The Anderson County & Oconee County Natural Hazards Mitigation Plan

Prepared by: Anderson County and Oconee County

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Chapter 2
Executive Summary

Chapter 2
Executive Summary

On October 30, 2000, the President signed into law the Disaster Mitigation Act of 2000, also known as DMA2K. Among its other features, DMA2K established a requirement that in order to remain eligible for federal disaster assistance and grants funds, local and state governments must develop and adopt Hazard Mitigation Plans (HMPs). On February 26, the Federal Emergency Management Agency published an Interim Final Rule (IFR) that set forth the guidance and regulations under which such plans are supposed to be developed. The IFR provides detailed descriptions of both the planning process that states and localities are required to observe, and the contents of the plan that emerges. The original version of the Anderson and Oconee County Hazard Mitigation Plan was submitted as part of the Western Piedmont Regional Emergency Management Task Force HMP in 2005. It was approved by the State and Federal Emergency Management Agency in 2005, and was subsequently adopted by the Anderson County Council & Oconee County Council. The IFR related to mitigation planning specifies that local jurisdictions must update their HMPs every five years. The first update was completed in 2012. This is the second update, and only represents Anderson and Oconee Counties, and their municipalities.

Hazard Mitigation is often defined as actions taken to reduce the effects of natural hazards on a place and its population. The 2017 HMP update entailed a comprehensive re-evaluation of all parts of the plan, including hazard profiles, risk assessment, mitigation goals, strategies, and mitigation priorities.

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2.1 How the Plan is Organized

The Anderson and Oconee Hazard Mitigation Plan Update is organized to parallel the structure provided in the Interim Final Rule (IFR). The plan has eight chapters and ten appendices (A-F).

Chapter 1: Table of Contents
Chapter 2: Executive Summary
Chapter 3: Background
Chapter 4: Approval and Adoption
Chapter 5: Planning Process
Chapter 6: Hazard Identification, Profiling, Ranking, and Vulnerability Risk Assessment
Chapter 7: Mitigation Strategy
Chapter 8: Plan Monitoring and Maintenance

There are references to the IFR throughout the plan update. When possible, these provide specific section and subsection notations to aid the review process. The plan also includes references to the FEMA crosswalk document, which is used in reviewing mitigation plans.

2.2 Background Information on the Plan

The purpose of a mitigation plan is to rationalize the process of determining appropriate hazard mitigation actions. This plan includes a detailed characterization of natural hazards impacting Anderson and Oconee Counties; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, strategies and actions that will guide mitigation activities, and a detailed plan for implementing and monitoring the plan. This plan focuses loss assessments on six of the nine identified hazards with the highest potential for damaging physical assets, people and operations in the region, based on their probability. These hazards are winter weather events, hail storms/thunderstorms, lightning/thunderstorms, tornadoes/high winds, drought/heat wave, and floods. Both the risk assessment section and goals sections reflect this emphasis, which was the result of careful consideration and a numerical ranking process carried out by the Mitigation Core Team (MCT).

2.3 Hazards and Risks

Hazards

Section 6 of this plan update includes a detailed description of the process that was used to assess and prioritize Anderson and Oconee Counties' risks from natural hazards, and quantitative risk assessments for Anderson and Oconee Counties, and more detailed assessments for certain asset classes. Nine hazards were initially identified and profiled by the Mitigation Core Team. The hazards included:

1. Winter Storms
2. Hail Storms/ Thunderstorms
3. Lightening Severe Storms/ Thunderstorms
4. Tornados/ High Winds
5. Drought/ Heat Wave
6. Floods
7. Wildfires
8. Hurricanes
9. Earthquakes

For each of these hazards, the profiles in Chapter 6 include:

- Description of the hazard
- Location and extent of the hazard
- Severity of the hazard
- Impact on life and property
- Occurrences of the Hazard
- Vulnerability to Hazard
- Risk Assessment

Risks

Risk is a numerical calculation of the potential future damages. Although the range of events from tornados to earthquakes all have some potential to affect the region, the hazard ranking determined that winter storms, hail storms/thunderstorms, lightning severe storms/thunderstorms, tornados/high winds, drought/heat wave and flood hazards would include a more detailed risk assessment in Chapter 6. The results of the risk assessment are summarized in Table 2.3-1.

Table 2.3-1: Summary of Frequent Hazards

Anderson County

HAZARD	FREQENCY	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Winter Storms	27	1.31	0.90	$16,262,789.60	$17,144,152.30
Hail Storms / Thunderstorms	11	2.20	0.00	$2,826,726.48	$856,759.00
Lightning Severe Storms / Thunderstorms	36	3.16	0.69	$12,973,595.30	1, 272,517.57
Tornados / High Winds	38	12.90	0.00	$9,846,961.62	$897,347.99
Drought/ Heat Wave	8	0.00	0.00	$9,652,956.04	$16,626,262.60
Floods	13	1.83	0.50	$3,731,112.02	$447,590.73

Oconee County

HAZARD	FREQENCY	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Winter Storms	28	1.03	1.77	$12,747,423.50	$19,724,707.00
Hail Storms / Thunderstorms	7	0.20	0.00	$1,062,253.17	$480,764.70
Lightning Severe Storms / Thunderstorms	23	0.53	0.19	$8,205,491.24	1,019,681.83
Tornados/ High Winds	18	15.20	1.00	$7,082,597.70	$5,163,176.88
Drought/ Heat Wave	8	0.00	0.00	$9,652,956.04	$16,626,262.60
Floods	10	2.66	0.67	$7,886,851.53	$452,521.99

2.4 Summary of Goals, Objectives, Strategies, and Actions

Chapter 7 of this plan describes the mitigation priorities for Anderson and Oconee Counties. The chapter prioritizes the actions, describes the funding required, identifies potential sources of funding, the level of support, and the estimated timing of the action. The chapter also includes the mitigation goals, objectives, and strategies of Anderson and Oconee Counties.

Anticipated Outcomes for Anderson and Oconee County Natural Hazard Mitigation Plan:

1. Protect the residents of the region from natural hazards.
2. Increase public understanding, support, and demand for hazard mitigation.
3. Protect existing and new properties.
4. Build and support local capacity and commitment to become less vulnerable to hazards.
5. Maximize resources for investment in hazard mitigation.
6. Reduce the potential impact of natural disasters on the region's historic assets.
7. Reduce the potential impact of natural disasters on the region's natural systems.

Objectives and Strategies

Objectives are well-defined intermediate points in the process of achieving goals. Strategies are a specific course of action to achieve the objectives. Anderson and Oconee Counties' planning objectives can be found in Chapter 7, Section 3, *Mitigation Objectives and Strategies.*

Action Items for the Region

The 2017 Mitigation Action Plan lists thirty-seven specific activities towards Hazard Mitigation goal achievement. These action items are included in Chapter 7, section 4. This section of Chapter 7 includes information about the parties responsible for implementing the actions, and about potential sources of funding for mitigation activities. This section also integrates specific hazard mitigation projects that have been identified and scoped in accordance with the requirements of the STAPLEE criteria. The projects developed as part of this plan update are listed in Chapter 7.

2.5 The Planning Process

Chapter 5 provides details about the process that were used to develop this plan. The process closely followed the guidance in the FEMA "386" series of planning guidance, which recommends a four-stage process for developing mitigation plans.

Step 1- Organize Resources
Step 2- Assess Risks
Step 3- Develop a Mitigation Plan
Step 4- Implement the plan and monitor progress

Step 1 included identification of a Mitigation Core Team (MCT) that was responsible for most aspects of plan development; and a stakeholder group, comprised of individuals from the participating counties, who were informed of the planning decisions and provided interim versions of the plan for review and comment. Each participating county and jurisdictional council is the approving authority for the plan.

Step 2, the risk assessment, was completed by the MCT. The risk assessment is included in Chapter 6 of this plan.

Step 3, development of the mitigation plan, is described in Chapter 5 (Planning Process). The section includes details about who was involved, the processes that were used, and the products that were developed.

Step 4, implementing the plan, is described in the mitigation strategy section, which includes details about who is responsible for implementation of specific strategies and actions; and in Chapter 8, the plan monitoring and maintenance chapter, which describes long-term implementation through periodic updates and reviews.

2.6 Approval and Adoption Process

Chapter 4 discusses the approval and adoption of the updated plan. Each county and jurisdictional council is responsible for approving and adopting the 2017 Hazard Mitigation Plan Update. The Councils will review and approve the plan update after interim FEMA approval.

2.7 Implementation Process

The implementation process is described as part of the specific actions in the mitigation strategy section.

2.8 Monitoring and Updating the Plan

Chapter 8 (Plan Monitoring and Maintenance) describes the schedule and procedures for ensuring that the plan update stays current. The section identifies when the plan must be updated, who is responsible for monitoring the plan and ensuring that the update procedures are implemented. This section provides a combination of cyclical dates (oriented toward FEMA requirements) and triggering events that will initiate amendments and updates to the plan. Representatives from Anderson & Oconee Counties Emergency Management Division are responsible for monitoring the plan and initiating the cyclical update process.

Chapter 3
County Demographics & Backgrounds

Chapter 3
Background

Contents of this Chapter

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3.1 Introduction

The Anderson and Oconee County Hazard Mitigation Plan Update is the first phase of a multi-hazard mitigation strategy for the entire community. This Plan encourages cooperation among various organizations and crosses political sub-divisions. As written, this Plan fulfills the requirements of the Federal Disaster Mitigation Act of 2000. The Federal Disaster Mitigation Act of 2000 provides federal assistance to state and local emergency management agencies and other disaster response organizations in an effort to reduce damage from disasters.

It is important that State and local government, public-private partnerships, and community citizens can see the results of these mitigation efforts; therefore, the goals and strategies need to be achievable.

3.1.1 Scope of the Plan

The original Anderson County Hazard Mitigation Plan was a concerted effort on the part of the County to develop all-hazards, County-wide approach to disaster damage reduction. In order to focus on a process needed to attain a sustainable future for the community, the County employed the Appalachian Council of Governments, a FEMA-approved process to identify and assess all potential hazards that may affect the community and develop an Action Plan to address the hazards. The original Plan was completed in 2006, and has been used to better articulate accurate needs for the community based on a process that involves all stakeholders including the general public, government, business and industry. The HMP update integrates various newly-identified hazard mitigation strategies and actions, as described in Chapter 7.

3.2 Area Background

Within Anderson and Oconee Counties there are 15 municipalities. The overall population of these two counties is 261,399 according to the 2011-2015 US Census Bureau American Community Survey 5-year Estimates. The region has both rural and urban settings with small towns and larger cities spread throughout the area. Anderson and Seneca, the largest cities have population figures of 26,978 and 8,184 respectively. Many of these small towns do not have full-time staff, and none employ a professional planner. They rely heavily on each County government and the Council of Governments to provide them with technical assistance for planning functions.

Anderson and Oconee are located in the northwest corner of South Carolina. Interstate 85 bisects the region, providing access to many markets in the southeastern United States. Interstate 85 also provides easy access to Charlotte and Atlanta. This is one of the fastest growing regions in the United States. This corridor is characterized by strong economic growth, job creation, and low unemployment. A high quality of life is reflected in lower cost of living standards, affordable home prices, and proximity to many of the recreational amenities people desire, including the mountains and the ocean.

The Appalachian and Blue Ridge Mountains border the region to the northwest and the Atlantic Ocean is approximately 200 miles to the east. The climate of this area is relatively mild, with an average temperature of 61.6 degrees Fahrenheit (Western Regional Climate Center, 2017). This is slightly lower than other portions of the state such as the Columbia region, which has an average annual temperature of 63.1, and the Charleston region with an average annual temperature of 64.8 degrees. Precipitation is fairly constant throughout the year with an average of 4.3 inches of rain per month. The Columbia region averages 4 inches of rain per month while the Charleston region averages 4.2 inches per month. The growing season is from late March to early November and averages 225 days. The region is located in an area that has a low natural disaster frequency, with an occasional, ice event, tornado or flood accounting for the majority of events. Growth in this area has been significant at approximately 15% for both state and region over the past 10 years. Also, the region contains a large portion of the Greenville-Spartanburg-Asheville media market, the thirty-fifth largest in the country with 734,000 households.

3.2.1 Area Population, Households, Median Incomes by County.

The following tables show the population, households and median household income for the two-county region and their municipalities. Additional detailed census information is identified in the Social Vulnerability section.

Table 3.2.1-1: Population by County.

County	*Population*	*Population 65+*	*Households*	*Median Income*
Anderson	***187,126***	***28,329***	***73,829***	***$42,143***
Oconee	***74, 273***	***14,106***	***30, 676***	***$41, 237***

2011- 2015 US Census Bureau, American Community Survey 5 Year Estimates.

Table 3.2.1-2 Population by Municipality.

County	*Municipality*	*Population*
Anderson County	*City of Anderson*	26,978
	City of Belton	4,247
	Town of Honea Path	3,649
	Town of Iva	1,085
	Town of Starr	150
	Town of Pendleton	3,089
	Town of Pelzer	82
	Town of West Pelzer	921
	Town of Williamston	4,029
Oconee County	*Town of Salem*	137
	City of Seneca	8,184
	City of Walhalla	4,234
	Town of West Union	316
	City of Westminster	2,435

2011- 2015 US Census Bureau, American Community Survey 5 Year Estimates.

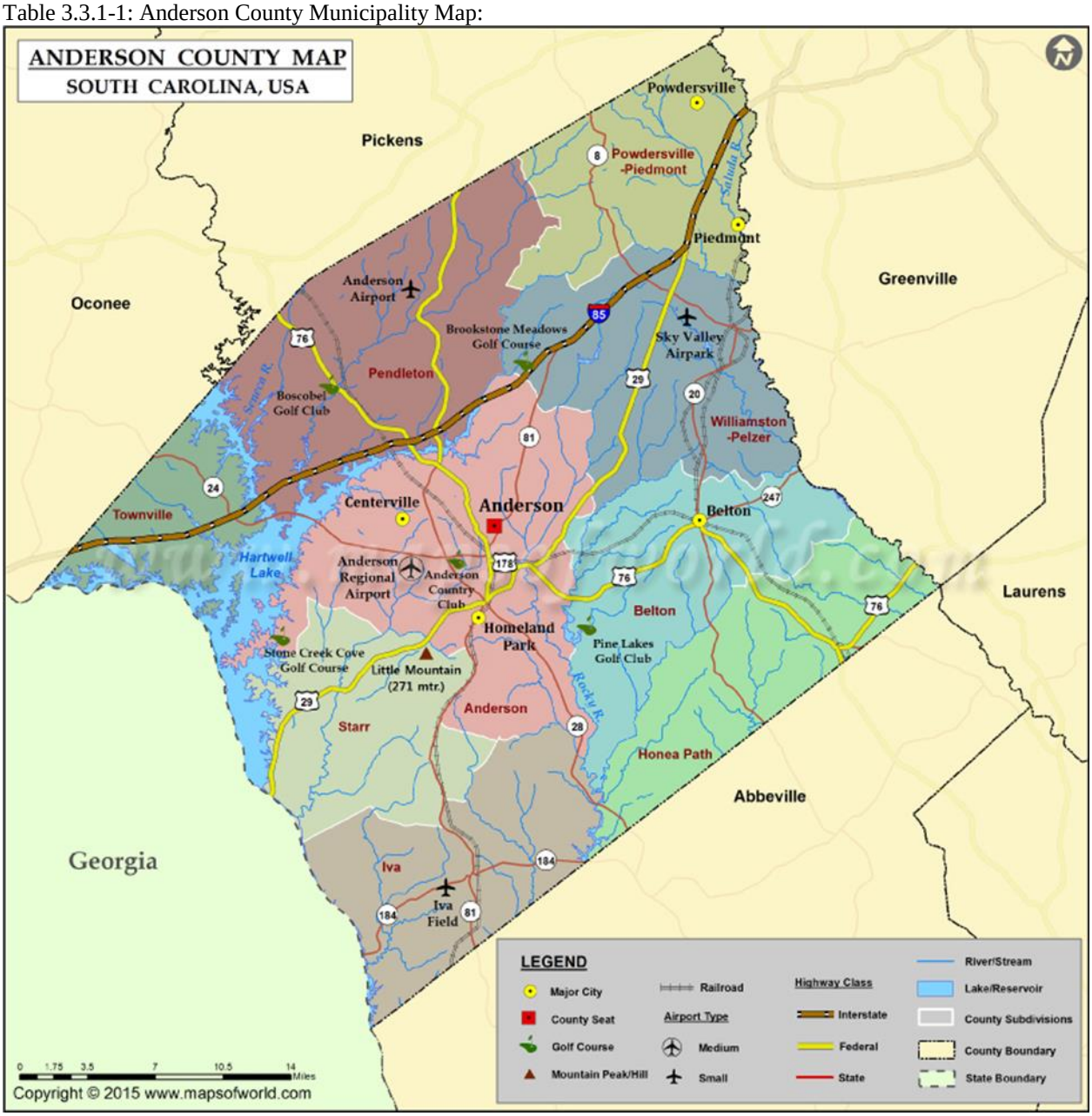
Table 3.2.1-3 County Demographics.

	Anderson County	***Oconee County***
Total Population:	187,126	74, 273
Race:		
White	149,818 (80%)	65,177 (87%)
Black	30,020 (16%)	5,613 (7.5%)
Hispanic/Latino	5,447 (3%)	3,349 (4.5%)
American Indian	518 (0.3%)	157 (0.2%)
Asian	1,637 (0.9%)	484 (0.6%)
Civilian Labor Force:	89, 507 (59%)	32, 133 (52.5%)
Employment in Civilian Labor Force:	81,226 (53.7%)	28,796 (47%)
Unemployment in Civilian Labor Force:	8,209 (5.4%)	3,337 (5.4%)
Median Income:	$42,143	$41,237
Families with Income Beneath Poverty Level:	16.4%	20.1%
Households:	73,829	30,676
Households over 65:	28,329 (38%)	9,814 (32%)
Average Temperature:	61.6 F	59.6 F
Average Monthly Rainfall:	3.8”	5.0”

2011- 2015 US Census Bureau, American Community Survey 5 Year Estimates.

3.3.1 Municipality Area Background - Anderson County

Table 3.3.1-1: Anderson County Municipality Map:



3.3.2 History Background of Anderson County and Municipalities.

City of Anderson:

The City of Anderson is located in the northwest corner of the state of South Carolina on the Piedmont Plateau. It is the county seat located in the geographical center of the county and principal city in Anderson County. The City is ideally located on the busy Interstate 85 corridor, to which much of its economic growth can be attributed. The City lies on the southern border of Interstate 85 and is approximately 127 miles north of Atlanta, Georgia and 132 miles south of Charlotte, North Carolina. The City encompasses approximately 14 square miles and is located in the geographical center of the county. The I-85 corridor from Atlanta to Charlotte is now known as one of the nation's hottest growth areas. Anderson County, South Carolina lies midway between Atlanta, Georgia and Charlotte, North Carolina. This stretch of highway is one of the heaviest traveled highways in the southeast. Business leaders and development officials in Anderson have taken advantage of this asset, and visible progress is the result (City of Anderson, 2017). According to the United States Census Bureau (2017), the city has a total area of 14.6 square miles (37.8 square km).

City of Belton:

Belton was chartered in 1855 soon after the Columbia and Greenville Railroad was built. It soon became a junction point of the C & G, the Piedmont and Northern and the Blue Ridge (Southern Railway) with 36 passenger trains serving the town. The city is still served today by two railroads: the Greenville & Western Railway and the Pickens Railway. The city is at the junction of four highway arteries with connections to I-385 in Greenville County, I-26 in Laurens County and I-85 in Anderson and Greenville. Anderson is only 15 minutes away and its only 30 minutes to downtown Greenville. Far enough away for Belton to retain its small-town ambiance and friendliness, but close enough to the big cities for any cultural, educational, work or shopping experience anyone would wish (City of Belton, 2017). According to the United States Census Bureau, the city has a total area of 3.8 square miles (10.0 km^2), all of it land.

Town of Honea Path:

The town of Honea Path has a lot to offer - whether you live in, work in or visit our community. Located in the Upstate of South Carolina, Honea Path is known for its historic homes, marvelous climate, lovely countryside and friendly residents. Located just minutes from Anderson and Greenwood the town of Honea Path offers a small-town charm and security for visitors and residents alike. Honea Path's heritage is captured in its love of history and historic preservation. Honea Path, which dates from 1794, is located primarily in Anderson County but partially in Abbeville County. Residents of the town pronounce the word *honey-uh*. On a more serious note, in 1934 Honea Path was the site of one of the most violent suppressions of a labor movement in the history of the United States. Known today as the Chiquola Incident, seven textile workers were killed by special deputies when 45,000 of the state's 80,000 textile workers went on strike.

Honea Path has many lakes and creeks: towards Anderson on Highway 252 is Blue Barker Creek (aka, Blue Creek) and Barkers Creek, and towards Princeton on Highway 76 is Broad Mouth Creek. According to the United States Census Bureau, the town has a total area of 3.5 square miles (9.0 km²), all land.

Town of Iva:

Iva, SC is located in the southern part of Anderson County and is populated by friendly folks who are proud of their rural heritage and progressive town. Come on over and enjoy the many lakes and rivers that are a part of our area and see why Iva is known as the "Gateway to the Fresh Water Coast." (Town of Iva, 2017). According to the United States Census Bureau, the town has a total area of 0.9 square miles (2.3 km²), all of it land.

Town of Starr:

Starr is located in Anderson County, south of the City of Anderson on SC 81. The town was originally named Twiggs, but when the Savannah Valley Railroad was completed in 1884, the name was changed to Starr Station in honor of a popular engineer who drove the train through town. Anderson is the largest city near Starr. According to the United States Census Bureau, the town has a total area of 1.5 square miles (3.8 km²), all of it land.

Town of Pendleton:

Pendleton, SC is a small town in Anderson County, SC. The town was founded in 1790 and is the largest historic area in the entire United States. The town boasts lovely historic homes and plantations, a town square around a village green, and one of the friendliest populations found anywhere! Just four miles from Clemson University, Pendleton offers a combination of History, Education, Friendship sand Laughter! According to the United States Census Bureau, the town has a total area of 3.6 square miles (9.3 km²), of which, 3.6 square miles (9.2 km²) of it is land and 0.28% is water.

Town of Pelzer:

Pelzer is located in eastern Anderson County on the Saluda River. The town's history is linked with that of Pelzer Manufacturing Company, which began textile production in the late 1880s. The company bought the very first generators made by the General Electric Company and was the first factory in the country to have incandescent lights. Anderson is the largest city near Pelzer. In 2015, Pelzer annexed commercial business and about 550 houses, raising the population to approximately 600 residents (Independent Mail, 2017). According to the United States Census Bureau, the town has a total area of 0.2 square miles (0.5 km²), all of it land.

Town of West Pelzer:

The Cherokee Indians were the first settlers of the present site of West Pelzer, originally called Frankville. There were settlers in the vicinity in the 1800s. The town of Frankville was chartered in 1913. The original survey for the town was made by John Franks. The street layout in the older part of the town is the same today as in the original street plat. A new petition was later filed and on September 13, 1918, the name was changed from Frankville to West Pelzer. West Pelzer is less than a quarter of a mile from Pelzer. West Pelzer is incorporated and has its own city government. The two towns share the same post office zip code, 29669, and the same telephone prefix, 947 (Town of West Pelzer, 2017). According to the United States Census Bureau, the town has a total area of 0.5 square miles (1.3 km^2), all of it land**.**

Town of Williamston:

Nestled in the Foothills of the Blue Ridge Mountains in the scenic Upstate, Williamston is a thriving area with industrial, commercial, and tourist activity. Its proximity to the I-85 business corridor and metropolitan areas make it a great place to live, work and play. Williamston is only 15 minutes from Greenville or Anderson, two hours to Atlanta or Charlotte, and four hours to sun at the beach or snow in the mountains. Fun is always in season with a climate that boasts 248 days of sunshine, 49 inches of precipitation, and a comfortable average temperature of 64 degrees. Indeed, Williamston is a pleasant place to spend a day, a week, or a lifetime.

The Williamston of the 21st century is known as a growing bedroom community with easy access to metropolitan areas, a moderate cost of living, and traditional family values. There are fine people, great schools, wonderful neighborhoods with few of the worries of a big city and the modern world. Come to Williamston for The Springwater Festival or Christmas in the Park — or come to stay (Town of Williamston, 2017).

3.4.1 Municipality Area Background - Oconee County Map

3.4.2 History Background of Oconee County and Municipalities.

Town of Salem:

Salem sits in the North East corner of Oconee County, just off Highway 11, and serves as the gateway to Lakes Jocassee and Keowee. Our little town is much more than the area inside of its town limits. We pride ourselves in being a community not just a town. The Salem community abounds in nature, wildlife, scenic vistas, opportunities for outdoor recreation, hunting and fishing, and just good ol' down home good folks (Town of Salem, 2017). According to the United States Census Bureau, the town has a total area of 0.8 square miles (2.2 km²), all of it land.

City of Seneca:

Nestled in the foothills of the Blue Ridge Mountains, Seneca reflects the hospitality and beauty of this little corner of our great state. Since it's founding in 1873, Seneca has always adapted to the ever-changing pace of life and has always strived to provide all of its businesses, residents, and visitors with an open, friendly atmosphere and a community with outstretched arms (City of Seneca, 2017). According to the United States Census Bureau, the city has a total area of 7.1 square miles (18.4 km²), of which, 7.1 square miles (18.3 km²) of it is land and 0.04 square miles (0.1 km²) of it (0.56%) is water.

City of Walhalla:

Walhalla, South Carolina is a town with rich heritage and the county seat of Oconee County in the upstate of South Carolina. In 1850, a group of immigrants from northern Germany arrived in Charleston and were unable to find land that suited their pocketbook or their idea of home. They formed the German Colonization Society led by General John A. Wagener and found what they were looking for here, in the garden of the Gods. Today, Walhalla is a charming southern town with historical homes, churches, and the beautifully restored Walhalla Civic Auditorium where regional and local theater events are held. With antique shops, cafes, shops, and tree-lined streets, Walhalla is a delightful town to explore on foot. Each October, Walhalla T honors our German heritage with the annual Oktoberfest. With events for children, families, and adults, Oktoberfest is a special time of fun for the whole community and the visitors who come from near and far.Walhalla is located just minutes away from the wide variety of activities Oconee County and the surrounding areas have to offer, including an abundance of hiking and mountain biking trails, numerous waterfalls, Stumphouse Tunnel, the Chatooga River, the Blue Ridge Mountains, Clemson University, and more (City of Walhalla, 2017). According to the United States Census Bureau, the city has a total area of 3.8 square miles (9.7 km²), of which, 3.7 square miles (9.6 km²) of it is land and 0.1 square miles (0.1 km²) of it (1.33%) is water.

Town of West Union:

West Union is a town in Oconee County, South Carolina. Even though its name suggests that it is near Union, they are about four counties apart. According to the United States Census Bureau, the town has a total area of 0.8 square miles (2.0 km²), all of it land.

City of Westminster:

The City of Westminster, South Carolina is located in southwestern Oconee County, twelve miles from the Georgia - South Carolina border and is nestled in the foothills of the Appalachian Mountains. The residents of Westminster enjoy a high quality of life which is reflected in lower cost of living standards, affordable home prices, and proximity to many of the recreational amenities many people desire—such as the Appalachian Mountains and Lake Hartwell, Jocasse, and Keowee. Westminster was established in 1874 upon completion of the Atlanta - Richmond Railway. The community was known as Westminster as early as 1836 when records show that there was a Westminster School. Along with the railroad, a post office was established in June of 1874. The city was officially chartered on March 17, 1875. The surrounding area is mostly rural and historically agricultural in nature, although it has become more developed over the last decade. The City of Clemson and Clemson University are just 16 miles from Westminster, the City of Seneca is eight miles east, and the City of Greenville is roughly 45 miles to the east. Oconee County and Westminster have grown steadily during the past decade, spurred by the growth of the Appalachian Region along Interstate 85 which is now recognized nationally as a development "hot-spot. The I-85 corridor, running from Charlotte, NC to Atlanta, GA is one of the fastest growing regions in the United States. This corridor is characterized by strong economic growth, job creation, and low unemployment and a high quality of life (City of Westminster, 2017). According to the United States Census Bureau, the city has a total area of 3.4 square miles (8.9 km²), all of it land.

References:

City of Anderson. (2017, April 24). *About Us* . Retrieved from City of Anderson Website : http://www.cityofandersonsc.com/

City of Belton. (2017, April 24). *Who We Are*. Retrieved from City of Belton Website : http://cityofbeltonsc.com/who-we-are/

City of Seneca. (2017, April 24). *Home Page*. Retrieved from City of Seneca Website: http://www.seneca.sc.us/Home.aspx

City of Walhalla. (2017, April 24). *History of Walhalla*. Retrieved from City of Walhalla Website: http://www.cityofwalhalla.com/about-walhalla/history-of-walhalla/

The Independent Mail . (2017, May 1). Pelzer Town Council Approves Annexation . Retrieved from The Independent Mail Website : http://archive.independentmail.com/news/local/pelzer-town-council-approves-annexation-ep-1195216106-347554681.html

Town of Iva . (2017, April 24). *Home Page*. Retrieved from Town of Iva Website : http://townofiva.com/

Town of Salem . (2017, April 24). *Home*. Retrieved from Town of Salem Website: http://salemsc.us/

Town of West Pelzer. (2017, April 24). *About Us*. Retrieved from Town of West Pelzer Website : http://westpelzer.com/about-us/

Town of Williamston . (2017, April 24). *About Williamston, SC*. Retrieved from Town of Williamston: http://www.williamstonsc.us/about/

United States Census Bureau . (2017, April 24). *QuickFacts* . Retrieved from United States Census Bureau Website: https://www.census.gov/quickfacts/table/LND110210/45

Western Regional Climate Center . (2017, April 28). *Average of Average Temperature*. Retrieved from The Western Regional Climate Center Website : http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?sc0170

Western Regional Climate Center. (2017, April 28). *Total of Precipitation* . Retrieved from The Western Regional Climate Center Website : http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?sc0170

Chapter 4
Approval and Adoption

Chapter 4
Approval and Adoption
Contents of this Section

4.1 IFR Requirement for Approval and Adoption
4.2 Authority
4.3 Approval and Adoption Procedure
4.4 Adoption Resolution

4.1 IFR Requirement for Approval and Adoption

IFR §201.6(c)(5): *[The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).* 2. *Multi-Jurisdictional Plan Adoption Requirement §201.6(c)(5): For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.*

4.2 Authority

Authority for the preparation of both the original Hazard Mitigation Plan (HMP) and Update is derived from the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988, P.L. 93-288, as amended by the Disaster Mitigation Act of 2000, P.L. 106-390. The Disaster Mitigation Act of 2000 (The Act) requires state and local governments to develop and formally adopt natural Hazard Mitigation Plans by November 2003 in order to be eligible to apply for Federal assistance under the HMGP. The Act was further amended to extend the planning requirement deadline to November 2004.

When the DMA 2000 was signed into law on October 30, 2000, the Robert T. Stafford Disaster Relief and Emergency Assistance Act was amended by adding a new section, 322 – Mitigation Planning. Section 322 places new emphasis on local mitigation planning. It requires local governments to develop and submit mitigation plans as a condition of receiving Hazard Mitigation Grant Program (HMGP) project grants. An Interim Final Rule (IFR) for implementing Section 322 was published in the Federal Register, 44 CFR Parts 201 and 206, on February 26, 2002. The requirements for local plans, or Local Mitigation Plan Criteria, are found in part 201.6.

In addition to the Plan requirement, the Act also requires communities to utilize a specific planning process developed for an all hazards approach to mitigation planning. This four step planning process is crucial to ensure that the effective planning by a community meets all the Plan content criteria required by the Act. The Act requires adoption by the local governing body and specifies

a stringent review process, by which states and FEMA Regional Offices will review, evaluate and approve hazard mitigation plans.

4.3 Approval and Adoption Process

The Appalachian Council of Governments submitted its original hazard mitigation plan to the South Carolina Emergency Management Division (SCEMD) for review in early 2006. After SCEMD and FEMA reviewed and approved the HMP, the County Council from each respective county in the Western Piedmont Regional Emergency Management Task Force formally adopted the Plan.

Section 5 provides details about public presentations for the original Plan and subsequent updates. Throughout the 2017 HMP Update process, the Mitigation Planning Committee and Stakeholders Group had opportunities to provide comments and feedback. On July 1, 2017 the Anderson County Emergency Management Division will submit the initial draft of the Plan Update to SCEMD for review and comment. Pending and addressing SCEMD comments to the document, the HMP will be resubmitted for final consideration and approval by SCEMD and FEMA.

Upon FEMA providing a letter of approvability the Plan will be forwarded to the Anderson County Council & Oconee County Council for adoption. The adoption resolution will be provided as Appendix A & A-1 in the 2017 HMP update. Following adoption, the plan will be resubmitted to FEMA for final approval. The FEMA final approval letter will be included as Appendix D.

4.4 Adoption Resolution

Both Anderson County Council & Oconee County Council adopted an original Hazard Mitigation Plan in 2006. Anderson County & Oconee County formally adopted the subsequent updated version of the HMP in 2012 and we anticipate the formal adoption of the 2017 Update after FEMA interim approval. The 2017 resolutions will be found in Appendix A & A-1.

Chapter 5
Planning Process

Chapter 5
Planning Process
Contents of this Section

5.1 IFR Requirements for the Planning Process
5.2 Federal Mitigation Planning Requirements
5.3 Description of the Planning Process
5.4 How the Public was Involved
5.5 Other Local Planning Mechanisms
5.6 Review and Incorporation of Plans, Studies, Reports and other Information

As part of the 2017 Anderson and Oconee County Natural Hazard Mitigation Plan Update, portions of the original Hazard Mitigation Plan (HMP) were preserved, including some of the terms and language. The core planning team made various decisions about adding and removing information from the original document. In many cases these changes are simply editorial in nature, and are not noted or highlighted specifically as changes. In developing the first-generation Hazard Mitigation Plan, the Appalachian Council of Governments (ACOG) established a Planning Committee to guide the process. During this update, it was decided to establish a core group (the Mitigation Core Team, or HMPC) and a Stakeholders group, as discussed in more detail in the sections below. This updated section periodically refers to the Steering Committee, which was the group developed to monitor, review, and provide comments on the original Plan. The present section, Planning Process, was restructured from that section in the original Plan, and now more accurately meets the requirements of the Interim Final Rule.

As part of the Update, Section 5.2, Federal Mitigation Planning Requirements, has been added to highlight and review some of the other FEMA programs that are related to hazard mitigation planning.

5.1 Interim Final Rule Requirements for the Planning Process

IFR §201.6(c)(1): [The Plan shall document] the Planning process used to develop the Plan, including how it was prepared, who was involved in the process, and how the public was involved.
IFR §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the Planning process shall include:

IFR §201.6(a)(3): Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process … Statewide plans will not be accepted as multi-jurisdictional plans.

(1) An opportunity for the public to comment on the Plan during the drafting stage and prior to Plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the Planning process; and

(3) Review and incorporation, if appropriate, of existing Plans, studies, reports, and technical information.

5.2 Federal Mitigation Planning Requirements:

As mentioned in Section 4.2, the Disaster Mitigation Act of 2000 (The Act) requires State and local governments to develop and formally adopt natural hazard mitigation Plans in order to be eligible to apply for Federal assistance under the HMGP. The Act authorizes up to seven percent of HMGP funds available to a State after a disaster to be used for the development of State, tribal, and local mitigation Plans. In addition to the Disaster Mitigation Act of 2000, further mitigation Planning requirements are set forth in six programs administered by FEMA.

These are described below. Although slightly different, all programs outline the same basic Planning process. Note that during the time this HMP update was conducted, FEMA initiated the HMA program integration, which aligned certain policies and timelines of the various mitigation programs. Five out of the six programs are grant programs available through DHS and FEMA as a part of the Hazard Mitigation Assistance (HMA) Unified Guidance.

These HMA programs present a critical opportunity to reduce the risk to individuals and property from natural hazards while simultaneously reducing the reliance on Federal disaster funds. States, Territories, Indian Tribal governments, and communities are encouraged to take advantage of funding provided by HMA programs in both pre- and post-disaster timeframes.

Together, these programs provide significant opportunities to reduce or eliminate potential losses to State, Tribal, and local assets through hazard mitigation planning and project grant funding. Each HMA program was authorized by separate legislative action, and as such, each program differs slightly in scope and intent.

The guidance applies to the programs of: Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Program (PDM), Flood Mitigation Assistance Program (FMA), Repetitive Flood Claims Program (RFC), and Severe Repetitive Loss Program (SRL). While the statutory origins of the programs differ, all share the common goal of reducing the risk of loss of life and property due to natural hazards. In regards to Anderson County, in general, the local government is a "sub-applicant" that is an eligible entity that submits a sub-application for FEMA assistance to the Applicant. The "Applicant," in this case is the State of South Carolina. If HMA funding is

awarded, the sub-applicant becomes the "sub-grantee" and is responsible for managing the sub-grant and complying with program requirements and other applicable Federal, State, Territorial, Tribal, and local laws and regulations.

By incorporating the five programs together the HMA consolidates the common requirements for all programs and explains the unique elements of the programs in individual sections. The organization improves the clarity and ease of use of the guidance by presenting information common to all programs in general order of the grant life cycle. The HMA Unified Guidance can be found on FEMA's website at http://www.fema.gov/library/viewRecord.do?id=3649.

 Flood Mitigation Assistance Program (FMA). To qualify to receive grant funds to implement projects such as acquisition or elevation of flood-prone homes, local jurisdictions must prepare a mitigation Plan. The Plan must include specific elements and be prepared following the process outlined in the National Flood Insurance Program's (NFIP) Community Rating System.

 Hazard Mitigation Grant Program (HMGP). To qualify for post-disaster mitigation funds, local jurisdictions must have adopted a mitigation Plan that is approved by FEMA.

 Pre-Disaster Mitigation Grant Program (PDM-C). To qualify for pre-disaster mitigation funds, local jurisdictions must adopt a mitigation Plan that is approved by FEMA.

 NFIP Community Rating System (CRS). The CRS offers recognition to communities that exceed minimum requirements of the National Flood Insurance Program. Recognition comes in the form of discounts on flood insurance policies purchased by citizens. The CRS offers credit for mitigation Plans that are prepared according to a multi-step process.

 FEMA/NFIP Severe Repetitive Loss Program (SRL). The SRL program was authorized by the Flood Insurance Reform Act of 2004 to provide funding to reduce or eliminate the long-term risk of flood damage to residential structures under the NFIP which have suffered repetitive losses. SRL properties have at least four NFIP claim payments over $5,000, with at least two of the claims within a 10 year period. SRL properties are also residential structures that have at least two separate claim payments made within a 10 year period with the cumulative amount of the building portion of the claims exceeding the value of the property.

 FEMA/NFIP Repetitive Flood Claim Program (RFC). The SRL program was authorized by the Flood Insurance Reform Act of 2004 to assist States and communities reduce flood damages to properties that have at least one NFIP claim payment. Various hazard mitigation activities are eligible including acquisition, elevation, and dry flood-proofing of residential structures.

5.3 Description of the Planning Process

5.3.1 How the Plan was Prepared and Updated:

The 2006 version of the Counties' Hazard Mitigation Plan was prepared by the Appalachian Council of Governments (ACOG). It was developed in accordance with the provisions of the Disaster Mitigation Act of 2000 (Public Law 106-390), the Pre-Disaster Mitigation Grant Program, 44 Code of Federal Regulations Part 206, and the planning standards adopted by the South Carolina Emergency Management Department. It should also be noted that both the original HMP and the updated HMP were prepared in accordance with the process established in the FEMA 386-series of mitigation planning How-To guides, as well as the requirements of the February 26, 2002 IFR. The process established in the guides comprises several steps, including; Assess Risks, Organize Resources, Develop a Mitigation Plan and Implement the Plan & Monitor Progress.

The 2012 update utilized the 386-series of guides provided the structure for the process that was used to develop and update the Anderson and Oconee County Natural Hazards Mitigation Plan Update. Each section of this updated Plan includes specifics about how the FEMA Interim Final Rule requirements were met, as well as the process that was used to obtain and interpret data, determine and prioritize goals, strategies and actions, and implement and monitor elements of the Plan.

The 2017 Update was prepared by the Anderson and Oconee County Hazard Mitigation Planning Committee in accordance with the provisions of the Disaster Mitigation Act of 2000 (Public Law 106-390), the Pre-Disaster Mitigation Grant Program, 44 Code of Federal Regulations Part 206, and the planning standards adopted by the South Carolina Emergency Management Department. Furthermore, the plan was updated in accordance to the 386-series of guides.

Open Public Process:

From the start of this update, the steering/planning committee developed a strategy that provided ample opportunity for all sectors of the community to become involved in the process or comment on the final product. This process helped ensure that a comprehensive, community approach was taken in Anderson and Oconee Counties during the development of this document. After a draft was completed copies were distributed and it was placed on the website for review and comment. Moreover, copies were distributed to the HMPC and Stakeholders Group for review and comment. Simultaneously, a copy was submitted to the South Carolina Emergency Management Division (SCEMD) for review and comment.
Public meetings were well-publicized through multiple avenues including; the County website and local newspapers. Additionally, a copy of the plan update with remain on Anderson and Oconee's respective websites for public access with point-of-contact information.

Finally, the Plan was discussed at the municipality meetings and leaders in their respective jurisdictions were encouraged to notify colleagues and the public through other outreach initiatives. In all cases, comments were sought, and concerns addressed (see Appendix C/C-1).

Inter-Agency Peer Review

Upon completion of the 2017 HMP draft, it was uploaded to the Anderson County Emergency Management Division Website. An e-mail invitation was sent to neighboring Emergency Managers and local academia for peer review and feedback (Reference Appendix C-1).

Revisions and Updates included in the Development of the 2017 Hazard Mitigation Plan:

As part of the plan update, certain elements of the original plan have been retained, and irrelevant or outdated information has been summarized, removed, or updated. In some cases the updated plan includes cross references to particular information in the original version of the plan. For the current version, the focus has shifted to streamlining the format and ensuring user friendliness in reading the plan. The Mitigation Planning Committee re-evaluated the goals, objectives, strategies, and action items, included in the original plan and updated each to show their status as completed, deleted, deferred or on-going. The current action items and mitigation strategies are consistent with the 2012 Hazard Mitigation Plan, and simple revisions were made as necessary.

