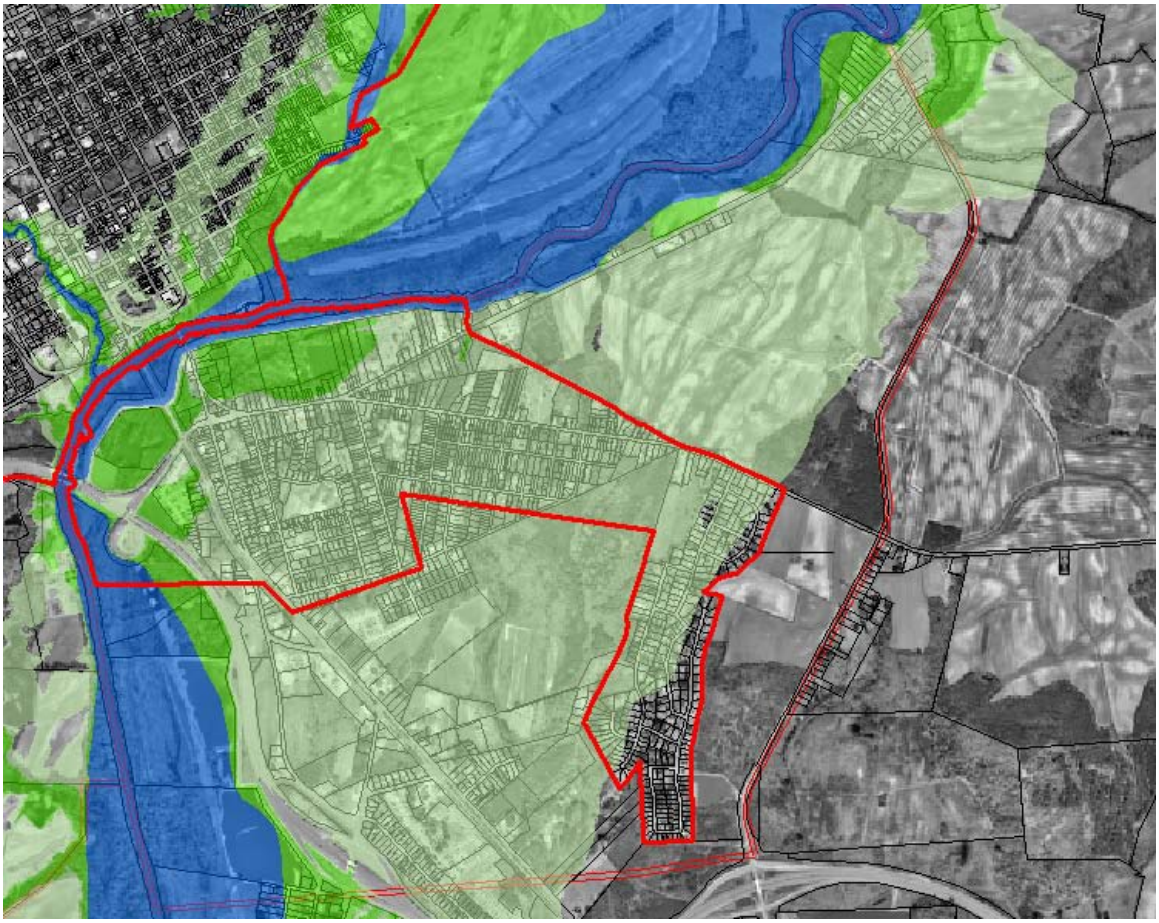
Town of Princeville, North Carolina

Hazard Mitigation Plan

September 27, 2004



Prepared by the Upper Coastal Plain Council of Governments

1 INTRODUCTION TO HAZARD MITIGATION PLANNING

Since the beginning of recorded history, the built environment and the natural environment had a less-than-harmonious relationship. Volcanoes, floods, and other perceived disasters are recorded since the advent of civilization. These events are a perfectly natural and inevitable phenomenon, so why are they called "disasters?"

The natural environment adapts to the conditions that exist, such as pines whose seeds only germinate after being exposed to fire. The human environment with its buildings, crops, and relatively short view of time do not always reconcile with their environment over the long term. When hurricanes, tornadoes, floods, and winter storms occur where there are no people, they are not "disasters." It is not until these events intersect with our homes and businesses, our crops and livestock that they become disasters.

1.1. What is Hazard Mitigation?

Hazard mitigation planning seeks to reduce the instances where the worlds of violent natural phenomenon and the human environment intersect. By reducing the risk of personal injury and property damage, a community can lessen the effects of a "disaster" when one of these events crosses paths with people.

1.2. Purpose of the Plan

Planning is the cornerstone to successful hazard mitigation efforts. Citizens, local government, and private interests with proactive policies can reduce the man-made environment in harms way. Benefits realized by implementing hazard mitigation measures include:

Saving lives by removing people from hazard prone situations
Limiting property damage by regulating development in hazard areas
Saving money for taxpayers by reducing the need for services during a disaster
Speeding disaster recovery and post-disaster relief funds
Demonstrating a strong commitment to the health and safety of the community.

Relocating people, institutions, and businesses from hazard prone areas saves property and lives. Removal of the structures means that there is less to pay for disaster recovery or for services during an event. Post-event, recovery crews will have less to do because there will be less damage. This speeds the recovery process.

Both state and federal governments made the development of a hazard mitigation plan a requirement for any local government requesting mitigation grant funding.

1.3. Scope of the Plan

This plan assesses the likelihood of all natural hazards possible in the Town of Princeville. It addresses mitigation measures for those hazards that pose a "high" or "moderate" risk where mitigation measures are possible and easily identifiable. In most of Princeville this will be flood risk. Other hazards, including man made hazards are considered but not fully addressed within this plan. Man made hazards must be tied to some natural phenomenon to be considered, such as a dam; otherwise HAZMIT sites

such as chemical manufacturing or petroleum distribution were noted during the critical facilities and vulnerability analysis.

The geographic area covered in the plan includes the incorporated areas of the Town and any Town owned or maintained facilities outside of the Town Limits.

1.4. Authority

This Edgecombe County Multi Jurisdictional Hazard Mitigation plan was adopted by the Town of Princeville under the authority and police powers granted to municipalities in the North Carolina General Statutes (NCGS), Chapter 160A, Article 8.

This plan was developed in accordance with current rules and regulations governing local hazard mitigation plans. The plan shall be routinely revisited to insure compliance with the following laws:

NCGS Chapter 166A: North Carolina Emergency Management Act as amended by Senate Bill 300: An Act to Amend the Laws Regarding Emergency Management as Recommended by the Legislative Disaster Response and Recovery Commission (2001).
The Robert T. Stafford Disaster Relief and Emergency Assistance ct as amended by the Disaster Mitigation Act of 2000 (Public Law 106-390, October 30, 2000).

1.5. Participants in the Planning Process

The Town of Princeville participated in the county-wide, multi-jurisdictional hazard mitigation planning process. In this process, there are three forms of participation: the advisory committee for the County, their counterparts from each municipality, and the public. The members of the Town's Advisory Committee were Gary Foxx, Wendle Black, and Sam Knight, the Town Manager. This Committee worked on the Town-specific appendix of this plan with sessions at the County, and also participated in the multi-jurisdictional process and the county-wide Committee.

1.6. Description of Planning Process and Citizen Participation

There are six steps in the overall planning process; the first three phases involve background research that becomes the foundation for defining a strategy to diminish the damage done when a hazard strikes. The last three steps involve drawing conclusions from your research and planning and implementing improvements for the future.

The first step, hazard identification and analysis looks at past events in Edgecombe County. These historic occurrences help determine the risk posed by a particular kind of threat based on frequency, magnitude, and impact on the community. The first meeting of the Advisory Committee meeting was the forum to go over what happened in the past and use Worksheet 1 (See end of Chapter 3) to determine risk.

The second step identifies specific facilities or neighborhoods that are in risk-prone areas. This "vulnerability assessment" is done through the use of geographic data and geographic information systems to graphically show where these risk areas are. It will also assess demographics and development trends that may exacerbate a particular hazard. These maps were presented to the

Advisory Committee for each Town in the multi-jurisdictional plan, then reviewed and final critical facilities that were vulnerable were identified.

The third and final part of the background research is the capabilities assessment, which reviews the ability of emergency services providers and local governments to respond to disaster. The capabilities reviewed in this plan include staffing, organizational capacity, fiscal and technical capability, policies and programs, and the legal and political environment.

Other plans and studies were also reviewed for applicability to hazard mitigation potential, notably the Regional Comprehensive Economic Development Strategy for future growth and employment trends. The Town also reviewed the 2001 County Hazard Mitigation Plan to craft the new plan. Other growth planning guides, such as the North Carolina Department of Transportation Thoroughfare Improvement Program (TIP), were also used.

Ultimately, this capability assessment will identify any gaps, conflicts, or shortcomings in local programs that might hamper mitigation efforts; it will also note successful efforts already in the community that can be built upon to establish a successful hazard mitigation program.

Once the background studies are done, the staff of the planning agency assisted the County and the respective municipalities with analysis of the background data. Paul E. Black, AICP of the Upper Coastal Plain Council of Governments with help from Chris Lukasina, GIS Planner reviewed the data gathered and helped the County, City, and Towns develop Community Goals Statements, the 5th step. These become the guiding principals for the final step, the Hazard Mitigation Strategy. The strategy becomes the action phase of the plan, with both general and specific measures to implement.

The public and other appropriate agencies such as private electric utilities, the Red Cross, et cetera were invited to attend Advisory Committee Meetings, and the public was notified for the kickoff meeting and Committee approval of the draft multi-jurisdictional document just prior to submittal to the State. Their input was also solicited in identifying past events and for crafting future policy.

A process for prioritization of identified hazard mitigation strategies was performed. The hazard mitigation advisory committee used the following criteria for prioritization of hazard mitigation strategies:

1) cost-benefit review
2) results of Hazard Identification and Analysis
3) results of Vulnerability Assessment
4) results of Community Capability Assessment
5) effectiveness in meeting hazard mitigation goals and comprehensive plan goals

Cost-benefit review was given special emphasis, in light of its possible use in environmental reviews for HMGP, FMA and other federal hazard mitigation projects. Given the tight budgets of recent years, most goals are based in existing programs or will be dependent on grants or other outside funds.

The public and other appropriate agencies such as neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties that could be identified were invited by letter to attend Advisory Committee Meetings. The public was notified through newspaper advertising for a public kickoff meeting in April and Committee approval and public review of the preliminary draft plan on 1 September 2004 just prior to submittal to the State.

The Town formalized a process by which the requirements of this hazard mitigation plan will be incorporated into other local plans. During the planning process for new and/or updates to existing plans, the planning department will make copies of the current hazard mitigation plan available to decision makers and the public either in paper copy or using the internet. Decision makers will also be briefed on the goals of the hazard mitigation plan and how hazard mitigation can be incorporated into their decision making process.

The Town has created a process by which the requirements of this hazard mitigation plan will be incorporated into other local plans. During the planning process for new and updated local planning documents, such as the comprehensive plan, capital improvements plan, or emergency management plan, to name a few examples, the Planning Department will provide a copy of the hazard mitigation plan to each respective advisory committee member. The Planning Department will also educate advisory committee members to ensure that all goals and strategies of new and updated local planning documents are consistent with the hazard mitigation plan and will not contribute to increased hazards in the jurisdiction.

2. COMMUNITY PROFILE

2.1. History

The Town of Princeville was the first chartered and incorporated as a Town on February 20, 1885. It the distinction of being the first municipality chartered by African-Americans in the United States. Known originally as "Freedom Hill", the Town has been plagued by numerous floods. The Tar River sent water into every house and in business in 1775, and the pattern continued in 1791, 1800, 1863, 1887, 1919, 1924, 1940, 1958, and 1999.

After the 1958 flood, the Town began negotiations with the Army Corps of Engineers to construct a protective dike on the Tar River. The dike was built and declared complete in 1965. The dike held firm until the devastating floods of Hurricane Floyd in 1999. Strong leadership and a sense of community have kept the Town going, and after Floyd the decision was made not to abandon the Town that was built on fighting adversity. Much of the Town has since been rebuilt, and a new Town Hall stands on Main Street.

