Annex C
Johnston County

This annex includes jurisdiction-specific information for Johnston County and its participating municipalities. It consists of the following five subsections:

- C.1 Johnston County Community Profile
- C.2 Johnston County Risk Assessment
- C.3 Johnston County Vulnerability Assessment
- C.4 Johnston County Capability Assessment
- C.5 Johnston County Mitigation Strategy

C.1 JOHNSTON COUNTY COMMUNITY PROFILE

C.1.1 Geography and the Environment

Johnston County is located in the East Central region of North Carolina. It comprises 11 municipalities, the Town of Archer Lodge, Town of Benson, Town of Clayton, Town of Four Oaks, Town of Kenly, Town of Micro, Town of Pine Level, Town of Princeton, Town of Selma, Town of Smithfield, and Town of Wilson's Mills, as well as many small unincorporated communities. An orientation map is provided as **Figure C.1**.

The southeastern half of Johnston County generally exhibits topographic features common to the Coastal Plains and is an area of level to gently rolling terrain. The northwestern half of the county resembles the Piedmont and is an area of steeper hills and slightly higher average elevation. The Neuse Rive, Little River, and Holts Lake are the major water bodies in the county. The total area of the county is 796 square miles, 4 square miles of which is water area.

From December to February, the average high temperature is in the mid to low 50s and low temperatures average around 30°F. However, the temperature drops to 10°F or 12°F about once during an average winter. Snow and sleet is usually light and occurs on average once or twice per year.

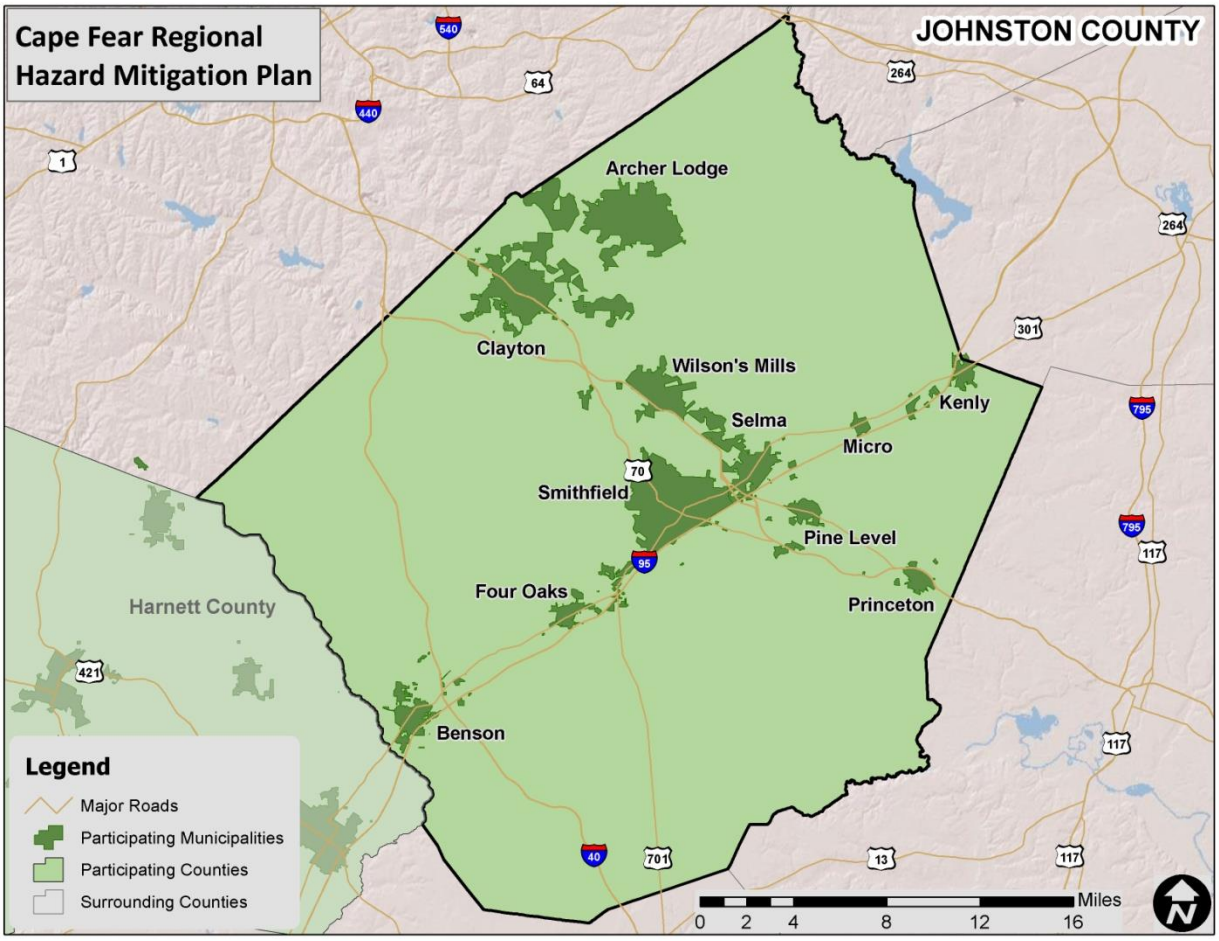
During the spring months, the days are warm and the nights are cool. Average high temperatures increase from the lower 60s in March to the nearly 80°F in May. There is a similar increase in average low temperatures, which start in the high 30s in March and climb to the mid 50s in May. Additionally, tornadoes are most likely early in the spring.

The summer is characterized by warm temperatures and rather high humidity. Average high temperatures range from the mid 80s to almost 90°F and low temperatures average in the lower to upper 60s. Summer precipitation is normally the greatest, but also the most variable, and thunderstorms are common events.

Autumn is typified by the most rapidly changing temperature. The drop-off is greatest in October and continues through November. Average high temperatures begin in the lower 80s in September and fall

to the low to mid 60s by November. Average lows also drop significantly from the high 50s to upper 30s from September to November. Autumn is the driest season.

FIGURE C.1: JOHNSTON COUNTY ORIENTATION MAP



C.1.2 Population and Demographics

According to the 2010 Census, Johnston County has a population of 168,878 people. The county has seen almost 39 percent growth between 2000 and 2010, and the average population density is 213 people per square mile. Population counts from the U.S. Census Bureau for 1990, 2000, and 2010 for the county and three participating municipalities are presented in **Table C.1**.

TABLE C.1: POPULATION COUNTS FOR JOHNSTON COUNTY

Jurisdiction	1990 Census Population	2000 Census Population	2010 Census Population	% Change 2000-2010
Johnston County	**81,306**	**121,965**	**168,878**	**38.5%**
Town of Archer Lodge	--	--	4,292	--
Town of Benson	2,810	2,923	3,311	13.3%
Town of Clayton	4,756	6,973	16,116	131.1%

Jurisdiction	1990 Census Population	2000 Census Population	2010 Census Population	% Change 2000-2010
Town of Four Oaks	1,308	1,424	1,921	34.9%
Town of Kenly	1,549	1,569	1,339	-14.7%
Town of Micro	417	454	441	-2.9%
Town of Pine Level	1,217	1,313	1,700	29.5%
Town of Princeton	1,181	1,066	1,194	12.0%
Town of Selma	4,600	5,914	6,073	2.7%
Town of Smithfield	7,540	11,510	10,966	-4.7%
Town of Wilson's Mills	--	1,291	2,277	76.4%

Source: United States Census Bureau

Based on the 2010 Census, the median age of residents of Johnston County is 36.3 years. The racial characteristics of the county are presented in **Table C.2**. Whites make up the majority of the population in the county, accounting for around 74 percent of the population.

TABLE C.2: DEMOGRAPHICS OF JOHNSTON COUNTY

Jurisdiction	White, Percent (2010)	Black or African American, Percent (2010)	American Indian or Alaska Native, Percent (2010)	Asian, Percent (2010)	Native Hawaiian or Other Pacific Islander, Percent (2010)	Other Race, Percent (2010)	Two or More Races, percent (2010)	Persons of Hispanic Origin, Percent (2010)*
Johnston County	**74.2%**	**15.1%**	**0.6%**	**0.6%**	**0.0%**	**7.5%**	**2.0%**	**12.9%**
Town of Archer Lodge	81.0%	8.8%	0.6%	0.3%	0.0%	7.2%	2.1%	12.2%
Town of Benson	60.2%	26.6%	0.4%	0.5%	0.0%	10.1%	2.3%	14.0%
Town of Clayton	69.5%	21.8%	0.4%	1.4%	0.0%	4.9%	2.1%	10.7%
Town of Four Oaks	69.8%	17.5%	0.9%	0.2%	0.0%	8.6%	3.0%	14.1%
Town of Kenly	58.5%	35.3%	0.7%	0.7%	0.0%	4.1%	0.8%	8.1%
Town of Micro	78.2%	12.5%	0.0%	0.2%	0.0%	8.4%	0.7%	9.5%
Town of Pine Level	73.2%	15.2%	0.7%	0.1%	0.0%	9.1%	1.6%	12.9%
Town of Princeton	67.2%	25.5%	0.8%	0.9%	0.0%	3.9%	1.7%	5.9%
Town of Selma	38.8%	37.2%	0.5%	0.2%	0.1%	20.3%	2.9%	34.8%
Town of Smithfield	56.9%	27.2%	0.5%	0.8%	0.1%	12.5%	1.9%	19.3%
Town of Wilson's Mills	57.0%	30.7%	0.7%	0.4%	0.0%	9.0%	2.2%	18.7%

*Hispanics may be of any race, so also are included in applicable race categories
Source: United States Census Bureau

C.1.3 Housing

According to the 2010 U.S. Census, there are 67,682 housing units in Johnston County, the majority of which are single family homes or mobile homes. Housing information for the county and towns is presented in **Table C.3**. As shown in the table, the county and towns all have a very low percentage of seasonal units.

TABLE C.3: HOUSING CHARACTERISTICS OF JOHNSTON COUNTY

Jurisdiction	Housing Units (2000)	Housing Units (2010)	Seasonal Units, Percent (2010)	Median Home Value (2006-2010)
Johnston County	**50,196**	**67,682**	**0.6%**	**$136,200**
Town of Archer Lodge	--	1,536	0.6%	$149,200
Town of Benson	1,364	1,554	0.8%	$117,100
Town of Clayton	3,006	6,648	0.4%	$151,000
Town of Four Oaks	667	888	0.3%	$113,300
Town of Kenly	754	703	0.6%	$108,200
Town of Micro	225	212	0.0%	$74,000
Town of Pine Level	652	760	0.5%	$117,200
Town of Princeton	525	571	0.7%	$88,300
Town of Selma	2,515	2,590	0.3%	$92,300
Town of Smithfield	4,674	4,834	0.5%	$120,500
Town of Wilson's Mills	505	823	0.5%	$106,600

Source: United States Census Bureau

C.1.4 Infrastructure

Transportation

There are several major highways that cross Johnston County. Interstate 95 is one of two interests that pass directly through Johnston County, traversing northeast to southwest from Harnett County through Benson, Four Oaks, Smithfield, Selma, and Kenly. The second interstate that passes through Johnston County is Interstate 40, which travels northwest to southwest along the southwest edge of the county, connecting it to Wake County and the Triangle. US-70 also connects the county to the Triangle, traversing northwest to southeast through Johnston County. There is also a designated scenic byway in Johnston County, Blue-Gray Scenic Byway, which parallels the Neuse River and Hannah's Creek.

Raleigh-Durham International Airport (RDU) is the nearest commercial airport to Johnston County. The airport currently offers daily direct flights to 39 domestic and international cities. The RDU airport is about 45 miles from Smithfield. An additional relief airport, Raleigh Exec, is also located nearby just outside of Sanford and provides additional capacity to the RDU airport. An additional general aviation airport servicing the county is the Johnston County Airport in Smithfield.

Utilities

Electrical power in Johnston County is provided by one public utility, three electricity cooperatives, and several municipalities. Duke Energy Progress serves major portions of the county while South River Electric Membership Corporation serves a small area in southeastern corner of the county, Tri-County Electric Membership Corporation serves a small area on the eastern edge of the county, and Wake Electric Membership Corporation services a small area in the northern part of the county. The Towns of Benson, Clayton, Selma, and Smithfield are all members of the North Carolina Eastern Municipal Power Association and are affiliated with ElectriCities of North Carolina; as such, they provide municipally-owned and operated electric service to their residents.

Water and sewer service in the county is provided by the Johnston County Public Utilities Department, which provides service to county residents as well as residents of the Towns of Archer Lodge and

Wilson's Mills. The remaining towns in Johnston County have their own water supply and wastewater collection systems. Some parts of the county do require the use of wells and septic systems.

Community Facilities

There are a number of buildings and community facilities located throughout Johnston County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 12 fire stations, 8 police stations, and 46 public schools located within the county.

There are two medical care facilities located in Johnston County. These facilities are operated by Johnston Health. The Johnston Medical Center is a 199-bed acute care hospital located in Smithfield with a secondary location in Clayton.

In addition to the Neuse River Greenway Trail and Clemmons Educational State Forest, the county contains numerous local parks and recreation areas. These facilities offer recreational opportunities to area residents and many visitors each year.

C.1.5 Land Use

Johnston County is experiencing growth and development due to its proximity to the major metropolitan area in the Triangle. There are several incorporated municipalities located throughout the county which make up most of the county's population. The incorporated areas are also where many businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of residential and commercial development in the municipal areas with some agricultural and recreational uses in the more rural areas. Agriculture remains one of the largest land uses in the region and comprises a mix of cropland, pastureland, and woodland dispersed across the region. However, over the last two decades, the region has become more urbanized and there has been a decline in agriculture.

C.1.6 Employment and Industry

According to the North Carolina Employment Security Commission, in 2012, Johnston County had an average annual employment of 74,971 workers and an average unemployment rate of 8.2 percent (compared to 8.0 percent for the state). In 2012, the Manufacturing industry employed 14.8 percent of the county's workforce followed closely by Retail Trade (14.3%) then Health Care and Social Assistance (12.2%) and Educational Services (11.8%). The American Community Survey (ACS) found the average annual median household income in Johnston County was $50,132 in Johnston County from 2008 to 2012 compared to $46,450 for the state of North Carolina.

C.2 JOHNSTON COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Johnston County. Each hazard profile includes a description of the hazard's location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

C.2.1 Drought

Location and Spatial Extent

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that the county would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment.

Historical Occurrences

According to the North Carolina Drought Monitor, Johnston County has had drought occurrences in each of the last fourteen years (2000-2013). **Table C.4** shows the most severe drought classification for each year, according to North Carolina Drought Monitor classifications. It should be noted that the North Carolina Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional but a majority of the county may actually be in a less severe condition.

TABLE C.4: HISTORICAL DROUGHT OCCURRENCES IN JOHNSTON COUNTY

Abnormally Dry | Moderate Drought | Severe Drought | Extreme Drought | Exceptional Drought

	Johnston County
2000	ABNORMAL
2001	SEVERE
2002	**EXTREME**
2003	ABNORMAL
2004	ABNORMAL
2005	MODERATE
2006	SEVERE
2007	**EXCEPTIONAL**
2008	**EXCEPTIONAL**
2009	MODERATE
2010	MODERATE
2011	SEVERE
2012	MODERATE
2013	MODERATE

Source: North Carolina Drought Monitor

Probability of Future Occurrences

Based on historical occurrence information, it is assumed that Johnston County has a probability level of likely (10 to 100 percent annual probability) for future drought events. This hazard may vary slightly by location but each area has an equal probability of experiencing a drought. However, historical information also indicates that there is a much lower probability for extreme, long-lasting drought conditions.

C.2.2 Extreme Heat

Location and Spatial Extent

Excessive heat typically impacts a large area and cannot be confined to any geographic or political boundaries. All of Johnston County is susceptible to extreme heat conditions.

Historical Occurrences

Data from the National Climatic Data Center was used to determine historical extreme heat and heat wave events in Johnston County. Two events were reported:

July 22, 1998 – *Excessive Heat* – Excessive heat plagued central North Carolina July 22 through July 23. Maximum temperatures reached the 98 to 103 degree range combined with dew points in the 78 to 80 degree range with little wind to give heat index values of around 110 degrees.

July 23, 1999 – *Excessive Heat* – A farm worker was overcome by heat exhaustion. He was taken to the local hospital where his body temperature was measured at 108. A 3 year old boy died after he apparently got into his parents car and could not get out.

In addition, information from the State Climate Office of North Carolina was reviewed to obtain historical temperature records in the county. Temperature information has been reported since 1892. The recorded maximum for Johnston County can be found below in **Table C.5**.

TABLE C.5: HIGHEST RECORDED TEMPERATURE IN JOHNSTON COUNTY

Location	Date	Temperature (F)
Clayton WTP	8/18/1988	107
JOHNSTON COUNTY MAXIMUM	--	**107**

Source: State Climate Office of North Carolina

The State Climate Office also reports average maximum temperatures in various locations in the county. The most centralized location is Smithfield. **Table C.6** shows the average maximum temperatures from 1971 to 2000 at the Smithfield observation station which can be used as a general comparison for the county.

TABLE C.6: AVERAGE MAXIMUM TEMPERATURE IN SMITHFIELD, JOHNSTON COUNTY

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Avg. Max (°F)	51.4	55.2	63.7	72.4	79.8	86.3	89.9	87.9	82.5	72.7	63.6	54.8

Source: State Climate Office of North Carolina

Probability of Future Occurrences

Based on historical occurrence information, it is assumed that all of Johnston County has a probability level of likely (10 to 100 percent annual probability) for future extreme heat events to impact the county.

C.2.3 Hailstorm

Location and Spatial Extent

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Johnston County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

Historical Occurrences

According to the National Climatic Data Center, 155 recorded hailstorm events have affected Jonston County since 1973.[1] **Table C.7** is a summary of the hail events in Johnston County. **Table C.8** provides detailed information about each event that occurred in the county. In all, hail occurrences resulted in almost $1.3 million (2013 dollars) in property damages. Hail ranged in diameter from 0.75 inches to 2.75 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Climatic Data Center. Therefore, it is likely that damages are greater than the reported value.

TABLE C.7: SUMMARY OF HAIL OCCURRENCES IN JOHNSTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2013)
Archer Lodge	3	0/0	$0
Benson	16	0/0	$290,268
Clayton	21	0/0	$5,075
Four Oaks	11	0/0	$0
Kenly	6	0/0	$890,783
Micro	0	0/0	$0
Pine Level	2	0/0	$0
Princeton	16	0/0	$0
Selma	2	0/0	$0
Smithfield	13	0/0	$8,069
Wilson's Mills	8	0/0	$0
Unincorporated Area	57	0/0	$55,928
JOHNSTON COUNTY TOTAL	**155**	**0/0**	**$1,250,123**

Source: National Climatic Data Center

[1] These hail events are only inclusive of those reported by the National Climatic Data Center (NCDC). It is likely that additional hail events have affected Jonhston County. In addition to NCDC, the North Carolina Department of Insurance office was contacted for information. As additional local data becomes available, this hazard profile will be amended.

TABLE C.8: HISTORICAL HAIL OCCURRENCES IN JOHNSTON COUNTY

	Date	Magnitude	Deaths / Injuries	Property Damage*
Archer Lodge				
ARCHERS LODGE	5/11/1996	0.75 in.	0/0	$0
ARCHERS LODGE	7/16/1997	0.75 in.	0/0	$0
ARCHERS LODGE	7/22/2008	0.88 in.	0/0	$0
Benson				
Benson	7/26/1995	1.00 in.	0/0	$0
BENSON	5/6/1996	0.75 in.	0/0	$0
BENSON	8/5/1997	2.75 in.	0/0	$290,268
BENSON	5/26/1998	1.75 in.	0/0	$0
BENSON	7/22/1998	1.25 in.	0/0	$0
BENSON	7/22/1998	1.00 in.	0/0	$0
BENSON	6/3/2000	0.75 in.	0/0	$0
BENSON	8/18/2003	2.00 in.	0/0	$0
BENSON	8/18/2003	1.00 in.	0/0	$0
BENSON	5/5/2006	0.75 in.	0/0	$0
BENSON	5/5/2006	0.75 in.	0/0	$0
BENSON	5/20/2006	1.75 in.	0/0	$0
BENSON	4/21/2008	1.00 in.	0/0	$0
BENSON	8/5/2009	1.25 in.	0/0	$0
BENSON	6/21/2011	1.00 in.	0/0	$0
BENSON	5/22/2012	0.75 in.	0/0	$0
Clayton				
Clayton	6/12/1995	2.00 in.	0/0	$0
CLAYTON	5/11/1996	0.75 in.	0/0	$0
CLAYTON	5/7/1998	1.00 in.	0/0	$0
CLAYTON	6/3/1998	1.25 in.	0/0	$0
CLAYTON	8/13/2000	0.75 in.	0/0	$0
CLAYTON	7/18/2003	0.75 in.	0/0	$0
CLAYTON	8/18/2003	0.75 in.	0/0	$0
CLAYTON	5/20/2006	1.00 in.	0/0	$0
CLAYTON	5/20/2006	1.00 in.	0/0	$0
CLAYTON	5/20/2006	1.25 in.	0/0	$0
CLAYTON	5/26/2006	1.75 in.	0/0	$0
CLAYTON	5/26/2006	1.75 in.	0/0	$0
CLAYTON	6/6/2006	0.75 in.	0/0	$0
CLAYTON	6/11/2006	0.75 in.	0/0	$0
CLAYTON	5/10/2008	1.00 in.	0/0	$0
CLAYTON	7/25/2009	0.88 in.	0/0	$0
CLAYTON	5/23/2012	1.75 in.	0/0	$0
CLAYTON	5/23/2012	1.00 in.	0/0	$0
CLAYTON	5/23/2012	1.75 in.	0/0	$5,075
CLAYTON	7/1/2012	1.00 in.	0/0	$0
CLAYTON	7/1/2012	1.00 in.	0/0	$0
Four Oaks				
FOUR OAKS	7/25/1996	0.75 in.	0/0	$0

	Date	Magnitude	Deaths / Injuries	Property Damage*
FOUR OAKS	9/11/1997	0.75 in.	0/0	$0
FOUR OAKS	5/8/1998	0.75 in.	0/0	$0
FOUR OAKS	4/4/1999	0.00 in.	0/0	$0
FOUR OAKS	7/11/2003	1.00 in.	0/0	$0
FOUR OAKS	5/18/2006	0.75 in.	0/0	$0
FOUR OAKS	6/12/2007	0.88 in.	0/0	$0
FOUR OAKS	7/27/2007	0.75 in.	0/0	$0
FOUR OAKS	4/12/2008	1.75 in.	0/0	$0
FOUR OAKS	6/22/2008	0.75 in.	0/0	$0
FOUR OAKS	5/23/2012	1.00 in.	0/0	$0
Kenly				
KENLY	5/29/1996	0.0 in.	0/0	$890,783
KENLY	4/21/1997	1.00 in.	0/0	$0
KENLY	5/1/1997	1.00 in.	0/0	$0
KENLY	5/26/2006	0.88 in.	0/0	$0
KENLY	5/29/2009	0.75 in.	0/0	$0
KENLY	8/2/2012	1.75 in.	0/0	$0
Micro				
None Reported	--	--	--	--
Pine Level				
PINE LEVEL	6/11/2008	0.75 in.	0/0	$0
PINE LEVEL	5/6/2009	1.00 in.	0/0	$0
Princeton				
Princeton	5/11/1995	1.00 in.	0/0	$0
PRINCETON	5/29/2003	0.75 in.	0/0	$0
PRINCETON	10/22/2005	0.75 in.	0/0	$0
PRINCETON	5/18/2006	1.25 in.	0/0	$0
PRINCETON	5/18/2006	0.75 in.	0/0	$0
PRINCETON	5/18/2006	0.75 in.	0/0	$0
PRINCETON	5/18/2006	1.00 in.	0/0	$0
PRINCETON	5/18/2006	1.75 in.	0/0	$0
PRINCETON	5/18/2006	0.88 in.	0/0	$0
PRINCETON	5/20/2006	1.00 in.	0/0	$0
PRINCETON	6/11/2006	0.75 in.	0/0	$0
PRINCETON	5/20/2008	0.88 in.	0/0	$0
PRINCETON	4/6/2009	0.75 in.	0/0	$0
PRINCETON	5/7/2009	0.75 in.	0/0	$0
PRINCETON	5/15/2012	1.00 in.	0/0	$0
PRINCETON	5/22/2012	1.00 in.	0/0	$0
Selma				
Selma	5/11/1995	1.00 in.	0/0	$0
SELMA	5/20/2008	0.88 in.	0/0	$0
Smithfield				
Smithfield	4/26/1993	0.75 in.	0/0	$0
Smithfield	5/19/1993	1.75 in.	0/0	$8,069
SMITHFIELD	7/5/1997	1.00 in.	0/0	$0

	Date	Magnitude	Deaths / Injuries	Property Damage*
SMITHFIELD	4/1/2001	1.00 in.	0/0	$0
SMITHFIELD	7/5/2002	0.88 in.	0/0	$0
SMITHFIELD	7/5/2002	1.75 in.	0/0	$0
SMITHFIELD	5/18/2006	1.00 in.	0/0	$0
SMITHFIELD	7/27/2007	1.75 in.	0/0	$0
SMITHFIELD	7/28/2007	0.75 in.	0/0	$0
SMITHFIELD	5/10/2008	0.88 in.	0/0	$0
SMITHFIELD	5/10/2008	1.50 in.	0/0	$0
SMITHFIELD	5/20/2008	0.88 in.	0/0	$0
SMITHFIELD	6/9/2009	0.88 in.	0/0	$0
Wilson's Mills				
Wilson Mills	5/19/1993	1.50	0/0	$0
WILSON MILLS	4/15/1996	0.75	0/0	$0
WILSONS MILLS	5/10/2008	0.88	0/0	$0
WILSONS MILLS	5/10/2008	0.88	0/0	$0
WILSONS MILLS	5/20/2008	1.25	0/0	$0
WILSONS MILLS	6/9/2009	0.88	0/0	$0
WILSONS MILLS	5/4/2012	0.75	0/0	$0
WILSONS MILLS	7/1/2012	1.75	0/0	$0
Unincorporated Area				
JOHNSTON COUNTY	9/18/1973	1.75	0/0	$0
JOHNSTON COUNTY	4/19/1978	1.75	0/0	$0
JOHNSTON COUNTY	5/23/1983	1.75	0/0	$0
JOHNSTON COUNTY	3/28/1984	1.75	0/0	$0
JOHNSTON COUNTY	5/8/1984	0.75	0/0	$0
JOHNSTON COUNTY	5/8/1984	1.75	0/0	$0
JOHNSTON COUNTY	4/16/1985	0.75	0/0	$0
JOHNSTON COUNTY	7/16/1985	1.00	0/0	$0
JOHNSTON COUNTY	7/16/1985	0.75	0/0	$0
JOHNSTON COUNTY	5/21/1986	1.75	0/0	$0
JOHNSTON COUNTY	5/30/1986	1.75	0/0	$0
JOHNSTON COUNTY	5/30/1986	1.00	0/0	$0
JOHNSTON COUNTY	8/27/1986	1.75	0/0	$0
JOHNSTON COUNTY	5/3/1987	0.75	0/0	$0
JOHNSTON COUNTY	5/3/1987	0.75	0/0	$0
JOHNSTON COUNTY	5/5/1988	0.75	0/0	$0
JOHNSTON COUNTY	6/2/1988	1.75	0/0	$0
JOHNSTON COUNTY	4/25/1989	1.75	0/0	$0
JOHNSTON COUNTY	4/25/1989	1.25	0/0	$0
JOHNSTON COUNTY	6/7/1989	1.75	0/0	$0
JOHNSTON COUNTY	8/29/1990	1.00	0/0	$0
JOHNSTON COUNTY	8/29/1990	0.75	0/0	$0
JOHNSTON COUNTY	5/1/1994	1.75	0/0	$0
JOHNSTON COUNTY	5/1/1994	0.75	0/0	$0
NR Cleveland	3/23/1995	0.75	0/0	$0
JOHNSTON COUNTY	5/15/1995	0.88	0/0	$0
Nr Meadows	7/10/1995	1.00	0/0	$0

	Date	Magnitude	Deaths / Injuries	Property Damage*
FOUR OAKS	7/25/1996	0.75	0/0	$0
PEACOCK CROSSROADS	5/1/1997	0.88	0/0	$0
FOUR OAKS	9/11/1997	0.75	0/0	$0
FOUR OAKS	5/8/1998	0.75	0/0	$0
FOUR OAKS	4/4/1999	0.00	0/0	$0
COUNTYWIDE	7/5/1999	1.75	0/0	$55,928
COATS XRDS	9/25/2000	0.75	0/0	$0
HARDY XRDS	12/17/2000	1.50	0/0	$0
PARKERS MILL	3/31/2002	0.88	0/0	$0
DRUG STORE	7/5/2002	1.00	0/0	$0
COATS XRDS	7/9/2003	0.75	0/0	$0
FOUR OAKS	7/11/2003	1.00	0/0	$0
FOUR OAKS	5/18/2006	0.75	0/0	$0
COATS XRDS	6/11/2006	0.75	0/0	$0
FOUR OAKS	6/12/2007	0.88	0/0	$0
COATS XRDS	6/29/2007	0.75	0/0	$0
FOUR OAKS	7/27/2007	0.75	0/0	$0
BENTONVILLE	8/9/2007	0.75	0/0	$0
FOUR OAKS	4/12/2008	1.75	0/0	$0
COATS XRDS	5/20/2008	1.00	0/0	$0
DRUG STORE	5/20/2008	0.88	0/0	$0
DRUG STORE	5/20/2008	1.00	0/0	$0
FOUR OAKS	6/22/2008	0.75	0/0	$0
BLACKMAN XRDS	7/6/2008	1.00	0/0	$0
BLACKMAN XRDS	4/20/2009	0.75	0/0	$0
EMIT	5/7/2009	0.75	0/0	$0
BLACKMAN XRDS	5/7/2009	1.00	0/0	$0
SELMA ARPT	6/9/2009	1.75	0/0	$0
PARKERS MILL	6/9/2009	0.88	0/0	$0
COATS XRDS	7/23/2009	0.88	0/0	$0
PARKERS MILL	7/23/2009	1.00	0/0	$0
COATS XRDS	6/21/2011	1.00	0/0	$0
BLACKMAN XRDS	5/22/2012	1.00	0/0	$0
BLACKMAN XRDS	5/22/2012	1.00	0/0	$0
RAINS XRDS	5/22/2012	0.75	0/0	$0
PEACOCKS XRDS	5/22/2012	1.00	0/0	$0
COATS XRDS	5/23/2012	1.00	0/0	$0
DRUG STORE	5/23/2012	1.75	0/0	$0
FOUR OAKS	5/23/2012	1.00	0/0	$0
COATS XRDS	5/23/2012	0.75	0/0	$0
BLACKMAN XRDS	6/1/2012	1.00	0/0	$0

*Property damage is reported in 2013 dollars; all damage may not have been reported.
Source: National Climatic Data Center

Probability of Future Occurrences

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard (coinciding with thunderstorms), it is assumed that Johnston County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

C.2.4 Hurricane and Tropical Storm

Location and Spatial Extent

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Johnston County. The entire county is equally susceptible to hurricane and tropical storms.

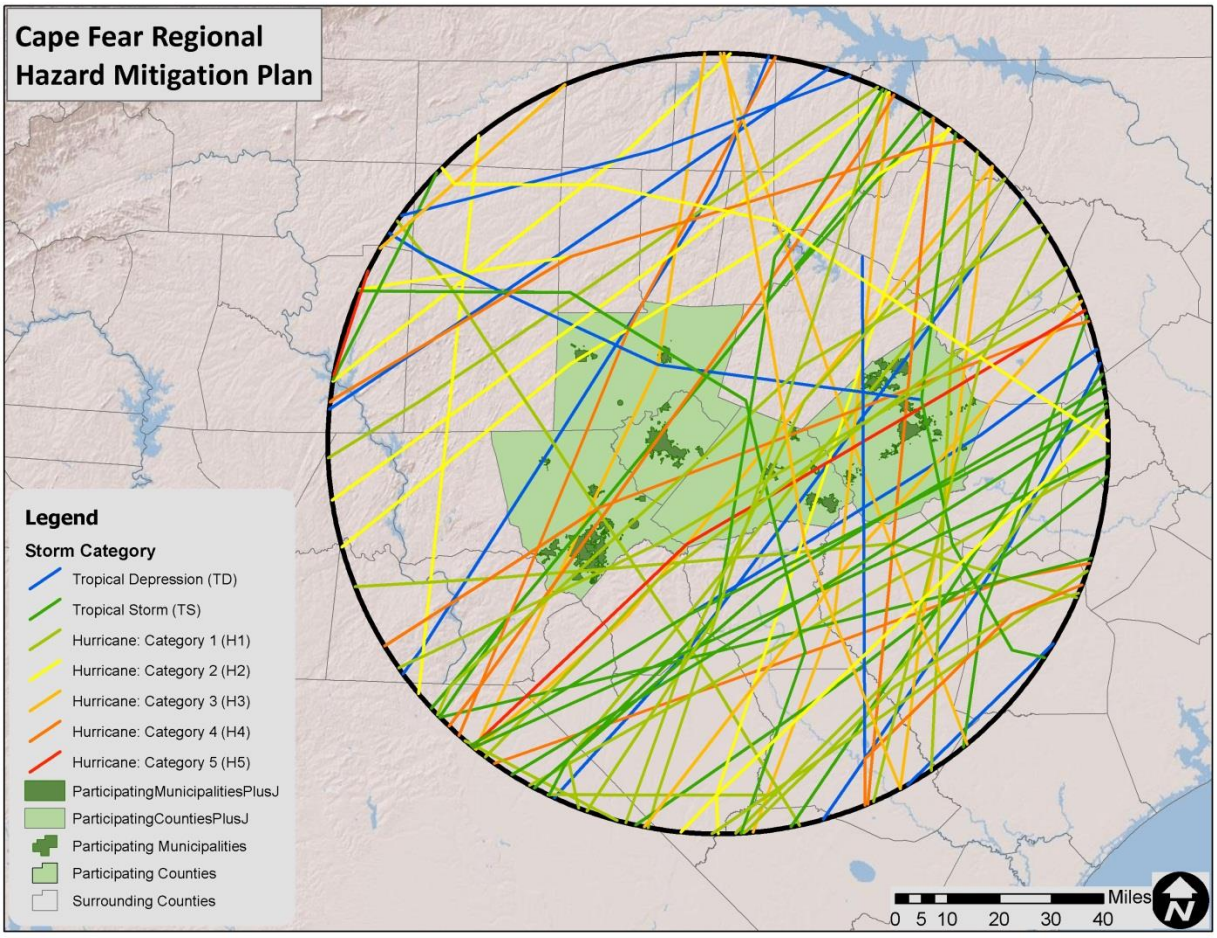
Historical Occurrences

According to the National Hurricane Center's historical storm track records, 68 hurricane or tropical storm tracks have passed within 75 miles of the Cape Fear Region since 1851.[2] This includes 43 hurricanes, 14 tropical storms, and 10 tropical depressions (based on the maximum storm category reached by the storm).

Of the recorded storm events, 22 have traversed directly through Johnston County as shown in **Figure C.2**. **Table C.9** provides the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the Cape Fear Region) and Maximum Category of the storm based on the Saffir-Simpson Scale for each event.

[2] These storm track statistics do not include extra-tropical storms. Though these related hazard events are less severe in intensity, they may cause significant local impact in terms of rainfall and high winds.

FIGURE C.2: HISTORICAL HURRICANE STORM TRACKS WITHIN 75 MILES OF THE CAPE FEAR REGION



Source: National Oceanic and Atmospheric Administration; National Hurricane Center

TABLE C.9: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE CAPE FEAR REGION (1850–2010)

Date of Occurrence	Storm Name	Maximum Wind Speed Within Buffer Area (knots)	Maximum Storm Category Achieved
8/25/1851	NOT NAMED	35	Tropical Storm (TS)
9/10/1854	NOT NAMED	57	Tropical Depression (TD)
1859	NOT NAMED	-	Tropical Depression (TD)
9/17/1859	NOT NAMED	35	Hurricane: Category 1 (H1)
6/23/1867	NOT NAMED	35	Hurricane: Category 1 (H1)
10/4/1877	NOT NAMED	48	Hurricane: Category 3 (H3)
9/13/1878	NOT NAMED	44	Hurricane: Category 2 (H2)
9/12/1883	NOT NAMED	44	Hurricane: Category 3 (H3)
10/13/1885	NOT NAMED	35	Tropical Depression (TD)
7/2/1886	NOT NAMED	31	Hurricane: Category 2 (H2)
6/22/1886	NOT NAMED	35	Tropical Depression (TD)

Date of Occurrence	Storm Name	Maximum Wind Speed Within Buffer Area (knots)	Maximum Storm Category Achieved
1886	NOT NAMED	53	Tropical Depression (TD)
1887	NOT NAMED	-	Hurricane: Category 1 (H1)
9/10/1888	NOT NAMED	31	Tropical Storm (TS)
9/24/1889	NOT NAMED	35	Hurricane: Category 2 (H2)
1891	NOT NAMED	-	Tropical Depression (TD)
10/4/1893	NOT NAMED	70	Hurricane: Category 3 (H3)
10/13/1893	NOT NAMED	35	Hurricane: Category 4 (H4)
9/30/1896	NOT NAMED	62	Hurricane: Category 3 (H3)
10/31/1899	NOT NAMED	66	Hurricane: Category 2 (H2)
7/13/1901	NOT NAMED	31	Hurricane: Category 1 (H1)
6/16/1902	NOT NAMED	31	Tropical Storm (TS)
9/14/1904	NOT NAMED	53	Hurricane: Category 1 (H1)
8/31/1911	NOT NAMED	22	Hurricane: Category 2 (H2)
6/14/1912	NOT NAMED	31	Tropical Storm (TS)
9/4/1913	NOT NAMED	66	Hurricane: Category 1 (H1)
10/10/1913	NOT NAMED	35	Hurricane: Category 1 (H1)
5/16/1916	NOT NAMED	31	Tropical Storm (TS)
9/6/1916	NOT NAMED	31	Tropical Storm (TS)
9/23/1920	NOT NAMED	31	Hurricane: Category 1 (H1)
9/30/1924	NOT NAMED	53	Hurricane: Category 1 (H1)
1927	NOT NAMED	44	Tropical Storm (TS)
8/11/1928	NOT NAMED	26	Hurricane: Category 2 (H2)
10/2/1929	NOT NAMED	35	Hurricane: Category 4 (H4)
9/6/1935	NOT NAMED	48	Hurricane: Category 5 (H5)
8/15/1940	NOT NAMED	62	Tropical Depression (TD)
8/2/1944	NOT NAMED	31	Hurricane: Category 1 (H1)
10/20/1944	NOT NAMED	48	Hurricane: Category 3 (H3)
9/18/1945	NOT NAMED	35	Hurricane: Category 4 (H4)
10/9/1946	NOT NAMED	22	Hurricane: Category 4 (H4)
9/25/1947	NOT NAMED	53	Tropical Storm (TS)
10/15/1954	HAZEL	35	Hurricane: Category 4 (H4)
8/17/1955	DIANE	53	Hurricane: Category 3 (H3)
9/26/1956	IVY	35	Hurricane: Category 1 (H1)
7/10/1959	CINDY	26	Hurricane: Category 1 (H1)
8/31/1964	CLEO	26	Hurricane: Category 4 (H4)
6/16/1965	UNNAMED	35	Tropical Storm (TS)
6/10/1968	CELESTE	31	Tropical Storm (TS)
5/26/1970	ALMA	22	Hurricane: Category 1 (H1)
9/13/1971	HEIDI	40	Tropical Depression (TD)
10/1/1971	UNNAMED	40	Tropical Storm (TS)
6/21/1972	AGNES	26	Hurricane: Category 1 (H1)
9/15/1976	SUBTROP:SUBTROP 3	53	Tropical Storm (TS)
9/5/1979	DAVID	35	Hurricane: Category 5 (H5)
9/14/1984	DIANA	40	Hurricane: Category 4 (H4)
8/18/1985	ONE-C	22	Tropical Depression (TD)

Date of Occurrence	Storm Name	Maximum Wind Speed Within Buffer Area (knots)	Maximum Storm Category Achieved
9/8/1987	UNNAMED	53	Tropical Depression (TD)
9/6/1996	FRAN	57	Hurricane: Category 3 (H3)
7/24/1997	DANNY	31	Hurricane: Category 1 (H1)
9/4/1998	EARL	66	Hurricane: Category 2 (H2)
9/5/1999	DENNIS	26	Hurricane: Category 2 (H2)
9/16/1999	FLOYD*	66	Hurricane: Category 1 (H1)
9/19/2000	GORDON	35	Tropical Storm (TS)
9/23/2000	HELENE	35	Hurricane: Category 1 (H1)
8/30/2004	GASTON	35	Hurricane: Category 3 (H3)
9/27/2004	JEANNE	-	Tropical Storm (TS)
6/13/2006	ALBERTO	35	Hurricane: Category 1 (H1)
9/6/2008	HANNA	40	Tropical Depression (TD)

**Although Hurricane Floyd's track traversed just outside of the 75 mile buffer area, it was included in the hazard history since a federal disaster area was declared for all five Cape Fear counties as a result of the storm's impact.*
Source: National Hurricane Center

The National Climatic Data Center has reported seven events associated with a hurricane or tropical storm in Johnston County since 1996. These storms are listed in **Table C.10** and are generally representative of storms with the greatest impact on the county over that time period.