Step 1 Organize Resources:

For the 2017 HMP update, the Steering/Planning Committee used a 3-tiered organization to develop its Hazard Mitigation Plan.

- Hazard Mitigation Planning Committee (HMPC, also MPC)
- Stakeholders Group
- Subject Matter Experts

5.3.2 Composition of the Hazard Mitigation Planning Committee:

As part of the Update, County officials from various departments were designated to be part of the HMPC. The Steering Committee helped to guide and up-date the development of the Natural Hazard Mitigation Plan. These committee members were chosen as a result of their expertise in natural hazard preparation and planning within their respective counties and municipalities that fall within their jurisdictions. The Planning Committee was further broken down into sub-groups and planning committees of subject matter experts (SME), including members from the municipalities of the various counties. The HMPC/Steering Committee is comprised of the following members:

Table 5.3.2-1 Hazard Mitigation Planning Committee/Steering Committee:

Director Taylor Jones (thru 12/16) / Director David Baker (began 1/17)	Anderson County Sheriff's Office / Emergency Management Division.
Scott Krein, Deputy Director	Oconee County Emergency Preparedness
James McAdams, Disaster Management Coordinator,	Anderson County Sheriff's Office / Emergency Management Division

5.3.3 Mitigation Core Team Meeting Schedule:

The HMPC was responsible for completing the Plan Update and all of its component sections. The HMPC met several times during the development of the Plan Update. The meetings took place at the Anderson County Department of Emergency Management and Oconee County Department of Emergency Management. See Appendix C & C-1 for all meeting minutes and list of attendees. Table 5.3.2-2 lists all meetings and presentations by the planning/steering committee, stakeholders, and the public concerning the Hazard Mitigation Plan Update in a comprehensive chart.

Table 5.3.2-2 Meetings and Presentations Concerning the Hazard Mitigation Plan Update

Date:	Activity:	Type:
January 25, 2016	Oconee County held an initial meeting for the plan update in Walhalla and the meeting was open to the public. A public notice was run in the *The Journal*, a local newspaper in Oconee county, on January 14th, 2016 to publicize the presentation.	Public
June 23, 2016	Stakeholder's Group Meeting for Anderson and Oconee County. Discussed the planning process for the Natural Hazard Mitigation Plan, requested municipality participation and public input, and defined who was a stakeholder.	Stakeholders
November 11, 2016	Oconee County met with municipal leaders to update the plan brief.	Stakeholders/ Public
December 6, 2016	James McAdams presented an update on the Hazard Mitigation Plan at the Anderson County Local Emergency Planning Committee Meeting.	Stakeholders/ Public
December 8, 2016	A Natural Hazards Mitigation Plan presentation for Anderson and Oconee County was held in Anderson County and was open to the public. A public notice was run in the *Independent Mail* daily newspaper on November 26th, 2016 to publicize the presentation.	Public
May 22, 2017	Stakeholders and subject matter experts from Anderson County, City of Anderson, and Town of Pendleton were invited to the Office of Emergency Management to review, discuss, and update the action items in the Hazard Mitigation Plan.	Stakeholder
May 23, 2017	Stakeholders and subject matter experts from the Towns of Belton, Honea Path, Starr, and Iva were invited to the Office of Emergency Management to review, discuss, and update the action items in the Hazard Mitigation Plan.	Stakeholder
May 24, 2017	Stakeholders and subject matter experts from the Towns of West Pelzer and Williamston were invited to the Office of Emergency Management to review, discuss, and update the action items in the Hazard Mitigation Plan.	Stakeholder
June 1-2, 2017	Stakeholders and subject matter experts from Oconee County Municipalities were invited to the Office of Emergency Management to review, discuss, and update the action items in the Hazard Mitigation Plan.	Stakeholder/ Public
January 16, 2018	Present Hazard Mitigation Plan during Anderson County Council, Public Safety Committee meeting, in open public forum.	Stakeholder/Public

January 16, 2018	Present Hazard Mitigation Plan to Anderson County Council in open public forum.	Public

5.3.4 Composition of the Stakeholders Group:

Early in the update process, the Anderson and Oconee County HMPC determined that a group of individuals and organizations with an interest in the Anderson and Oconee Counties Natural Hazards Mitigation Plan Update and Project Scoping should be identified. There was a similar group involved in the development of the original document as well. The (HMP update) Stakeholders Group was provided regular updates on the planning process, and reviewed the Plan at key points in its development. The composition of the Stakeholder group was determined by the Anderson and Oconee County HMPC at the first meeting, and is provided in Table 5.3.4-1 below.

Table 5.3.4-1 Hazard Mitigation Plan Stakeholders Group:

Sheriff John Skipper (thru 12/16) / Sheriff Chad McBride (Began 1/17)	Anderson County Sheriff's Office
Director Taylor Jones (thru 12/16) / Director David Baker (Began 1/17)	Anderson County Sheriff's Office / Emergency Management Division.
Scott Krein, Deputy Director	Oconee County Emergency Preparedness
Linda McConnell, City Manager	City of Anderson
Alvin Sims, Town Manager	Town of Belton
Beverly Crawford, Town Clerk/Treasurer	Town of Honea Path
Timothy Taylor, Town Clerk/Treasurer	Town of Iva
Mayor Steve McGregor	Town of Pelzer
Mayor Frank Cranshaw	Town of Pendleton
Mayor Ed Sokol	Town of Starr
Paula Payton, Town Clerk	Town of West Pelzer
Michelle Starnes, Town Clerk/Treasurer	Town of Williamston
Mayor Diane Head	Town of Salem
Mayor Daniel Alexander	City of Seneca
Nancy Goehle, Administrator	City of Walhalla
Jackie Kelley, Town Clerk/Treasurer	Town of West Union
Chris Carter, Administrator	City of Westminster

As drafts of the Updated Plan were prepared, the Anderson and Oconee County (HMPC) used email and website to distribute them to Stakeholders, and requested that they provide comments. The Stakeholders were requested to provide feedback through email, telephone or contact POC, James McAdams or a member of the (HMPC). In addition, drafts were e-mailed to neighboring counties for their review and feedback.

County, city, and town participation must be defined in order to create a standard for participation in the Natural Hazard Mitigation Plan. This criteria was established so that county and municipal representative's participation was sufficient to add to and comment on the plan.

In order for counties and municipalities to approve the plan and be an official participant of this planning process, they must satisfy one of the following considerations:

• The county EMD Director shall be a member of the Natural Hazard Plan Steering Committee and provide input and comments on the plan and the planning process.

• The mayor, administrator, or manager shall attend a county or public meeting concerning the Natural Hazard Mitigation Plan and provide input or comments.

• The mayor, administrator, or manager shall appoint a city or town employee to attend a county or public meeting concerning the Natural Hazard Mitigation Plan and provide input or comments.

• A HMPC member shall personally discuss and receive on input or comments on the Natural Hazard Mitigation Plan with a mayor, administrator, manager, or appointed municipal representative.

• A mayor, administrator, or manager, shall send input or comments.

Municipalities were contacted through emails and phone calls explaining the purpose of the Natural Hazards Mitigation Plan and what was covered at the meetings. Officials were informed through these emails and phone calls that the Anderson and Oconee County HMPC needed their input and comments for the plan. Each municipality satisfied as least one of the above criteria as they did in the previous plan to be considered an official participant.

Table 5.3.2-3 Participating and Non-Participating Jurisdictions

Participating	
Counties:	
	Anderson County
	Oconee County
Municipalities:	
	City of Anderson
	City of Belton
	Town of Honea Path
	Town of Iva
	Town of Starr
	Town of Pendleton
	Town of Pelzer
	Town of West Pelzer
	Town of Williamston
	Town of Salem
	Town of Seneca
	City of Walhalla
	Town of West Union
	City of Westminster
Non-Participating:	
	N/A
Total Participating:	
Counties:	2
Municipalities:	14
Total Non-Participating:	0

Step 2 Identify Hazards and Assess Risks:

In accordance with general mitigation planning practice, as well as the process FEMA established in its Planning How-To series of guides, the risk assessment formed the basis of the original hazard mitigation plan by identifying and characterizing vulnerabilities across Anderson & Oconee County. As noted earlier, this part of the original document met FEMA requirements, with the result that the plan was approved by SCEMD and FEMA Region IV. However, we recognized that there were several opportunities for improvement in the next-generation document. As described in Chapter 6 of the updated HMP, the document now includes more detailed risk calculations, which support Anderson and Oconee's process for identifying and prioritizing mitigation actions and strategies.

As required by FEMA rules and guidance, Chapter 6 of this plan:

 Identifies the natural hazards that are most likely to affect Anderson & Oconee Counties
 Describes how often hazards are expected to impact Anderson & Oconee Counties
 Explains the expected severity and extent of the impacts.
 Describes what areas of the County are likely to be affected.
 Calculates expected future losses if the risk is not mitigated.

Identifying Hazards:

Early in the update process, hazards from the 2012 Hazard Mitigation Plan were re-evaluated and deemed all appropriate to carry forward into the 2012 update. Hazards were profiled, reducing the emphasis on low probability disasters and focusing on the most probable natural hazard events.

The updated list of hazards includes:

- Winter Storms
- Hail Storms / Thunderstorms
- Lightning Sever Storms / Thunderstorms
- Tornadoes / High Winds
- Drought / Heat Wave
- Floods
- Wildfires
- Hurricanes
- Earthquakes

Each of these hazards is addressed in detail in Section 6, which includes discussions of hazard history and occurrences, severity and extent, and expected probabilities. The subsections are structured to closely parallel FEMA requirements from the Interim Final Rule and subsequent guidance and regulations.

Risk Assessment:

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural or man-made hazards The first step in the risk assessment process was to identify each of the hazards that can occur within each County and its incorporated municipalities. This information is included in the risk assessment section of this document. Information concerning hazards was obtained from the University of South Carolina Hazards & Vulnerability Research Institute - SHELDUS™ | Spatial Hazard Events and Losses Database for the United States; University of South Carolina Hazards Lab; National Oceanic and Atmospheric Administration; local information from residents and from county and municipal employees and representatives. The hazard maps used in this plan were provided by the University

of South Carolina Hazards and Vulnerability Research Institute. The findings from these steps were utilized to determine the priority hazards for each County and its municipalities, which will become the focus of the mitigation strategies developed in the remainder of this plan. This section includes a description, location, extent, probability, and vulnerability analysis of each hazard.

The risk assessment section (also known as vulnerability and loss estimation) was modified significantly from the 2006 and 2012 version of the HMP. For the most recent update, the HMPC streamlined how hazard information was presented. This update also presented loss estimates for six of the most significant natural hazards in the counties, based on their level of probability; Winter Storms, Hail Storms / Thunderstorms, Lightning Severe Storms / Thunderstorms, Tornadoes / High Winds, Drought / Heat Wave and Floods.

Step 3 Develop Mitigation Strategies:
The Mitigation Strategies process in the 2017 HMP update process included several phases:

1. HMPC reviewed goals, objectives, strategies and actions from the original HMP.
2. HMPC determined the status of each strategy and action from the original plan.
3. Subject matter experts and county officials met to identify and develop technical information for additional hazard mitigation actions and strategies.
4. Subject matter experts made a general assessment of the cost effectiveness of actions.
5. The HMPC completed a STAPLEE evaluation of all strategies and actions in the HMP, including those that were part of the original document and were retained.
6. The HMP was modified to include tables with all strategies and actions, with related information about cost effectiveness and prioritization (Chapter 7).

Develop Mitigation Strategies:

Mitigation goals and objectives were formulated with the intent to reduce or eliminate the long-term risk to human life and property from each hazard. An action plan was developed that identifies future mitigation actions, estimates costs, defines benefits, identifies the responsible organization(s), provides an implementation schedule, relates to the mitigation objectives, establishes priorities, and identifies potential funding sources for each action.

Municipality meetings were held with officials representing various County and municipality offices and departments to solicit input in developing mitigation goals, objectives, actions, and implementation plans. In addition, discussions will be held with the appropriate County office and department representatives to ensure that this Hazard Mitigation Action Plan is built upon, and integrated into, the County and municipality's Comprehensive Planning processes.

Step 4 Develop the Mitigation Plan:

The process employed to develop this plan was based entirely on the FEMA 386-series of guides describing hazard mitigation planning procedures. Throughout the document there are cross references to Interim Final Rule and FEMA crosswalk criteria. The Interim Final Rule addresses State mitigation planning, identifies new local mitigation planning requirements, authorizes Hazard Mitigation Grant Program (HMGP) funds for planning activities, and increases the amount of HMGP funds available to States that develop a comprehensive, enhanced mitigation plan. This rule also requires that repairs or construction funded by a disaster loan or grant must be carried out in accordance with applicable standards and says that FEMA may require safe land use and construction practices as a condition of grantees receiving disaster assistance under the Stafford Act. The FEMA Plan Review Crosswalk is based on the Multi-Hazard Mitigation Planning Guidance under the Disaster Mitigation Act of 2000, published by FEMA, dated March 2004. This Plan Review Crosswalk is consistent with the Disaster Mitigation Act of 2000 (P.L. 106-390), enacted October 30, 2000 and 44 CFR Part 201 – Mitigation Planning, Interim Final Rule (the Rule), published February 26, 2002. The plan cannot be approved if the plan has not been formally adopted. Each requirement includes separate elements. All elements of the requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a score of "Satisfactory."

Step 5 Implement the Plan and Monitor Progress:

As with the original plan document, this version must be updated every five years in order for each county and municipality to maintain its eligibility for various FEMA grant programs and funds. During this five year period, the plan will be reviewed periodically to ensure compliance with FEMA and State requirements for plan maintenance (See Chapter 8 – Plan Monitoring and Maintenance for more details). After the Update is approved, each county and municipality will implement specific actions to achieve the goals and objectives described in the Mitigation Strategies section.

Each county/ municipal council governs their individual county or municipality and has the final decision on what projects are implemented, and how they will be funded. The council will coordinate with the Office of Emergency Management and Lead Manager of each mitigation item to accomplish the goals and action items. The Lead Manager will follow any current County or municipal procedures in completing the Action Items. Any progress reports and status reports (meeting minutes) will be submitted to the county or municipal council. The OEM will be responsible for overall Plan monitoring and maintenance. This Office will review the Plan annually to consider changes in land development, population growth, or recent programs and activities that may affect mitigation initiatives. See Chapter 8.3 for the complete method and schedule for updating the plan.

5.4 How the Public was Involved:

The Planning Committee met numerous times during development of the original version of the HMP. Two outreach opportunities were open to the public. Public notices were distributed and posted through newspapers, press announcements, and on the County websites, informing the public about the Hazard Mitigation Planning process and urged the public to be involved. All the meetings were open discussions, where each person attending, whether a Steering Committee member or not, had the opportunity to volunteer information about the community and present ideas. Data was also collected from the respective jurisdiction representatives and used to assist with the Plan development. During the Plan Update, the public was involved by requesting their attendance, participation, comments, and feedback. Drafts of the Plan were available for public review, and the public was invited to provide input on the document. Each County published public notices about the presentations. The ads explained the purpose of the meeting, and provided the date, time, and location of the meeting place. The meeting minutes and attendee list for the public meeting are included in Appendix B/B-1 of the Plan Update. See table 5.3.2-2 for complete list of public presentations.

5.5 Other Local Planning Mechanisms:

As required by FEMA Interim Final Rule that governs mitigation planning, the project requirements from the Hazard Mitigation Plan will be incorporated into other planning mechanisms, as applicable, during the routine re-evaluation and update of each County Plans.
Anderson County and Oconee County are members of the NFIP and have a Floodplain Management Ordinance. The Anderson County Floodplain Ordinance was last updated in 2007. When the County updates its Floodplain Ordinances, the requirements from this HMP will be included in the newly revised document(s). This Plan Update will be made available to each committee leader involved with revising the Floodplain Ordinance. The Counties follow the International Building Code guidelines, and maintain a General Development Plan, a Capital Improvement Plan, and Site Development Regulations. Like most jurisdictions, Anderson and Oconee Counties periodically review and update their standards and guidelines. As part of these future reviews and updates, the Counties will seek opportunities to integrate hazard mitigation into regulations and guidelines. The Ordinances that are integrated into hazard mitigation regulations and guidelines are list in Table 5.3.2-4.

Additionally, the Hazard Mitigation Plan was consulted during the writing process of the Anderson County and Oconee County Comprehensive Plan, which includes past and future land use, transportation, and priority investment planning for each county and their respective municipalities.

Table 5.3.2-4 Jurisdictional Ordinances

Ordinance Number:	Brief Description:	Type:
Sec. 38-426 Sec. 38-430	"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 article prevents or regulates the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands." "A development permit shall be required in conformance with the provisions of this article prior to the commencement of any development activities." Source: Anderson County SC, Code of Ordinances, enacted 2014	County of Anderson
Sec. 50-3 Sec. 50-5	"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 article prevents or regulates the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands." "A development permit shall be required in conformance with the provisions of this article prior to the commencement of any development activities." Source: City of Anderson SC, Code of Ordinances, enacted 2014	City of Anderson
Sec. 42-3 Sec. 45-5	"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 flood waters or which may increase flood hazards to other lands." "A development permit shall be required in conformance with the provisions of this chapter prior to the commencement of any development activities." Source: City of Williamston SC, Code of Ordinances, adopted 2016	City of Williamston

Sec. 901-5	"Any zoning applications affecting property subject to the National Flood Insurance Program must comply with guidelines established by the Department of Housing and Urban Development." Source: http://townofpendleton.org/wp-content/uploads/2015/06/Town-of-Pendleton-Zoning-Ordinance-January-2014.pdf	Town of Pendleton
Sec. 10-81	"Anderson County hereby incorporates herein, by reference thereto and made a part hereof, as fully as if set forth verbatim herein, only the latest edition, amendments, and appendices, save and except such portions as may be hereinafter amended, of the following nationally recognized *building codes* and the standards referenced in those *codes* as the official *building codes* of the county: CABO One- and Two-family Dwelling *Code* *International Building Code*, and appendices A—J *International* Energy Conservation *Code* *International* Existing *Building Code* *International* Fire *Code*, and appendices A—J *International* Fuel Gas *Code*, and appendices A—D *International* Mechanical *Code*, and appendices A—B *International* Plumbing *Code*, and appendices B—G *International* Property Maintenance *Code*, and all appendices *International* Residential *Code*, and appendices A—K National Electric *Code* Standard *Building* Abatement *Code* Standard Swimming Pool *Code* Source: Anderson County SC, Code of Ordinances, enacted 2014	Anderson County
Sec. 16-82	Development permits shall be required for all development, including the placement of manufactured homes, so that the county may determine whether or not such construction or other development is proposed in the special flood hazard area. Source: Oconee County SC, Code of Ordinances, enacted 2006	Oconee County
Sec. 16-84	The National Flood Insurance Program requires flood data to be reviewed and approved by DHS-FEMA. This ensures that flood maps, studies and other data identified in section 16-32 accurately represent flooding conditions so appropriate special flood hazard area management criteria are based on current data, the following map maintenance activities are identified: (1)Requirement to submit new technical data. a.For all development proposals that impact floodway delineations or BFEs, the floodplains manager shall ensure that technical data reflecting such changes is submitted to DHS-FEMA within six months of the date such information becomes available. These development proposals include: 1.Floodway encroachments that increase or decrease BFEs or alter floodway boundaries; 2.Fill sites to be used for the placement of proposed structures where the applicant desires to remove the site from the special flood hazard area;	Oconee County

	3. Alteration of watercourses that result in a relocation or elimination of the special flood hazard area, including the placement of culverts; and 4.Subdivision or large scale development proposals requiring the establishment of base flood elevations in accordance with section 16-124 b.It is the responsibility of the applicant to have technical data, required in accordance with section 16-84, prepared in a format required for a CLOMR or LOMR, and submitted to DHS-FEMA. Submittal and processing fees for these map revisions shall also be the responsibility of the applicant. c. The floodplains manager shall require a CLOMR prior to the issuance of a floodplain development permit for: 1. Proposed floodway encroachments that increase the base flood elevation; and 2. Proposed development which increases the base flood elevation by more than one foot in areas where DHS-FEMA has provided base flood elevations but no floodway. D .Development permits issued by the floodplains manager shall be conditioned upon the applicant obtaining a LOMR from DHS-FEMA for any development proposal subject to section 16-84. e. CLOMRs and/or LOMRs must go through the variance process outlined in this article. Source: Oconee County SC, Code of Ordinance, enacted 2006	
Sec. 16-122 (3)	Existing critical facilities in the special flood hazard area that are substantially damaged or substantially improved as well as new and substantially improved critical facility structures shall be elevated or floodproofed in accordance with this article. New critical facilities shall not be permitted in the special flood hazard area. Source: Oconee County SC, Code of Ordinance, enacted 206	Oconee County

The County will use this mitigation plan – in particular the actions and projects described in Chapter 8 – as part of its process to identify and prioritize capital improvement projects related to risk reduction. Anderson County, as well as Oconee County, also incorporate information and data in the Hazard Mitigation Plan into their respective County Comprehensive Development Plans (See appendix D & D-1). Each municipality is invited to participate in the County Comprehensive Plan as stakeholders to guide the future development and growth throughout the County and municipalities. Stakeholders have the ability to describe their communities' process to integrate data, analysis, and mitigation goals and actions into the planning process.

Oconee County, in compliance with FEMA Interim Final Rule that governs mitigation planning, project requirements from the Hazard Mitigation Plan will be incorporated into other planning

mechanisms, as applicable, during the routine re-evaluation and update of county Plans. Oconee County is a member of the NFIP and has a Floodplain Management Ordinance. The County Floodplain Ordinance was last updated in 2008. When the County updates its Floodplain Ordinances, the requirements from this HMP will be included in the newly revised document(s). This Plan Update will be made available to each committee leader involved with revising the Floodplain Ordinance. The County follows the International Building Code guidelines, and maintains a General Development Plan, a Capital Improvement Plan, and Site Development Regulations. Like most jurisdictions, Oconee County periodically reviews and updates its standards and guidelines. As part of these future reviews and updates, the County will seek opportunities to integrate hazard mitigation into regulations and guidelines. The Ordinances that are integrated into hazard mitigation regulations and guidelines are list in Table 5.3.2-4.

5.6 Review and Incorporation of Plans, Studies, Reports and other Information:

The capability assessment examined existing documents and plans carried out by the participating counties and municipalities. Existing, recently approved hazard mitigation plans from the State and other Counties were reviewed for their format and content by Anderson and Oconee Counties' HMPC for the 2017 Natural Hazard Mitigation Plan. County plans that were reviewed include the Greenville County HMP, the Berkeley County HMP, & the Dillon County HMP.

Other planning documents can be used as a valuable resource for integrating information related to hazard mitigation into the HMP. The 2006 version of the HMP included the review and incorporation of other Plans, studies, and reports that are applicable to the hazards discussed in the Plan. These documents were reviewed again as part of the Plan Update and any new information or changes incorporated into the HMP. A search was also conducted to identify additional Plans or studies that may have been completed since the release of the original Plan. This HMP has been made available to each committee leader responsible for updating these other Plans.

When updating the Natural Hazard statistical information in Chapter 6, the Spatial Hazard Events and Losses Database, through the University of South Carolina, was referenced. This report provided the date of every natural hazard event that occurred in Oconee & Anderson County from 1/1/1960-1/1/2016. Additionally, this report provided the number of injuries and deaths from each event, and the amount of property and crop damage. Although many natural hazard events have occurred in each respective County, the HMPC chose only to include notable events. A notable event was defined as an event that caused greater than $50,000 in combined property and crop damage.

Chapter 6

Hazard Identification, Profiling, Ranking, Vulnerability, and Risk Assessment

Chapter Six
Hazard Identification, Profiling, Ranking, and Vulnerability
Contents of this Chapter

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6.4 Methodology for Identifying Natural Hazards for Additional Analysis
6.5 Future Development Trends
6.6 Summary of Risk Assessment
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6.8 Social Vulnerability

As mentioned elsewhere, during the 2017 Plan Update some parts of the original Plan were preserved. Where applicable, portions of the historical hazard data have been retained. As part of the update process, the HMPC reviewed the hazards section of the previous plans, and incorporated changes related to recent hazard events that have affected the Counties.

The HMPC continues to focus only on natural hazards and therefore any man-made hazards are not included in the Update. Note that eliminating man-made hazards does not suggest that those type hazards are not of concern to the Counties, only that they are not natural hazards, and therefore the HMPC determined that they would not be included in the Plan update.

6.1 IFR Requirement for Hazard Identification and Profiling

Profiling Hazards

Requirement §201.6(c)(2)(i): *[The risk assessment **shall** include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The plan **shall** include information on previous occurrences of hazard events and on the probability of future hazard events.*

6.2 Hazard Identification

In accordance with IFR requirements and as part of its efforts to support and encourage hazard mitigation initiatives Anderson and Oconee County Natural Hazards Mitigation Planning Committee (HMPC) prepared this general assessment of the hazards that have potential to impact each County. The following subsections provide detailed information about past and potential losses (risk) for a subset of hazards with the most potential to affect Anderson and Oconee Counties. The term "planning area" is used frequently in this section. This term refers to the geographic limits of Anderson and Oconee counties. Much of the open-source information about natural hazards is compiled on the County level, so this section includes numerous references to the impacts of hazards on each County.

> ***IFR §201.6(c)(2):*** *The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*
>
> ***IFR §201.6(c)(2)(ii):*** *[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.*

6.3 Overview of type and location of all natural hazards that can affect the counties:

6.3.1 Winter Storms
6.3.2 Hail Storms / Thunderstorms
6.3.3 Lightning Severe Storms / Thunderstorms
6.3.4 Tornadoes / High Winds
6.3.5 Drought / Heat Wave
6.3.6 Floods
6.3.7 Wildfires
6.3.8 Hurricanes
6.3.9 Earthquakes

The DMA 2000 legislation and related FEMA planning guidance require mitigation plans to include discussion of community vulnerability to natural hazards. Vulnerability is generally defined as the damage (including direct damages and loss of function) that would occur when various levels of hazards impact a structure, operation or population. For example, vulnerability can be expressed as the percent damage to a building when it is flooded, or the number of days that a government office will be shut down after a wind storm, etc., assuming there is sufficient detailed data available to support the calculations. Because this Plan update is at the scale of multiple entire Counties, it is not practical to complete vulnerability assessments on the many individual assets, operations and populations in the planning area. It is possible, however, to make some general observations based on the hazard identifications and risk assessments that are the subjects of Section 6 of this Plan update. Therefore, the following terms are used to describe levels of vulnerability.

- High – 66%-100% percent damage to a building when it is flooded, or the number of days that a government office will be shut down.
- Moderate – 34%-65% percent damage to a building when it is flooded, or the number of days that a government office will be shut down.
- Low – 0%-33% percent damage to a building when it is flooded, or the number of days that a government office will be shut down.

As illustrated in Section 6 (Hazard Identification), each County is subject to numerous natural hazards, although in some cases the hazards have rarely impacted the area, or their effects have been relatively minor. It is important to recognize that several other hazards present significant risks (i.e. potential for future losses) to the County, even though they have occurred infrequently in the past, or have not caused much damage.

The impact/extent of damage is derived primarily from utilizing calculations from the University of South Carolina Hazards & Vulnerability Research Institute Department of Geography Spatial Hazard Event Loss Dataset for the US (SHELDUS) information which originally contained only those events that generated greater than $50,000 in combined crop and property damage. This damage assessment is countywide regardless of municipal boundaries. Damage in less severe degrees may have occurred throughout the county and its municipalities affecting each municipality in varying degrees depending on severity of the hazard and time of year. The full list of events, regardless of dollar amount, can be found through the University of South Carolina Hazards & Vulnerability Research Institute's SHELDUS website.

Section 6.3.1 - Winter Storms

Winter storms (consisting of snow, ice, and cold temperatures) can cause major problems in regions that are not prepared for them. These types of storms can damage property, create safety risks, destroy crops and valuable timber, damage infrastructure components such as power lines, and have enormous economic impacts (SCEMD). There were major Southeastern snow storms in 1899, 1914, 1973, 2000, and 2002. Additionally, there have been many more localized winter storms. In January 1968 and February 1979 large ice storms paralyzed the County for several days. More recently in 2002, 2004, 2005, and 2014 ice and snow storms covered the Region resulting in power outages and hazardous driving conditions. Each County suffers an average of one to two winter storms each year.

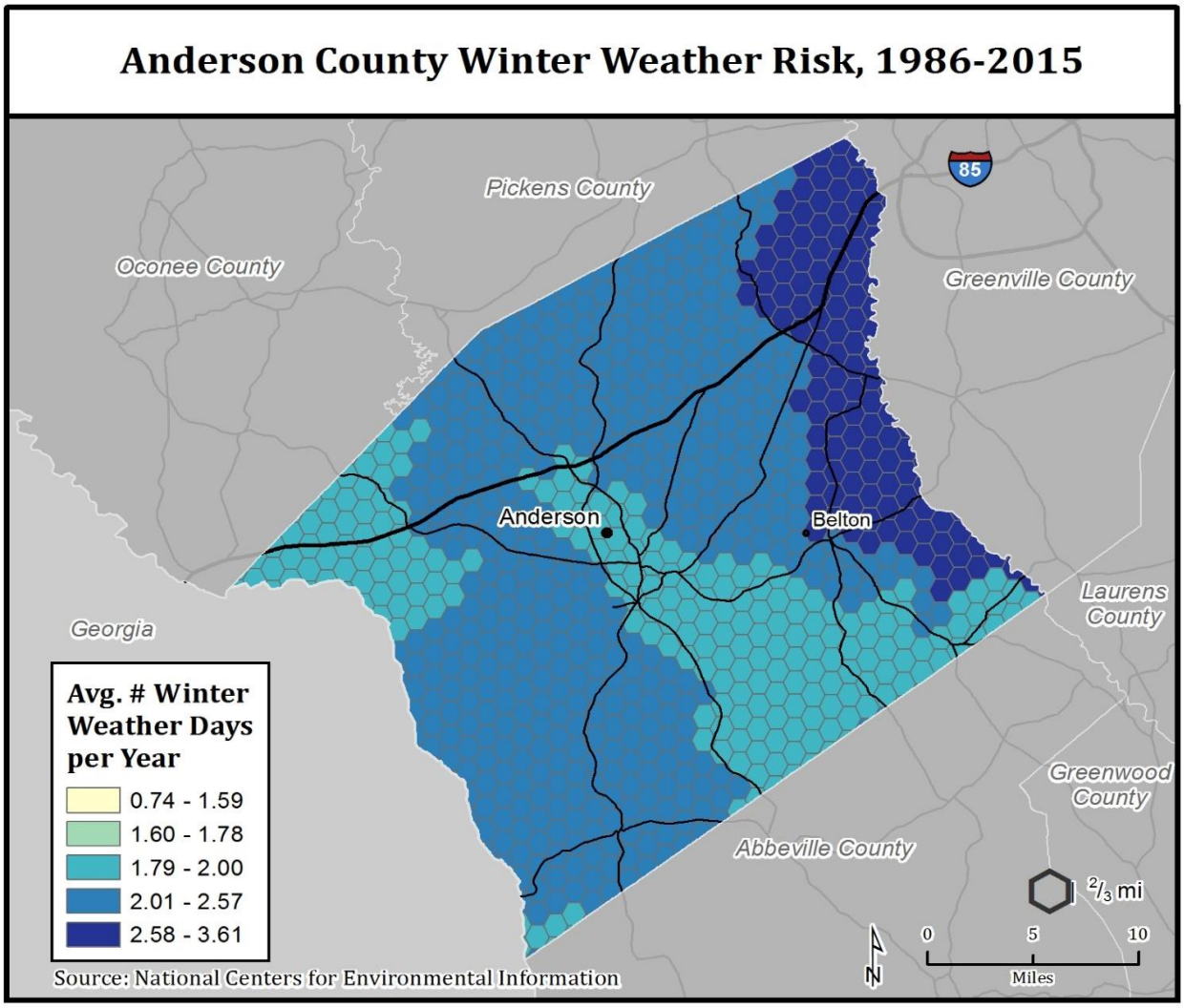
There have been several significant winter storm events within South Carolina designated as "Major Disaster Declaration."

Table 6.3.1-1: Major Disaster Declarations

Severe Weather Storm	Incident Start Date:	Incident End Date:	Declared as Major Disaster:
Winter Storm: DR-4166	2/10/2014	2/15/2014	3/12/2014
Winter Storm: EM-3369	2/10/2014	2/12/2014	2/12/2014
Ice Storm: DR-1625	12/15/2005	12/16/2005	1/20/2006
Ice Storm: DR-1509	1/26/2004	1/30/2004	2/13/2004
Ice Storm: DR-1451	12/4/2002	12/6/2002	1/8/2003
Winter Storm: DR-1313	1/22/2000	2/1/2000	1/31/2000

Official website of the Department of Homeland Security (https://www.fema.gov/disasters)

Winter Storms: Anderson County



Anderson County
Extent

Anderson County has experienced 27 notable winter weather events from the time frame of 01/01/1960 thru 01/01/2016. A winter weather event is considered notable when it causes at or above $50,000 in combined property and crop damages. These winter weather events have caused 1.31 injuries to county residents and 0.90 fatalities. These notable winter weather events have caused a collective $16,262,789.60 in property damage and $17,144,152.30 in crop damage, adjusted for 2015 inflation.

Anderson County's 24-hour snowfall record is 12.0 inches and occurred on December 17, 1930. The lowest temperature in Anderson County was -6 degrees and occurred on January 21, 1985 (National Climatic Data Center, 2017).

Table 6.3.1-2 – Winter Weather Data Summary (Anderson County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Winter Weather	49%	1.31	0.90	16,262,789.6	$17,144,152.30

Table 6.3.1-3: Anderson County Notable Winter Weather Events from 1/1/1960-1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1/2/1999	Winter Weather	Anderson	0.00	0.00	2,845,342.15	0.00
2004	Winter Weather	Anderson	0.00	0.00	297,996.15	0.00
2005	Winter Weather	Anderson	0.00	0.00	121,360.47	0.00
1/1/1964	Winter Weather	Anderson	0.57	0.00	8,419.22	84,191.92
1966	Winter Weather	Anderson	0.00	0.03	104,504.82	0.00
1966	Winter Weather	Anderson	0.00	0.15	0.00	79,514.6
1968	Winter Weather	Anderson	0.00	0.00	106,419.27	10.62
1969	Winter Weather	Anderson	0.00	0.00	68,704.58	6,870,456.31
1971	Winter Weather	Anderson	0.67	0.39	162,563.11	162.58
1971	Winter Weather	Anderson	0.00	0.00	63,611.68	63,611.68
1/7/1973	Winter Weather	Anderson	0.00	0.00	58,024.16	580,241.37
2/9/1973	Winter Weather	Anderson	0.00	0.2	580,241.37	580.26
1973	Winter Weather	Anderson	0.00	0.00	0.00	148,283.92

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1985	Winter Weather	Anderson	0.00	0.00	0.00	183,563.34
2/6/1979	Winter Weather	Anderson	0.00	0.00	544,116.17	544.13
1982	Winter Weather	Anderson	0.00	0.00	0.00	266.972.02
4/7/1982	Winter Weather	Anderson	0.00	0.00	0.00	3,070,168.4
1983	Winter Weather	Anderson	0.00	0.00	0.00	2,586,618.22
1983	Winter Weather	Anderson	0.00	0.00	25,866.19	25,866.19
1989	Winter Weather	Anderson	0.07	0.13	207,763.85	0.00
2007	Winter Weather	Anderson	0.00	0.00	0.00	95,260.08
1967	Winter Weather	Anderson	0.00	0.00	0.00	1,971,199.29
1964	Winter Weather	Anderson	0.00	0.00	0.00	831,055.39
1993	Winter Weather	Anderson	0.00	0.00	58,580.58	58580.58
1992	Winter Weather	Anderson	0.00	0.00	30,167.11	30,167.11
1990	Winter Weather	Anderson	0.00	0.00	0.00	197,113.37
2002	Winter Weather	Anderson	0.00	0.00	10,979,108.78	0.00
Total			1.31	0.90	16,262,789.6	17,144,152.3

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Winter Storm Probability and Vulnerability

Anderson County:

Table 6.3.1-4: Anderson County Winter Weather Probability

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Anderson	**27**	**55**	**2.04**	**49%**

Vulnerability

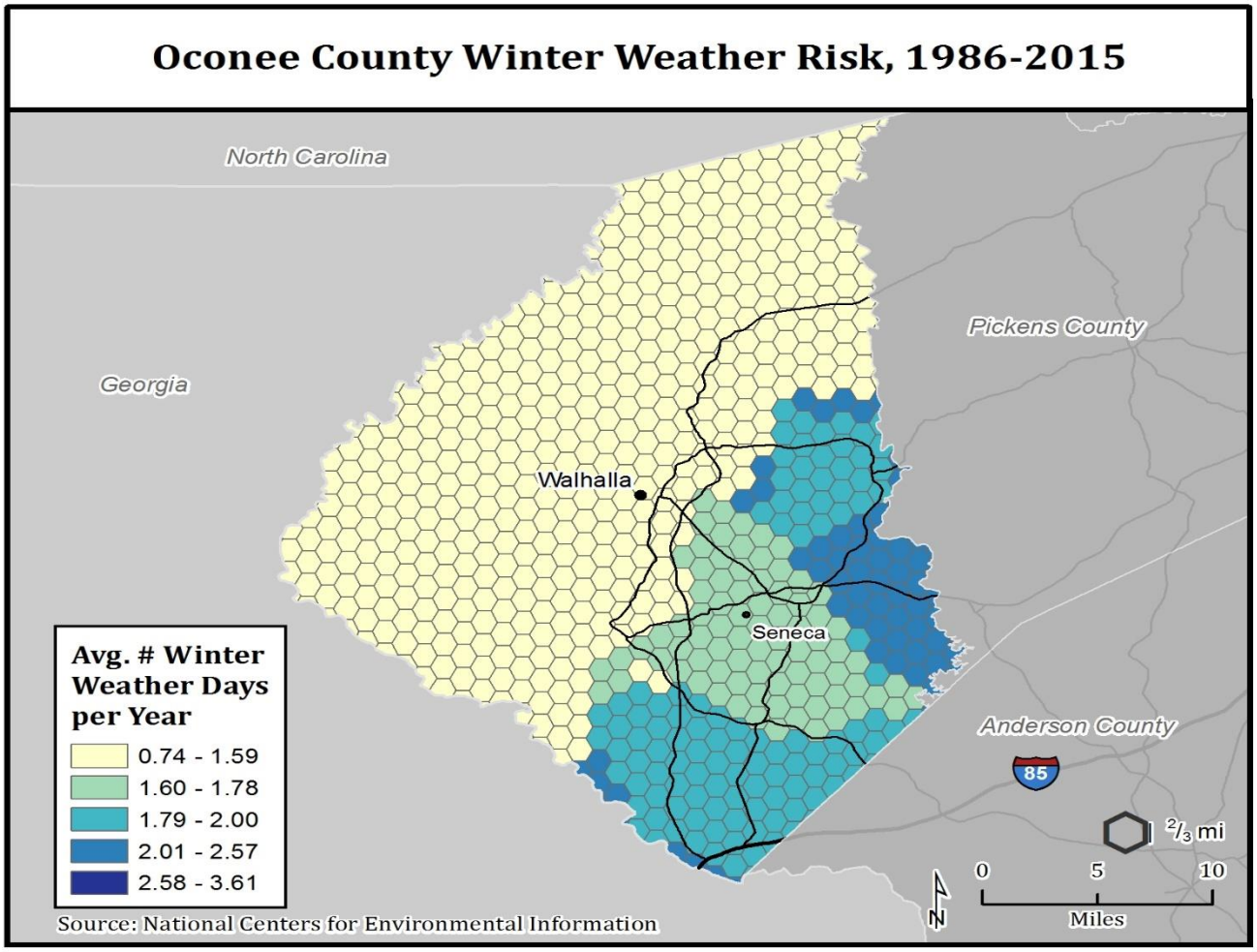
Anderson County

Overall, Anderson County has a moderate level vulnerability to winter storms. The probability of one or more winter weather events in Anderson County is 49%. Examining past events, it is evident that winter storms can significantly disrupt normal operations within a community. In addition, some ice storms associated with winter storms have caused significant property damage and disruption of the electric utilities. Overall, when taking into consideration the moderate level vulnerability of winter storms in the county, and the past history of the event, the municipalities have a moderate level vulnerability to winter storms.

Recommendation:

Early warnings are possibly the best hope for residents when a winter storm strikes. Citizens must immediately be aware when a community will be facing a winter storms incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of winter storm events. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Winter Weather: Oconee County



Oconee County
Extent

Oconee County has experienced 28 notable winter weather events from the time frame of 01/01/1960 thru 01/01/2016. A winter weather event is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These winter weather events have caused 1.03 injuries to county residents and 1.77 fatalities. These notable winter weather events have caused a collective $12,747,423.5 in property damage and $19,724,707 in crop damage, adjusted for 2015 inflation.

Oconee's County record 24-hour snowfall is 15.0 inches, and occurred on January 7, 1988. The lowest recorded temperature is -8 and occurred on January 21, 1985 (National Climatic Data Center, 2017).