2.2. General Geography and Location

Edgecombe County lies in the eastern part of North Carolina between Raleigh and the Atlantic Coast. The County is in the physiographic region known as the Eastern Coastal Plain and is characterized by flat, sandy soils. US Route 64 bisects the county from east to west. The Town of Princeville is in the central part of the county just south and east of of Tarboro on the south bank of the Tar River. US routes 64, 64A, and 258, plus NC routes 44 and 33 all go through Princeville.

2.3. Climate

Princeville, like the rest of Edgecombe County is hot and generally humid in summer because of the moist maritime air that is carried by the Gulf Stream just off the coast of North Carolina. Winter is moderately cold but of short duration due to latitude and low elevation. The average winter temperature is 42º F (6º C) with an average winter low right at the freezing mark (0ºC) In summer the average temperature is 78ºF (26ºC) with an average maximum temperature of 89º Fahrenheit (32ºC). Average rainfall is 46 inches annually, and it is evenly distributed across the seasons. Average annual snowfall is 6 inches, and the greatest snow depth at any one time during the period of record was 13 inches (all averages based on Edgecombe County).

2.4. Geology

Edgecombe County lies just east of the break between Piedmont and the Coastal Plain. This break is known colloquially as the "Fall Line" or "Fall Zone." The Fall Zone was an old shore line during the Pliocene about three million years ago. The old shoreline is about 300 feet above present sea level. East of the Fall Line there are flat, sandy soils left by the retreating ocean. The majority of the County (82%) is relatively flat, with about 1% steep slopes adjacent to drainageways, and the remainder between the flat and the steep characterized by gentle slopes down toward the drainageways.

2.5. Soils

The soils of Edgecombe County mimic the underlying physiography, with relatively flat, hydric soils in the eastern Coastal Plain area.

2.6. Water Resources

2.6.1. Surface Waters

The entire county is in the Tar-Pamlico river basin, and the Tar runs through the heart of the county. Upstream from Tarboro, it drains 2,183 square miles, and upstream from Greenville it drains 2,620 square miles. The river in Edgecombe County is generally a slow-moving, flat waterway.

2.6.2. Public Water and Sewer

Town of Princeville system: Princeville has a water distribution system and sewer collection system. The systems are maintained by the Town. Treated water and wastewater treatment are purchased from Tarboro.

2.7. Natural Resources

Commercial Forest covers nearly 150,000 acres (46%) of the County based on 1990 data. Dominant species of trees include loblolly pine, oak, sweetgum, cypress, and hickory.

The sandy, flat soil is ideal agricultural land, and the area is known as a tobacco and soybean growing region, though cotton is quickly replacing tobacco. Livestock operations including large hog farms have also emerged in the past decade as a major part of the agricultural sector.

2.8. Recreation

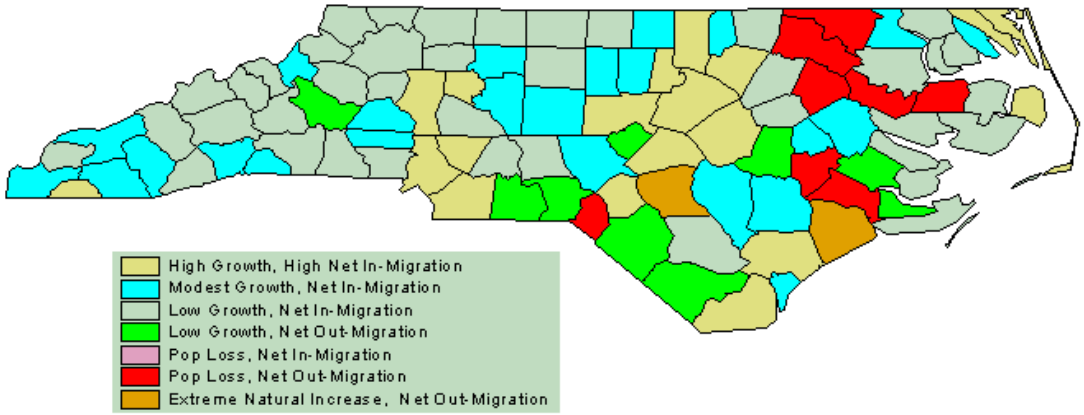
The Tar River and major tributaries are slated to have several paddle trails developed in the near future with 5 boat ramps in current plans. There are two State-owned fishing access areas downstream from Tarboro, and the County has a recreation department. There are no state parks or game lands in Edgecombe County.

The Town of Princeville has a park on the Tar River.

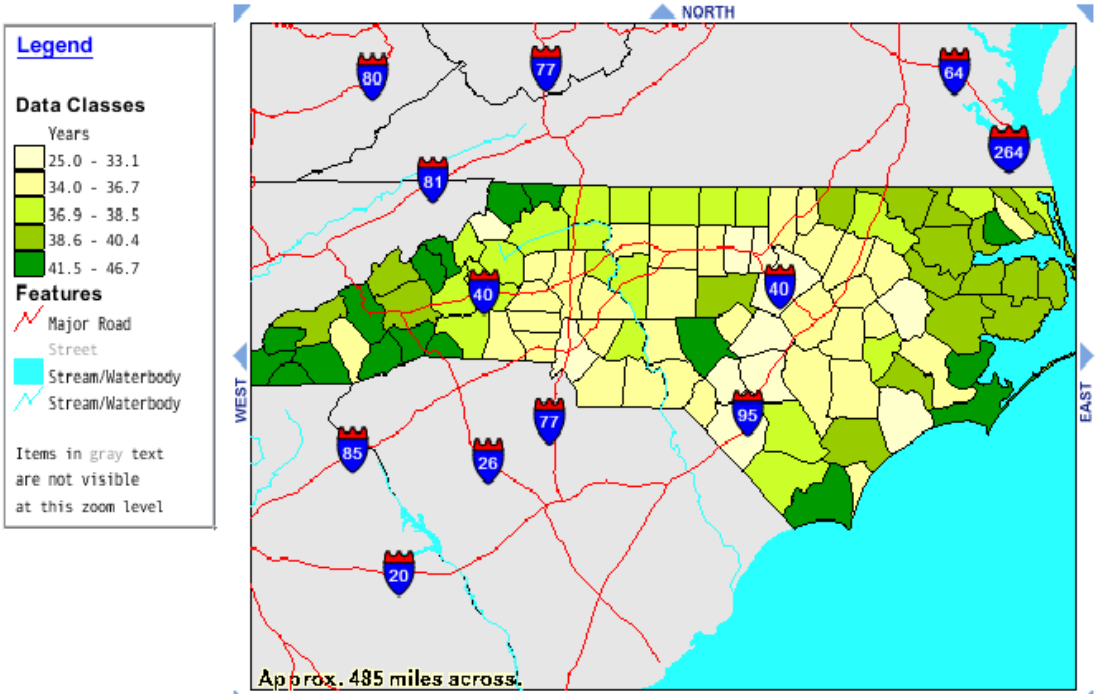
2.9. Population

The 2000 Census lists the population of Edgecombe County at 55,606. According to the Office of State Planning, the County population decreased at a marginal rate between 2000 and 2002. State estimates show a decrease of a little over 1000 persons during the ten-year period between the 1990 and 2000 Census, or just under -1% which is relatively stable. However, with the State's overall growth average around 3.4%, Edgecombe County lags 4.4% behind the state average.

Figure 1: POPULATION GROWTH 2000 TO 2002 (Source: OSP)



The population is consistent with state averages with a lean toward youth in terms of age with nearly 30% of the population under 19 years of age. Another 42 % are younger than 49. The median age is 36.2 compared to the State median of 35.3. On a county by county basis, Edgecombe shows as being weighted to the young. This is particularly evident once coastal and mountain counties with large retiree populations are factored in.



2.10. Background of Municipalities

There are nine municipalities in Edgecombe County ranging in population from Speed's 70 persons to The City of Rocky Mount with 17,297 in Edgecombe County and 55,893 in the City overall. The Town's population is officially 940, but the Town is getting a special census. April 15, 2000 found many of the current residents still living in temporary quarters outside the Town Limits due to Hurricane Floyd flooding *(Population Source: 2000 Census).*

3. NATURAL HAZARD IDENTIFICATION AND ANALYSIS

Identifying past occurrences of natural hazards affecting the community is the first concrete step in mitigating their effects should they occur again. This section of the plan will identify what events affected Edgecombe County as a whole, with breakouts for the Town of Princeville for localized phenomena if appropriate.

There are five facets to consider when looking at past events, according to the North Carolina Division of Emergency Management. These are:
The ***types of natural hazards*** that occurred in Edgecombe County,
The ***likelihood of occurrence*** of each of the hazard types,
The ***locations*** of past events,
The ***strength*** or intensity of the hazards, and
The ***impacts*** of the hazard events on the area.

3.1. Hurricanes/Tropical Storms

Hurricanes and tropical storms are low-pressure storm systems that originate over the warm waters of the tropics. As these storms move from their warm water birthplace into the mid-latitudes they pose a problem for North Carolina. When they come ashore and cross paths with our man-made environment, the results can be devastating to the lives and livelihoods of thousands of people.

Though they occur in all of the worlds tropical oceans, North Carolina is only affected by Atlantic basin hurricanes, which include those originating in the Caribbean Sea and the Gulf of Mexico. They can form from June to November, with storm probability peaking in early to mid-September.

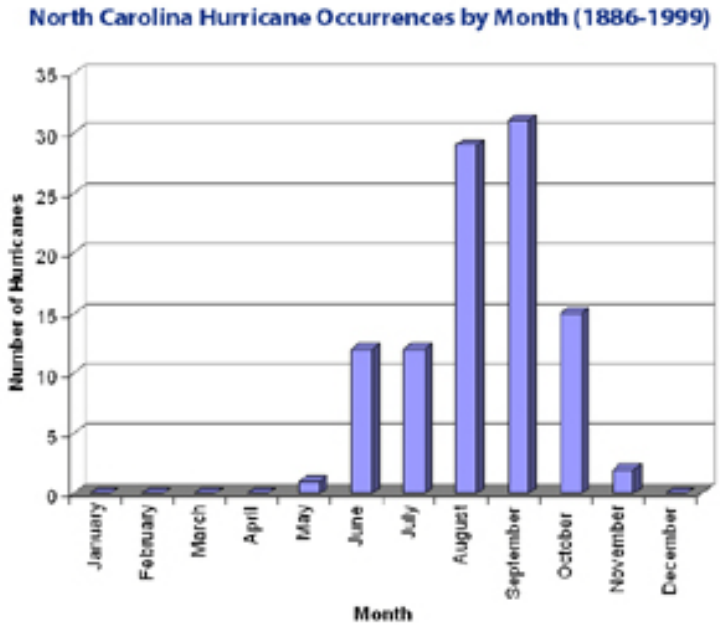


Figure 2: North Carolina Hurricanes by Month.

Source: State Climate Office of North Carolina

The vectors of destruction include very high, sustained winds, heavy precipitation, and tornadoes. Coastal areas and inland areas with significant estuaries can also experience high surf, storm surge, and tidal flooding.

When the sustained wind speeds of one of these tropical low pressure systems reach 39 miles per hour, it becomes an official tropical storm and is given a name determined by the World Meteorological Organization. When the sustained winds reach 74 miles per hour, it becomes a hurricane. There are degrees of intensity based on maximum sustained winds, and these fall into 5 categories on the Saffir-Simpson Scale.

Table 1: The Saffir-Simpson Scale.

Category	Barometric Pressure	Wind Speed	Storm Surge	Damage Potential
1 weak	28.94" or more 980.2mb or more	65 - 82kt 75 - 95mph	4 - 5ft 1.2 - 1.5m	Minimal damage to vegetation
2 moderate	28.50" - 28.93" 965.12 - 979.68mb	83 - 95kt 96 - 110mph	6 - 8ft 1.8 - 2.4m	Moderate damage to houses
3 strong	27.91"-28.49" 945.14 - 964.78mb	96 - 113kt 111 - 130mph	9 - 12ft 2.7 - 3.7m	Extensive damage to small buildings
4 very strong	27.17"-27.90" 920.08 - 944.80mb	114 - 135kt 131 -155mph	13 - 18ft 3.9 - 5.5m	Extreme structural damage
5 devastating	< 27.17" < 920.08mb	> 135kt > 155mph	> 18ft > 5.5m	Catastrophic building failures possible

Source: State Climate Office of North Carolina

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North Carolina's protruding coastline puts it in the path of many Atlantic storms. Since 1900, it is behind only Texas, Florida, and Louisiana in landfalling hurricanes.