TABLE C.10: HISTORICAL HURRICANE/TROPICAL STORM OCCURRENCES IN JOHNSTON COUNTY

Date of Occurrence	Storm Name	Deaths/Injuries	Property Damage*
7/12/1996	Hurricane Bertha	0/0	$0
9/5/1996	Hurricane Fran	0/0	$0
8/27/1998	Hurricane Bonnie	0/0	$0
9/4/1999	Hurricane Dennis	0/0	$0
9/15/1999	Hurricane Floyd	0/0	$161,330,536
8/30/2004	Tropical Depression Gaston	0/0	$0
9/1/2006	Tropical Storm Ernesto	0/0	$0

*Property damage is reported in 2013 dollars; all damage may not have been reported.

Federal records also indicate that two disaster declarations were made in 1996 (Hurricane Fran), 1999 (Hurricane Floyd), 2003 (Hurricane Isabel), and 2011 (Hurricane Irene) for the county.[3]

Flooding and high winds are both hazards of concern with hurricane and tropical storm events in Johnston County as evidenced by the difference in impacts caused by Hurricanes Fran and Floyd. Whereas Floyd's effects were primarily due to flooding, Fran's high winds caused damage throughout the county in conjunction with flooding impacts. Some anecdotal information is available for the major storms that have impacted the area as found below:

Tropical Storm Fran – September 5-6, 1996
After being saturated with rain just a few weeks earlier by Hurricane Bertha, the Cape Fear region was impacted by the one of the most devastating storms to ever make landfall along the Atlantic Coast. Fran

[3] A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*.

dropped more than 10 inches of rain in many areas and had sustained winds of around 115 miles per hour as it hit the coast and began its path along the I-40 corridor central North Carolina. In the end, over 3 billion dollars in damages were reported in the state. Damages to infrastructure and agriculture added to the overall toll and more than 1.7 million people in the state were left without power.

Hurricane Floyd – September 16-17, 1999
Much like Hurricane Fran, Hurricane Floyd hit the North Carolina coast just 10 days after Tropical Storm Dennis dropped more than 10 inches of rain in many areas of the state. As a result, the ground was heavily saturated when Floyd dumped an additional 15 to 20 inches in some areas. Although much of the heavy damage from the storm was found further east, the Cape Fear region suffered significant damage from the storm. Across the state more than 6 billion dollars in property damage was recorded and agricultural impacts were extremely high.

Probability of Future Occurrences
Given the inland location of the county, Johnston County is less likely to be affected by a hurricane or tropical storm system than counties closer to the coast. However, given the county's location in the eastern part of the state, hurricanes and tropical storms still remain a real threat. Based on historic evidence, the probability level of future occurrence is likely (between 10 and 100 percent annual probability). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. When the county is impacted, the damage could be significant, threatening lives and property throughout the planning area.

C.2.5 Lightning

Location and Spatial Extent
Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Johnston County is uniformly exposed to lightning.

Historical Occurrences
According to the National Climatic Data Center, there have been eight recorded lightning events in Johnston County since 1999, as listed in summary **Table C.11**.[4] These events resulted in almost $1.3 million (2013 dollars) in damages. A complete listing of those events can be found in **Table C.12**. Many of the reported events are those that caused damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

TABLE C.11: SUMMARY OF LIGHTNING OCCURRENCES IN JOHNSTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2013)
Archer Lodge	1	0/0	$194,804
Benson	1	0/2	$0
Clayton	3	0/1	$21,659
Four Oaks	0	0/0	$0
Kenly	0	0/0	$0
Micro	0	0/0	$0

[4] These lightning events are only inclusive of those reported by the National Climatic Data Center (NCDC). It is certain that additional lightning events have occurred in Johnston County. The State Fire Marshall's office was also contacted for additional information but none could be provided. As additional local data becomes available, this hazard profile will be amended.

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2013)
Pine Level	0	0/0	$0
Princeton	0	0/0	$0
Selma	2	0/2	$0
Smithfield	0	0/0	$0
Wilson's Mills	0	0/0	$0
Unincorporated Area	1	0/1	$0
JOHNSTON COUNTY TOTAL	**8**	**0/6**	**$216,463**

Source: National Climatic Data Center

TABLE C.12: HISTORIC LIGHTNING OCCURRENCES IN JOHNSTON COUNTY

	Date	Deaths / Injuries	Property Damage*	Details
Archer Lodge				
ARCHERS LODGE	7/21/2008	0/0	$194,804	A vacant house in the Buffalo Creek Subdivision of Zebulon caught on fire after it was hit by lightning. Another nearby home on Amsterdam Drive was also hit by lightning.
Benson				
BENSON	8/20/2001	0/2	$0	The driver and a passenger on a bus were treated for injuries when lightning struck the bus on I-95 South.
Clayton				
CLAYTON	7/25/1999	0/1	$0	A fourteen year old was trying to hold up a metal pole that was supporting a tent. Lightning hit a nearby road...then ran through the ground to the boy's feet. He was treated by paramedics at his home. He was not seriously injured.
CLAYTON	9/14/2007	0/0	$5,617	EVENT NARRATIVE: A spotter reported a barn fire caused by lightning north of Clayton.
CLAYTON	7/8/2010	0/0	$16,042	A house was struck by lightning at 1052 Ridge Drive in Clayton. Damage was sustained by the house when fire damaged the attic and then proceeded to spread to a bedroom.
Four Oaks				
None Reported	--	--	--	--
Kenly				
None Reported	--	--	--	--

	Date	Deaths / Injuries	Property Damage*	Details
Micro				
None Reported	--	--	--	--
Pine Level				
None Reported	--	--	--	--
Princeton				
None Reported	--	--	--	--
Selma				
SELMA	6/16/2001	0/0	$0	Lightning struck a house on Live Oak Church Road. Damage unknown.
SELMA	7/19/2006	0/2	$0	Two residents struck by lightning.
Smithfield				
None Reported	--	--	--	--
Wilson's Mills				
None Reported	--	--	--	--
Unincorporated Area				
BENTONVILLE	7/27/2009	0/1	$0	Child struck by lightning in Bentonville. Injuries unknown but not considered to be serious.

*Property Damage is reported in 2013 dollars; all damage may not have been reported.
Source: National Climatic Data Center

Probability of Future Occurrences

Although there was not a high number of historical lightning events reported in Johnston County via NCDC data, it is considered a regular occurrence, especially accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN®), Johnston County is located in an area of the country that experienced an average of 3 to 5 lightning flashes per square kilometer per year between 1997 and 2010. Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

C.2.6 Thunderstorm Wind / High Wind

Location and Spatial Extent

A wind event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. Also, Johnston County typically experiences several straight-line wind events each year. These wind events can and have caused significant damage. It is assumed that Johnston County has uniform exposure to a thunderstorm/wind event and the spatial extent of an impact could be large.

Historical Occurrences

Severe storms were at least partially responsible for one disaster declaration in Johnston County in 2011.[5] According to NCDC, there have been 250 reported thunderstorm wind and high wind events since 1958 in Johnston County.[6] These events caused over $700,000 (2013 dollars) in damages. There were also reports of one injury. **Table C.13** summarizes this information. **Table C.14** presents detailed thunderstorm wind and high wind event reports including date, magnitude, and associated damages for each event.[7]

TABLE C.13: SUMMARY OF THUNDERSTORM / HIGH WIND OCCURRENCES IN JOHNSTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2013)
Archer Lodge	7	0/0	$16,876
Benson	15	0/1	$77,228
Clayton	29	0/0	$6,109
Four Oaks	9	0/0	$10,363
Kenly	6	0/0	$15,497
Micro	5	0/0	$0
Pine Level	2	0/0	$4,587
Princeton	11	0/0	$13,982
Selma	7	0/0	$47,671
Smithfield	28	0/0	$160,478
Wilson's Mills	3	0/0	$0
Unincorporated Area	128	0/0	$363,640
JOHNSTON COUNTY TOTAL	**250**	**0/1**	**$716,431**

Source: National Climatic Data Center

TABLE C.14: HISTORICAL THUNDERSTORM / HIGH WIND OCCURRENCES IN JOHNSTON COUNTY

	Date	Type	Magnitude	Deaths / Injuries	Property Damage*
Archer Lodge					
ARCHERS LODGE	6/24/1996	TSTM WIND	50 kts.	0/0	$14,846
ARCHERS LODGE	11/16/2006	THUNDERSTORM WIND	50 kts.	0/0	$0
ARCHERS LODGE	4/15/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
ARCHER	6/27/2011	THUNDERSTORM WIND	50 kts.	0/0	$0
ARCHERS LODGE	7/25/2011	THUNDERSTORM WIND	50 kts.	0/0	$0
ARCHERS LODGE	5/4/2012	THUNDERSTORM WIND	50 kts.	0/0	$0
ARCHER	7/24/2012	THUNDERSTORM WIND	50 kts.	0/0	$2,030
Benson					
BENSON	8/5/1997	TSTM WIND	50 kts.	0/0	$0
BENSON	5/23/1998	TSTM WIND	50 kts.	0/0	$0

[5] A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*.
[6] These thunderstorm events are only inclusive of those reported by the National Climatic Data Center (NCDC). It is certain that additional thunderstorm events have occurred in Johnston County. As additional local data becomes available, this hazard profile will be amended.
[7] The dollar amount of damages provided by NCDC is divided by the number of affected counties to reflect a damage estimate for the county.

	Date	Type	Magnitude	Deaths / Injuries	Property Damage*
BENSON	5/26/1998	TSTM WIND	50 kts.	0/1	$71,454
BENSON	3/3/1999	TSTM WIND	50 kts.	0/0	$0
BENSON	6/11/2004	TSTM WIND	50 kts.	0/0	$0
BENSON	4/17/2006	TSTM WIND	50 kts.	0/0	$0
BENSON	5/5/2006	TSTM WIND	50 kts.	0/0	$0
BENSON	6/12/2006	TSTM WIND	50 kts.	0/0	$5,774
BENSON	6/21/2006	TSTM WIND	50 kts.	0/0	$0
BENSON	6/29/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
BENSON	6/14/2008	THUNDERSTORM WIND	50 kts.	0/0	$0
BENSON	6/22/2008	THUNDERSTORM WIND	50 kts.	0/0	$0
BENSON	7/16/2009	THUNDERSTORM WIND	50 kts.	0/0	$0
BENSON	7/23/2012	THUNDERSTORM WIND	50 kts.	0/0	$0
BENSON	9/18/2012	THUNDERSTORM WIND	50 kts.	0/0	$0
Clayton					
CLAYTON	11/8/1996	TSTM WIND	50 kts.	0/0	$0
CLAYTON	3/21/1999	TSTM WIND	50 kts.	0/0	$0
CLAYTON	8/14/1999	TSTM WIND	0 kts.	0/0	$0
CLAYTON	4/17/2000	TSTM WIND	50 kts.	0/0	$0
CLAYTON	6/22/2000	TSTM WIND	50 kts.	0/0	$0
CLAYTON	6/1/2002	TSTM WIND	50 kts.	0/0	$0
CLAYTON	11/11/2002	TSTM WIND	50 kts.	0/0	$0
CLAYTON	7/10/2003	TSTM WIND	50 kts.	0/0	$0
CLAYTON	6/11/2004	TSTM WIND	60 kts.	0/0	$0
CLAYTON	9/17/2004	TSTM WIND	50 kts.	0/0	$0
CLAYTON	3/8/2005	TSTM WIND	50 kts.	0/0	$0
CLAYTON	7/28/2005	TSTM WIND	52 kts.	0/0	$0
CLAYTON	4/22/2006	TSTM WIND	50 kts.	0/0	$0
CLAYTON	5/26/2006	TSTM WIND	50 kts.	0/0	$0
CLAYTON	6/21/2006	TSTM WIND	50 kts.	0/0	$0
CLAYTON	11/16/2006	THUNDERSTORM WIND	54 kts.	0/0	$0
CLAYTON	4/15/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
CLAYTON	4/15/2007	THUNDERSTORM WIND	52 kts.	0/0	$0
CLAYTON	8/21/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
CLAYTON	8/21/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
CLAYTON	3/4/2008	THUNDERSTORM WIND	52 kts.	0/0	$0
CLAYTON	3/4/2008	THUNDERSTORM WIND	51 kts.	0/0	$0
CLAYTON	7/31/2009	THUNDERSTORM WIND	50 kts.	0/0	$0
CLAYTON	1/25/2010	THUNDERSTORM WIND	50 kts.	0/0	$0
CLAYTON	6/23/2010	THUNDERSTORM WIND	50 kts.	0/0	$0
CLAYTON	11/17/2010	THUNDERSTORM WIND	50 kts.	0/0	$5,347
CLAYTON	11/17/2010	THUNDERSTORM WIND	50 kts.	0/0	$0
CLAYTON	7/28/2012	THUNDERSTORM WIND	50 kts.	0/0	$0
CLAYTON	9/6/2012	THUNDERSTORM WIND	50 kts.	0/0	$761
Four Oaks					
FOUR OAKS	4/4/1999	TSTM WIND/HAIL	0 kts.	0/0	$0
FOUR OAKS	7/10/2002	TSTM WIND	60 kts.	0/0	$0

	Date	Type	Magnitude	Deaths / Injuries	Property Damage*
FOUR OAKS	4/15/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
FOUR OAKS	6/29/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
FOUR OAKS	8/26/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
FOUR OAKS	6/9/2009	THUNDERSTORM WIND	50 kts.	0/0	$0
FOUR OAKS	1/25/2010	THUNDERSTORM WIND	50 kts.	0/0	$0
FOUR OAKS	1/25/2010	THUNDERSTORM WIND	50 kts.	0/0	$0
FOUR OAKS	7/23/2011	THUNDERSTORM WIND	50 kts.	0/0	$10,363
Kenly					
KENLY	4/20/1996	TSTM WIND	0 kts.	0/0	$0
KENLY	5/29/1996	TSTM WIND	0 kts.	0/0	$0
KENLY	7/24/1999	TSTM WIND	50 kts.	0/0	$0
KENLY	8/27/2001	TSTM WIND	50 kts.	0/0	$0
KENLY	7/20/2010	THUNDERSTORM WIND	50 kts.	0/0	$5,347
KENLY	8/2/2012	THUNDERSTORM WIND	50 kts.	0/0	$010,150
Micro					
MICRO	4/8/2000	TSTM WIND	50 kts.	0/0	$0
MICRO	6/16/2001	TSTM WIND	50 kts.	0/0	$0
MICRO	7/5/2002	TSTM WIND	50 kts.	0/0	$0
MICRO	7/28/2006	TSTM WIND	50 kts.	0/0	$0
MICRO	7/8/2010	THUNDERSTORM WIND	50 kts.	0/0	$0
Pine Level					
Pine Level	5/11/1995	THUNDERSTORM WINDS	0 kts.	0/0	$4,587
PINE LEVEL	8/21/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
Princeton					
PRINCETON	7/24/1999	TSTM WIND	50 kts.	0/0	$13,982
PRINCETON	6/14/2002	TSTM WIND	50 kts.	0/0	$0
PRINCETON	7/11/2003	TSTM WIND	50 kts.	0/0	$0
PRINCETON	5/20/2006	TSTM WIND	50 kts.	0/0	$0
PRINCETON	6/8/2006	TSTM WIND	50 kts.	0/0	$0
PRINCETON	6/11/2006	TSTM WIND	50 kts.	0/0	$0
PRINCETON	6/21/2006	TSTM WIND	50 kts.	0/0	$0
PRINCETON	7/19/2006	TSTM WIND	50 kts.	0/0	$0
PRINCETON	7/19/2006	TSTM WIND	50 kts.	0/0	$0
PRINCETON	7/29/2006	TSTM WIND	50 kts.	0/0	$0
PRINCETON	7/29/2006	TSTM WIND	50 kts.	0/0	$0
Selma					
SELMA	7/15/1996	TSTM WIND	0 kts.	0/0	$0
SELMA	3/3/1999	TSTM WIND	50 kts.	0/0	$0
SELMA	7/5/2002	TSTM WIND	60 kts.	0/0	$0
SELMA	3/8/2005	TSTM WIND	60 kts.	0/0	$47,671
SELMA	8/17/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
SELMA	9/14/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
SELMA	7/23/2011	THUNDERSTORM WIND	50 kts.	0/0	$0
Smithfield					
Smithfield	8/3/1993	THUNDERSTORM WINDS	0 kts.	0/0	$0

	Date	Type	Magnitude	Deaths / Injuries	Property Damage*
Smithfield	7/18/1994	THUNDERSTORM WINDS	0 kts.	0/0	$0
Smithfield	5/10/1995	THUNDERSTORM WINDS	0 kts.	0/0	$0
Smithfield	5/11/1995	THUNDERSTORM WINDS	0 kts.	0/0	$22,935
Smithfield	5/11/1995	THUNDERSTORM WINDS	0 kts.	0/0	$122,318
SMITHFIELD	6/24/1996	TSTM WIND	50 kts.	0/0	$0
SMITHFIELD	7/17/1996	TSTM WIND	0 kts.	0/0	$0
SMITHFIELD	7/4/1997	TSTM WIND	50 kts.	0/0	$0
SMITHFIELD	3/9/1998	TSTM WIND	50 kts.	0/0	$0
SMITHFIELD	6/22/2000	TSTM WIND	50 kts.	0/0	$0
SMITHFIELD	5/12/2001	TSTM WIND	50 kts.	0/0	$0
SMITHFIELD	5/12/2001	TSTM WIND	50 kts.	0/0	$0
SMITHFIELD	6/1/2001	TSTM WIND	50 kts.	0/0	$0
SMITHFIELD	5/25/2003	TSTM WIND	52 kts.	0/0	$0
SMITHFIELD	5/2/2004	TSTM WIND	60 kts.	0/0	$0
SMITHFIELD	5/18/2006	TSTM WIND	62 kts.	0/0	$0
SMITHFIELD	7/23/2006	TSTM WIND	50 kts.	0/0	$0
SMITHFIELD	11/16/2006	THUNDERSTORM WIND	50 kts.	0/0	$0
SMITHFIELD	4/11/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
SMITHFIELD	8/21/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
SMITHFIELD	3/4/2008	THUNDERSTORM WIND	52 kts.	0/0	$0
SMITHFIELD	8/2/2008	THUNDERSTORM WIND	50 kts.	0/0	$0
SMITHFIELD	6/9/2009	THUNDERSTORM WIND	50 kts.	0/0	$0
SMITHFIELD	7/17/2010	THUNDERSTORM WIND	50 kts.	0/0	$0
SMITHFIELD	6/23/2011	THUNDERSTORM WIND	50 kts.	0/0	$0
SMITHFIELD	7/24/2011	THUNDERSTORM WIND	50 kts.	0/0	$0
SMITHFIELD	6/1/2012	THUNDERSTORM WIND	50 kts.	0/0	$5,075
SMITHFIELD	7/5/2012	THUNDERSTORM WIND	50 kts.	0/0	$10,150
Wilson's Mills					
WILSONS MILLS	6/14/2008	THUNDERSTORM WIND	50 kts.	0/0	$0
WILSONS MILLS	7/22/2008	THUNDERSTORM WIND	50 kts.	0/0	$0
WILSONS MILLS	11/17/2010	THUNDERSTORM WIND	50 kts.	0/0	$0
Unincorporated Area					
JOHNSTON COUNTY	6/15/1958	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/15/1958	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	4/2/1970	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	4/2/1970	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/21/1970	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/25/1970	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/23/1971	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	5/28/1973	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	9/18/1973	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	3/24/1975	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	5/13/1978	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/3/1982	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	10/13/1983	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	4/4/1984	TSTM WIND	0 kts.	0/0	$0

	Date	Type	Magnitude	Deaths / Injuries	Property Damage*
JOHNSTON COUNTY	5/8/1984	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/20/1984	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	4/6/1985	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/5/1985	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/5/1985	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/18/1985	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	5/29/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	5/30/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	5/30/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/20/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/24/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/28/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/28/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	7/10/1986	TSTM WIND	75 kts.	0/0	$0
JOHNSTON COUNTY	7/10/1986	TSTM WIND	55 kts.	0/0	$0
JOHNSTON COUNTY	7/12/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	7/27/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	8/10/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	8/11/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	8/20/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	8/20/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	8/27/1986	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	5/2/1987	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	5/2/1987	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/3/1987	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	8/3/1987	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	8/3/1987	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	8/4/1987	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	8/4/1987	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	8/19/1987	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	5/16/1988	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	5/17/1988	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	5/19/1988	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	2/21/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	2/21/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	3/6/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	3/18/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	4/25/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	4/25/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	4/25/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	4/25/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	4/27/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	4/29/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	5/23/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/12/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/15/1989	TSTM WIND	0 kts.	0/0	$0

	Date	Type	Magnitude	Deaths / Injuries	Property Damage*
JOHNSTON COUNTY	6/15/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/15/1989	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	5/1/1990	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	6/22/1990	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	7/11/1990	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	9/10/1990	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	3/2/1991	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	3/29/1991	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	8/9/1991	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	8/19/1991	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	3/19/1992	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	1/24/1993	THUNDERSTORM WINDS	0 kts.	0/0	$80,687
McGee's	4/26/1993	THUNDERSTORM WINDS	0 kts.	0/0	$80,687
SW Selma	5/11/1995	THUNDERSTORM WINDS	0 kts.	0/0	$30,580
JOHNSTON COUNTY	6/8/1995	THUNDERSTORM WINDS	0 kts.	0/0	$0
Southern	6/26/1995	THUNDERSTORM WINDS	0 kts.	0/0	$0
Wrn	7/10/1995	THUNDERSTORM WINDS	0 kts.	0/0	$0
NE	10/5/1995	THUNDERSTORM WINDS	0 kts.	0/0	$0
Sampson	10/5/1995	THUNDERSTORM WINDS	0 kts.	0/0	$21,406
COUNTYWIDE	5/6/1996	TSTM WIND	0 kts.	0/0	$0
MCGEE CROSSROADS	7/2/1996	TSTM WIND	0 kts.	0/0	$0
JOHNSTON COUNTY	2/16/1998	HIGH WIND	52 kts.	0/0	$0
DRUG STORE	8/18/2000	TSTM WIND	60 kts.	0/0	$19,742
COATS XRDS	4/1/2001	TSTM WIND	50 kts.	0/0	$0
DRUG STORE	5/13/2002	TSTM WIND	50 kts.	0/0	$0
PARKERS MILL	7/9/2003	TSTM WIND	50 kts.	0/0	$0
JOHNSTON COUNTY	3/7/2004	HIGH WIND	65 kts.	0/0	$6,446
EMIT	11/16/2006	THUNDERSTORM WIND	50 kts.	0/0	$0
COATS XRDS	8/21/2007	THUNDERSTORM WIND	52 kts.	0/0	$0
COATS XRDS	8/26/2007	THUNDERSTORM WIND	50 kts.	0/0	$0
EMIT	6/11/2008	THUNDERSTORM WIND	50 kts.	0/0	$0
EMIT	6/14/2008	THUNDERSTORM WIND	50 kts.	0/0	$0
COATS XRDS	6/28/2008	THUNDERSTORM WIND	50 kts.	0/0	$0
SELMA ARPT	7/6/2008	THUNDERSTORM WIND	50 kts.	0/0	$0
BLACKMAN XRDS	7/6/2008	THUNDERSTORM WIND	50 kts.	0/0	$0
EMIT	8/2/2008	THUNDERSTORM WIND	50 kts.	0/0	$0
BLACKMAN XRDS	8/7/2008	THUNDERSTORM WIND	50 kts.	0/0	$54,112
JOHNSTON COUNTY	9/6/2008	HIGH WIND	50 kts.	0/0	$13,528
BLACKMAN XRDS	1/7/2009	THUNDERSTORM WIND	51 kts.	0/0	$0
EMIT	7/17/2009	THUNDERSTORM WIND	50 kts.	0/0	$0
BLACKMAN XRDS	7/17/2009	THUNDERSTORM WIND	50 kts.	0/0	$0
RAINS XRDS	7/25/2009	THUNDERSTORM WIND	50 kts.	0/0	$0
SELMA ARPT	7/25/2009	THUNDERSTORM WIND	50 kts.	0/0	$0
LOWELL MILL	7/25/2009	THUNDERSTORM WIND	50 kts.	0/0	$0
BLACKMAN XRDS	7/27/2009	THUNDERSTORM WIND	50 kts.	0/0	$0

	Date	Type	Magnitude	Deaths / Injuries	Property Damage*
FLOWERS	7/27/2009	THUNDERSTORM WIND	50 kts.	0/0	$0
BLACKMAN XRDS	1/25/2010	THUNDERSTORM WIND	50 kts.	0/0	$0
COATS XRDS	6/29/2010	THUNDERSTORM WIND	50 kts.	0/0	$1,604
COATS XRDS	7/17/2010	THUNDERSTORM WIND	50 kts.	0/0	$0
DRUG STORE	7/17/2010	THUNDERSTORM WIND	50 kts.	0/0	$16,042
HARDY XRDS	7/17/2010	THUNDERSTORM WIND	50 kts.	0/0	$0
DRUG STORE	7/20/2010	THUNDERSTORM WIND	50 kts.	0/0	$0
COATS XRDS	3/6/2011	THUNDERSTORM WIND	50 kts.	0/0	$3,109
RAINS XRDS	4/5/2011	THUNDERSTORM WIND	50 kts.	0/0	$0
BAGLEY	4/5/2011	THUNDERSTORM WIND	50 kts.	0/0	$20,726
HARDY XRDS	6/28/2011	THUNDERSTORM WIND	50 kts.	0/0	$0
DRUG STORE	7/23/2011	THUNDERSTORM WIND	50 kts.	0/0	$0
COATS XRDS	8/14/2011	THUNDERSTORM WIND	50 kts.	0/0	$0
COATS XRDS	8/14/2011	THUNDERSTORM WIND	50 kts.	0/0	$0
HARDY XRDS	9/6/2011	THUNDERSTORM WIND	50 kts.	0/0	$0
PARKERS MILL	12/7/2011	THUNDERSTORM WIND	50 kts.	0/0	$0
COATS XRDS	7/5/2012	THUNDERSTORM WIND	50 kts.	0/0	$3,045
COATS XRDS	7/23/2012	THUNDERSTORM WIND	50 kts.	0/0	$0
EMIT	7/24/2012	THUNDERSTORM WIND	50 kts.	0/0	$10,150
BENTONVILLE	7/24/2012	THUNDERSTORM WIND	50 kts.	0/0	$0
BENTONVILLE	7/24/2012	THUNDERSTORM WIND	50 kts.	0/0	$1,015
FLOWERS	8/8/2012	THUNDERSTORM WIND	50 kts.	0/0	$0
CLAYTON FLOWERS ARPT	9/8/2012	THUNDERSTORM WIND	50 kts.	0/0	$761

*Property damage is reported in 2013 dollars; all damage may not have been reported.
Source: National Climatic Data Center

Probability of Future Occurrences

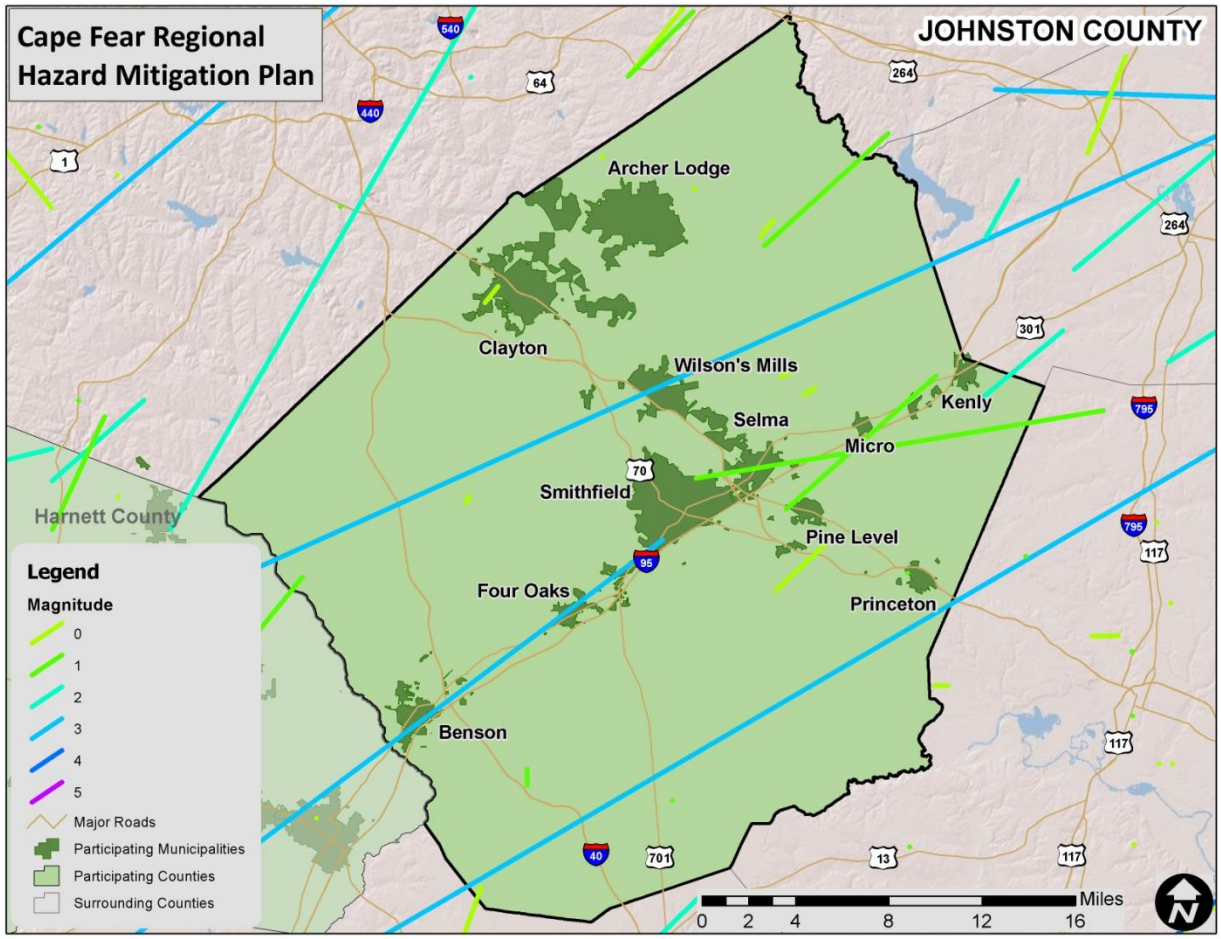
Given the high number of previous events, it is certain that wind events, including straight-line wind and thunderstorm wind, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for future wind events for the entire county.

C.2.7 Tornado

Location and Spatial Extent

Tornadoes occur throughout the state of North Carolina, and thus in Johnston County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Johnston County is uniformly exposed to this hazard. With that in mind, Figure **C.3** shows tornado track data for many of the major tornado events that have impacted the county. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

FIGURE C.3: HISTORICAL TORNADO TRACKS IN JOHNSTON COUNTY



Source: National Weather Service Storm Prediction Center

Historical Occurrences

Tornadoes were at least partially responsible for one disaster declaration in Johnston County in 2011.[8] According to the National Climatic Data Center, there have been a total of 20 recorded tornado events in the Johnston County since 1973 (**Table C.15**), resulting in almost $31.2 million (2013 dollars) in property damages.[9] In addition, 1 fatality and 81 injuries were reported (**Table C.16**). The magnitude of these tornadoes ranges from F0 to F3 in intensity, although an F4 or F5 event is possible. It is important to note that only tornadoes that have been reported are factored into this risk assessment. It is likely that a high number of occurrences have gone unreported over the past 57 years.

TABLE C.15: SUMMARY OF TORNADO OCCURRENCES IN JOHNSTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2013)
Archer Lodge	1	0/0	$0

[8]A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*.
[9] These tornado events are only inclusive of those reported by the National Climatic Data Center (NCDC). It is likely that additional tornadoes have occurred in Johnston County. As additional local data becomes available, this hazard profile will be amended.

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2013)
Benson	2	0/67	$25,907,875
Clayton	1	0/0	$0
Four Oaks	0	0/0	$0
Kenly	2	1/2	$541,121
Micro	1	0/0	$30,424
Pine Level	1	0/0	$0
Princeton	1	0/0	$0
Selma	0	0/0	$0
Smithfield	0	0/0	$0
Wilson's Mills	0	0/0	$0
Unincorporated Area	11	0/12	$4,714,086
JOHNSTON COUNTY TOTAL	**20**	**1/81**	**$31,193,506**

Source: National Climatic Data Center

TABLE C.16: HISTORICAL TORNADO IMPACTS IN JOHNSTON COUNTY

	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
Archer Lodge					
ARCHER	8/27/2008	F0	0/0	$0	Local fire departments and law enforcement reported a brief tornado touchdown near the intersection of Covered Bridge Road and Thanksgiving Road. Multiple trees were snapped and uprooted in the highly wooded area.
Benson					
BENSON	9/14/2007	F0	0/0	$0	Law enforcement reported a tornado and multiple trees down on Stephenson Road.

	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
BENSON	4/16/2011	F2	0/67	$25,907,875	The tornado exited Harnett County and continued northeast into southern Johnston County. The tornado track south of Benson, where it crossed NC Highway 242 and NC Highway 50. Several modular homes were destroyed, and numerous other homes sustained major damage. There were also hundreds of trees that were uprooted or snapped in half. The tornado subsequently crossed Interstate 40 near mile Marker 330 and continued moving northeast to just south of Four Oaks before crossing Interstate 95 near mile marker 90. The tornado lifted just before reaching Smithfield, where little or no damage was observed. Throughout this part of the track there was a broad swath of EF0 damage with embedded areas of EF1 and EF2 damage. In total, 450 homes were damaged, of which 287 homes were completely destroyed.
Clayton					
CLAYTON	9/14/2007	F0	0/0	$0	A tornado touch downed at Clayton Middle School on Guy Road. A second tornado touched down from the same thunderstorm near the Jordan community.
Four Oaks					
None Reported	--	--	--	--	--
Kenly					
KENLY	10/11/2002	F1	0/0	$0	A tornado touched down just west of Kenly, causing F0 to strong F1 damage. It began near J. Howell Road and Old Highway 222, causing minor damage to a hog farm. The worst damage was along Bunn Road where 4 mobile homes were damaged, one of which was overturned and totally destroyed. The other mobile homes sustained projectile damage, and a roof was blown off a barn. The tornado traveled northeast and severely damaged a home on highway 222, collapsing the rear wall of the house. The damage path ended near the Wilson County border.

	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
KENLY	11/15/2008	F2	1/2	$541,121	The tornado initially touched down around just north of Piney Grove Church Road, and damage was limited to minor tree and structural damage. The tornado then tracked northeast, over bare fields and stands of mature trees for approximately three quarters of a mile, twisting off mature trees, before producing significant damage at the intersection of NC Hwy 222 and Crumpler Road. The strongest evidence of EF-2 damage was at this intersection, where a well-constructed single level brick home was destroyed. The entire roof was blown off this home, a large pine tree fell through the kitchen. All of the walls on the west side of the house were missing. In addition, one vehicle was flipped upside down and another, with an attached trailer, was moved approximately 30 feet down the home's driveway. The family of 4 was awakened as the damage occurred, but by great fortune, none sustained any injury. As the tornado crossed Scott Road, a double-wide mobile home was removed from its foundation and flipped approx. 50 feet. A 61 year old female occupant of this mobile home was killed, while her husband was transported to a medical facility. In addition, 3 other double-wide mobile homes were condemned as they sustained significant structural damage to roofs and southwest-facing exterior walls. A pickup truck was completely overturned in one of the driveways. Continuing northeast, the tornado moved across the Kenly International Airport. The tornado was likely aloft at this point, producing EF-1 damage to trees, but there was considerable debris from the homes on Scott Road strewn about the airport grounds. A portion of an open aircraft hangar constructed of sheet tin over a wooden frame was twisted and destroyed. There was also some damage to the Cessna 150 housed in this hangar.

	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
Micro					
MICRO	5/5/2009	F0	0/0	$30,424	An EF-0 tornado touched down in the area of 2550 NC Highway 39. The tornado damaged the roofs of four buildings and blew a boat into a car causing moderate damage.
Pine Level					
PINE LEVEL	4/16/2011	F1	0/0	$0	A tornado touched down near Pine level, just south of Highway 70 and tracked northeast towards Micro in the vicinity of Highway 301. The tornado lifted just southwest of Kenly. Numerous trees were snapped in half or uprooted resulting in downed power-lines and damage to homes and businesses. Peak winds were estimated at 90 mph.
Princeton					
PRINCETON	6/4/2004	F0	0/0	$0	Police spotted a tornado near Oakland Church Road.
Unincorporated Area					
JOHNSTON COUNTY	5/29/1973	F1	0/0	$131,152	
JOHNSTON COUNTY	3/4/1977	F1	0/0	$96,155	
JOHNSTON COUNTY	11/4/1992	F1	0/0	$4,152	
JOHNSTON COUNTY	11/4/1992	F1	0/0	$0	
JOHNSTON COUNTY	11/23/1992	F3	0/12	$4,151,674	
EMIT	9/14/2007	F0	0/0	$0	There was a report of a brief tornado touchdown near the Jordan community.
PEACOCKS XRDS	11/15/2008	F1	0/0	$32,467	The tornado initially touched down just off Noah Road, where it uprooted several trees. It traveled north-northwest across bare fields, taking down mature trees for approximately one half mile. The tornado then crossed Wood Crossroads Road, where it produced significant roof damage to one double-wide mobile home and ripped the porch off a single level brick home. The tornado then proceeded north-northwest across open fields before producing minor damage on Five Point Roads to a aluminum skirt of a double-wide mobile home and other minor damage to sheds and storage buildings.