Table 6.3.1-5 – Winter Weather Data Summary (Oconee County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Winter Weather	50%	1.03	1.77	$12,747,423.5	$19,724,707

Table 6.3.1-6: Oconee County Notable Winter Weather Events from 1/1/1960-1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1/9/1997	Winter Weather	Oconee	0.00	0.00	59,069.66	0.00
2005	Winter Weather	Oconee	0.00	0.00	101,133.72	0.00
1963	Winter Weather	Oconee	0.57	0.00	84,191.92	8,419.22
1966	Winter Weather	Oconee	0.00	0.03	104,504.82	0.00
1966	Winter Weather	Oconee	0.00	0.15	0.00	79,514.6
1968	Winter Weather	Oconee	0.00	0.00	106,419.27	10.62
1969	Winter Weather	Oconee	0.00	0.00	68,704.58	6,870,456.31
1971	Winter Weather	Oconee	0.00	0.00	63,611.68	63,611.68
1971	Winter Weather	Oconee	0.39	0.67	162,563.11	162.58
1972	Winter Weather	Oconee	0.00	0.00	0.00	322,174.03
1973	Winter Weather	Oconee	0.00	0.00	58,024.16	580, 241.37
1973	Winter Weather	Oconee	0.00	0.2	580,241.37	580.26
1973	Winter Weather	Oconee	0.00	0.00	0.00	148,283.92
1979	Winter Weather	Oconee	0.00	0.00	544,116.17	544.13

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage	Crop Damage
1982	Winter Weather	Oconee	0.00	0.00	0.00	266,972.02
4/7/1982	Winter Weather	Oconee	0.00	0.00	0.00	3,070,168.4
1983	Winter Weather	Oconee	0.00	0.00	0.00	2,586,618.22
1983	Winter Weather	Oconee	0.00	0.59	0.00	25,866.19
1989	Winter Weather	Oconee	0.07	0.13	207,763.85	0.00
2007	Winter Weather	Oconee	0.00	0.00	0.00	95,260.08
1967	Winter Weather	Oconee	0.00	0.00	0.00	1,971,199.29
1964	Winter Weather	Oconee	0.00	0.00	0.00	831,055.39
1993	Winter Weather	Oconee	0.00	0.00	58,580.58	58,580.58
3/8/1996	Winter Weather	Oconee	0.00	0.00	0.00	2,517,707.68
1992	Winter Weather	Oconee	0.00	0.00	30,167.11	30,167.11
1990	Winter Weather	Oconee	0.00	0.00	0.00	197,113.37
1989	Winter Weather	Oconee	0.00	0.00	119,464.21	0.00
2002	Winter Weather	Oconee	0.00	0.00	10,979,108.78	0.00
Total			1.03	1.77	12,747,423.5	19,724,707

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Oconee County:

Table 6.3.1-7: Oconee County Winter Weather Probability

County	Number of Events	Number of Years	Recurrence Interval (years)	Hazard Frequency (% chance/year)
Oconee	**28**	**55**	**1.96**	**50%**

Vulnerability

Oconee County

Overall, Oconee County has a moderate level of vulnerability to winter storms. The probability of one or more winter weather events in Oconee County is 50%. Examining past events, it is evident that winter storms can significantly disrupt normal operations within a community. In addition, some ice storms associated with winter storms have caused significant property damage and disruption of the electric utilities. Overall, when taking into consideration the moderate level of vulnerability to winter storms in the county, and the past history of the event, the municipalities have a moderate level of vulnerability to winter storms.

Recommendations

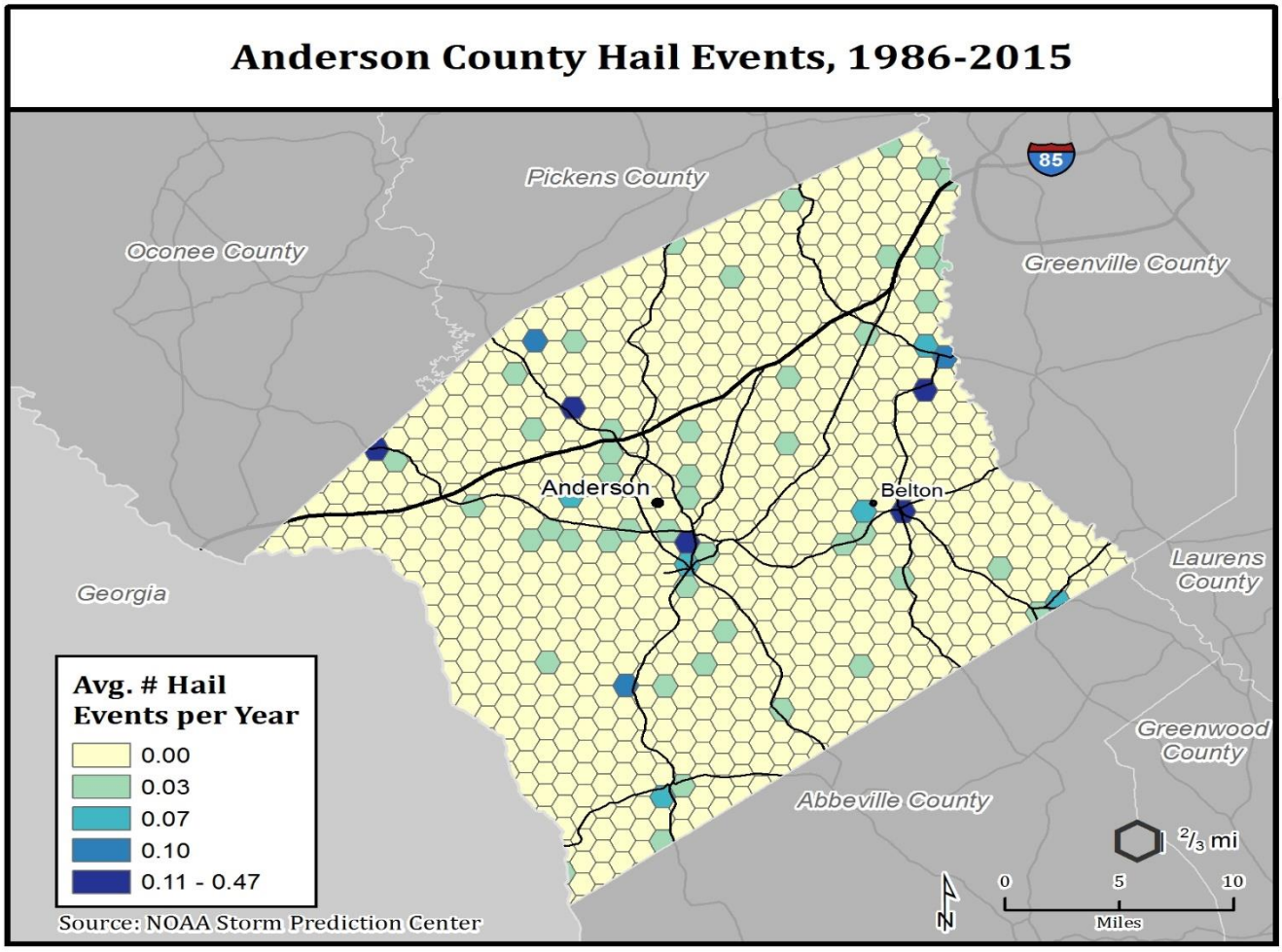
Early warnings are possibly the best hope for residents when a winter storms strikes. Citizens must immediately be aware when a community will be facing a winter storms incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of winter storm events. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Section 6.3.2 – Hail Storms/ Thunderstorms

Hail is frozen droplets of water that thaw and freeze while wind patterns (updrafts and downdrafts) take them between colder and warmer elevations within a thunderstorm cloud. Each time the droplet re-freezes, another layer of ice is added to the object, thus making it larger until it falls to the earth. Hail is a costly result of severe weather in the United States. In an average year, hail causes one billion dollars in crop and property damage each year in this country.

Unlike ice pellets, hail stones are layered and can be irregular and clumped together. Hail is composed of transparent ice or alternating layers of transparent and translucent ice at least 1 millimeter (0.039 in) thick, which are deposited upon the hail stone as it cycles through the cloud multiple times, suspended aloft by air with strong upward motion until its weight overcomes the updraft and falls to the ground. There are methods available to detect hail-producing thunderstorms using weather satellites and radar imagery. Hail stones generally fall at higher speeds as they grow in size, though complicating factors such as melting, friction with air, wind, and interaction with rain and other hail stones can slow their descent through Earth's atmosphere. Severe weather warnings are issued for hail when the stones reach a damaging size, as it can cause serious damage to man-made structures and, most commonly, farmers' crops. In the United States, the National Weather Service issues severe thunderstorm warnings for hail 1" or greater in diameter. This threshold, effective January 2010, marked an increase over the previous threshold of ¾" hail. The Service made the change for two main reasons: a) public complacency and b) recent research suggesting that damage does not occur until a hailstone reaches 1" in diameter. (NOAA/ National Weather Service National Centers for Environmental Prediction).

Hail Storms/ Thunderstorms: Anderson County



Anderson County
Extent

Anderson County has experienced 11 notable hail storms/ thunderstorms from the time frame of 01/01/1960 thru 01/01/2016. A hail storm/ thunderstorm is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 11 notable hail storms have caused 2.20 injuries to county residents and 0.00 fatalities. These notable hail storms have caused a collective $2,826,726.48 in property damage and $856,759 in crop damage, adjusted for 2015 inflation.

The maximum hail size record for Anderson County is 4.25 inches and occurred on March 15, 2008. Since the 2012 Hazard Mitigation was written, the maximum hail sized record is 1.75 inches and occurred on July 3, 2014 (National Climatic Data Center, 2017).

The previous eleven (11) notable occurrences of hail storm/thunderstorm events happened throughout Anderson County, signifying that each area/municipality of the County is equally at risk for another future notable event.

Table 6.3.2-1 – Hail/ Thunderstorms Data Summary (Anderson County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Hail/ Thunderstorms	20%	2.20	0.00	$2,826,726.48	$856,759.1

Table 6.3.2-2: Anderson County Notable Hail Storms/ Thunderstorms from 1/1/1960-1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1993	Hail	Anderson	2.00	0.00	82,012.8	0.00
1989	Hail/Tornado	Anderson	0.00	0.00	955,713.7	0.00
2003	Hail	Anderson	0.00	0.00	128,813.6	0.00
1963	Hail	Anderson	0.00	0.00	0.00	84,191.92
1984	Hail	Anderson	0.00	0.00	1,140,602	114,060
1987	Hail	Anderson	0.00	0.00	104,320.9	10,432.09
1979	Hail	Anderson	0.00	0.00	1,632.35	163,234.9
1975	Hail	Anderson	0.00	0.00	12,237.57	122,375.6
1975	Hail	Anderson	0.00	0.00	6,293.59	62,935.99
1982	Hail	Anderson	0.2	0.00	299,528.6	299,528.6
1989	Hail	Anderson	0.00	0.00	95,571.37	0.00
Total:			2.20	0.00	2,826,726.48	856,759.1

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Anderson County:

Table 6.3.2-3: Anderson County Probability of a Hail Storm/ Thunderstorm

County	Number of Events	Number of Years	Recurrence Interval (years)	Hazard Frequency (% chance/year)
Anderson	**11**	**55**	**5**	**20%**

Vulnerability

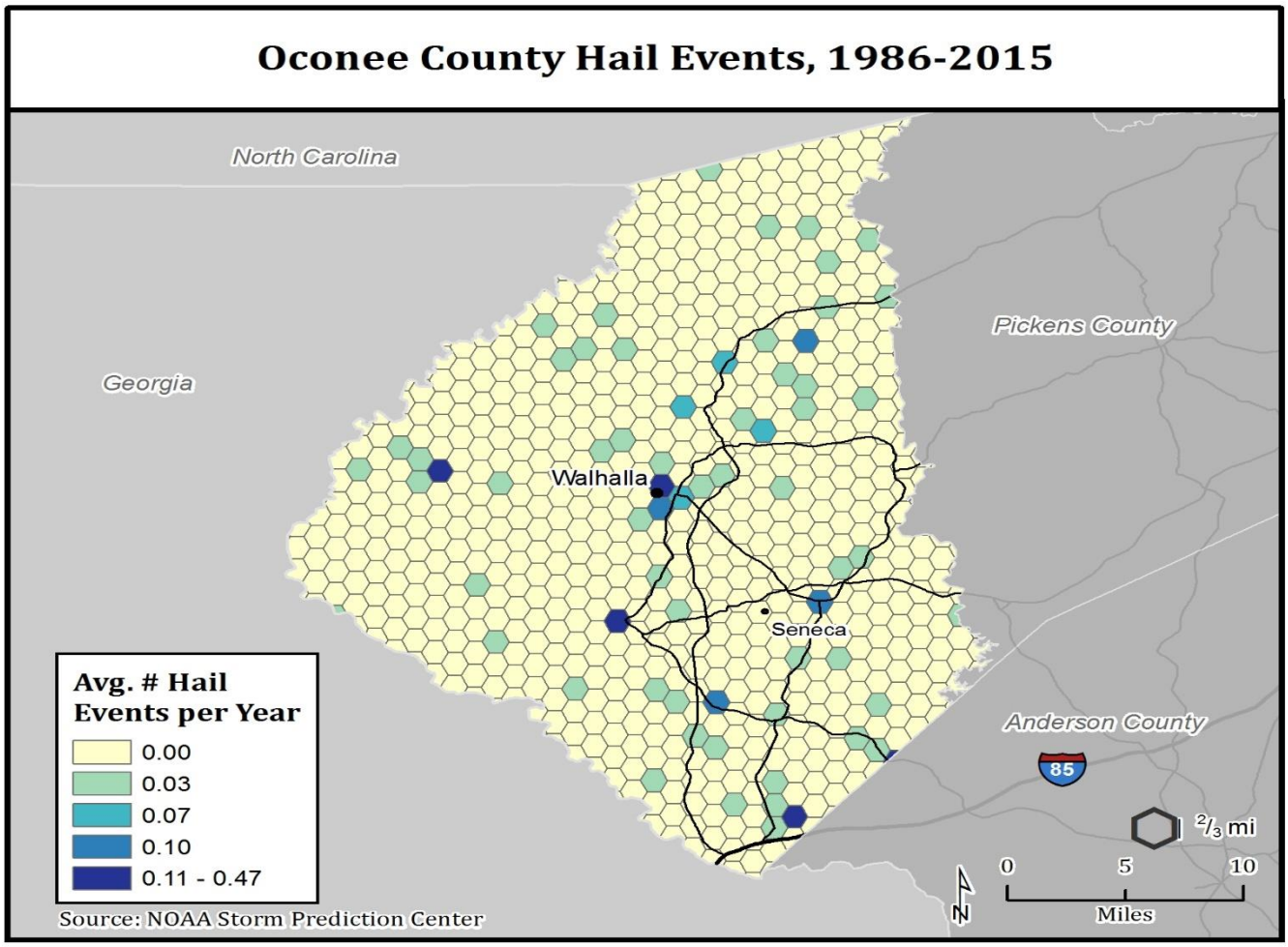
Anderson County

Overall, Anderson County has a low vulnerability to hail storms. There is a 20% probability that more than one hail producing storm will occur in Anderson County in a year time frame. Based on passed events, the hail storms have caused some damage within the County. Overall, the County's vulnerability to a damaging event is low.

Recommendation:

Early warnings are possibly the best hope for residents when hail storms strike. Citizens must immediately be aware when a community will be facing a severe weather incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of hail storm events. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Hail Storms/ Thunderstorms: Oconee County


Oconee County Hail Events, 1986-2015
North Carolina
Georgia
Pickens County
Anderson County
Walhalla
Seneca
85
Avg. # Hail Events per Year
0.00
0.03
0.07
0.10
0.11 - 0.47
Source: NOAA Storm Prediction Center
N
0
5
10
Miles
2/3 mi

Oconee County
Extent

Oconee County has experienced 7 notable hail storms/ thunderstorms from the time frame of 01/01/1960 thru 01/01/2016. A hail storm/ thunderstorm is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 7 notable hail storms have caused 0.20 injuries to county residents and 0.00 fatalities. These notable hail storms have caused a collective $1,062,253.17 in property damage and $480,764.70 in crop damage, adjusted for 2015 inflation.

The maximum hail size record for Oconee County is 3.0 inches and occurred on April 28, 2002. Since the 2012 Hazard Mitigation was written, the maximum hail sized record is 2.00 inches and occurred on June 6, 2014 (National Climatic Data Center, 2017).

The previous seven (7) notable occurrences of hail storm/thunderstorm events happened throughout Oconee County, signifying that each area/municipality of the County is equally at risk for another future notable event.

Table 6.3.2-4 – Hail/ Thunderstorms Data Summary (Oconee County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Hail/ Thunderstorms	12.7%	0.20	0.00	$1,062,253.17	$480,764.70

Table 6.3.2-5: Oconee County Notable Hail Storms/ Thunderstorms from 1/1/1960-1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
4/4/1989	Hail Storm/ Thunderstorm	Oconee	0.00	0.00	95,571.37	955.71
2002	Hail Storm/ Thunderstorm	Oconee	0.00	0.00	658,746.5	0.00
1963	Hail Storm/ Thunderstorm	Oconee	0.00	0.00	0.00	84,191.92
1979	Hail Storm/ Thunderstorm	Oconee	0.00	0.00	1,632.35	163,234.92
7/4/1975	Hail Storm/ Thunderstorm	Oconee	0.00	0.00	6,293.59	62,935.99
1982	Hail Storm/ Thunderstorm	Oconee	0.20	0.00	299,528.6	299,528.6
1974	Hail Storm/ Thunderstorm	Oconee	0.00	0.00	480.76	480,764.7
Total:			0.20	0.00	1,062,253.17	480, 764. 70

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Oconee County:

Table 6.3.2-6: Oconee County Probability of a Hail Storm/ Thunderstorm

County	Number of Events	Number of Years	Recurrence Interval (years)	Hazard Frequency (% chance/year)
Oconee	**7**	**55**	**7.85**	**12.7%**

Vulnerability

Oconee County

Overall, Oconee County has a low vulnerability to hail storms. There is a 12.7% probability that more than one hail producing storm will occur in Oconee County in a year time frame. Based on past events, the hail storms have caused some damage within the County. Overall, the County's vulnerability to a damaging event is low.

Recommendation:

Early warnings are possibly the best hope for residents when hail storms strike. Citizens must immediately be aware when a community will be facing a severe weather incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of hail storm events. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Section 6.3.3- Lightning Severe Storms/ Thunderstorms

The formation of lightning is still something of a mystery. Even the perceived motion of lightning is false. The light that seems to come down from the sky actually jumps up from the earth's surface. Lightning bolts are triggered when a negatively charged cloud base induces a positive charge in the ground. Negative particles, small streaming sparks known as stepped leaders, begin to flow downward, creating a conductive channel an inch or two wide. At the same time, similar streamers are moving upward from the ground, especially high places like treetops and tall structures. When the two streamers meet, they form a channel and a subsequent lightning bolt. The bright flash of light happens when the electrical charge excites air molecules in its path, forcing them to release light.

Lightning travels up to 60,000 miles per hour, cutting a jagged path through the air as much as 10 miles long! A lightning flash is brighter than ten million 100-watt light-bulbs, and contains billions of watts - as much power as in all the electricity plants in the United States.

Lightning causes damage to buildings and equipment in three different ways.
First, there can be damage caused by a direct lightning strike. Such damage includes damage to roofing materials, structures such as chimneys, heating or air conditioning units located on the roof or exterior of a building, or fires caused by lightning igniting combustible material, such as wood-frame buildings or flammable liquids or vapors.

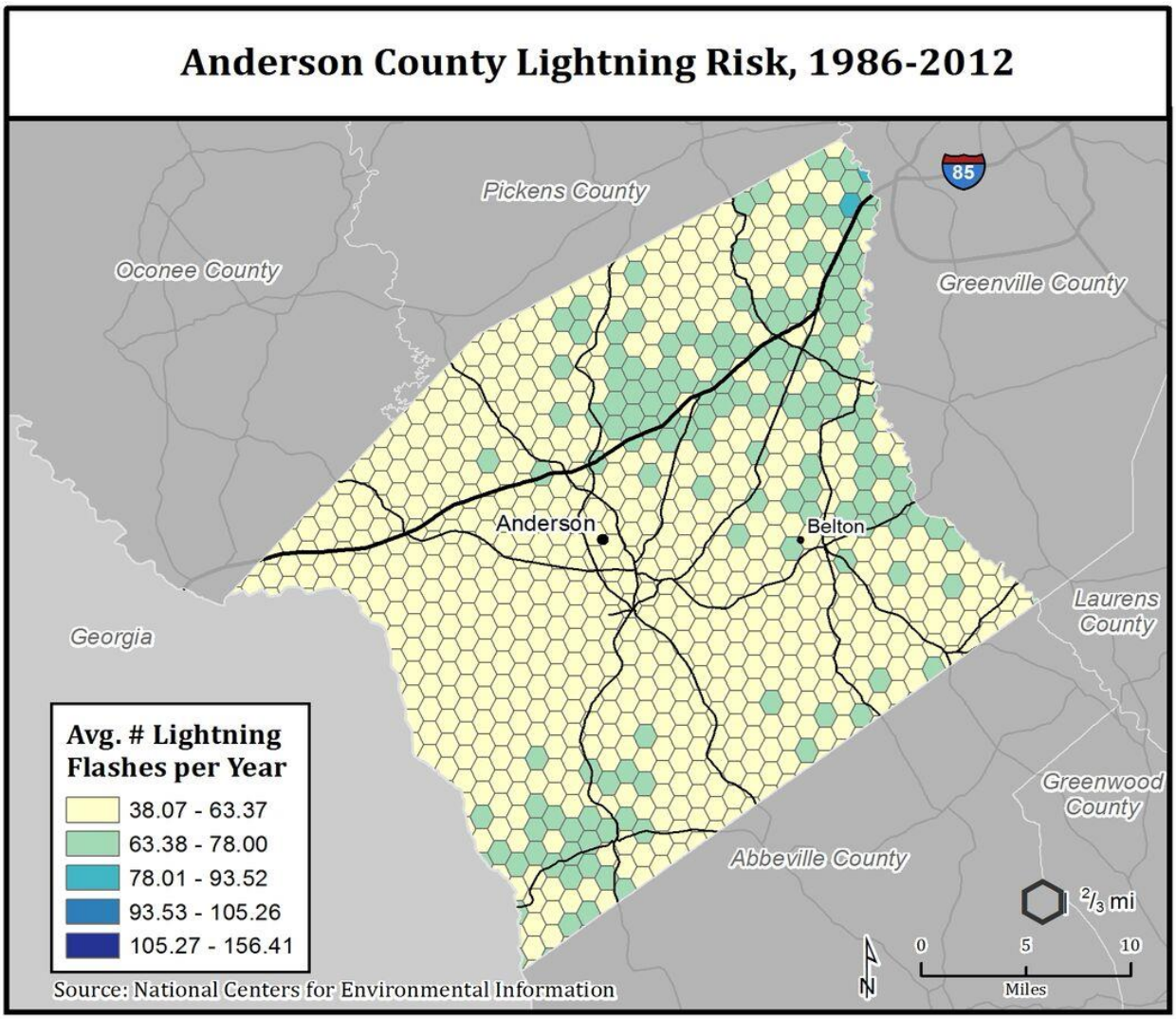
Second, part of the lightning current can be carried inside a building by electric power, telephone, analog or digital data lines (e.g., closed circuit television cameras, sensors in an industrial plant, etc.). This direct injection of lightning current inside a building can cause immense damage to electrical – and especially electronic – circuits and equipment.

Finally, The electromagnetic fields from the current in a lightning stroke can induce currents and voltage in wire and cables inside a building. Such surge currents are typically less intense than direct injection of current, but can easily vaporize integrated circuits in computers, modems, electronic control circuits, etc.

Electronic equipment is typically designed to operate in a well-controlled electrical environment. It is the responsibility of the user to install lightning protection, electrical surge-protective devices, and power conditioning equipment to mitigate the effects of disturbances in the electrical voltage waveform. It is well recognized that the trend toward integrated circuits with more transistors per unit area, and faster switching speeds, makes these circuits more vulnerable to both upset and damage.

Damage is a permanent alteration in the physical properties of one or more components, that requires repair or replacement before the equipment can resume normal operation. Examples of lightning damage to electrical equipment include flashover of insulation inside motors or transformers, so that the equipment is no longer functional. Examples of lightning damage to electronic equipment includes vaporized traces on printed circuit boards, vaporized transistors and integrated circuits, blown fuses, etc.

Lightning Severe Storms/ Thunderstorms: Anderson County



Anderson
Extent

Anderson County has experienced 36 notable Lightning Severe Storms/ Thunderstorms from the time frame of 01/01/1960 thru 01/01/2016. A Lightning Severe Storm/ Thunderstorm is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 36 notable lightning storms/ thunderstorms have caused 3.16 injuries to county residents and 0.69 fatalities. These notable storms have caused a collective $12,973,595.3 in property damage and $1,272,517.57 in crop damage, adjusted for 2015 inflation.

Since the 2012 Hazard Mitigation Plan was published, there have been no notable lightening severe storms (National Centers for Environmental Information, 2017).

The previous thirty-six (36) notable occurrences of lightning severe storms/thunderstorm events happened throughout Anderson County, signifying that each area/municipality of the County is equally at risk for another future notable event.

Table 6.3.3-1 – Lightning Severe Storms/ Thunderstorms Data Summary (Anderson County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Lightning/ Thunderstorms	65%	3.16	0.69	$12,973,595.30	$1,272,517.57

Table 6.3.3-2: Anderson County Notable Lightning Severe Storms/ Thunderstorms from 1/1/1960- 1/1/2016

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
2000	Thunderstorm	Anderson	0.00	0.00	137,640.5	0.00
1996	Lightning	Anderson	0.00	0.00	7,553,123.0	0.00
1996	Lightning	Anderson	0.00	0.00	226,593.7	0.00
1993	Thunderstorm	Anderson	0.00	0.00	164,025.6	0.00
1993	Thunderstorm	Anderson	0.00	0.00	82,012.8	0.00
1994	Lightning	Anderson	0.00	0.00	79,965.25	0.00
1995	Lightning	Anderson	0.00	0.00	155,523.0	0.00
1998	Thunderstorm	Anderson	0.00	0.00	145,409.2	0.00
2002	Thunderstorm	Anderson	0.00	0.00	131,749.3	0.00
1963	Thunderstorm	Anderson	0.00	0.17	64,547.09	0.00
1964	Thunderstorm	Anderson	0.00	0.00	637,142.5	637,142.5
1964	Thunderstorm	Anderson	0.00	0.02	83,105.58	83,105.58
1967	Thunderstorm	Anderson	0.00	0.00	118,272.0	11,827.22
1967	Thunderstorm	Anderson	0.00	0.00	77,133.92	771.37
1968	Thunderstorm	Anderson	0.00	0.00	106,419.3	10.62
1970	Lightning	Anderson	0.00	0.00	305,434.3	0.00
1971	Thunderstorm	Anderson	0.00	0.00	63,611.68	63,611.68
1976	Thunderstorm	Anderson	0.33	0.00	347,125.1	34,712.49
1986	Lightning	Anderson	0.00	0.00	108,128.2	0.00
1988	Thunderstorm	Anderson	0.00	0.00	100,176.3	0.00
1979	Thunderstorm	Anderson	0.00	0.00	1,632.35	163,234.9
1975	Lightning	Anderson	0.00	0.00	12,237.57	122,375.6
1975	Lightning	Anderson	0.00	0.00	6,293.59	62,935.99
1975	Lightning	Anderson	1.50	0.50	1,101,380.0	11,013.8
1983	Thunderstorm	Anderson	0.00	0.00	118,984.4	0.00
1989	Thunderstorm	Anderson	0.00	0.00	95,571.37	0.00
1990	Thunderstorm	Anderson	0.00	0.00	90,672.15	0.00
1965	Thunderstorm	Anderson	0.00	0.00	0.00	81,786.44
2008	Lightning	Anderson	0.00	0.00	55,042.66	0.00
1979	Thunderstorm	Anderson	1.33	0.00	54,411.63	0.00
2010	Thunderstorm	Anderson	0.00	0.00	108,695.5	0.00
2010	Thunderstorm	Anderson	0.00	0.00	271,738.7	0.00
2011	Lightning	Anderson	0.00	0.00	52,684.73	0.00
2011	Lightning	Anderson	0.00	0.00	105,369.5	0.00
2013	Thunderstorm	Anderson	0.00	0.00	101742.8	0.00
2015	Thunderstorm	Anderson	0.00	0.00	200,000.0	0.00
Total:			3.16	0.69	12,973,595.3	1,272,517.57

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Lightning Severe Storm/ Thunderstorm Probability and Vulnerability

Anderson County:

Table 6.3.3-3: Anderson County Probability of a Lightning Severe Storm/ Thunderstorm

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Anderson	**36**	**55**	**1.5**	**65%**

Vulnerability

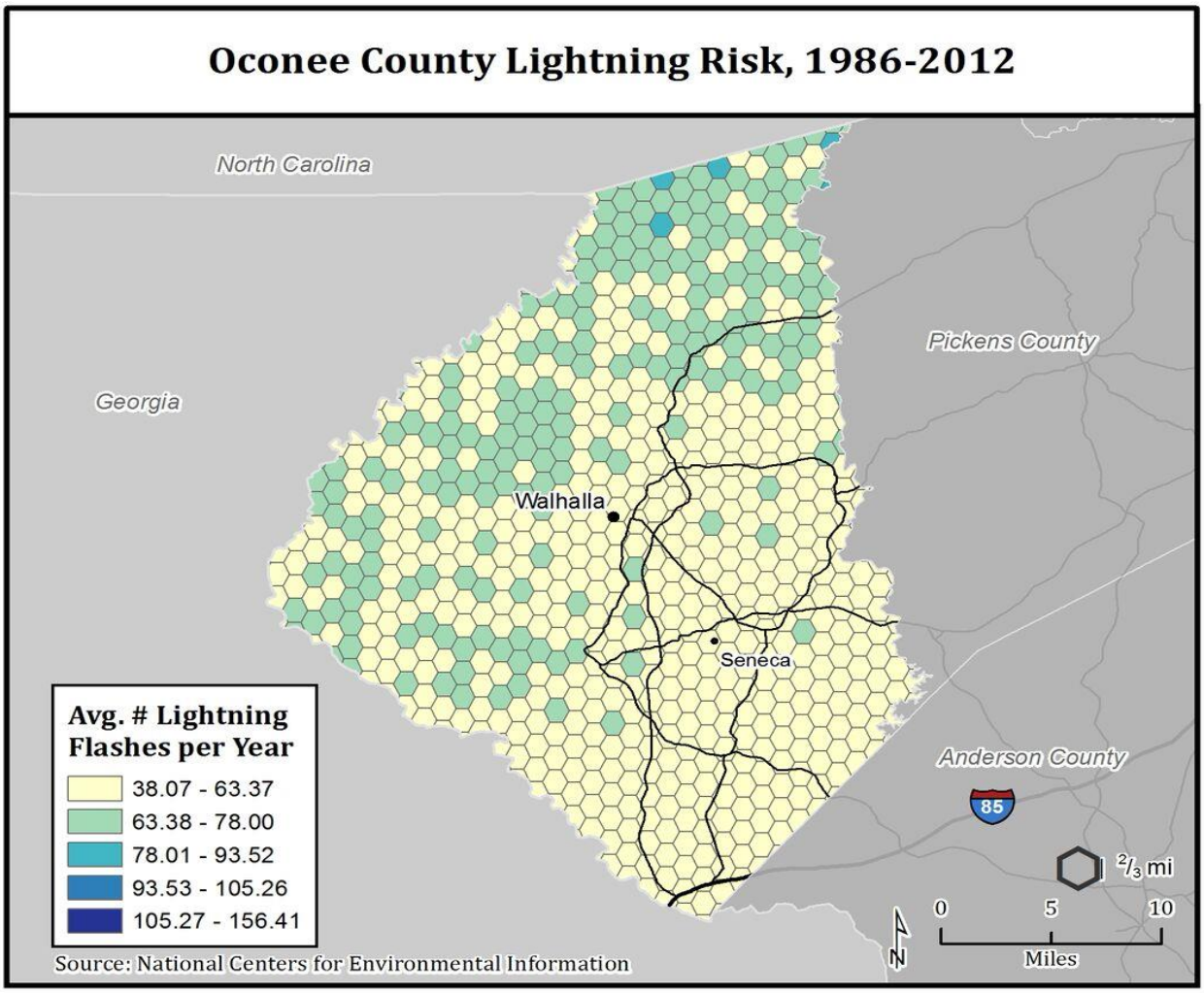
Anderson County

Overall, Anderson County has a high moderate level vulnerability to lightning severe storms / thunderstorms events. There is a 65% probability that the region would suffer a lightning severe storms / thunderstorms event in any one year time frame. This can impact the ability of the region to function. Overall, Anderson County has a high moderate vulnerability to lightning severe storms / thunderstorms events.

Recommendation

Early warnings are possibly the best hope for residents when severe weather strikes. Citizens must immediately be aware when a community will be facing a severe weather incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of Lightning Severe Storms / Thunderstorms events. A community-wide shelter program should be adopted for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Lightning Severe Storms/ Thunderstorms: Oconee County



Oconee County
Extent

Oconee County has experienced 23 notable lightning severe storms/ thunderstorms from the time frame of 01/01/1960 thru 1/1/2016. A lightning severe storm/ thunderstorm is considered notable when it causes $50,000+ in combined property and crop damages. These 23 notable lightning storms/ thunderstorms have caused 0.53 injuries to county residents and 0.19 fatalities. These notable lightning storms/ thunderstorms have caused a collective $8,205,491.24 in property damage and $2,019,681.83 in crop damage, adjusted for 2015 inflation.

Since the 2012 Hazard Mitigation Plan was published, there have been three lightning events in Oconee County. Two of these events occurred on August 6, 2012 and one on September 6, 2014. The lightning event that occurred on September 6, 2014 resulted in 2 injuries (National Centers for Environmental Information, 2017).

The previous twenty-three (23) notable occurrences of lightning severe storms/thunderstorm events happened throughout Anderson County, signifying that each area/municipality of the County is equally at risk for another future notable event.

Table 6.3.3-4 – Lightning Severe Storms/ Thunderstorms Data Summary (Oconee County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Lightning/ Thunderstorms	41.8%	0.53	0.19	$8,205,491.24	$2,019,681.83

Table 6.3.3-5: Oconee Notable Lightning Severe Storms/ Thunderstorms from 1/1/1960-1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
3/6/1996	Lightning/ Thunderstorm	Oconee	0.00	0.00	113,296.85	0.00
1993	Lightning/ Thunderstorm	Oconee	0.00	0.00	82,012.8	0.00
1994	Lightning/ Thunderstorm	Oconee	0.00	0.00	79,965.25	0.00
2004	Lightning/ Thunderstorm	Oconee	0.00	0.00	100,377.77	0.00
1961	Lightning/ Thunderstorm	Oconee	0.00	0.00	132,116.53	132,116.5
3/5/1963	Lightning/ Thunderstorm	Oconee	0.00	0.17	64,547.09	0.00
4/6/1964	Lightning/ Thunderstorm	Oconee	0.00	0.00	637,142.45	637,142.5
1964	Lightning/ Thunderstorm	Oconee	0.00	0.02	83,105.58	83,105.58
6/2/1967	Lightning/ Thunderstorm	Oconee	0.00	0.00	118,271.98	11, 827.22
1967	Lightning/ Thunderstorm	Oconee	0.00	0.00	77,133.92	771.37
1968	Lightning/ Thunderstorm	Oconee	0.00	0.00	106,419.27	10.62
1969	Lightning/ Thunderstorm	Oconee	0.00	0.00	322,911.45	0.00
1971	Lightning/ Thunderstorm	Oconee	0.00	0.00	63,611.68	63,611.68
1973	Lightning/ Thunderstorm	Oconee	0.00	0.00	4,448,517.27	4,448.5
1976	Lightning/ Thunderstorm	Oconee	0.33	0.00	347,125.06	34,712.49
8/7/1978	Lightning/ Thunderstorm	Oconee	0.00	0.00	454,403.76	4,544.04
1975	Lightning/ Thunderstorm	Oconee	0.00	0.00	12,237.57	122,375.6
7/4/1975	Lightning/ Thunderstorm	Oconee	0.00	0.00	6,293.59	62,935.99

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1982	Lightning/ Thunderstorm	Oconee	0.20	0.00	299,528.63	299,528.6
6/5/1989	Lightning/ Thunderstorm	Oconee	0.00	0.00	95,571.37	0.00
6/8/1965	Lightning/ Thunderstorm	Oconee	0.00	0.00	0.00	81,786. 44
2008	Lightning/ Thunderstorm	Oconee	0.00	0.00	550,426.61	0.00
1974	Lightning/ Thunderstorm	Oconee	0.00	0.00	480.76	480,764.7
Total:			0.53	0.19	8,205,491.24	2,019,681.83

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Lightning Severe Storm/ Thunderstorm Probability and Vulnerability

Oconee County

Table 6.3.3-6: Oconee County Probability of a Lightning Severe Storm/ Thunderstorm

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Oconee	**23**	**55**	**2.4**	**41.8%**

Vulnerability

Oconee County

Overall, Oconee County has a moderate level vulnerability to Lightning Severe Storms / Thunderstorms events. There is a 41.8% probability that the region would suffer Lightning Severe Storms / Thunderstorms events in any one year time frame. This can impact the ability of the region to function. Overall Oconee County has a moderate vulnerability to Lightning Severe Storms / Thunderstorms events.

Recommendation:

Early warnings are possibly the best hope for residents when severe weather strikes. Citizens must immediately be aware when a community will be facing a severe weather incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of Lightning Severe Storms / Thunderstorms events. A community-wide shelter program should be adopted for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Section 6.3.4 – Tornados/ High Winds

A Tornado is a "violently rotating column of air extending from a thunderstorm to the ground" (NOAA). Tornadoes can be extremely violent storms that can have relatively low wind speeds (less than 73 mph) to very high winds in excess of 300 miles per hour. In the South, tornadoes touch down most frequently from the month of March through May (NOAA). Since 1950, there have been numerous tornadoes in South Carolina. The State averages approximately eleven tornadoes a year, which ranks twenty-sixth in the nation for tornado strikes. Tornadoes have claimed forty-seven casualties in South Carolina, and have injured 1,057 residents since 1950 (SCEMD).

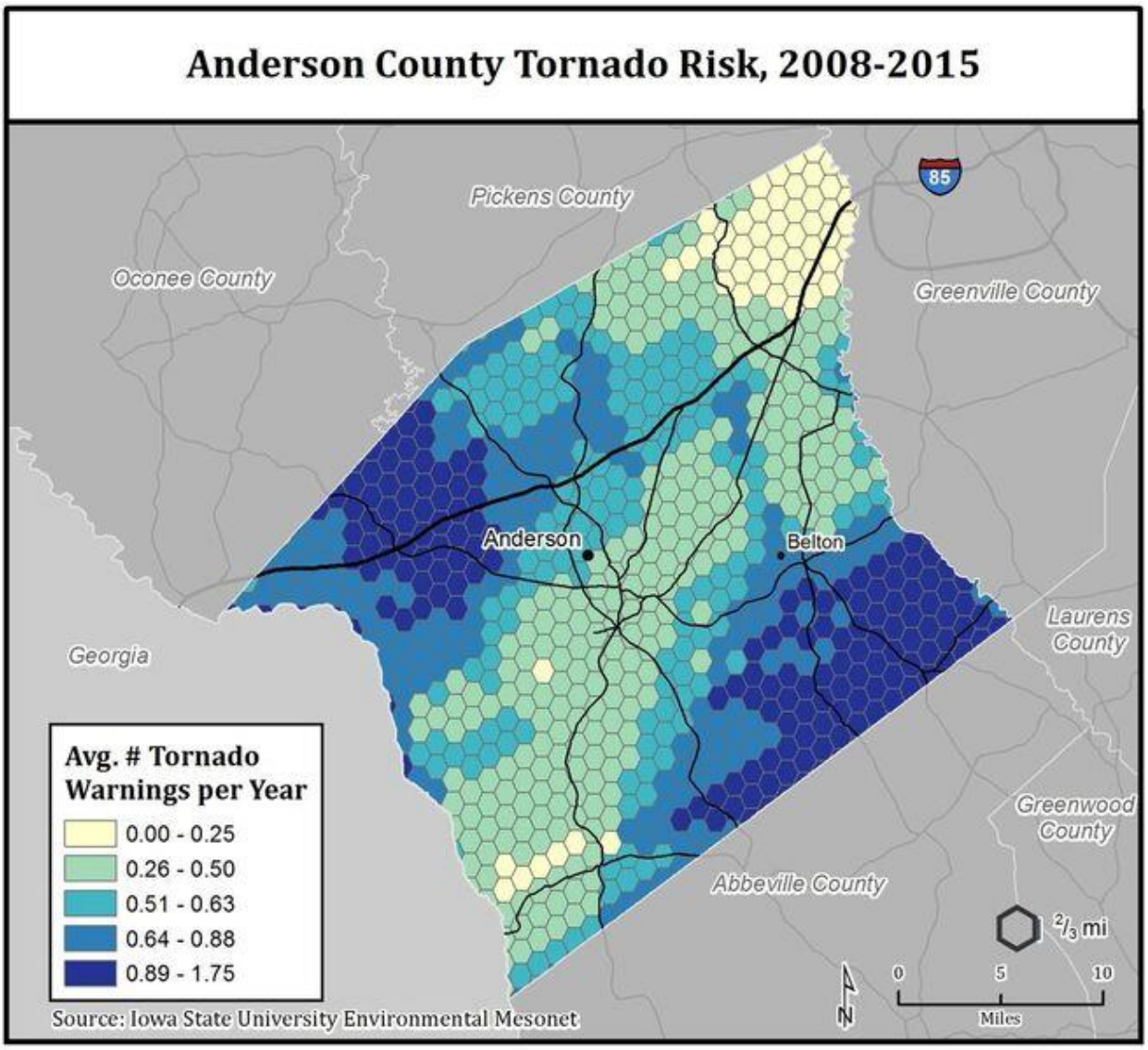
The following Enhanced F Scale for Tornado Damage on the following page explains tornado classifications, wind speeds, and a typical damage description of the various categories of tornadoes.