If tropical storms are also included, the number is much higher. Since reliable classification of storms began in 1886 through 1999, nine hundred and fifty-one tropical cyclones were recorded in the Atlantic Ocean and Gulf of Mexico. Thirty-eight tropical cyclones made direct landfall in North Carolina. Of these, 10 were tropical storms, 22 were minor hurricanes, and 6 were major hurricanes. *(Source: State Climate Office of North Carolina)*

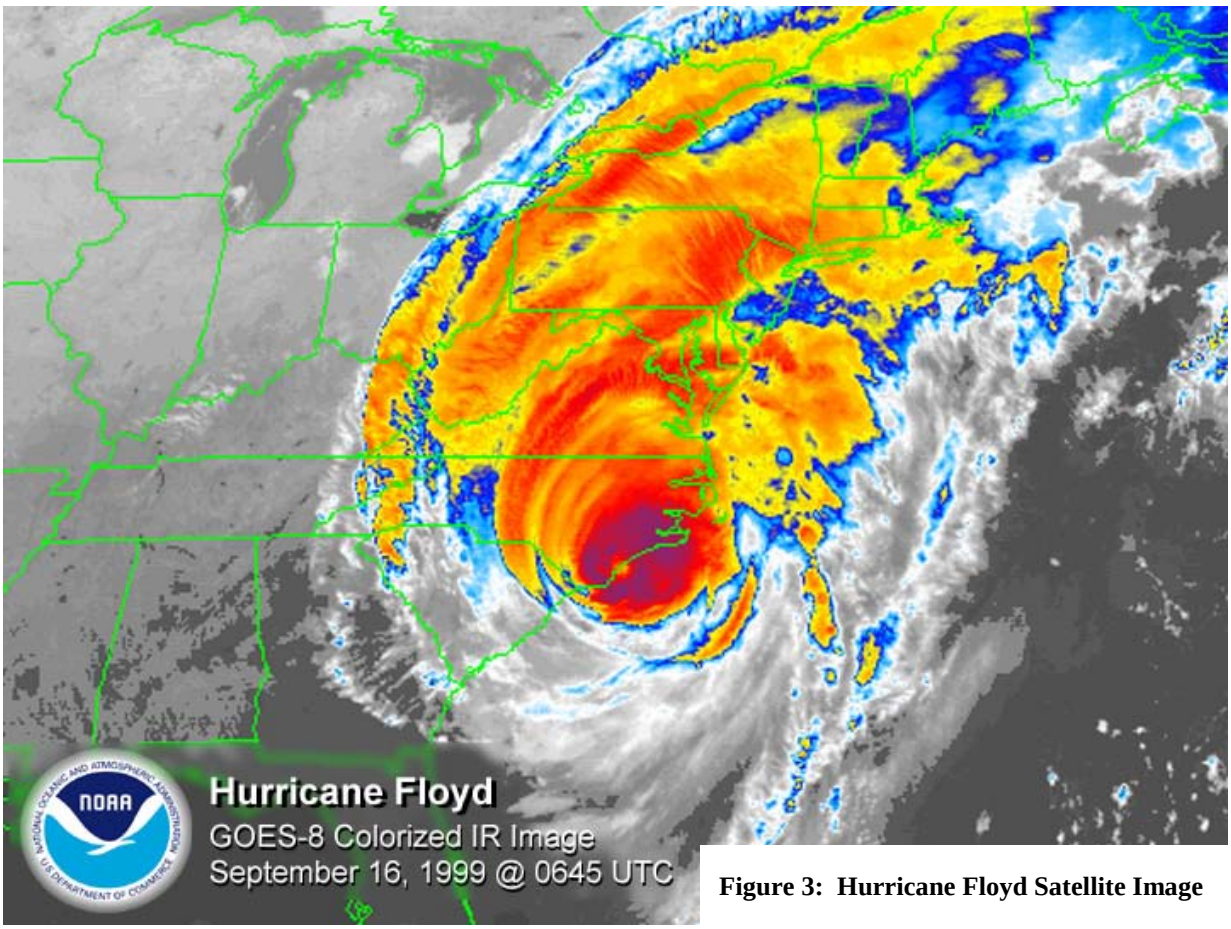


Figure 3: Hurricane Floyd Satellite Image

Table 2: Hurricane Strikes by State.

AREA	Category Number					ALL 1,2,3,4,5	MAJOR 3,4,5
	1	2	3	4	5		
U.S. (Texas to Maine)	58	36	47	15	2	158	64
Texas	12	9	9	6	0	36	15
(North)	7	3	3	4	0	17	7
(Central)	2	2	1	1	0	6	2
(South)	3	4	5	1	0	13	6
Louisiana	8	5	8	3	1	25	12
Mississippi	1	1	5	0	1	8	6
Alabama	4	1	5	0	0	10	5
Florida	17	16	17	6	1	57	24
(Northwest)	9	8	7	0	0	24	7
(Northeast)	2	7	0	0	0	9	0
(Southwest)	6	3	6	2	1	18	9
(Southeast)	5	10	7	4	0	26	11
Georgia	1	4	0	0	0	5	0
South Carolina	6	4	2	2	0	14	4
North Carolina	10	4	10	1*	0	25	11
Virginia	2	1	1*	0	0	4	1*
Maryland	0	1*	0	0	0	1*	0
Delaware	0	0	0	0	0	0	0
New Jersey	1*	0	0	0	0	1*	0
New York	3	1*	5*	0	0	9	5*
Connecticut	2	3*	3*	0	0	8	3*
Rhode Island	0	2*	3*	0	0	5*	3*
Massachusetts	2	2*	2*	0	0	6	2*
New Hampshire	1*	1*	0	0	0	2*	0
Maine	5*	0	0	0	0	5*	0

Source: National Weather Service Tropical Prediction Center.

The National Climatic Data Center lists 6 “Hurricane and Tropical Storm” events that affected Edgecombe County in the period from January 1, 1950 through April 2004.

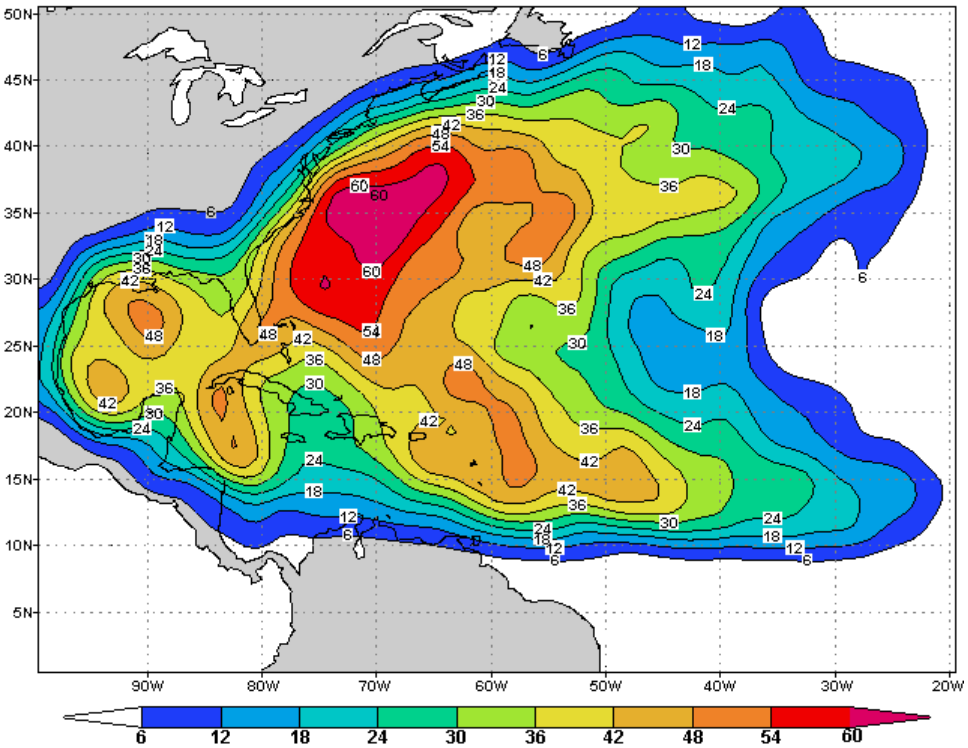
Table 3: NCDC Hurricane Events for Edgecombe County 1950-2002.

Storm	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Bertha	7/12/1996	0800	Hurricane	N/A	0	0	0	0
Fran	9/5/1996	1700	Hurricane	N/A	7	2	0	0
Bonnie	8/27/1998	2000	Hurricane	N/A	0	0	0	50.0M
Dennis	9/4/1999	2100	Hurricane	N/A	0	0	0	3.0M
Floyd	9/15/1999	1600	Hurricane	N/A	0	0	3.0B	500.0M
Isabel	9/18/2003	0900	Hurricane/typhoon	N/A	1	0	7.3M	0
TOTALS:					**8**	**2**	**3.007B**	**553.000M**

Reviewing the NCDC table of events in its entirety, coverage of all types of hazard events in Edgecombe County is somewhat spotty prior to the mid-1980s (See Appendix J). Additional Hurricanes or Tropic Storms not listed in the NCDC tables but brought up by the public include Hazel, Bonnie, and Gloria. Hazel was noted to be particularly destructive, with wind damage to structures and crop damage rather than flooding as the primary problems. Other Hurricanes or storms with a track near Edgecombe County but not included are Arthur, Charlie, Diana, Ginger and Irene.

The table looks as though every 3 years roughly three hurricanes or tropical storms will affect Edgecombe County. Even after the addition of storms not noted by the NCDC this is misleading, as prior to 1996 only the 1955 hurricane season had three hurricanes making landfall in North Carolina in one year: Connie, Diane, and Ione. The additional storms added by the public create a more balanced view of past events with at least a few storms every decade.

Figure 4: Annual Probability of a Named Storm.
Source: National Weather Service

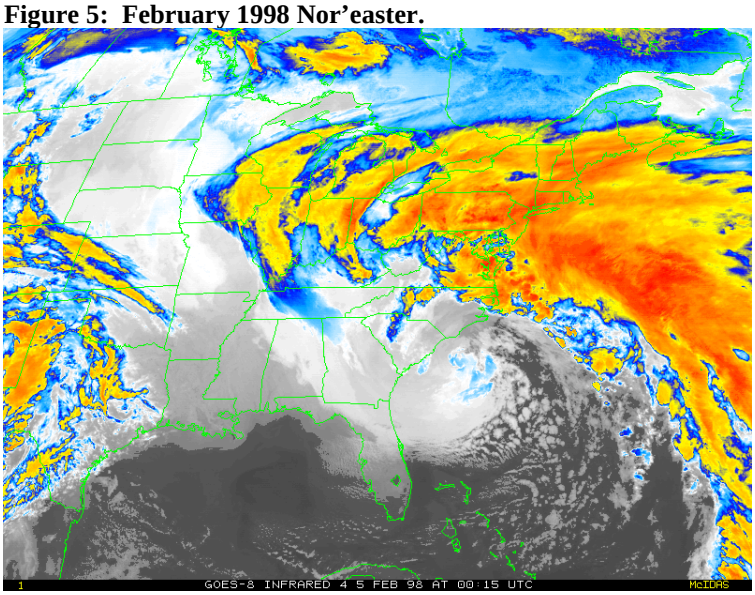


The NOAA Hurricane Research Division estimates the probability of a named storm in the region between 18 and 24 percent annually. With the destructive Hazel in 1954 and Floyd in 1999 it is reasonable to assume that some of these storms will cause heavy damage in the County. NCDEM rates hurricanes a moderate risk for Edgecombe County.

3.2. Nor'Easters

The technical definition of a nor'easter is a coastal low pressure system along the Atlantic seaboard that is characterized by strong northeasterly winds off the Atlantic that produce heavy amounts of precipitation, high surf, and coastal erosion. The counter-clockwise rotation of the low pressure system and the location and tack of the storm mean the onshore winds at the onset of the storm come from the northeast, hence it's name nor'easter. They are the strong storms that form outside of hurricane season, and their origins are different from hurricanes because of the winter weather patterns. They typically form near the Bahamas or north of Cuba, along the Appalachians or off Cape Hatteras. Nor'easters are spawned by a trough in the Jet Stream that dips far south allowing cold arctic air to meet warm air. The warm air rises over the cold, creating instability high in the atmosphere and an area of low pressure below. As the incoming air rises around the center, the Jet Stream whisks it away further increasing the speed of the incoming air. The faster the air moves the faster the barometric pressure drops, and the gradient of the pressure change generates the strong winds.