	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
BROGDEN	11/15/2008	F0	0/0	$81,168	The tornado initially touched down near Daughtry Road south of U.S. Highway 70 damaging several pine trees and causing minor roof damage. The tornado tracked northeast crossing Crocker Road where a car was smashed when a large carport collapsed. A travel trailer was overturned and a nearby home suffered shingle and siding damage. The tornado crossed Creechs Mill Road, where a horse farm had one small barn destroyed. A 30 foot horse trailer was also blown over and two large bay doors were blown in on the stables. The tornado proceeded northeast across Stevens Chapel Road and Country Store Road, damaging numerous trees and outbuildings along the way. Finally, at one dwelling, the tornado broke a garage window and blew out a garage door.
COATS XRDS	3/27/2009	F0	0/0	$0	Numerous trees were blown down and snapped in a wooded area behind an open field.
PARKERS MILL	3/27/2009	F0	0/0	$0	Five houses on OBJ Road sustained minor damage ranging from shingle damage, damaged garage doors, to blown out windows.

	Date	Magnitude	Deaths/ Injuries	Property Damage*	Details
EMIT	5/5/2009	F1	0/0	$217,318	An EF-1 tornado touched down initially just to the west of NC Highway 96 in a wooded area. The tornado cross NC Highway 96 and produced significant damage to several homes along and east of NC Highway 96. The homes sustained exterior and roof damage with uprooted or snapped tree damage consistent with EF-1 damage. The tornado proceeded to cross NC Highway 39. Several homes between Antioch Church Road and NC Highway 42 sustained damaged. The tornado continued to track east-northeast, causing roof shingle damage to the Antioch Fire Station and a nearby home. A mobile home near the fire department also sustained shingle and siding damage. The tornado then continued to track northeast across Barnes Lake Road and NC Highway 222, where it caused significant tree damage and some minor roof or shingle damage to surrounding homes or mobile homes. The tornado then exited the county, crossing over into southwest Nash County.

*Property damage is reported in 2013 dollars; all damage may not have been reported.
Source: National Climatic Data Center

Probability of Future Occurrences

According to historical information, tornado events are not an annual occurrence for the county. However, given the county's location in the southeastern United States and history of tornadoes, an occurrence is possible every few years. While the majority of the reported tornado events are small in terms of size, intensity, and duration, they do pose a significant threat should Johnston County experience a direct tornado strike. The probability of future tornado occurrences affecting Johnston County is likely (10 to 100 percent annual probability).

C.2.8 Winter Storm and Freeze

Location and Spatial Extent

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Johnston County is accustomed to severe winter weather conditions and often receives winter weather during the winter months. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

Historical Occurrences

Winter weather has resulted in four disaster declarations in Johnston County. This includes severe ice storms in 1968 and 2002, the Blizzard of 1996, and a severe winter storm in 2000.[10] According to the National Climatic Data Center, there have been a total of 30 recorded winter storm events in Johnston County since 1993 (**Table C.17**).[11] These events resulted in over $812,000 (2013 dollars) in damages.[12] Detailed information on the recorded winter storm events can be found in **Table C.18**.

TABLE C.17: SUMMARY OF WINTER STORM EVENTS IN JOHNSTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2013)
Johnston County	30	0/0	$812,486

Source: National Climatic Data Center

TABLE C.18: HISTORICAL WINTER STORM IMPACTS IN JOHNSTON COUNTY

	Date	Type of Storm	Deaths / Injuries	Property Damage*
Archer Lodge				
None Reported	--	--	--	--
Benson				
None Reported	--	--	--	--
Clayton				
None Reported	--	--	--	--
Four Oaks				
None Reported	--	--	--	--
Kenly				
None Reported	--	--	--	--
Micro				
None Reported	--	--	--	--
Pine Level				
None Reported	--	--	--	--
Princeton				
None Reported	--	--	--	--
Selma				
None Reported	--	--	--	--
Smithfield				
None Reported	--	--	--	--
Wilson's Mills				
None Reported	--	--	--	--
Unincorporated Area				
Statewide	3/12/1993	WINTER STORM	2/10†	$806,869

[10] A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*.
[11] These ice and winter storm events are only inclusive of those reported by the National Climatic Data Center (NCDC). It is certain that additional winter storm conditions have affected Johnston County.
[12] The dollar amount of damages provided by NCDC is divided by the number of affected counties to reflect a damage estimate for the county.

	Date	Type of Storm	Deaths / Injuries	Property Damage*
Northern and Central	1/3/1994	HEAVY SNOW	0/0	$0
Northern Interior and	2/10/1994	ICE STORM	0/0	$0
JOHNSTON COUNTY	1/6/1996	ICE STORM	0/0	$0
JOHNSTON COUNTY	1/11/1996	ICE STORM	0/0	$0
JOHNSTON COUNTY	2/2/1996	ICE STORM	0/0	$0
JOHNSTON COUNTY	2/16/1996	HEAVY SNOW	0/0	$0
JOHNSTON COUNTY	1/19/1998	HEAVY SNOW	0/0	$0
JOHNSTON COUNTY	12/23/1998	ICE STORM	0/0	$0
JOHNSTON COUNTY	1/18/2000	WINTER STORM	0/0	$0
JOHNSTON COUNTY	1/20/2000	WINTER STORM	0/0	$0
JOHNSTON COUNTY	1/22/2000	WINTER STORM	0/0	$0
JOHNSTON COUNTY	1/24/2000	WINTER STORM	0/0	$0
JOHNSTON COUNTY	1/28/2000	WINTER STORM	0/0	$0
JOHNSTON COUNTY	11/19/2000	HEAVY SNOW	0/0	$0
JOHNSTON COUNTY	12/3/2000	WINTER STORM	0/0	$0
JOHNSTON COUNTY	1/3/2002	WINTER STORM	0/0	$0
JOHNSTON COUNTY	12/4/2002	WINTER STORM	0/0	$0
JOHNSTON COUNTY	2/16/2003	WINTER STORM	0/0	$0
JOHNSTON COUNTY	1/26/2004	WINTER STORM	0/0	$0
JOHNSTON COUNTY	2/26/2004	WINTER STORM	0/0	$0
JOHNSTON COUNTY	12/26/2004	WINTER STORM	0/0	$0
JOHNSTON COUNTY	1/18/2007	WINTER WEATHER	0/0	$0
JOHNSTON COUNTY	2/1/2007	WINTER WEATHER	0/0	$0
JOHNSTON COUNTY	2/1/2007	WINTER STORM	0/0	$0
JOHNSTON COUNTY	12/7/2007	WINTER WEATHER	0/0	$5,617
JOHNSTON COUNTY	1/17/2008	WINTER WEATHER	0/0	$0
JOHNSTON COUNTY	1/19/2008	WINTER WEATHER	0/0	$0
JOHNSTON COUNTY	1/19/2008	WINTER STORM	0/0	$0
JOHNSTON COUNTY	1/10/2011	WINTER WEATHER	0/0	$0

*Property damage is reported in 2013 dollars; all damage may not have been reported.
†Deaths/injuries were not reported at the county level; potentially outside of the county.
Source: National Climatic Data Center

There have been several severe winter weather events in Johnston County. The text below describes two of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

1996 Winter Storm – January 6-8, 1996
This storm left two feet of snow in some areas and several thousand citizens without power for up to nine days. Although shelters were opened, some roads were impassible for many days. This event caused considerable disruption to business, industry, schools, and government services.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

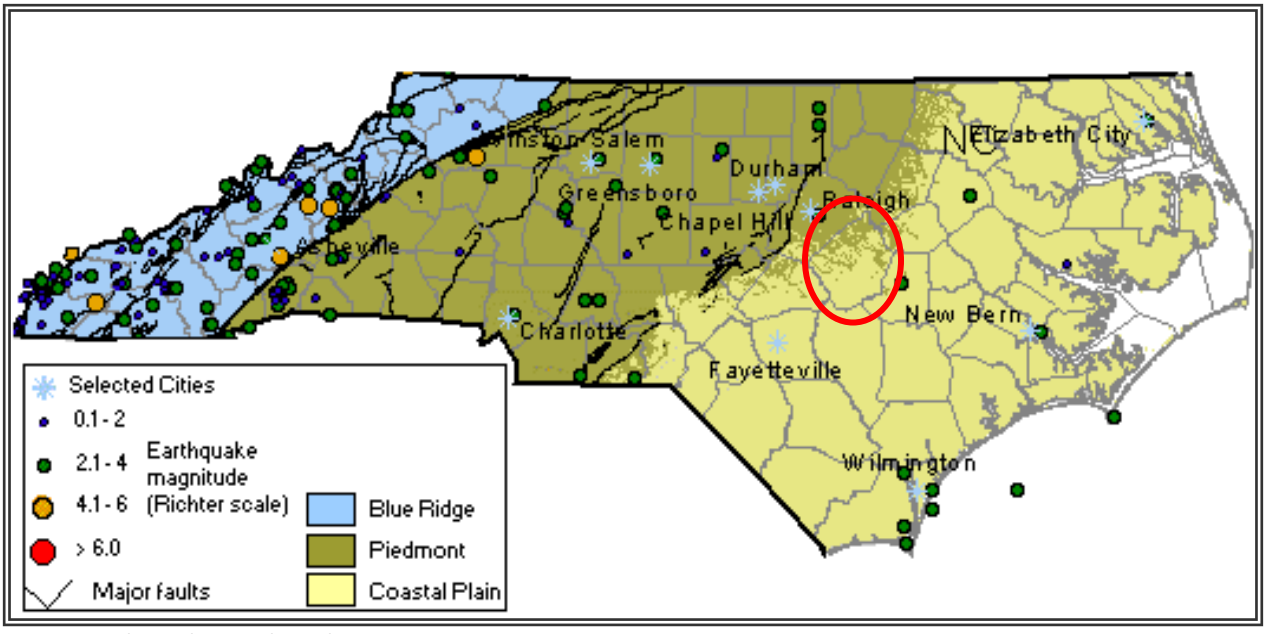
2002 Ice Storm – December 4-5, 2002
An ice storm produced up to an inch of freezing rain in central North Carolina impacting 40 counties. A total of 24 people were killed, and as many as 1.8 million people were left without electricity. Additionally, property damage was estimated at almost $100 million. New records were also set for traffic accidents and school closing durations. The scale of destruction was comparable to that of hurricanes that have impacted the state, such as Hurricane Fran in 1996. The storm cost the state $97.2 million in response and recovery.

Probability of Future Occurrences
Winter storm events will remain a regular occurrence in Johnston County. According to historical information, Johnston County generally experiences one winter storm events each year. Therefore, the annual probability is likely (10 to 100 percent).

C.2.9 Earthquake

Location and Spatial Extent
Approximately two-thirds of North Carolina is subject to earthquakes, with the western and southeast region most vulnerable to a very damaging earthquake. The state is affected by both the Charleston Fault in South Carolina and New Madrid Fault in Tennessee. Both of these faults have generated earthquakes measuring greater than 8 on the Richter Scale during the last 200 years. In addition, there are several smaller fault lines throughout North Carolina. **Figure C.4** is a map showing geological and seismic information for North Carolina.

FIGURE C.4: GEOLOGICAL AND SEISMIC INFORMATION FOR NORTH CAROLINA

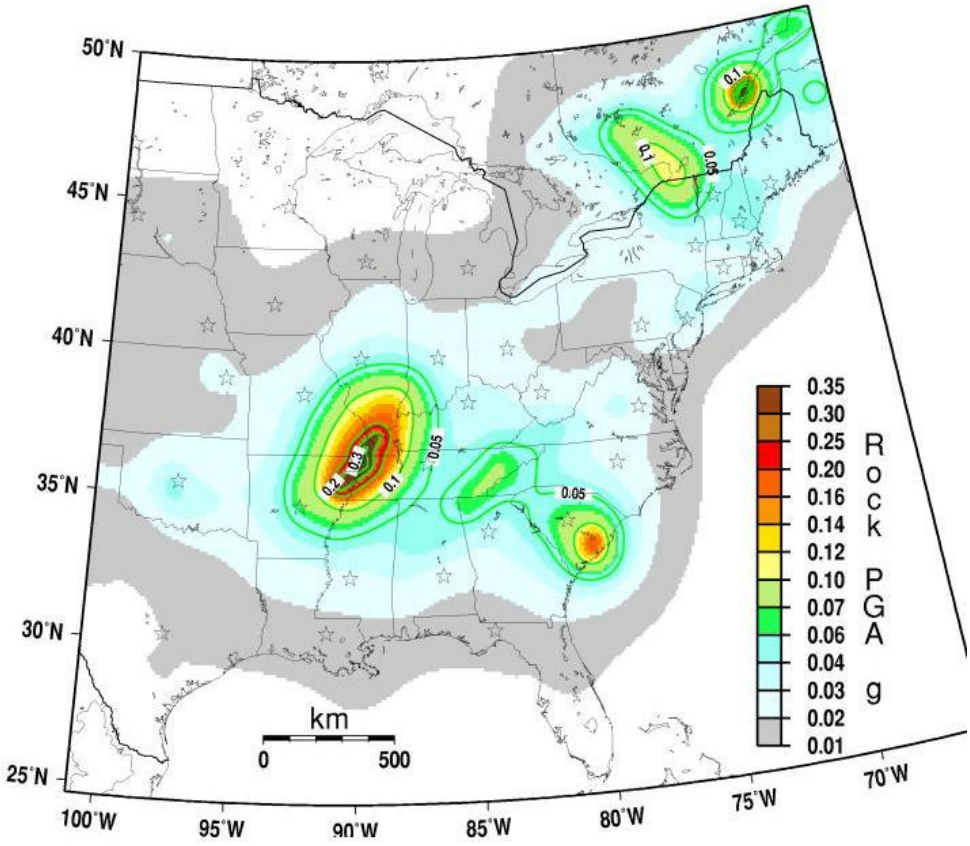


Source: North Carolina Geological Survey

Figure C.5 shows the intensity level associated with Johnston County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground

acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Johnston County lies within an approximate zone of level "2" to "3" ground acceleration. This indicates that the county exists within an area of low to moderate seismic risk.

FIGURE C.5: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Source: United States Geological Survey, 2008

Historical Occurrences

At least one earthquake is known to have affected Johnston County since 1969. It measured a IV on the Modified Mercalli Intensity (MMI) scale. **Table C.19** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. **Table C.20** presents a detailed occurrence of each event including the date, distance from the epicenter, magnitude, and Modified Mercalli Intensity (if known). [13]

[13] Due to reporting mechanisms, not all earthquakes events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of "unknown" is reported.

TABLE C.19: SUMMARY OF SEISMIC ACTIVITY IN JOHNSTON COUNTY

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Broadway	0	--	--
Sanford	0	--	--
Unincorporated Area	1	V	< 4.8
JOHNSTON COUNTY TOTAL	**1**	**IV**	**< 4.8**

Source: National Geophysical Data Center

TABLE C.20: SIGNIFICANT SEISMIC EVENTS IN JOHNSTON COUNTY (1638 -1985)

Location	Date	Epicentral Distance	Magnitude	MMI
Archer Lodge				
None Reported	--	--	--	--
Benson				
None Reported	--	--	--	--
Clayton				
None Reported	--	--	--	--
Four Oaks				
None Reported	--	--	--	--
Kenly				
None Reported	--	--	--	--
Micro				
None Reported	--	--	--	--
Pine Level				
None Reported	--	--	--	--
Princeton				
None Reported	--	--	--	--
Selma				
Selma	11/20/1969	318.0 km	4.3	IV
Smithfield				
None Reported	--	--	--	--
Wilson's Mills				
None Reported	--	--	--	--
Unincorporated Area				
None Reported	--	--	--	--

Source: National Geophysical Data Center

Probability of Future Occurrences

The probability of significant, damaging earthquake events affecting Johnston County is unlikely. It is also unlikely that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the county. The annual probability level for the county is estimated between 1 percent (unlikely).

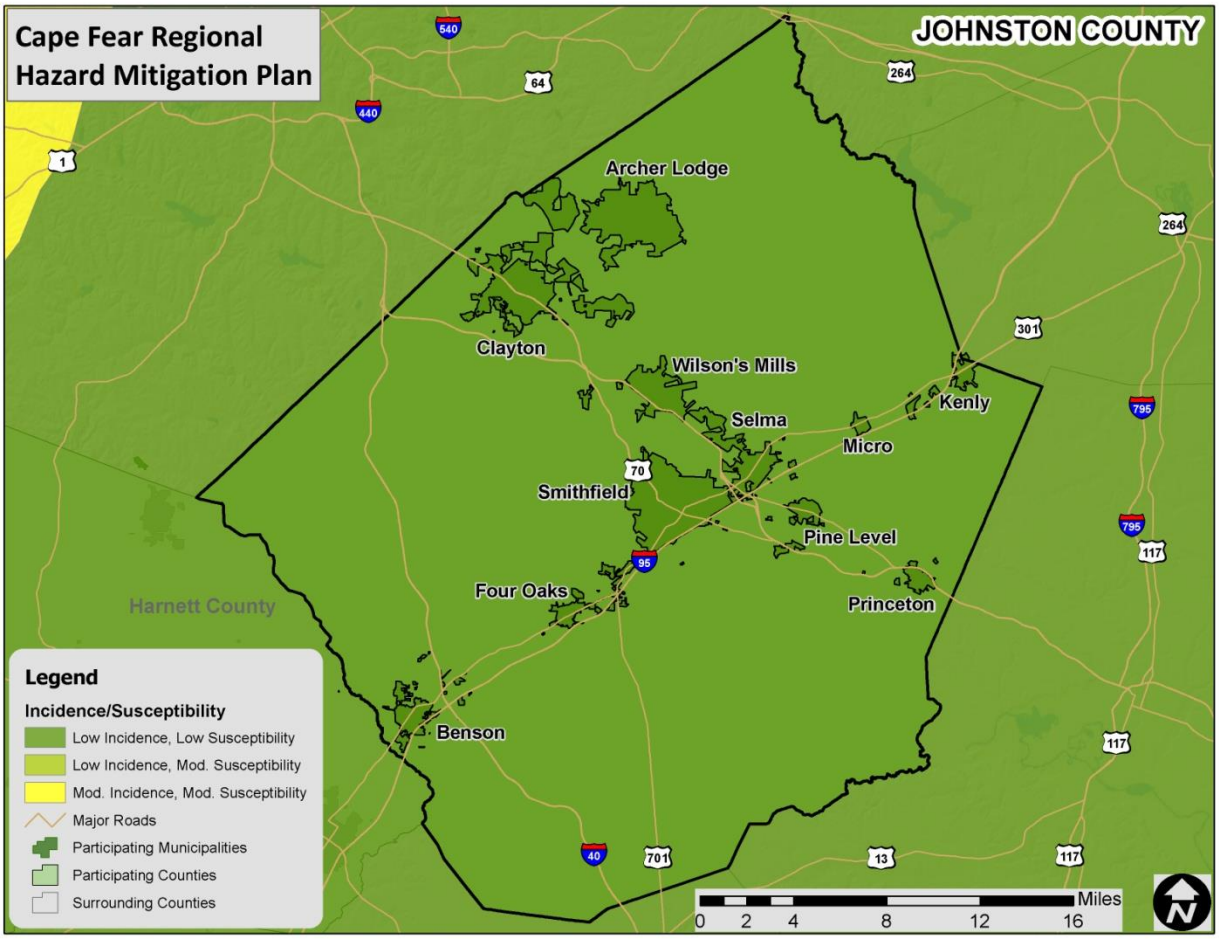
C.2.10 Landslide

Location and Spatial Extent

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable steep slopes and constructing roads by cutting through mountains. Landslides are possible throughout Johnston County.

According to **Figure C.6** below, the county has low landslide activity. There is low susceptibility across the county.

FIGURE C.6: LANDSLIDE SUSCEPTIBILITY AND INCIDENCE MAP OF JOHNSTON COUNTY



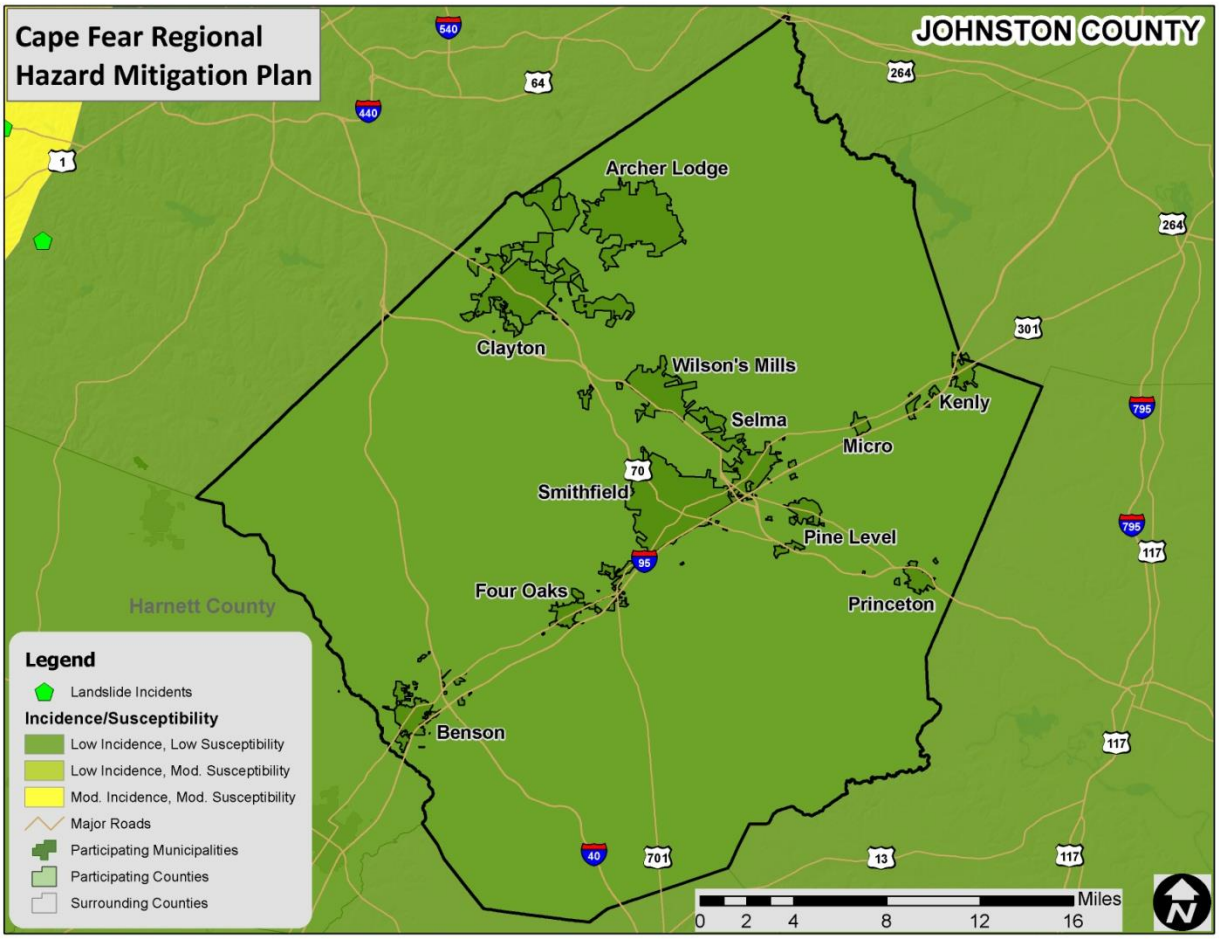
Source: United States Geological Survey

Historical Occurrences

Johnston County has low susceptibility to landslides. Most landslides are caused by heavy rainfall in the area. Building on steep slopes that was not previously possible also contributes to risk. Although no landslide incidents have been reported in the county, it should be noted that the North Carolina Geological Survey emphasized the dataset provided was incomplete. Therefore, there may be additional historical landslide occurrences that were not reported. Some incidence mapping has also been completed throughout the western portion of North Carolina though it is not complete either. The

locations of landslide events that occurred nearby the county are presented in **Figure C.7**. Again, it should be noted that it is possible more incidents have occurred than what is mapped.

FIGURE C.7: LOCATION OF PREVIOUS LANDSLIDE OCCURRENCES IN JOHNSTON COUNTY



Source: North Carolina Geological Survey

Probability of Future Occurrences

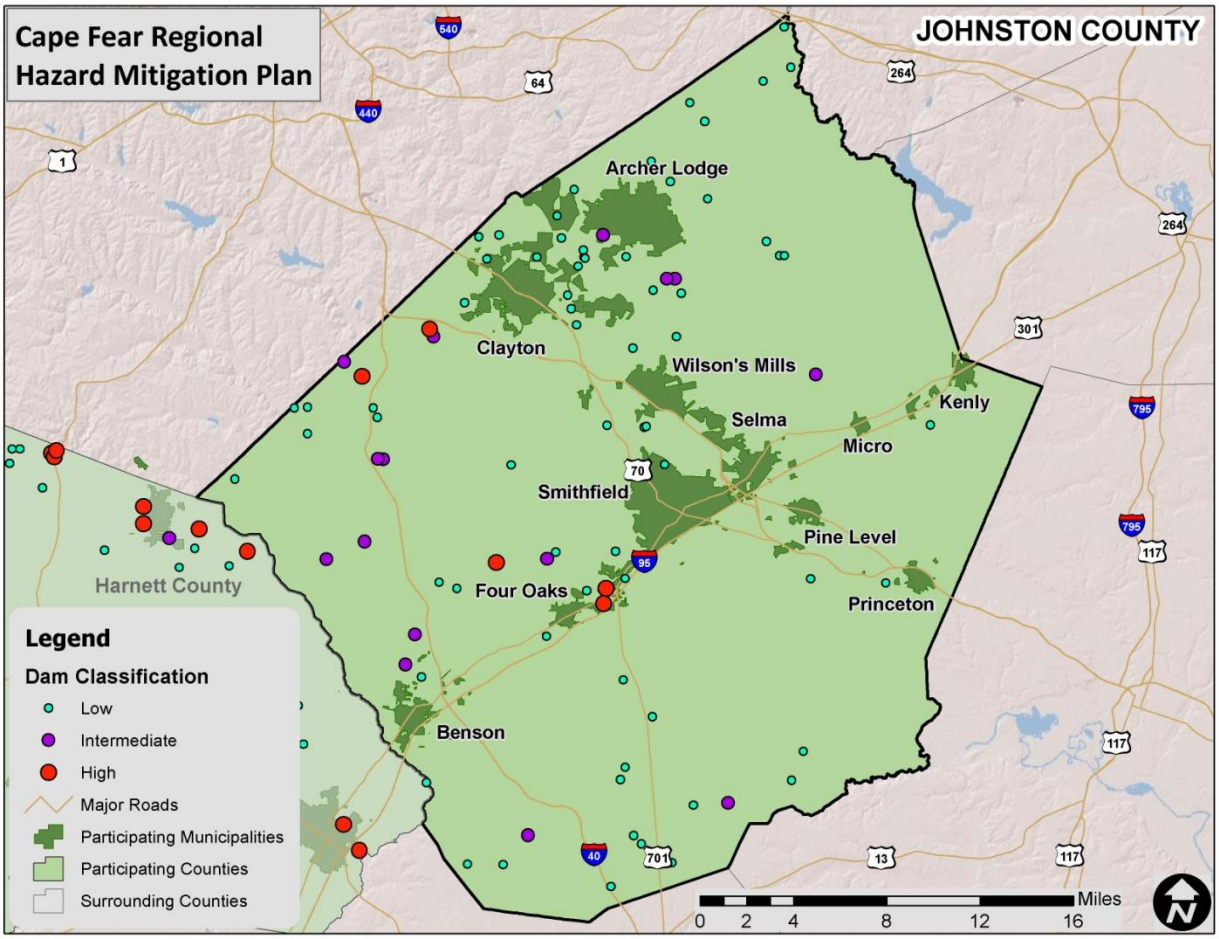
Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent annual probability). Local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in Johsnton County have greater risk than others given factors such as steepness on slope and modification of slopes.

C.2.11 Dam and Levee Failure

Location and Spatial Extent

According to the North Carolina Division of Energy, Mineral, and Land Resources, there are 89 dams in Johnston County.[14] **Figure C.8** shows the dam location and the corresponding hazard ranking for each. Of these dams, five are classified as high hazard potential. These high hazard dams are listed in **Table C.21**.

FIGURE C.8: JOHNSTON COUNTY DAM LOCATION AND HAZARD RANKING



Source: North Carolina Division of Energy, Mineral, and Land Resources, 2013

TABLE C.21: JOHNSTON COUNTY HIGH HAZARD DAMS

Dam Name	Hazard Potential	Surface Area (acres)	Max Capacity (Ac-ft)	Owner Type
Johnston County				
Keen Lake Dam #1	High		180	Private
Berry Downs Dam	High		48	Private
Gates Pond	High	10.0	52	Private
Son Lan Lee Shipwash Dam	High	1.8	2	Private

[14] The September 23, 2013 list of high hazard dams obtained from the North Carolina Division of Energy, Mineral, and Land Resources (http://portal.ncdenr.org/web/lr/dams) was reviewed and amended by local officials to the best of their knowledge.

Dam Name	Hazard Potential	Surface Area (acres)	Max Capacity (Ac-ft)	Owner Type
Miry Branch Dam	High	23.0	0	

Source: North Carolina Division of Energy, Mineral, and Land Resources, 2013

It should also be noted that the North Carolina dam classification regulations were recently updated. As a result of the change, more dams are generally classified as high hazard.

Historical Occurrences

There have been two dam breaches reported in Johnston County. Although no damage was reported with these events, several breach scenarios in the region could be catastrophic.

The information below identifies additional historical information reported in the previous county hazard mitigation plan.

Johnston County

Two dam breaches were reported, one at Keen Lake Dam #1 and one at Austin Lake Dam. There is little information provided about these two events and no date of occurrence or damage associated with these dam failures is identified.

Probability of Future Occurrences

Given the current dam inventory and historic data, a dam breach is unlikely (less than 1 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events.

C.2.12 Erosion

Location and Spatial Extent

Erosion in Johnston County is typically caused by flash flooding events. Unlike coastal areas, where the soil is mainly composed of fine grained particles such as sand, Johnston County soils have much greater organic matter content. Furthermore, vegetation also helps to prevent erosion in the area. Erosion occurs in the county, particularly along the banks of rivers and streams, but it is not an extreme threat. No areas of concern were reported by the planning team.

Historical Occurrences

Several sources were vetted to identify areas of erosion in Johnston County. This includes searching local newspapers, interviewing local officials, and reviewing the previous hazard mitigation plan. Erosion was not addressed in the previous hazard mitigation plan.

Probability of Future Occurrences

Erosion remains a natural, dynamic, and continuous process for Johnston County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent).

C.2.13 Flood

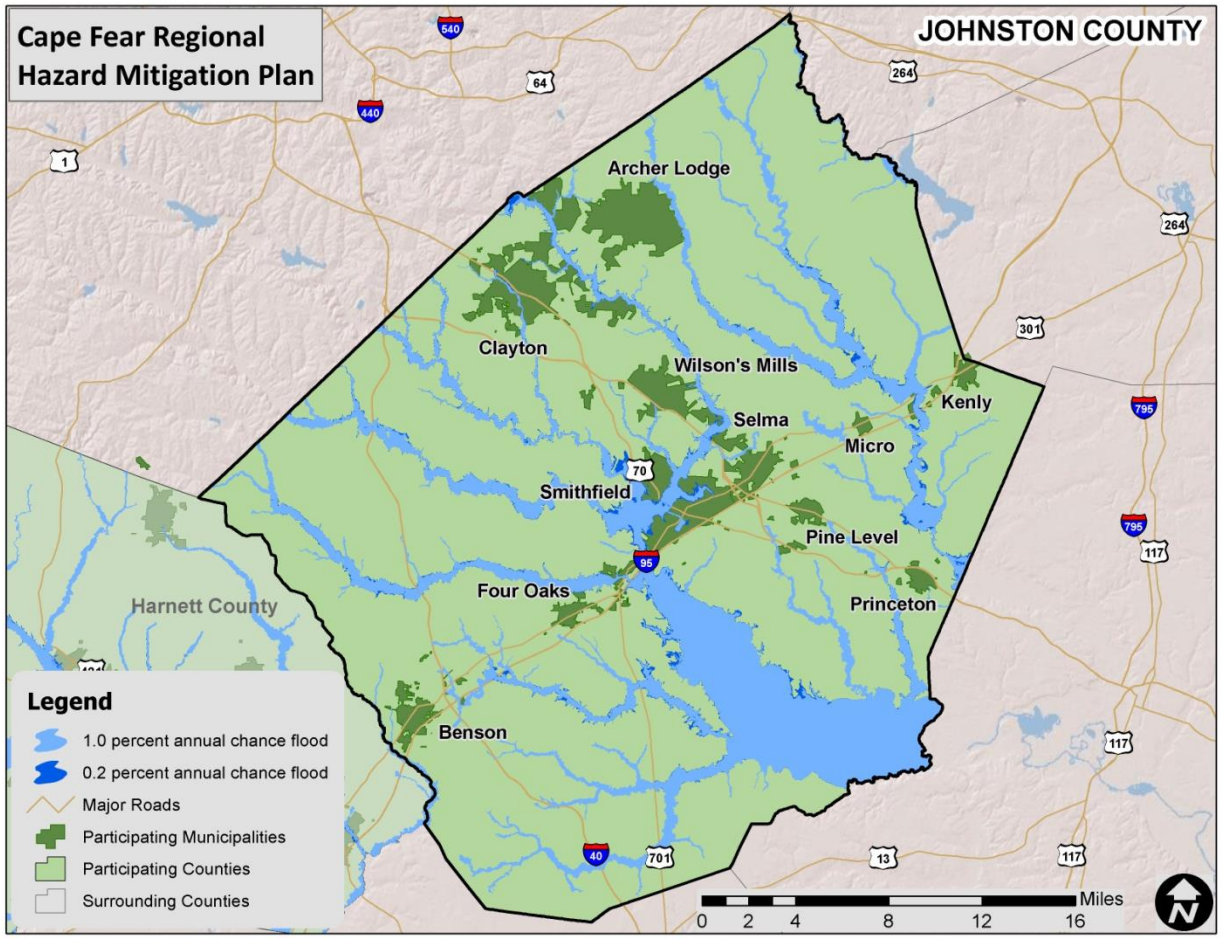
Location and Spatial Extent

There are areas in Johnston County that are susceptible to flood events. Special flood hazard areas in the county were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM).[15] This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevation), and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 796 square miles that make up Johnston County, there are 126.0 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 7.8 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain).

These flood zone values account for 16.8 percent of the total land area in Johnston County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure C.9**, **Figure C.10**, **Figure C.11**, **Figure C.12**, **Figure C.13**, **Figure C.14**, **Figure C.15**, **Figure C.16**, **Figure C.17**, **Figure C.18**, **Figure C.19**, and **Figure C.20** illustrate the location and extent of currently mapped special flood hazard areas for Johnston County and its municipalities based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data.

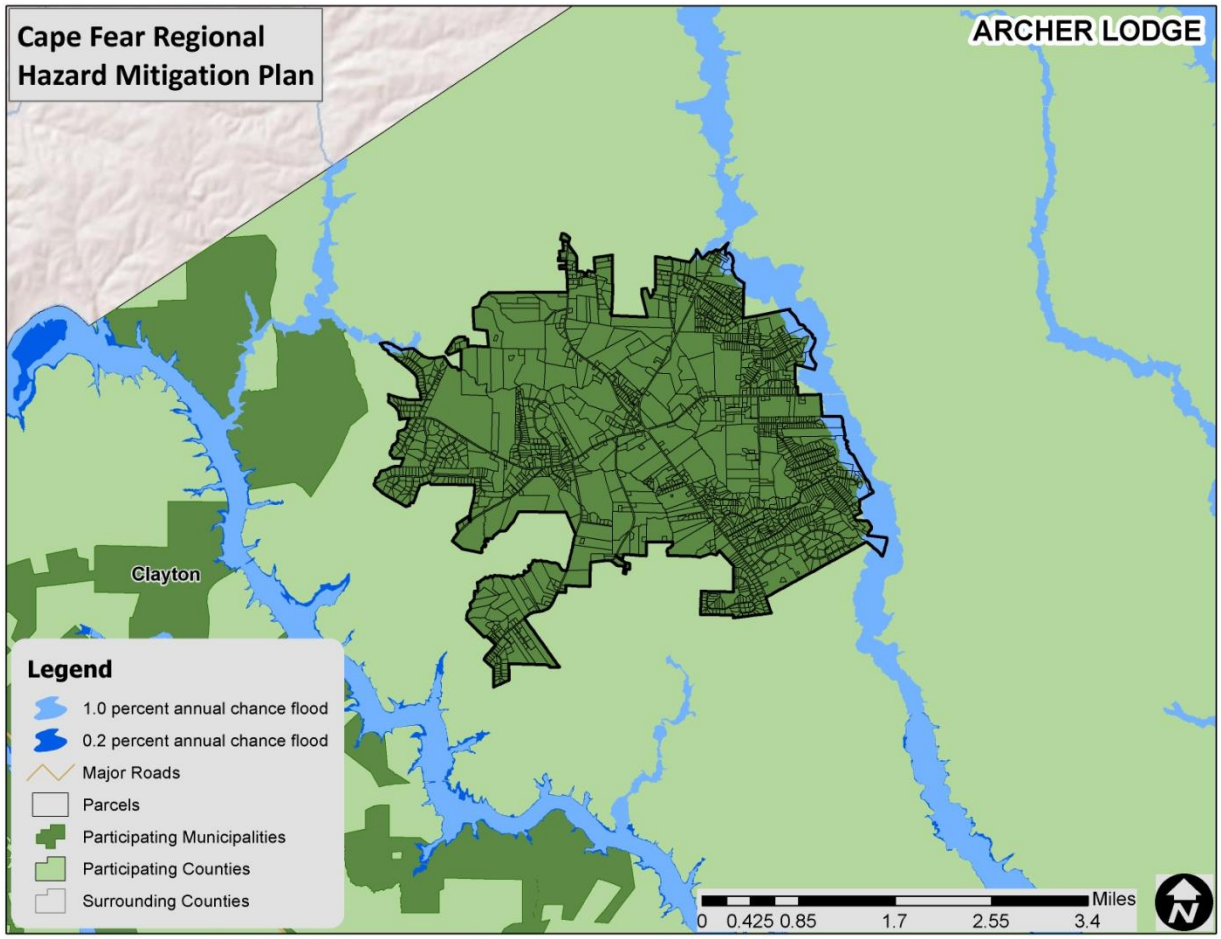
[15] The county-level DFIRM data used for Johnston County were updated in 2010.