Table 6.3.4-1 – Tornado Force Classifications, Wind Speed, and Damage

Wind Speed MPH	Saffir-Simpson Scale	Category	Typical Effects
40-72 mph (35-62 kt)	NA	F0 Category	Gale tornado. Light damage: some damage to chimneys; breaks twigs and branches off trees; damages signboards; some windows broken; hurricane wind speed begins at 73 mph.
73-112 mph (63-97 kt)	Cat 1/2/3	F1 Category	Moderate tornado. Moderate damage: Peels surfaces off roofs; mobile homes pushed off foundations or overturned; outbuildings demolished; moving autos pushed off roads; trees snapped or broken.
113-157 mph (98-136 kt)	Cat 3/4/5	F2 Category	Significant tornado. Considerable damage: roofs torn off frame houses; mobile homes demolished; frame houses with weak foundations lifted and moved; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
158-206 mph (137-179 kt)	Cat 5	F3 Category	Severe tornado. Severe damage: Roofs and some walls torn of well- constructed houses; trains overturned; most trees in the forest uprooted; heavy cars lifted off the ground and thrown; weak pavement blown off roads.
207-260 mph (180-226 kt)	Cat 5?	F4 Category	Devastating tornado. Devestating damage: Well-constructed homes leveled; structures with foundations blown some distance; cars thrown and disintegrated; large missiles generated; trees in forest uprooted and carried some distance away.
261-318 mph (227-276 kt)	NA	F5 Category	Incredible tornado. Incredible damage: Strong frame houses lifted of foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 300 ft.; trees debarked; incredible phenomena will occur.
Gtr than 319 mph (277 kt)	NA	F6-F12 Category	The maximum wind speeds of tornadoes are not expected to reach the F6 wind speeds.

(www.noaa.gov/tornadoes.html**)**

Tornadoes/ High Winds: Anderson County



Anderson County
Extent

Anderson County has experienced 38 notable Tornado/ High Wind events from the time frame of 01/01/1960 thru 01/01/2016. 12 of these notable events were tornadoes, and the remaining 26 high wind events. The tornadoes that have touched down have primarily been EF1 or EF2 tornadoes. A tornado/ high wind event is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 38 notable tornadoes/ high wind events have caused 12.90 injuries to county residents and 0.00 fatalities. These notable tornadoes/ high wind events have caused a collective $9,846,961.62 in property damage and $897,347.99 in crop damage, adjusted for 2015 inflation.

The strongest tornado Anderson County experienced was an F3 that occurred on April 8, 1974. Since the 2012 Hazard Mitigation Plan was published, the strongest tornado experienced was a EF1 tornado that occurred on June 2, 2013.

Table 6.3.4-2 – Tornado/ High Winds Data Summary (Anderson County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Tornado/ High Winds	69%	12.90	0.00	$9,846,961.62	$897,347.99

Table 6.3.4-3: Anderson County Notable Tornadoes/ High Winds from 1/1/1960- 1/1/2016
SHELDUS

Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
2000	High Winds	Anderson	0.00	0.00	137,640.5	0.00
1993	High Winds	Anderson	0.00	0.00	164,025.6	0.00
1993	High Winds	Anderson	2.00	0.00	82,012.8	0.00
1994	High Winds	Anderson	0.00	0.00	79,965.25	0.00
1995	High Winds	Anderson	0.00	0.00	55,543.92	0.00
1998	High Winds	Anderson	0.00	0.00	145,409.2	0.00
1980	Tornado	Anderson	2.50	0.00	719,105.0	0.00
1984	Tornado	Anderson	8.00	0.00	3,802,005.0	380,200.0
1989	Tornado	Anderson	0.00	0.00	955,713.7	0.00
1996	Tornado	Anderson	0.00	0.00	113,296.9	0.00
1996	Tornado	Anderson	2.00	0.00	4,531,874.0	0.00
1996	Tornado	Anderson	0.00	0.00	1,510,625.0	0.00
1996	Tornado	Anderson	0.00	0.00	1,510,625.0	0.00
2002	High Winds	Anderson	0.00	0.00	131,749.3	0.00
2001	Wind	Anderson	0.00	0.00	669,161.5	0.00
2001	Wind	Anderson	0.00	0.00	2,007,484.0	0.00
2001	Wind	Anderson	0.00	0.00	2,007,484.0	0.00
2005	Tornado	Anderson	0.00	0.00	182,040.7	0.00
1970	Windstorm	Anderson	0.20	0.00	61,086.86	0.00
1984	Wind	Anderson	0.00	0.00	1,140,602.0	114,060.15
1984	Wind	Anderson	0.00	0.00	114,060.2	0.00
1987	Wind	Anderson	0.00	0.00	104,320.9	1,043.21
1988	Wind	Anderson	0.00	0.00	100,176.3	0.00
1982	Wind	Anderson	0.20	0.00	299,528.6	299,528.63
1983	Wind	Anderson	0.00	0.00	118,984.4	0.00
1989	Wind	Anderson	0.00	0.00	95,571.37	0.00
1989	Wind	Anderson	0.00	0.00	95,571.37	0.00
1990	Wind	Anderson	0.00	0.00	90,672.15	0.00
2008	Wind	Anderson	0.00	0.00	110,085.3	0.00
2009	Tornado	Anderson	0.00	0.00	331,435.1	0.00
1993	Tornado	Anderson	0.00	0.00	82,012.8	0.00
1993	Blizzard Winds	Anderson	0.00	0.00	102,516.0	102,516.0
2010	Wind	Anderson	0.00	0.00	108,695.5	0.00
2010	Tornado	Anderson	0.00	0.00	108,695.5	0.00
2010	Wind	Anderson	0.00	0.00	211,738.7	0.00
2013	Tornado	Anderson	0.00	0.00	152,614.2	0.00
2013	Wind	Anderson	0.00	0.00	101,742.8	0.00

2015	Wind	Anderson	0.00	0.00	200,000	0.00
Total:			12.90	0.00	9,846,961.62	897,347.99

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Tornado/ High Winds Probability and Vulnerability

Anderson County:

Table 6.3.4-4: Anderson County Probability of a Tornado

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Anderson	**12**	**55**	**4.5**	**21%**

Table 6.3.4-5: Anderson County Probability of High Winds

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Anderson	**26**	**55**	**2.1**	**47%**

Vulnerability

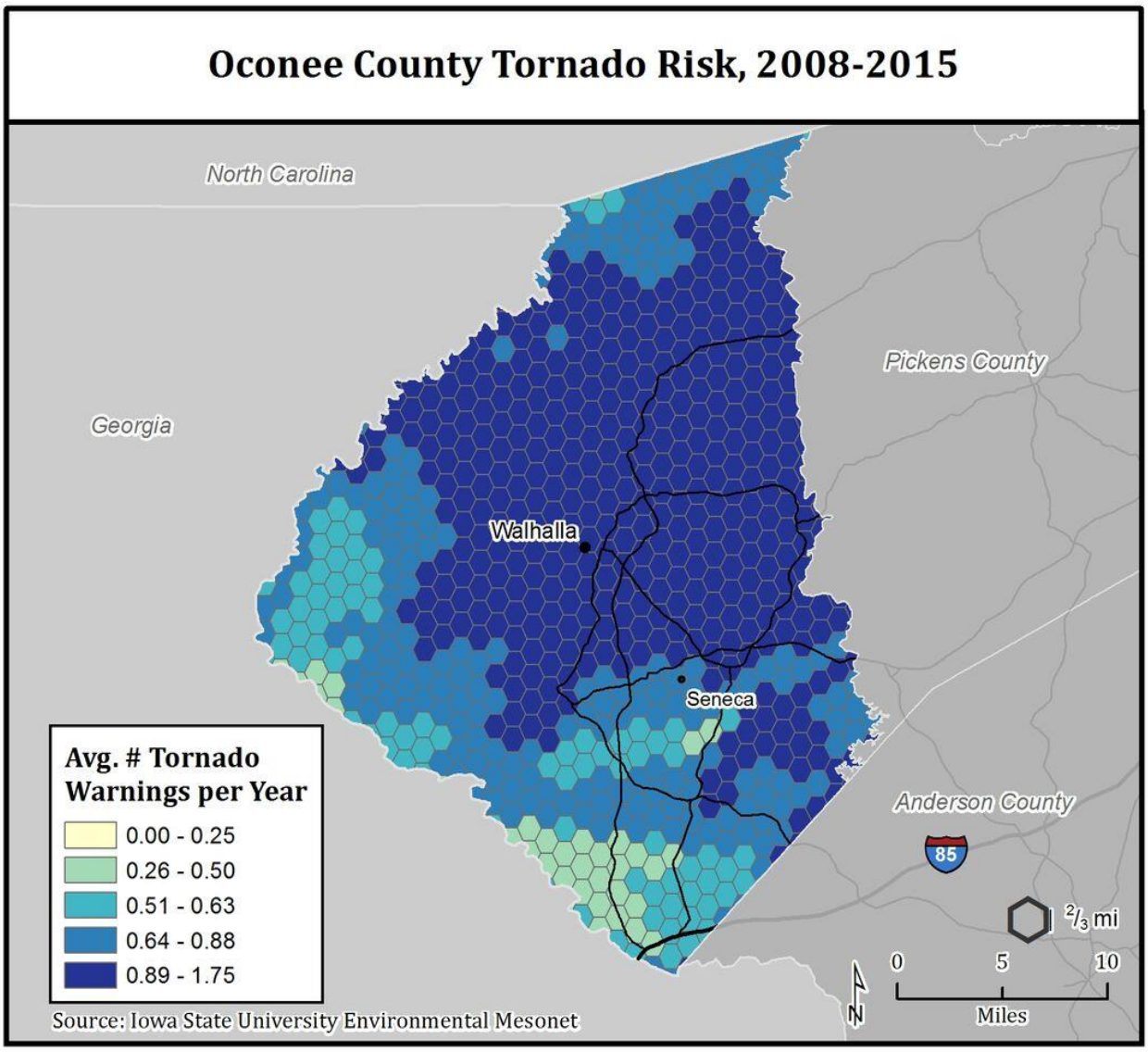
Anderson County

Overall, Anderson County has a low level vulnerability to tornadoes, and a moderate level vulnerability to high winds. The probability of one or more notable tornadoes touching down in Anderson County is 21% for any given year. While there have not been a huge number of tornadoes, it is clear from examining past events that they do have the potential to do significant damage within the County. Since tornadoes strike randomly throughout the county, one jurisdiction has the same chance of this hazard as the rest of the county and its municipalities. Thus each municipality has the same vulnerability as the County.

Recommendation

Early warnings are possibly the best hope for residents when tornadoes strike. While more than two hours warning is not possible for tornados, citizens must immediately be aware when a community will be facing a tornado incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of tornados and severe thunderstorms. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Tornadoes/ High Winds: Oconee County



Oconee County

Extent

Oconee County has experienced 18 notable Tornado/ High Wind events from the time frame of 01/01/1960 thru 01/01/2016. 8 of these notable events were tornadoes, and the remaining 10 were high wind events. The tornadoes that have touched down have primarily been EF1 or EF2 tornadoes. A tornado/ high wind event is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 18 notable tornadoes/ high wind events have caused 15.20 injuries to county residents and 1.00 fatality. These notable tornadoes/ high wind events have caused a collective $7,082,597.7 in property damage and $5,163,176.88 in crop damage, adjusted for 2015 inflation.

The strongest tornado Oconee County experienced was an F3 that occurred on March 27, 1994. Since the 2012 Hazard Mitigation Plan was published, the strongest tornado experienced was a EF0 tornado that occurred on October 14, 2014 (National Climactic Data Center, 2017).

Table 6.3.4-6– Tornado/ High Winds Data Summary (Oconee County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Tornado/ High Winds	32%	15.20	1.00	$7,082,597.7	$5,163,176.88

Table 6.3.4-7: Oconee County Notable Tornados/High Winds from 1/1/1960- 1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1994	Winds	Oconee	0.00	0.00	79,965.25	0.00
1995	High Winds	Oconee	0.00	0.00	55,543.92	0.00
1973	Tornado	Oconee	1.00	0.00	266,911.04	266.91
4/4/1989	Tornado	Oconee	0.00	0.00	95,571.37	955.71
5/5/1989	Tornado	Oconee	0.00	0.00	95,571.37	95,571.37
1994	Tornado	Oconee	1.00	0.00	399,826.25	0.00
1996	Tornado	Oconee	0.00	0.00	302,124.92	0.00
2002	Wind	Oconee	0.00	0.00	65,874.65	0.00
2004	Tornado	Oconee	0.00	0.00	94,104.16	0.00
1975	Wind	Oconee	0.00	0.00	12,237.57	122,375.60
7/4/1975	Wind	Oconee	0.00	0.00	6,293.59	62,935.99
1982	Wind	Oconee	0.20	0.00	299,528.63	299,528.6
6/5/1989	Winds	Oconee	0.00	0.00	95,571.37	0.00
2007	High Winds	Oconee	0.00	1.00	190,520.18	0.00
1974	Wind	Oconee	0.00	0.00	480.76	480,764.7
1990	Tornado	Oconee	1.00	0.00	217,613.16	0.00
1994	Tornado	Oconee	12.00	0.00	4,797,914.9	3,998,262.0
1993	High Winds	Oconee	0.00	0.00	102,516.0	102,516.0
Total:			15.20	1.00	7,082,597.7	5,163,176.88

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Tornado/ High Winds Probability and Vulnerability
Oconee County:

Table 6.3.4-8: Oconee County Probability of a Tornado

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Oconee	8	55	6.8	14.5%

Table 6.3.4-9: Oconee County Probability of High Winds

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Oconee	10	55	5.5	18%

Vulnerability

Oconee County

Overall, Oconee County has a low level vulnerability to tornadoes and high wind events. The probability of one or more tornadoes touching down in Oconee County is 14.5% for any given year, and the probability of one or more high wind events is 18%. While there have not been a huge number of tornadoes, it is clear from examining past events that they do have the potential to do significant damage within the County. Since tornadoes strike randomly throughout the county, one jurisdiction has the same chance of this hazard as the rest of the county and its municipalities. Thus, each municipality has the same vulnerability as the County.

Recommendation

Early warnings are possibly the best hope for residents when tornadoes strike. While more than two hours warning is not possible for tornados, citizens must immediately be aware when a community will be facing a tornado incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of tornados and severe thunderstorms. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Section 6.3.5 - Drought/Heat Wave

Drought is a period of abnormally dry weather which persists long enough to produce a serious hydrologic imbalance (for example crop damage, water supply shortage, etc.) The severity of the drought depends upon the degree of moisture deficiency, the duration and the size of the affected area."

There is no precise definition to the term drought. The term drought is subjective. It is one of those words that you know when one is happening if it is intense, but it is difficult to put into terms that are applicable to all people. Here are a few ways that drought can be described:

1) Below normal precipitation for several months

2) Agriculture has insufficient supply of precipitation

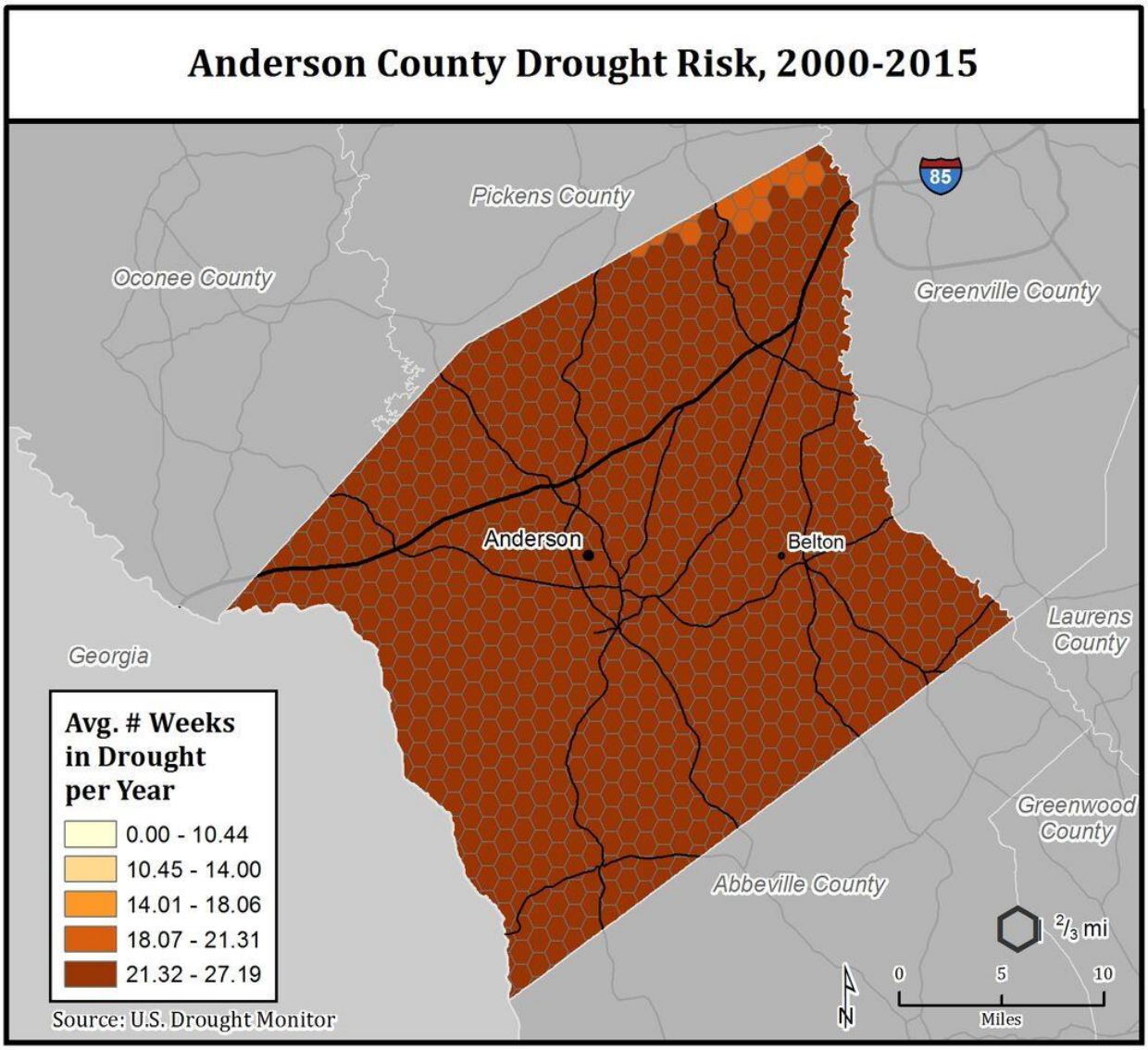
3) Economy is suffering from a temporary shortage of water

A heat wave is a meteorological condition in which hot temperatures, often combined with high dew-points, produces a large heat index value that exists from days to weeks. Heat waves are often associated with blocking patterns in the atmosphere. A heat wave puts an extreme stress on outdoor activities, those without air-conditioning, and vegetation. Heat waves are often accompanied by "drought-like" conditions.
(NOAA/NationalWeatherServiceNationalCentersforEnvironmentalPrediction).

Location

Anderson and Oconee Counties experienced a severe drought between 1998 and 2003. Other droughts have occurred in this region during 1931-35, 1954-57, 1983, 1986, and 1993. Crop and Livestock Feed Assessment Reports confirm the droughts of the summer have devastated crops and pastures in the Counties. Soybeans and other crops have burned up due to extreme heat and below normal rainfall. Pastures and hay crops were extremely short with poor prospects for fall. There are few, if any, cases of livestock deaths due to droughts. Droughts are region-wide natural disasters and will be addressed that way. There is no location mapping for droughts in this region.

Drought/ Heat Wave: Anderson County



Anderson County
Extent

Anderson County has experienced 8 notable drought/ heat events from the time frame of 01/01/1960 thru 01/01/2016. A drought/ heat event is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 8 notable drought/ heat events have caused 0.00 injuries to county residents and 0.00 fatalities. These notable drought/ heat events have caused a collective $9,652,956.04 in property damage and $16,626,262.6 in crop damage, adjusted for 2015 inflation.

The hottest recorded temperature in Anderson County is 108 degrees and occurred on July 29, 1952 (National Climactic Data Center, 2017).

Table 6.3.5-1 – Drought/ Heat Data Summary (Anderson County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Drought/ Heat	14%	0.00	0.00	$9,652,956.04	$16,626,262.6

Table 6.3.5-2: Anderson County Notable Drought/ Heat Events from 1/1/1960- 1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1993	Heat	Anderson	0.00	0.00	0.00	1,782,887.0
1993	Drought	Anderson	0.00	0.00	9,413,643.46	0.00
1994	Drought	Anderson	0.00	0.00	0.00	1,738,375.0
1995	Drought	Anderson	0.00	0.00	0.00	676,186.8
1977	Drought/Heat	Anderson	0.00	0.00	4,251.29	425,127.3
1985	Heat	Anderson	0.00	0.00	0.00	239,430.5
1986	Drought	Anderson	0.00	0.00	235,061.29	2,350,613
1993	Drought	Anderson	0.00	0.00	0.00	9,413,643.0
Total:			0.00	0.00	9,652,956.04	16,626,262.6

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Drought/ Heat Probability and Vulnerability

Anderson County:

Table 6.3.5-3: Anderson County Probability of a Drought/ Heat

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Anderson	**8**	**55**	**6.8**	**14%**

Vulnerability

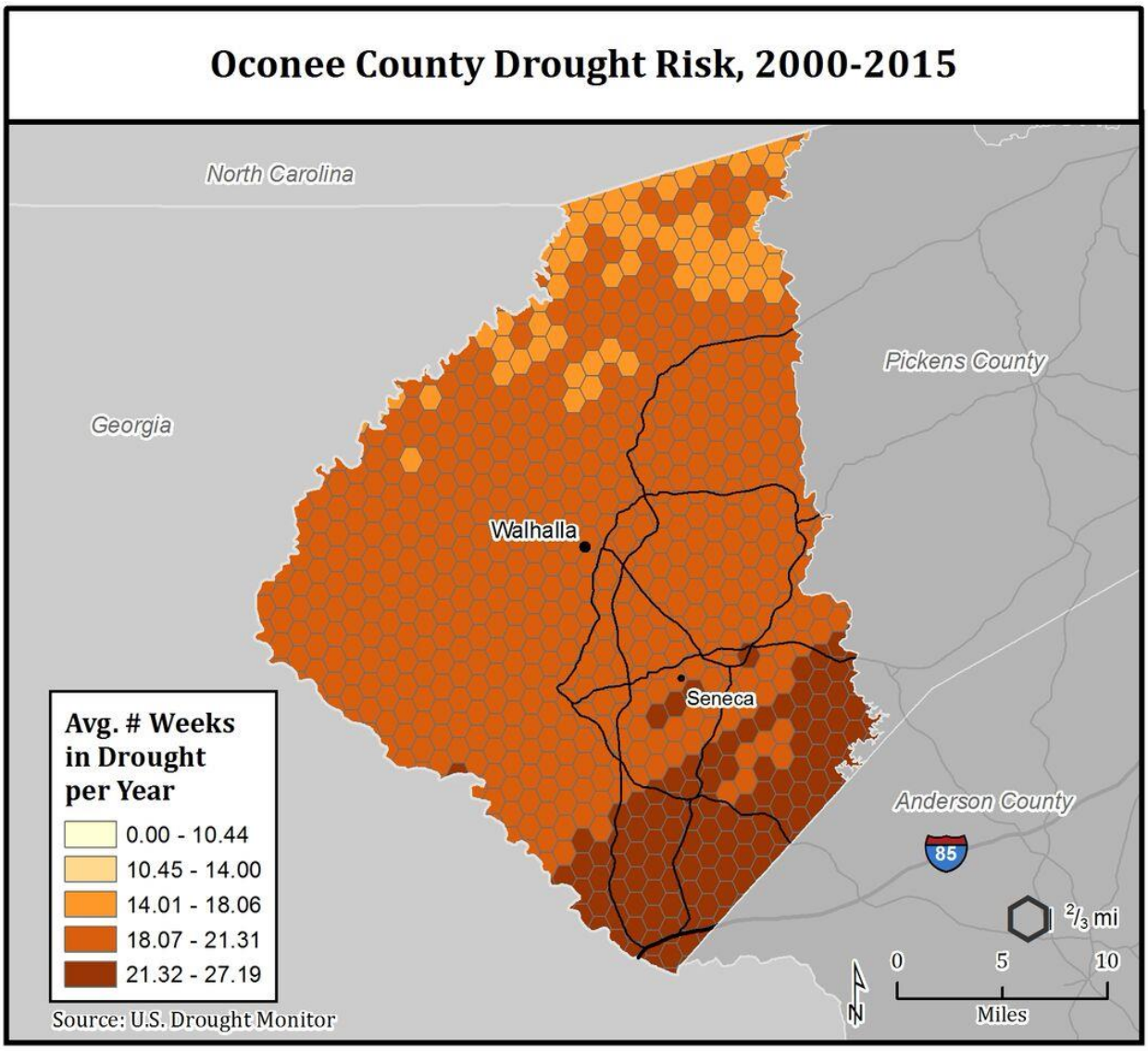
Anderson County

Overall, Anderson County has a low vulnerability to drought as it relates to property and crop damage at or greater than $50,000. Yet, Anderson County experiences long durations of drought 21-27 weeks per year (U.S. Drought Monitor, 2017). There is a 14% probability that the region would suffer a drought that would cause at or greater than $50,000 of property or crop damage in any one year time frame. Droughts can greatly affect the agricultural production of the area as well as affect water treatment and wastewater treatment operations. This can have additional impacts that affect the ability of the region to function. Overall, the County's vulnerability to a damaging drought event is low.

Recommendation:

Local governments should adopt water conservation ordinances that limit the amount of water that residents may use during a period of drought. Local governments should develop water monitoring plans as an early warning system. Local governments should inventory and review their reservoir operation plans. A water conservation awareness program should be presented to the public either through pamphlets, workshops or a drought information center. Voluntary water conservation should be encouraged. Local governments should continually look for and fund water system improvements, new systems and new wells. Local governments would certainly benefit from an education program to inform citizens of likely locations and dangers of droughts.

Drought/ Heat Events: Oconee County



Oconee County
Extent

Oconee County has experienced 8 notable drought/ heat events from the time frame of 01/01/1960 thru 01/01/2016. A drought/ heat event is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 8 notable drought/ heat events have caused 0.00 injuries to county residents and 0.00 fatalities. These notable drought/ heat events have caused a collective $9,652,956.04 in property damage and $16,626,262.6 in crop damage, adjusted for 2015 inflation.

The hottest recorded temperature in Oconee County is 108 degrees and occurred on September 7, 1925 (National Climactic Data Centers, 2017).

Table 6.3.5-4 – Drought/ Heat Data Summary (Oconee County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Drought/ Heat	14%	0.00	0.00	$9,652,956.04	$16,626,262.6

Table 6.3.5-5: Oconee County Notable Drought/ Heat Events from 1/1/1960- 1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
6/1/1993	Drought & Heat	Oconee	0.00	0.00	0.00	1,782,887.02
7/1/1993	Drought & Heat	Oconee	0.00	0.00	9,413,643.46	0.00
5/1/1994	Drought	Oconee	0.00	0.00	0.00	1,738,374.99
5/1/1995	Drought	Oconee	0.00	0.00	0.00	676,186.81
7/1/1977	Drought	Oconee	0.00	0.00	4,251.29	425,127.34
6/1/1985	Heat	Oconee	0.00	0.00	0.00	239,430.45
7/1/1986	Drought	Oconee	0.00	0.00	235,061.29	2,350,612.9
8/1/1993	Drought	Oconee	0.00	0.00	0.00	9,413,643.46
Total:			0.00	0.00	9,652,956.04	16,626,263.0

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Drought/ Heat Probability and Vulnerability

Oconee County:

Table 6.3.5-6: Oconee County Probability of a Drought/ Heat

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Oconee	**8**	**55**	**6.8**	**14%**

Oconee County

Overall, Oconee County has a low vulnerability to drought as it relates to property and crop damage at or greater than $50,000. Yet, Oconee County experiences long durations of drought 18-21 weeks per year (U.S. Drought Monitor, 2017). There is a 14% probability that the region would suffer a drought that would cause at or greater than $50,000 of property or crop damage in any one year time frame. Droughts can greatly affect the agricultural production of the area as well as affect water treatment and wastewater treatment operations. This can have additional impacts that affect the ability of the region to function. Overall, using the $50,000 threshold, the County's vulnerability to a damaging drought event is low.

Recommendation:

Local governments should adopt water conservation ordinances that limit the amount of water that residents may use during a period of drought. Local governments should develop water monitoring plans as an early warning system. Local governments should inventory and review their reservoir operation plans. A water conservation awareness program should be presented to the public either through pamphlets, workshops or a drought information center. Voluntary water conservation should be encouraged. Local governments should continually look for and fund water system improvements, new systems and new wells. Local governments would certainly benefit from an education program to inform citizens of likely locations and dangers of droughts.

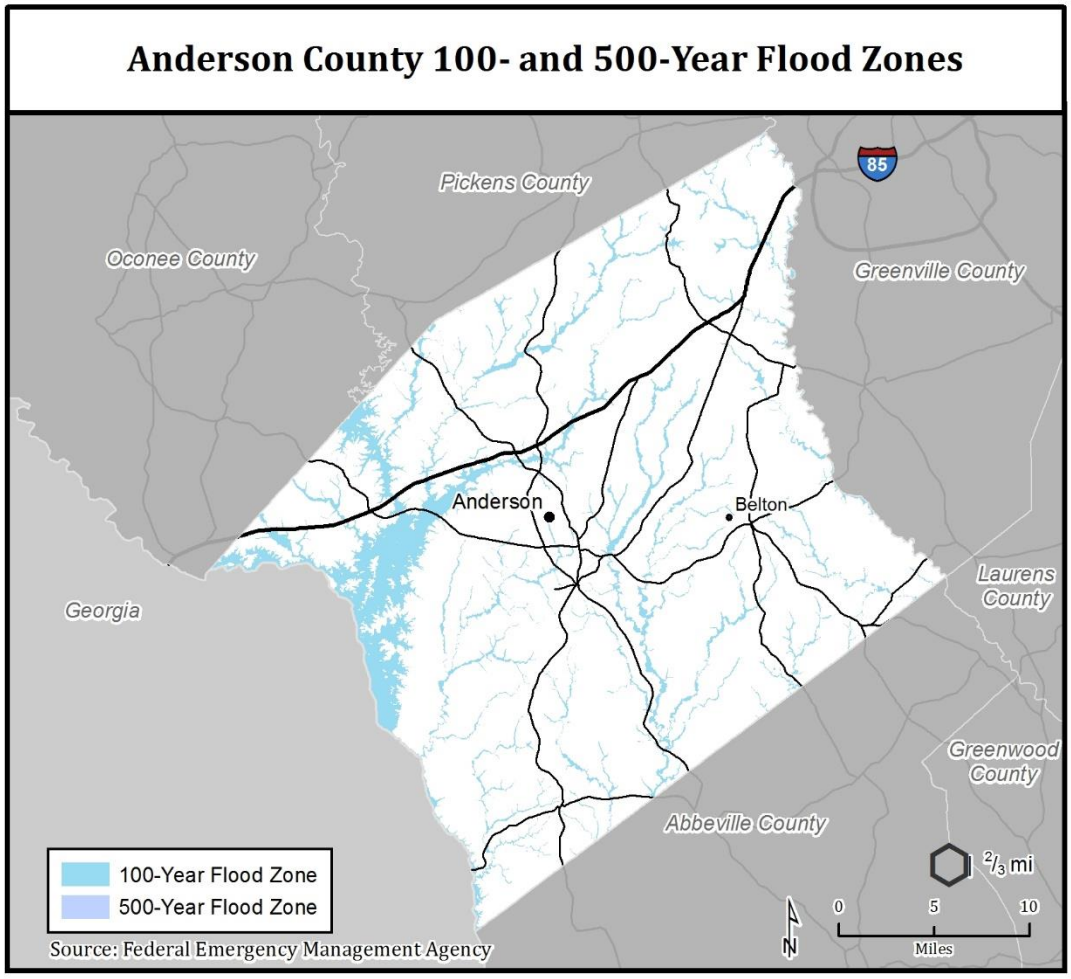
Section 6.3.6 – Floods

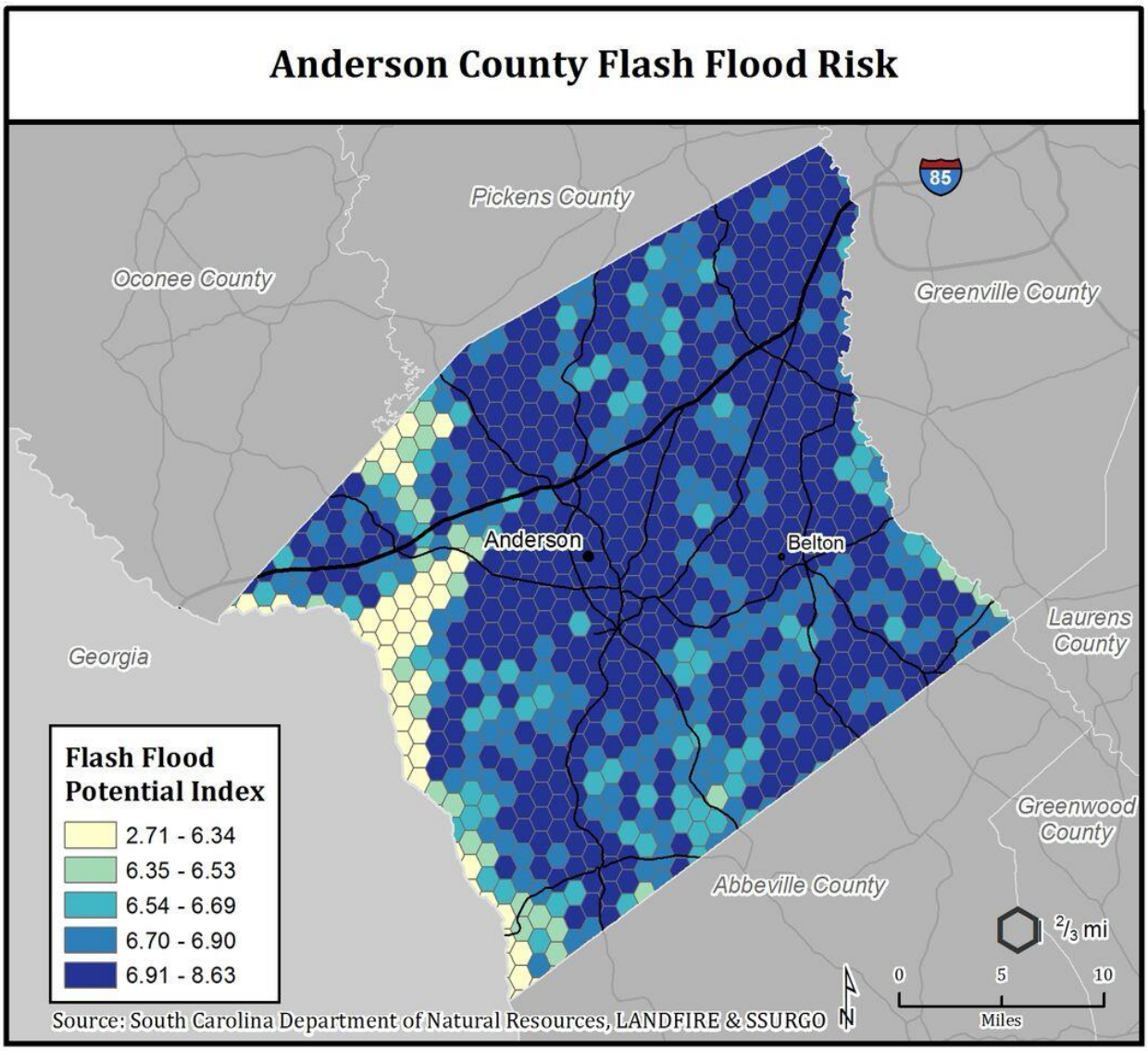
Flooding is defined as a general and temporary condition of partial or complete inundation of normally dry land areas from: the overflow of inland or tidal waters; the unusual and rapid accumulation or runoff of surface waters from any source; or mudflows or the sudden collapse of shoreline land. Flooding is one of the moderate priority natural hazards in each County. This is largely due to the physical geography of the county, which includes several rivers and creeks as well as a varied topography. Identification of floodplain areas within the county and the incorporated municipalities was based on the most recent Flood Insurance Rate Maps (FIRM) produced by FEMA. These maps display the locations of all of the major water bodies in the county and delineate the 100-year floodplain boundaries. There are areas that have a one percent chance of equaling or exceeding the recorded base flood elevation during any year. Based on these maps, each county and municipality has 100-year floodplains within their jurisdictions. Each community may also have additional flooding problems not represented on the floodplain maps. Nuisance flooding impacts many roads due to poorly designed and maintained drainage systems. Rivers and creeks designated as flood prone areas include but are not limited to the following: Beaver Dam Creek, Rocky Creek. Potential flooding impact in or near the City of Anderson and Seneca are the areas most noted for potential flooding problems.

Flash Flood – A flood which is caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours. Also, at times a dam failure can cause a flash flood, depending on the type of dam and time period during which the break occurs.

Flash Flood Watch - Issued to indicate current or developing hydrologic conditions that are favorable for flash flooding in and close to the watch area, but the occurrence is neither certain or imminent. Flash Flood Warning – Issued to inform the public, emergency management, and other cooperating agencies that flash flooding is in progress, imminent or highly likely. (http://www.noaawatch.gov/themes/severe.php)

Flooding: Anderson County




Anderson County Flash Flood Risk
Pickens County
Oconee County
Greenville County
85
Anderson
Belton
Laurens County
Georgia
Greenwood County
Abbeville County
Flash Flood Potential Index
2.71 - 6.34
6.35 - 6.53
6.54 - 6.69
6.70 - 6.90
6.91 - 8.63
2/3 mi
0
5
10
Miles
N
Source: South Carolina Department of Natural Resources, LANDFIRE & SSURGO

Anderson County
Extent

Anderson County has experienced 13 notable flooding events from the time frame of 01/01/1960 thru 01/01/2016. A flooding event is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 13 notable flooding events have caused 1.83 injuries to county residents and 0.50 fatalities. These flooding events have caused a collective $3,731,112.02 in property damage and $447,590.73 in crop damage, adjusted for 2015 inflation.

The most extensive flooding in South Carolina, including Anderson County, occurred in 1908 and was associated with a 25.60 ft. crest of the Saluda River (The National Weather Service categorizes any crest of the Saluda River at or above 20 feet a major flood stage. Please reference http://water.weather.gov /ahps2/hydrograph.php?wfo=gsp&gage=weps1). The greatest 24-hour rainfall recorded in Anderson County was 11.65 inches in 24 hours (South Carolina DNR). Since the 2012 Hazard Mitigation Plan was published, there have been two flooding events in Anderson County, occurring in October and December, 2015 (National Centers for Environmental Information, 2017). Hydrologic monitoring of the Saluda River, recorded an October 2015 peak of 1,660 cubic feet per second, falling significantly short of the 1949 record of 11,000 cubic feet per second (www.cisa.sc.edu) Additionally associated with these events were recorded crests of 8.50 ft. and 8.67 ft., both below minor flood stage thresholds. Although the 2015 peak rainfall was not record-setting, this volume of rainfall still has the capacity to alter stream flows, ultimately impacting the frequency of future flooding.