Figure 5: February 1998 Nor'easter.



The normal Jet Stream winter pattern is to follow the coast which drags the storm to the northeast. Sometimes a high pressure center further north blocks the path of the nor'easter and it churns over the ocean for a long time. This sends strong waves onshore causing tremendous erosion. During the October to April nor'easter season, February is the busiest month.

While a nor'easter does not achieve the wind-speed of hurricanes, their destructive capability is in their duration (up to a week) and size (up to 1000 miles or more in diameter). Because of their winter occurrence, they can also create problems with frozen precipitation. The March 1993 "Storm of the Century" is one example, though it was not technically a nor'easter until it came east of the Appalachians and strengthened. It is listed under winter storm events for this report.

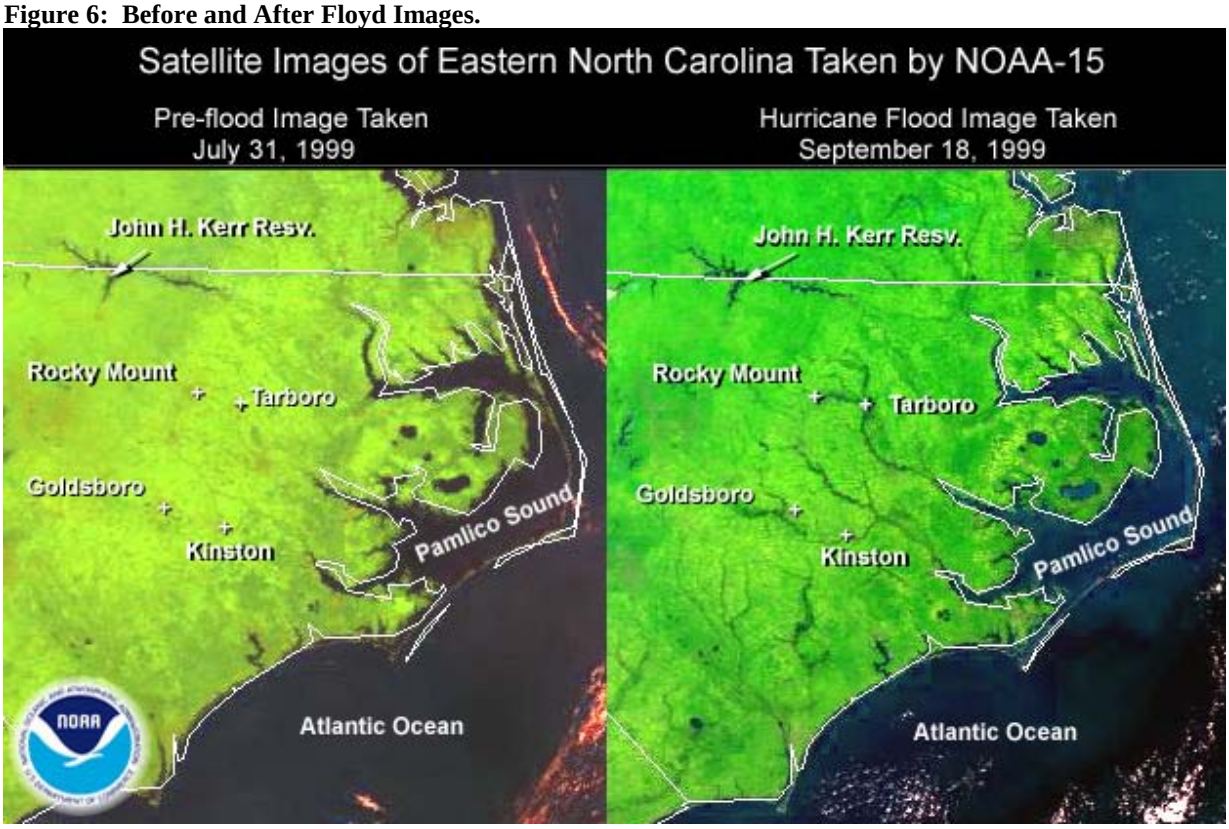
Though nor'easters are perceived as a coastal phenomenon, they pose a threat inland from wind and heavy rain. North Carolina's proximity to the Gulf Stream makes it vulnerable to nor'easters. The North Carolina Department of Emergency Management rates nor'easters as a moderate risk for Edgecombe County (*Local Hazard Planning Mitigation Manual, November 1998*).

3.3. Flooding

Flooding is the most pressing environmental hazard in low-lying Edgecombe County. There are two types of flooding: flash floods and general floods. General flooding caused by tropical storms, hurricanes and nor'easters is the most common in Edgecombe County, though flash floods occurred in urbanized areas during hurricane Irene.

Flash floods are caused different ways. Generally they are caused when a great deal of precipitation falls over a short period of time and overloads the natural drainage systems. They can also be caused by dam or levee failure, or when an ice jam dislodges and releases the water it held back. They are more prevalent in areas with pronounced topographic relief or urbanized areas because the runoff is quickly channeled to the lowest lying areas faster than it can move downstream.

Figure 6: Before and After Floyd Images.



General floods result from precipitation falling over a longer time period over a given river basin. There are 3 types of general floods: riverine, coastal, and urban. Riverine flooding is a function of excessive precipitation and runoff within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves, and heavy rainfall produced by hurricanes, tropical storms, nor'easters and other large coastal storms. Urban flooding occurs where man-made development obstructs the natural flow of water and decreases the ability of natural groundcover to absorb and retain surface water runoff.

The severity of a flood event is determined by a combination of factors, including stream and river basin topography and physiography, soil saturation levels, precipitation and weather patterns, and the degree of urbanization or clearing of vegetation.

Periodic flooding of lands adjacent to rivers, streams and shorelines is a natural and inevitable occurrence whose probability can be determined based upon established recurrence intervals. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval.

A "floodplain" is the lowland area adjacent to a river, lake or ocean. Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by a 10-year flood event and the 100-year floodplain by the 100-year flood.

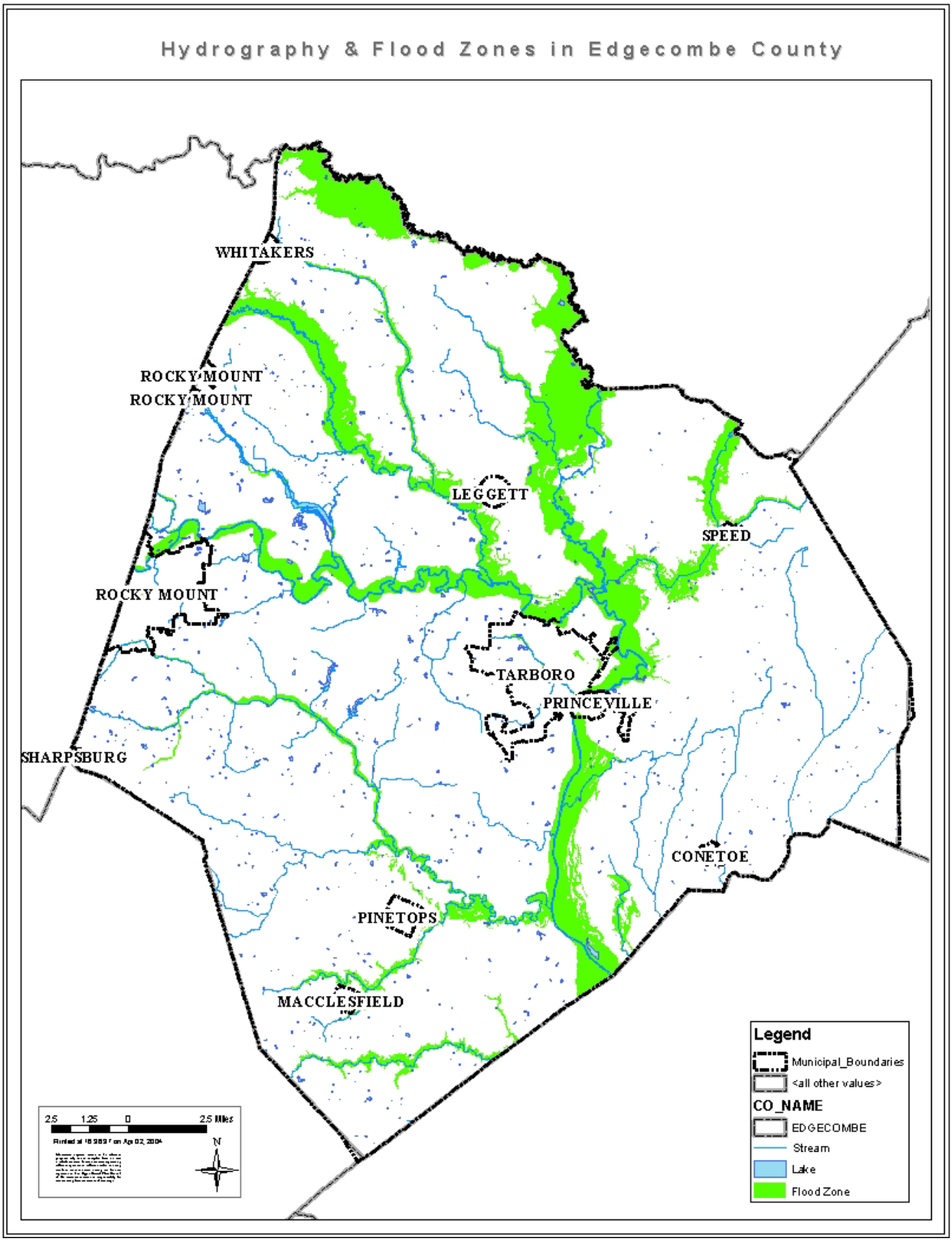
Flood probabilities, such as the "100-year flood," are determined by statistically analyzing the elevation of known floods for an area and determining how often floods of a particular size occur. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1% chance of occurring in any given year.

Past flood events wreaked havoc on Edgecombe County. From 1995 until May of 2003, hurricanes, tropical storms, nor'easters, and intense summer storms all left their high-water marks on the County. Combined they are responsible for 500 million dollars of structural damage and over 3.0 billion in crop damage in Edgecombe County alone. Floyd was a particularly devastating event for the County with a combined crop and property damage toll of 3.5 billion dollars. Property and crop damage is listed in the hurricane section of this plan. Tragically, flooding associated with Floyd also is responsible for 8 deaths in the County and is listed below.

Table 4: NCDC Flood Damage Report

Storm	Date	Time	Type	Mag	Deaths	Injuries	Prop. Damage	Crop Damage
1 Rocky Mount	7/16/1994	1725	Flash Flood	N/A	0	0	0	0
2 Countywide	9/5/1996	2300	Flash Flood	N/A	0	0	0	0
3 Countywide	7/24/1997	0830	Flash Flood	N/A	0	0	0	0
4 NCZ011 - 028	1/22/1998	1600	Flood	N/A	0	0	0	0
5 NCZ028 - 039 - 042>043 - 073>077 - 084 - 086	1/27/1998	1300	Flood	N/A	0	0	0	0
6 NCZ026>028	2/9/1998	0800	Flood	N/A	0	0	0	0
7 Countywide	9/6/1999	2000	Flash Flood	N/A	0	0	0	0
8 Countywide*	***9/15/1999***	***2200***	***Flash Flood***	***N/A***	***8***	***0***	***0***	***0***
9 Countywide	9/21/1999	1145	Flash Flood	N/A	0	0	0	0
10 Countywide	9/27/1999	2330	Flash Flood	N/A	0	0	0	0
11 Countywide	9/28/1999	1630	Flash Flood	N/A	0	0	0	0
12 Countywide	9/28/1999	0820	Flash Flood	N/A	0	0	0	0
13 Countywide	10/17/1999	1800	Flash Flood	N/A	0	0	0	0
14 Northeast Portion	6/16/2001	1100	Flash Flood	N/A	0	0	0	0
15 Central Portion	7/5/2002	2000	Flash Flood	N/A	0	0	0	0
16 Northwest Portion	9/16/2002	1100	Flash Flood	N/A	0	0	0	0
17 Tarboro	9/18/2003	1600	Flash Flood	N/A	0	0	0	0
Note: Hurricane Floyd Damage Listed Under The Hurricane Category								
Total					**8**		**0**	**$ 0.00**

Figure 7: Edgecombe County Flood Zone Map



Princeville was particularly hard hit by flooding from Hurricane Floyd. Nearly the entire community was under water for the weeks after Floyd. Many residents were forced into temporary housing for more than a year following the disaster.