FIGURE C.9: SPECIAL FLOOD HAZARD AREAS IN JOHNSTON COUNTY



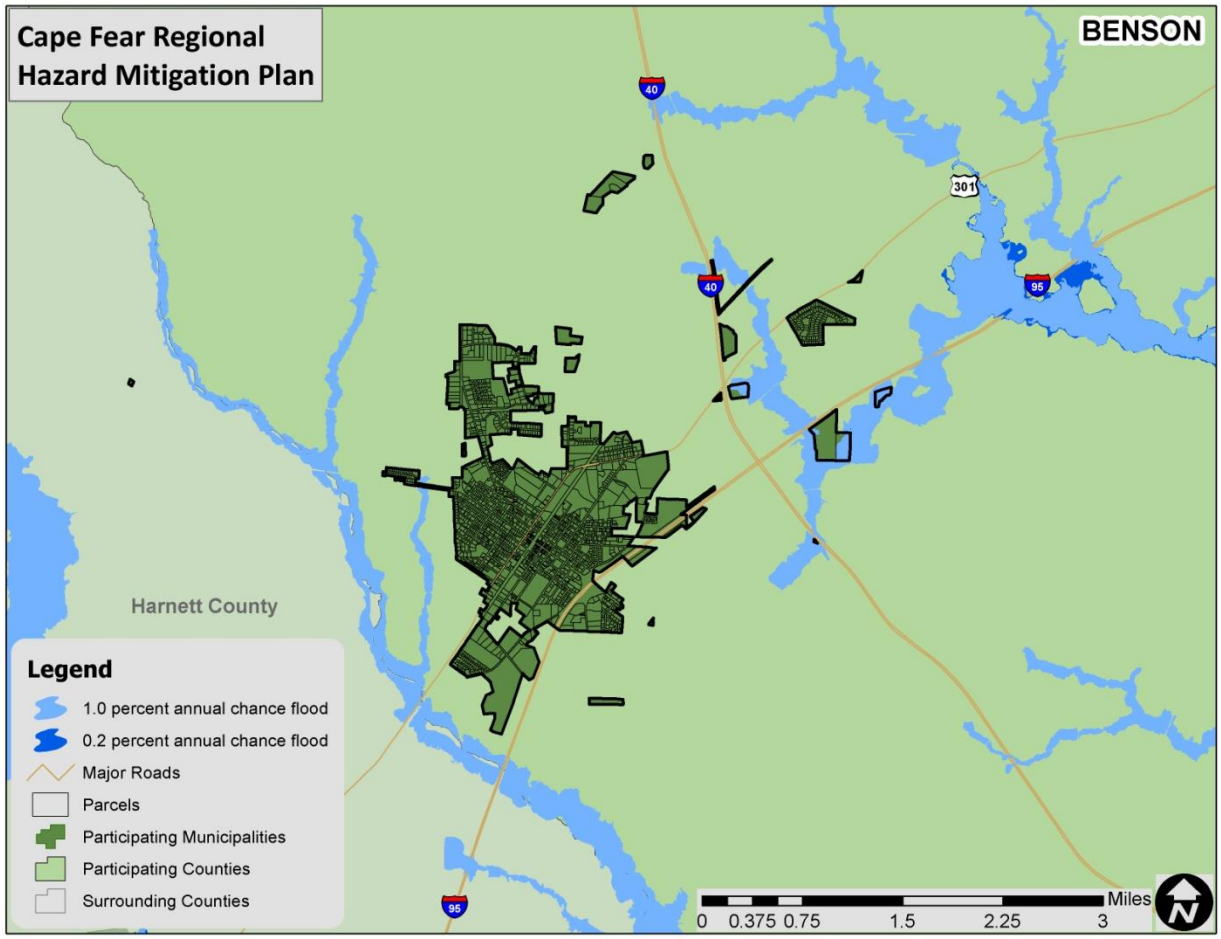
Source: Federal Emergency Management Agency

FIGURE C.10: SPECIAL FLOOD HAZARD AREAS IN ARCHER LODGE



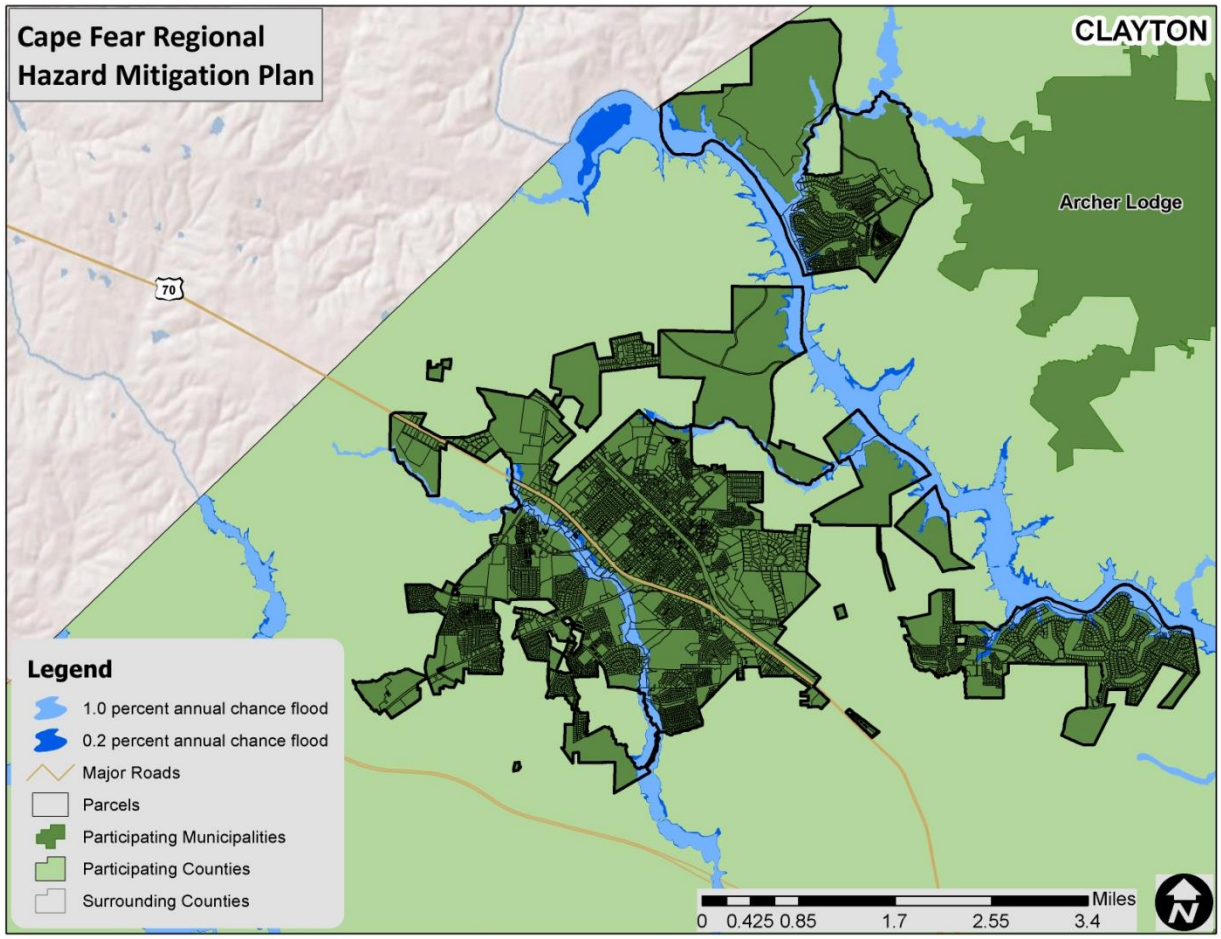
Source: Federal Emergency Management Agency

FIGURE C.11: SPECIAL FLOOD HAZARD AREAS IN BENSON



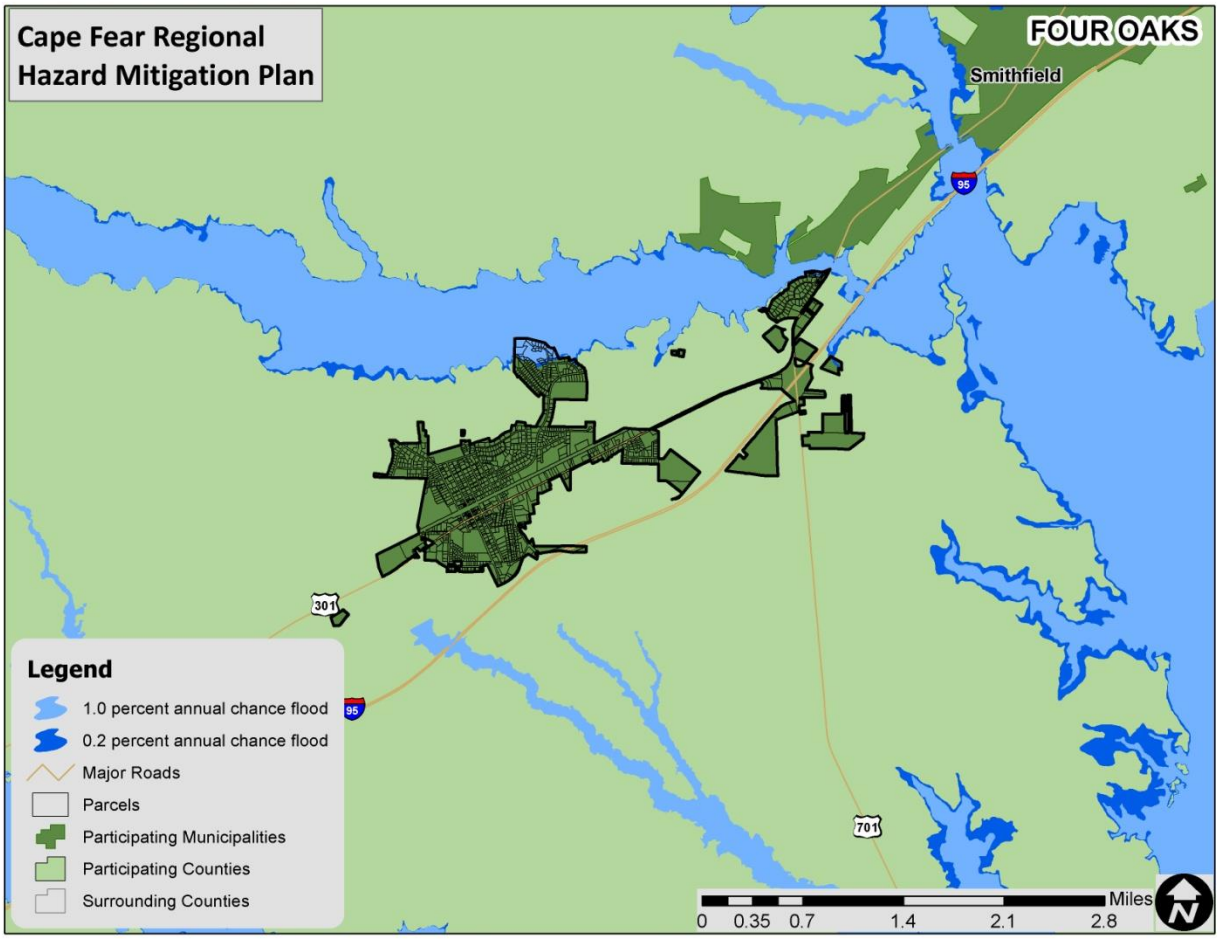
Source: Federal Emergency Management Agency

FIGURE C.12: SPECIAL FLOOD HAZARD AREAS IN CLAYTON



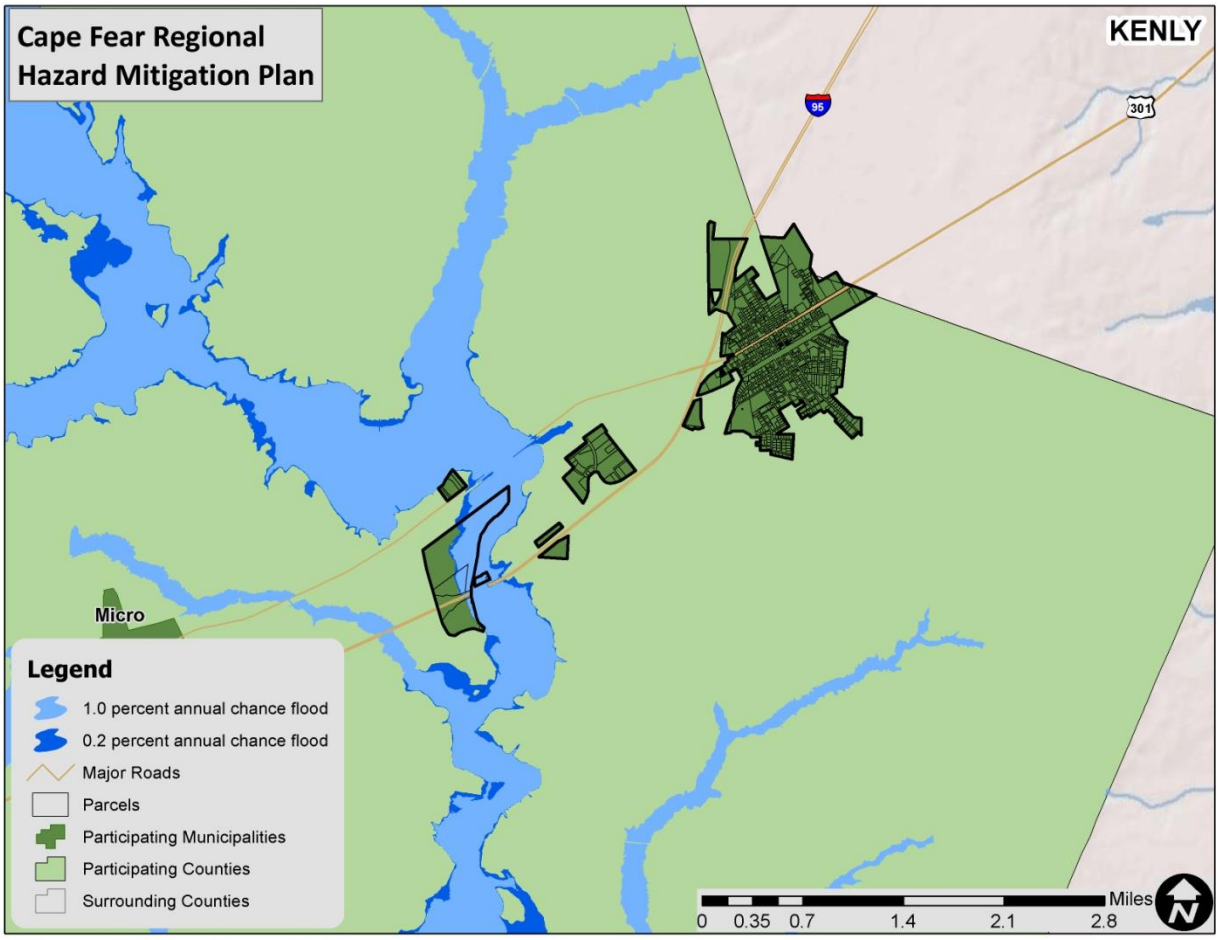
Source: Federal Emergency Management Agency

FIGURE C.13: SPECIAL FLOOD HAZARD AREAS IN FOUR OAKS



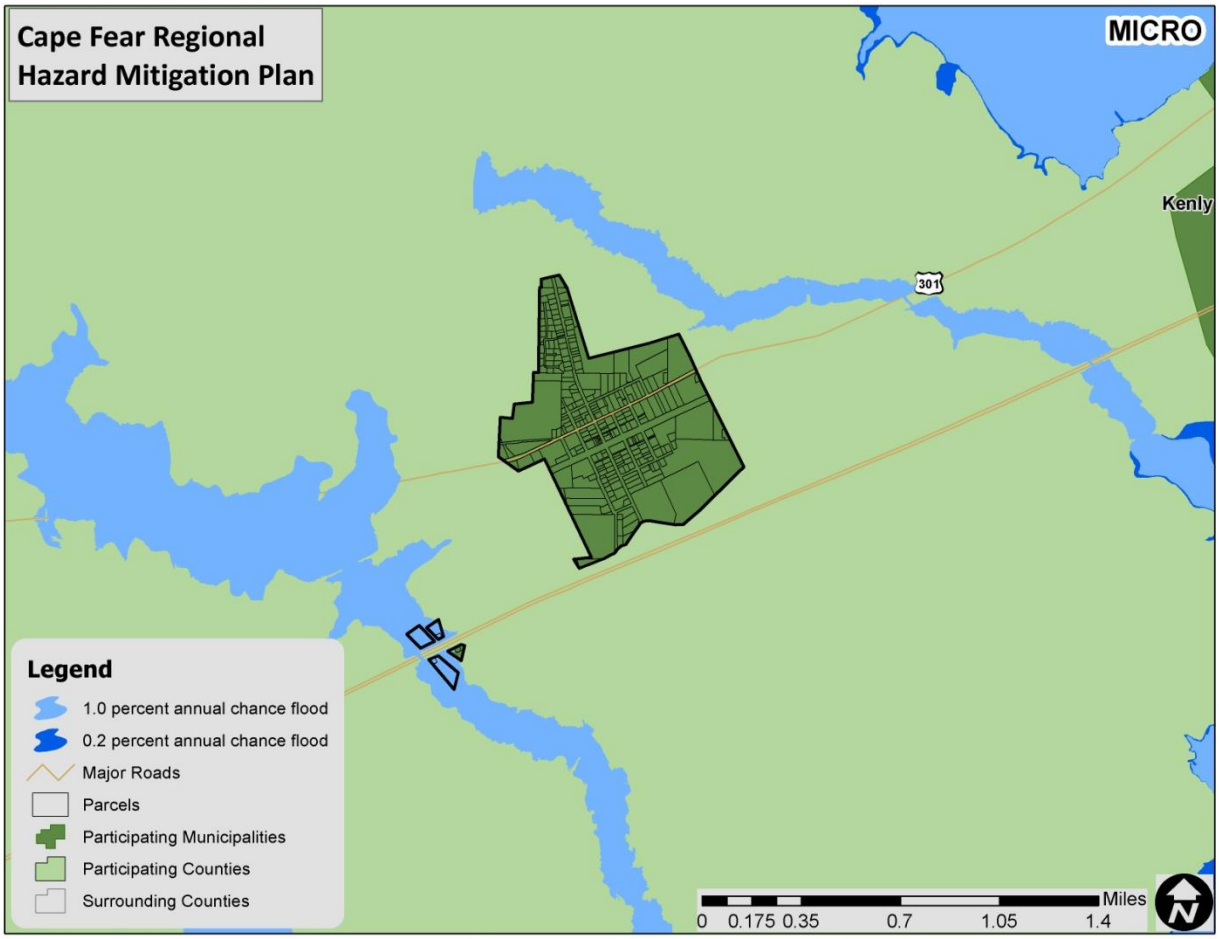
Source: Federal Emergency Management Agency

FIGURE C.14: SPECIAL FLOOD HAZARD AREAS IN KENLY



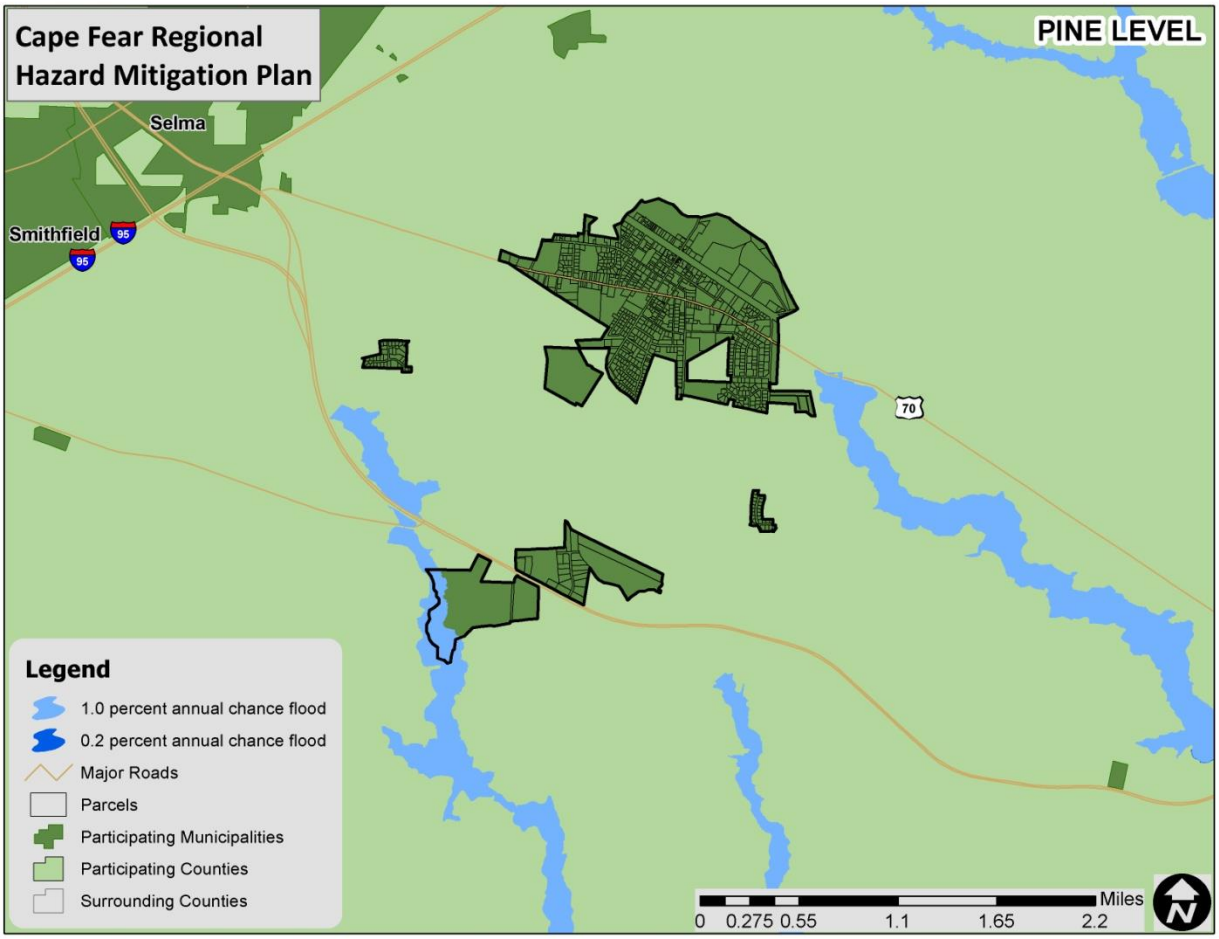
Source: Federal Emergency Management Agency

FIGURE C.15: SPECIAL FLOOD HAZARD AREAS IN MICRO



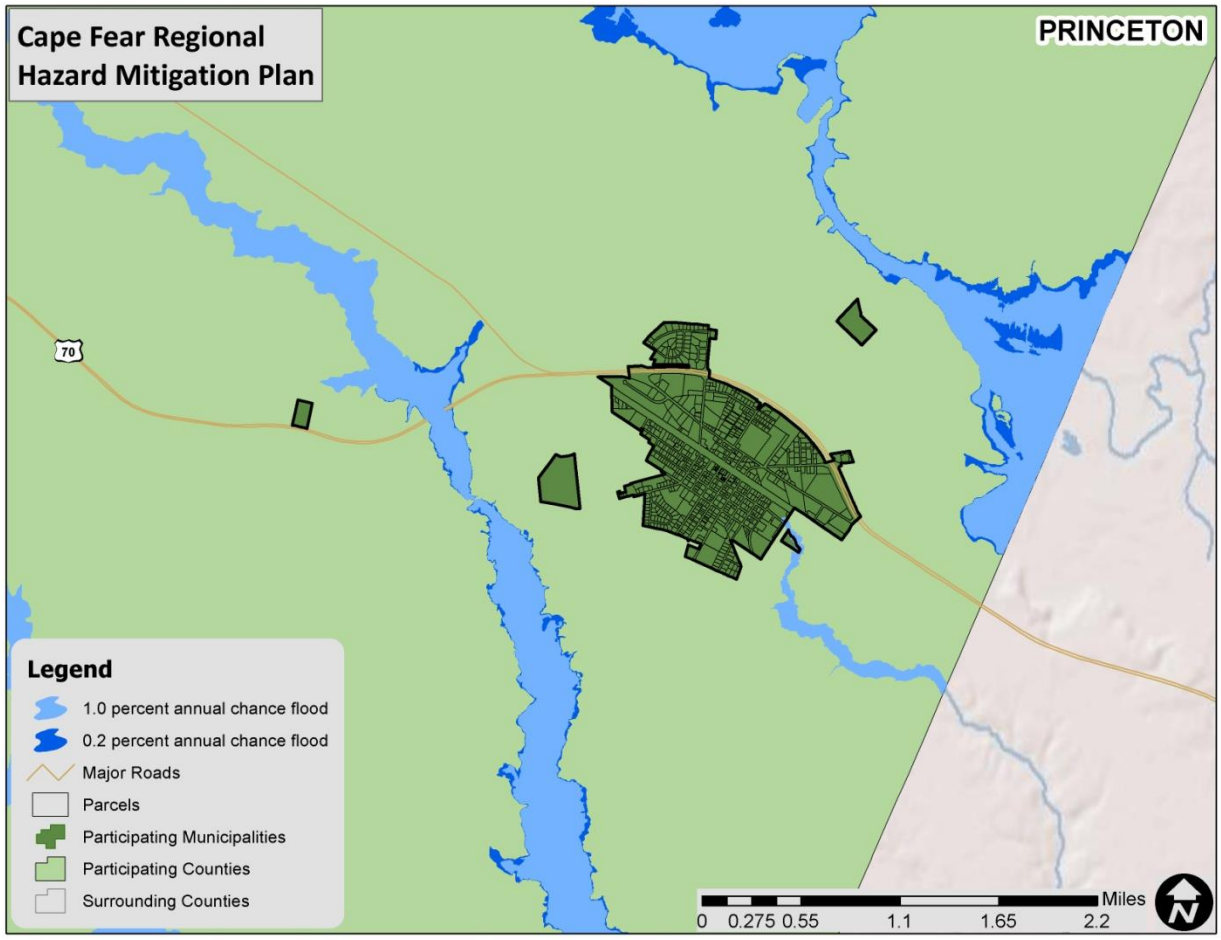
Source: Federal Emergency Management Agency

FIGURE C.16: SPECIAL FLOOD HAZARD AREAS IN PINE LEVEL



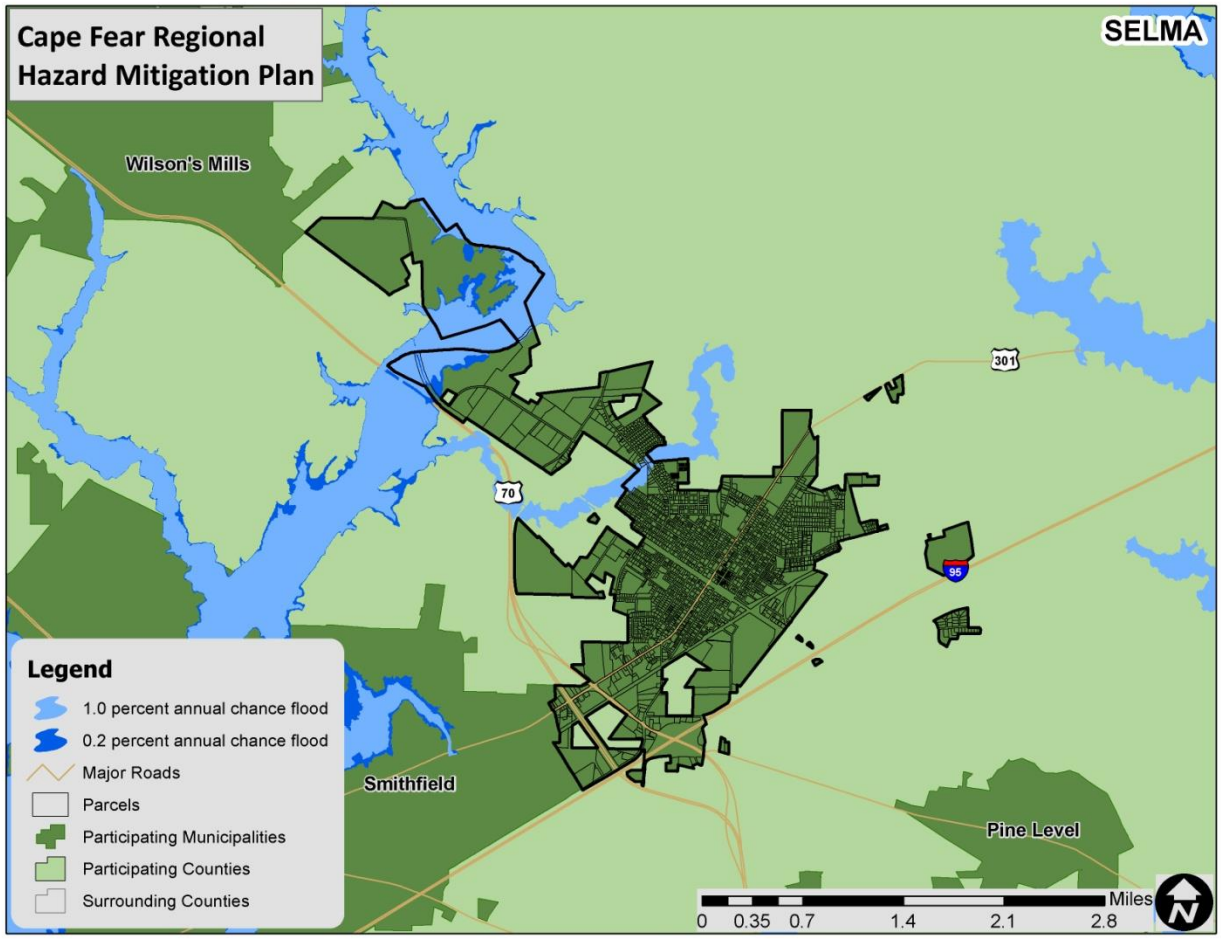
Source: Federal Emergency Management Agency

FIGURE C.17: SPECIAL FLOOD HAZARD AREAS IN PRINCETON



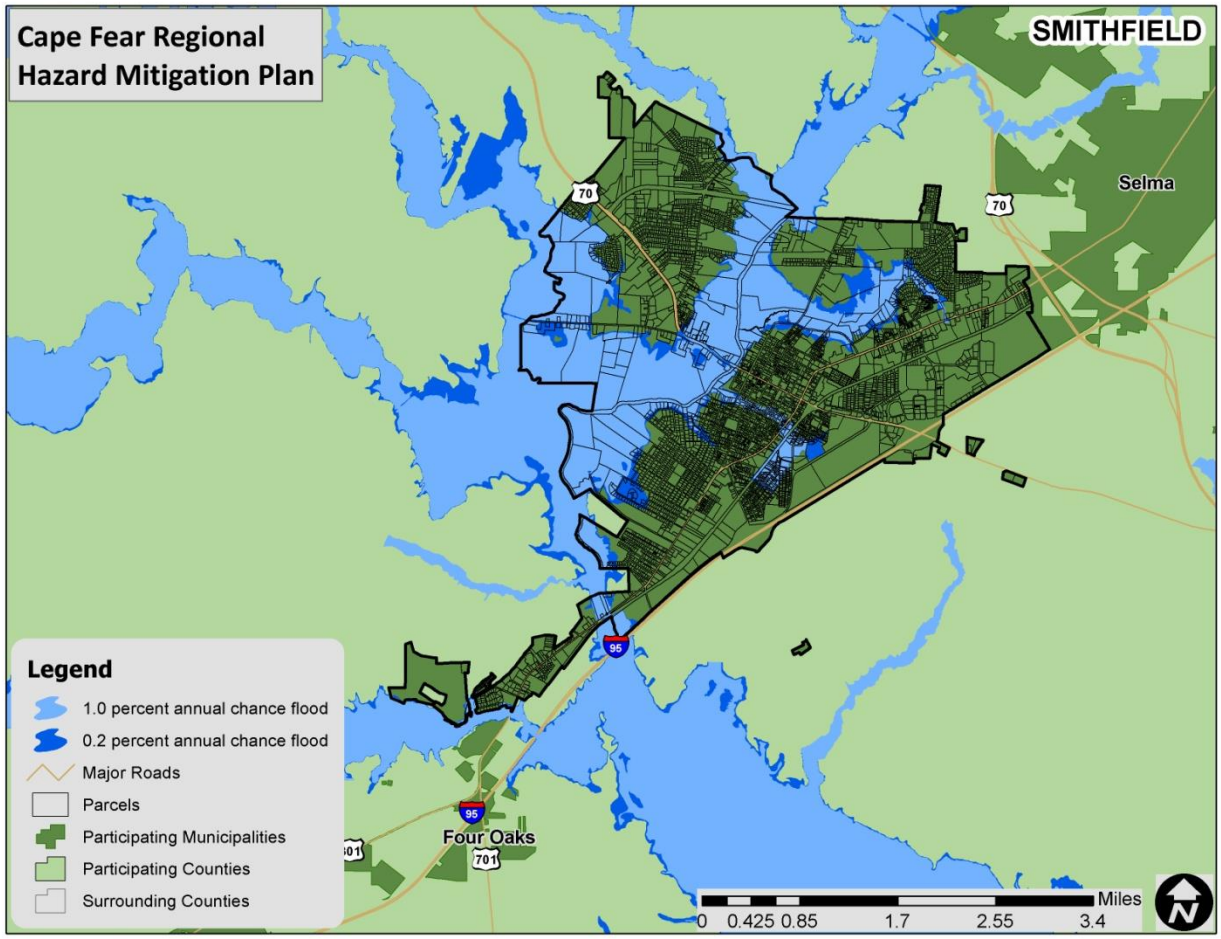
Source: Federal Emergency Management Agency

FIGURE C.18: SPECIAL FLOOD HAZARD AREAS IN SELMA



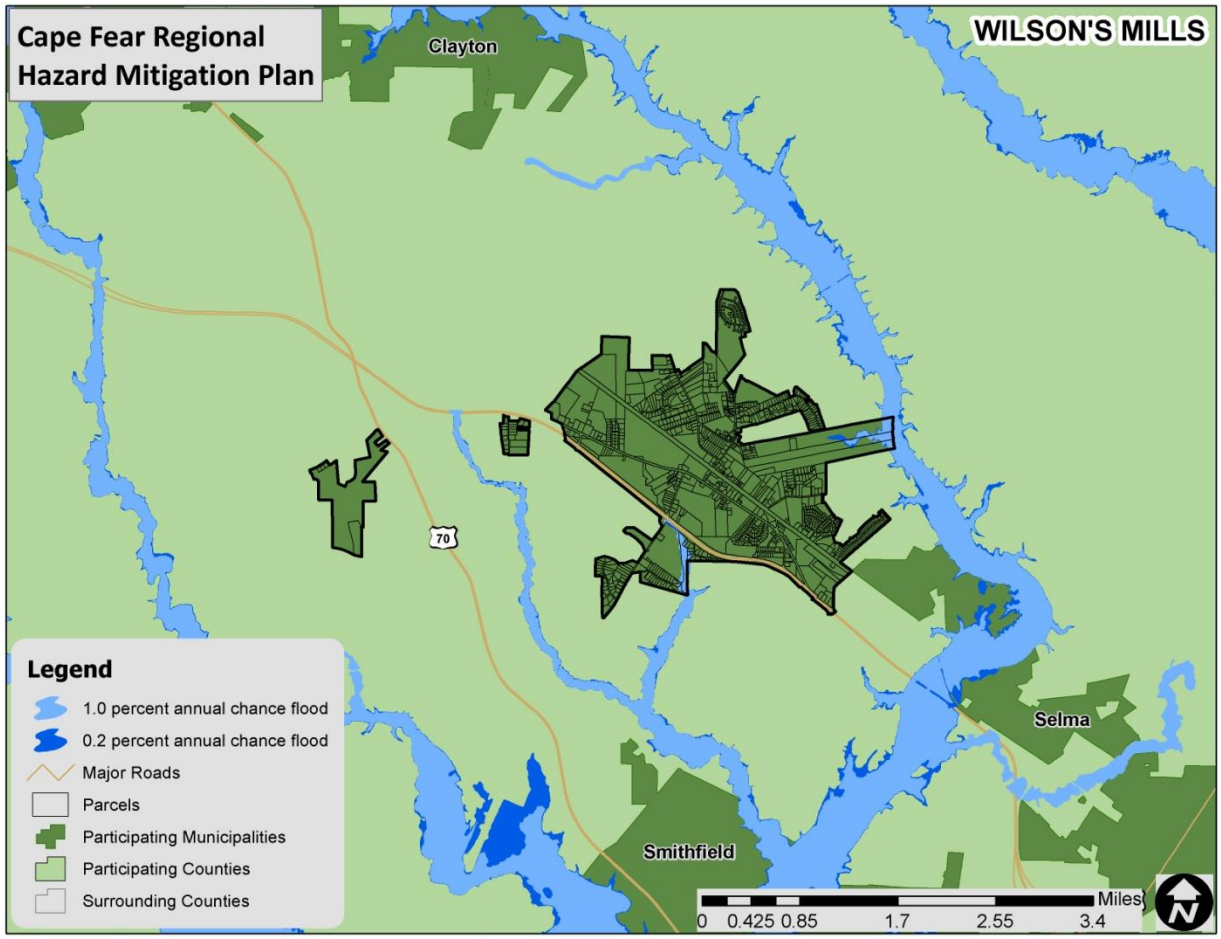
Source: Federal Emergency Management Agency

FIGURE C.19: SPECIAL FLOOD HAZARD AREAS IN SMITHFIELD



Source: Federal Emergency Management Agency

FIGURE C.20: SPECIAL FLOOD HAZARD AREAS IN WILSON'S MILLS



Source: Federal Emergency Management Agency

Historical Occurrences

Flooding was at least partially responsible for one disaster declaration in Johnston County in 2011.[16] Information from the National Climatic Data Center was used to ascertain additional historical flood events. The National Climatic Data Center reported a total of 34 events in Johnston County since 1993.[17] A summary of these events is presented in **Table C.22**. These events accounted for almost $46,000 (2013 dollars) in property damage in the county and 3 fatalities were reported.[18] Specific information on flood events, including date, type of flooding, and deaths and injuries, can be found in **Table C.23**.

TABLE C.22: SUMMARY OF FLOOD OCCURRENCES IN JOHNSTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2013)
Archer Lodge	1	0/0	$0

[16] A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*.
[17] These events are only inclusive of those reported by NCDC. It is likely that additional occurrences have occurred and have gone unreported.
[18] The total damage amount was averaged over the number of affected counties when multiple counties were involved in the flood event.