Table 6.3.6-1 – Flooding Data Summary (Anderson County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Flooding	23%	1.83	0.50	$3,731,112.02	$447,590.73

Table 6.3.6-2: Anderson County Notable Flooding Events from 1/1/1960- 1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1995	Flooding	Anderson	0.00	0.00	388,807.42	0.00
1998	Flooding	Anderson	0.00	0.00	697,964.17	0.00
2004	Flooding	Anderson	0.00	0.00	125,472.21	0.00
2003	Flooding	Anderson	0.00	0.00	128,813.59	0.00
2003	Flooding	Anderson	0.00	0.00	322,033.97	0.00
2004	Flooding	Anderson	0.00	0.00	62,736.10	0.00
1976	Flooding	Anderson	0.33	0.00	347,125.06	34,712.49
1976	Flooding	Anderson	0.00	0.00	45,277.2	45,277.2
1991	Flooding	Anderson	0.00	0.00	348,042.59	0.00
1975	Flooding	Anderson	1.50	0.50	1,101,380.11	11,013.8
1989	Flooding	Anderson	0.00	0.00	95,571.37	0.00
1993	Flooding	Anderson	0.00	0.00	17,828.88	356,587.24
2014	Flooding	Anderson	0.00	0.00	50,059.35	0.00
Total:			1.83	0.50	3,731,112.02	447,590.73

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Flooding Probability and Vulnerability

Anderson County:

Table 6.3.5-3: Anderson County Probability of Flooding

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Anderson	**13**	**55**	**4.2**	**23%**

Vulnerability

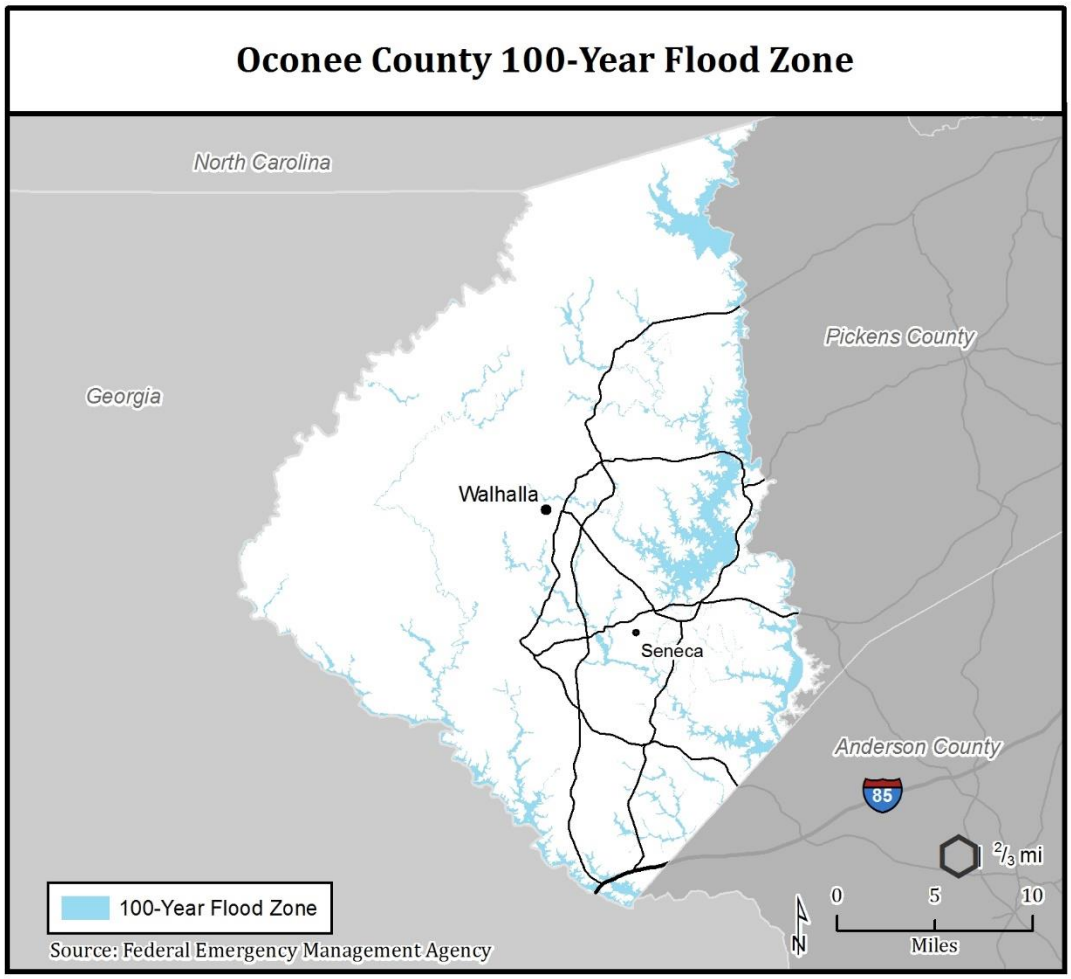
Anderson County

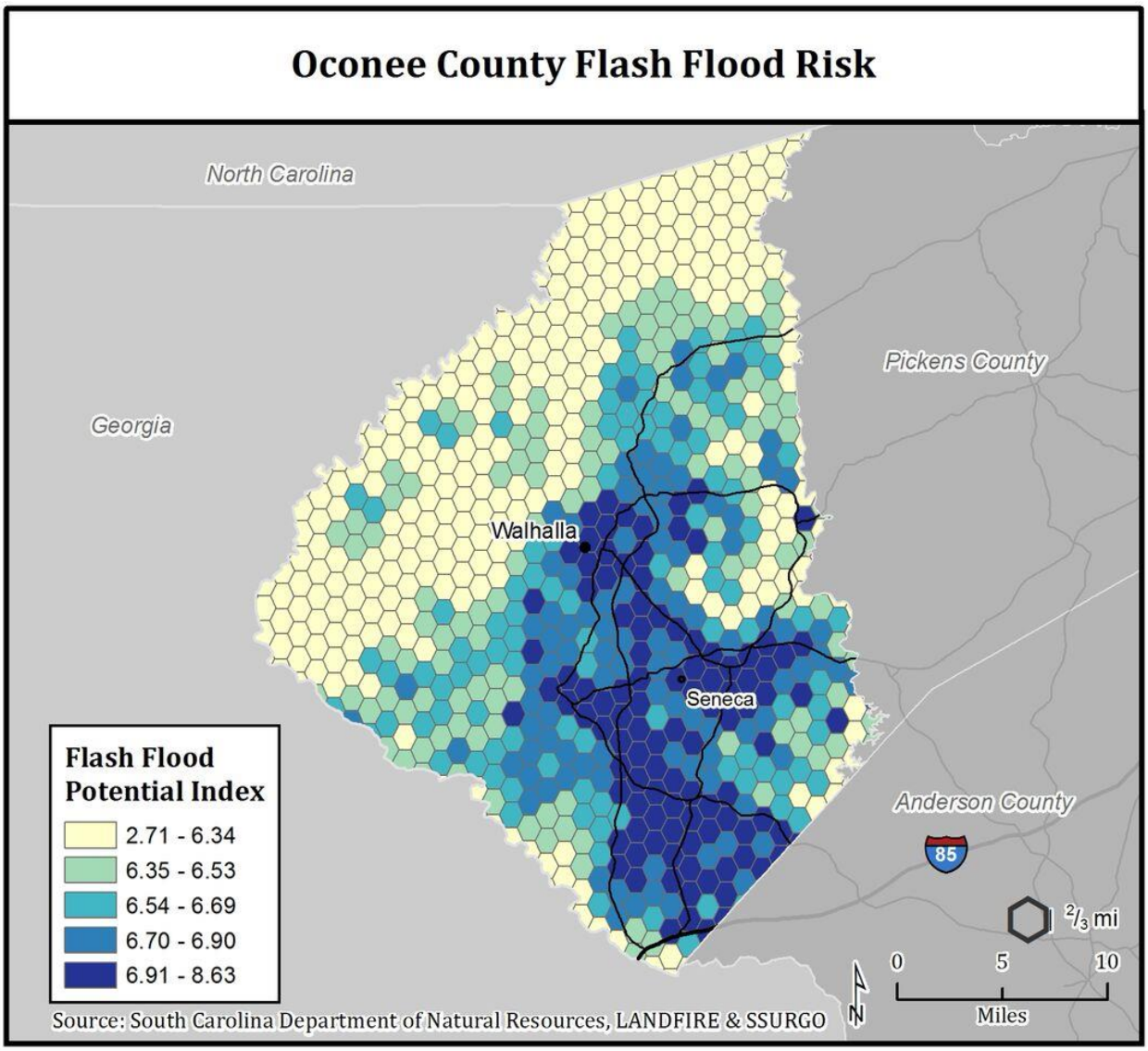
Overall, Anderson County has low level vulnerability to flooding as it relates to at or greater than $50,000 of property and crop damage. Yet according the South Carolina Department of Natural Resources, most of Anderson County is high on the index for potential flash flooding. The numerous streams and waterways create areas that do commonly flood but flooding problems are limited primarily to developed areas that have creeks or streams running through them. Very little of the cities are located within the 100 year flood zone. There is a 23% probability that the region would suffer a flooding event that would cause at or greater than $50,000 in property and crop damage in any one year time frame. Flooding events can greatly affect the agricultural production of the area as well as affect water treatment and wastewater treatment operations. This can have additional impacts that affect the ability of the region to function. Overall, using the $50,000 threshold, Anderson County has a low vulnerability to flooding because of numerous lakes and streams within its limits.

Recommendation:

Counties and municipalities should ensure adoption of Floodplain Management Ordinances concerning construction in floodplain areas. Counties and municipalities should consider doing buyouts of properties that are flood prone and have had repetitive losses to mitigate future disasters. Local governments should make strong efforts to further improve warning systems to insure that future deaths and injuries do not occur due to the effects of flooding events. Local governments should consider making improvements to roads and low water crossings that consistently flood by placing them on a hazard mitigation projects list and actively seek funding to successful complete the projects.

Flooding: Oconee County




Oconee County Flash Flood Risk
North Carolina
Georgia
Pickens County
Anderson County
Walhalla
Seneca
85
Flash Flood Potential Index
2.71 - 6.34
6.35 - 6.53
6.54 - 6.69
6.70 - 6.90
6.91 - 8.63
2/3 mi
0
5
10
Miles
N
Source: South Carolina Department of Natural Resources, LANDFIRE & SSURGO

Oconee County
Extent

Oconee County has experienced 13 notable flooding events from the time frame of 01/01/1960 thru 01/01/2016. A flooding event is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 13 notable flooding events have caused 2.66 injuries to county residents and 0.67 fatalities. These flooding events have caused a collective $7,886,851.53 in property damage and $452,521.99in crop damage, adjusted for 2015 inflation.

Since the 2012 Hazard Mitigation Plan was published, there have been no recorded flooding events in Oconee County (National Centers for Environmental Information, 2017). The National Weather Service's Hydrologic Data for the Seneca River confirms the lack of both recent and historic flooding events. Both the Jocasse and Keowee hydrologic gauges demonstrate maximum crest of the river between 100.48ft-100.82ft, falling below the 102ft. threshold for minor flood stage, as established by the National Weather Service (http://water.weather.gov/ahps2/hydrograph.php?wfo=gsp&gage=jcss1).

Table 6.3.5-4 – Flooding Data Summary (Oconee County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Flooding	18%	2.66	0.67	$7,886,851.53	$452,521.99

Table 6.3.6-5: Oconee County Notable Flooding Events from 1/1/1960- 1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1994	Flooding	Oconee	0.00	0.00	79,965.25	0.00
2004	Flooding	Oconee	0.00	0.00	1,631,138.7	0.00
2004	Flooding	Oconee	0.00	0.00	72,773.88	0.00
1973	Flooding	Oconee	0.00	0.00	4,448,517.27	4448.5
1976	Flooding	Oconee	2.33	0.67	694,250.16	6,942.52
1976	Flooding	Oconee	0.33	0.00	347,125.06	34,712.49
1976	Flooding	Oconee	0.00	0.00	45,277.2	45,277.2
8/6/1978	Flooding	Oconee	0.00	0.00	454,403.76	4,544.04
7/3/1989	Flooding	Oconee	0.00	0.00	95,571.37	0.00
1/1/1993	Flooding	Oconee	0.00	0.00	17,828.88	356,587.24
Total:			2.66	0.67	7,886,851.53	452,521.99

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Flooding Probability and Vulnerability

Oconee County:

Table 6.3.5-3: Oconee County Probability of a Flooding

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Oconee	**10**	**55**	**5.5**	**18%**

Vulnerability

Oconee County

Overall, Oconee County has low level vulnerability to flooding as it relates to at or greater than $50,000 of property and crop damage. Yet according the South Carolina Department of Natural Resources, the southeastern part of Oconee County is high on the index for potential flash flooding. The numerous streams and waterways create areas that do commonly flood but flooding problems are limited primarily to developed areas that have creeks or streams running through them. Very little of the cities are located within the 100 year flood zone. There is an 18% probability that the region would suffer a flooding event that would cause at or greater than $50,000 in property and crop damage in any one year time frame. Flooding events can greatly affect the agricultural production of the area as well as affect water treatment and wastewater treatment operations. This can have additional impacts that affect the ability of the region to function. Overall, using the $50,000 threshold, Oconee County has a low vulnerability to flooding because of numerous lakes and streams within its limits.

Recommendation:

Counties and municipalities should ensure adoption of Floodplain Management Ordinances concerning construction in floodplain areas. Counties and municipalities should consider doing buyouts of properties that are flood prone and have had repetitive losses to mitigate future disasters. Local governments should make strong efforts to further improve warning systems to insure that future deaths and injuries do not occur due to the effects of flooding events. Local governments should consider making improvements to roads and low water crossings that consistently flood by placing them on a hazard mitigation projects list and actively seek funding to successful complete the projects.

Estimate of Potential Losses (Risk Assessment)

This section describes the risks to each County, including its citizens, residential, government and commercial assets, and County operations. As noted above, risk is an expression of expected future monetary losses resulting from the impacts of natural hazards. Risk assessment methodologies differ based on the nature of data that is available, the hazard, and the way that the results are expressed. The sections below provide brief descriptions of the methodologies.

Flood Risk in each County

This subsection describes how each county and it's municipalities participate in and continued plans for participation in the NFIP. Most of the municipalities that participate in the NFIP have memorandums of understanding with the County for floodplain management duties and enforcement of the County flood damage prevention ordinances within their corporate limits. Those municipalities not participating in the NFIP generally follow the County flood management ordinance as outlined in Table 5.3.2-4 in Chapter 5.

Also this subsection of the Plan provides estimates of future flood losses, i.e. risk. Each of the loss calculations is based on best available data, but they must be considered estimates because highly detailed engineering studies were not performed as part of this planning process. The present section is intended to provide a moderately-detailed overview of risk in each County.

Flood Risk Assessment Method 1
Analysis of NFIP Repetitive Loss and Severe Repetitive Loss Data:

The first risk assessment method is based on analysis of National Flood Insurance Program (NFIP) data on repetitive flood loss properties. The NFIP defines repetitive loss properties as those that have received at least two NFIP insurance payments of more than $1,000 each in any rolling ten-year period. As of 2010, Anderson County had 3 such properties, based on a query of the Department of Natural Resources (CIS). Of this total, there are 3 residential and 0 non-residential properties.

Table 6.3.5-4 (Anderson County) and table 6.3.5-5 (Oconee County) summarizes the NFIP claims value and number of claims statistics for both residential and non-residential repetitive loss properties. The Table indicates that 100% percent of paid claims are associated with residential building damages.

Table 6.3.5-4 Summary of Residential and Non-Residential NFIP Repetitive; Loss Statistics, Anderson County:

Repetitive Loss Category	Properties	Building	Contents	Total	# of Claims	Average
Residential	3	$67,226.00	$0000000	$67,226.00	3	$22,408.66
Non-Residential	0	$0000000	$000000	$00000000	0	$00000000
Grand Total	**3**	**$67,226.00**	**$0000000**	**$67,226.00**	3	**$22,408.66**

Table 6.3.5-5 Summary of Residential and Non-Residential NFIP Repetitive; Loss Statistics, Oconee County:

Repetitive Loss Category	Properties	Building	Contents	Total	# of Claims	Average
Residential	xx	$0000000	$00000000	$00000000	xx	$000000
Non-Residential	x	$0000000	$00000000	$00000000	xx	$000000
Grand Total	**xx**	**$0000000**	**$00000000**	**$00000000**	**xx**	**$000000**

Since the 2012 Flood Risk Assessment Analysis update, in which 3 residential priorities experienced repetitive loss to the amount of $67,226.00, there have been no reported loss claims to Anderson County. Additionally, Oconee County has filed no repetitive loss claims.

All municipalities within Anderson and Oconee Counties, including the unincorporated areas, are members of the National Flood Insurance Program (NFIP), with the exceptions of Starr, West Union, Pelzer, West Pelzer, and Salem. The municipalities who do participate in the NFIP adopt and enforce floodplain management requirements, rely on updated floodplain maps, and regulate new construction in Special Flood Hazard Areas. (See Table 5.3.2-4).

The above mentioned municipalities have chosen not to participate in the NFIP due in part to the following considerations: smaller population size, limited historical flood risk, and limited resources to become members of the NFIP.

Current floodplain maps do not indicate any floodplains within The Town of Starr. However, Starr and West Union do have a FIRM identified. In addition to an identified Flood Insurance Rate Map (FIRM), Pelzer and Salem also have a Flood Hazard Boundary Map (FHBM) identified. The Hazard Mitigation Planning Committee encourages municipality membership in the NFIP, providing a list of the program's benefits, including but not limited to: providing residents with the ability to purchase flood insurance and municipal eligibility for federal assistance following a disaster.

Community:	ANDERSON COUNTY *	**State:**	SOUTH CAROLINA
County:	ANDERSON COUNTY	**CID:**	450013

Overview | Occupancy | Zone | Pre/Post FIRM

Total by Community

Total Number of Policies:	113
Total Premiums:	$53,538
Insurance in Force:	$26,095,600
Total Number of Closed Paid Losses:	3
$ of Closed Paid Losses:	$67,226

Group Flood Insurance

Total Number of Policies:	0
Total Premiums:	$0
Insurance in Force:	$0
Total Number of Closed Paid Losses:	0
$ of Closed Paid Losses:	$0

Post Firm Minus Rated Policies

Total Number of Minus Rated Policies:	2
A Zone Minus Rated Policies:	2
V Zone Minus Rated Policies:	0

Manufactured Homes

Total Number of Policies:	1
Total Number of Closed Paid Losses:	0
$ of Closed Paid Losses:	$0

ICC

Total Number of ICC Closed Paid Losses:	0
$ of ICC CLosed Paid Losses:	$0

1316

Number of Properties by Community:	0

Substantial Damage Losses

Number of Substantial Damage Closed Paid Losses:	0

Community:	ANDERSON COUNTY *	**State:**	SOUTH CAROLINA
County:	ANDERSON COUNTY	**CID:**	450013

Overview | Occupancy | Zone | Pre/Post FIRM

	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	$ of Closed Paid Losses	Adjustment Expense
Single Family	106	$49,197	$24,838,300	3	$67,225.99	$2,850.00
2-4 Family	0	$0	$0	0	$0.00	$0.00
All Other Residential	3	$750	$217,300	0	$0.00	$0.00
Non Residential	4	$3,591	$1,040,000	0	$0.00	$0.00
Total	113	$53,538	$26,095,600	3	$67,225.00	$2,850.00

	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	$ of Closed Paid Losses	Adjustment Expense
Condo	6	$1,389	$515,300	0	$0.00	$0.00
Non Condo	107	$52,149	$25,580,300	3	$67,225.99	$2,850.00
Total	113	$53,538	$26,095,600	3	$67,225.00	$2,850.00

(Department of Natural Resources (CIS –Report/CID#450013).

Federal Emergency Management Agency
Community Status Book Report
SOUTH CAROLINA

Communities Not in the National Flood Program

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Map Date	Sanction Date	Tribal
450148#	BLENHEIM, TOWN OF	MARLBORO COUNTY	08/12/77	06/16/11	06/16/11	08/12/78	No
450234#	BONNEAU, TOWN OF	BERKELEY COUNTY		10/16/03	10/16/03	10/16/04	No
450162#	BRANCHVILLE, TOWN OF	ORANGEBURG COUNTY	06/07/74	02/01/80	01/16/14	02/04/88(S)	No
450202#	CALHOUN FALLS, TOWN OF	ABBEVILLE COUNTY		03/03/11	03/03/11	03/03/12	No
450077B	COWARD, TOWN OF	FLORENCE COUNTY	05/31/74	12/16/04	12/16/14	05/31/75	No
450286#	COWPENS, TOWN OF	SPARTANBURG COUNTY		01/06/11	01/06/11	01/06/12	No
450239#	EUTAWVILLE, TOWN OF	ORANGEBURG COUNTY		01/16/14	01/16/14	01/16/15	No
450289#	JONESVILLE, TOWN OF	UNION COUNTY		08/02/11	08/02/11	08/02/12	No
450276#	LITTLE MOUNTAIN, TOWN OF	NEWBERRY COUNTY		09/16/11	09/16/11	09/16/12	No
450150#	MCCOLL, TOWN OF	MARLBORO COUNTY	07/25/75	06/16/11	06/16/11	07/25/76	No
450243#	MCCONNELLS, TOWN OF	YORK COUNTY		09/26/08	09/26/08	09/26/09	No
450199#	NORRIS, TOWN OF	PICKENS COUNTY		04/16/08	04/16/08	04/16/09	No
450154#	PEAK, TOWN OF	NEWBERRY COUNTY		09/16/11	09/16/11	09/16/12	No
450018#	PELZER, TOWN OF	ANDERSON COUNTY	06/18/76	09/29/11	09/29/11	06/18/77	No
450299#	POMARIA, TOWN OF	NEWBERRY COUNTY		09/16/11	09/16/11	09/16/12	No
450277#	PROSPERITY, TOWN OF	NEWBERRY COUNTY		09/16/11	09/16/11	09/16/12	No
450212#	SALEM, TOWN OF	OCONEE COUNTY	11/08/74	09/11/09	09/11/09	11/08/75	No
450155#	SILVERSTREET, TOWN OF	NEWBERRY COUNTY	01/24/75	09/16/11	09/16/11	01/24/76	No
450057#	SMOAKS, TOWN OF	COLLETON COUNTY	09/06/74	11/07/01	11/07/01	09/06/75	No
450246#	SOCIETY HILL, TOWN OF	DARLINGTON COUNTY	10/13/78	02/06/13	02/06/13	10/13/79	No
450072	ST. GEORGE, TOWN OF	DORCHESTER COUNTY	07/23/76		07/23/76	07/23/77	No
450273#	ST. MATTHEWS, TOWN OF	CALHOUN COUNTY		04/16/07	04/16/07	04/16/08	No
450247#	STARR, TOWN OF	ANDERSON COUNTY		09/29/11	09/29/11	09/29/12	No
450287#	WELLFORD, CITY OF	SPARTANBURG COUNTY		01/06/11	01/06/11	01/06/12	No
450278#	WEST UNION, TOWN OF	OCONEE COUNTY		09/11/09	09/11/09	09/11/10	No
450272#	WILLISTON, TOWN OF	BARNWELL COUNTY		09/29/10	09/29/10	09/29/11	No
450292#	WINNSBORO, TOWN OF	FAIRFIELD COUNTY		05/03/11	05/03/11	05/03/12	No

Summary:

Total Not in Flood Program	27
Total Suspended from Emergency Program	0
Total Suspended from Regular Program	1
Total Withdrawn Communities Not In Program	0
Total Not In Program With Hazard Area Identified	27
	0

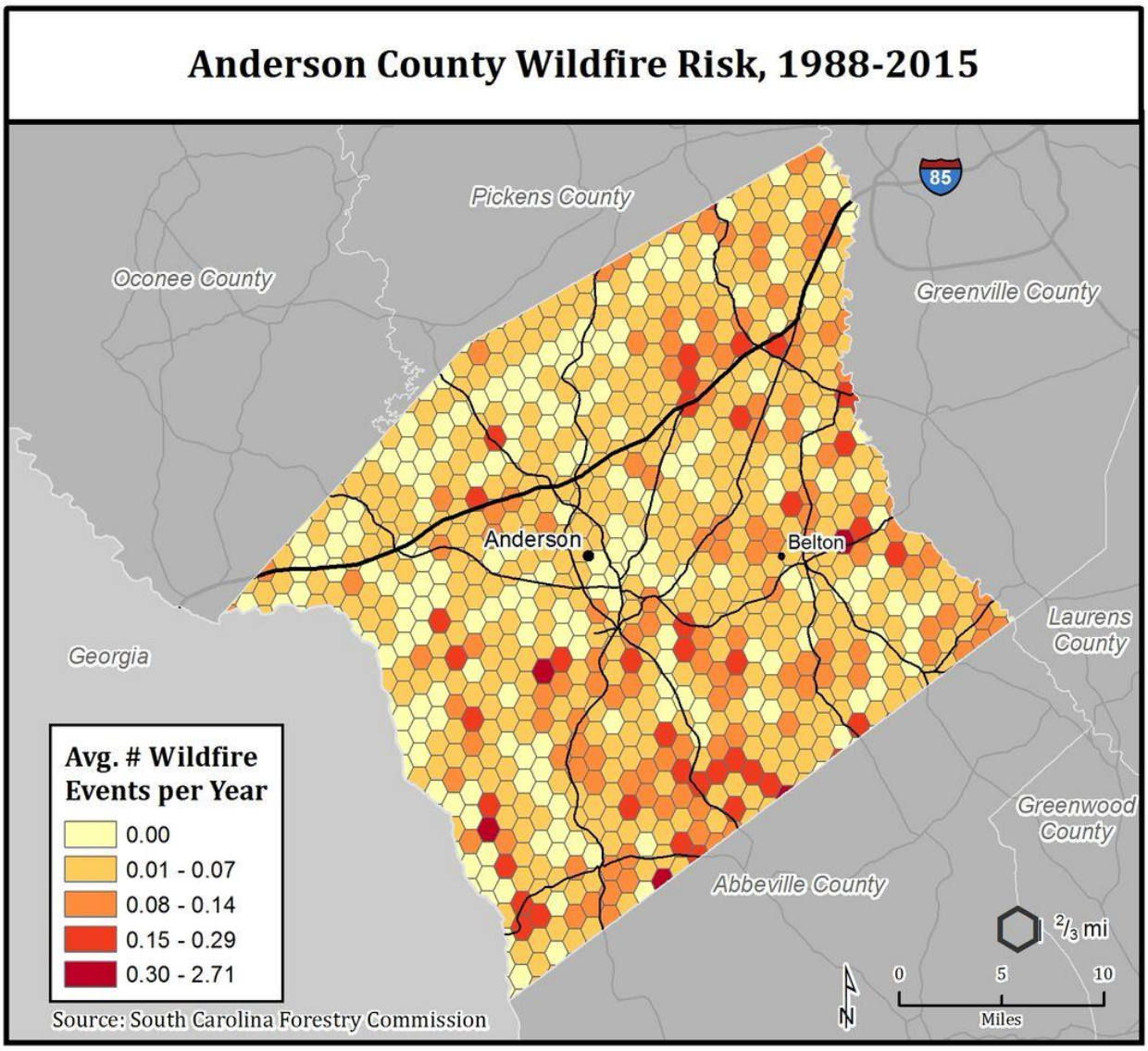
Section 6.3.7- Wildfires

Wildfires are the most common natural hazards in South Carolina. Approximately 5,000 wildfires occur in South Carolina each year. Wildfires can result from natural causes, but most actually result from human actions. The most common cause of fires is arson and debris burning. There is an average of 30,000 acres a year burnt by wildfires in the State (SC Emergency Management Division, 2017). According to the South Carolina Forestry Commission (2017), the cause of fires in South Carolina by percentage are:

Woods Arson – 25-30%
Debris Burning – 35-45%
Equipment Use – 5%
Miscellaneous (fireworks, etc…) – 4-6%
Smoking – 3-4%
Children – 3-5%
Lightning – 2%
Campfires – 1-3%
Railroads – 1-2%

A significant number of forest fires occur in Anderson and Oconee County region. The majority of fires are caused by humans including campfires, smoking, debris burning, incendiary equipment use, and railroads. Although the total number of forest fires in each county is documented, there is not a current database of wildfire locations that can be separated out from land clearing activities that burn timber or any map data that represents precise locations within each county. (Source: South Carolina Forestry Commission)

Wildfires: Anderson County



Anderson County
Extent

Anderson County has experienced 2 notable wildfires from the time frame of 01/01/1960 thru 01/01/2016. A wildfire is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 2 notable wildfires have caused 0.00 injuries to county residents and 0.00 fatalities. These wildfires have caused a collective $103,457.66 in property damage and $239,430.45 in crop damage, adjusted for 2015 inflation.

After extensive research, little to no data was found on wildfires in Anderson County, consistent with the low level of probability. Furthermore, Anderson County was not mentioned in a list of significant South Carolina wildfires, as reported by the South Carolina Forestry Commission, from 1898 to 2016 (https://www.state.sc.us/forest/firesign.htm).

Table 6.3.7-1 – Wildfire Data Summary (Anderson County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Wildfire	3%	0.00	0.00	$103,457.66	$239,430.45

Table 6.3.7-2: Anderson County Notable Wildfires from 1/1/1960- 1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1966	Wildfire	Anderson	0.00	0.00	79,514.6	0.00
1985	Wildfire	Anderson	0.00	0.00	23,943.06	239,430.45
Total:			0.00	0.00	103,457.66	239,430.45

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Wildfire Probability and Vulnerability

Anderson County:

Table 6.3.7-3: Anderson County Probability of a Wildfire

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Anderson	**2**	**55**	**27.5**	**3%**

Vulnerability

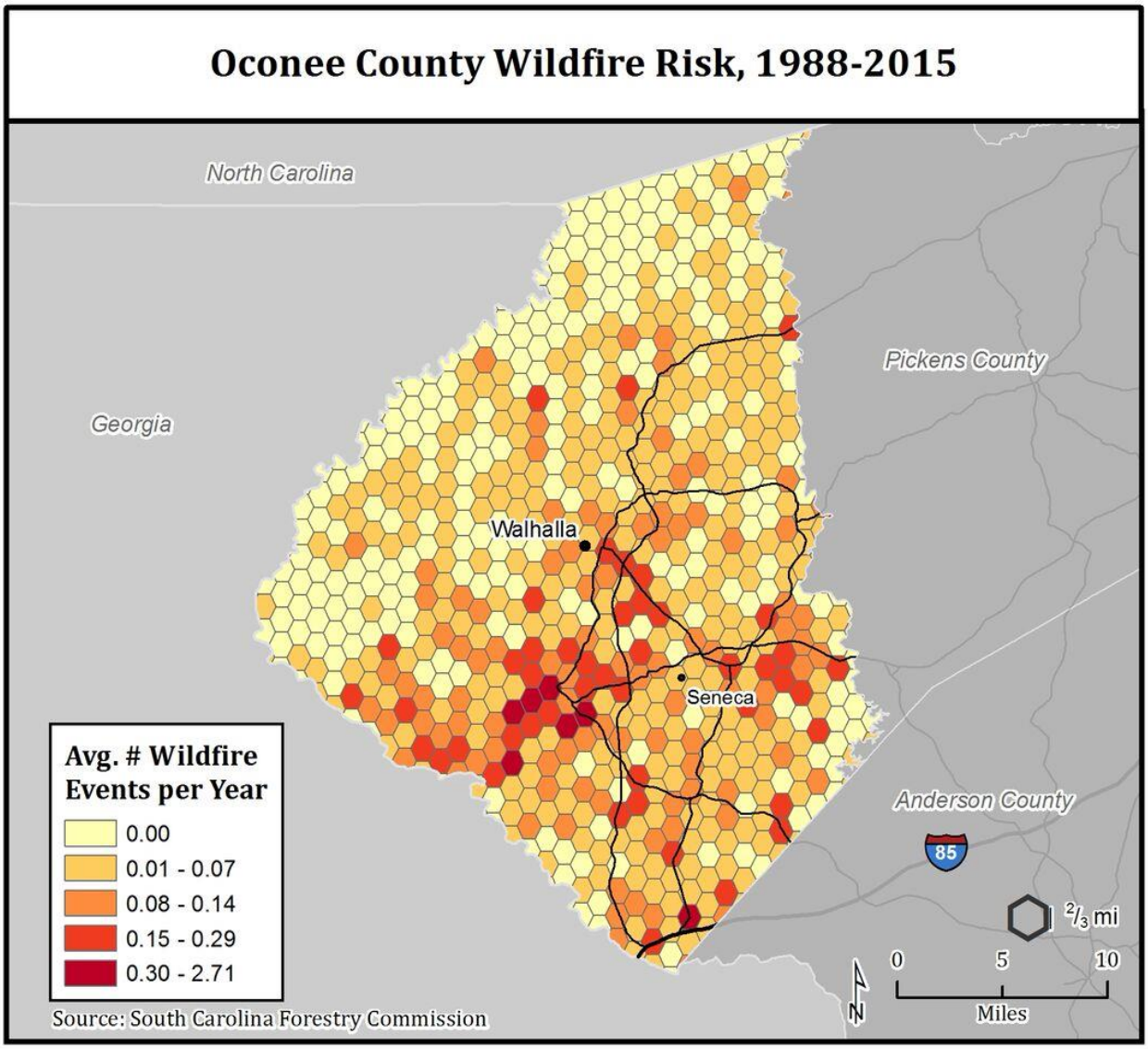
Anderson County

Overall Anderson County has a very low level vulnerability of wildfire events causing significant property damage. The probability of one or more wildfire events causing significant property damage originating in Anderson County is near zero. Since 1988 Anderson County has not experienced any wildfire events causing significant property damage. Examining past wildfire events that have occurred in the County, there have been numerous fires, but they have not caused a great amount of significant reported damage. These wildfire events within the County also have not caused any reported significant property damage within the municipalities. Overall, when taking into consideration the very low probability of fire in the county, and the past history of the event, the county has a very low level vulnerability to wildfire events causing significant property damage while the municipalities have a very low vulnerability to wildfire events causing significant property damage as well. Overall when taking into consideration the very low probability of wildfire events in Anderson County the County has a very low level vulnerability to this hazard causing significant property damage.

Recommendation

Counties and municipalities should consider design and implement a comprehensive community awareness and educational campaign on wildfire event fire danger, targeted at areas of highest risk. Develop capabilities, systems and procedures to pre-deploy fire-fighting resources during times of high wildfire event hazards. Through training and education, prepare local fire departments for wildfire scenarios. Encourage development and dissemination of maps relating to the fire hazard to help educate and assist builders and homeowners in being engaged in wildfire mitigation activities, and to help guide emergency services during response.

Wildfires: Oconee County



Oconee County
Extent

Oconee County has experienced 2 notable wildfires from the time frame of 01/01/1960 thru 01/01/2016. A wildfire is considered notable when it causes at or greater than $50,000 in combined property and crop damages. These 2 notable wildfires have caused 0.00 injuries to county residents and 0.00 fatalities. These wildfires have caused a collective $103,457.66 in property damage and $239,430.45 in crop damage, adjusted for 2015 inflation.

After extensive research, little to no data was found on wildfires in Oconee County, consistent with the low level of probability. Furthermore, Oconee County was not mentioned in a list of significant South Carolina wildfires, as reported by the South Carolina Forestry Commission, from 1898 to 2016 (https://www.state.sc.us/forest/firesign.htm).

Table 6.3.7-4 – Wildfire Data Summary (Oconee County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Wildfire	3%	0.00	0.00	$103,457.66	$239,430.45

Neighboring Pickens County did however experience a significant Pinnacle Mountain Fire in 2016. On Wednesday November 9, 2016 fire spread from a campfire inside Table Rock State Park. As of Wednesday November 16, 2016 the fire size is about 3,283 acres and was 35% contained. A major 'burnout' operation will take place Thursday November 17 to purposely burn over 2,000 acres ahead of the fire in order to starve it of fuel. "This burning operation, undertaken to bring the wildfire under control, will encompass both sides of Table Rock and will extend north to the Table Rock Reservoir, south to the Pinnacle Lake area, and east to the Table Rock State Park boundary near High Low Gap." The Pinnacle Mountain Fire has now been added to the official source inter-agency incident management system, supplying a single point of information on this incident. Please see below link for maps, photos, announcements, etc. Other fires can be found on this site as well:

InciWeb the Incident Information System: Pinnacle Mountain Fire

As of Wednesday Nov23,2016, 7:37pm: Size: 7,282 acres, Containment: 40%

Table 6.3.7-5: Oconee County Notable Wildfire Events from 1/1/1960- 1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1966	Wildfire	Oconee	0.00	0.00	79,514.6	0.00
3/1/1985	Wildfire	Oconee	0.00	0.00	23,943.06	239,430.5
Total:			0.00	0.00	103,457.66	239.430.5

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Wildfire Probability and Vulnerability

Oconee County:

Table 6.3.7-6: Oconee County Probability of a Wildfire

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Oconee	**2**	**55**	**27.5**	**3%**

Vulnerability

Oconee County

Overall, Oconee County has a very low level vulnerability of wildfire events causing significant property damage. The probability of one or more wildfire events causing significant property damage originating in Oconee County is near zero. Since 1988, Oconee County has not experienced any wildfire events causing significant property damage. Examining past wildfire events that have occurred in the County, there have been numerous fires, but they have not caused a great amount of significant reported damage. These wildfire events within the County also have not caused any reported significant property damage within the municipalities. Overall, when taking into consideration the very low probability of fire in the county, and the past history of the event, the county has a very low level vulnerability to wildfire events causing significant property damage while the municipalities have a very low vulnerability to wildfire events causing significant property damage as well. Overall when taking into consideration the very low probability of wildfire events in Oconee County the County has a very low level vulnerability to this hazard causing significant property damage.

Recommendation

Counties and municipalities should consider design and implement a comprehensive community awareness and educational campaign on wildfire event fire danger, targeted at areas of highest risk. Develop capabilities, systems and procedures to pre-deploy fire-fighting resources during times of high wildfire event hazards. Through training and education, prepare local fire departments for wildfire scenarios. Encourage development and dissemination of maps relating to the fire hazard to help educate and assist builders and homeowners in being engaged in wildfire mitigation activities, and to help guide emergency services during response.

6.3.8 – Hurricanes

Hurricanes are severe tropical storms "with winds that have reached a constant speed of 74 miles per hour or more" (FEMA). Hurricanes commonly form in the Caribbean Sea, Atlantic Ocean, and the Gulf of Mexico. Hurricanes can cause devastating effects resulting from violent winds, waves, rains, and floods. In an average year, there are six hurricanes over the Atlantic Ocean. An average of five hurricanes strikes the United States every three years (NOAA). South Carolina is one of the most vulnerable states to hurricanes in the United States (SCEMD).

The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 categorization based on the hurricane's intensity at the indicated time. The scale – originally developed by wind engineer Herb Saffir and meteorologist Bob Simpson – has been an excellent tool for alerting the public about the possible impacts of various intensity hurricanes. The scale provides examples of the type of damage and impacts in the United States associated with winds of the indicated intensity. In general, damage rises by about a factor of four for every category increase. The maximum sustained surface wind speed (peak 1-minute wind at the standard meteorological observation height of 10 m [33 ft] over unobstructed exposure) associated with the cyclone is the determining factor in the scale. (Note that sustained winds can be stronger in hilly or mountainous terrain – such as the over the Appalachians or over much of Puerto Rico – compared with that experienced over flat terrain.) The historical examples provided in each of the categories correspond with the observed or estimated maximum wind speeds from the hurricane experienced at the location indicated. These do not necessarily correspond with the peak intensity reached by the system during its lifetime. It is also important to note that peak 1-minute winds in hurricane are believed to diminish by one category within a short distance, perhaps a kilometer [~ half a mile] of the coastline. For example, Hurricane Wilma made landfall in 2005 in southwest Florida as a Category 3 hurricane. Even though this hurricane only took four hours to traverse the peninsula, the winds experienced by most Miami-Dade, Broward, and Palm Beach County communities were Category 1 to Category 2 conditions. However, exceptions to this generalization are certainly possible.

The scale does not address the potential for other hurricane-related impacts, such as storm surge, rainfall-induced floods, and tornadoes. It should also be noted that these wind-caused damage general descriptions are to some degree dependent upon the local building codes in effect and how well and how long they have been enforced. For example, building codes enacted during the 2000s in Florida, North Carolina and South Carolina are likely to reduce the damage to newer structures from that described below. However, for a long time to come, the majority of the building stock in existence on the coast will not have been built to higher code. Hurricane wind damage is also very dependent upon other factors, such as duration of high winds, change of wind direction, and age of structures.

The following chart shows hurricane levels, wind speed, and the damage that it is able to cause.

Figure 6.3.8-1: Hurricane Force Classifications

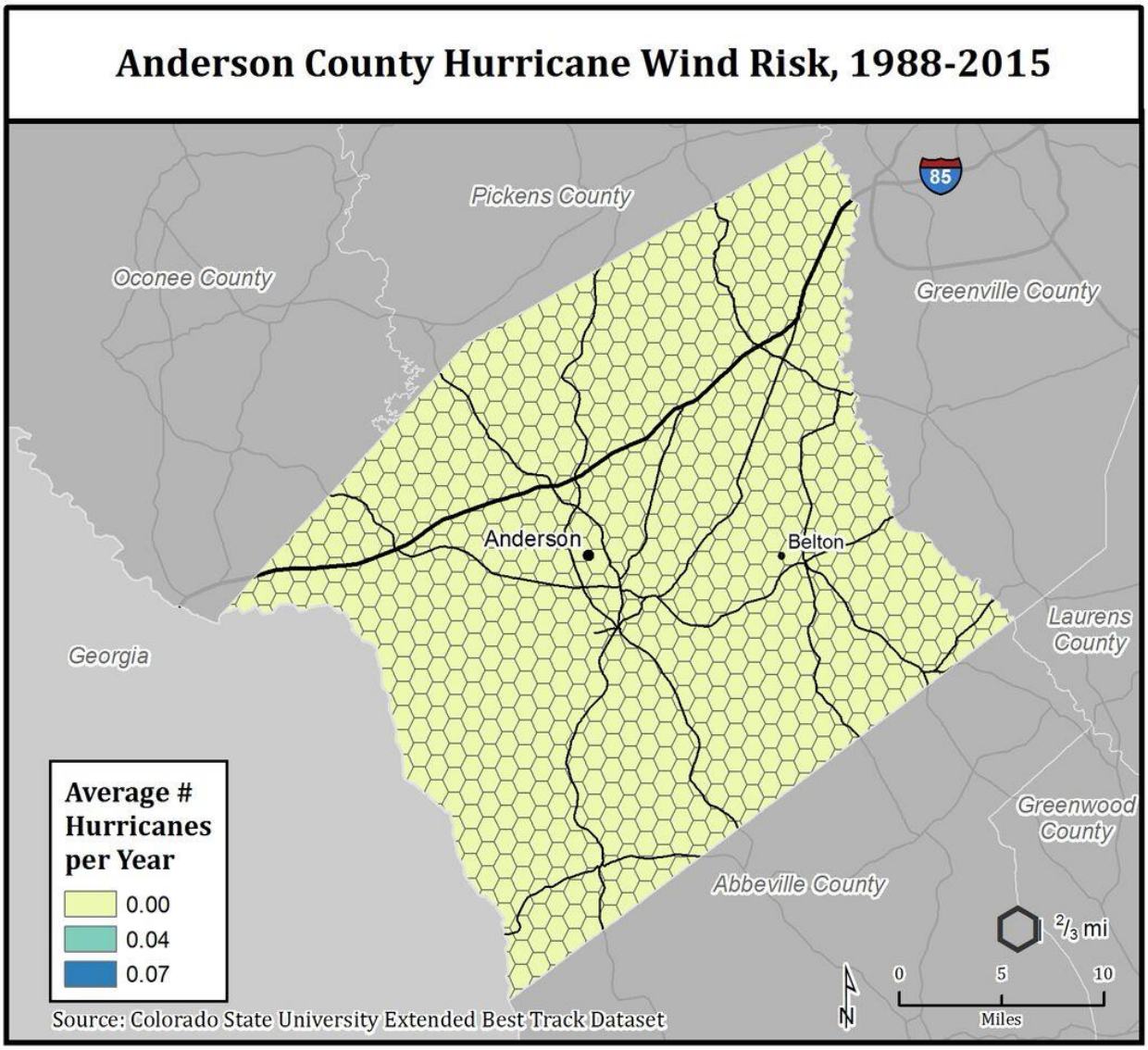
Category	Winds (1 min sustained winds in mph and km/hr)	Summary	People, Livestock, and Pets	Mobile Homes	Frame Homes	Apartments, Shopping Centers, and Industrial Buildings	High-Rise Windows and Glass	Signage, Fences, and Canopies
1	74-95 mph 64-82 kt 119-153 km/hr	*Very dangerous winds will produce some damage*	People, livestock, and pets struck by flying or falling debris could be injured or killed.	Older (mainly pre-1994 construction) mobile homes could be destroyed, especially if they are not anchored properly as they tend to shift or roll off their foundations. Newer mobile homes that are anchored properly can sustain damage involving the removal of shingle or metal roof coverings, and loss of vinyl siding, as well as damage to carports, sunrooms, or lanais.	Some poorly constructed frame homes can experience major damage, involving loss of the roof covering and damage to gable ends as well as the removal of porch coverings and awnings. Unprotected windows may break if struck by flying debris. Masonry chimneys can be toppled. Well-constructed frame homes could have damage to roof shingles, vinyl siding, soffit panels, and gutters. Failure of aluminum, screened-in, swimming pool enclosures can occur.	Some apartment building and shopping center roof coverings could be partially removed. Industrial buildings can lose roofing and siding especially from windward corners, rakes, and eaves. Failures to overhead doors and unprotected windows will be common.	Windows in high-rise buildings can be broken by flying debris. Falling and broken glass will pose a significant danger even after the storm.	There will be occasional damage to commercial signage, fences, and canopies.