Digital floodplain maps are newly re-mapped and adopted for Edgecombe County, and this makes it much easier to accurately show vulnerable areas countywide.

NCDEM classifies Edgecombe County as a moderate risk for flooding in the August 2001 *Statewide Risk Assessment for Natural Hazards*. In light of hurricane Floyd in 1999 and subsequent weather events, this is probably an underestimation and should be upgraded to moderate and perhaps higher. The current draft plan circulated by the State shows Edgecombe County as a moderate risk. The Town of Princeville Advisory Committee rated the hazard as moderate—in spite of the past floods because the dike has performed in most cases except Floyd since it's completion in 1965. The high risk was listed under Dam/Levee failure because even though the likelihood of a breach is not high, the impact of a breach is catastrophic.

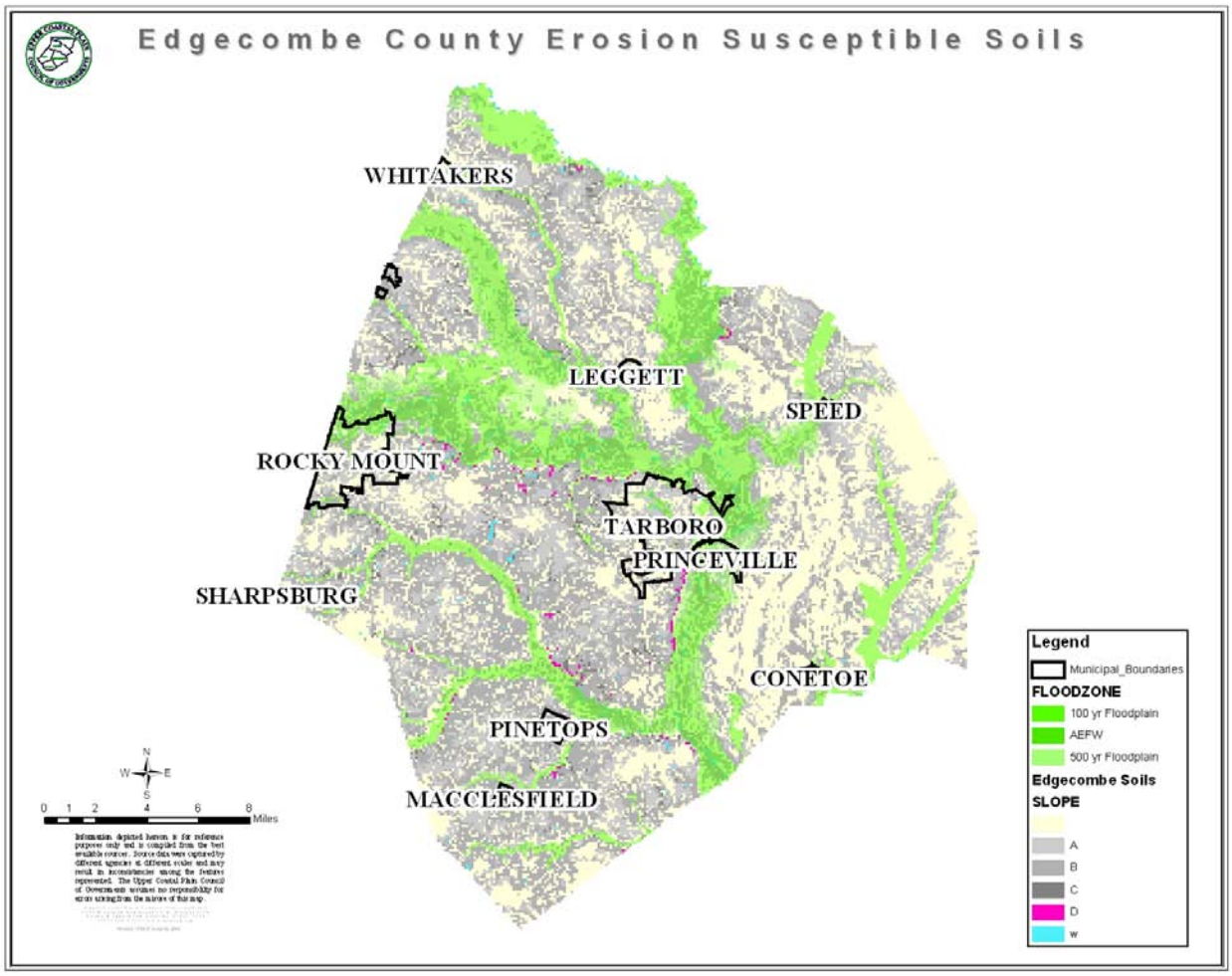
3.4. Coastal/Riverine Erosion

Erosion is the removal of soil or weathered material, usually by wind or water. Coastal erosion occurs during storm events from storm surge and wave action. Riverine erosion is generally caused by large flows caused by heavy rain events. There are two kinds of erosion that typify inland erosion processes: sheet erosion and rill erosion. Sheet erosion is more or less evenly distributed over an area and removes this layers of soil. Rill erosion is caused by running water scouring small channels.

The USDA Soil Conservation Service Soil Survey for the county shows that soils in the county with relatively steep slopes are those with a D, E, or F slope characteristic. Figure 8: Erosion Prone Soils illustrates the areas in the Piedmont (western) portion of the county, and areas eroded already by streams, notably along the Meherrin River in the northeast and Roanoke along the southern border.

Edgecombe County is not a coastal county, and coastal erosion is not applicable to the area. Riverine processes do exist in the county, though. The County is relatively flat, but parts of the county are susceptible to rill erosion. Generally, the rate of soil formation is enough to keep pace with erosion, and the risk for the county is low.

Figure 8: Erosion Prone Soils.



3.5. Severe Winter Storms/Freezes

Severe winter weather includes heavy snow, wind, freezing rain and ice pellets, and extreme cold. These storms are extra-tropical cyclones fueled by strong temperature gradients and an active upper-level jet stream. The severe winter storms that impact North Carolina usually emerge in the Gulf of Mexico or off the southeast Coast.

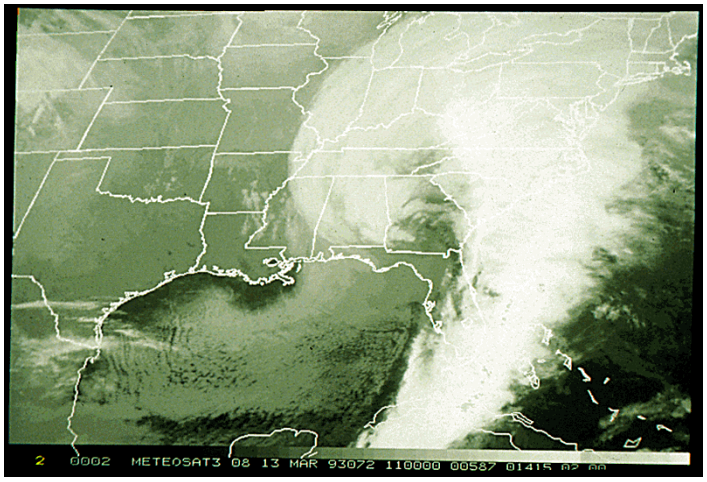


Figure 9: Storm of the Century--1993 Blizzard.

Although most winter storms occur in the mountainous regions of the Appalachians, the geographical orientation of the mountains and the piedmont contribute to a regular occurrence of freezing precipitation events in the piedmont. These winter storms may result from cold air damming. Cold air damming is a shallow, surface-based layer of relatively cold, stable-stratified air entrenched against the eastern slopes of the Appalachian Mountains. With warmer air above, falling precipitation in the form of snow melts, then either becomes supercooled (liquid below the freezing point of water) or refreezes. This results in freezing rain or sleet. Cold air damming generally occurs in the western half of North Carolina. Edgecombe County is not classified as being vulnerable for cold air damming.

The largest threat for Edgecombe County for severe winter weather is from Nor'easters and other severe winter coastal storms. There are 17 winter weather events including the March 1993 "Storm of the Century are listed for Edgecombe County by the National Climatic Data Center. Together they are responsible for $525,000 of reported damage in the county since 1993.

Table 5: Recorded Winter Storm Events for Edgecombe County (NCDC).

Storm	Date	Time	Type	Mag	Deaths	Injuries	Prop. Damage	Crop Damage
102 NCZ007>011 - 021>028 - 038>043 - 073>078 - 083>086 - 088>089	1/18/2000	0200	Winter Storm	N/A	0	0	0	0
103 NCZ007>011 - 021>024 - 026>028 - 038>043 - 076>077 - 089	1/20/2000	0000	Winter Storm	N/A	0	0	0	0
104 NCZ007>011 - 021>028 - 038>043 - 073>078 - 083>086 - 088>089	1/22/2000	1800	Winter Storm	N/A	0	0	0	0
105 NCZ007>011 - 021>028 - 038>043 - 073>078 - 083>086 - 088>089	1/24/2000	0500	Winter Storm	N/A	0	0	0	0
106 NCZ007>011 - 021>028 - 038>043 - 073>077 - 083>086 - 088>089	1/28/2000	1000	Winter Storm	N/A	0	0	0	0
112 NCZ010>011 - 026>028 - 042>043 - 077 - 077>078 - 088>089	12/3/2000	1200	Winter Storm	N/A	0	0	0	0
118 NCZ007>011 - 021>028 - 038>043 - 073>078 - 083>086 - 088>089	1/3/2002	0000	Winter Storm	N/A	0	0	0	0
126 NCZ007>011 - 021>028 - 038>043 - 073>077 - 083>084	12/4/2002	1500	Winter Storm	N/A	0	0	0	0

In 1997 the National Climatic Data Center (NCDC) compiled extreme snowfall statistics for the contiguous United States. One-day, observed-maximum-snowfall amounts, in inches, were compiled for selected stations (many for the period of 1948-1996). Based on the Local Hazard Mitigation Planning Manual, the extreme one-day snowfall averaged for the FEMA study stations in Edgecombe County is 11.3 inches. This snowfall is below the extreme average-one-day snowfall for the County's Climate Division (Climate Division 8): 12.24 inches. Although the northern coastal divisions fall second in extreme average snowfall to the mountainous climate divisions (Climate Divisions 1 and 2) compared with the rest of the state, the North Carolina Division of Emergency Management has classified Edgecombe County as having a "Low" vulnerability to severe winter weather.

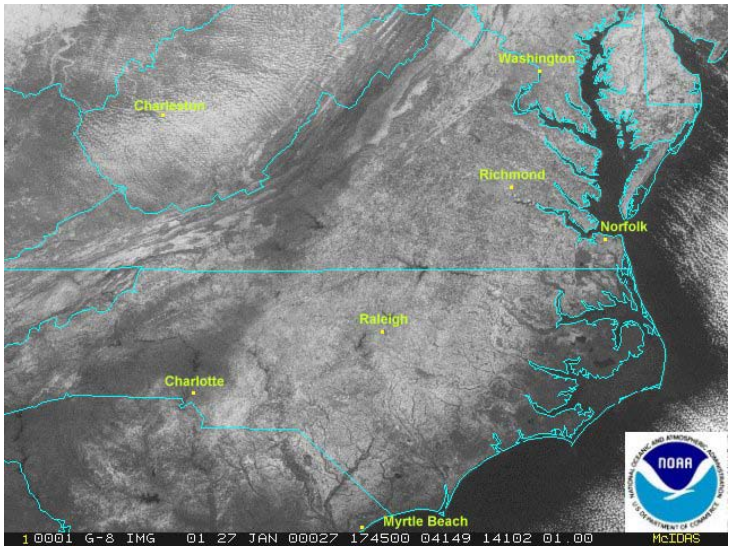


Figure 10: Visible Snow Cover From the January 24th 2000 Storm.

3.6. Tornadoes/Severe Storms

Tornadoes are violently rotating air columns and are generated from major storm events. Sometimes the source is a hurricane. Other times, the main agent is not a hurricane, but a major thunderstorm. The strong winds of tornadoes can destroy weak or fragile structures and can blow down trees and limbs. This destruction may cause additional damage as the items fall to the ground.