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2013)
Benson	2	0/0	$0
Clayton	5	0/0	$0
Four Oaks	0	0/0	$0
Kenly	0	0/0	$0
Micro	0	0/0	$0
Pine Level	0	0/0	$0
Princeton	1	0/0	$0
Selma	2	0/0	$0
Smithfield	5	0/0	$0
Wilson's Mills	1	0/0	$0
Unincorporated Area	17	3/0	$45,869
JOHNSTON COUNTY TOTAL	**34**	**3/0**	**$45,869**

Source: National Climatic Data Center

TABLE C.23: HISTORICAL FLOOD EVENTS IN JOHNSTON COUNTY

	Date	Type	Deaths / Injuries	Property Damage*
Archer Lodge				
ARCHERS LODGE	2/5/2010	FLOOD	0/0	$0
Benson				
BENSON	8/4/2000	FLASH FLOOD	0/0	$0
BENSON	9/14/2007	FLASH FLOOD	0/0	$0
Clayton				
Clayton	10/4/1995	FLASH FLOOD	0/0	$0
CLAYTON	8/3/2000	FLASH FLOOD	0/0	$0
CLAYTON	8/4/2000	FLASH FLOOD	0/0	$0
CLAYTON	8/15/2004	FLASH FLOOD	0/0	$0
CLAYTON	8/24/2010	FLASH FLOOD	0/0	$0
Four Oaks				
None Reported	--	--	--	--
Kenly				
None Reported	--	--	--	--
Micro				
None Reported	--	--	--	--
Pine Level				
None Reported	--	--	--	--
Princeton				
PRINCETON	9/30/2010	FLASH FLOOD	0/0	$0
Selma				
SELMA	3/9/1998	FLASH FLOOD	0/0	$0
SELMA	6/4/2004	FLASH FLOOD	0/0	$0
Smithfield				
Smithfield	10/5/1995	FLASH FLOOD	0/0	$0

	Date	Type	Deaths / Injuries	Property Damage*
SMITHFIELD	10/11/2002	FLASH FLOOD	0/0	$0
SMITHFIELD	6/4/2004	FLASH FLOOD	0/0	$0
SMITHFIELD	8/30/2004	FLASH FLOOD	0/0	$0
SMITHFIELD	9/14/2007	FLASH FLOOD	0/0	$0
Wilson's Mills				
WILSONS MILLS	3/29/2010	FLASH FLOOD	0/0	$0
JOHNSTON COUNTY	3/23/1993	FLASH FLOODS	0/0	$0
JOHNSTON COUNTY	6/12/1995	FLASH FLOOD	0/0	$0
JOHNSTON COUNTY	6/19/1995	FLASH FLOOD	0/0	$45,869
COUNTYWIDE	9/5/1996	FLASH FLOOD	0/0	$0
JOHNSTON COUNTY	1/19/1998	FLOOD	0/0	$0
JOHNSTON COUNTY	1/27/1998	FLOOD	0/0	$0
JOHNSTON COUNTY	2/10/1998	FLOOD	0/0	$0
COUNTYWIDE	9/15/1999	FLASH FLOOD	3/0	$0
COUNTYWIDE	9/21/1999	FLASH FLOOD	0/0	$0
COUNTYWIDE	9/27/1999	FLASH FLOOD	0/0	$0
COUNTYWIDE	9/28/1999	FLASH FLOOD	0/0	$0
COUNTYWIDE	9/28/1999	FLASH FLOOD	0/0	$0
COUNTYWIDE	9/28/1999	FLASH FLOOD	0/0	$0
COUNTYWIDE	10/17/1999	FLASH FLOOD	0/0	$0
COUNTYWIDE	6/16/2001	FLASH FLOOD	0/0	$0
WEST PORTION	7/9/2001	FLASH FLOOD	0/0	$0
WEST CENTRAL PORTION	6/14/2006	FLASH FLOOD	0/0	$0

*Property damage is reported in 2013 dollars; all damage may not have been reported.
Source: National Climatic Data Center

Historical Summary of Insured Flood Losses

According to FEMA flood insurance policy records as of June 2014, there have been 79 flood losses reported in Johnston County through the National Flood Insurance Program (NFIP) since 1978, totaling almost $2.3 million in claims payments. A summary of these figures for the county is provided in **Table C.24**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in Johnston County were either uninsured, denied claims payment, or not reported.

TABLE C.24: SUMMARY OF INSURED FLOOD LOSSES IN JOHNSTON COUNTY

Location	Flood Losses	Claims Payments
Archer Lodge	0	$0
Benson	0	$0
Clayton	2	$1,498
Four Oaks	0	$0
Kenly	0	$0
Micro*	--	--
Pine Level	0	$0

Location	Flood Losses	Claims Payments
Princeton	0	$0
Selma	0	$0
Smithfield	48	$1,596,593
Wilson's Mills*	--	--
Unincorporated Area	29	$680,206
JOHNSTON COUNTY TOTAL	**79**	**$2,278,297**

*This community does not participate in the National Flood Insurance Program. Therefore, no values are reported.
Source: Federal Emergency Management Agency, National Flood Insurance Program

Repetitive Loss Properties

FEMA defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP. Currently there are over 140,000 repetitive loss properties nationwide.

As of July 2013, there are no non-mitigated repetitive loss properties located in Johnston County. **Table C.25** presents detailed information on repetitive loss properties and NFIP claims and policies for Johnston County.

TABLE C.25: REPETITIVE LOSS PROPERTIES IN JOHNSTON COUNTY

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Archer Lodge	0	--	0	$0	$0	$0	$0
Benson	0	--	0	$0	$0	$0	$0
Clayton	0	--	0	$0	$0	$0	$0
Four Oaks	0	--	0	$0	$0	$0	$0
Kenly	0	--	0	$0	$0	$0	$0
Micro*	--	--	--	--	--	--	--
Pine Level	0	--	0	$0	$0	$0	$0
Princeton	0	--	0	$0	$0	$0	$0
Selma	0	--	0	$0	$0	$0	$0
Smithfield	0	--	0	$0	$0	$0	$0
Wilson's Mills*	--	--	--	--	--	--	--
Unincorporated Area	0	--	0	$0	$0	$0	$0
JOHNSTON COUNTY TOTAL	**0**	**--**	**0**	**$0**	**$0**	**$0**	**$0**

*This community does not participate in the National Flood Insurance Program. Therefore, no values are reported.
Source: National Flood Insurance Program

Probability of Future Occurrences

Flood events will remain a threat in areas prone to flooding in Johnston County, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The participating jurisdictions and unincorporated areas of the county have risk to flooding, though not all areas will experience floods. The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

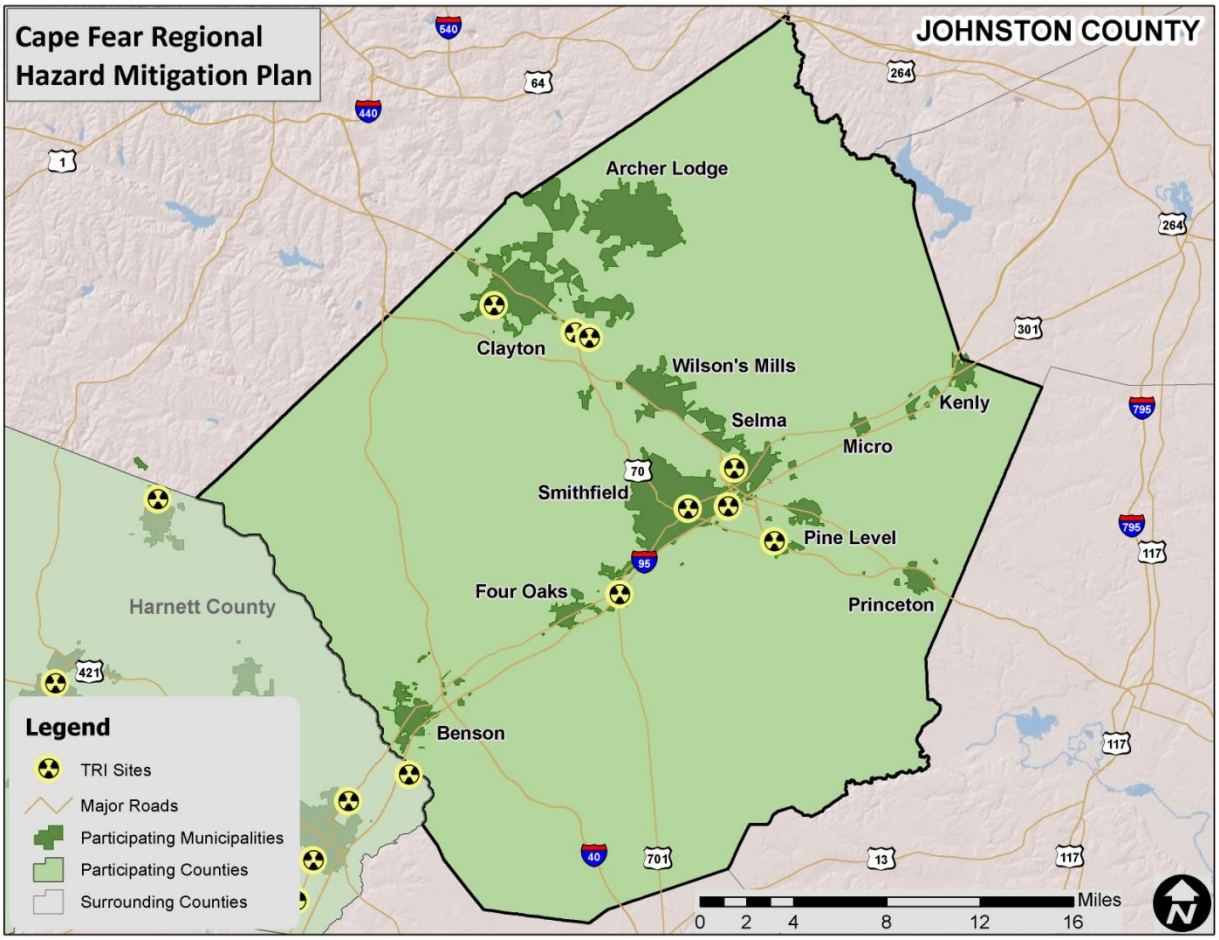
It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county and participating jurisdictions. For example, Smithfield has more floodplain and thus a higher risk of flood than Micro. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for properties in the floodplain.

C.2.14 Hazardous Materials Incidents

Location and Spatial Extent

Johnston County has eight TRI sites. These sites are shown in **Figure C.21.**

FIGURE C.21: TOXIC RELEASE INVENTORY (TRI) SITES IN JOHNSTON COUNTY



Source: Environmental Protection Agency

In addition to "fixed" hazardous materials locations, hazardous materials may also impact the county via roadways and rail. Many roads in the county are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident.

Historical Occurrences

There have been a total of 76 recorded HAZMAT incidents in Johnston County since 1971 (**Table C.26**). These events resulted in over $23,000 (2013 dollars) in property damage as well as two fatalities and two injuries. **Table C.27** presents detailed information on historic HAZMAT incidents in Johnston County as reported by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA).

TABLE C.26: SUMMARY OF HAZMAT INCIDENTS IN JOHNSTON COUNTY

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2013)
Archer Lodge	0	0/0	$0
Benson	3	0/0	$2,144
Clayton	7	0/0	$0
Four Oaks	1	0/0	$0
Kenly	10	0/1	$5,597
Micro	0	0/0	$0
Pine Level	1	0/0	$0
Princeton	2	0/0	$2,356
Selma	36	2/1	$11,918
Smithfield	14	0/0	$0
Wilson's Mills	1	0/0	$0
Unincorporated Area	1	0/0	$1,266
JOHNSTON COUNTY TOTAL	**76**	**2/2**	**$23,280**

Source: Unitd States Department of Transportation Pipeline and Hazardous Materials Safety Administration

TABLE C.27: HAZMAT INCIDENTS IN JOHNSTON COUNTY

Report Number	Date	City	Mode	Serious Incident?	Fatalities / Injuries	Damages ($)*	Quantity Released
Archer Lodge							
None Reported	--	--	--	--	--	--	--
Benson							
I-1997080858	8/8/1997	BENSON	Highway	No	0/0	$0	1 LGA
I-1998081322	8/13/1998	BENSON	Highway	Yes	0/0	$2,144	312.5 LGA
I-2004020566	1/16/2004	BENSON	Highway	No	0/0	$0	10 LGA
Clayton							
I-1989080254	7/31/1989	CLAYTON	Highway	Yes	0/0	$0	5,061 LGA
I-1996080136	6/27/1996	CLAYTON	Highway	No	0/0	$0	101 LGA
I-1997030952	2/28/1997	CLAYTON	Highway	No	0/0	$0	0.264172 LGA
I-2003100516	9/23/2003	CLAYTON	Highway	No	0/0	$0	25 SLB
I-2004061504	5/25/2004	CLAYTON	Highway	No	0/0	$0	0.1875 LGA
I-2006120260	10/29/2006	CLAYTON	Highway	Yes	0/0	$0	400 LGA
E-2010080128	8/2/2010	CLAYTON	Highway	No	0/0	$0	0.015625 LGA
Four Oaks							
I-2010090100	4/22/2010	FOUR OAKS	Highway	No	0/0	$0	0
Kenly							
I-1972050173	5/11/1972	KENLY	Highway	No	0/0	$0	0

Report Number	Date	City	Mode	Serious Incident?	Fatalities / Injuries	Damages ($)*	Quantity Released
I-1988060530	6/20/1988	KENLY	Highway	Yes	0/0	$0	340 LGA
I-1990060846	6/15/1990	KENLY	Highway	Yes	0/0	$0	400 LGA
I-1993010405	1/7/1993	KENLY	Highway	No	0/0	$0	8 SLB
I-1998010429	12/31/1997	KENLY	Highway	No	0/0	$0	15 LGA
I-2004080356	6/27/2004	KENLY	Highway	Yes	0/0	$0	150 LGA
I-2005040867	4/1/2005	KENLY	Highway	No	0/0	$0	0.000132 lGA
I-2008040402	3/5/2008	KENLY	Highway	Yes	0/0	$0	6,885 LGA
I-2008110446	7/16/2008	KENLY	Highway	Yes	0/1	$5,597	21.02118 GCF
E-2011050135	5/5/2011	KENLY	Highway	No	0/0	$0	2.5 LGA
Micro							
None Reported	--	--	--	--	--	--	--
Pine Level							
I-1979091263	8/25/1979	PINE LEVEL	Highway	Yes	0/0	$0	3,512 LGA
Princeton							
I-1997060065	4/3/1997	PRINCETON	Highway	Yes	0/0	$2,177	500 LGA
I-1998031242	3/8/1998	PRINCETON	Highway	Yes	0/0	$179	8,500 LGA
Selma							
I-1975080461	8/2/1975	SELMA	Highway	No	0/0	$0	0
I-1976070353	6/26/1976	SELMA	Highway	No	0/0	$0	42 LGA
I-1978020166	1/17/1978	SELMA	Rail	No	0/0	$0	20 LGA
I-1978120045	11/23/1978	SELMA	Highway	Yes	0/0	$0	2,750 LGA
I-1979090526	7/20/1979	SELMA	Highway	No	0/0	$0	0
I-1985060489	6/14/1985	SELMA	Highway	Yes	0/0	$0	1,250 LGA
I-1986050236	5/6/1986	SELMA	Highway	Yes	0/0	$0	900 LGA
I-1987090456	9/14/1987	SELMA	Highway	Yes	1/0	$0	9,100 LGA
I-1991020271	1/31/1991	SELMA	Highway	No	0/0	$0	18 LGA
I-1991080730	8/8/1991	SELMA	Highway	No	0/0	$0	25 LGA
I-1991100066	9/28/1991	SELMA	Highway	No	0/0	$0	1.5 LGA
I-1992020574	1/30/1992	SELMA	Highway	Yes	0/0	$0	422 LGA
I-1993060602	4/20/1993	SELMA	Highway	Yes	0/0	$0	904 LGA
I-1995030394	2/1/1995	SELMA	Rail	No	0/1	$0	0.03125 LGA
I-1997110267	10/30/1997	SELMA	Rail	No	0/0	$0	1 LGA
I-1998030066	1/27/1998	SELMA	Highway	Yes	0/0	$0	145 LGA
I-1998030248	2/25/1998	SELMA	Highway	No	0/0	$0	1 LGA
I-1998061389	6/9/1998	SELMA	Rail	No	0/0	$0	1 LGA
I-1998100666	9/21/1998	SELMA	Rail	No	0/0	$0	5 LGA
I-1998110988	10/13/1998	SELMA	Highway	No	0/0	$0	10 LGA
I-1999010557	1/15/1999	SELMA	Rail	No	0/0	$0	1 LGA
I-1999050622	4/13/1999	SELMA	Rail	No	0/0	$0	2 LGA
I-2000010637	1/9/2000	SELMA	Highway	No	0/0	$0	50 LGA
I-2001041108	4/14/2001	SELMA	Highway	No	0/0	$0	100 LGA
I-2002011342	10/23/2001	SELMA	Rail	No	0/0	$0	1 LGA
I-2002021325	12/18/2001	SELMA	Rail	No	0/0	$0	1 LGA
I-2006010667	1/10/2005	SELMA	Highway	Yes	1/0	$0	349 LGA
I-2005050505	3/16/2005	SELMA	Highway	No	0/0	$0	20 LGA
I-2006120466	9/8/2005	SELMA	Highway	Yes	0/0	$11,918	5,000 LGA

Report Number	Date	City	Mode	Serious Incident?	Fatalities / Injuries	Damages ($)*	Quantity Released
E-2006110023	10/18/2006	SELMA	Highway	No	0/0	$0	10 LGA
I-2007080426	6/6/2007	SELMA	Highway	Yes	0/0	$0	0 LGA
I-2007080426	6/6/2007	SELMA	Highway	Yes	0/0	$0	5 LGA
E-2009040179	3/18/2009	SELMA	Highway	No	0/0	$0	1 LGA
I-2010100303	8/18/2010	SELMA	Highway	No	0/0	$0	0
X-2011030093	3/2/2011	Selma	Rail	No	0/0	$0	0.25 LGA
X-2012060083	6/7/2012	SELMA	Rail	No	0/0	$0	0.007812 LGA
Smithfield							
I-1971010039	1/11/1971	SMITHFIELD	Highway	No	0/0	$0	0
I-1973010329	1/16/1973	SMITHFIELD	Highway	No	0/0	$0	0
I-1973110245	10/29/1973	SMITHFIELD	Highway	No	0/0	$0	0
I-1977040110	2/7/1977	SMITHFIELD	Highway	No	0/0	$0	0
I-1977030229	2/22/1977	SMITHFIELD	Highway	No	0/0	$0	0
I-1980071282	6/30/1980	SMITHFIELD	Highway	No	0/0	$0	0
I-1980071283	6/30/1980	SMITHFIELD	Highway	No	0/0	$0	0
I-1986040235	4/6/1986	SMITHFIELD	Highway	No	0/0	$0	5 LGA
I-1989050696	5/2/1989	SMITHFIELD	Highway	No	0/0	$0	10 LGA
I-1999071919	7/22/1999	SMITHFIELD	Highway	No	0/0	$0	10 LGA
I-2000061547	3/21/2000	SMITHFIELD	Highway	No	0/0	$0	0.000001 LGA
I-2000061640	5/30/2000	SMITHFIELD	Highway	No	0/0	$0	2 LGA
I-2001020363	1/18/2001	SMITHFIELD	Highway	No	0/0	$0	1 LGA
I-2002071159	7/10/2002	SMITHFIELD	Highway	No	0/0	$0	20 LGA
Wilson's Mills							
I-2004051096	4/20/2003	WILSON MILLS	Highway	Yes	0/0	$1,266	500 LGA
Unincorporated Area							
I-1998041039	3/12/1998	WILLOW SPRINGS	Highway	No	0/0	$0	10 LGA

*Property damage is reported in 2013 dollars.
Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

Probability of Future Occurrences

Given the location of eight toxic release inventory sites in Johnston County and several roadway incidents, it is likely that a hazardous material incident may occur in the county (between 1 and 10 percent annual probability). County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence. The county may also be impacted by neighboring counties which also face risk due to TRI sites.

C.2.15 Wildfire

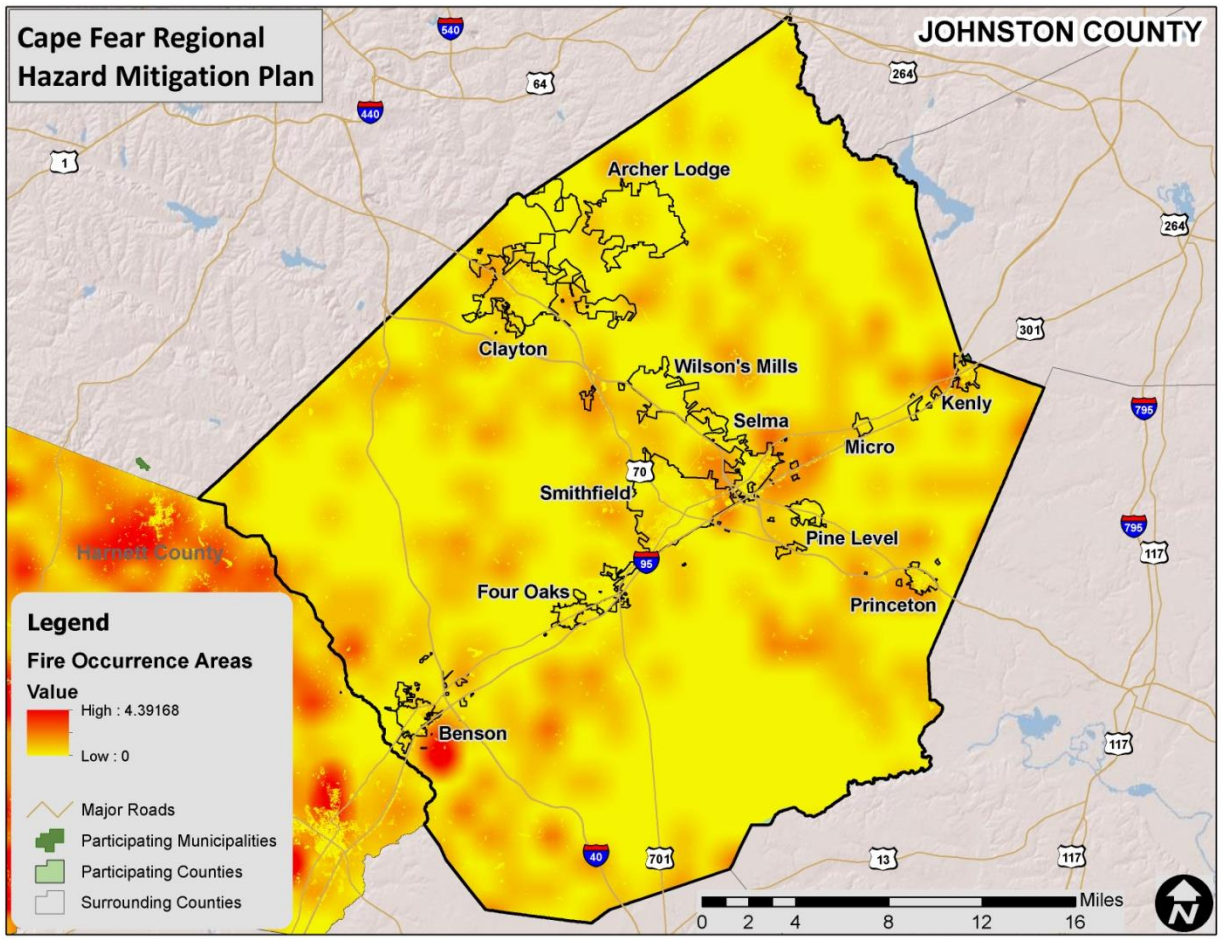
Location and Spatial Extent

The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Fire Occurrence Areas in the figure below give an indication of historic location.

Historical Occurrences

Figure C.22 shows the Fire Occurrence Areas (FOA) in Johnston County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and is reported as the number of fires that occur per 1,000 acres each year.

FIGURE C.22: HISTORIC WILDFIRE EVENTS IN JOHNSTON COUNTY



Source: Southern Wildfire Risk Assessment

Based on data from the North Carolina Division of Forest Resources from 2003 to 2012, Johnston County experienced an average of 37 wildfires annually which burn an average of 191 acres per year. The data indicates that most of these fires are small, averaging four acres per fire. **Table C.28** lists the number of reported wildfire occurrences in the county between the years 2003 and 2012.

TABLE C.28: HISTORICAL WILDFIRE OCCURRENCES IN JOHNSTON COUNTY

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Johnston County										
Number of Fires	17	16	29	35	75	29	24	59	55	29
Number of Acres	49.9	263.4	112.9	93.1	384.2	198.5	199.8	188.6	257.3	164.1

Source: North Carolina Division of Forest Resources

Probability of Future Occurrences

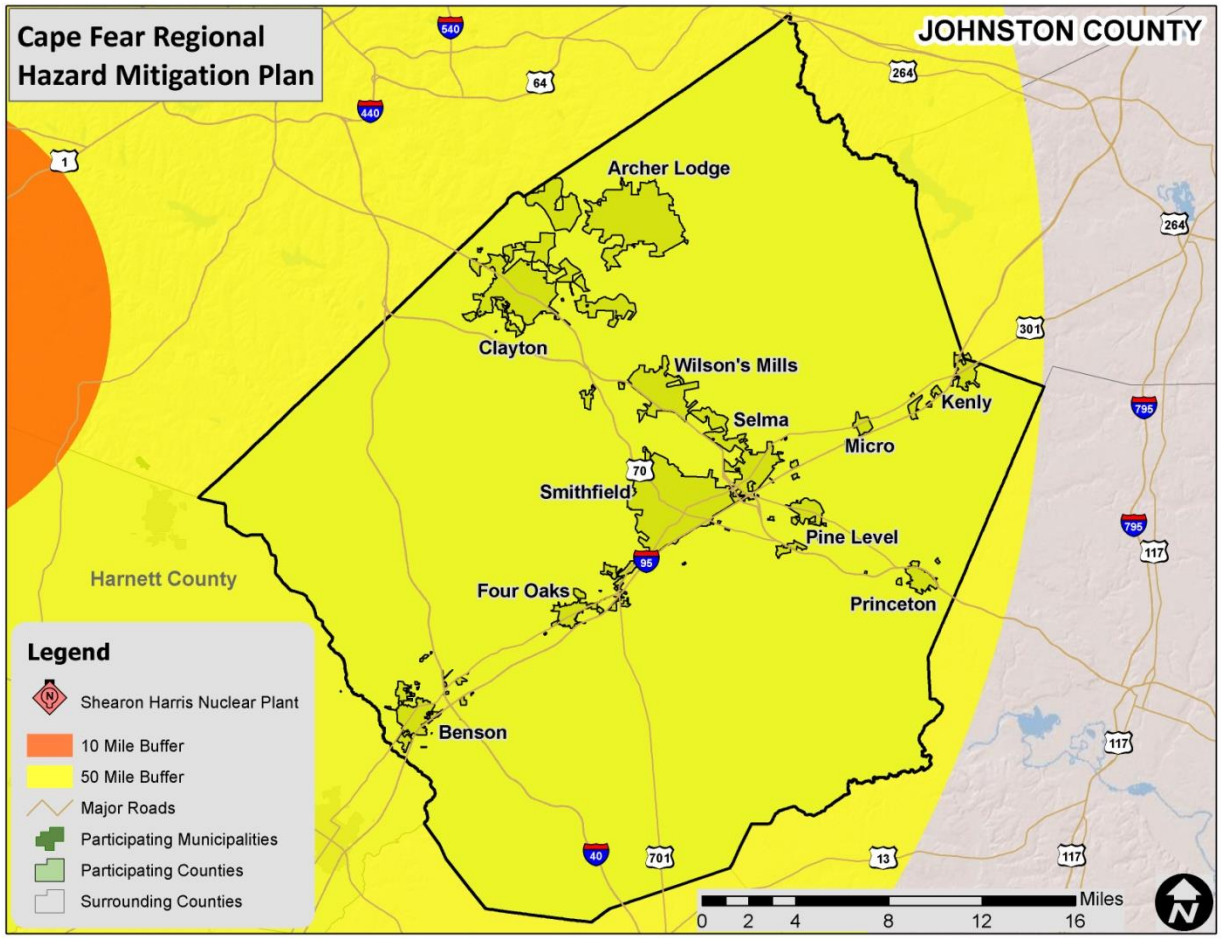
Wildfire events will be an ongoing occurrence in Johnston County. The likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Johnston County for future wildfire events is likely (10 to 100 percent annual probability).

C.2.16 Nuclear Accident

Location and Spatial Extent

The entire county is at risk to a nuclear incident due to its proximity to the Shearon Harris Nuclear Station. Areas located within 10 miles of the station are considered to be within the zone of highest risk to a nuclear incident and is the designated evacuation radius recommended by the Nuclear Regulatory Commission (**Figure C.23**). All areas of the county are located within the 50 mile radius that is still considered to be at risk from a nuclear incident.

FIGURE C. 23: SHEARON HARRIS NUCLEAR POWER STATION INCIDENT HAZARD ZONES IN JOHNSTON COUNTY



Source: International Atomic Energy Agency

Historical Occurrences

Although there have been no major nuclear events at the Shearon Harris Nuclear Station, there is some possibility that one could occur as there have been incidents in the past in the United States at other facilities and at facilities around the world. In May of 2013, there was an unplanned shutdown of the plant which resulted from the discovery of a ¼ inch crack in the Reactor Pressure Vessel Head.

Shearon Harris has declared 2 "Alerts" and 28 "Notice of Unusual Events" since 1986. There have also been 338 additional incidents reported to the NRC since 1986, but they did not necessitate an emergency declaration and therefore were not included in this analysis.[19]

Probability of Future Occurrences

A nuclear event is a very rare occurrence in the United States due to the intense regulation of the industry. There have been incidents in the past, but it is considered unlikely (less than 1 percent annual probability).

[19] More information on Shearon Harris Emergency Declaration events can be found in Section 5: *Hazard Profiles*.

C.2.17 Terror Threat

Location and Spatial Extent

A terror threat could potentially occur at any location in the county. However, the very definition of a terrorist event indicates that it is most likely to be targeted at a critical or symbolic resource/location. Ensuring and protecting the continuity of critical infrastructure and key resources (CIKR) of the United States is essential to the Nation's security, public health and safety, economic vitality, and way of life. CIKR includes physical and/or virtual systems or assets that, if damaged, would have a detrimental impact on national security, including large-scale human casualties, property destruction, economic disruption, and significant damage to morale and public confidence. **Table C.29** lists the U.S. Department of Homeland Security's (DHS) identified main critical infrastructure sectors.

TABLE C.29 U.S. DEPARTMENT OF HOMELAND SECURITY CRITICAL INFRASTRUCTURE SECTORS

- Agriculture and Food
- Banking and Finance
- Chemical
- Commercial Facilities
- Communications
- Critical Manufacturing
- Dams
- Defense Industrial Base
- Emergency Services
- Energy
- Government Facilities
- Healthcare and Public Health
- Information Technology
- National Monuments and Icons
- Nuclear Reactors, Materials, and Waste
- Postal and Shipping
- Transportation Systems
- Water

Although all critical facilities (see Section C.3.3) are at a heightened level of risk in Johnston County, there are several that have been identified as the likely primary targets. These critical facilities include the Johnston County Emergency Operations Center and Johnston Medical Center.

Historical Occurrences

Although there have been no major terror events in Johnston County, there is some possibility that one could occur in the future as there have been incidents in the United States in the past and there are several facilities that could be potential targets.

Probability of Future Occurrences

Johnston County has no recorded terrorist events. Due to no recorded incidents against the county, the probability of future occurrences of a terrorist attack is unlikely (less than 1 percent annual probability).

C.2.18 Conclusions on Hazard Risk

The hazard profiles presented above were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

Hazard Extent

Table C.30 describes the extent of each natural hazard identified for Johnston County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE C.30: EXTENT OF JOHNSTON COUNTY HAZARDS

Atmospheric Hazards	
Drought	Drought extent is defined by the North Carolina Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought (page 5:6). According to the North Carolina Drought Monitor Classifications, the most severe drought condition is Exceptional. Johnston County has received this ranking two times over the fourteen-year reporting period.
Extreme Heat	The extent of extreme heat can be defined by the maximum temperature reached. The highest temperature recorded in Johnston County is 107 degrees Fahrenheit (reported on August 18, 1988).
Hailstorm	Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Johnston County was 2.75 inches (reported on August 5, 1997). It should be noted that future events may exceed this.
Hurricane and Tropical Storm	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5 (Table 5.10). The greatest classification of hurricane to traverse directly through Johnston County was an Unnamed 1893 Storm which reached a maximum wind speed of 70 knots in the county.
Lightning	According to the Vaisala flash density map (Figure 5.5), Johnston County is located in an area that experiences 3 to 5 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.
Thunderstorm Wind / High Wind	Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 56-year history from the National Climatic Data Center, the strongest recorded wind event in Johnston County was reported on July 10, 1986 at 75 knots (approximately 86 mph). It should be noted that future events may exceed these historical occurrences.
Tornado	Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA (Figure 5.6) as well as the Fujita/Enhanced Fujita Scale (Tables 5.16 and 5.17). The greatest magnitude reported was an F3 (reported on November 23, 1992).
Winter Storm and Freeze	The extent of winter storms can be measured by the amount of snowfall received (in inches). The greatest 24-hour snowfall reported in Johnston County was 18.0 inches on March 2, 1927. Due to unpredictable variations in snowfall throughout the county, extent totals will vary for each participating jurisdiction and reliable data on snowfall totals is not available.
Geologic Hazards	
Earthquake	Earthquake extent can be measured by the Richter Scale (Table 5.20) and the Modified Mercalli Intensity (MMI) scale (Table 5.21) and the distance of the epicenter from Johnston County. According to data provided by the National Geophysical Data Center, the greatest MMI to impact the county was IV (moderate) with a correlating Richter Scale measurement of approximately 4.8 (reported on November 20, 1969). The epicenter of this earthquake was located 318.0 km away.

Landslide	As noted above in the landslide profile, the landslide data provided by the North Carolina Geological survey is incomplete. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is low across Johnston County. There is also low susceptibility throughout the county.
Hydrologic Hazards	
Dam Failure	Dam failure extent is defined using the North Carolina Division of Land Resources criteria (Table 5.24). Of the 89 dams in Johnston County, 5 are classified as high-hazard.
Erosion	The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in Johnston County.
Flood	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 16.8 percent of the total land area in Johnston County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was at the Neuse River near Clayton on September 19, 1945. Water reached a discharge of 22,900 cubic feet per second and the stream gage height was recorded at 22.12 feet. It should also be noted that local officials recall flooding depths of at least 5 feet in some historic events and this is loosely corroborated by NCDC narrative records.
Other Hazards	
Hazardous Materials Incident	According to USDOT PHMSA, the largest hazardous materials incident reported in the county was 9,100 LGA released on the highway on September 14, 1987. It should be noted that larger events are possible.
Wildfire	Wildfire data was provided by the North Carolina Division of Forest Resources and is reported annually by county from 2003-2012. The greatest number of fires to occur in Johnston County in any year was 75 in 2007. The greatest number of acres to burn in the county in a single year occurred in 2007 when 384.2 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.
Nuclear Accident	Although there is no history of a nuclear accident at the Shearon Harris Nuclear Station, other events across the globe and in the United States in particular indicate that an event is possible. Since several national and international events were Level 7 events on the INES, the potential for a Level 7 event at Shearon Harris is possible.
Terror Threat	There is no history of terror threats in Johnston County; however; it is possible that one of these events could occur. If this were to take place, the magnitude of the event could range on the scale of critical damage with many fatalities and injuries to the population.

Priority Risk Index Results

In order to draw some meaningful planning conclusions on hazard risk for Johnston County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a "Priority Risk Index" (PRI). More information on the PRI and how it was calculated can be found in Section 5.20.2.

Table C.31 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Planning Team. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE C.31: SUMMARY OF PRI RESULTS FOR JOHNSTON COUNTY

Hazard	Category/Degree of Risk					
	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Atmospheric Hazards						
Drought	Likely	Minor	Large	More than 24 hours	More than 1 week	**2.5**
Extreme Heat	Likely	Minor	Large	More than 24 hours	Less than 1 week	**2.4**
Hailstorm	Highly Likely	Minor	Moderate	Less than 6 hours	Less than 6 hours	**2.6**
Hurricane and Tropical Storm	Likely	Critical	Large	More than 24 hours	Less than 24 hours	**2.9**
Lightning	Highly Likely	Minor	Negligible	Less than 6 hours	Less than 6 hours	**2.2**
Thunderstorm/High Wind	Highly Likely	Critical	Large	6 to 12 hours	Less than 6 hours	**3.3**
Tornado	Likely	Critical	Small	Less than 6 hours	Less than 6 hours	**2.7**
Winter Storm and Freeze	Likely	Limited	Moderate	More than 24 hours	Less than 1 week	**2.5**
Geologic Hazards						
Earthquake	Unlikely	Minor	Moderate	Less than 6 hours	Less than 6 hours	**1.7**
Landslide	Unlikely	Minor	Negligible	Less than 6 hours	Less than 6 hours	**1.3**
Hydrologic Hazards						
Dam and Levee Failure	Unlikely	Critical	Small	Less than 6 hours	Less than 6 hours	**2.1**
Erosion	Possible	Minor	Small	More than 24 hours	More than 1 week	**1.8**
Flood	Likely	Limited	Moderate	6 to 12 hours	Less than 1 week	**3.0**
Other Hazards						
Hazardous Materials Incident	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	**2.5**
Wildfire	Likely	Minor	Small	Less than 6 hours	Less than 1 week	**2.3**
Nuclear Accident	Unlikely	Limited	Moderate	6 to 12 hours	Less than 1 week	**1.9**
Terror Threat	Unlikely	Critical	Small	Less than 6 hours	Less than 24 hours	**2.2**

C.2.19 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Johnston County, including the PRI results and input from the Regional Hazard Mitigation Planning Team, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table C.32**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Johnston County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment* and below in Section C.3. It should be noted that

although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

TABLE C.32: CONCLUSIONS ON HAZARD RISK FOR JOHNSTON COUNTY

HIGH RISK	Thunderstorm Wind / High Wind Flood Hurricane and Tropical Storm Tornado Hailstorm Drought Winter Storm and Freeze
MODERATE RISK	Hazardous Material Incident Extreme Heat Wildfire Lightning
LOW RISK	Terror Threat Dam and Levee Failure Nuclear Accident Erosion Earthquake Landslide

C.3 JOHNSTON COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Johnston County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

C.3.1 Asset Inventory

Table C.33 lists the number of parcels, total value of parcels, total number of parcels with improvements, and the total assessed value of improvements for Johnston County and its participating jurisdictions (study area of vulnerability assessment).[20]

[20] Total assessed values for improvements is based on tax assessor records as joined to digital parcel data. This data does not include dollar figures for tax-exempt improvements such as publicly-owned buildings and facilities. It should also be noted that, due to record keeping, some duplication is possible thus potentially resulting in an inflated value exposure for an area.

TABLE C.33: IMPROVED PROPERTY IN JOHNSTON COUNTY

Location	Number of Parcels	Total Assessed Value of Parcels	Estimated Number of Buildings	Total Assessed Value of Improvements[21]
Archer Lodge	1,750	$247,693,690	1,595	$170,585,060
Benson	1,712	$257,648,473	1,458	$178,956,673
Clayton	7,504	$1,494,324,813	4,762	$1,031,714,203
Four Oaks	1,131	$129,732,334	915	$92,646,954
Kenly	741	$68,712,041	750	$48,529,791
Micro	244	$15,870,507	256	$11,897,567
Pine Level	795	$98,304,350	820	$70,814,330
Princeton	707	$104,664,930	628	$83,358,730
Selma	2,311	$308,607,010	2,506	$205,382,510
Smithfield	5,236	$1,182,116,491	4,798	$815,559,431
Wilson's Mills	1,093	$124,486,200	895	$82,053,740
Unincorporated Area	68,495	$9,536,489,839	61,125	$5,816,517,259
JOHNSTON COUNTY TOTAL	**91,719**	**$13,568,650,678**	**80,508**	**$8,608,016,248**

Table C.34 lists the fire stations, police stations, EMS/rescue stations, emergency operations centers (EOCs), medical care facilities, schools and other critical facilities located in Johnston County. Local governments at the county level provided a majority of the data for this analysis. In addition, **Figure C.24** shows the locations of essential facilities in Johnston County. **Table C.49**, near the end of this section, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided by the county.