2	96-110 mph 83-95 kt 154-177 km/hr	*Extremely dangerous winds will cause extensive damage*	There is a substantial risk of injury or death to people, livestock, and pets due to flying and falling debris.	Older (mainly pre-1994 construction) mobile homes have a very high chance of being destroyed and the flying debris generated can shred nearby mobile homes. Newer mobile homes can also be destroyed.	Poorly constructed frame homes have a high chance of having their roof structures removed especially if they are not anchored properly. Unprotected windows will have a high probability of being broken by flying debris. Well-constructed frame homes could sustain major roof and siding damage. Failure of aluminum, screened-in, swimming pool enclosures will be common.	There will be a substantial percentage of roof and siding damage to apartment buildings and industrial buildings. Unreinforced masonry walls can collapse.	Windows in high-rise buildings can be broken by flying debris. Falling and broken glass will pose a significant danger even after the storm.	Commercial signage, fences, and canopies will be damaged and often destroyed.
3	111-130 mph 96-113 kt 178-209 km/hr	*Devastating damage will occur*	There is a high risk of injury or death to people, livestock, and pets due to flying and falling debris.	Nearly all older (pre-1994) mobile homes will be destroyed. Most newer mobile homes will sustain severe damage with potential for complete roof failure and wall collapse.	Poorly constructed frame homes can be destroyed by the removal of the roof and exterior walls. Unprotected windows will be broken by flying debris. Well-built frame homes can experience major damage involving the removal of roof decking and gable ends.	There will be a high percentage of roof covering and siding damage to apartment buildings and industrial buildings. Isolated structural damage to wood or steel framing can occur. Complete failure of older metal buildings is possible, and older unreinforced masonry buildings can collapse.	Numerous windows will be blown out of high-rise buildings resulting in falling glass, which will pose a threat for days to weeks after the storm.	Most commercial signage, fences, and canopies will be destroyed.

4	131-155 mph 114-135 kt 210-249 km/hr	*Catastrophic damage will occur*	There is a very high risk of injury or death to people, livestock, and pets due to flying and falling debris.	Nearly all older (pre-1994) mobile homes will be destroyed. A high percentage of newer mobile homes also will be destroyed.	Poorly constructed homes can sustain complete collapse of all walls as well as the loss of the roof structure. Well-built homes also can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Extensive damage to roof coverings, windows, and doors will occur. Large amounts of windborne debris will be lofted into the air. Windborne debris damage will break most unprotected windows and penetrate some protected windows.	There will be a high percentage of structural damage to the top floors of apartment buildings. Steel frames in older industrial buildings can collapse. There will be a high percentage of collapse to older unreinforced masonry buildings.	Most windows will be blown out of high-rise buildings resulting in falling glass, which will pose a threat for days to weeks after the storm.	Nearly all commercial signage, fences, and canopies will be destroyed.
5	> 155 mph > 135 kt > 249 km/hr	*Catastrophic damage will occur*	People, livestock, and pets are at very high risk of injury or death from flying or falling debris, even if indoors in mobile homes or framed homes.	Almost complete destruction of all mobile homes will occur, regardless of age or construction.	A high percentage of frame homes will be destroyed, with total roof failure and wall collapse. Extensive damage to roof covers, windows, and doors will occur. Large amounts of windborne debris will be lofted into the air. Windborne debris damage will occur to nearly all unprotected windows and many protected windows.	Significant damage to wood roof commercial buildings will occur due to loss of roof sheathing. Complete collapse of many older metal buildings can occur. Most unreinforced masonry walls will fail which can lead to the collapse of the buildings. A high percentage of industrial buildings and low-rise apartment buildings will be destroyed.	Nearly all windows will be blown out of high-rise buildings resulting in falling glass, which will pose a threat for days to weeks after the storm.	Nearly all commercial signage, fences, and canopies will be destroyed.

Source: NOAA/National Weather Service, National Centers for Environmental Prediction, National Hurricane Center, 11691 SW 17th Street, Miami, Florida 33165

Hurricanes: Anderson County



Anderson County
Extent

Anderson County has experienced 1 notable hurricane from the time frame of 01/01/1960 thru 01/01/2016. A hurricane is considered notable when it causes at or greater than $50,000 in combined property and crop damages. This hurricane caused 0.00 injuries to county residents and 0.00 fatalities. This hurricane caused a collective $217,391.3 in property damage and $3,380.93 in crop damage, adjusted for 2015 inflation.

Hurricanes and tropical storms are irregular visitors to coastal South Carolina. The strongest wind speeds we reasonably expect to experience in Anderson/Oconee county are tropical storm force winds or weaker. The highest recorded wind speed due to a tropical storm was approximately 30 – 40 mph in Anderson County / 35 – 45 mph in Oconee County https://coast.noaa.gov/hurricanes. Since the 2012 Hazard Mitigation Plan was published there have been no reported hurricanes in Anderson County (National Centers for Environmental Information, 2017).

Table 6.3.8-2 – Hurricane Data Summary (Anderson County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Hurricane/ Tropical Storm	1%	0.00	0.00	$217,391.3	$3,380.93

Table 6.3.8-3: Anderson County Notable Hurricanes from 1/1/1960- 1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1995	Hurricane/Tropical Storm	Anderson	0.00	0.00	217391.3	3,380.93
Total:			0.00	0.00	217,391.3	3,380.93

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Hurricane Probability and Vulnerability

Anderson County:

Table 6.3.8-4: Anderson County Probability of a Hurricane

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Anderson	**1**	**55**	**55**	**1%**

Vulnerability

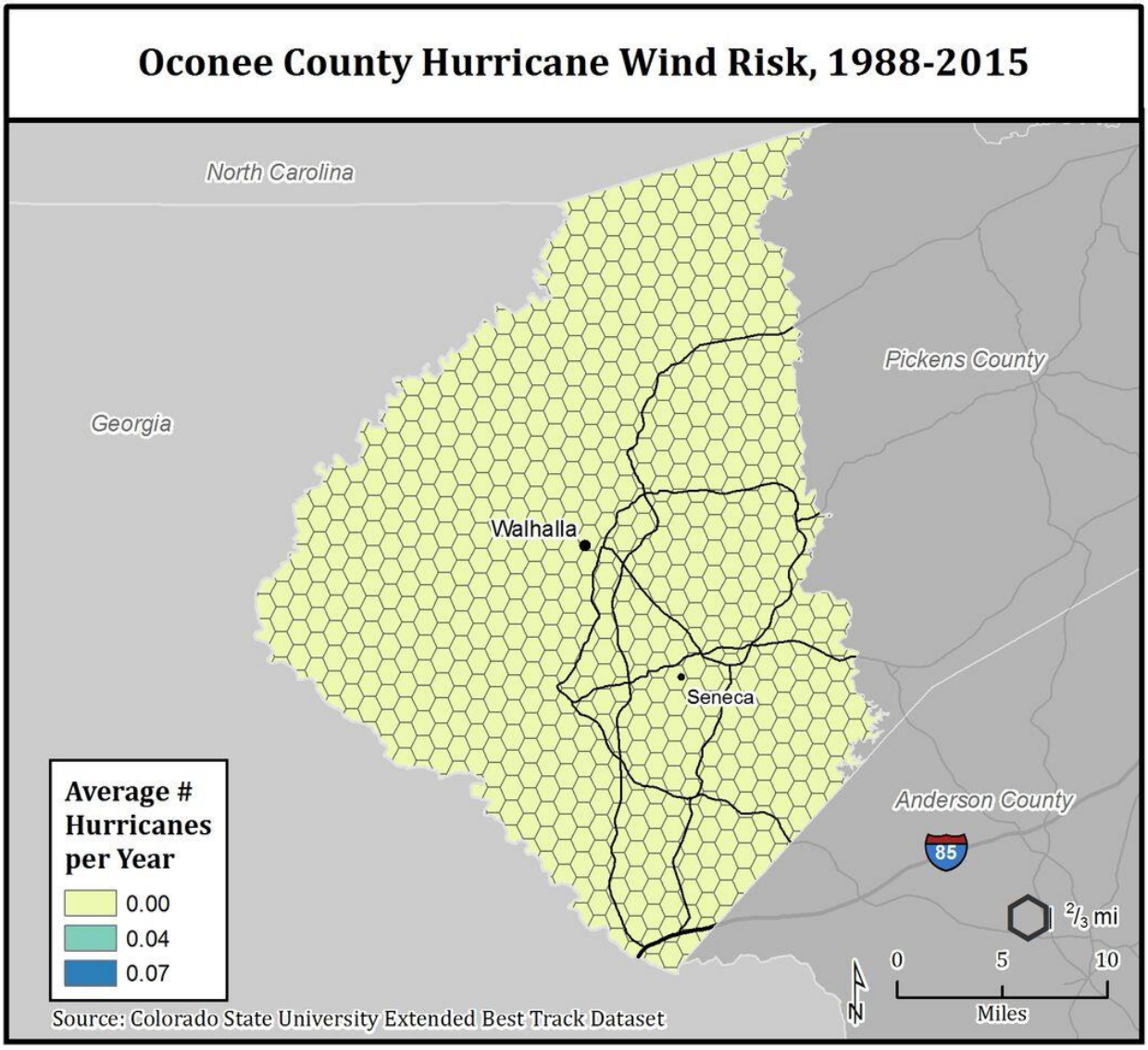
Anderson County

Overall, Anderson County has a very low level vulnerability to hurricanes, primarily due to it being far inland. The probability of hurricane effects in Anderson County is 1% for any given year. While Anderson County is far inland for hurricanes to strike, it is clear from examining past events that hurricane effects do have the potential to do damage within the County. Since hurricane effects may be experienced randomly throughout the county, one jurisdiction has the same chance of this hazard as the rest of the county and its municipalities. Thus each municipality has the same vulnerability as the County.

Recommendation

Early warnings are possibly the best hope for residents when hurricanes strike. Citizens must immediately be aware when a community will be facing a hurricane incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of hurricane events. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

Hurricanes: Oconee County



Oconee County
Extent

Oconee County has experienced 1 notable hurricane/tropical storm from the time frame of 01/01/1960 thru 01/01/2016. A hurricane/tropical is considered notable when it causes at or greater than $50,000 in combined property and crop damages. This hurricane/tropical storm caused 0.00 injuries to county residents and 0.00 fatalities. This hurricane/tropical storm caused a collective $338,093.40 in property damage and $3,380.93 in crop damage, adjusted for 2015 inflation.

Hurricanes and tropical storms are irregular visitors to coastal South Carolina. The strongest wind speeds we reasonably expect to experience in Anderson/Oconee county are tropical storm force winds or weaker. The highest recorded wind speed due to a tropical storm was approximately 30 – 40 mph in Anderson County / 35 – 45 mph in Oconee County (https://coast.noaa.gov/hurricanes. Since the 2012 Hazard Mitigation Plan was published, there have been no reported hurricanes in Oconee County (National Centers for Environmental Information, 2017).

Table 6.3.8-5 – Hurricane/ Tropical Storm Data Summary (Oconee County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Hurricane/ Tropical Storm	1%	0.00	0.00	$338,093.40	$3,380.93

Table 6.3.8-6: Oconee County Notable Hurricanes/Tropical Storm from 1/1/1960- 1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
1995	Hurricane/ Tropical Storm	Oconee	0.00	0.00	338,093.40	3,380.93
Total:			0.00	0.00	338,093.40	3,380.93

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Hurricane Probability and Vulnerability

Oconee County:

Table 6.3.8-7: Oconee County Probability of a Hurricane/Tropical Storm

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Oconee	**1**	**55**	**55**	**1%**

Vulnerability

Oconee County

Overall, Oconee County has a very low level vulnerability to hurricanes, primarily due to it being far inland. The probability of hurricane effects in Oconee County is 1% for any given year. While Oconee County is far inland for hurricanes to strike, it is clear from examining past events that hurricane effects do have the potential to do damage within the County. Since hurricane effects may be experienced randomly throughout the county, one jurisdiction has the same chance of this hazard as the rest of the county and its municipalities. Thus each municipality has the same vulnerability as the County.

Recommendation

Early warnings are possibly the best hope for residents when hurricanes strike. Citizens must immediately be aware when a community will be facing a hurricane incident. Communities that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of hurricane events. A community-wide shelter program should be considered for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

6.3.9- Earthquakes

Earthquake is a term used to describe both sudden slip on a fault and the resulting ground shaking and radiated seismic energy caused by the slip, or by volcanic or magmatic activity, or other sudden stress changes in the earth (USGS). Magnitude and intensity are important to understand when discussing earthquakes. The following information is from the USGS: "Magnitude and Intensity measure different characteristics of earthquakes. Magnitude measures the energy released at the source of the earthquake. Magnitude is determined from measurements on seismographs. Intensity measures the strength of shaking produced by the earthquake at a certain location. Intensity is determined from effects on people, human structures, and the natural environment. (provided by the United States Geological Survey's (USGS) Earthquake Hazards Program).

An earthquake (also known as a quake, tremor or temblor) is the result of a sudden release of energy in the Earth's crust that creates seismic waves. The seismicity or seismic activity of an area refers to the frequency, type and size of earthquakes experienced over a period of time. Earthquakes are measured using observations from seismometers. The moment magnitude (or the partly obsolete Richter magnitude, numerically similar over the range of validity of the Richter scale) of an earthquake is conventionally reported, with magnitude 3 or lower earthquakes being mostly almost imperceptible and magnitude 7 and over potentially causing serious damage over large areas, depending on their depth. The largest earthquakes in historic times have been of magnitude slightly over 9, although there is no limit to the possible magnitude. The most recent large earthquake of magnitude 9.0 or larger was a 9.0 magnitude earthquake in Japan in 2011 (as of March 2011), and it was the largest Japanese earthquake since records began. Intensity of shaking is measured on the modified Mercalli scale. The shallower an earthquake, the more damage to structures it causes, all else being equal. (http://en.wikipedia.org/wiki/Earthquake)

The table on the following page gives intensities that are typically observed at locations near the epicenter of earthquakes of different magnitudes.

Table 6.3.9-1: Magnitude / Intensity Comparison

Magnitude	Typical Maximum Modified Mercalli Intensity
1.0 - 3.0	**I**
3.0 - 3.9	**II - III**
4.0 - 4.9	**IV - V**
5.0 - 5.9	**VI - VII**
6.0 - 6.9	**VII - IX**
7.0 and higher	**VIII** or higher

Abbreviated Modified Mercalli Intensity Scale

I. Not felt except by a very few under especially favorable conditions.

II. Felt only by a few persons at rest, especially on upper floors of buildings.

III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.

IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cacking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.

V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.

VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.

VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.

VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.

X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.

XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air From The Severity of an Earthquake.

Earthquake: Anderson County

Anderson County
Extent

Anderson County has experienced no notable earthquakes from the time frame of 01/01/1960 thru 01/01/2016. An earthquake is considered notable when it causes at or greater than $50,000 in combined property and crop damages. Earthquakes have caused 0.00 injuries to county residents and 0.00 fatalities. Additionally, earthquakes have caused no property or crop damage.

After extensive research, little data on earthquakes in Anderson County was found, consistent with the low level of probability. However, according to city-data.com, Anderson's historical earthquake is slightly above the South Carolina average, but below the national average. The chart below lists earthquakes that have occurred near Anderson City and the magnitude of each earthquake:

Date:	Magnitude:	Distance:
4/29/2003	4.9	Occurred 169.9 miles away from city center
8/21/1992	4.4	Occurred 177.4 miles away from city center
7/27/1980	5.2	Occurred 265.2 miles away from city center
8/2/1974	4.9	Occurred 45.4 miles away from city center
11/22/1974	4.7	Occurred 182.3 miles away from city center
11/30/1973	4.7	Occurred 115.8 miles away from city center

Table 6.3.9-2 – Earthquake Data Summary (Anderson County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Earthquake	0%	0.00	0.00	$0.00	$0.00

Table 6.3.9-3: Anderson County Notable Earthquakes from 1/1/1960- 1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
Total:		Anderson	0.00	0.00	0.00	0.00

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Earthquake Probability and Vulnerability

Anderson County:

Table 6.3.9-4: Anderson County Probability of an Earthquake

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Anderson	**0**	**55**	**0**	**0%**

Vulnerability

Anderson County

Overall Anderson County has a very low level vulnerability to earthquakes. The probability of one or more earthquake epicenters to originate in Anderson County is near 0%. The County has not experienced any earthquakes that have resulted in significant damage. Overall when taking into consideration the very low probability of earthquakes in Anderson County, the County has a very low level vulnerability to this hazard.

Recommendation

Local governments should encourage residents to purchase earthquake hazard insurance. Local governments should consider establishing structurally sound emergency shelters in several parts of the county. The community would also benefit from an education program to inform citizens and developers of the causes and likely locations and dangers of earthquakes.

Earthquakes: Oconee County

Oconee County
Extent

Oconee County has experienced no notable earthquakes from the time frame of 01/01/1960 thru 01/01/2016. An earthquake is considered notable when it causes at or greater than $50,000 in combined property and crop damages. Earthquakes have caused 0.00 injuries to county residents and 0.00 fatalities. Additionally, earthquakes have caused no property or crop damage.

After extensive research, little data on earthquakes in Oconee County was found, consistent with the low level of probability. However, according to city-data.com, Oconee's historical earthquake is slightly above the South Carolina average, but below the national average. The chart below lists earthquakes that have occurred near Oconee County and the magnitude of each earthquake:

Date:	Magnitude:	Distance:
4/29/2003	4.9	Occurred 149.9 miles away from county center
7/27/1980	5.2	Occurred 246.8 miles away from county center
8/2/1974	4.9	Occurred 65.8 miles away from county center
11/22/1974	4.7	Occurred 207.6 miles away from county center
11/30/1973	4.7	Occurred 91.9 miles away from county center

Table 6.3.9-5 – Earthquake Data Summary (Oconee County)

Hazard	Frequency	Injuries	Fatalities	Property Damage	Crop Damage
Earthquake	0%	0.00	0.00	$0.00	$0.00

Table 6.3.9-6: Oconee County Notable Earthquakes from 1/1/1960- 1/1/2016

SHELDUS
Query results

Begin Date	Hazard Type	County	Injuries	Fatalities	Property Damage*	Crop Damage*
Total:		Oconee	0.00	0.00	0.00	0.00

Source: Hazards & Vulnerability Research Institute, Department of Geography, University of South Carolina, Columbia, South Carolina 29208

Earthquake Probability and Vulnerability

Oconee County:

Table 6.3.9-7: Oconee County Probability of an Earthquake

County	Number of Events	Years	Recurrence Intervals (years)	Hazard Frequency (% change/year)
Oconee	**0**	**55**	**0**	**0%**

Vulnerability

Oconee County

Overall Oconee County has a very low level vulnerability to earthquakes. The probability of one or more earthquake epicenters to originate in Oconee County is near 0%. The County has not experienced any earthquakes that have resulted in significant damage. Overall when taking into consideration the very low probability of earthquakes in Oconee County, the County has a very low level vulnerability to this hazard.

Recommendation

Local governments should encourage residents to purchase earthquake hazard insurance. Local governments should consider establishing structurally sound emergency shelters in several parts of the county. The community would also benefit from an education program to inform citizens and developers of the causes and likely locations and dangers of earthquakes.

6.3.10 Summary of Loss Statistics

The following charts illustrate Summary of Loss Statistics for Anderson and Oconee County for the most likely occurring hazards.

Table 6.3.10-1 Summary of Loss Statistics Anderson County:

HAZARD	FREQENCY	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Winter Storms	27	1.31	0.90	$16,262,789.60	$17,144,152.30
HAIL Storms / Thunderstorms	11	2.20	0.00	$2,826,726.48	$856,759.00
Lightning Severe Storms / Thunderstorms	36	3.16	0.69	$12,973,595.30	1, 272,517.57
TORNADOES / HIGH WINDS	38	12.90	0.00	$9,846,961.62	$897,347.99
DROUGHT/HEAT WAVE	8	0.00	0.00	$9,652,956.04	$16,626,262.60
FLOODS	13	1.83	0.50	$3,731,112.02	$447,590.73

Table 6.3.10-2 Summary of Loss Statistics Oconee County:

HAZARD	FREQENCY	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Winter Storms	28	1.03	1.77	$12,747,423.50	$19,724,707.00
HAIL Storms / Thunderstorms	7	0.20	0.00	$1,062,253.17	$480,764.70
Lightning Severe Storms / Thunderstorms	23	0.53	0.19	$8,205,491.24	1,019,681.83
TORNADOES / HIGH WINDS	18	15.20	1.00	$7,082,597.70	$5,163,176.88
DROUGHT/HEAT WAVE	8	0.00	0.00	$9,652,956.04	$16,626,262.60
FLOODS	10	2.66	0.67	$7,886,851.53	$452,521.99

6.4 Methodology for Identifying Natural Hazards for Additional Analysis.

In accordance with the requirements of the Interim Final Rule, all hazards with potential to affect Anderson and Oconee Counties are profiled in the present section of the Plan. However, because this is a regional-level hazard mitigation plan, it is useful to identify the hazards that are of the most concern, so these can be the focus of more detailed assessment. It is important to note, however, that many hazards and risks are very site-specific, so as local municipalities perform more detailed risk assessments and identify mitigation actions they should recognize that this process and the resulting table should be used only as a guide.

Various national, regional and local sources were used to identify and classify different hazards for Anderson and Oconee Counties.

The criteria used were:

1. History – incorporating historical accounts and records that the hazard has affected the county often in the past, and that the hazard has occurred often and/or with widespread or severe consequences.

2. **Potential for mitigation** – acknowledging that there are ways to address the hazard, and that the methods are technically feasible and have the potential to be cost-effective [i.e. mitigation measures are available at a reasonable cost, and damages to property, lives and/or community functions would be reduced or eliminated.]

3. **Presence of susceptible areas or vulnerability** – indicating that Anderson and Oconee Counties have numerous facilities, operations or populations that may be subjected to damage from the hazard.

4. **Data availability** – demonstrating that sufficient quality data is available to permit an accurate and comprehensive risk assessment.

5. **Federal disaster declarations and local emergency declarations** – noting that Anderson and Oconee Counties have received numerous disaster declarations for the particular hazard.

The table on the following pages lists the hazards, describes the rationale for identifying (or not identifying) hazards as significant, shows sources of information that were consulted for the determination, and the disposition of the hazard with regard to hazard identification and risk assessment in this Plan. The initial hazards of the table are those that were identified by the Anderson and Oconee County HMPC as significant enough to warrant a full risk assessment.

Table 6.4-1: Anderson & Oconee Counties Qualitative Hazard Ranking:

HAZARD #	HAZARD	RATIONAL	SOURCE	DISPOSITION
1	Winter Storms	Moderate annual probability, widespread impacts, but losses generally limited except in most extreme events.	NOAA and National Climatic Data Center (NCDC) records, National Weather Service, Hazards & Vulnerability Research Institute Department of Geography University of South Carolina.	Profile and risk assessment
2	Hail Storms/ Thunderstorms	Low annual probability, widespread impacts, but losses generally limited except in most extreme events.	NOAA and National Climatic Data Center (NCDC) records, National Weather Service, Hazards & Vulnerability Research Institute Department of Geography University of South Carolina.	Profile and risk assessment
3	Lightning Severe Storms / Thunderstorms	High moderate annual probability, widespread impacts, but losses generally limited except in most extreme events.	NOAA and National Climatic Data Center (NCDC) records, National Weather Service (NWS). Hazards & Vulnerability Research Institute Department of Geography University of South Carolina.	Profile and risk assessment
4	Tornadoes/High Winds	Moderate annual probability, widespread impacts, but losses generally limited except in most extreme events.	NOAA and National Climatic Data Center (NCDC) records. Hazards & Vulnerability Research Institute Department of Geography University of South Carolina.	Profile and risk assessment

HAZARD #	HAZARD	RATIONAL	SOURCE	DISPOSITION
5	Drought/Heat Wave	Low annual probability, widespread impacts, but losses generally limited except in most extreme events.	NOAA and National Climatic Data Center (NCDC) records. Hazards & Vulnerability Research Institute Department of Geography University of South Carolina.	Profile and risk assessment
6	Floods	Low annual probability, widespread impacts, history of occurrences in the county, potentially significant annual damages	FEMA Flood Insurance Studies, FEMA Flood Insurance Rate Maps, FEMA Public Assistance records, FEMA National Flood Insurance Program claims data, US Army Corps of Engineers (USACE), and National Oceanographic and Atmospheric Administration (NOAA), studies and records. Hazards & Vulnerability Research Institute Department of Geography University of South Carolina.	Profile and risk assessment
7	Wildfires	Low annual probability of site-specific events, but impacts generally limited	Forest Service, Hazards & Vulnerability Research Institute Department of Geography University of South Carolina.	Profile and risk assessment
8	Hurricanes	Hurricanes: Relatively low historic probability; potential for widespread impacts. Tropical Storms: Low to moderate probability; potential for widespread impacts Nor'easters: Moderate probability of more extreme events, potential for moderately widespread impacts.	NOAA and National Climatic Data Center (NCDC) records, National Hurricane Center, NOAA Coastal Service Center – Historic Hurricane Tracks database, Hazards & Vulnerability Research Institute Department of Geography University of South Carolina.	Profiled, but not part of detailed risk assessment
9	Earthquakes	Low annual probability.	United States Geologic Survey (USGS), Hazards & Vulnerability Research Institute Department of Geography University of South Carolina.	Profiled, but not part of detailed risk assessment

6.5 Future Development Trends

The land development trend in Anderson and Oconee counties over the last 50 years has been rural style developments with large lots in the unincorporated portions of the counties. Development has caused little change in the counties except for calls for increased services in the vicinity of larger municipalities. Growth within the municipal boundaries has been moderate and the area wide economy has seemingly benefited from the associated growth.

Since the 2012 Hazard Mitigation Plan was published, Anderson County and Oconee County have implemented Critical Infrastructure Projects and development increasing the quality of life for citizens by way of infrastructure expansion and economic growth. These projects increase resiliency, and allow for both municipal and county governments to effectively maintain continuity of government operations, ensuring leadership and emergency responders are able to execute preparation, mitigation, response, and recovery efforts to all natural or manmade disasters. For a further detailed explanation of past and future development trends, see the Land Use, Transportation, and Priority Investment sections of both the Anderson County and Oconee County Comprehensive plans.

Anderson County Comprehensive Plan:
http://www.andersoncountysc.org/Portals/0/Departments/Planning%20and%20Community%20Development/Documents/2016%20Comprehensive%20Plan_FINAL.pdf?ver=2016-10-20-140028-377

Oconee County Comprehensive Plan:
http://www.oconeesc.com/Portals/0/Documents/Planning/oconeecounty_comprehensive_plan.pdf

Currently each County and their municipalities are working to update their comprehensive plans and land use maps. Once completed, these maps can be compared against the mapped hazard areas to determine if any designated growth areas lie within the identified hazard areas. In the future each County will try to determine how the growth areas in each of the municipalities and the county intersect with hazard areas and include this information in future plan updates.

Future building locations are governed by zoning and building code regulations in each County and by most of the municipalities. These regulations prevent the location of buildings in flood plains. Therefore, the only losses to future buildings should be in cases where random natural events like tornadoes or fires occur. Since these events are random, each County and the municipal governments strive to place and secure future buildings in locations that offer them the best protection possible from natural hazards.

6.6 Summary of Risk Assessment

These figures must be considered with some caution because of the underlying data and assumptions that were used in the analyses. After determining the annual figures for damages, deaths and injuries for each County, the risk assessment comprises a simple projection of future expected damages based on a standard present value coefficient of 14.27. This represents a 100-year time horizon and a 7% discount rate. These figures have been combined to calculate the natural hazard risks presented below. Although these summary data compare risk by the same planning horizon, it is important to recognize that, generally speaking, mitigation efforts are highly localized. Although the table shows County-wide risk, many of the hazards are difficult or impossible to mitigate on a large scale.

Table 6.6-1 - Summary of Projected Estimated Loss Statistics Anderson County:

HAZARD	PROPERTY DAMAGE	CROP DAMAGE
Winter Storms	$232,070,008.00	$244,647,053.00
HAIL Storms / Thunderstorms	$11,416,000.00	$12,225,950.90
Lightning Severe Storms / Thunderstorms	$185,133,205.00	$18,158,825.7
TORNADOES / HIGH WINDS	$137,747,691.00	$12,805,155.80
DROUGHT/HEAT WAVE	$137,747,683.00	$237,256,767.00
FLOODS	$53,242,968.5	$6,387,119.72

Table 6.6-2 - Summary of Projected Estimated Loss Statistics Oconee County:

HAZARD	PROPERTY DAMAGE	CROP DAMAGE
Winter Storms	$181,905,733.00	$281,471,569.00
HAIL Storms / Thunderstorms	$15,158,352.70	$6,860,512.27
Lightning Severe Storms / Thunderstorms	$117,092,360.00	$14,550,859.7
TORNADOES / HIGH WINDS	$101,068,669.00	$73,678,534.1
DROUGHT/HEAT WAVE	$137,747,683.00	$237,256,767.00
FLOODS	$112,545,371.00	$6,457,488.80

After determining the annual figures for damages, the risk assessment comprises a simple projection of future expected damage based on estimates provided by research with County tax assessor, and the U.S. Census Bureau. Average Anderson County home value is $110,00 and average commercial value $249, 476. Average Oconee County home value is $125,000 and average commercial value is $246,800.

Table 6.6-3 - Summary of Total Projected Estimated Loss Anderson County Loss Estimation:

Type of Buildings	Number	Average Value	Projected Loss Total:
Residential	83,004	$110,000	$9,130,440,000.00
Commercial	5,630	$249, 476	$1,404,550,000.00
Non-Residential	27,051	$67,257	$1,819,369,000.00

Table 6.6-4 - Summary of Total Projected Estimated Loss Oconee County Loss Estimation:

Type of Buildings	Number	Average Value	Projected Loss Total:
Residential	43,440	$125,000	$543,000,000
Commercial	2,425	$246,800	$598,490,000
Non-Residential	1,286	$150,000	$192,900,000

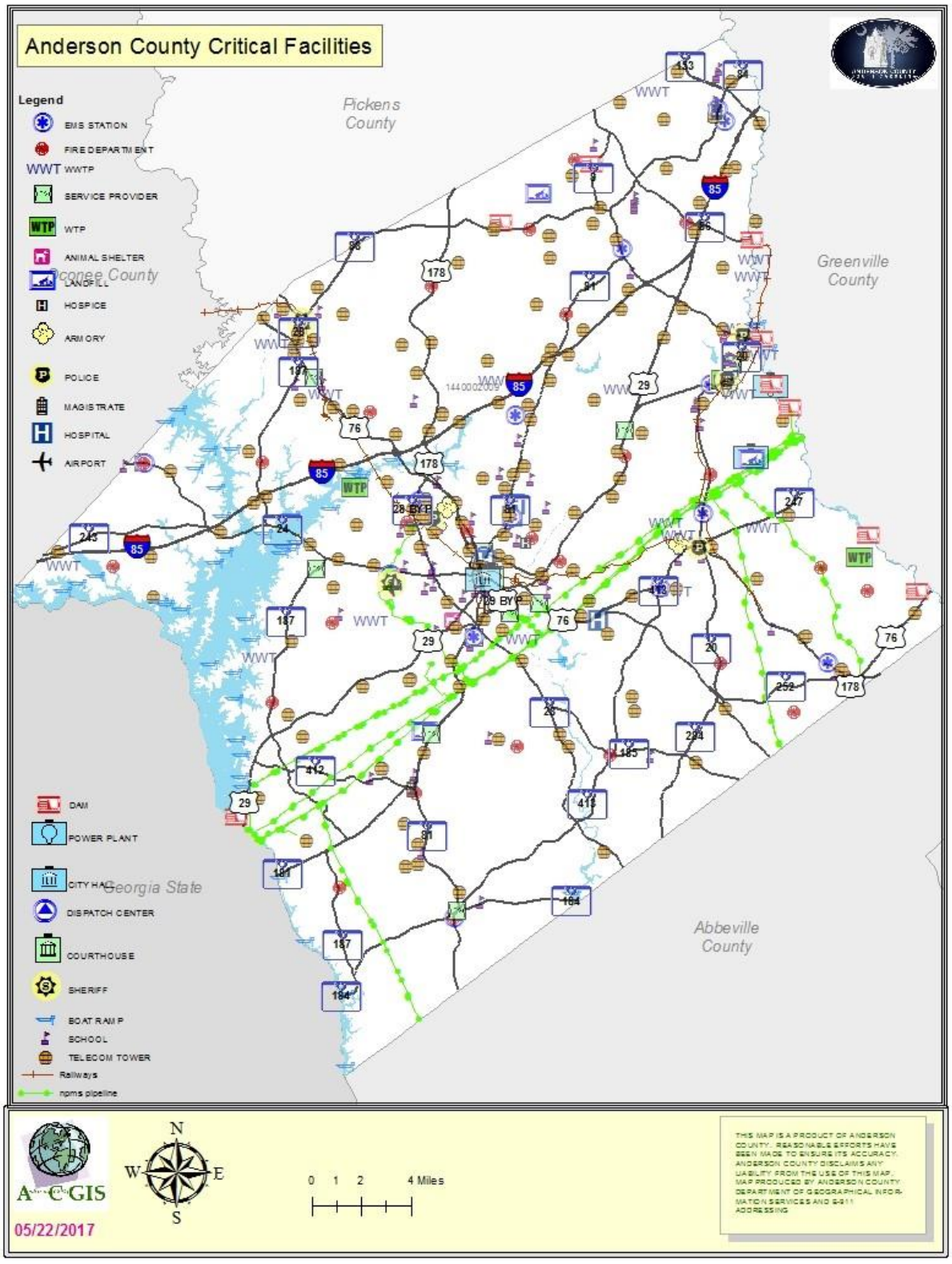
Source: Anderson County Tax Assessor, Mike Freeman; Oconee County GIS Office, Lisa Simmering

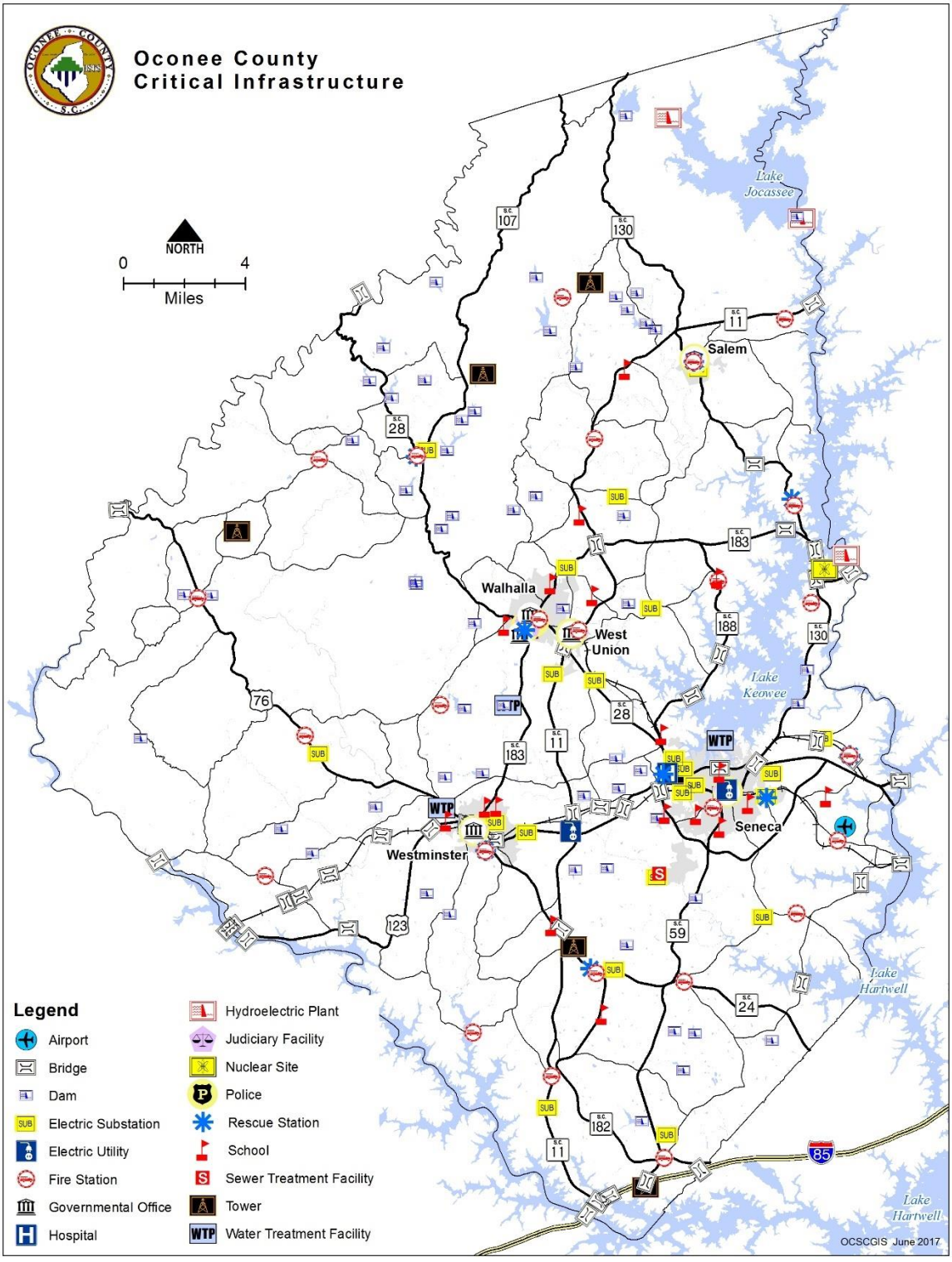
6.7 Natural Hazard Risk to Critical Facilities

Generally speaking, critical facilities are those assets and operations that are essential to a jurisdiction maintaining functionality, especially during and after emergencies or significant natural hazard events. There is a range of facilities that can be categorized as critical, including:

- Police, fire, and dispatch facilities
- Water and wastewater treatment plants
- Hospitals (in particular, trauma centers)
- Electric Power Facilities
- State Buildings
- Key infrastructure, such as bridges, roads, and railways
- Lifelines, in particular utility lines (water, electricity, gas)
- Dams
- Schools

The following maps identify Anderson and Oconee County critical facilities:


Anderson County Critical Facilities
Legend
EMS STATION
FIRE DEPARTMENT
WWTP
SERVICE PROVIDER
WTP
ANIMAL SHELTER
LANDFILL
HOSPICE
ARMORY
POLICE
MAGISTRATE
HOSPITAL
AIRPORT
DAM
POWER PLANT
CITY HALL
DISPATCH CENTER
COURTHOUSE
SHERIFF
BOAT RAMP
SCHOOL
TELECOM TOWER
Railways
npms pipeline
Pickens County
Oconee County
Greenville County
Georgia State
Abbeville County
N
W
E
S
0 1 2 4 Miles
05/22/2017
THIS MAP IS A PRODUCT OF ANDERSON COUNTY. REASONABLE EFFORTS HAVE BEEN MADE TO ENSURE ITS ACCURACY. ANDERSON COUNTY DISCLAIMS ANY LIABILITY FROM THE USE OF THIS MAP. MAP PRODUCED BY ANDERSON COUNTY DEPARTMENT OF GEOGRAPHICAL INFORMATION SERVICES AND E-911 ADDRESSING


Oconee County
Critical Infrastructure
NORTH
0
4
Miles
Lake Jocassee
Salem
Walhalla
West Union
Lake Keowee
Seneca
Westminster
Lake Hartwell
OCSCGIS June 2017
Legend
Airport
Bridge
Dam
Electric Substation
Electric Utility
Fire Station
Governmental Office
Hospital
Hydroelectric Plant
Judiciary Facility
Nuclear Site
Police
Rescue Station
School
Sewer Treatment Facility
Tower
Water Treatment Facility

6.8 Social Vulnerability

According to social science research, certain social descriptors can help to portray populations that are vulnerable to natural hazards. Factors such as age, gender, race, housing, and income can be indicators of vulnerability. Social vulnerability maps have been created to portray the most socially vulnerable census block groups in each county. The University of South Carolina has determined the method for determining social vulnerability. This methodology was carried out by the Appalachian Council of Governments in the initial preparation of this mitigation plan and for the review of the plan by Anderson and Oconee Counties described follows:

There are eight vulnerable population subgroups. These subgroups are the following: number of people less than 18 years, number of people over 65 years of age, number of females, number of non-whites, number of housing units, total population, number of mobile homes, and mean house value. The following is USC's reasoning behind using these eight social factors.

1. Number of people less than 18 years of age:

This variable is useful as an indicator of the location of dependent populations. Particularly the youngest members of this population group will need assistance during a hazard event and are more prone to respiratory distress from inhaled toxins. This population may also have less ability to recover quickly after a disaster.

2. Number of people over 65 years of age:

This variable is useful as an indicator of the location of dependent populations. Particularly the oldest members of this population group will need assistance during a hazard event and are more prone to respiratory distress from certain inhaled toxins. This population may also have less ability to recover quickly after a disaster.

3. Number of females:

This variable has been shown in the social science literature to be correlated with a lack of resources and influence, limiting the range of adjustments available to them during an emergency. Certain toxins are also threats to women's reproductive health. This population may also have less ability to recover quickly after a disaster.

4. Number of non-whites:

Often correlated with a lack of resources, race has also been shown by some research to exist alongside less desired land used that includes industry and transportation networks. This population may also have less ability to recover quickly after a disaster.