Tornadoes occur all over the state of North Carolina. In fact, the state ranks 22nd nationally for number of tornadoes reported. Edgecombe County and the counties immediately surrounding Edgecombe have experienced a number of strong tornadoes in the last 100 years. The NCDC lists 11 reported tornadoes since 1980 either originating in or tracking though part of Edgecombe County.

Tornadoes are measured using the Fujita scale, which ranks a tornado based on its wind speed and the level of destruction it causes.

Table 6: The Fujita Scale of Tornado Intensity.

F-Scale Number	Intensity Phrase	Wind Speed	Type of Damage Done
F0	Gale tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F1	Moderate tornado	73-112 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	Significant tornado	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe tornado	158-206 mph	Roof and some walls torn off well constructed houses; trains overturned; most trees in fores uprooted
F4	Devastating tornado	207-260 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	Incredible tornado	261-318 mph	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel reinforced concrete structures badly damaged.
F6	Inconceivable tornado	319-379 mph	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies

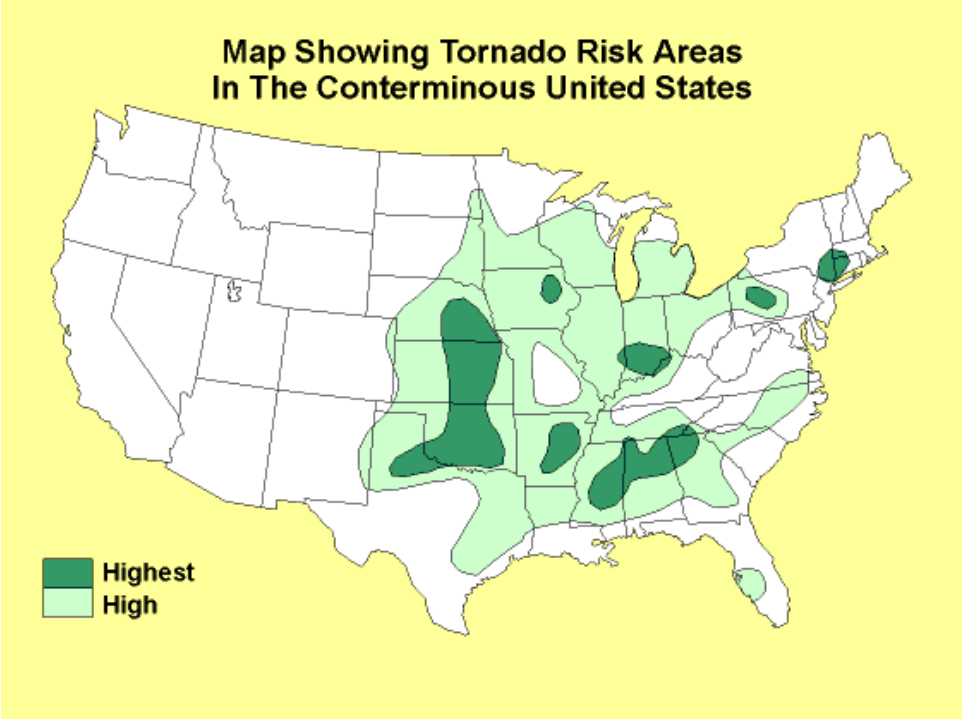
Edgecombe County had 2 magnitude F3 (severe) tornadoes that did 250,000 dollars worth of damage in the 1950's, and numerous other smaller events that combined for a total of 325,000 dollars of damage.

Table 7: Tornado Events in Edgecombe County 1980- June 2003.

Storm	Date	Time	Type	Mag	Deaths	Injuries	Prop. Damage	Crop Damage
1 EDGECOMBE	3/15/1953	2050	Tornado	F3	0	0	0K	0
2 EDGECOMBE	11/8/1957	1800	Tornado	F3	0	3	250K	0
13 EDGECOMBE	5/5/1977	1730	Tornado	F1	0	0	25K	0
60 Pinetops	11/11/1995	1950	Tornado	F1	0	3	50K	0
125 Conetoe	10/11/2002	2338	Tornado	F1	0	0	0	0
Totals:					**0**	**6**	**$325,000**	**0**

Edgecombe County's eastern location - within a moderate distance to locations experiencing regular hurricane activity – increases its risk of tornado development. Its location makes it more likely than many other areas of the state to experience tornadoes. Accordingly, the NC Division of Emergency Management assigned Edgecombe County a "Moderate" threat level for tornado activity based on its general climatic conditions and the frequency of historic tornadoes.

Figure 11: Tornado Risk in the Contiguous US (USGS).



3.7. Wildfires/Forest Fires

Figure 12: Wildfire.

A wildfire is an undesirable, uncontrolled burning of grasslands, brush or woodlands. According to the National Weather Service, more than 100,000 wildfires occur in the United States each year. Humans start roughly ninety percent of these wildfires, i.e., campfires, debris burning, smoking, et cetera. Lightning starts the other ten percent. The potential for wildfire depends upon surface fuel characteristics, weather conditions, recent climate conditions, topography and fire behavior.

Fuels are any combustible materials that sustain a fire. Typically, this is whatever vegetation is prevalent in a given area and the debris from the vegetation. Fuel availability is affected by how often fires occur; if an area has long intervals between fires, there is more fuel available when a fire event happens.

Weather is one of the most significant factors in determining the severity of wildfires. The intensity of fires and the rate with which they spread is directly rated to the wind speed, temperature and relative humidity. Climatic conditions such as long-term drought also play a major role in the number and intensity of wildfires, and topography is important because the slope and shape of the terrain can change the rate of speed at which fire travels.

There are four major types of wildfires: ground fires, surface fires, crown fires, and spotting fires. Ground fires burn in natural litter, duff, roots or sometimes soils with high organic content like peat. Once started they are very difficult to control, and some ground fires may even rekindle after being extinguished. Surface fires burn in grasses and low shrubs (up to 4' tall) or in the lower branches of trees. They have the potential to spread rapidly, and the ease of their control depends upon the fuel involved. Crown fires burn in the tops of trees, and the ease of their control depends greatly upon wind conditions. Spotting fires occur when burning embers are thrown ahead of the main fire, and can be produced by crown fires as well as wind and topographic conditions. Once spotting begins, the fire will be very difficult to control.

Wildfires become significant threats to life and property along what is known as the "wildland/urban interface." The wildland/urban interface is defined as the area where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Since 1985, approximately 9,000 homes have been lost to urban/wildland interface fires across the United States.

All of North Carolina is susceptible to wildfire, although according to the North Carolina Division of Emergency Management only the southern coastal plain is said to be at especially "high" risk. Although wildfires are possible throughout the year, normal fire season peaks for eastern North Carolina are in the Spring and late Fall months. Between 1928 and 2000, the North Carolina Division of Forest Resources has recorded a total of 281,660 wildfires for an average number of 3,858 fires per year. For that same period, a total of 9,598,498 acres have burned for an average of 131,486 acres per year. According to the U.S. Forest service, a total of 4,949 fires burned 25,146 acres and destroyed 27 homes and 275 structures in North Carolina during the year 2000.

According to the North Carolina Division of Emergency Management, Edgecombe County faces a low risk to wildfire. The North Carolina State Forest Service assessed wildfire potential using forest service

records for the period between 1950 and 1993. The State Forest Service categorized Edgecombe County having a “Low” wildfire potential for both number of fires and number of acres burned.

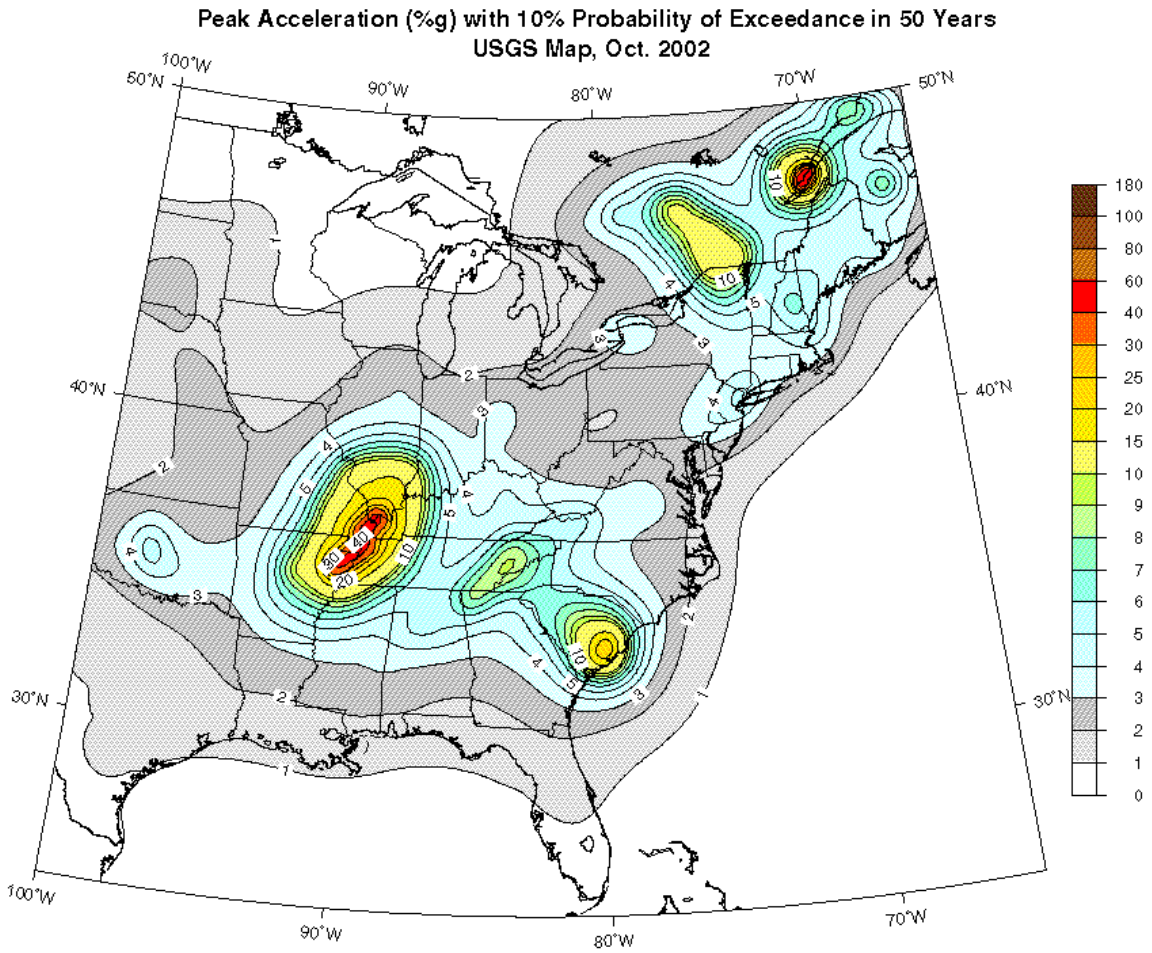
The average wildfire category for Edgecombe County’s climate division (Climate Division 8) is 2.2 (“Moderate”). Therefore, Edgecombe County, with a category of 1 (“Low”) for both number of fires and number of acres burned, falls below this average. Based on this information, wildfire does not appear to pose a significant natural hazard risk for Edgecombe County.