TABLE C.34: CRITICAL FACILITY INVENTORY IN JOHNSTON COUNTY

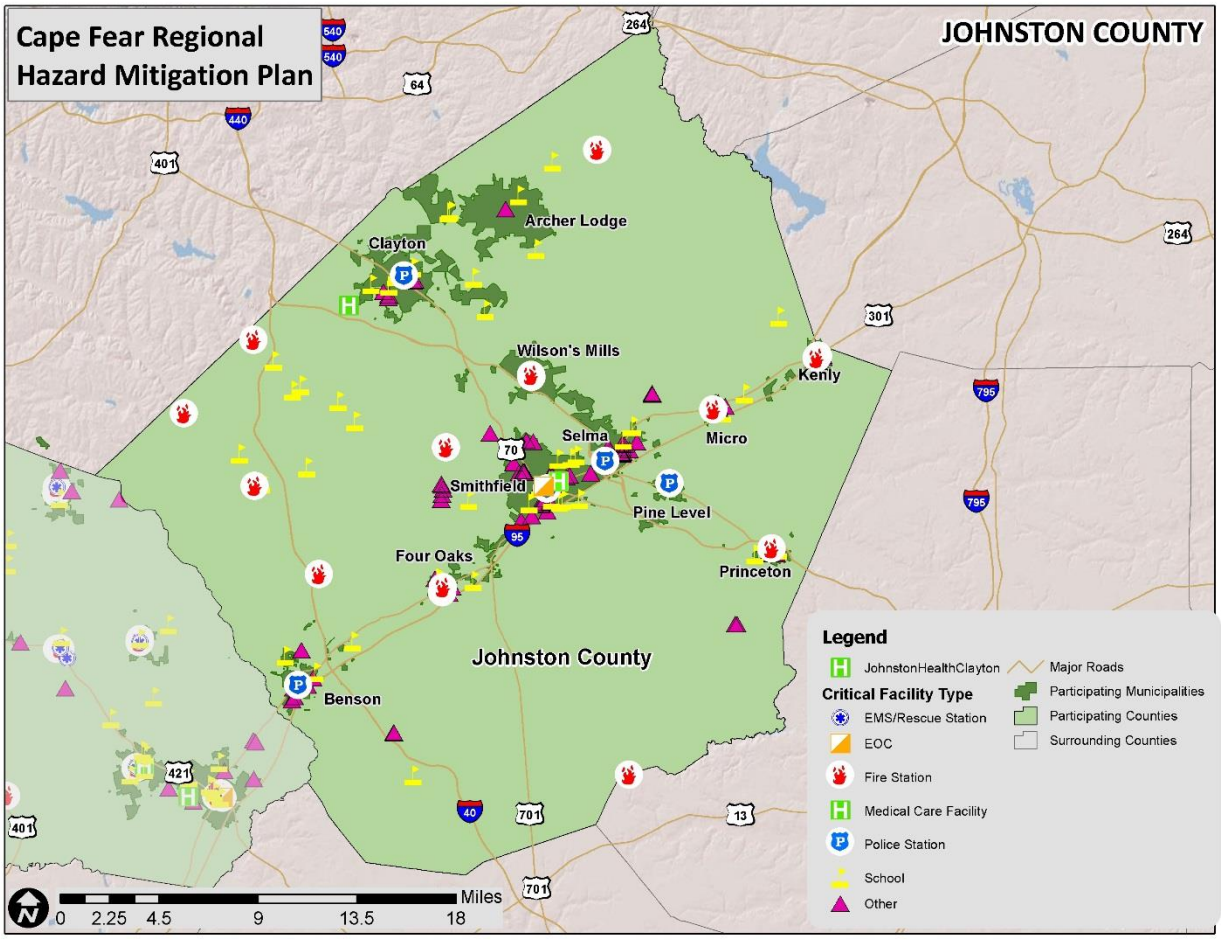
Location	Fire Stations	Police Stations	EMS/Rescue Stations*	Medical Care Facilities	EOC	Schools	Other
Archer Lodge	0	0	0	0	0	1	1
Benson	0	1	0	0	0	2	7
Clayton	0	1	0	1	0	7	8
Four Oaks	1	1	0	0	0	2	4
Kenly	1	1	0	0	0	0	6
Micro	1	0	0	0	0	1	5
Pine Level	0	1	0	0	0	1	3
Princeton	1	0	0	0	0	2	6
Selma	0	1	0	0	0	2	12
Smithfield	0	1	0	1	1	9	37
Wilson's Mills	1	1	0	0	0	1	2
Unincorporated Area	7	0	0	0	0	18	14
JOHNSTON COUNTY TOTAL	**12**	**8**	**0**	**2**	**1**	**46**	**105**

*Some jurisdictions included their EMS/Rescue Stations as separate facilities, while others elected to list only Fire Stations which in many cases are co-located with EMS/Rescue Stations.

Source: Local Government; Hazus-MH

[21] Building value for each county is based on the number of parcels with an improved building value greater than zero.

FIGURE C.24: CRITICAL FACILITY LOCATIONS IN JOHNSTON COUNTY



Source: Local Governments

C.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in Johnston County that are potentially at risk to these hazards.

Table C.35 lists the population by jurisdiction according to U.S. Census 2010 population estimates. The total population in Johnston County according to Census data is 168,878 persons. Additional population estimates are presented above in Section C.1.

TABLE C.35: TOTAL POPULATION IN JOHNSTON COUNTY

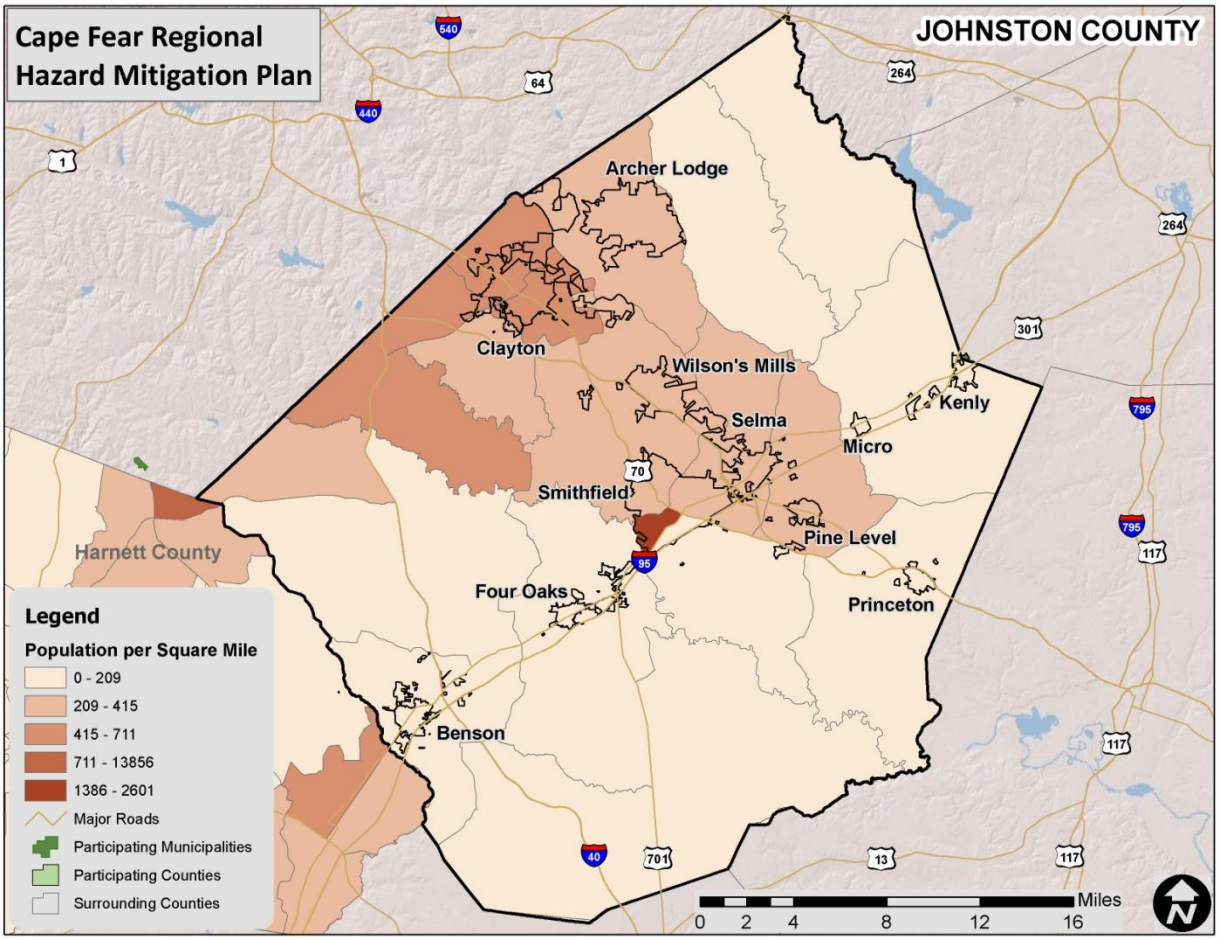
Jurisdiction	2010 Census Population
Johnston County	**168,878**
Town of Archer Lodge	4,292
Town of Benson	3,311

Jurisdiction	2010 Census Population
Town of Clayton	16,116
Town of Four Oaks	1,921
Town of Kenly	1,339
Town of Micro	441
Town of Pine Level	1,700
Town of Princeton	1,194
Town of Selma	6,073
Town of Smithfield	10,966
Town of Wilson's Mills	2,277

Source: United States Census 2010

In addition, **Figure C.25** illustrates the population density by census tract as it was reported by the U.S. Census Bureau in 2010.

FIGURE C.25: POPULATION DENSITY IN JOHNSTON COUNTY



Source: United States Census Bureau, 2010

C.3.3 Development Trends and Changes in Vulnerability

Since the previous county hazard mitigation plans was approved (in 2011), Johnston County has experienced some growth and development. **Table C.36** shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

TABLE C.36: BUILDING COUNTS FOR JOHNSTON COUNTY

Jurisdiction	Total Housing Units (2012)	Units Built 2010 or later	% Building Stock Built Post-2010
Archer Lodge	1,540	0	0.0%
Benson	1,599	0	0.0%
Clayton	6,657	0	0.0%
Four Oaks	907	0	0.0%
Kenly	736	0	0.0%
Micro	222	5	2.3%
Pine Level	793	0	0.0%
Princeton	572	0	0.0%
Selma	2,719	0	0.0%
Smithfield	4,970	0	0.0%
Wilson's Mills	873	0	0.0%
Unincorporated Area	45,947	348	0.8%
JOHNSTON COUNTY TOTAL	**67,535**	**353**	**0.5%**

Source: United States Census Bureau

Table C.37 shows population growth estimates for the county from 2010 to 2013 based on the U.S. Census Annual Estimates of Resident Population.

TABLE C.37: POPULATION GROWTH FOR JOHNSTON COUNTY

Jurisdiction	Population Estimates (as of July 1)				% Change 2010-2013
	2010	2011	2012	2013	
Archer Lodge	4,290	4,378	4,435	4,516	5.3%
Benson	3,322	3,381	3,422	3,484	4.9%
Clayton	16,206	16,642	17,058	17,694	9.2%
Four Oaks	1,929	1,959	1,969	2,005	3.9%
Kenly	1,345	1,366	1,381	1,400	4.1%
Micro	442	451	457	464	5.0%
Pine Level	1,708	1,739	1,758	1,787	4.6%
Princeton	1,198	1,222	1,236	1,252	4.5%
Selma	6,089	6,152	6,189	6,237	2.4%
Smithfield	11,011	11,220	11,356	11,560	5.0%
Wilson's Mills	2,287	2,326	2,348	2,386	4.3%
Unincorporated Area	119,786	121,911	123,192	125,182	4.5%
JOHNSTON COUNTY TOTAL	**169,613**	**172,747**	**174,801**	**177,967**	**4.9%**

Source: United States Census Bureau

Based on the data above, there has been a relatively low rate of residential development and population growth in the county since 2010. However, unincorporated Micro has experienced a slightly higher rate of development compared to the rest of the Cape Fear Region, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. Additionally, there has been a slightly higher ratesof population growth in Clayton. Since the population has increased in this municipality, there are now greater numbers of people exposed to the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plans were approved and there has been a slight increase in the overall vulnerability.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, moderate landside susceptibility areas, high wildfire risk areas, or primary and secondary TRI site buffers.

C.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, modeling tool, or sufficient historical data allow for further analysis. Those results, specific to Johnston County, are presented here. All other hazards are assumed to impact the entire planning region (drought, extreme heat, hailstorm, lightning, thunderstorm wind, tornado, and winter storm and freeze) or, due to lack of data, analysis would not lead to credible results (dam and levee failure, erosion, and terror threat). The total county exposure, and thus risk, was presented in **Table C.33**.

The annualized loss estimate for all hazards is presented at the end of this section in **Table C.48.**

The hazards presented in this section include: hurricane and tropical storm winds, earthquake, landslide, flood, hazardous materials incident, wildfire, and nuclear accident.

Hurricane and Tropical Storm

Historical evidence indicates that Johnston County has a significant risk to the hurricane and tropical storm hazard. Several tracks have come near or traversed through the county, as shown and discussed in Section C.2.4.

Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds and precipitation, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard. Hazus-MH 2.1 was used to determine annualized losses for the county as shown below in **Table C.38.** Only losses to buildings, contents, and inventory are reported, in order to best match annualized losses reported for other hazards. Hazus-MH reports losses at the U.S. Census tract level, so determining participating jurisdiction losses was not possible.

TABLE C.38: ANNUALIZED LOSS ESTIMATIONS FOR HURRICANE WIND HAZARD

Location	Total Annualized Loss
Johnston County	$2,339,000

Source: Hazus-MH 2.1

In addition, probable peak wind speeds were calculated in Hazus. These are shown below in **Table C.39.**

TABLE C.39: PROBABLE PEAK HURRICANE / TROPICAL STORM WIND SPEEDS (MPH)

Location	50-year event	100-year event	500-year event	1,000-year event
Archer Lodge	77.7	87.1	104.4	111.0
Benson	80.8	90.1	109.2	116.0
Clayton	79.0	88.3	106.1	113.2
Four Oaks	80.8	90.3	108.8	115.5
Kenly	80.7	89.8	107.5	113.6
Micro	81.2	90.5	108.1	114.9
Pine Level	81.7	91.0	109.4	115.7
Princeton	83.2	92.4	110.2	116.2
Selma	81.2	90.5	108.1	114.9
Smithfield	81.7	91.0	109.4	115.7
Wilson's Mills	79.0	88.3	106.1	113.2
Unincorporated Area	77.7	87.1	110.8	117.4
MAXIMUM WIND SPEED REPORTED	**83.2**	**92.4**	**110.8**	**117.4**

Source: Hazus-MH 2.1

Social Vulnerability

Given equal susceptibility across the county, it is assumed that the total population is at risk to the hurricane and tropical storm hazard.

Critical Facilities

Given equal vulnerability across Johnston County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation actions for vulnerable structures, including critical facilities, to reduce the impacts of the hurricane wind hazard. A list of specific critical facilities and their associated risk can be found in **Table C.49** at the end of this section.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Johnston County. Hurricane events can cause substantial damage in their wake including fatalities, extensive debris clean-up, and extended power outages.

Earthquake

For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the annualized loss for Johnston County. The results of the analysis reported at the U.S. Census tract level do not make it feasible to estimate losses at the jurisdiction level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to building damage and do not include losses to contents, inventory, or business interruption. **Table C.40** summarizes the findings.

TABLE C.40: ANNUALIZED LOSS ESTIMATIONS FOR EARTHQUAKE HAZARD

Location	Total Annualized Loss
Johnston County	$20,000

Source: Hazus-MH 2.1

Social Vulnerability
It can be assumed that all existing future populations are at risk to the earthquake hazard.

Critical Facilities
The Hazus probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. A list of individual critical facilities and their risk can be found in **Table C.49**.

In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Johnston County. Minor earthquakes may rattle dishes and cause minimal damage while stronger earthquakes will result in structural damage as indicated in the Hazus scenario above. Impacts of earthquakes include debris clean-up, service disruption and, in severe cases, fatalities due to building collapse. Specific vulnerabilities for assets will be greatly dependent on their individual design and the mitigation measures in place, where appropriate. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates if data becomes available. Furthermore, mitigation actions to address earthquake vulnerability will be considered.

Landslide

In order to complete the vulnerability assessment for landslides in Johnston County, GIS analysis was used. The potential dollar value of exposed land and property total can be determined using the USGS Landslide Susceptibility Index (detailed in Section C.2.10), county level tax parcel data, and GIS analysis. **Table C.41** presents the potential at-risk property where available. All areas of Johnston County are identified low incidence areas by the USGS landslide data. All areas are also of low landslide susceptibility. Since no areas of high incidence were identified, the moderate incidence level was used to identify different areas of concern for the analysis below.

TABLE C.41: TOTAL POTENTIAL AT-RISK PARCELS FOR THE LANDSLIDE HAZARD

Location	Number of Parcels At Risk	Number of Improvements At Risk	Total Value of Improvements At Risk ($)
Incidence Level	**Moderate**		
Archer Lodge	0	0	$0
Benson	0	0	$0
Clayton	0	0	$0
Four Oaks	0	0	$0
Kenly	0	0	$0
Micro	0	0	$0
Pine Level	0	0	$0
Princeton	0	0	$0
Selma	0	0	$0
Smithfield	0	0	$0
Wilson's Mills	0	0	$0

Location	Number of Parcels At Risk	Number of Improvements At Risk	Total Value of Improvements At Risk ($)
Incidence Level	**Moderate**		
Unincorporated Area	0	0	$0
JOHNSTON COUNTY TOTAL	**0**	**0**	**$0**

Source: U.S. Geological Survey

Social Vulnerability

Given low susceptibility across the northwestern portion of the county, it is assumed that the total population is at low risk.

Critical Facilities

All critical facilities are located in a low susceptibility area. All facilities in Johnston County are also located in a low incidence area. A list of specific critical facilities and their associated risk can be found in **Table C.49** at the end of this section.

In conclusion, a landslide has low potential to impact the existing and future buildings, facilities, and populations in Johnston County, though some areas may be at a higher risk than others due to a variety of factors. For example, steep slopes and modified slopes bear a greater risk than flat areas. Specific vulnerabilities for county assets will be greatly dependent on their individual design and the mitigation measures in place, where appropriate. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates if data becomes available.

Flood

Historical evidence indicates that Johnston County is susceptible to flood events. A total of 34 flood events have been reported by the National Climatic Data Center resulting in nearly $46,000 in damages. Therefore, it is difficult to calculate a reliable annualized loss figure. On an annualized level, these damages amount to $2,293.

In order to assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using Digital Flood Insurance Rate Map (DFIRM) data in combination with local tax assessor records for the county. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total assessed building values for only those improved properties that were confirmed to be located within an identified floodplain. **Table C.42** presents the potential at-risk property. Both the number of parcels and the approximate value are presented.

TABLE C.42: ESTIMATED EXPOSURE OF PARCELS TO THE FLOOD HAZARD

Location	1.0-percent ACF			0.2-percent ACF		
	Approx. Number of Parcels	Approx. Number Improved Buildings	Approx. Improved Value of Buildings	Approx. Number of Parcels	Approx. Number Improved Buildings	Approx. Improved Value of Buildings
Archer Lodge	42	2	$3,039,260	0	0	$0
Benson	4	1	$51,270	0	0	$0
Clayton	213	20	$58,841,010	68	34	$10,496,010
Four Oaks	29	3	$1,501,390	23	4	$2,645,850
Kenly	0	0	$0	0	0	$0

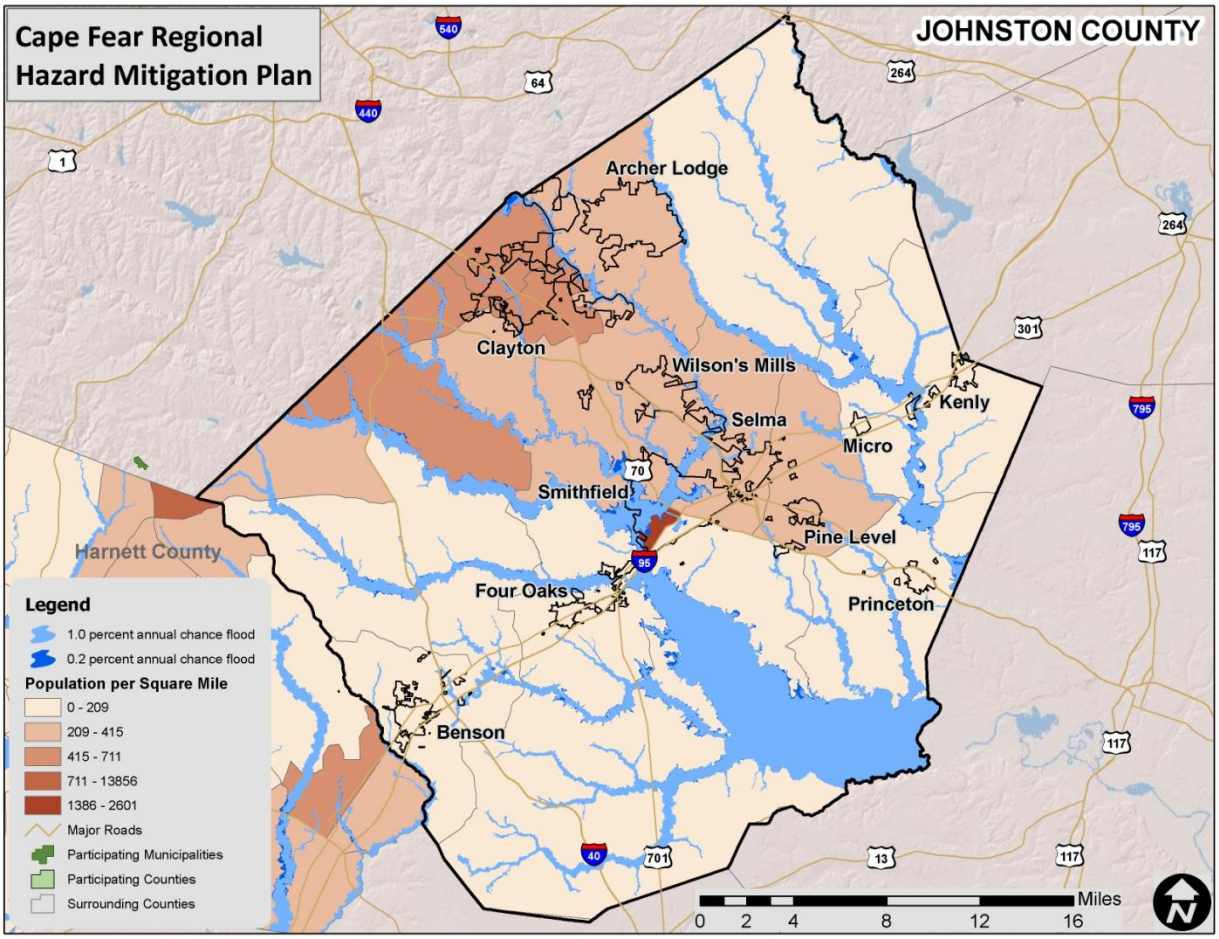
Location	1.0-percent ACF			0.2-percent ACF		
	Approx. Number of Parcels	Approx. Number Improved Buildings	Approx. Improved Value of Buildings	Approx. Number of Parcels	Approx. Number Improved Buildings	Approx. Improved Value of Buildings
Micro	1	0	$0	0	0	$0
Pine Level	1	0	$31,870	0	0	$0
Princeton	1	0	$120,110	0	0	$0
Selma	23	2	$1,070,130	0	0	$0
Smithfield	609	287	$105,484,330	272	178	$34,648,500
Wilson's Mills	14	1	$536,410	0	0	$0
Unincorporated Area	6,449	604	$450,308,610	422	237	$40,634,180
JOHNSTON COUNTY TOTAL	**7,386**	**920**	**$620,984,390**	**785**	**453**	**$88,424,540**

Source: Federal Emergency Management Agency DFIRM

Social Vulnerability

Since 2010 tract level population data and flood zones do not overlay precisely, at-risk population figures are difficult to determine. **Figure C.26** is presented to gain a better understanding of at risk population.

FIGURE C.26 : POPULATION DENSITY NEAR FLOODPLAINS IN JOHNSTON COUNTY



Source: Federal Emergency Management Agency DFIRM; United States Census 2010

Critical Facilities

In Johnston County there are five facilities located in the 1.0 percent annual chance floodplain including two adult care facilities, two town-owned buildings, and a school. There are also two facilities located in the 0.2 percent annual chance floodplain: Smithfield Operation Center and Meadowview Assisted Living Center. A list of specific critical facilities and their associated risk can be found in **Table C.49** at the end of this section.

In conclusion, a flood has the potential to impact many existing and future buildings and populations in Johnston County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. As noted, the floodplains used in this analysis include the 100-year and 500-year FEMA regulated floodplain boundaries. It is certainly possible that more severe events could occur beyond these boundaries or urban (flash) flooding could impact additional structures. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

Hazardous Materials Incident

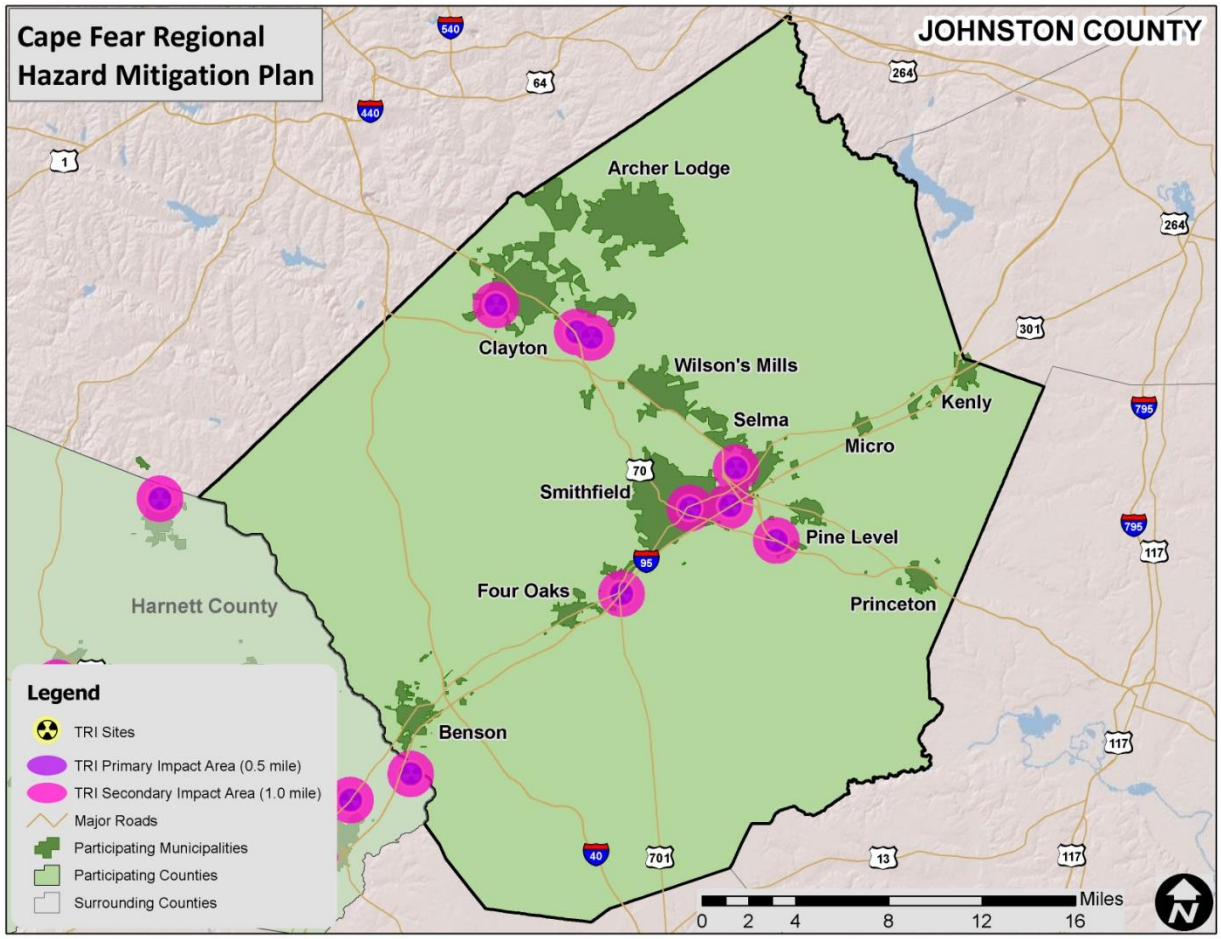
Historical evidence indicates that Johnston County is susceptible to hazardous materials events. A total of 76 HAZMAT incidents have been reported by the Pipeline and Hazardous Materials Safety Administration resulting in approximately $23,000 in property damages, 2 fatalities, and 2 injuries. On an annualized level, these damages amount to $858 for Johnston County.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas and parcels.[22] In both scenarios, two sizes of buffers—0.5-mile and 1.0-mile—were used. These areas are assumed to respect the different levels of effect: immediate (primary) and secondary. Primary and secondary impact sites were selected based on guidance from FEMA 426, Reference Manual to Mitigate Potential Terrorist Attacks against Buildings and engineering judgment. For the fixed site analysis, geo-referenced TRI listed toxic sites in Johnston County, along with buffers, were used for analysis as shown in **Figure C.27.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure C.28** shows the areas used for mobile toxic release buffer analysis. The results indicate the approximate number of parcels, improved value, as shown in **Table C.43** (fixed sites), **Table C.44** (mobile road sites) and **Table C.45** (mobile railroad sites).[23]

[22] This type of analysis will likely yield inflated results (generally higher than what is actually reported after an event).
[23] Note that parcels included in the 1.0-mile analysis are also included in the 0.5-mile analysis.

FIGURE C.27 : TRI SITES WITH BUFFERS IN JOHNSTON COUNTY



Source: Environmental Protection Agency

TABLE C.43: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS MATERIALS (FIXED SITES)

Location	0.5-mile buffer			1.0-mile buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value
Archer Lodge	0	0	$0	0	0	$0
Benson	0	0	$0	0	0	$0
Clayton	676	455	$89,812,190	2165	1492	$252,085,700
Four Oaks	47	47	$6,134,280	107	89	$13,623,180
Kenly	0	0	$0	0	0	$0
Micro	0	0	$0	0	0	$0
Pine Level	1	0	$0	33	82	$2,901,220
Princeton	0	0	$0	0	0	$0
Selma	223	205	$23,799,580	1,476	1,361	$138,515,920
Smithfield	738	642	$155,396,310	2,284	1,881	$471,013,961
Wilson's Mills	0	0	$0	0	0	$0
Unincorporated Area	494	474	$191,325,140	1,856	1,648	$361,551,130
JOHNSTON COUNTY TOTAL	**2,179**	**1,823**	**$466,467,500**	**7,921**	**6,553**	**$1,239,691,111**

FIGURE C.28 : MOBILE HAZMAT BUFFERS IN JOHNSTON COUNTY

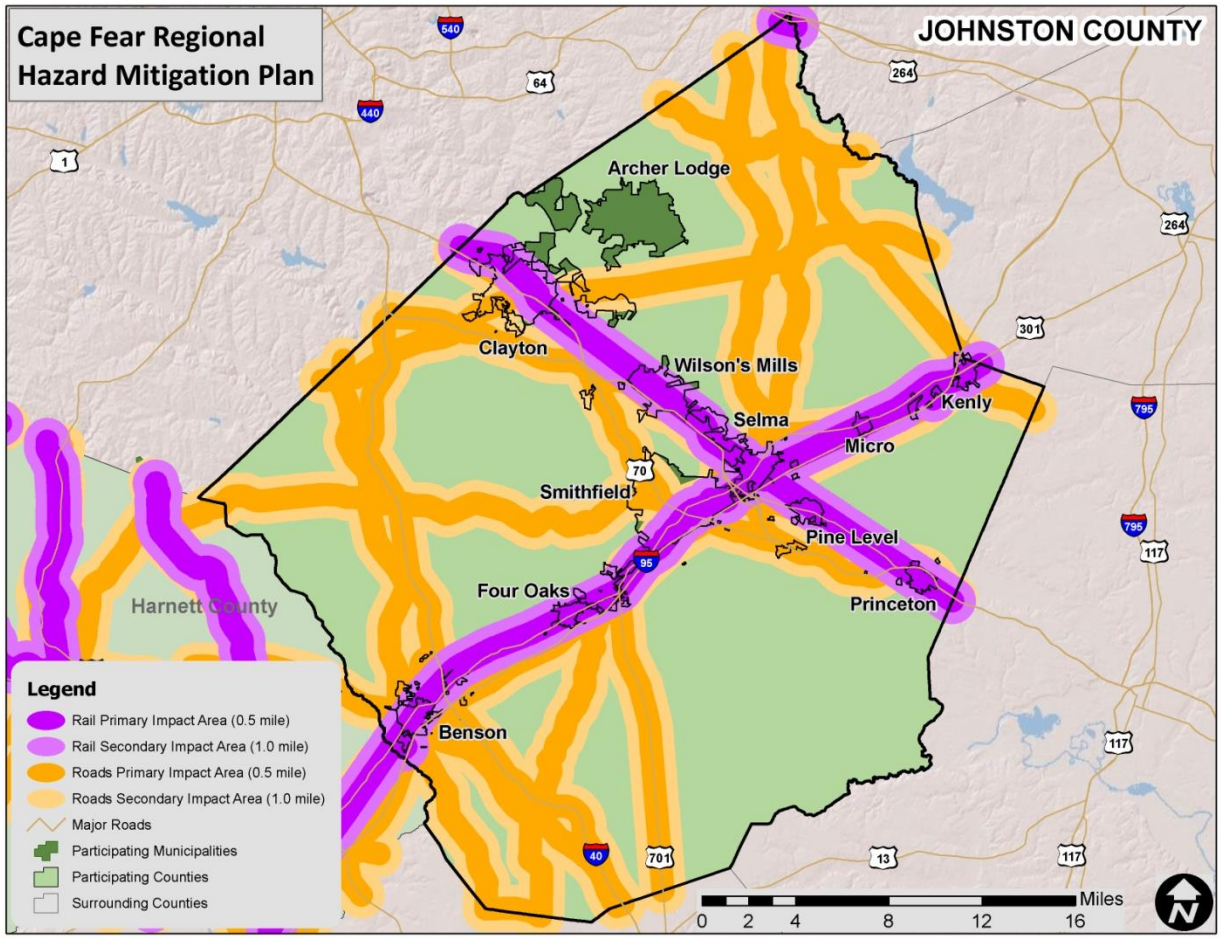


TABLE C.44: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS MATERIALS SPILL (MOBILE ANALYSIS - ROAD)

Location	0.5-mile buffer			1.0-mile buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value
Archer Lodge	0	0	$0	20	13	$1,164,490
Benson	1,712	1458	$178,956,673	1,712	1,458	$178,956,673
Clayton	3,534	2,712	$505,484,383	6,044	4,213	$817,554,253
Four Oaks	977	832	$85,536,644	1,131	915	$92,646,954
Kenly	741	742	$48,529,791	741	750	$48,529,791
Micro	244	254	$11,897,567	244	256	$11,897,567
Pine Level	754	808	$68,553,540	795	820	$70,814,330
Princeton	436	394	$67,521,100	707	628	$83,358,730
Selma	2,006	2,099	$186,057,540	2,311	2,506	$205,382,510
Smithfield	4,568	4,125	$704,429,091	5,208	4,763	$814,517,971
Wilson's Mills	434	377	$44,864,030	890	792	$70,463,670

Location	0.5-mile buffer			1.0-mile buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value
Unincorporated Area	26,954	23,640	$2,487,194,673	41,398	37,307	$3,609,118,983
JOHNSTON COUNTY TOTAL	**42,360**	**37,441**	**$4,389,025,032**	**61,201**	**54,421**	**$6,004,405,922**

TABLE C.45: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS MATERIALS SPILL (MOBILE ANALYSIS - RAILROAD)

Location	0.5-mile buffer			1.0-mile buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value
Archer Lodge	0	0	$0	0	0	$0
Benson	1,223	1,117	$123,465,933	1,628	1,382	$169,048,163
Clayton	2,353	1,840	$289,210,633	3,851	2,462	$492,544,973
Four Oaks	1,014	854	$88,689,664	1,131	915	$92,646,954
Kenly	711	692	$46,486,171	741	750	$48,529,791
Micro	239	242	$11,694,027	244	256	$11,897,567
Pine Level	618	644	$56,764,240	756	737	$67,194,450
Princeton	696	618	$80,436,730	707	626	$83,358,730
Selma	2,087	2,163	$178,150,020	2,311	2,506	$205,382,510
Smithfield	3,092	2,734	$528,934,641	4,055	3,631	$683,811,301
Wilson's Mills	792	689	$58,194,890	997	836	$73,824,230
Unincorporated Area	3,808	3,305	$488,341,260	7,616	6,940	$776,212,680
JOHNSTON COUNTY TOTAL	**16,633**	**14,898**	**$1,950,368,209**	**24,037**	**21,041**	**$2,704,451,349**

Social Vulnerability

Given high susceptibility across the entire county, it is assumed that the total population is at risk to a hazardous materials incident. It should be noted that areas of population concentration may be at an elevated risk due to a greater burden to evacuate population quickly.

Critical Facilities

Fixed Site Analysis:

The critical facility analysis for fixed TRI sites revealed that there are 44 Johnston County facilities located in a HAZMAT risk zone. The primary impact zone includes 11 facilities, 1 medical care facility, 1 school, and 9 others. The remaining 33 at-risk critical facilities are in the secondary, 1.0-mile, zone. A list of specific critical facilities and their associated risk can be found in **Table C.49** at the end of this section.

Mobile Analysis:

The critical facility analysis for road and railroad transportation corridors in Johnston County revealed that there are 158 critical facilities located in the primary and secondary mobile HAZMAT buffer areas for roads and 119 critical facilities located in the railroad HAZMAT buffer areas. It should be noted that many of the facilities located in the buffer areas for railroad are also located in the buffer areas for road. The primary road buffer area includes 134 critical facilities. The remaining at-risk critical facilities are located in the secondary road buffer area. The primary railroad buffer area includes 97 critical facilities. The remaining at-risk critical facilities are located in the secondary railroad buffer. Although this is a

worst case scenario model, it indicates that many of the critical facilities in Johnston County are vulnerable to a potential mobile HAZMAT incident. A list of specific critical facilities and their associated risk can be found in **Table C.49** at the end of this section.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in Johnston County. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area such direction and speed of wind, volume of release, etc. Further, incidents from neighboring counties could also impact the county and participating jurisdictions.