5. Number of housing units:

Determining the intersection of hazard zones and areas occupied by humans drives the hazards assessment. The number of housing units serves as an indicator of where the greatest number of people reside, an important consideration when combined with known areas of hazard occurrence.

6. Total population:

Like housing units, the total population variable is an important consideration when combined with known areas of hazard occurrence. While these data could also be used to determine population density, raw population numbers are used since there is the potential to mask important information. Two census blocks may have the same population density, or the same percentage of elderly, but one may have a vastly greater number of people, and important consideration from an evacuation standpoint.

7. Number of mobile homes:

This variable is an indicator of housing stock that is of a lower structural quality than standard housing. Hazards with high wind speeds are particularly troublesome for this type of housing construction.

8. Mean house value:

This variable is used as a surrogate measure of income. Mean house value however can indicate the economic statues of individuals. Lower house values may indicate a more vulnerable population due to a lack of resources for mitigation and recovery or housing that is of a lower structural quality.

Calculating Social Vulnerability Scores

According to the USC, the method for calculating the socially vulnerable areas is the same for each variable except for mean housing value. For the seven, the percentage for each was determined by dividing the number of each variable in the block group by the total number of that variable for the entire county and then scaled for final vulnerability summation.

Example 1.

Step 1: Calculate X

X= # of Mobile Homes in Census Block Groups

# of Mobile Home in County

This determines the percent of the county's mobile homes in each block.

Step 2: Calculate Mobile Home Score by dividing X by maximum X

Mobile Home Score= X/maximum X

This places values in the same scale as other social variables.

Example 2.

Step 1: Calculate X

X= County Average Mean House Value – Mean House Value for Census Block Group

This determines how different each block is from the county mean.

Step 2: Calculate Y

Y= X + Absolute Value of Maximum X

This removes all of the negative values

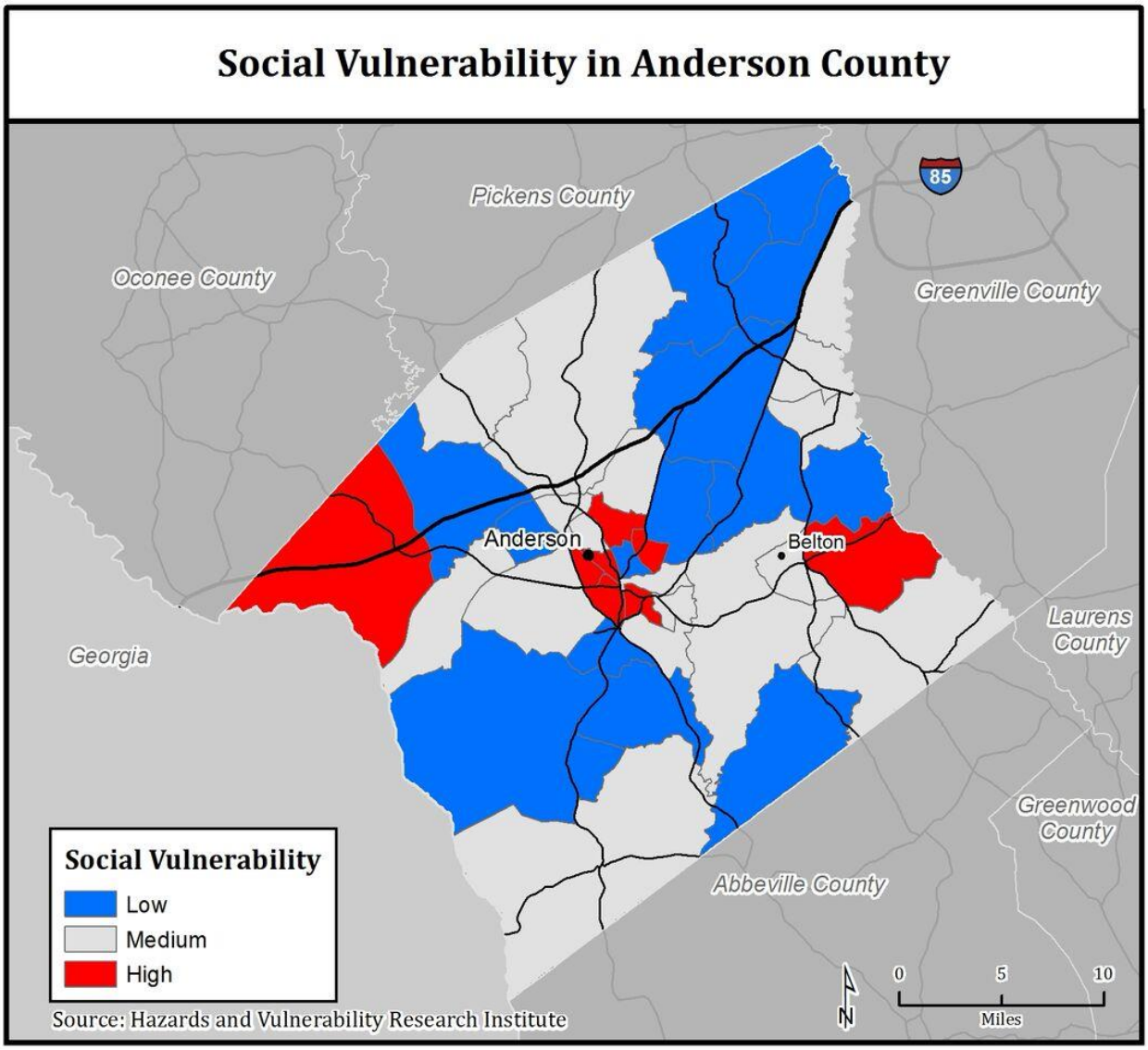
Step 3: Calculate Mean House Value Score

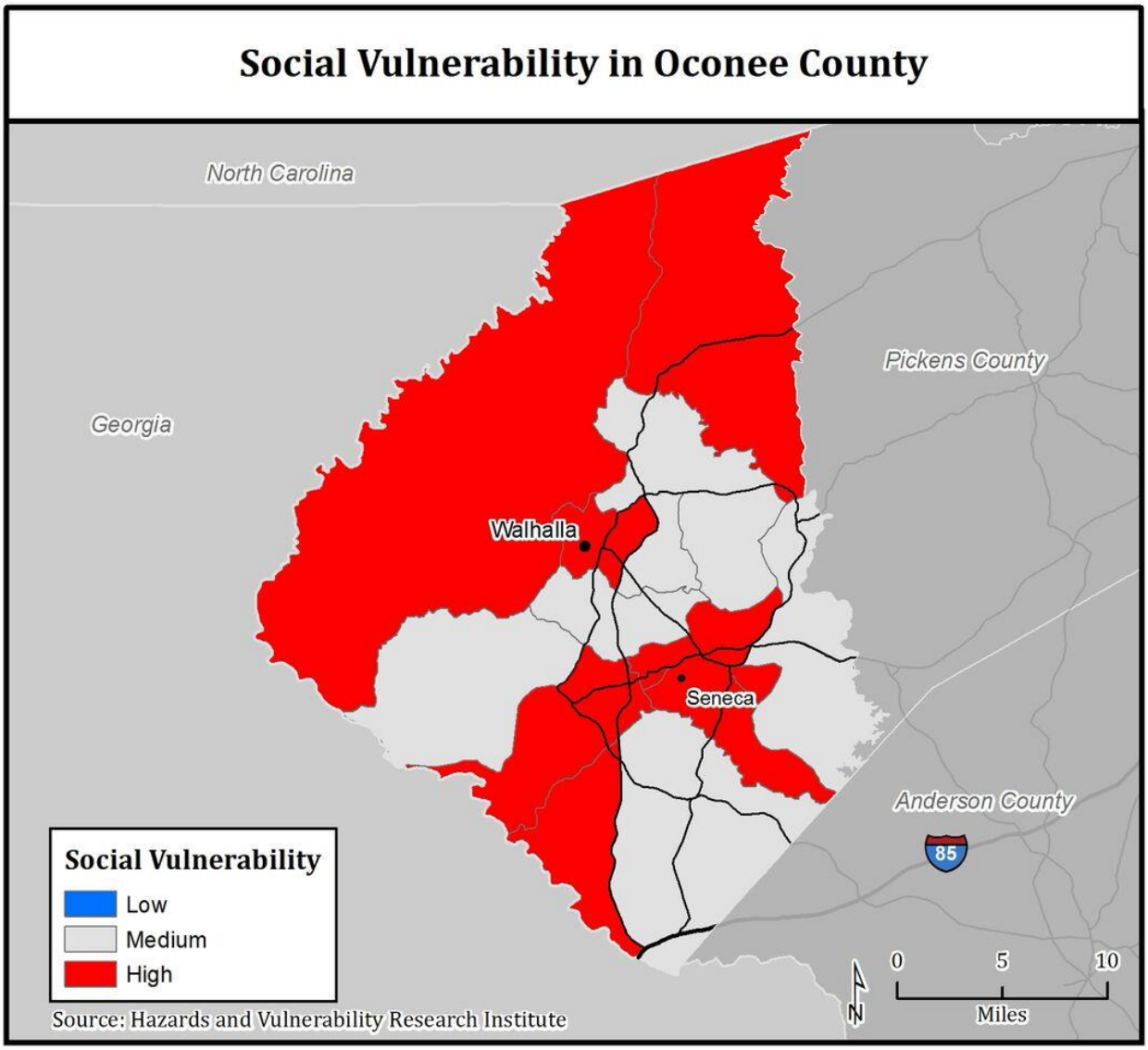
Mean House Value Score= Y/maximum Y

This places values in the same scale as other social variables.

Overall Social Vulnerability Scores

The social vulnerability scores for each social factor are added up for each block group in the county. The block groups can then be compared to each other to determine the most socially vulnerable population to natural hazards. These numbers have been applied to each county map to visually portray the most socially vulnerable areas. Those with lower scores (1-2) are much less vulnerable than those with higher scores (6-8). The maps show the most socially vulnerable areas to natural hazards within the counties.


Social Vulnerability in Anderson County
Pickens County
Oconee County
Greenville County
85
Anderson
Belton
Georgia
Laurens County
Greenwood County
Abbeville County
Social Vulnerability
Low
Medium
High
Source: Hazards and Vulnerability Research Institute
N
0
5
10
Miles


Social Vulnerability in Oconee County
North Carolina
Georgia
Pickens County
Anderson County
Walhalla
Seneca
85
Social Vulnerability
Low
Medium
High
Source: Hazards and Vulnerability Research Institute
N
0
5
10
Miles

Chapter 7
Mitigation Strategy

Chapter 7
Mitigation Strategy
Contents of this Section

7.1 IFR Requirements for Mitigation Strategy
7.2 Mitigation Goals and Accomplishments
7.3 Mitigation Objectives and Strategies
7.4 Prioritized Mitigation Actions and Projects

As mentioned elsewhere, during the 2017 Plan Update portions of the original HMP were preserved, including many of the terms and language. This Section includes various elements from the original 2006 version of the Plan. The update also includes discussion about progress on the goals, strategies and actions from the 2006 version of the HMP. This information is found in Section 7.2 (Mitigation Goals and Accomplishments).

7.1 IFR Requirements for Mitigation Strategy

> ***IFR §201.6(c)(3):*** *The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.*
>
> ***IFR §201.6(c)(3)(i):*** *[The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*
>
> ***IFR §201.6(c)(3)(ii):*** *[The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*
>
> ***IFR §201.6(c)(3) (iii):*** *[The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

7.2 Mitigation Goals and Accomplishments- Anderson & Oconee Counties with Municipalities

Goals are general descriptions of desired long-term outcomes. State and federal guidance and regulations pertaining to mitigation planning require the development of mitigation goals to reduce or avoid long-term vulnerabilities to identified hazards. Mitigation goals have been established by FEMA, the State of South Carolina, Anderson and Oconee County.

As part of the original (2006) Plan development process, the Planning Team and OEM met on numerous occasions to discuss possible mitigation measures to reduce or eliminate disaster-related damages in each County. Winter Storms is the predominant hazard in the Region, and was the focus of the discussions. The original planning team developed a list of actions for the 2006 version of the plan; all the actions were developed as a means to move the Region toward achieving its mitigation goals and objectives.

Since the 2012 Hazard Mitigation Plan was published, Anderson County and Oconee County have implemented Critical Infrastructure Projects and development increasing the quality of life for citizens by way of infrastructure expansion and economic growth. These projects increase resiliency, and allow for both municipal and county governments to effectively maintain continuity of government operations, ensuring leadership and emergency responders are able to execute preparation, mitigation, response, and recovery efforts to all natural or manmade disasters. For a further detailed explanation of past and future development trends, see the Land Use, Transportation, and Priority Investment sections of both the Anderson County and Oconee County Comprehensive plans.

In the 2017 Plan Update, Tables 7.3.2.1-1 and 7.4-2 list the Mitigation Strategies and Action Items. Table 7.3.2.1-2 lists notable mitigation efforts that have been carried out by the Counties and Municipalities in the last 5 years. Table 7.4-3 lists potential future action items that the municipalities have indicated they would like to undertake in future years if funding allows.

The 2006 Planning Team developed an overall goal to reduce or eliminate the long-term risk of loss of life and property damage from the full range of natural hazards. In addition to this overall goal, the Planning Team also established seven specific goals:

Goal 1. Local government will have the capability to develop, implement and maintain effective mitigation programs to protect its residents from natural hazards:

Goal 2. Local communities will have the capability to initiate and sustain emergency response operations during and after a natural disaster to build and support local efforts and commitment to become less vulnerable to natural hazards:

Goal 3. The continuity of local government operations will not be significantly disrupted by natural disasters:

Goal 4. The health, safety and welfare of the community's residents and visitors will not be significantly disrupted or threatened by natural disasters:

Goal 5. The policies and regulations of local governments will support effective hazard mitigation programming throughout the community thereby reducing the potential impact of natural disasters on the community.

Goal 6. The availability and functioning of the community's infrastructure will not be significantly disrupted by a natural disaster; communities will better maximize resources for investment in hazard mitigation; Thereby protecting both existing and new properties.

Goal 7. All members of the community will understand the natural hazards threatening local areas and the techniques to minimize vulnerability to those natural hazards through public education.

As part of the 2017 HMP Update, the Mitigation Planning Committee (MPC) reviewed the goals from the first-generation HMP. The HMC modified several of the goals and determined that the goals remained valid to pursue for the Plan Update. The Planning Team also discussed the need to identify and describe progress towards achieving the goals since release of the 2012 Plan.

7.3 Mitigation Objectives and Strategies

7.3.1 Objectives:

Objectives are well-defined intermediate points in the process of achieving goals. For the seven goals listed above, the Planning Team established a list of objectives within each goal.

7.3.2 Strategies:

Strategies are a specific course of action to achieve the objectives. As part of the 2017 Plan update, the original strategies and action items were reviewed and many of the items listed re-defined as strategies based on the description. The Counties will continue this effort indefinitely, revisiting the hazards and Plan as needed. The following table identifies planning strategies for Anderson and Oconee Counties. The mitigation planning objectives and strategies for each goal include:

Goal 1: Local government will have the capability to develop, implement and maintain effective mitigation programs to protect its residents from natural hazards:

- **Objective 1.1:** The effectiveness of mitigation initiatives implemented in the community will be measured and documented.

- **Objective 1.2:** There will be a program to derive mitigation "lessons learned" from each significant disaster event occurring in or near the community.

- **Objective 1.3:** Up-to-date technical skills in mitigation planning and programming will be available for the community.

Goal 2: Local communities will have the capability to initiate and sustain emergency response operations during and after a natural disaster to build and support local efforts and commitment to become less vulnerable to natural hazards:

- **Objective 2.1:** Designated evacuation shelters will be retrofitted or relocated to ensure their operability during and after disaster events.
- **Objective 2.2:** Emergency services organizations will have the capability to detect emergency situations and promptly initiate emergency response operations.
- **Objective 2.3:** Emergency services facilities will be able to withstand the structural impacts of disasters.
- **Objective 2.4:** Response capabilities will be available to protect visitors, special needs individuals, and the homeless from a disaster's health and safety impacts.
- **Objective 2.5:** Utility and communications systems supporting emergency services operations will be retrofitted or relocated to withstand the impacts of disasters.

Goal 3: The continuity of local government operations will not be significantly disrupted by natural disasters:

- **Objective 3.1:** Buildings and facilities used for the routine operations of government will be retrofitted or relocated to withstand the impacts of disasters.
- **Objective 3.2**: Important local government records and documents will be protected from the impacts of disasters.
- **Objective 3.3:** Plans will be developed, and resources identified, to facilitate reestablishing local government operations after a disaster.
- **Objective 3.4:** Redundant equipment, facilities, and/or supplies will be obtained to facilitate reestablishing local government operations after a disaster.

Goal 4: The health, safety and welfare of the community's residents and visitors will not be significantly disrupted or threatened by natural disasters:

- **Objective 4.1:** Adequate systems for notifying the public at risk and providing emergency instruction during a disaster will be available in all identified hazard areas.

- **Objective 4.2:** Facilities in the community posing an extra health or safety risk when damaged or disrupted will be made less vulnerable to the impacts of a disaster.

- **Objective 4.3:** Public and private medical and health care facilities in the community will be retrofitted or relocated to withstand the impacts of disasters.

- **Objective 4.4:** Structures, facilities and systems serving visitors to the community will be prepared to meet their immediate health and safety needs.

- **Objective 4.5:** There will be adequate resources, equipment and supplies to meet victims' health and safety needs after a disaster.

Goal 5: The policies and regulations of local governments will support effective hazard mitigation programming throughout the community thereby reducing the potential impact of natural disasters on the community.

- **Objective 5.1:** All reconstruction or rehabilitation of local government facilities will incorporate techniques to minimize the physical or operational vulnerability to disasters.

- **Objective 5.2:** Land use policies, plans and regulations will discourage or prohibit inappropriate location of structures or infrastructure components in areas of higher risk.

- **Objective 5.3:** Local governments will establish and enforce building and land development codes that are effective in addressing the hazards threatening the community.

- **Objective 5.4:** New local government facilities will be located outside of hazard areas and/or will be designed to not be vulnerable to the impacts of such hazards.

Goal 6: The availability and functioning of the community's infrastructure will not be significantly disrupted by a natural disaster; communities will better maximize resources for investment in hazard mitigation; Thereby protecting both existing and new properties.

- **Objective 6.1:** Local governments will encourage hazard mitigation programming by private sector organizations owning or operating key community utilities.

- **Objective 6.2:** Routine maintenance of the community's infrastructure will be done to minimize the potential for system failure because of or during a disaster.

- **Objective 6.3:** Transportation facilities and systems serving the community will be constructed and/or retrofitted to minimize the potential for disruption during a disaster.

- **Objective 6.4:** Water and sewer will not fail because of a disaster.

Goal 7: All members of the community will understand the natural hazards threatening local areas and the techniques to minimize vulnerability to those natural hazards through public education.

- **Objective 7.1:** An education program will be developed to inform residents of the risks posed to the community, help them understand their vulnerability to disasters, and provide ideas for effective mitigation techniques**.**

Table 7.3.2.1-1 Strategy and Status

Number	Strategy	Hazard	Anderson County Status as of 2017	Oconee County Status as of 2017
1.1	The effectiveness of mitigation initiatives implemented in the community will be measured and documented.	All Hazards	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing
1.2	There will be a program to derive mitigation "lessons learned" from each significant disaster event occurring in or near the community.	All Hazards	Anderson County: Completed & Ongoing Anderson City: Completed & Ongoing Belton: Completed & Ongoing Honea Path: Completed & Ongoing Iva: Completed & Ongoing Starr: Completed & Ongoing Pendleton: Completed & Ongoing Pelzer: Completed & Ongoing West Pelzer: Completed & Ongoing Williamston: Completed & Ongoing	Oconee County: Completed & Ongoing Salem: Completed & Ongoing Seneca: Completed & Ongoing Walhalla: Completed & Ongoing West Union: Completed & Ongoing Westminster: Completed & Ongoing
1.3	Up-to-date technical skills in mitigation planning and programming will be available for the community.	All Hazards	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing

			Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	
2.1	Designated evacuation shelters will be retrofitted or relocated to ensure their operability during and after disaster events.	Winter Storms Hail Storms/Thunder storms Lightning Severe Storms/Thunder storms Drought/Heat Wave Floods	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing
2.2	Emergency services organizations will have the capability to detect emergency situations and promptly initiate emergency response operations.	All Hazards	Anderson County: Completed & Ongoing Anderson City: Completed & Ongoing Belton: Completed & Ongoing Honea Path: Completed & Ongoing Iva: Completed & Ongoing Starr: Completed & Ongoing Pendleton: Completed & Ongoing Pelzer: Completed & Ongoing West Pelzer: Completed & Ongoing Williamston: Completed & Ongoing	Oconee County: Completed & Ongoing Salem: Completed & Ongoing Seneca: Completed & Ongoing Walhalla: Completed & Ongoing West Union: Completed & Ongoing Westminster: Completed & Ongoing
2.3	Emergency services facilities will be able to withstand the structural impacts of disasters.	All Hazards	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing

			Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing
2.4	Response capabilities will be available to protect visitors, special needs individuals, and the homeless from a disaster's health and safety impacts.	All Hazards	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing
2.5	Utility and communications systems supporting emergency services operations will be retrofitted or relocated to withstand the impacts of disasters.	All Hazards	Anderson County: Completed & Ongoing Anderson City: Completed & Ongoing Belton: Completed & Ongoing Honea Path: Completed & Ongoing Iva: Completed & Ongoing Starr: Completed & Ongoing Pendleton: Completed & Ongoing Pelzer: Completed & Ongoing West Pelzer: Completed & Ongoing Williamston: Completed & Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing

Number	Strategy	Hazard	Anderson County Status as of 2017	Oconee County Status as of 2017
3.1	Buildings and facilities used for the routine operations of government will be retrofitted or relocated to withstand the impacts of disasters.	All Hazards	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing
3.2	Important local government records and documents will be protected from the impacts of disasters.	All Hazards	Anderson County: Completed & Ongoing Anderson City: Completed & Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Completed & Ongoing Pelzer: Completed & Ongoing West Pelzer: Completed & Ongoing Williamston: Completed & Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing
3.3	Plans will be developed, and resources identified, to facilitate reestablishing local government operations after a disaster.	All Hazards	Anderson County: Completed & Ongoing Anderson City: Completed & Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing	Oconee County: Completed & Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing

			West Pelzer: Ongoing Williamston: Ongoing	
3.4	Redundant equipment, facilities, and/or supplies will be obtained to facilitate reestablishing local government operations after a disaster.	All Hazards	Anderson County: Completed & Ongoing Anderson City: Completed & Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing
4.1	Adequate systems for notifying the public at risk and providing emergency instruction during a disaster will be available in all identified hazard areas.	All Hazards	Anderson County: Completed & Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Oconee County: Completed & Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing
4.2	Facilities in the community posing an extra health or safety risk when damaged or disrupted will be made less vulnerable to the impacts of a disaster.	Winter Storms Hail Storms/Thunderstorms Lightning Severe Storms/Thunderstorms Drought/Heat Wave Floods	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing

			Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Westminster: Ongoing
4.3	Public and private medical and health care facilities in the community will be retrofitted or relocated to withstand the impacts of disasters.	Winter Storms Hail Storms/Thunderstorms Lightning Severe Storms/Thunderstorms Drought/Heat Wave Floods	Anderson County: Completed & Ongoing Anderson City: Completed & Ongoing Belton: Completed & Ongoing Honea Path: Completed & Ongoing Iva: Completed & Ongoing Starr: Completed & Ongoing Pendleton: Completed & Ongoing Pelzer: Completed & Ongoing West Pelzer: Completed & Ongoing Williamston: Completed & Ongoing	Oconee County: Completed & Ongoing Salem: Completed & Ongoing Seneca: Completed & Ongoing Walhalla: Completed & Ongoing West Union: Completed & Ongoing Westminster: Completed & Ongoing
4.4	Structures, facilities and systems serving visitors to the community will be prepared to meet their immediate health and safety needs.	Winter Storms Hail Storms/Thunderstorms Lightning Severe Storms/Thunderstorms Drought/Heat Wave Floods	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing
4.5	There will be adequate resources, equipment and supplies to meet victims' health and safety needs after a disaster.	Winter Storms Hail Storms/Thunderstorms	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing

		Lightning Severe Storms/Thunderstorms Drought/Heat Wave Floods	Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing

Number	Strategy	Hazard	Anderson County Status as of 2017	Oconee County Status as of 2017
5.1	All reconstruction or rehabilitation of local government facilities will incorporate techniques to minimize the physical or operational vulnerability to disasters.	Winter Storms Hail Storms/Thunderstorms Lightning Severe Storms/Thunderstorms Drought/Heat Wave Floods	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing
5.2	Land use policies, plans and regulations will discourage or prohibit inappropriate location of structures or infrastructure components in areas of higher risk.	All Hazards	Anderson County: Completed & Ongoing Anderson City: Completed & Ongoing Belton: Completed & Ongoing Honea Path: Completed & Ongoing Iva: Completed & Ongoing Starr: Completed & Ongoing Pendleton: Completed & Ongoing Pelzer: Completed & Ongoing West Pelzer: Completed & Ongoing Williamston: Completed & Ongoing	Oconee County: Completed & Ongoing Salem: Completed & Ongoing Seneca: Completed & Ongoing Walhalla: Completed & Ongoing West Union: Completed & Ongoing Westminster: Completed & Ongoing

5.3	Local governments will establish and enforce building and land development codes that are effective in addressing the hazards threatening the community.	All Hazards	Anderson County: Completed & Ongoing Anderson City: Completed & Ongoing Belton: Completed & Ongoing Honea Path: Completed & Ongoing Iva: Completed & Ongoing Starr: Completed & Ongoing Pendleton: Completed & Ongoing Pelzer: Completed & Ongoing West Pelzer: Completed & Ongoing Williamston: Completed & Ongoing	Oconee County: Completed & Ongoing Salem: Completed & Ongoing Seneca: Completed & Ongoing Walhalla: Completed & Ongoing West Union: Completed & Ongoing Westminster: Completed & Ongoing
5.4	New local government facilities will be located outside of hazard areas and/or will be designed to not be vulnerable to the impacts of such hazards.	All Hazards	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing
6.1	Local governments will encourage hazard mitigation programming by private sector organizations owning or operating key community utilities.	All Hazards	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing

6.2	Routine maintenance of the community's infrastructure will be done to minimize the potential for system failure because of or during a disaster.	All Hazards	Anderson County: Completed & Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Completed & Ongoing West Pelzer: Completed & Ongoing Williamston: Completed & Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Completed & Ongoing
6.3	Transportation facilities and systems serving the community will be constructed and/or retrofitted to minimize the potential for disruption during a disaster.	Winter Storms Hail Storms/Thunderstorms Lightning Severe Storms/Thunderstorms Drought/Heat Wave Floods	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing West Pelzer: Ongoing Williamston: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing
6.4	Water and sewer will not fail because of a disaster.	Winter Storms Hail Storms/Thunderstorms Lightning Severe Storms/Thunderstorms Drought/Heat Wave Floods	County of Anderson: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing

			West Pelzer: Ongoing Williamston: Ongoing	
7.1	An education program will be developed to inform residents of the risks posed to the community, help them understand their vulnerability to disasters, and provide ideas for effective mitigation techniques.	All Hazards	Anderson County: Ongoing Anderson City: Ongoing Belton: Ongoing Honea Path: Ongoing Iva: Ongoing Starr: Ongoing Pendleton: Ongoing Pelzer: Completed & Ongoing West Pelzer: Completed & Ongoing Williamston: Ongoing	Oconee County: Ongoing Salem: Ongoing Seneca: Ongoing Walhalla: Ongoing West Union: Ongoing Westminster: Ongoing

Table 7.3.2.1-2 Notable Mitigation Efforts

Notable Mitigation Efforts by Counties and Municipalities Since 2012			
Action Item Number:	**Priority**	**Responsible Government:**	**Description:**
#1-Work with Relief Groups	Medium	Town of Walhalla	Work with Christ Central Ministries during relief efforts
#5-Transportation for Special Needs Populations	High	Oconee County	Established a Special Needs Task Force.
#5- Transportation for Special Needs Populations	High	Town of Honea Path	Maples Nursing Home Facility has an Emergency Operations Plan and the Honea Path first-responders are partners in this plan.
#7-Backup for Critical Facilities	High	Town of West Union	Undergoing a broadband project that will have all critical facilities backed up within a year
#8 - Review of Communications	High	Oconee County	Conducting a fire study to determine the future of the Legacy Communications Program
#17- Public Information	High	Towns of Pelzer & West Pelzer	Publish monthly pamphlet, *The West*, explaining the siren warning system in case of an emergency.
#17-Public Information	High	Oconee County	Publish information calendars for informational purposes. Special Needs Task Force collaborating with Duke Energy and State EMD to produce braille emergency information and sign language PSA's.

#29- Inspect water & sewer infrastructure	High	Anderson County	Raised vital 6 & 20 pump station out of floodplain.
#29- Inspect water & sewer infrastructure	High	Town of Pelzer	Installed 90% new sewer lines in the past three years.
#29- Inspect water & sewer infrastructure	High	Town of West Pelzer	Completed a 6-year project to install new sewer and water lines. Additionally, raised Spring Street Pump Station out of low lying area.
#29- Inspect water & sewer infrastructure	High	Town of Williamston	Carrying out ongoing plan to inspect 20% of water and sewer infrastructure per year, so that over 5 years, all infrastructure has been inspected. Problems are addressed as they arise.
#29-Inspect water & sewer infrastructure	High	Town of Westminster	Have an approved plan for inspection and upgrade routines, which includes "smoking" the sewer lines test infrastructure after events, but need mitigation assistance for infrastructure access (underground lines, overgrown sewer right a-ways and tree cutting).
#29- Inspect water & sewer infrastructure	High	Town of Honea Path	Duke Energy responsible for inspecting the facilities they own. A yearly contractor is hired to inspect DHEC regulated infrastructure such as fire hydrants and valves. Honea Path cycles through a camera inspection of water and sewer lines following an incident.
#29- Inspect water & sewer infrastructure	High	Town of Iva	Undergoing at $5 million dollar update of sewer lines, eliminating use of lagoons. By July 2017, a 150,000 gallon water tank will be installed. Iva also has a valve maintenance program.

#31- Identify susceptible roadways	High	Anderson County	Bought out properties on Susan and Booker Streets to mitigate future repetitive flood damage/loss. Actively monitoring Sullivan and Steven Streets as well.
#31- Identify susceptible roadways	High	City of Anderson	Raised Walker Street and bridge 5 ft. to mitigate flooding. Actively monitoring West Franklin Street, Mauldin Street, and North Avenue.
#31- Identify susceptible roadways	High	Town of Pendleton	Actively monitoring Sarrar Street for flooding.
#31- Identify susceptible roadways	High	Town of Iva	Repaving, street scape, and pipe replacement on Washington Street.
#32-Mitigating Improvements	High	City of Anderson	Installed Thor Guard Lightning Prediction & Warning System in public areas: Recreation Center Complex, Linley Park, Old McCants Football Field, & Carolina Wren Park.
#32-Mitigating Improvements	High	Town of West Pelzer	Installing two new pump stations.
#32- Mitigating Improvements	High	Town of Honea Path	Currently cycling through installation of new low-pressure pump stations associated with the sewer system.

7.4 Prioritized Mitigation Actions and Projects:

As mentioned earlier in this section, a Mitigation Action Plan was prepared to develop specific actions to achieve the seven goals discussed in Chapter 8.2, Mitigation Goals and Accomplishments. The Action Plan identified an appropriate lead agency/person for each action, a schedule for completion and possible funding sources. For the 2017 Plan update, the process that the MPC chose to help them consider potential action items in a systematic way was the **S**ocial, **T**echnical, **A**dministrative, **P**olitical, **L**egal, **E**conomic, and **E**nvironmental (STAPLEE) Method. This method helped the MPC to weigh the pros and cons of different alternative actions for each of the identified objectives and strategies. Table 7.4-1 provides an explanation of the criteria used for the STAPLEE methodology.

Table 7.4-1

STAPLEE Methodology STAPLEE	Criteria Explanation
S – Social	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community's social and cultural values.
T – Technical	Mitigation actions are technically most effective if they provide long- term reduction of losses and have minimal secondary adverse impacts.
A – Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P – Political	Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.
L – Legal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E – Economic	Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.
E - Environmental	Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations, and that are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

The MPC developed and prioritized the strategies. These updates and comments were integrated into the 2012 version of the Action Plan. The action items in Table 7.4-2 were prioritized by the MPC based on the STAPLEE criteria, as well as their potential to reduce risk to each County, including its citizens, operations, and physical assets. Many of the actions included in the original plan have been re-defined as strategies (See Section 7.3, Mitigation Objectives and Strategies). The highest priority actions are those that are most effective in reducing risks to multiple assets simultaneously.

The Steering Committee defined High, Medium, and Low priorities in the Action Plan to be as follows:

- High: Meets five of the seven STAPLEE criteria.
- Medium: Meets four of the seven STAPLEE criteria.
- Low: Meets three of the seven STAPLEE criteria.

These same priorities were applied to update the Action Plan. The action items were sorted by high, medium, and low. As discussed in Section 6 (Risk Assessment), a key criterion for each County's prioritization of actions is the cost-effectiveness of actions and projects. High-priority actions and projects are assessed for feasibility and cost-effectiveness to determine if they are good candidates for mitigation actions. Cost effectiveness will continue to be central to each County's decision-making processes in identifying and funding mitigation actions. The table below includes all the specific actions listed in the original version of the HMP, and indicates their present status. All of the original actions remain in the tables for reference purposes. Completed actions are noted in the status column. It is notable that each County has completed or is presently working on most of the actions that were listed in the 2012 version of the plan, and as a result has made further advances in protecting its infrastructure and citizens against losses from natural hazards.

Goal 1: Local government will have the capability to develop, implement and maintain effective mitigation programs to protect its residents from natural hazards:

- **Objective 1.1:** The effectiveness of mitigation initiatives implemented in the community will be measured and documented.
- **Objective 1.2:** There will be a program to derive mitigation "lessons learned" from each significant disaster event occurring in or near the community.
- **Objective 1.3:** Up-to-date technical skills in mitigation planning and programming will be available for the community.

Table 7.4-2

#	Priority	Action Item Description/ Benefit	Lead Agency	Funding Source	Schedule	Hazard	Cost Effectiveness	Anderson County Status as of 2017	Oconee County Status as of 2017
1	Medium	Work with local relief groups (i.e. the Red Cross) to promote public training classes and events related to hazard preparation.	County/ Municipal Gov., County EMD	General Funds Revenue As available and Grants	Ongoing	Multi-Hazard	Highly cost effective and relatively low cost of action.	**Anderson County**: MOU"s with Red Cross, Salvation Army, & United Way **Anderson City: *** **Belton:** Established relationship with Belton Interfaith Ministries. ***** **Honea Path:** Established relationship with First Baptist Church and Watkins Community Center. * **Iva:** Established relationship with the Red Cross. ***** **Starr: *** **Pendleton: *** **Pelzer:*** **West Pelzer:*** **Williamston: *** *Municipalities are encouraged to work with other municipalities until resources are exhausted. If resources are exhausted, municipalities rely on the County EOC to coordinate resources with NGO's such as Red Cross & The Salvation Army.	**Oconee County:** MOU's with Red Cross, Southern Baptist Disaster Relief, & Beaver Dam Baptist Association **Salem: *** **Seneca:** Established relationship with the Red Cross **Walhalla: *** **West Union: *** **Westminster:*** *Municipalities are encouraged to work with other municipalities until resources are exhausted. If resources are exhausted, municipalities rely on the County EOC to coordinate resources with NGO's such as Red Cross & The Salvation Army.
2	Medium	Utilize the existing Local Emergency Planning Group to meet following disasters and to review	Incident Com-mander with help of	General Funds Revenue As available	Incident Driven	Multi-Hazard	Highly cost-effective due to future life safety issues.	**Anderson County: *** **Anderson City: *** **Belton: *** **Honea Path: ***	**Oconee County:*** **Salem:*** **Seneca: *** **Walhalla: *** **West Union: ***

		response effectiveness and mitigation needs.	County EMD	and Grants				**Iva: *** **Starr:*** **Pendleton: *** **Pelzer:*** **West Pelzer:*** **Williamston: *** *Standard procedure to conduct after-action reviews following an incident. With the revision of the Emergency Operations Plan, roles and responsibilities further defined and classified.	**Westminster: *** *Standard procedure to conduct after-action reviews following an incident. With the revision of the Emergency Operations Plan, roles and responsibilities further defined and classified.
3	Medium	Developing a tracking system for mitigation activities that reviews effectiveness following disaster events.	County/ Municipal Gov., County EMD	General Funds Revenue As available and Grants	Ongoing	Multi-Hazard	Highly cost-effective because action has general effectiveness in reducing damages and preventing injuries and loss of life.	**Anderson County:*** **Anderson City:*** **Belton:*** **Honea Path:*** **Iva:*** **Starr:*** **Pendleton:*** **Pelzer:*** **West Pelzer:*** **Williamston:*** ***Repetitive disaster areas of concern are routinely monitored and tracked by county, city , or municipal departments/divisions. Through the development of ordinances and codes by council, effective mitigation activities can be adopted following repetitive disaster events.	**Oconee County:*** **Salem: *** **Seneca:** Working with the County to develop a tracking system. * **Walhalla: *** **West Union: *** **Westminster: *** *Repeated disaster areas of concern are routinely monitored and tracked by county, city , or municipal departments/divisions. Through the development of ordinances and codes by council, effective mitigation activities can be

								Municipalities are responsible for developing a mitigation system and for contacting the County EMD when resources are exhausted.	adopted following repetitive disaster events. Municipalities are responsible for developing a mitigation system and for contacting the County EMD when resources are exhausted.
4	Medium	Review local government storm water regulations to assess how well they prevent hazardous situations due to storm water flooding.	Public Works Depart.	General Funds Revenue As available and Grants	3-5 years	Floods	Highly cost-effective with relatively low cost of action.	**Anderson County:** Responsibility of County Storm Water Management Division. **Anderson City:** Responsibility of City Storm Water Management **Belton: *** **Honea Path: *** **Iva: *** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *It is the responsibility of the municipalities for initiating review of storm water regulations and for contacting County EMD when resources are exhausted.	**Oconee County:** Responsibility of County Storm Water Management Division in all municipalities except Seneca. **Salem: *** **Seneca: *** **Walhalla: *** **West Union: *** **Westminster: *** *It is the responsibility of the municipalities for initiating review of storm water regulations and for contacting County EMD when resources are exhausted.

Goal 2: Local communities will have the capability to initiate and sustain emergency response operations during and after a natural disaster to build and support local efforts and commitment to become less vulnerable to natural hazards:

- **Objective 2.1:** Designated evacuation shelters will be retrofitted or relocated to ensure their operability during and after disaster events.
- **Objective 2.2:** Emergency services organizations will have the capability to detect emergency situations and promptly initiate emergency response operations.
- **Objective 2.3:** Emergency services facilities will be able to withstand the structural impacts of disasters.
- **Objective 2.4:** Response capabilities will be available to protect visitors, special needs individuals, and the homeless from a disaster's health and safety impacts.
- **Objective 2.5:** Utility and communications systems supporting emergency services operations will be retrofitted or relocated to withstand the impacts of disasters.

