2,532.73**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	5,669	428,877	45,322	474,199
Total	**5,669**	**428,877**	**45,322**	**474,199**

Hazus-MH: Hurricane Event Report

Region Name: PickensCoHMP_EQFLH

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Sunday, October 09, 2016

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

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Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- South Carolina

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 512.03 square miles and contains 28 census tracts. There are over 45 thousand households in the region and has a total population of 119 ,224 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 48 thousand buildings in the region with a total building replacement value (excluding contents) of 11,490 million dollars (2010 dollars). Approximately 93% of the buildings (and 79% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 48,394 buildings in the region which have an aggregate total replacement value of
11,490 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	9,101,224	79.2%
Commercial	1,427,396	12.4%
Industrial	484,852	4.2%
Agricultural	25,871	0.2%
Religious	183,914	1.6%
Government	38,722	0.3%
Education	227,970	2.0%
Total	**11,489,949**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 151 beds. There are 35 schools, 10 fire stations, 12 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 118 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 1 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	118	95.71	4	3.54	1	0.56	0	0.19	0	0.01
Commercial	1,991	96.17	68	3.30	11	0.52	0	0.02	0	0.00
Education	102	97.64	2	2.27	0	0.09	0	0.00	0	0.00
Government	60	97.47	2	2.42	0	0.11	0	0.00	0	0.00
Industrial	689	96.61	22	3.08	2	0.25	0	0.05	0	0.00
Religion	260	97.15	7	2.70	0	0.14	0	0.01	0	0.00
Residential	43,160	95.80	1,790	3.97	102	0.23	1	0.00	1	0.00
Total	**46,380**		**1,896**		**116**		**2**		**1**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	149	96.38	5	3.38	0	0.23	0	0.00	0	0.00
Masonry	2,887	95.45	117	3.87	20	0.66	1	0.02	0	0.00
MH	9,939	99.93	5	0.05	1	0.01	0	0.00	0	0.00
Steel	1,175	96.47	38	3.08	5	0.43	0	0.01	0	0.00
Wood	30,374	95.07	1,511	4.73	63	0.20	1	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 151 hospital beds available for use. On the day of the hurricane, the model estimates that 151 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	10	0	0	10
Hospitals	2	0	0	2
Police Stations	12	0	0	12
Schools	35	0	0	35

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 112,009 tons of debris will be generated. Of the total amount, 92,517 tons (83%) is Other Tree Debris. Of the remaining 19,492 tons, Brick/Wood comprises 23% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 181 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 14,957 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 119,224) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 54.2 million dollars, which represents 0.47 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 54 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 95% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	42,897.55	1,305.73	435.98	240.85	44,880.11
	Content	5,581.41	224.59	173.95	27.23	6,007.19
	Inventory	0.00	3.94	38.75	1.78	44.47
	Subtotal	**48,478.96**	**1,534.26**	**648.69**	**269.86**	**50,931.76**
Business Interruption Loss						
	Income	0.00	126.84	2.03	0.51	129.38
	Relocation	2,150.63	123.63	9.20	12.09	2,295.56
	Rental	773.83	52.58	1.76	0.37	828.53
	Wage	0.00	45.17	3.36	1.79	50.33
	Subtotal	**2,924.46**	**348.23**	**16.36**	**14.75**	**3,303.80**
Total						
	Total	**51,403.42**	**1,882.49**	**665.04**	**284.61**	**54,235.56**

South Carolina
- Pickens

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
South Carolina				
Pickens	119,224	9,101,224	2,388,725	11,489,949
Total	**119,224**	**9,101,224**	**2,388,725**	**11,489,949**