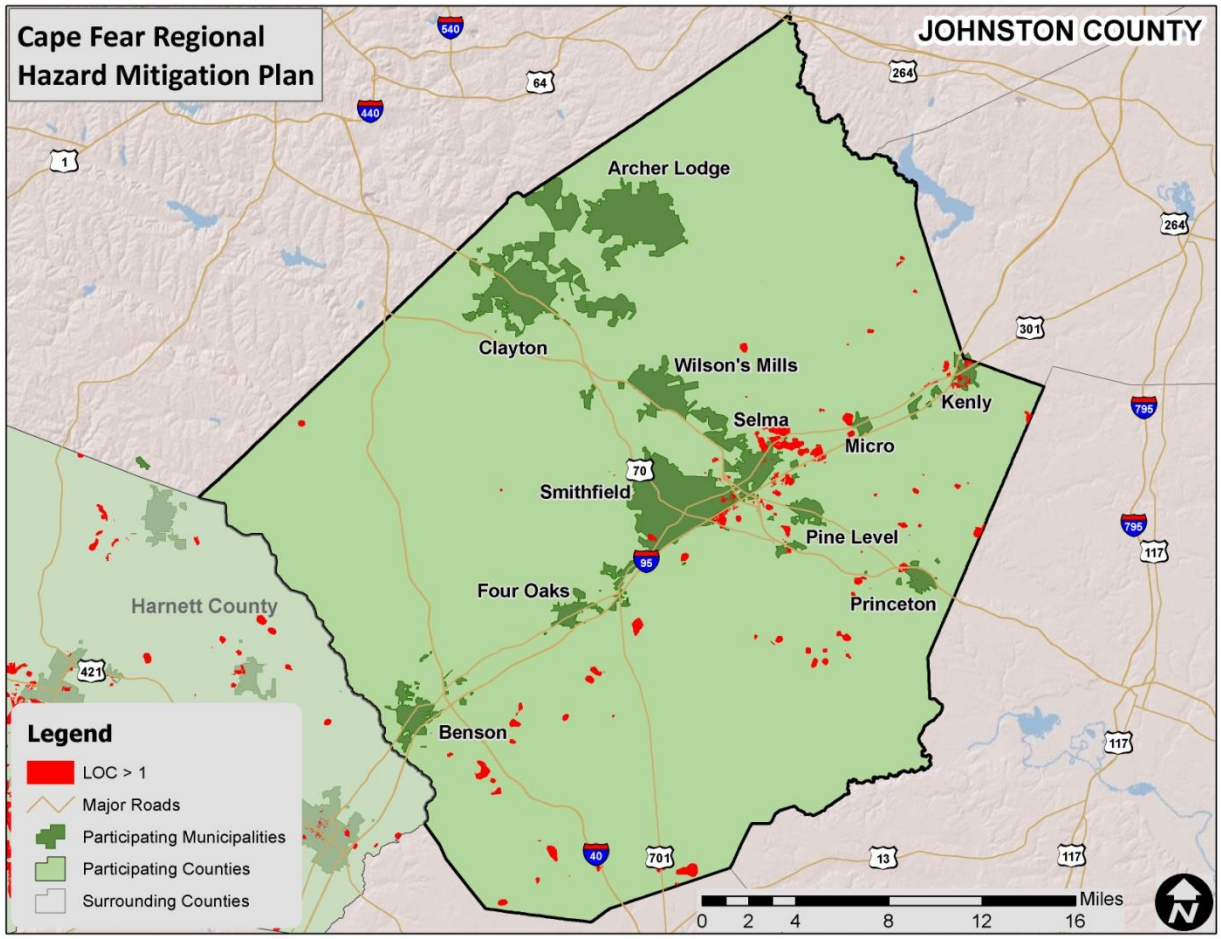
Wildfire

Although historical evidence indicates that Johnston County is susceptible to wildfire events, there are few reports which include dollar damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, the approximate number of parcels and their associated improved value was determined using GIS analysis. For the critical facility analysis, areas of concern were intersected with critical facility locations. **Figure C.29**, **Figure C.30**, **Figure C.31**, **Figure C.32**, **Figure C.33**, **Figure C.34**, **Figure C.35**, **Figure C.36**, **Figure C.37**, **Figure C.38**, **Figure C.39**, and **Figure C.40** show the Level of Concern data. Initially provided as raster data, it was converted to a polygon to allow for analysis. The LOC data ranges from 1 – 100 with higher values being most severe (as noted previously, this is only a measure of relative risk). Sixteen was the highest level recorded in the Cape Fear planning area. Therefore, areas with a value above 1 were chosen to be displayed as areas of risk. The county contains some lands where the value falls into the at-risk category, and though it has somewhat less land labeled as at-risk compared to other regions of North Carolina, the level of concern in those areas that are considered at-risk is somewhat higher than other areas of the state. Since all of this land area is on the lower fifth of the overall LOC scale, there is likely considerably less risk in the county than in other areas of the country.

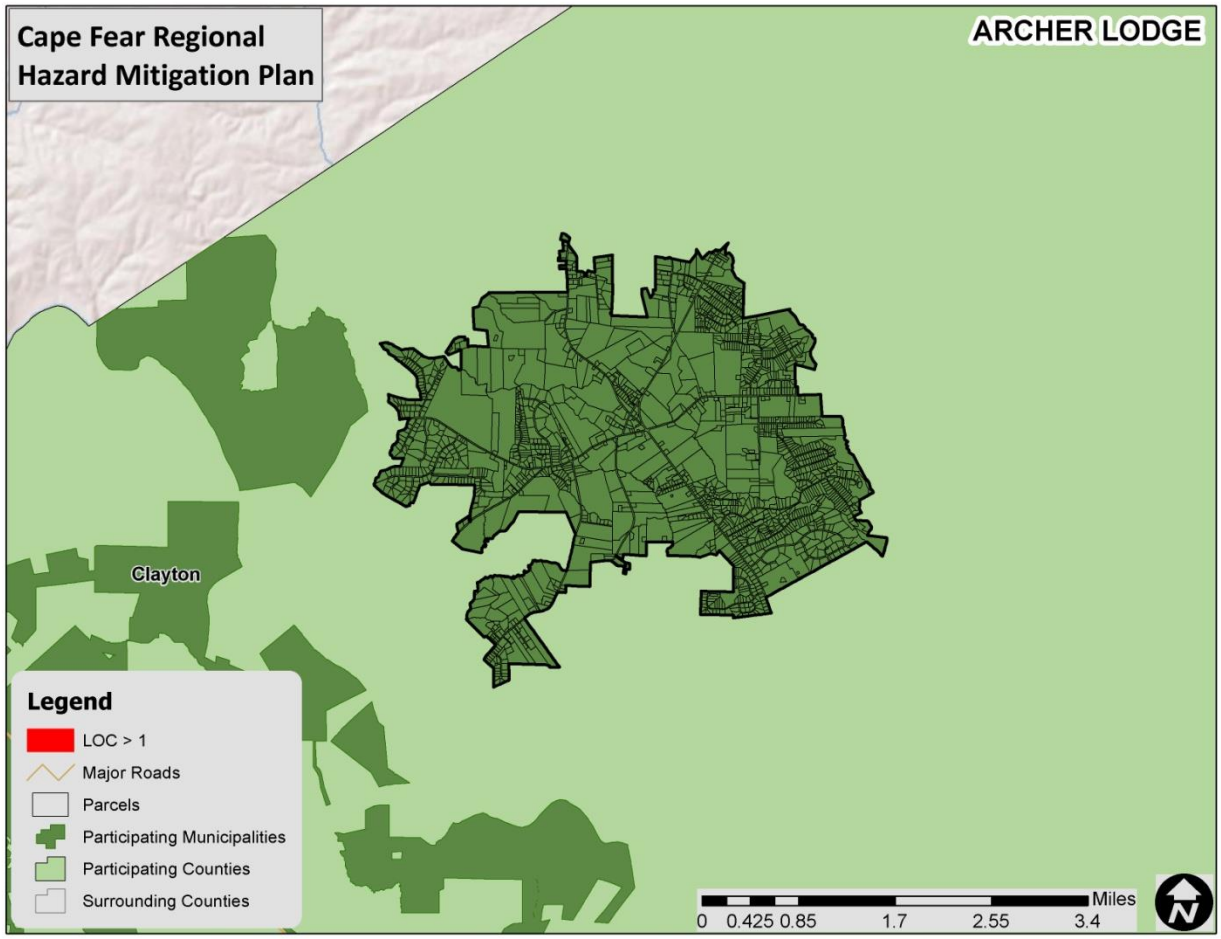
Table C.46 shows the results of the analysis.

FIGURE C.29: WILDFIRE RISK AREAS IN JOHNSTON COUNTY



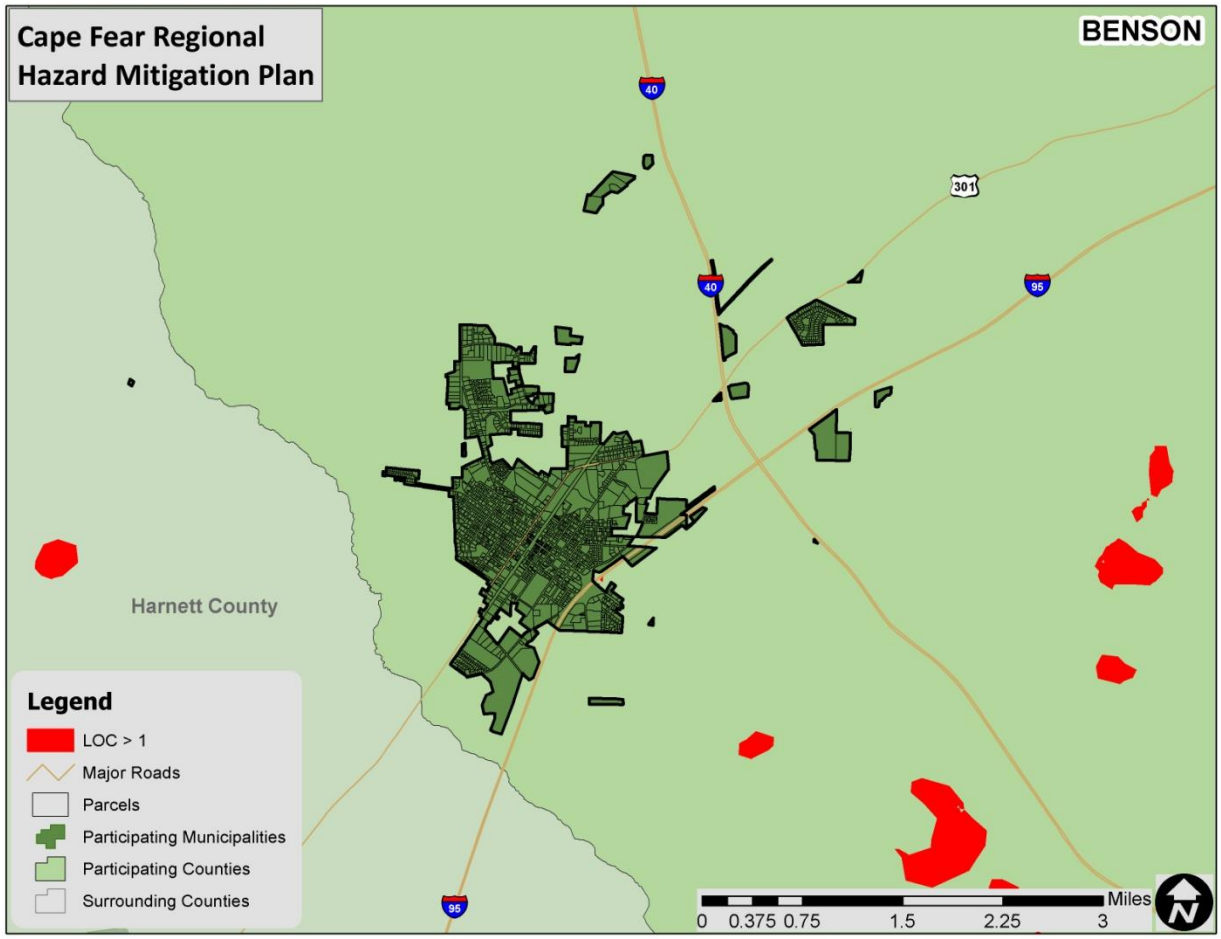
Source: Southern Wildfire Risk Assessment Data

FIGURE C.30: WILDFIRE RISK AREAS IN ARCHER LODGE



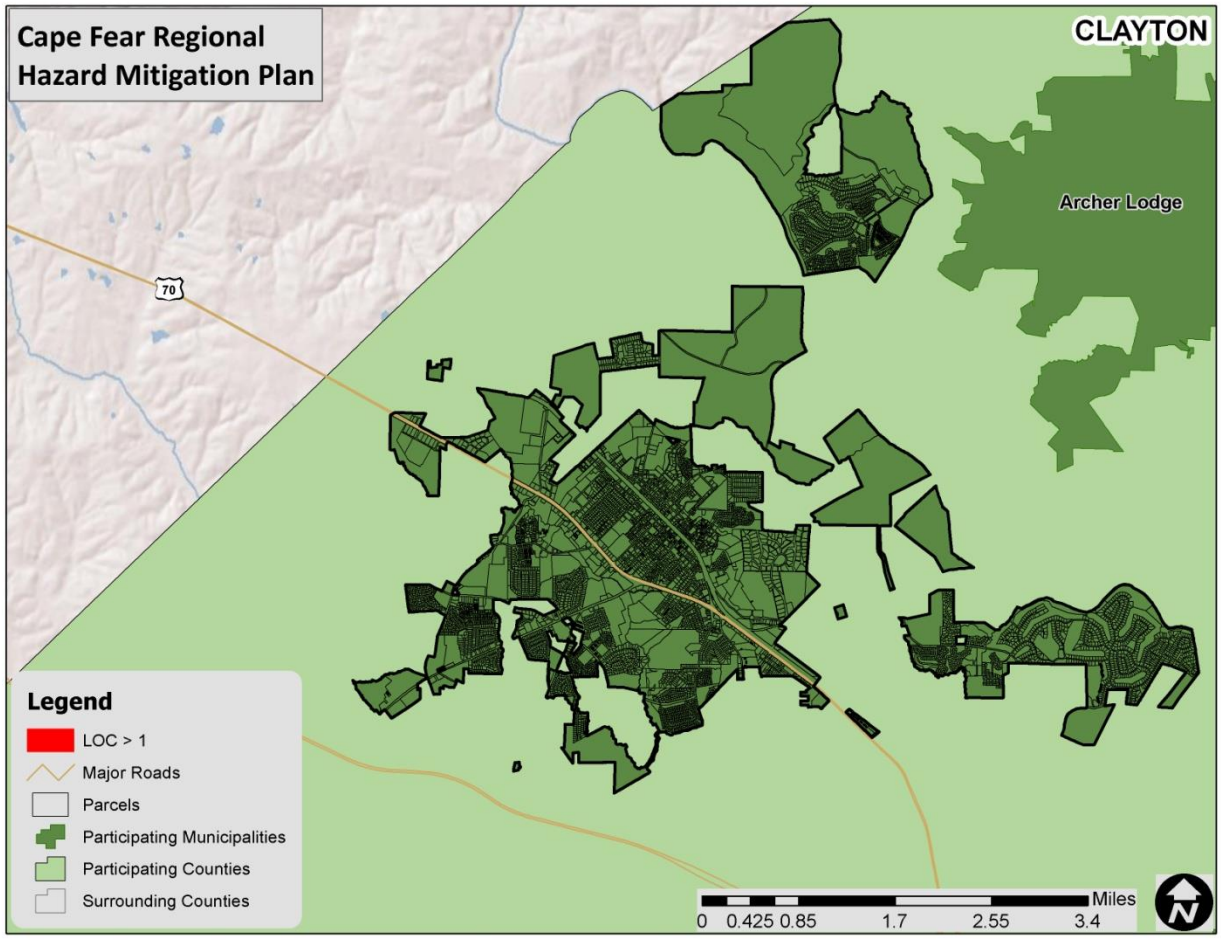
Source: Southern Wildfire Risk Assessment Data

FIGURE C.31: WILDFIRE RISK AREAS IN BENSON



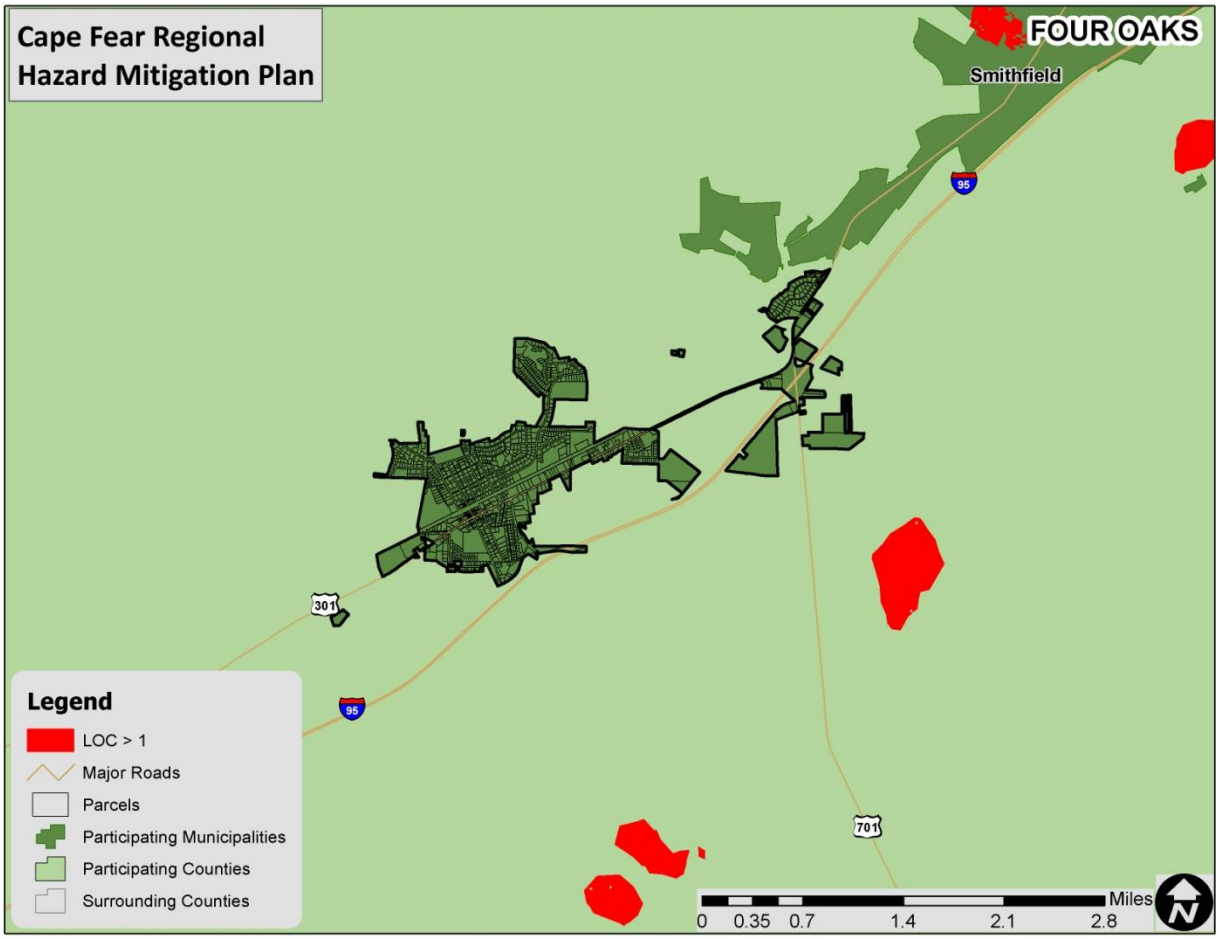
Source: Southern Wildfire Risk Assessment Data

FIGURE C.32: WILDFIRE RISK AREAS IN CLAYTON



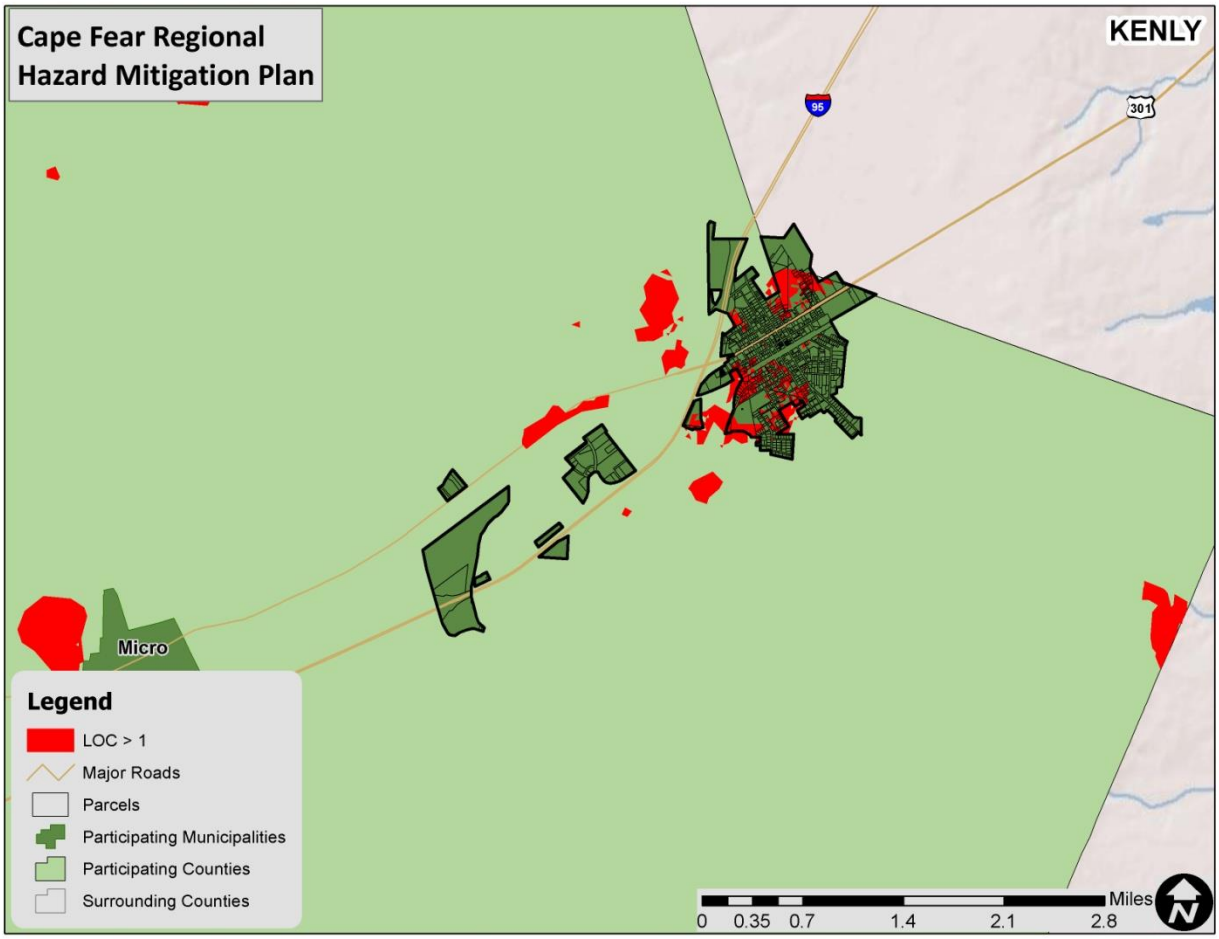
Source: Southern Wildfire Risk Assessment Data

FIGURE C.33: WILDFIRE RISK AREAS IN FOUR OAKS



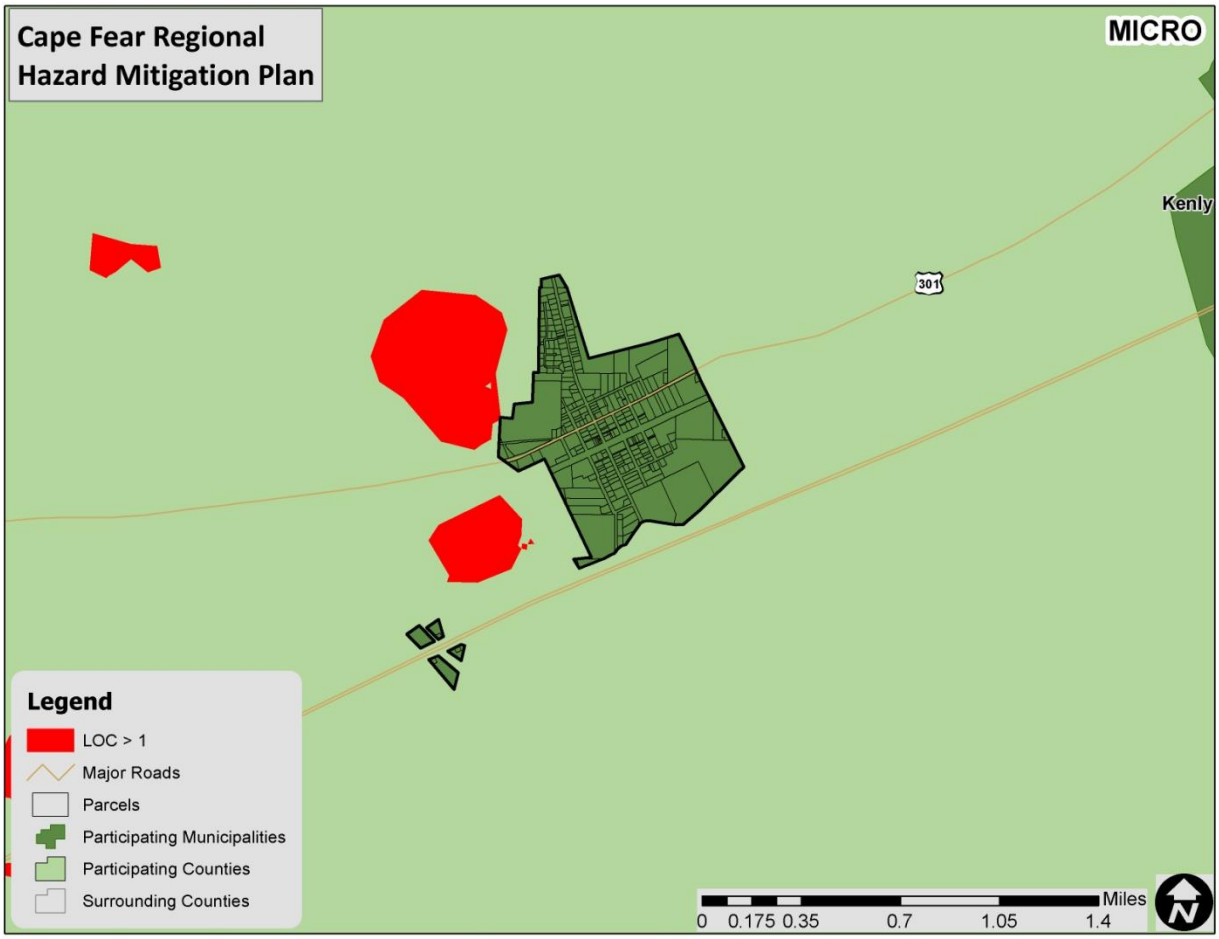
Source: Southern Wildfire Risk Assessment Data

FIGURE C.34: WILDFIRE RISK AREAS IN KENLY



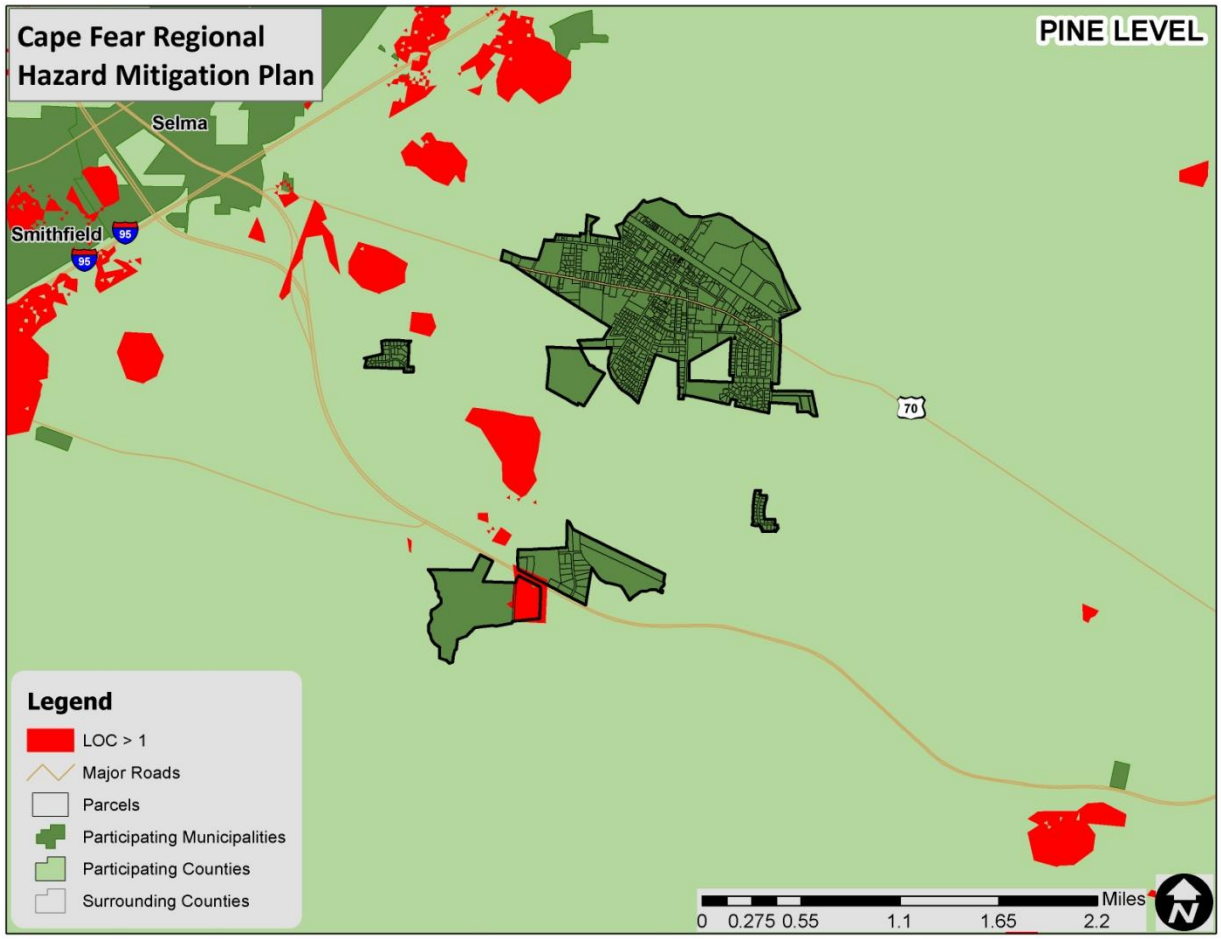
Source: Southern Wildfire Risk Assessment Data

FIGURE C.35: WILDFIRE RISK AREAS IN MICRO



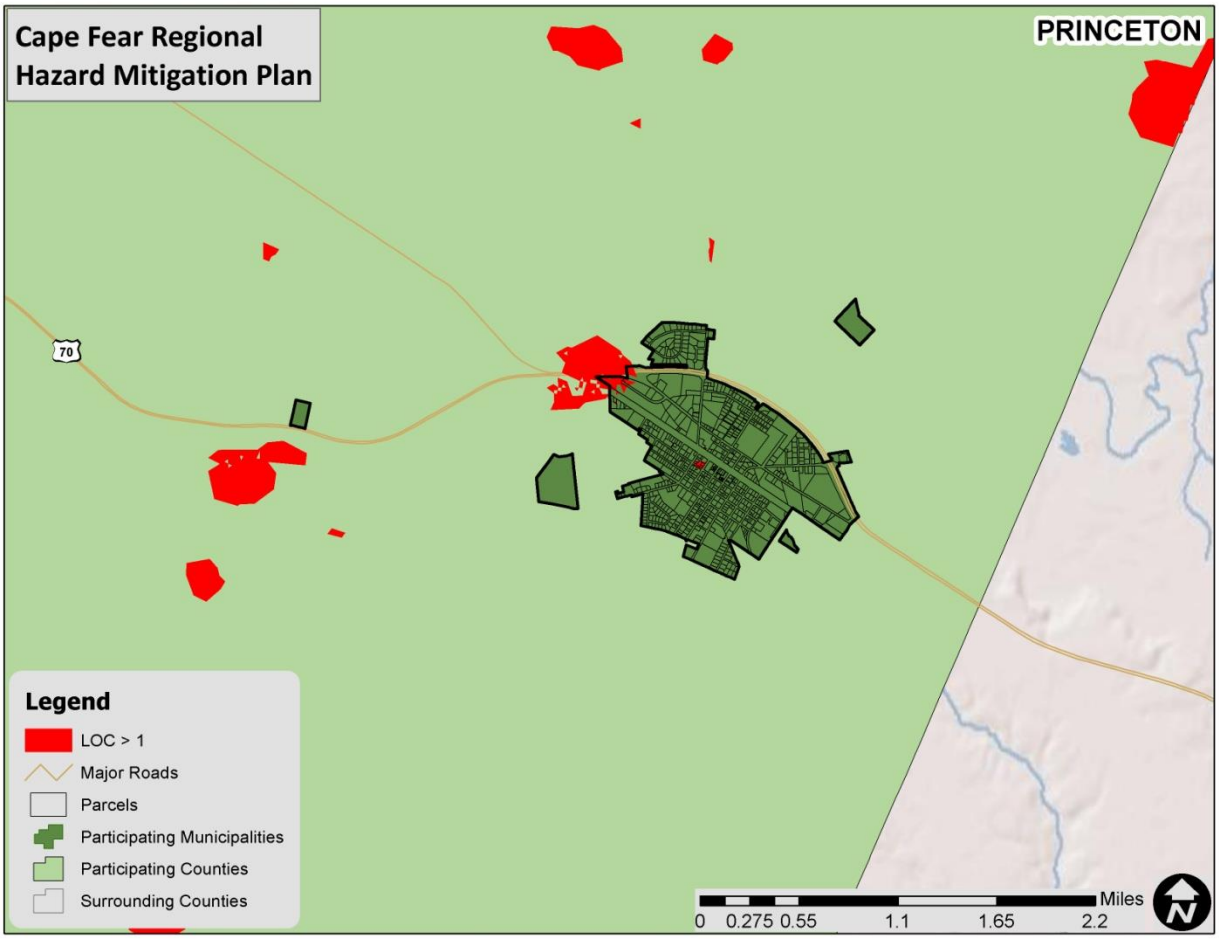
Source: Southern Wildfire Risk Assessment Data

FIGURE C.36: WILDFIRE RISK AREAS IN PINE LEVEL



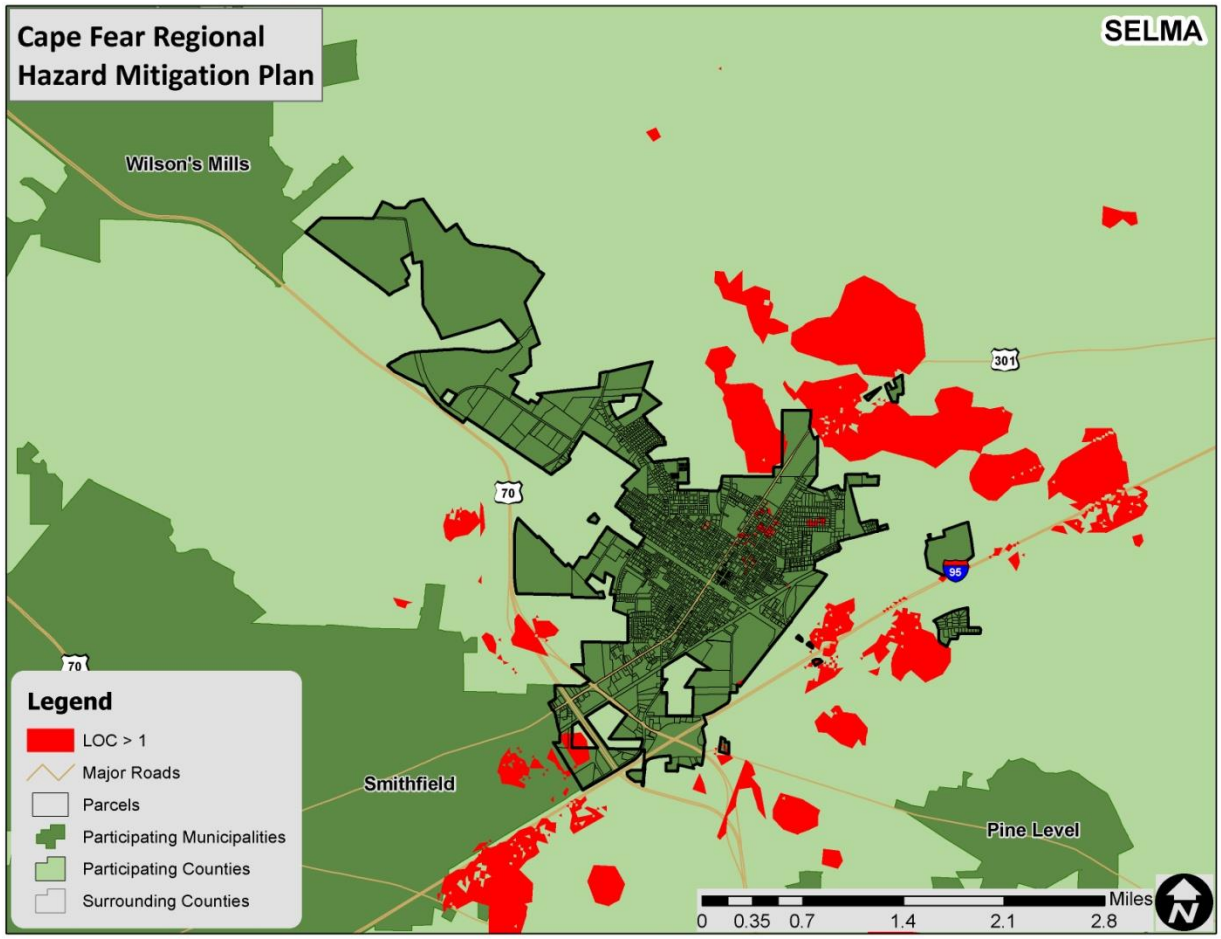
Source: Southern Wildfire Risk Assessment Data