#	Priority	Action Item Description/ Benefit	Lead Agency	Funding Source	Schedule	Hazard	Cost Effectiveness	Anderson County Status as of 2017	Oconee County Status as of 2017:
5	High	Identify special needs populations and establish procedures for providing transportation to shelters in the case of a natural disaster.	County/Municipal Gov., Special Populations Department	General Funds Revenue As available and Grants	Annual	Multi-Hazard	Highly cost-effective with relatively low costs.	**Anderson County: *** **Anderson City: *** **Belton:** Maintains Assistance Contact Line**.*** **Honea Path:*** **Iva:** Fire Department trains with Nursing Home annually for emergency response. ***** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *Rely on Anderson County Emergency Operations Plan. Roles and responsibilities further defined thru emergency support functions.	**Oconee County:*** **Salem: *** **Seneca:*** **Walhalla:*** **West Union: *** **Westminster:*** *Rely on Oconee County Emergency Operations Plan. Roles and responsibilities further defined thru emergency support functions. All municipalities participate in the County's Special Needs Task Force.
6	High	Provide emergency back-up power to critical facilities: emergency generators, secondary feeds, etc.	County/ municipal Gov., County EMD	General Funds Revenue As available and Grants	Ongoing	Multi-Hazard	Highly cost-effective because of life safety issues and moderate-high cost of action.	**Anderson County:** Critical facilities have been identified and many have backup generators. The county also has portable generators for some facilities without a permanent generator. **Anderson City:** Critical facilities have been identified and many have backup generators. The city also has portable generators for some	**Oconee County:** IT Department of Municipal Building and Law Enforcement Center have back-up power. **Salem:*** **Seneca:** City Hall, Fire Department, and Water System have backup power. **Walhalla: *** **West Union: *** **Westminster: ***

								facilities without a permanent generator. **Belton:** All critical facilities have backup generators except the armory which is currently under renovation. **Honea Path:** Need generators for critical facilities.* **Iva:** No fixed back-up generators at critical facilites. The town has three portable back- up generators. ***** **Starr:** Currently no emergency backup power for critical facilities. Seeking funding options. * **Pendleton:** Critical facilities have backup generators. * **Pelzer: *** **West Pelzer: *** **Williamston:** Some critical facilities have generators. *It is the responsibility of the Municipality to assess emergency backup power needs and to communicate any resource gaps to the County EMD.	*It is the responsibility of the Municipality to assess emergency backup power needs and to communicate any resource gaps to the County EMD.
7	High	Post disaster, structurally analyze all buildings or rooms identified as shelters and retrofit or strength as necessary.	County EMD, ARC, Building & Codes,	General Funds Revenue As available and Grants	Incident Driven	Multi-Hazard	Highly cost-effective because action has general effectiveness in reducing damages and preventing	**Anderson County:** Has Building & Codes Department and Engineers.	**Oconee County:** Red Cross executes shelter surveys **Salem: *** **Seneca: *** **Walhalla: ***

			County Engineers				injuries and loss of life. Cost itself may be moderate to high depending on retrofitting needs.	**Anderson City:** Has Building & Codes Department and Engineers. **Belton:** Relies on County Building & Codes Department and Engineers. **Honea Path:** Relies on County Building & Codes Department and Engineers. **Iva:** Relies on County Building & Codes Department, County Engineers, and Red Cross. **Starr:** Relies on County Building & Codes Department and Engineers. **Pendleton:** Relies on County Building & Codes Department and Engineers. **Pelzer:** Relies on County Building & Codes Department and Engineers. **West Pelzer:** Relies on County Building & Codes Department and Engineers. **Williamston:** Have municipality building & codes department. *Pre and post disaster, Red Cross designates appropriate shelters for the designated area. It is the responsibility of the Municipality to coordinate structural analysis with the County.	**West Union: *** **Westminster: *** *Pre and post disaster, Red Cross designates appropriate shelters for the designated area. It is the responsibility of the Municipality to coordinate structural analysis with the County.
8	High	Review communications procedures on a regular basis	County EMD,	General Funds Revenue	Annually	Multi-Hazard	Highly cost-effective with low cost of action.	**Anderson County: *** **Anderson City:***	**Oconee County:*** **Salem: ***

		to ensure communication between response agencies are maintained during a disaster.	EMS, Police, Fire	As available and Grants				**Belton: *** **Honea Path:** Equipped with Palmetto 800, also have backup communications if primary fails. **Iva: *** **Starr: *** **Pendleton:** * **Pelzer: *** **West Pelzer: *** **Williamston**: * *All emergency response agencies within the county and municipalities are equipped with interoperable communication devices including Palmetto 800 MHz radios.	**Seneca: *** **Walhalla: *** **West Union: *** **Westminster: *** *Currently**, t**hroughout the county, there are mixed communication systems including UHF, UVF, Palmetto 800, and digital. The digital equipment in some municipalities leads to some interoperability issues. A study is being done to determine the continuance of the Legacy Communications Program.
9	High	Update communications equipment, especially the E-911 Center, as needed and funding is available.	County EMD, EMS, Police, Fire	General Funds Revenue As available and Grants	Ongoing	Multi-Hazard	Although monetarily expensive, this action is highly cost-effective because of life saving benefits and mitigation of property and crop loss.	**Anderson County: *** **Anderson City: *** **Belton: *** **Honea Path: *** **Iva: *** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *Each municipality monitors effectiveness of	**Oconee County: *** **Salem: *** **Seneca: *** **Walhalla: *** **West Union: *** **Westminster: *** *Each municipality is responsible for updating their

								communications equipment and recommends upgrades to county.	communications equipment as needed.
10	High	Inventory Emergency Response personnel and equipment to identify areas where the community is deficient in disaster response and establish actions to remedy the situation.	County/ Municipal Gov., County EMD	General Funds Revenue as available and Grants	Annually	Multi-Hazard	Highly cost-effective because of life saving benefits and mitigation of property and crop loss and relatively low cost of action.	**Anderson County: *** **Anderson City:** * **Belton:*** **Honea Path:** Departments maintain and audit inventories weekly. * **Iva:** Initiated by municipality and County partnership. * **Starr: *** **Pendleton: *** **Pelzer:*** **West Pelzer: *** **Williamston: *** *Each municipality is responsible for maintaining an emergency response personnel and equipment resource list and report gaps to county EMD. Municipalities are encouraged to provide EMD with resource list.	**Oconee County: *** **Salem: *** **Seneca:** Have in-house inventory available. * **Walhalla: *** **West Union: *** **Westminster: *** *Each municipality is responsible for maintaining an emergency response personnel and equipment resource list and report gaps to county EMD. Municipalities are encouraged to provide EMD with resource list.
11	High	Establish a program to provide disaster training for all first responders	County/ Municipal Gov., County EMD	General funds Revenue as available and Grants	Annually	Multi-Hazard	Highly cost-effective because action has general effectiveness in reducing damages and preventing injuries and loss of life with low cost of action.	**Anderson County: *** **Anderson City: *** **Belton: *** **Honea Path:** First-responders take ICS 100, 200, 700, & 800. **Iva:** First-responders receive training through the SC Criminal Justice Academy and individual municipal departments. * **Starr: *** **Pendleton: ***	**Oconee County: *** **Salem: *** **Seneca: *** **Walhalla: *** **West Union: *** **Westminster: *** *Each municipality is responsible for identifying and providing emergency

								Pelzer: * **West Pelzer: *** **Williamston: *** *Each municipality is responsible for identifying and providing emergency response training programs for emergency responders. Training gaps to be reported to county EMD. County EMD will provide NIMS training as needed and coordinate additional requests.	response training programs for emergency responders. Training gaps to be reported to county EMD. County EMD will provide NIMS training as needed and coordinate additional requests.

Goal 3: The continuity of local government operations will not be significantly disrupted by natural disasters:

- **Objective 3.1:** Buildings and facilities used for the routine operations of government will be retrofitted or relocated to withstand the impacts of disasters.

- **Objective 3.2**: Important local government records and documents will be protected from the impacts of disasters.

- **Objective 3.3:** Plans will be developed, and resources identified, to facilitate reestablishing local government operations after a disaster.

- **Objective 3.4:** Redundant equipment, facilities, and/or supplies will be obtained to facilitate reestablishing local government operations after a disaster.

#	Priority	Action Item Description/ Benefit	Lead Agency	Funding Source	Schedule	Hazard	Cost Effectiveness	Anderson County Status as of 2017	Oconee County Status as of 2017
12	High	Survey critical emergency response facilities (fire stations, law enforcement centers, and emergency hdqrts.) to identify risks posed to structures and seek funding to mitigate the identified risks.	County EMD, Building & Codes, Municipal Engineers	General Funds Revenue As available and Grants	Annually / Incident Driven	Multi-Hazard	Highly cost-effective, low cost of action to high cost of action depending on mitigation efforts required.	**Anderson County:** Has Building & Codes Department and Engineers **Anderson City:** Has Building & Codes Department and Engineers **Belton: *** **Honea Path:** Risks are analyzed as part of the Emergency Preparedness Plan review process. **Iva:*** **Starr: *** **Pendleton:*** **Pelzer: *** **West Pelzer: *** **Williamston: *** *Relies on County Building & Codes Department and Engineers. Municipalities are responsible for initiating critical facilities survey with the County Engineers.	**Oconee County:** Has Building & Codes Department. **Salem: *** **Seneca:** Has Building & Code Department, pre-plans, and identification of needs. **Walhalla: *** **West Union: *** **Westminster:** Has Codes Department, relies on county for building Department. *Relies on County Building & Codes Department and Engineers. Municipalities are responsible for initiating critical facilities survey with the County Engineers.
13	Medium	Establish data backup options (i.e. laptops, off-site backups) for critical data that are easily removed and accessed at different location in case evacuation	County/ Municipal Gov., Information	General Funds Revenue As available and Grants	Annually /Ongoing	Multi-Hazard	Highly cost-effective due to continuity of operations concerns. Potentially a moderate to high cost of action.	**Anderson County: :** IT uses backup servers across the country to preserve and protect critical data. *	**Oconee County:** IT uses Cloud and external hard drives to backup critical data. * **Salem: ***

		of public facilities is necessary.	Technology Department					**Anderson City:** IT uses backup servers across the country to preserve and protect critical data.* **Belton:** All critical data is backed up on the Cloud. * **Honea Path:** Hires IT Source Cyber Solutions and backups up data on the Cloud. * **Iva:** Critical data backed up offsite. ***** **Starr: *** **Pendleton:** All critical data is backed up in the Cloud and can be accessed through government issued employee Ipads. * **Pelzer:** All critical data is backed up on the Cloud. * **West Pelzer:** All critical data is backed up on a hard drive daily.* **Williamston:** All critical data is backed up to the Cloud. * * County and Municipalities are recommended to have COOP/COG Plans that address critical back-up procedures.	**Seneca:** Data backed up with the cloud and hard drive system**. *** **Walhalla:** Uses Cloud and external hard drive to back up critical data. * **West Union:** Uses an external hard drive to back up critical data. ***** **Westminster:** Power provider backs up critical data. * County and Municipalities are recommended to have COOP/COG Plans that address critical back-up plans.

14	High	Provide generators to all existing critical facilities to prevent lengthy power outages.	County/ Municipal Gov., County EMD	General Funds Revenue As available and Grants	Ongoing	Multi-Hazard	Highly cost-effective because of life safety issues.	**Anderson County:** Critical facilities have been identified and many have backup generators. The county also has portable generators for some facilities without a permanent generator. **Anderson City:** Critical facilities have been identified and many have backup generators. The city also has portable generators for some facilities without a permanent generator. * **Belton:** Critical facilities have been identified and all have backup power except the armory. **Honea Path:** Critical Facilities need backup generators. * **Iva:** Critical facilities do not have permanent generators, but the town has three portable back-up generators. ***** **Starr:** Critical facilities do not have backup generators. Currently seeking funding. *	**Oconee County:** Law Enforcement Center 7 IT Department at Municipal Building have backup generators. **Salem: *** **Seneca:** Most critical facilities and other buildings have been identified for generators. **Walhalla: *** **West Union: *** **Westminster: *** * Municipalities encouraged to update critical facilities and resource lists annually and partner with neighboring municipalities for resources as needed. Needs that exceed this partnership to be reported to County EMD.

								Pendleton: Critical facilities have backup generators. * **Pelzer:** Some critical facilities have generators. * **West Pelzer:** Some critical facilities have generators. * **Williamston:** Some critical facilities have generators; in process of purchasing generators for pump stations. * * Municipalities encouraged to update critical facilities and resource lists annually and partner with neighboring municipalities for resources as needed. Needs that exceed this partnership to be reported to County EMD.	
15	High	Establish procedures and location for setting up an operations center for local government in the event that a natural disaster forces the evacuation of local government buildings.	County/ Municipal Gov., County EMD	General Funds Revenue As available and Grants	Annually	Multi-Hazard	Highly cost-effective because action has general effectiveness in reducing damages and preventing injuries and loss of life and there is low cost to establish procedures.	**Anderson County: *** **Anderson City: *** **Belton: *** **Honea Path:** Have Emergency Preparedness Plan. *	**Oconee County:** Has a COOP, alternative facilities identified. **Salem: *** **Seneca:** Plans underway for an alternate facility, but is

								Iva: Have an Emergency Preparedness Plan. ***** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *****The County and all municipalities are encouraged to formalize a Continuity of Operations plan & to sign MOU's with other municipalities in case local government operations need to be relocated to another municipality. County EMD available to assist municipalities in the development of their COG/COOPs.	not currently operational. **Walhalla: *** **West Union: *** **Westminster: *** *****The County and all municipalities are encouraged to formalize a Continuity of Operations plan & to sign MOU's with other municipalities in case local government operations need to be relocated to another municipality. County EMD available to assist municipalities in the development of their COG/COOPs.
16	High	Install surge protectors in critical facilities.	County/ Municipal Gov., County EMD	General Funds Revenue As available and Grants	Ongoing	Multi-Hazard	Highly cost-effective because of life safety issues and relatively low cost of action.	**Anderson County:*** **Anderson City:*** **Belton:** * **Honea Path:** Critical facilities do not have surge protectors but individual work elements do. **Iva:** Critical facilities do not have surge protectors.*****	**Oconee County:** Oconee County Law Enforcement Center has surge protectors installed. **Salem: *** **Seneca:** All facilities have computers and electronics on surge protectors. **Walhalla: ***

								Starr: * **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *Municipalities are responsible for assessing the stability of their identified critical facilities and retrofitting surge protection as needed.	**West Union: *** **Westminster: *** *Municipalities are responsible for assessing the stability of their identified critical facilities and retrofitting surge protection as needed.

Goal 4: The health, safety and welfare of the community's residents and visitors will not be significantly disrupted or threatened by natural disasters:

- **Objective 4.1:** Adequate systems for notifying the public at risk and providing emergency instruction during a disaster will be available in all identified hazard areas.

- **Objective 4.2:** Facilities in the community posing an extra health or safety risk when damaged or disrupted will be made less vulnerable to the impacts of a disaster.

- **Objective 4.3:** Public and private medical and health care facilities in the community will be retrofitted or relocated to withstand the impacts of disasters.

- **Objective 4.4:** Structures, facilities and systems serving visitors to the community will be prepared to meet their immediate health and safety needs.

- **Objective 4.5:** There will be adequate resources, equipment and supplies to meet victims' health and safety needs after a disaster.

#	Priority	Action Item Description/ Benefit	Lead Agency	Funding Source	Schedule	Hazard	Cost Effectiveness	Anderson County Status as of 2012	Oconee County Status as of 2017:
17	High	Provide information to residents about the community warning systems and how to respond in case of a disaster.	County/ Municipal Gov., County EMD	General Funds Revenue As available and Grants	Ongoing	Multi-Hazard	Highly cost-effective because of life safety issues and relatively low cost of action.	**Anderson County:*** **Anderson City:*** **Belton:** Yourgov.app, Reverse 911, Social Media **Honea Path:** Siren, Reverse 911, Town Website, & Social Media. **Iva:** Siren, Reverse 911, town social media, website, PSA through local Western Carolina News Station. * **Starr:** * **Pendleton:** * **Pelzer:** * **West Pelzer:** * **Williamston:** * * Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc.	**Oconee County:** Nuclear Sirens **Salem:** * **Seneca:** * **Walhalla:** * **West Union:** * OneTone Emergency Alert System **Westminster:** * Emergency Sirens *All municipalities have access to reverse 911. Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc.

18	High	Evaluate critical facilities such as shelters to ensure they are structurally sound and capable of withstanding the effects of natural disasters.	County/ Municipal Gov., Engineers, & Building and Codes	General Funds Revenue As available and Grants	Annually / Incident Driven	Multi-Hazard	Highly cost effective because of life safety issues with low cost of action.	**County of Anderson:** Has Building & Codes Department and Engineers **Anderson City:** Has Building & Codes Department and Engineers **Belton: *** **Honea Path:** Rely on County Building Inspectors and Red Cross. **Iva: *** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *Rely on County Building and Codes Department and Engineers. It is the responsibility of the Municipality to initiate critical facility survey with the County Engineers.	**Oconee County: *** **Salem: *** **Seneca:** Evaluated during fire inspections. **Walhalla: *** **West Union: *** **Westminster: *** *Rely on County Building and Codes Department and Engineers. It is the responsibility of the Municipality to initiate critical facility survey with the County Engineers.
19	High	Evaluate medical facilities within the community to ensure they are protected from the threats posed by natural disasters. *	Healthcare System Leadership, County/ Municipal Gov., County EMD	General Funds Revenue As available and Grants	Annually	Multi-Hazard	Highly cost-effective because of life safety issues and relatively low cost of action.	**Anderson County:** Has Building & Codes Department and Engineers. **Anderson City:** Has Building & Codes Department and Engineers. **Belton: ***	**Oconee County:** Has Building & Codes Department **Salem: *** **Seneca: *** **Walhalla: *** **West Union: *** **Westminster:** Has Building & Codes Department

								Honea Path: * **Iva: *** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston:** Has Building & Codes Department and Engineers. *Municipal and healthcare leadership responsible for assessing the stability of identified critical facilities and retrofitting as needed. May rely on County Building & Codes and Engineers. It is the responsibility of the municipality to initiate contact with the County Engineers.	*Municipal and healthcare leadership responsible for assessing the stability of identified critical facilities and retrofitting as needed. May rely on County Building & Codes and Engineers. It is the responsibility of the municipality to initiate contact with the County Engineers.
20	High	Inventory emergency response equipment and resources and establish a list of equipment needed to respond effectively to a natural disaster. Seek funding to acquire the equipment.	County/ Municipal Gov., EMD, EMS, Police, Fire	General Funds Revenue As available and Grants	Annually / Incident Driven	Multi-Hazard	Presumed highly cost-effective because action has general effectiveness in reducing damages and preventing injuries and loss of life, low cost of action.	**Anderson County:** County maintains inventory of personnel and equipment. **Anderson City:** Maintains inventory of personnel and equipment. **Belton: *** Honea Path: Departments maintain and audit inventory weekly.	**Oconee County:*** **Salem: *** **Seneca:** Have in-house equipment inventory. **Walhalla: *** **West Union: *** **Westminster: ***

								Iva: Department driven.***** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *Each municipality is responsible for maintaining an emergency response personnel and equipment resource list and report gaps to county EMD. Municipalities are encouraged to provide EMD with resource list	*Each municipality is responsible for maintaining an emergency response personnel and equipment resource list and report gaps to county EMD.
21	Medium	Develop informational pamphlets to notify tourists of the local relief agencies who can be contacted in the event that disaster sheltering is necessary.	County/ Municipal Gov,, County EMD	General Funds Revenue As available and Grants	Annually	Multi-Hazard	Highly cost-effective because of life safety issues and relatively low cost of action.	**Anderson County: *** **Anderson City: *** **Belton: *** **Honea Path:** Partner with Red Cross. **Iva:** Rely on FEMA & Red Cross materials. Considering reinstating town newsletter. ***** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and	**Oconee County: *** **Salem: *** **Seneca: *** **Walhalla: *** **West Union: *** **Westminster: *** *Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc.

								information into their public council meetings, educational outreach, and official website, etc.	

Goal 5: The policies and regulations of local governments will support effective hazard mitigation programming throughout the community thereby reducing the potential impact of natural disasters on the community.

- **Objective 5.1:** All reconstruction or rehabilitation of local government facilities will incorporate techniques to minimize the physical or operational vulnerability to disasters.

- **Objective 5.2:** Land use policies, plans and regulations will discourage or prohibit inappropriate location of structures or infrastructure components in areas of higher risk.

- **Objective 5.3:** Local governments will establish and enforce building and land development codes that are effective in addressing the hazards threatening the community.

- **Objective 5.4:** New local government facilities will be located outside of hazard areas and/or will be designed to not be vulnerable to the impacts of such hazards.

#	Priority	Action Item Description/ Benefit	Lead Agency	Funding Source	Schedule	Hazard	Cost Effectiveness	Anderson County Status as of 2017	Oconee County Status as of 2017:
22	High	Establish local regulations ensuring no development occurs within floodplains.	County / Municipality Government, Planning and Development Standards Department	General Fund Revenue as available	Ongoing	Multi-Hazard	Highly cost-effective because of life safety issues and relatively low cost of action	**Anderson County:** County Floodplain ordinance. **Anderson City:** City Floodplain ordinance. **Belton: *** **Honea Path:** Review and letter of approval, in conjunction with County Building & Codes.* **Iva: *** **Starr:** In progress of creating building codes **Pendleton:** Municipality floodplain ordinance. **Pelzer: *** **West Pelzer: *** **Williamston: *** *Rely on County Floodplain Ordinance. See Table 5.3.2-4 for listing of floodplain and building code ordinances.	**Oconee County: *** **Salem: *** **Seneca:** Rely on County Flood Plan. **Walhalla: *** **West Union: *** **Westminster:*** *Rely on County Floodplain Ordinance. See Table 5.3.2-4 for listing of floodplain and building code ordinances.
23	High	Acquire updated flood plain maps (current SCDNR mapping project in process) that more accurately reflect current flood areas for use in reviewing development proposals.	County Gov., Planning and Development Standards Department	General Fund Revenue As available	As updated maps are available	Multi-Hazard	Highly cost-effective due to the mitigation of future property loss, with low cost of action.	**Anderson County:** Acquired updated floodplain maps in 2012 **Anderson City:** Floodplain manager reviews updated	**Oconee County: *** **Salem: *** **Seneca:** * **Walhalla: *** **West Union: *** **Westminster: ***

								maps and development proposals. **Belton: *** **Honea Path: *** **Iva: *** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** ***** Utilize County floodplain maps and building codes. See Table 5.3.2-4 for applicable ordinances.	*All utilize the County Economic Development and GIS Departments. Floodplain maps are available to municipalities and the public online.
24	High	Strictly adhere to the most current building and fire codes as adopted by the SC Building Codes Council and State Fire Marshall.	Municipal/ County Code Enforcement Dept. / Fire Dept.	General Fund Revenue As available	Ongoing	Multi-Hazard	Highly cost-effective because of life safety issues and relatively low cost of action.	**Anderson County:** Adhere to currently adopted County ordinances and codes **Anderson City:** Adhere to currently adopted city ordinances and codes **Belton: *** **Honea Path:*** **Iva:*** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston:** Adhere to currently adopted municipality ordinances and codes	**Oconee County:*** **Salem: *** **Seneca:** Rely on most recently adopted City Building Codes. **Walhalla: *** **West Union: *** **Westminster: *** * Adhere to currently adopted County ordinances and codes

								* Adhere to currently adopted County ordinances and codes	
25	High	Review all public building projects to prevent location in hazardous areas and ensure construction mitigates the risks of potential hazards.	County/ Municipality Building and Development Standards Department	General Fund Revenue As available	Ongoing	Multi-Hazard	Highly cost-effective because action has general effectiveness in reducing damages and preventing injuries and loss of life.	**Anderson County:** Adhere to County Building and Development Standards Department. **Anderson City:** Adhere to municipal Building and Development Standards Department. **Belton:** Utilize private contractor for inspections. **Honea Path: *** **Iva: *** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston:** Adhere to municipal Building and Development Standards Department. *Rely on County Building and Development Standards Department Reference table 5.3.2-4 for relevant ordinances.	**Oconee County: *** **Salem: *** **Seneca: *** **Walhalla: *** **West Union: *** **Westminster: *** *Rely on County Building and Development Standards Department Reference table 5.3.2-4 for relevant ordinances.

26	Medium	Examine ways to identify and acquire parcels of land subject to the effects of disasters that could provide for open and green spaces in the community.	County / Municipal Government, Planning and Development Standards	General Fund Revenue as available , Grants	Ongoing	Multi-Hazard	Although monetarily expensive, highly cost-effective as it mitigates repetitive flood loss.	**Anderson County:** County Codes & Ordinances **Anderson City:** City Codes & Ordinances **Belton: *** **Honea Path: *** **Iva: *** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston:** Municipal Codes and Ordinances *Rely on County Codes and Ordinances. Reference table 5.3.2-4 for relevant ordinances.	**Oconee County: *** **Salem: *** **Seneca: *** **Walhalla: *** **West Union: *** **Westminster: *** *****No land parcels have been purchased.
27	Medium	Review local codes to determine whether they address the hazards identified for the community.	County/ Municipal Governments, Planning and Building and Codes Departments	General Fund Revenue as available	Ongoing	Multi-Hazard	High cost-effectiveness because of life safety issues and relatively low cost of action.	**Anderson County:** County Building & Codes **Anderson City:** Municipal Building & Codes **Belton: *** **Honea Path:*** **Iva:*** **Starr: *** **Pendleton:*** **Pelzer:*** **West Pelzer: *** **Williamston:** Municipal Building & Codes	**Oconee County: *** **Salem: *** **Seneca:** Code review done by Fire Marshal and Building Code Personnel. **Walhalla: *** **West Union: *** **Westminster: ***

								*Municipalities rely on County Building & Codes Department. See table 5.4.3-2 for relevant ordinances.	*Municipalities are responsible for reviewing all Oconee County codes for applicability

Goal 6: The availability and functioning of the community's infrastructure will not be significantly disrupted by a natural disaster; communities will better maximize resources for investment in hazard mitigation; Thereby protecting both existing and new properties.

- **Objective 6.1:** Local governments will encourage hazard mitigation programming by private sector organizations owning or operating key community utilities.

- **Objective 6.2:** Routine maintenance of the community's infrastructure will be done to minimize the potential for system failure because of or during a disaster.

- **Objective 6.3:** Transportation facilities and systems serving the community will be constructed and/or retrofitted to minimize the potential for disruption during a disaster.

- **Objective 6.4:** Water and sewer will not fail because of a disaster.

#	Priority	Action Item Description/ Benefit	Lead Agency	Funding Source	Schedule	Hazard	Cost Effectiveness	Anderson County Status as of 2017	Oconee County Status as of 2017
28	High	Inspect utility lines and upgrade utility infrastructure that is at risk to natural hazards, so to minimize possible damage, as needed.	County / Municipal Governments, Public Works Department	General Fund Revenue as available and Grant Funding	Ongoing	Multi-Hazard	Although monetarily expensive to upgrade infrastructure, highly cost-effective because of life safety issues.	**Anderson County: *** **Anderson City: *** **Belton: *** **Honea Path: *** **Iva: *** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *Each municipality is responsible for initiating inspection of utility infrastructure and upgrading as necessary.	**Oconee County: *** **Salem: *** **Seneca:** Electric lines inspected annually. **Walhalla: *** **West Union: *** **Westminster:** *Rely on County Public Works department. Each municipality is responsible for initiating inspection of utility infrastructure and upgrading as necessary.
29	High	Inspect water and sewer infrastructure for vulnerability to natural hazards. Identify and elevate vulnerable equipment and electrical controls at wastewater and potable water treatment facilities.	County/ Municipal Governments, Public Works Department, Water Providers	General Fund Revenue As Available and Grants	Ongoing	Multi-Hazard	Although monetarily expensive, highly cost-effective because of life safety issues.	**Anderson County:*** **Anderson City: *** **Belton: *** **Honea Path: *** **Iva: *** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: ***	**Oconee County:*** **Salem: *** **Seneca:** Water/sewer lines inspected annually. **Walhalla: *** **West Union: *** **Westminster: *** *Rely on County Public Works department. Each municipality is responsible for initiating

								*Each municipality is responsible for initiating inspection of water and sewer infrastructure and upgrading as necessary	inspection of utility infrastructure and upgrading as necessary.
30	High	Office of Building Development Standards incorporates consideration of utility infrastructure during development plan review process prior to issuing permits.	County/ municipal Gov., Planning and Development Standards Department, Local Utility Providers	General Fund Revenue As Available	Ongoing	Multi-Hazard	Although monetarily expensive, highly cost-effective because of life safety issues.	**Anderson County:** County Office of Building Development Standards. **Anderson City:** Municipal Office of Building Development Standards. **Belton: *** **Honea Path: *** **Iva: *** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston:** Municipal Office of Building Development Standards. * Municipalities rely on County Office of Building Development Standards. Municipalities are responsible for initiating contact with the County Department. See Table 5.3.2-4 for relevant ordinances.	**Oconee County:*** **Salem:*** **Seneca:*** **Walhalla:*** **West Union:*** **Westminster:*** * Municipalities rely on County Office of Building Development Standards. Municipalities are responsible for initiating contact with the County Department. See Table 5.3.2-4 for relevant ordinances.
31	High	Identify roadways and traffic systems susceptible to natural hazards (i.e. flooding) and	County / Municipal	General Fund Revenue As	Ongoing	Multi-Hazard	Although monetarily expensive to implement	**Anderson County:** * **Anderson City: *** **Belton: ***	**Oconee County:*** **Salem:*** **Seneca:***

		prioritize improvement projects to minimize disruption to the roadways.	Governments, Public Works	Available and Grants			improvements, high cost effectiveness due to reducing damages and preventing injuries and loss of life.	**Honea Path:*** **Iva:*** **Starr: *** **Pendleton:** * **Pelzer: *** **West Pelzer: *** **Williamston: *** * Each municipality is responsible for initiating inspection of roadway infrastructure and upgrading as necessary	**Walhalla:*** **West Union: *** **Westminster:*** * Each municipality is responsible for initiating inspection of roadway infrastructure and upgrading as necessary
32	High	Determine whether there are incremental mitigating improvements that can be made to facilities as part of ongoing maintenance and performance enhancements.	County, Municipal Governments, Building and Codes Department, Utility Providers, Water Providers	General Funds Revenue As available and private funding as available , grants	3-5 years	Multi-Hazard	Although monetarily expensive to implement improvements, this action is highly cost-effective because of life safety issues.	**Anderson County: *** **Anderson City:** * **Belton: *** **Honea Path: *** **Iva: *** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** * It is the municipalities responsibility to initiate incremental mitigating improvements	**Oconee County:*** **Salem:*** **Seneca:** Have City improvement plan to project future needs. **Walhalla:*** **West Union:*** **Westminster:*** * It is the municipalities responsibility to initiate incremental mitigating improvements
33	Medium	Replace low bridges or other obstructions that may induce flooding of houses or businesses.	County/ Municipal Governments, Public Works and Roads and Bridges Departments	General Funds Revenue As available and Grants	Ongoing	Multi-Hazard	Although monetarily expensive to replace, presumed highly cost-effective due to mitigation of	**Anderson County:*** **Anderson City:** * **Belton: *** **Honea Path: *** **Iva: *** **Starr: ***	**Oconee County: *** **Salem: *** **Seneca:*** **Walhalla:*** **West Union:*** **Westminster:***

							repetitive flood loss.	**Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *Municipality's responsible for initiating evaluation and replacement of low bridges that lie in the flood plains within and owned by the municipality.	*****County maintains a list of bridge replacement needs

Goal 7: All members of the community will understand the natural hazards threatening local areas and the techniques to minimize vulnerability to those natural hazards through public education.

- **Objective 7.1:** An education program will be developed to inform residents of the risks posed to the community, help them understand their vulnerability to disasters, and provide ideas for effective mitigation techniques. To include mitigation strategy and actions related to continued compliance with the NFIP.

#	Priority	Action Item Description/ Benefit	Lead Agency	Funding Source	Schedule	Hazard	Cost Effectiveness	Anderson County as of Status as of 2011	Oconee County Status as of 2017
34	High	Develop a display to be used at public events. The display will provide information on natural hazards that threaten the area and what individuals can do to reduce these risks. NFIP compliance. Existing brochures and manuals from FEMA and SCEMD would be available for distribution.	County/ Municipal Governments, County Public Information Officer and Information Technology Department	General Funds Revenue as available, Grants, FEMA publications	Ongoing	Multi-Hazard	Highly cost-effective because of life safety issues and relatively low cost of action.	**Anderson County:*** **Anderson City: *** **Belton:*** **Honea Path:** Present information to community at annual Fall Festival. **Iva:** Rely on FEMA & Red Cross Literature. * **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc.	**Oconee County: *** **Salem: *** **Seneca: *** **Walhalla: *** **West Union: *** **Westminster: *** *Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official County EMD website, etc
35	High	Utilize the media for the distribution and publication of hazard information. Send news releases and regular public relations pieces to local newspapers and radio stations. Promote pre-disaster planning.	County/Municipal Governments, County Public Information Officer and Information Technology	General Funds Revenue As available and Grants	Ongoing	Multi-Hazard	Highly cost effective due to relatively low cost.	**Anderson County:** Has disaster preparedness information on website **Anderson City: *** **Belton:** Utilize yourgov.app, Reverse 911, and Social Media. **Honea Path:** Utilize website & Social Media. Considering a PSA in the newspaper.	**Oconee County: *** **Salem: *** **Seneca: *** **Walhalla: *** **West Union: *** **Westminster: *** *All municipalities maintain their own websites and

			Department					**Iva:** Utilize town website and social media. ***** **Starr: *** **Pendleton:** * **Pelzer: *** **West Pelzer: *** **Williamston: *** *Municipalities ae encouraged to link the County's website to their own for disaster preparedness information.	utilize social media to distribute disaster preparedness information.
36	Medium	Provide information to residents of the community regarding flood insurance available.	County Building & Codes Dept., Development Standards Office	General Funds Revenue As available and Grants	Ongoing	Multi-Hazard	High return with minimum costs, therefore, highly cost effective	**Anderson County:** **Anderson City:*** **Belton: *** **Honea Path:** Utilize Website and Social Media. **Iva: *** **Starr: *** **Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *County encourages municipalities to be members of the NFIP.	**Oconee County:*** **Salem:*** **Seneca:*** **Walhalla:*** **West Union:*** **Westminster:*** *All participating municipalities maintain their own websites and utilize social media to distribute NFIP information to the public.
37	Medium	Develop informational brochures in conjunction with the visitor's bureau that informs tourists of the natural hazards present in the community and what they should do in case one occurs. This information would be available at	County EMD	General Funds Revenue As available, Grants, FEMA	Ongoing	Multi-Hazard	High return with low monetary costs.	**Anderson County: *** **Anderson City: *** **Belton: *** **Honea Path: *** **Iva: *** **Starr: ***	**Oconee County:*** **Salem:*** **Seneca:*** **Walhalla:*** **West Union:*** **Westminster:***

		welcome centers, hotels, and other tourist attractions.		publications				**Pendleton: *** **Pelzer: *** **West Pelzer: *** **Williamston: *** *Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc. .	*Municipalities are encouraged to order FEMA educational resources and to incorporate emergency preparedness programs and information into their public council meetings, educational outreach, and official website, etc.

Table 7.4-3 – Future Development Action Items

Municipality	Future Development Action Items:	Impact on Vulnerability:
Town of Starr	Develop new Municipal Building Codes Division	Regulate construction in vulnerable land areas and would improve infrastructure safety.
Anderson City	New lake to relive flooding downstream by Whitner Street. Anderson County is interested in a partnership on this project.	Mitigate flooding in several neighborhoods, protecting or reducing loss of resources, life, and property.
Town of Pendleton	Undergoing a plan to lift pump station out of the floodplain. Actively monitoring Sarrar Street for flooding. Need funds to install proper box culvert to mitigate any future problems.	Decrease and mitigate the vulnerability of compromised wastewater capabilities in the event of a flood.
Anderson County	Broadway Lake Dam Project- currently have $800,000 of the $30 million to properly fix.	Mitigating the likelihood of a breach to the dam, causing major flooding and damage to downstream areas.
Town of Williamston	Old Lagoon Pump Station needs to be raised out of low lying area.	Decrease the vulnerability of compromised wastewater capabilities in the event of a flood.
Town of Williamston	Purchase permanent backup generators for lift stations.	Decrease the vulnerability of compromised wastewater capabilities in the event of power failure.
Town of Pelzer	Purchase permanent backup generators for lift stations.	Decrease the vulnerability of compromised wastewater capabilities in the event of power failure.
Town of West Pelzer	Purchase permanent backup generators for lift stations.	Would decrease the vulnerability of compromised wastewater capabilities in the event of power failure.
Oconee County	Install interoperable communications for first responders and emergency management.	Decrease vulnerability by increasing ability for first-responders and emergency management to communicate effectively during an emergency.
Town of West Union	Install interoperable communications and generators for critical facilities. Conduct infrastructure upgrades.	Decrease vulnerability by increasing ability for first-responders and emergency

		management to communicate effectively during an emergency.
Town of Westminster	Install interoperable communications and generators for critical facilities.	Decrease vulnerability by increasing ability for first-responders and emergency management to communicate effectively during an emergency.
Town of Walhalla	Install interoperable communications and generators for critical facilities.	Decrease vulnerability by increasing ability for first-responders and emergency management to communicate effectively during an emergency.
Town of Honea Path	Upgrade infrastructure to Brooks Street.	Mitigate floodwater damage of roadway, protecting roadway users and municipal assets.
Town of Honea Path	Install generators & surge protectors at critical facilities.	Mitigate loss of normal operations at critical facilities in the event of a natural disaster.
Town of Honea Path	Purchase a Hummer to access rural areas that regular municipality vehicles cannot get to.	Improve response and recovery efforts in rural areas, mitigating the effects of prolonged delay of services in the event of a natural disaster.
Town of Iva	Upgrade water line and sewer infrastructure.	Mitigate loss of water and sewer to community due to either natural disaster or damaged infrastructure.
Town of Iva	Invest in purchasing weather radios.	Mitigate effects of a natural disaster by providing citizens with early warning and notice.

*In addition to these municipal projects, Anderson County and Oconee County have developed Comprehensive Development Plans. These plans have incorporated information from the 2006 and 2012 Western Piedmont Regional Taskforce Hazard Mitigation Plan. Please view appendix D & D-1 for an excerpt of Anderson County and Oconee County's Development Plans.

To access the full Anderson County and Oconee County Development Plan, visit:

http://www.andersoncountysc.org/Portals/0/Departments/Planning%20and%20Community%20Development/Documents/2016%20Comprehensive%20Plan_FINAL.pdf?ver=2016-10-20-140028-377

http://www.oconeesc.com/Portals/0/Documents/Planning/oconeecounty_comprehensive_plan.pdf

Chapter 8
Plan Monitoring & Maintenance

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8.1 IFR Requirements for Plan Monitoring and Maintenance

> ***IFR §201.6(c)(4)(i):*** *[The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle*
>
> ***IFR §201.6(c)(4)(ii):*** *[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*
>
> ***IFR§201.6(c)(4)(iii):*** *[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.*

8.2 Method for Monitoring the Plan

This Plan will be monitored by the Office of Emergency Management for several related purposes:

1. Maintain the currency of hazard and risk information.
2. Ensure that mitigation projects and actions reflect the priorities of each County, the Hazard Mitigation Planning Committee (HMPC) and the Stakeholders group.
3. To comply with SCEMD and FEMA requirements for Plan maintenance, and maintain each County's eligibility for federal disaster assistance and mitigation grants.

The Office of Emergency Management is responsible for monitoring and maintaining this Plan. The Office of Emergency Management will continuously monitor the Plan with respect to the purposes noted above, and with respect to the update circumstances noted in Section 8.4 below. Although the representatives filling the positions may change from year to year, the future HMPC and Stakeholders group will continue to be comprised of the same job functions or titles. However, the decision of specific job duties will be left to the Office of Emergency Management to be assigned as deemed appropriate.

8.3 Method and Schedule for Updating the Plan

The OEM will be responsible for overall Plan monitoring and maintenance. This Office will review the Plan annually to consider changes in land development, population growth, or recent programs and activities that may affect mitigation initiatives. These activities will at least include:

- Evaluate progress made on plan recommendations during the previous 12 months.
- Update the Plan to reflect mitigation accomplishments in projects, programs, and policies.
- Identify new mitigation needs.
- Justify and cancel planned initiatives that will no longer be implemented.

Additionally, should Anderson County or Oconee County be impacted by a disaster that receives a Presidential Disaster Declaration or as circumstances warrant, OEM will begin a review of the Plan to capture any "lessons learned" for the purpose of continuing development of this Plan. The annual update process described above will also be used following a major disaster. However, post-disaster deliberations will also consider the following:

- Determine "Lessons Learned" from the disaster, and what new initiatives should be added to the plan to help reduce the likelihood of similar damage in the future.
- Evaluate follow-up needed on relevant items from any After Action Reports produced.
- Integrate mitigation into the recovery process.

Every five years, OEM will conduct a comprehensive review and update, with appropriate public involvement. The comprehensive review process will include the following:

- Announce that the plan is under review.
- Establish a work plan, budget, and time frame for updating the Plan.
- Review progress made on plan recommendations during the previous 60 months.
- Review hazards and risk analysis.
- Note the current status of the mitigation initiatives including actions undertaken to obtain funding, permits, approvals or other resources.
- Record mitigation initiatives that have been completed.
- Engage in public involvement activities.

- Justify and cancel planned initiatives that will no longer be implemented.
- Provide additional information or analysis that has been developed that would modify the priority originally assigned to the mitigation initiative when it was incorporated into the plan and may include new hazards that put a county at risk.
- Integrate relevant feedback and circulate revised Plan.
- If significant revisions are made to the Plan, it will be formally adopted again.
- If significant revisions are made to the Plan, submit revised Plan to FEMA via the SCEMD State Hazard Mitigation Officer.

The Anderson and Oconee County HMPC has established a tentative timeline for the upcoming 2022 Hazard Mitigation Plan Update Cycle:

Table 8.3-1 -Tentative 2022 HMP Update Timeline

Month & Year	Activity
November 2017	Stakeholders review and evaluate all mitigation goals and action items and report progress made in the previous year.
November 2018	Stakeholders review and evaluate all mitigation goals and action items and report progress made in the previous year.
November 2019	Stakeholders review and evaluate all mitigation goals and action items and report progress made in the previous year.
November 2020	Stakeholders review and evaluate all mitigation goals and action items and report progress made in the previous year.
January 2021	Tentative first draft of 2021 Updated Hazard Mitigation Plan written and reviewed by Planning Committee. Planning Committee develop a proposed timeline for completion by June 1st, 2022.
November 2021	Stakeholders review and evaluate all mitigation goals and action items and report progress made in the previous year.
January 2022	Series of Public Meetings held to inform and include the community in the planning process. Announcements for these public hearings will be published in local papers and websites prior to the meeting.
February 2022	All natural hazard event information and maps updated to reflect probability, vulnerability, and risk assessments. EMD will meet with each Municipality for updates to discuss mitigation goals, strategies, and progress.
April 2022	Draft of 2022 Updated Hazard Mitigation Plan sent to surrounding counties and local academia for review and comment. Draft also uploaded to the County Website for public review and comment.

June 1st, 2022	2022 Updated Hazard Mitigation Plan submitted to FEMA via the South Carolina Emergency Management Division for review.

8.4 Circumstances that will Initiate Plan Review and Updates

This section identifies additional circumstances or conditions, other than the scheduled yearly review or a disaster event occurrence, under which the County will initiate Plan reviews and Updates.

1. On the recommendation of the Office of Emergency Management, or on its own initiative, any County Council or Municipal Council may initiate a Plan review at any time.

2. When activities of either County, or other jurisdictions including the State, significantly alter the potential effects of natural hazards on County assets, operations and/or constituents. Examples include when mitigation projects are completed, when public works or building projects are initiated in other areas and negatively impact the County, and when laws or regulations are changed.

3. When new mitigation opportunities or sources of funding are identified.

8.5 Continued Public Involvement

Both Anderson County and Oconee County will continue to utilize an open public process where public participation is encouraged. When changes are made to the plan in accordance with the method and schedule for updating the plan, OEM will post the changes in a location where the public can easily access the information, provide feedback and make comments. Postings will be made with at least 2 weeks advance notice of finalizations. When an update is required by FEMA and SCEMD regulations, each County will continue to use the same process as used in past updates, and make changes as necessary to ensure the public's continued opportunity to be involved in the planning process.

A copy of the plan will stay on file with each County OEM. Both locations of the plan will remain in place in order for the public to make comments and provide feedback at their convenience.

Each County will continue to monitor opportunities for the public to become involved in Hazard Mitigation planning through attendance at local and neighborhood planning meetings, distribution of literature, and through public outreach if requested. Comments received by OEM will be catalogued appropriately.

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