Figure 13: Climate Divisions of North Carolina

3.8. Earthquakes

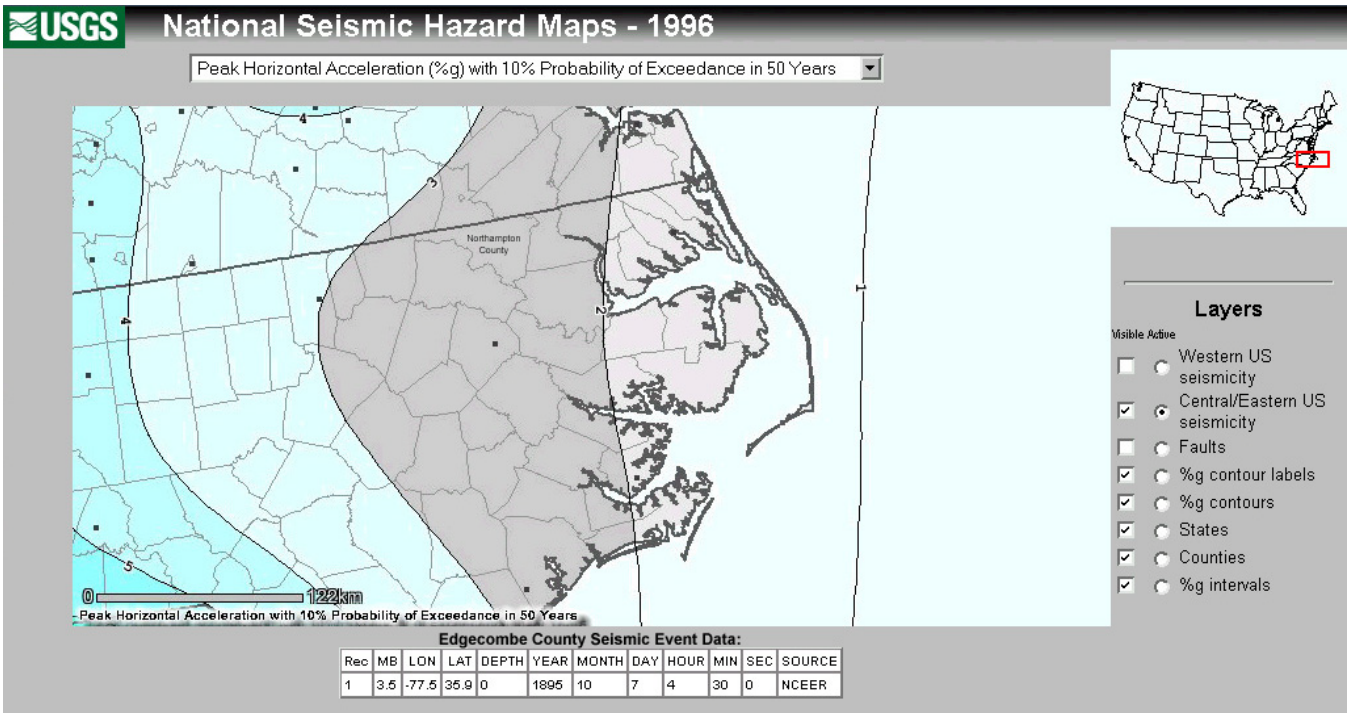
An earthquake is the violent shaking of the Earth caused by a sudden movement of rock beneath its surface. Rocks respond to stress (squeezed or pulled apart) near the Earth's surface by breaking, and when rocks move along either side of a fracture, it is called a fault. The land around a fault may shift horizontally, vertically, or a combination of these motions. The force that causes the stress within the rock is a result of movement of giant sections of the Earth's crust.

Figure 14: Earthquake Probability Map.



The epicenters of earthquakes affecting North Carolina are generally concentrated in the active Charleston and Eastern Tennessee Seismic Zones. The Charleston Seismic Zone is part of a crescent of moderate seismic activity risk extending from Charleston, South Carolina, northwestward into eastern Tennessee where it meets the East Tennessee Seismic Zone. This zone roughly follows the path of Interstate 75 between Chattanooga and Knoxville. Edgecombe County lies well to the northeast of these regions. The Virginia Seismic Zone is far less active, but is much closer than the other major fault zones and plays a significant role in the County's earthquake history. It is discernable on the map as the northeastward bulge of 3 percent probability into central Virginia.

Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude. Each unit increase in magnitude on the Richter Scale corresponds to a ten-fold increase in wave amplitude, or a 244-fold increase in energy (USGS 1996). Intensity is most commonly measured using the Modified Mercalli Intensity (MMI) Scale. It is a twelve-level scale based on direct and indirect measurements of seismic effects. Roman Numeral I corresponds to imperceptible (instrumental effects), IV corresponds to moderate (felt by people), and XII for catastrophic (total destruction). There have not been any earthquakes in the Eastern Tennessee Seismic Zone since 1928 with MMI intensity greater than IV. (This corresponds to a Richter Scale magnitude between 4.8 and 4.2, and a maximum acceleration of less than 100 mm/sec.) However, the area has the potential to produce an earthquake of significant intensity in the future (NCDEM 1999).



Rec	MB	LON	LAT	DEPTH	YEAR	MONTH	DAY	HOUR	MIN	SEC	SOURCE
1	3.5	-77.5	35.9	0	1895	10	7	4	30	0	NCEER

North Carolina's vulnerability to earthquakes decreases from west to east and south to north in relation to the two Seismic Zones. The eastern portion of the State (including Edgecombe County) faces minimal effects from seismic activity. The North Carolina Division of Emergency Management has classified Edgecombe County as a "Low" vulnerability area for earthquakes. The U.S. Geologic Survey rates earthquake probability by looking at past events and proximity to known background fault zones. The USGS estimates probability of a major earthquake in a 50 year interval in Edgecombe County at 2 percent. Until the 4.5 magnitude earthquake on the 9th of December 2003, the closest significant earthquakes in recorded history occurred in Edgecombe County on October 4th 1895 and in central Virginia in 1875.

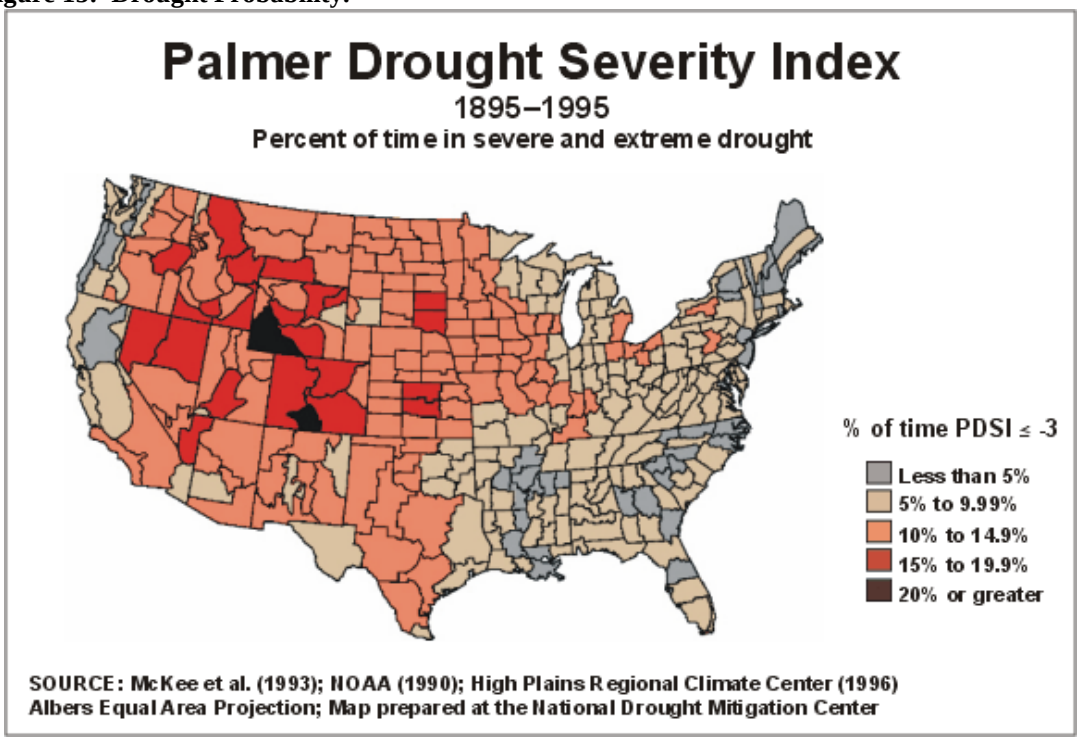
3.9. Drought/Heat Waves

Drought is a normal, recurrent feature of climate, although many erroneously consider it a rare and random event. It occurs in virtually all climatic zones, but its characteristics vary significantly from one region to another. Drought is a temporary aberration; it differs from aridity, which is restricted to low rainfall regions and is a permanent feature of climate.

Drought has scores of definitions, but it originates from a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. Drought should be considered relative to some long-term average condition of balance between precipitation and evapotranspiration (i.e., evaporation + transpiration by plants) in a particular area, a condition often perceived as "normal". It is also related to the timing, i.e., principal season of occurrence, delays in the start of the rainy season, occurrence of rains in relation to principal crop growth stages, and the ability of the soil to absorb the rains. Other climatic factors such as high temperature, high wind, and low relative humidity are often associated with it in many regions of the world and can significantly aggravate its severity.

Long term drought probability can be measured using the Palmer Index. The Palmer Index was developed by Wayne Palmer in the 1960s and uses temperature and rainfall information in a formula to determine dryness. It has become the semi-official drought index. The Palmer Index is most effective in determining long term drought—a matter of several months—and is not as good with short-term forecasts (a matter of weeks). It uses a 0 as normal, and drought is shown in terms of minus numbers; for example, minus 2 is moderate drought, minus 3 is severe drought, and minus 4 is extreme drought. The advantage of the Palmer Index is that it is standardized to local climate, so it can be applied to any part of the country to demonstrate relative drought or rainfall conditions. The negative is that it is not as good for short term forecasts, and is not particularly useful in calculating supplies of water locked up in snow, so it works best east of the Continental Divide. Edgecombe County is a low risk area for extreme drought, though seasonal droughts are not uncommon.

Figure 15: Drought Probability.

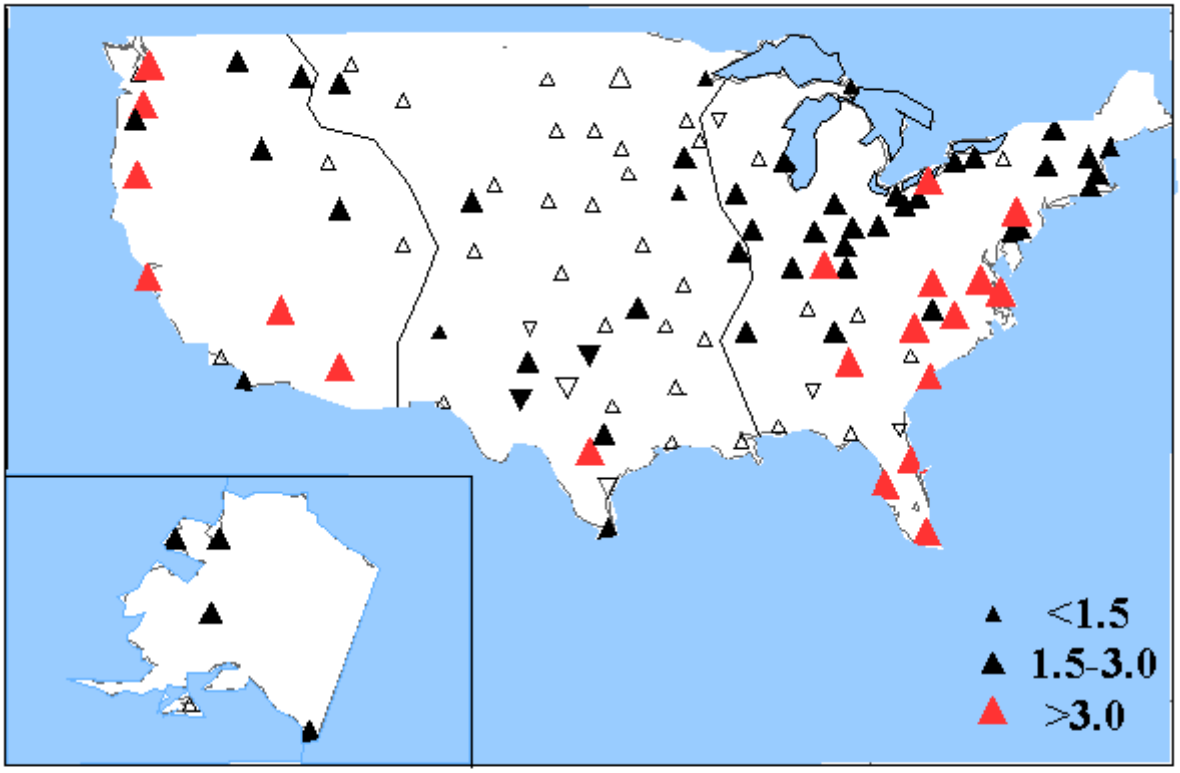


A heat wave is generally a period of abnormally and uncomfortably hot and usually humid weather. It could last from several days to several weeks. The Weather Channel uses the following criteria for a heat wave: a minimum of ten states with 90 degree plus temperatures and the temperatures must be at least five degrees above normal in parts of that area for at least two days or more.

Heat kills by taxing the human body beyond its ability to cool itself. North American summers are hot, and in the Southeast they are humid and sunny as well. High humidity and direct sunlight further burden the human body's ability to cool itself. Both are factors of the Edgecombe County summer.