FIGURE C.37: WILDFIRE RISK AREAS IN PRINCETON



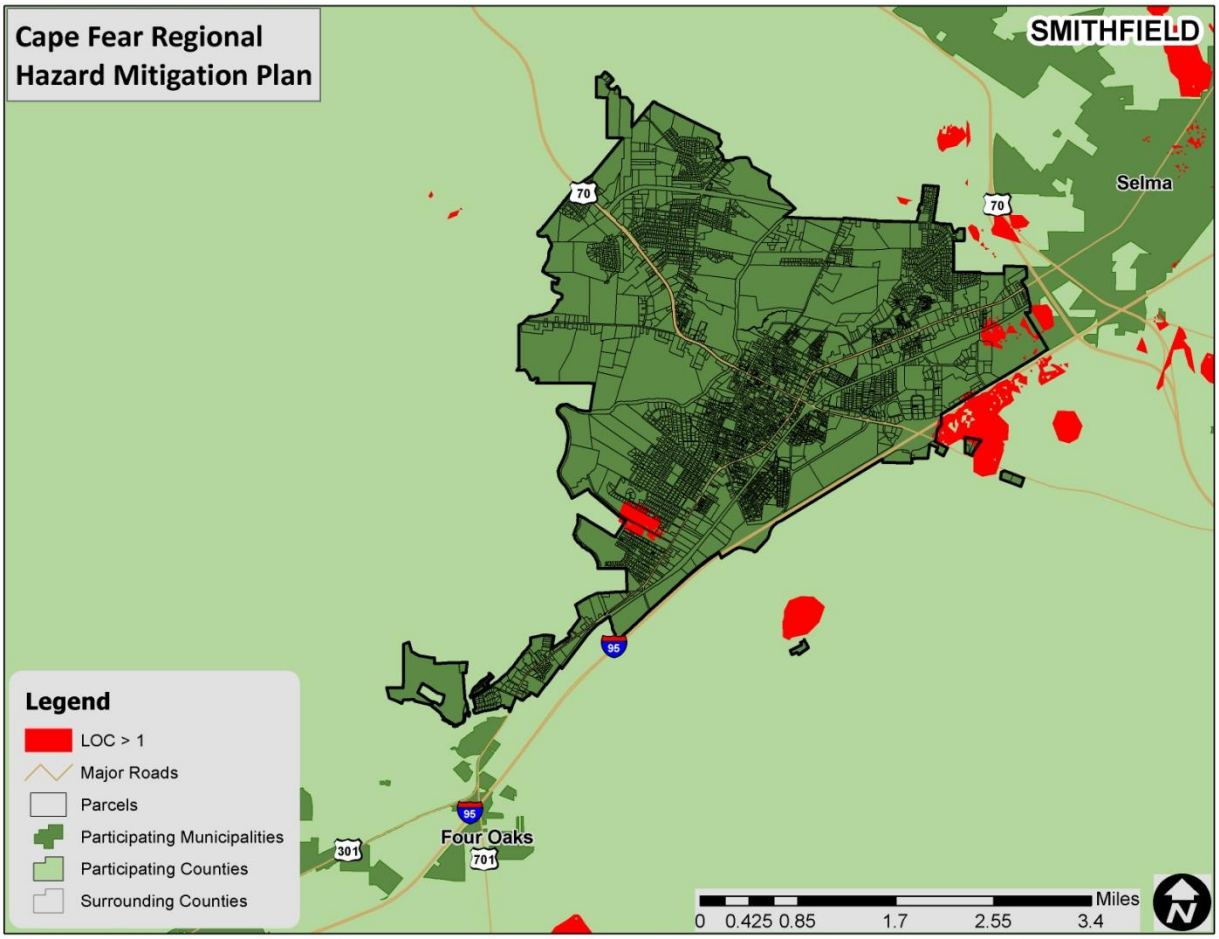
Source: Southern Wildfire Risk Assessment Data

FIGURE C.38: WILDFIRE RISK AREAS IN SELMA



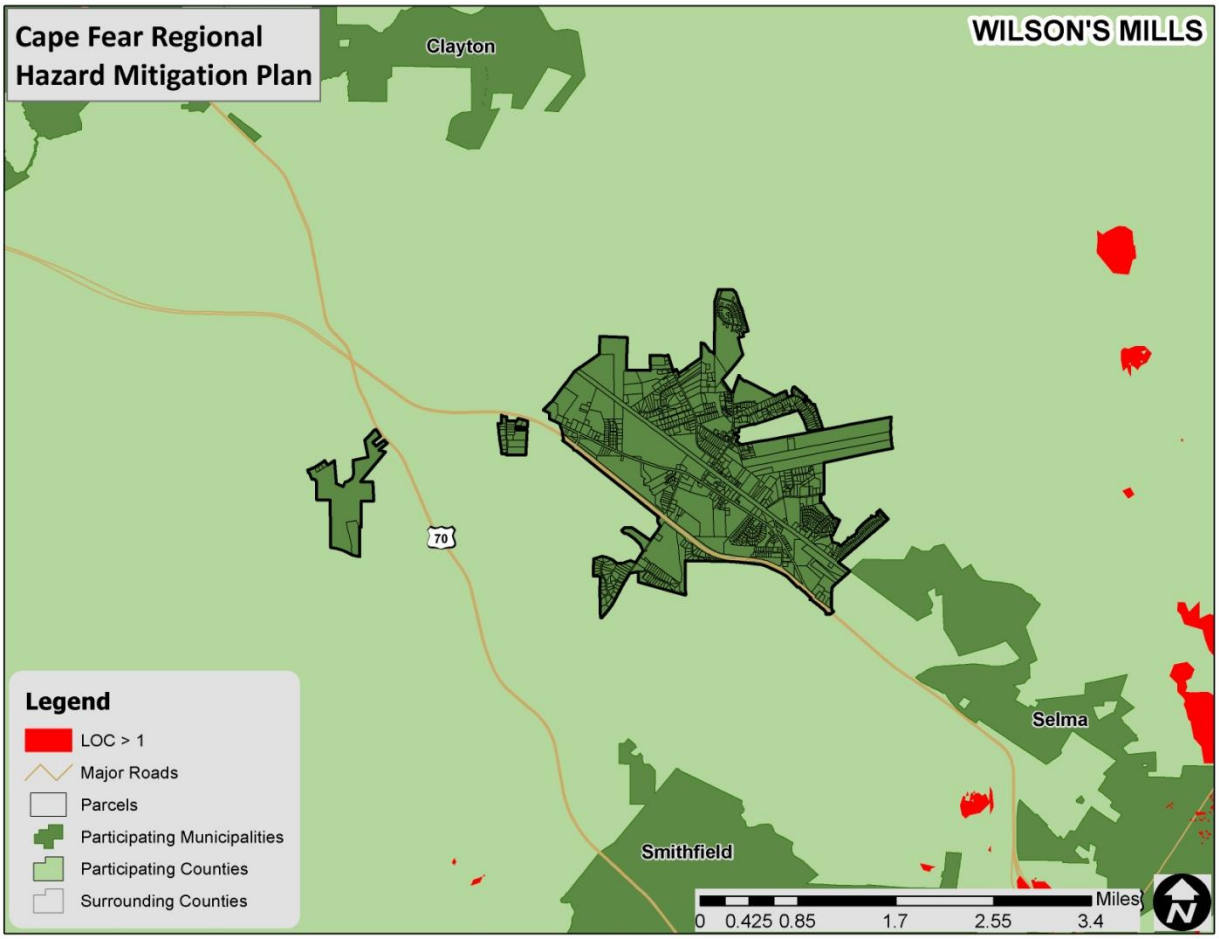
Source: Southern Wildfire Risk Assessment Data

FIGURE C.39: WILDFIRE RISK AREAS IN SMITHFIELD



Source: Southern Wildfire Risk Assessment Data

FIGURE C.40: WILDFIRE RISK AREAS IN WILSON'S MILLS



Source: Southern Wildfire Risk Assessment Data

TABLE C.46: EXPOSURE OF IMPROVED PROPERTY TO WILDFIRE AREAS OF CONCERN

Location	HIGH WILDFIRE RISK AREA		
	Approx. Number of Parcels	Approx. Number of Buildings	Approx. Improved Value
Archer Lodge	0	0	$0
Benson	0	0	$0
Clayton	0	0	$0
Four Oaks	1	0	$0
Kenly	264	142	$14,562,830
Micro	6	0	$7,600
Pine Level	13	13	$1,340,190
Princeton	15	5	$471,680
Selma	146	73	$48,572,760
Smithfield	70	36	$42,369,820
Wilson's Mills	0	0	$0

Location	HIGH WILDFIRE RISK AREA		
	Approx. Number of Parcels	Approx. Number of Buildings	Approx. Improved Value
Unincorporated Area	762	301	$31,356,370
JOHNSTON COUNTY TOTAL	**1,277**	**570**	**$138,681,250**

Looking at jurisdictional level, a few areas scattered across the unincorporated portion of the county face the highest level of concern areas. However, several municipalities also have some areas where the level of concern is above 1.

Social Vulnerability

Although not all areas have equal vulnerability, there is some susceptibility across the county. It is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading.

Critical Facilities

The critical facility analysis revealed that there are no critical facilities located in wildfire areas of concern. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found in **Table C.49** at the end of this section.

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Johnston County.

Nuclear Accident

The location of Shearon Harris Nuclear Station west of Johnston County demonstrates that the county is at risk to the effects of a nuclear accident. Although there have not been any major events at this plant in the past, there have been major events at other nuclear stations around the country. Additionally, smaller scale incidents at Shearon-Harris Nuclear Station have occurred.

In order to assess nuclear risk, a GIS-based analysis was used to estimate exposure during a nuclear event within each of the risk zones described in Section 5: *Hazard Profiles*. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total assessed building values for only those improved properties that were confirmed to be located within one of the risk zones. All of Johnston County is located within one of the risk zones. **Table C.47** presents the potential at-risk property. Both the number of parcels/buildings and the approximate value are presented.

TABLE C.47: ESTIMATED EXPOSURE OF PARCELS/BUILDINGS TO A NUCLEAR ACCIDENT

Location	10-mile buffer			50-mile buffer		
	Approx. Number of Parcels	Approx. Number Improved Buildings	Approx. Improved Value of Buildings[24]	Approx. Number of Parcels	Approx. Number Improved Buildings	Approx. Improved Value of Buildings[25]
Archer Lodge	0	0	$0	1,750	1,595	$170,585,060
Benson	0	0	$0	1,712	1,458	$178,956,673
Clayton	0	0	$0	7,504	4,762	$1,031,714,203
Four Oaks	0	0	$0	1,131	915	$92,646,954
Kenly	0	0	$0	741	750	$48,529,791
Micro	0	0	$0	244	256	$11,897,567
Pine Level	0	0	$0	795	820	$70,814,330
Princeton	0	0	$0	707	628	$83,358,730
Selma	0	0	$0	2,311	2,506	$205,382,510
Smithfield	0	0	$0	5,236	4,798	$815,559,431
Wilson's Mills	0	0	$0	1,093	895	$82,053,740
Unincorporated Area	0	0	$0	68,495	61,125	$5,816,517,259
JOHNSTON COUNTY TOTAL	**0**	**0**	**$0**	**91,719**	**80,508**	**$8,608,016,248**

Source: International Atomic Energy Agency

Social Vulnerability

Since all areas of the county are within the 50-mile buffer area, the total population is considered to be at risk to a nuclear accident.

Critical Facilities

The critical facility analysis revealed that there are no critical facilities located in the 10-mile nuclear buffer area in Johnston County. However, all critical facilities in the county are located within the 50-mile nuclear buffer. A list of specific critical facilities and their associated risk can be found in **Table C.49** at the end of this section.

In conclusion, a nuclear accident has the potential to impact many existing and future buildings, facilities, and populations in Johnston County. All structures in the county are at some risk given that they are all located within the 50-mile buffer area.

Conclusions on Hazard Vulnerability

Table C.48 presents a summary of annualized loss for each hazard in Johnston County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

[24] Improved value of buildings is estimated based on the building value associated with parcels that have been identified as being located in the 10-mile buffer, since building footprints were not associated with dollar value data.
[25] Improved value of buildings is estimated based on the building value associated with parcels that have been identified as being located in the 50-mile buffer, since building footprints were not associated with dollar value data.

TABLE C.48: ANNUALIZED LOSS FOR JOHNSTON COUNTY

Event	Johnston County
Atmospheric Hazards	
Drought	Negligible
Extreme Heat	Negligible
Hailstorm	$70,609
Hurricane & Tropical Storm	$2,339,000
Lightning	$40,508
Severe Thunderstorm / High Wind	$26,524
Tornado	$4,492,630
Winter Storm & Freeze	$40,624
Geologic Hazards	
Earthquake	$20,000
Landslide	Negligible
Hydrologic Hazards	
Dam Failure	Negligible
Erosion	Negligible
Flood	$2,293
Other Hazards	
HAZMAT Incident	$858
Wildfire	Negligible
Nuclear Accident	Negligible
Terror Threat	Negligible

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought, extreme temperature, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind, tornado, and winter storm and freeze. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. **Table C.49** shows the critical facilities vulnerable to additional hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**").

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TABLE C.49: AT-RISK CRITICAL FACILITIES IN JOHNSTON COUNTY

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEOLOGIC			HYDROLOGIC		OTHER								
		Drought	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Lightning	Thunderstorm	Tornado	Winter Storm and Freeze	Earthquake	Landslide – High Incidence	Landslide- Mod. Incidence	Flood – 100 yr	Flood – 500 yr	Fixed HAZMAT 0.5 mile	Fixed HAZMAT 1 mile	Mobile HZMT 0.5 Mile (road)	Mobile HZMT 1 mile (road)	Mobile HZMT 0.5 mile (rail)	Mobile HZMT 1 mile (rail)	Wildfire	Nuclear Accident	Terror Threat
JOHNSTON COUNTY																							
Bentonville Fire Department	Fire Station	X	X	X	X	X	X	X	X	X													X
Cleveland Fire Department Inc	Fire Station	X	X	X	X	X	X	X	X	X								X					X
Elevation Fire Dept Inc	Fire Station	X	X	X	X	X	X	X	X	X							X	X					X
50-210 Community Fire Dept Inc	Fire Station	X	X	X	X	X	X	X	X	X							X	X					X
50-210 Community Fire Dept Inc	Fire Station	X	X	X	X	X	X	X	X	X													X
Wilson Mills Fire Dept Inc	Fire Station	X	X	X	X	X	X	X	X	X													X
Corinth-Holder Vol Fire Dept	Fire Station	X	X	X	X	X	X	X	X	X							X	X					X
Autumn Care #1	Other	X	X	X	X	X	X	X	X	X								X					X
Autumn Wind Rest Home & Retirem	Other	X	X	X	X	X	X	X	X	X							X	X					X
Mclamb's Rest Home #1	Other	X	X	X	X	X	X	X	X	X							X	X					X
Oasis Of Four Oaks Rest Home	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Progressive Care	Other	X	X	X	X	X	X	X	X	X													X
Hester's Family Care	Other	X	X	X	X	X	X	X	X	X													X
Autumn Care #2	Other	X	X	X	X	X	X	X	X	X								X					X
Autumn Care #3	Other	X	X	X	X	X	X	X	X	X								X					X
Mclamb's Rest Home #2	Other	X	X	X	X	X	X	X	X	X							X	X					X
Landfill	Other	X	X	X	X	X	X	X	X	X							X	X					X
Johnston County Airport Authority	Other	X	X	X	X	X	X	X	X	X								X					X
Johnston County Livestock Arena	Other	X	X	X	X	X	X	X	X	X							X	X					X

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEOLOGIC			HYDROLOGIC		OTHER									
		Drought	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Lightning	Thunderstorm	Tornado	Winter Storm and Freeze	Earthquake	Landslide – High Incidence	Landslide- Mod. Incidence	Flood – 100 yr	Flood – 500 yr	Fixed HAZMAT 0.5 mile	Fixed HAZMAT 1 mile	Mobile HZMT 0.5 Mile (road)	Mobile HZMT 1 mile (road)	Mobile HZMT 0.5 mile (rail)	Mobile HZMT 1 mile (rail)	Wildfire	Nuclear Accident	Terror Threat
Johnston County Garage	Other	X	X	X	X	X	X	X	X	X								X					X
Johnston County Landfill	Other	X	X	X	X	X	X	X	X	X								X					X
North Johnston High	School	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Meadow Elementary	School	X	X	X	X	X	X	X	X	X							X	X					X
Glendale-Kenly Elem	School	X	X	X	X	X	X	X	X	X							X	X					X
South Johnston High	School	X	X	X	X	X	X	X	X	X							X	X		X			X
Mcgee's Crossroads Elem	School	X	X	X	X	X	X	X	X	X							X	X					X
East Clayton Elem	School	X	X	X	X	X	X	X	X	X							X	X					X
Cleveland Elementary	School	X	X	X	X	X	X	X	X	X													X
Cleveland Middle	School	X	X	X	X	X	X	X	X	X													X
Corinth-Holders School	School	X	X	X	X	X	X	X	X	X							X	X					X
Polenta Elementary	School	X	X	X	X	X	X	X	X	X													X
Mcgees Crossroads Middle	School	X	X	X	X	X	X	X	X	X							X	X					X
River Dell Elem	School	X	X	X	X	X	X	X	X	X								X					X
West Johnston High	School	X	X	X	X	X	X	X	X	X								X					X
West Smithfield Elem	School	X	X	X	X	X	X	X	X	X							X	X					X
Dixon Road Elem	School	X	X	X	X	X	X	X	X	X								X					X
West View Elem	School	X	X	X	X	X	X	X	X	X							X	X					X
Corinth Holders High	School	X	X	X	X	X	X	X	X	X													X
Cleveland High	School	X	X	X	X	X	X	X	X	X													X
Archer Lodge Town Hall	Other	X	X	X	X	X	X	X	X	X													X

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEOLOGIC			HYDROLOGIC		OTHER								
		Drought	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Lightning	Thunderstorm	Tornado	Winter Storm and Freeze	Earthquake	Landslide – High Incidence	Landslide- Mod. Incidence	Flood – 100 yr	Flood – 500 yr	Fixed HAZMAT 0.5 mile	Fixed HAZMAT 1 mile	Mobile HZMT 0.5 Mile (road)	Mobile HZMT 1 mile (road)	Mobile HZMT 0.5 mile (rail)	Mobile HZMT 1 mile (rail)	Wildfire	Nuclear Accident	Terror Threat
Archer Lodge Middle	School	X	X	X	X	X	X	X	X	X													X
Oasis Of Benson Rest Home(1 - 6	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Liberty Commons	Other	X	X	X	X	X	X	X	X	X							X	X		X			X
Mary Duncan Public Library	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Benson Post Office	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Benson Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X		X			X
Benson Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Benson Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Benson Town Hall	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Town Of Benson Police	Police Station	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Benson Elementary	School	X	X	X	X	X	X	X	X	X							X	X					X
Benson Middle	School	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Johnston Health Clayton	Medical Care Facility	X	X	X	X	X	X	X	X	X							X	X					X
Brian Center	Other	X	X	X	X	X	X	X	X	X						X	X	X					X
Front Street Family Care	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Diversicare AL Of Clayton	Other	X	X	X	X	X	X	X	X	X						X	X	X					X
Hocutt-Ellington Memorial Library	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Clayton Post Office	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Clayton Town Hall	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Clayton Operations Center	Other	X	X	X	X	X	X	X	X	X					X	X	X	X					X

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEOLOGIC			HYDROLOGIC		OTHER								
		Drought	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Lightning	Thunderstorm	Tornado	Winter Storm and Freeze	Earthquake	Landslide – High Incidence	Landslide- Mod. Incidence	Flood – 100 yr	Flood – 500 yr	Fixed HAZMAT 0.5 mile	Fixed HAZMAT 1 mile	Mobile HZMT 0.5 Mile (road)	Mobile HZMT 1 mile (road)	Mobile HZMT 0.5 mile (rail)	Mobile HZMT 1 mile (rail)	Wildfire	Nuclear Accident	Terror Threat
Town Of Clayton Police	Police Station	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Clayton High	School	X	X	X	X	X	X	X	X	X							X	X	X	X			X
West Clayton Elem	School	X	X	X	X	X	X	X	X	X						X	X	X		X			X
Cooper Elementary	School	X	X	X	X	X	X	X	X	X								X	X	X			X
Riverwood Elementary	School	X	X	X	X	X	X	X	X	X													X
Riverwood Middle	School	X	X	X	X	X	X	X	X	X													X
Clayton Middle	School	X	X	X	X	X	X	X	X	X					X	X	X	X					X
Powhatan Elem	School	X	X	X	X	X	X	X	X	X													X
Four Oaks Rescue Inc	Fire Station	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Johnston County Group Home	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Jame Bryan Creech Public Library	Other	X	X	X	X	X	X	X	X	X								X	X	X			X
Smithfield Post Office 2	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Four Oaks Town Hall	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Town Of Four Oaks Police	Police Station	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Four Oaks Elementary	School	X	X	X	X	X	X	X	X	X								X	X	X			X
Four Oaks Middle	School	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Kenly Volunteer Fire Depart	Fire Station	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Kenly Public Library	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Kenly Post Office	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Kenly Village Association	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEOLOGIC			HYDROLOGIC		OTHER								
		Drought	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Lightning	Thunderstorm	Tornado	Winter Storm and Freeze	Earthquake	Landslide – High Incidence	Landslide- Mod. Incidence	Flood – 100 yr	Flood – 500 yr	Fixed HAZMAT 0.5 mile	Fixed HAZMAT 1 mile	Mobile HZMT 0.5 Mile (road)	Mobile HZMT 1 mile (road)	Mobile HZMT 0.5 mile (rail)	Mobile HZMT 1 mile (rail)	Wildfire	Nuclear Accident	Terror Threat
College Court Apartments	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Kenly Town Hall	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Kenly Maintenance/Storage Facility	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Town Of Kenly Police	Police Station	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Micro Volunteer Fire Dept Inc	Fire Station	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Hilmont Village	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Micro Post Office	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Micro Town Hall	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Micro Public Works Department	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Micro Town Dump	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
North Johnston Middle	School	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Pine Level Post Office	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Pine Level Town Hall	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Pine Level Public Works	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Town Of Pine Level Police	Police Station	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Micro-Pine Level Elem	School	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Princeton Volunteer Fire	Fire Station	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Princeton Senior Center	Other	X	X	X	X	X	X	X	X	X								X	X	X			X
Princeton Public Library	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Princeton Post Office	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEOLOGIC			HYDROLOGIC		OTHER								
		Drought	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Lightning	Thunderstorm	Tornado	Winter Storm and Freeze	Earthquake	Landslide – High Incidence	Landslide- Mod. Incidence	Flood – 100 yr	Flood – 500 yr	Fixed HAZMAT 0.5 mile	Fixed HAZMAT 1 mile	Mobile HZMT 0.5 Mile (road)	Mobile HZMT 1 mile (road)	Mobile HZMT 0.5 mile (rail)	Mobile HZMT 1 mile (rail)	Wildfire	Nuclear Accident	Terror Threat
Princeton Town Hall	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Princeton Maintenance Building	Other	X	X	X	X	X	X	X	X	X								X	X	X			X
Princeton Parking Garage	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Princeton Ms_Hs	School	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Princeton Elem	School	X	X	X	X	X	X	X	X	X								X		X			X
Selma Public Library	Other	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Selma Post Office	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Selma Housing Authority	Other	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Selma Housing Authority	Other	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Selma Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Selma Housing Authority	Other	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X			X
Selma Housing Authority	Other	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Selma Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Selma Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Selma Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Selma Housing Authority	Other	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X			X
Selma Town Hall	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Selma Public Works	Other	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Town Of Selma Police	Police Station	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Selma Middle School	School	X	X	X	X	X	X	X	X	X							X	X		X			X
Selma Elementary	School	X	X	X	X	X	X	X	X	X							X	X	X	X			X
County Of Johnston Police	Eoc	X	X	X	X	X	X	X	X	X						X	X	X		X			X

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEOLOGIC			HYDROLOGIC		OTHER								
		Drought	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Lightning	Thunderstorm	Tornado	Winter Storm and Freeze	Earthquake	Landslide – High Incidence	Landslide- Mod. Incidence	Flood – 100 yr	Flood – 500 yr	Fixed HAZMAT 0.5 mile	Fixed HAZMAT 1 mile	Mobile HZMT 0.5 Mile (road)	Mobile HZMT 1 mile (road)	Mobile HZMT 0.5 mile (rail)	Mobile HZMT 1 mile (rail)	Wildfire	Nuclear Accident	Terror Threat
Johnston Medical Center	Medical Care Facility	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X			X
Diversicare AL Of Smithfield Wes	Other	X	X	X	X	X	X	X	X	X			X			X	X	X		X			X
Classic Care #101	Other	X	X	X	X	X	X	X	X	X							X	X					X
Britthaven	Other	X	X	X	X	X	X	X	X	X								X					X
Smithfield Manor Inc.	Other	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Council On Aging	Other	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X			X
Meadowview Assisted Living Cente	Other	X	X	X	X	X	X	X	X	X				X			X	X					X
Carolina House Of Smithfield	Other	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Pine Knoll Manor #2	Other	X	X	X	X	X	X	X	X	X							X	X					X
Pine Knoll Manor #1	Other	X	X	X	X	X	X	X	X	X							X	X					X
Greenwood Group Home	Other	X	X	X	X	X	X	X	X	X			X				X	X					X
Laurel Woods Group Home	Other	X	X	X	X	X	X	X	X	X								X					X
Rha Group Home	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Public Library Of Johnston County And Smithfield	Other	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
The Heritage Center	Other	X	X	X	X	X	X	X	X	X						X	X	X		X			X
Smithfield Post Office	Other	X	X	X	X	X	X	X	X	X						X	X	X		X			X
Smithfield Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Smithfield Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Smithfield Housing Authority	Other	X	X	X	X	X	X	X	X	X			X			X	X	X	X	X			X
Smithfield Housing Authority	Other	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEOLOGIC			HYDROLOGIC		OTHER								
		Drought	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Lightning	Thunderstorm	Tornado	Winter Storm and Freeze	Earthquake	Landslide – High Incidence	Landslide- Mod. Incidence	Flood – 100 yr	Flood – 500 yr	Fixed HAZMAT 0.5 mile	Fixed HAZMAT 1 mile	Mobile HZMT 0.5 Mile (road)	Mobile HZMT 1 mile (road)	Mobile HZMT 0.5 mile (rail)	Mobile HZMT 1 mile (rail)	Wildfire	Nuclear Accident	Terror Threat
Smithfield Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Smithfield Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Smithfield Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Smithfield Housing Authority	Other	X	X	X	X	X	X	X	X	X							X	X	X	X			X
Smithfield Town Hall	Other	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Johnston County Court House	Other	X	X	X	X	X	X	X	X	X						X	X	X		X			X
Johnston County Happ	Other	X	X	X	X	X	X	X	X	X						X	X	X		X			X
Johnston County Human Resources	Other	X	X	X	X	X	X	X	X	X						X	X	X		X			X
Johnston County Maintenance	Other	X	X	X	X	X	X	X	X	X						X	X	X		X			X
Johnston County Land Use Center	Other	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Johnston County Agricultural Building	Other	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X			X
Johnston County Division Of Social Services	Other	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X			X
Johnston County Health Center	Other	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X			X
Town Of Smithfield Maintenance	Other	X	X	X	X	X	X	X	X	X			X			X	X	X		X			X
Johnston County Animal Shelter	Other	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X			X
Smithfield Operation Center	Other	X	X	X	X	X	X	X	X	X				X		X	X	X		X			X
Johnston Memorial Hospital	Other	X	X	X	X	X	X	X	X	X					X	X	X	X	X	X			X
Smithfield Parks & Rec	Other	X	X	X	X	X	X	X	X	X						X	X	X		X			X
Town Of Smithfield Police	Police Station	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Smithfield-Selma High	School	X	X	X	X	X	X	X	X	X								X		X			X

FACILITY NAME	FACILITY TYPE	ATMOSPHERIC								GEOLOGIC			HYDROLOGIC		OTHER									
		Drought	Extreme Heat	Hailstorm	Hurricane and Tropical Storm	Lightning	Thunderstorm	Tornado	Winter Storm and Freeze	Earthquake	Landslide – High Incidence	Landslide- Mod. Incidence	Flood – 100 yr	Flood – 500 yr	Fixed HAZMAT 0.5 mile	Fixed HAZMAT 1 mile	Mobile HZMT 0.5 Mile (road)	Mobile HZMT 1 mile (road)	Mobile HZMT 0.5 mile (rail)	Mobile HZMT 1 mile (rail)	Wildfire	Nuclear Accident	Terror Threat
Smithfield Middle	School	X	X	X	X	X	X	X	X	X													X
South Campus Cmty	School	X	X	X	X	X	X	X	X	X			X			X	X	X		X			X
South Smithfield Elem	School	X	X	X	X	X	X	X	X	X							X	X		X			X
Neuse Charter School	School	X	X	X	X	X	X	X	X	X								X		X			X
Board Of Education	School	X	X	X	X	X	X	X	X	X							X	X		X			X
Operations	School	X	X	X	X	X	X	X	X	X						X	X	X		X			X
Jo Co Middle College High	School	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Jo Co Early Academy	School	X	X	X	X	X	X	X	X	X						X	X	X	X	X			X
Wilson Mills Fire Department	Fire Station	X	X	X	X	X	X	X	X	X								X	X	X			X
Wilsons Mill Post Office	Other	X	X	X	X	X	X	X	X	X								X	X	X			X
Wilson's Mills Town Hall	Other	X	X	X	X	X	X	X	X	X								X	X	X			X
Town Of Wilson's Mills Police	Police Station	X	X	X	X	X	X	X	X	X								X	X	X			X
Wilson's Mills Elem	School	X	X	X	X	X	X	X	X	X							X	X	X	X			X

C.4 JOHNSTON COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Johnston County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

C.4.1 Planning and Regulatory Capability

Table C.50 provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Johnston County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the Cape Fear Regional Hazard Mitigation Plan.

TABLE C.50: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System
JOHNSTON COUNTY	✓	✓		✓	✓			✓	✓			✓	*		✓	✓	✓			✓	✓	✓	
Archer Lodge		*		*				✓							✓	✓	✓			✓	✓	✓	
Benson	✓	✓		✓				✓				✓	✓		✓	✓	✓	✓		✓	✓	✓	
Clayton	✓	✓		✓	✓			✓				✓	✓		✓	✓	✓	✓		✓	✓	✓	
Four Oaks	✓			*				✓				✓			✓	✓	✓			✓	✓	✓	
Kenly	✓	✓		*				✓							✓	✓				✓	✓	✓	
Micro	✓			*	✓			✓							✓	✓	✓			✓	✓		
Pine Level	✓	✓		*				✓							✓	✓	✓			✓	✓	✓	
Princeton	✓	✓		*	*			✓							✓	✓	✓			✓	✓	✓	

Planning Tool/Regulatory Tool	Hazard Mitigation Plan	Comprehensive Land Use Plan	Floodplain Management Plan	Open Space Management Plan (Parks & Rec/Greenway Plan	Stormwater Management Plan/Ordinance	Natural Resource Protection Plan	Flood Response Plan	Emergency Operations Plan	Continuity of Operations Plan	Evacuation Plan	Disaster Recovery Plan	Capital Improvements Plan	Economic Development Plan	Historic Preservation Plan	Flood Damage Prevention Ordinance	Zoning Ordinance	Subdivision Ordinance	Unified Development Ordinance	Post-Disaster Redevelopment Ordinance	Building Code	Fire Code	National Flood Insurance Program (NFIP)	NFIP Community Rating System
Selma	✓	✓		*				✓				✓			✓	✓	✓	✓		✓	✓	✓	
Smithfield	✓	✓		*	✓			✓				✓	✓		✓	✓	✓	✓		✓	✓	✓	
Wilson's Mills	✓	✓		*	✓			✓				✓			✓	✓	✓			✓	✓		

A more detailed discussion on the county's planning and regulatory capabilities follows.

Emergency Management

Hazard Mitigation Plan
Johnston County has previously adopted a hazard mitigation plan. All of the participating municipalities were also included in this plan except the Town of Archer Lodge, which was not incorporated until November 2009.

Emergency Operations Plan
Johnston County maintains an emergency operations plan through its Emergency Management Department. This plan has been adopted by each of the municipalities within the county.

Continuity of Operations Plan
Johnston County has developed a continuity of operations plan.

General Planning

Comprehensive Land Use Plan
Johnston County has adopted a comprehensive plan. Each of the participating municipalities has also adopted a land use or comprehensive plan except the Towns of Archer Lodge, Four Oaks, and Micro, and the Town of Archer Lodge is currently in the process of developing a comprehensive land use plan.

Capital Improvements Plan
Johnston County maintains a tax-supported capital improvement plan. The Towns of Benson, Clayton, Four Oaks, Selma, Smithfield, and Wilson's Mills also have capital improvement plans in place.

Zoning Ordinance
Johnston County and all of its municipalities have adopted zoning ordinances. The Towns of Benson, Clayton, Selma, and Smithfield include zoning regulations as part of their local unified development ordinance.

Subdivision Ordinance
Johnston County and all of its municipalities except the Town of Kenly have adopted subdivision regulations. Again, the Towns of Benson, Clayton, Selma, and Smithfield include subdivision regulations as part of their local unified development ordinance.

Building Codes, Permitting, and Inspections
North Carolina has a state compulsory building code which applies throughout the state. Johnston County Building Inspections provides building code enforcement to the unincorporated county as well as the following municipalities: Archer Lodge, Kenly, Micro, Pine Level, Smithfield, and Wilson's Mills. The remaining municipalities administer their own building code enforcement.

Floodplain Management

Table C.51 provides NFIP policy and claim information for each participating jurisdiction in Johnston County.

TABLE C.51: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
JOHNSTON COUNTY†	09/30/83	07/07/14	249	$52,636,900	29	$680,206
Archer Lodge	05/06/14	12/02/05	0	$0	0	$0
Benson	09/13/00	01/05/07	5	$1,480,000	0	$0
Clayton	04/01/82	01/05/07	42	$12,495,900	2	$1,498
Four Oaks	09/24/02	01/05/07	3	$674,200	0	$0
Kenly	04/12/01	01/05/07	3	$840,000	0	$0
Micro*	--	--	--	--	--	--
Pine Level	06/22/05	01/05/07	5	$1,400,000	0	$0
Princeton	02/14/97	01/05/07	2	$252,000	0	$0
Selma	10/20/00	01/05/07	6	$1,470,000	0	$0
Smithfield	04/01/82	01/05/07	104	$19,672,500	48	$1,596,593
Wilson's Mills*	--	--	--	--	--	--

†Includes unincorporated areas of county only
*Community does not participate in the NFIP
Source: NFIP Community Status information as of 8/15/14; NFIP claims and policy information as of 6/30/14

Flood Damage Prevention Ordinance
All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Johnston County and all of its municipalities except Micro and Wilson's Mills participate in the NFIP and have adopted flood damage prevention regulations. Although Micro and Wilson's Mills do not currently participate in the NFIP, they have both adopted flood damage prevention ordinances.

Open Space Management Plan
Johnston County is currently developing a county-wide parks and recreation master plan. The Towns of Benson and Clayton already have municipal parks and recreation plans in place. Johnston County, Clayton, and Smithfield have also developed a master plan for the county's portion of the Mountains-to-Sea Trail.

Stormwater Management Plan
Although Johnston County and its municipalities do not have stormwater management plans in place, the county, Clayton, Micro, Smithfield, and Wilson's Mills have adopted stormwater management regulations through various local ordinances. Additionally, the Town of Princeton has a study in progress that will lead to the development of a stormwater management plan.

C.4.2 Administrative and Technical Capability

Table C.52 provides a summary of the capability assessment results for Johnston County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

TABLE C.52: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
JOHNSTON COUNTY	✓	✓	✓	✓	✓		✓	✓	✓	
Archer Lodge	✓	✓		✓	✓		✓			
Benson	✓	✓		✓	✓		✓	✓		
Clayton	✓	✓		✓	✓		✓	✓	✓	

Staff / Personnel Resource	Planners with knowledge of land development/land management practices	Engineers or professionals trained in construction practices related to buildings and/or infrastructure	Planners or engineers with an understanding of natural and/or human-caused hazards	Emergency Manager	Floodplain Manager	Land Surveyors	Scientists familiar with the hazards of the community	Staff with education or expertise to assess the community's vulnerability to hazards	Personnel skilled in GIS and/or Hazus	Resource development staff or grant writers
Four Oaks	✓	✓		✓	✓		✓			
Kenly		✓		✓	✓		✓	✓		
Micro		✓		✓			✓	✓		
Pine Level		✓		✓	✓		✓	✓		
Princeton		✓		✓	✓		✓	✓		
Selma	✓	✓		✓	✓		✓			
Smithfield	✓	✓		✓	✓		✓	✓	✓	
Wilson's Mills	✓	✓		✓	✓		✓	✓		

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

C.4.3 Fiscal Capability

Table C.53 provides a summary of the results for Johnston County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plan.

TABLE C.53: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	Capital Improvement Programming	Community Development Block Grants (CDBG)	Special Purpose Taxes (or taxing districts)	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other: PDM, FMAP, HMGP, PA, SBA, and other Federal and state funding sources, etc.
JOHNSTON COUNTY	✓	✓	✓						✓	✓
Archer Lodge			✓						✓	✓
Benson	✓	✓	✓						✓	✓
Clayton	✓	✓	✓						✓	✓
Four Oaks	✓		✓						✓	✓
Kenly		✓	✓						✓	✓
Micro			✓						✓	✓
Pine Level		✓	✓						✓	✓
Princeton			✓						✓	✓
Selma	✓	✓	✓						✓	✓
Smithfield	✓	✓	✓						✓	✓
Wilson's Mills	✓	✓	✓						✓	✓

C.4.4 Political Capability

The previous hazard mitigation plan indicates that the general populace and governing officials in Johnston County are open to mitigation efforts. Following the devastation that Hurricanes Fran and Floyd inflicted on Johnston County, and following several severe ice events in the last few years, the citizens and leaders of Johnston County are aware of the widespread damage that can be done by a natural event. Analyzing how mitigation can be inserted into everyday decision making as a routine course may help to depoliticize the issue. Public education and awareness campaigns about the economic efficiency and social utility of mitigation measures can help foster its general acceptance by citizens, and, in turn, by politicians.

C.4.5 Conclusions on Local Capability

Table C.54 shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for the county and its municipalities is 28.3, which falls into the moderate capability ranking.

TABLE C.54: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
JOHNSTON COUNTY	43	High
Archer Lodge	21	Moderate
Benson	33	Moderate
Clayton	36	Moderate
Four Oaks	25	Moderate
Kenly	24	Moderate
Micro	16	Limited
Pine Level	24	Moderate
Princeton	25	Moderate
Selma	30	Moderate
Smithfield	34	Moderate
Wilson's Mills	28	Moderate

C.5 JOHNSTON COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Johnston County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Planning Committee and the findings and conclusions of the capability assessment and risk assessment. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

C.5.1 Mitigation Goals

Johnston County developed six mitigation goals in coordination with the other participating Cape Fear Region jurisdictions. The regional mitigation goals are presented in **Table C.55**.

TABLE C.55: CAPE FEAR REGIONAL MITIGATION GOALS

	Goal
Goal #1	Increase public awareness of hazards and encourage collective and individual responsibility for mitigating hazard risks.
Goal #2	Strive to reduce loss of life, personal injury, and property damage from natural hazards.
Goal #3	Strive to maintain existing structures and infrastructure in such a manner that they will be as resilient as possible from natural hazards.
Goal #4	Protect the most vulnerable populations, buildings, and critical facilities through the implementation of cost-effective and technically feasible mitigation actions.
Goal #5	Manage future development to minimize vulnerability of public and private property to natural hazards.
Goal #6	Protect and preserve the natural resources and environmentally sensitive areas within the region.

C.5.2 Mitigation Action Plan

The mitigation actions proposed by Johnston County, the Town of Archer Lodge, the Town of Benson, the Town of Clayton, the Town of Four Oaks, the Town of Kenly, the Town of Micro, the Town of Pine Level, the Town of Princeton, the Town of Selma, the Town of Smithfield, and the Town of Wilson's Mills are listed in the following individual Mitigation Action Plans.