The National Climatic Data Center Looked at nearly 40 years worth of heat-related data for the Continental United States, and the Upper Coastal Plain shows a significant more, hotter days (see Figure 16: Temperature Trends Map from NOAA NCDC). Edgecombe County's location makes it prone to hot, humid summers. Therefore the risk of prolonged periods of hot, harmful weather is likely. The risk of experiencing a heat wave is moderate.

Figure 16: Temperature Trends Map from NOAA NCDC.



Trends in the annual frequency of daily minimum apparent temperature exceeding local threshold values from 1949-1995. The size and color of the triangle indicates the magnitude of the trend (ranging from -2.7 to +5.2 per decade); its orientation (on its base or on its apex) indicates the sign of the trend (positive or negative, respectively). Filled triangles indicate significant trends (at $p < 0.05$, using non-parametric methods).

3.10. Landslides/Sink Holes

A landslide is the movement of earth materials caused by gravity, and generally involved downslope movement. An avalanche is a similar movement of snow and ice.

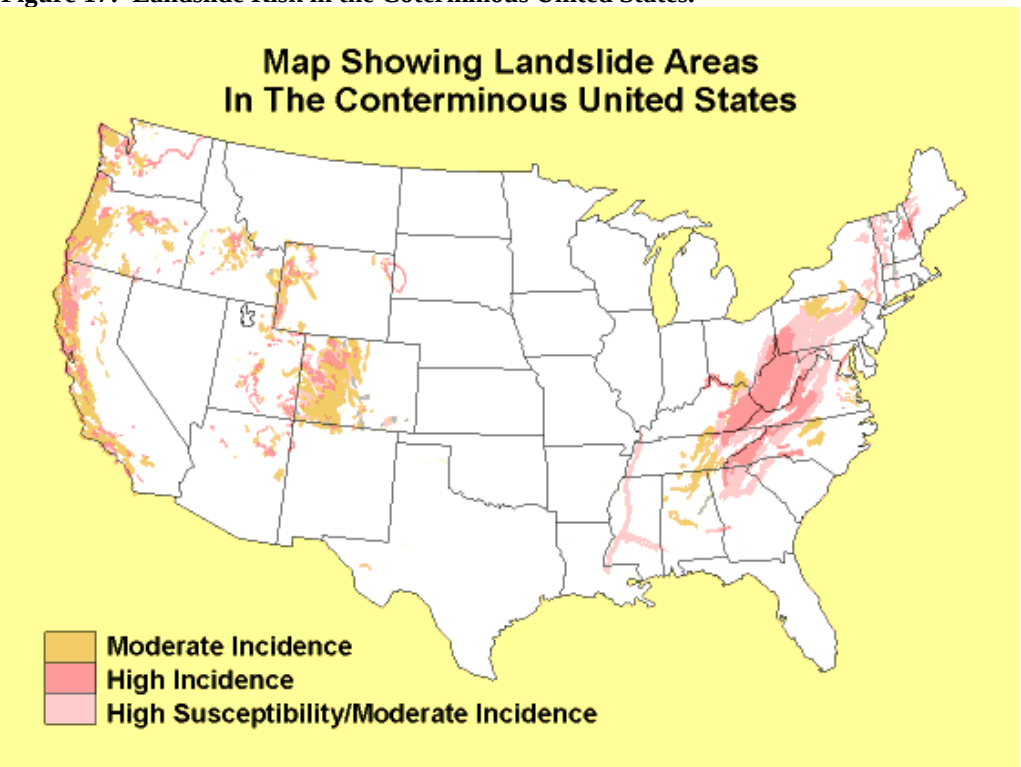
According to the United States Geological Survey (USGS), landslides are a major geologic hazard that happen in all 50 states, cause over $2 billion in damage annually, and result in 25 to 50 deaths each year (FEMA 2003). Landslides are can be caused by heavy rainfall, steepening of slopes by erosion or construction, alternate freezing or thawing cycles, earthquakes, and volcanic eruptions.

Although uncommon in the northern coastal plains, landslides are common throughout the mountainous Appalachian region due to the clay-rich soils. The USGS identifies landslide incidence/susceptibility for the eastern United States by:

Classifying geographic areas by high, medium, or low landslide incidence and
Evaluating geologic formations in these areas by high, medium, or low susceptibility to a landslide.

The North Carolina Division of Emergency Management has classified Edgecombe County as having a "Low" vulnerability to landslides. As shown in the *Local Hazard Mitigation Planning Manual*, the County has a landslide vulnerability value of 1. Again, the "Low" classification includes vulnerability values of 1 and 2. The categorization is based on a scale of 1-6 ("Low to High") for national landslide susceptibility and incidence for the conterminous United States. The value of 1 implies low landslide incidence and low landslide susceptibility, meaning that less than 1.5 percent of the area has been involved in a landslide.

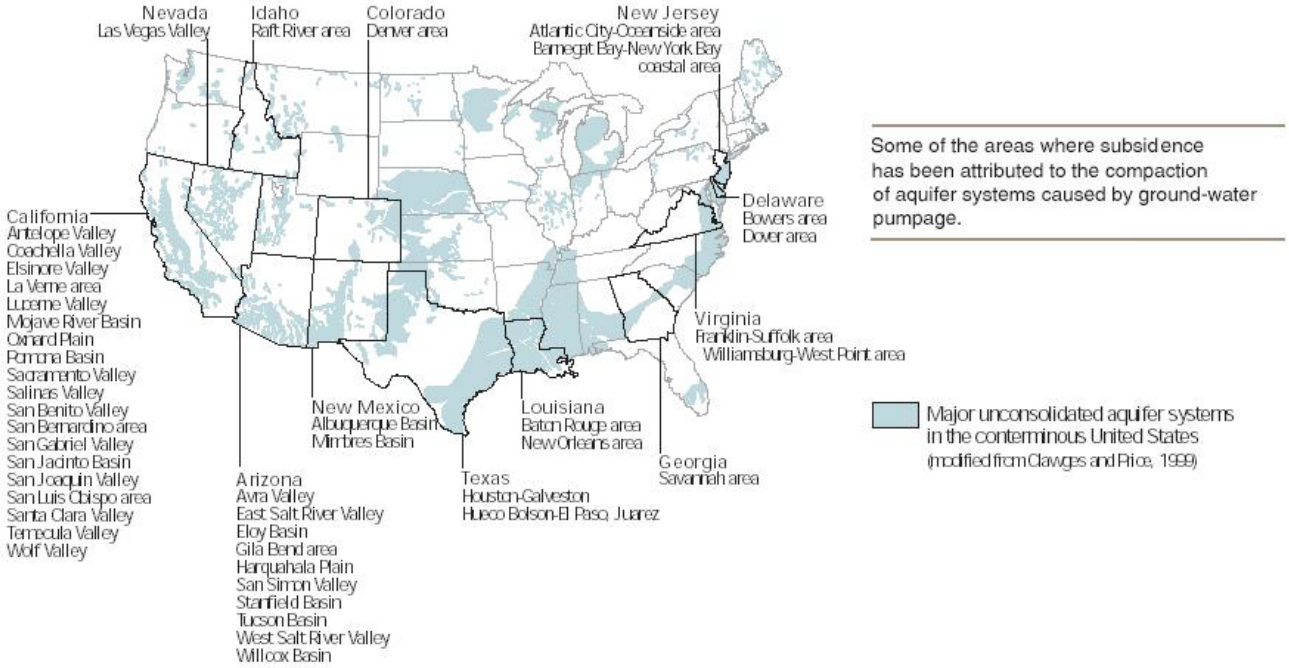
Figure 17: Landslide Risk in the Coterminous United States.



Source: USGS, Geographic Distribution of Major Hazards in the US.

FEMA notes that:
Areas that are generally prone to landslide hazards include existing old landslides; the bases of steep slopes; the bases of drainage channels; and developed hillsides where leach-field septic systems are used.
Areas that are typically considered safe from landslides include areas that have not moved in the past; relatively flat-lying areas away from sudden changes in slope; and areas at the top or along ridges, set back from the tops of slopes.
For most of Edgecombe County, steep slopes are not problematic for development purposes. Only one percent of the County has slopes that average greater than 10 percent. These slopes are found adjacent to drainage ways. Based on this information, landslides do not appear to pose a significant natural hazard risk for Edgecombe County.

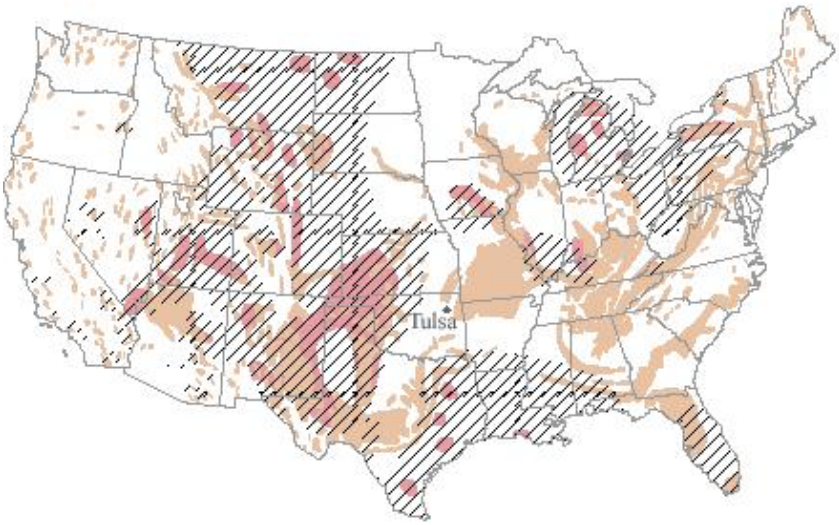
Sinkholes are when soil subsidence occurs into a natural void beneath the soil surface. Three distinct processes account for most of the water-related subsidence—compaction of aquifer systems, drainage and subsequent oxidation of organic soils, and dissolution and collapse of susceptible rocks (USGS). The compaction of aquifer systems is generally caused by the mining of groundwater for municipal and agricultural use. As the water is withdrawn from an unconsolidated aquifer, the weight of the soil and structures above can exceed the pressure once exerted by the water, and subsidence occurs.



Organic soils are found mostly in the northern United States and Alaska, though some exist in the lowland swamps of the Southeast.

Most organic soils occur in the northern contiguous 48 States and Alaska.

Rock dissolution primarily occurs in areas of limestone or gypsum bedrock. Subsidence occurs when groundwater passes over soluble minerals in the bedrock, dissolving the bedrock. Eastern North Carolina does have some areas with this kind of bedrock.



Salt and gypsum underlie about 40 percent of the contiguous United States. Carbonate karst landscapes constitute about 40 percent of the United States east of Tulsa, Oklahoma (White and others, 1995).

Evaporite rocks—salt and gypsum
Karst from evaporite rock
Karst from carbonate rock
(modified from Davies and Legrand, 1972)

Sinkhole risk in Edgecombe County is primarily from unconsolidated aquifers. Though there is significant agricultural activity in the county, there is generally sufficient rainfall to recharge the aquifers. Sinkhole risk is therefore low.

3.11. Tsunamis

A tsunami a series of waves generated by an undersea disturbance such as an earthquake. From the area of the disturbance, the waves will travel outward in all directions, much like the ripples caused by throwing a rock into a pond. The time between wave crests may be from 5 to 90 minutes, and the wave speed in the open ocean will average 450 miles per hour. Very large inland lakes, such as North America's Great Lakes can also have tsunamis.

Japanese for "harbor wave," tsunamis reaching heights of more than 100 feet have been recorded. As the waves approach the shallow coastal waters, they appear normal and the speed decreases. Then as the tsunami nears the coastline, it may grow to great height and smash into the shore, causing much destruction.

Figure 18 Tsunami.

Tsunamis are caused by an underwater disturbance, usually an undersea earthquake. Landslides, volcanic eruptions, and even meteorites can also generate a tsunami. Tsunamis can originate hundreds or even thousands of miles away from coastal areas. Local geography may intensify the effect of a tsunami. Areas at greatest risk are less than 50 feet above sea level and within one mile of the shoreline.

Edgecombe County is 30 miles from Pamlico Sound, which is protected by the Outer Banks barrier island chain. It is roughly 70 miles to the open sea. Edgecombe County has a low risk of tsunamis because tsunamis generally do not impact that far inland.

3.12. Dam/Levee Failure

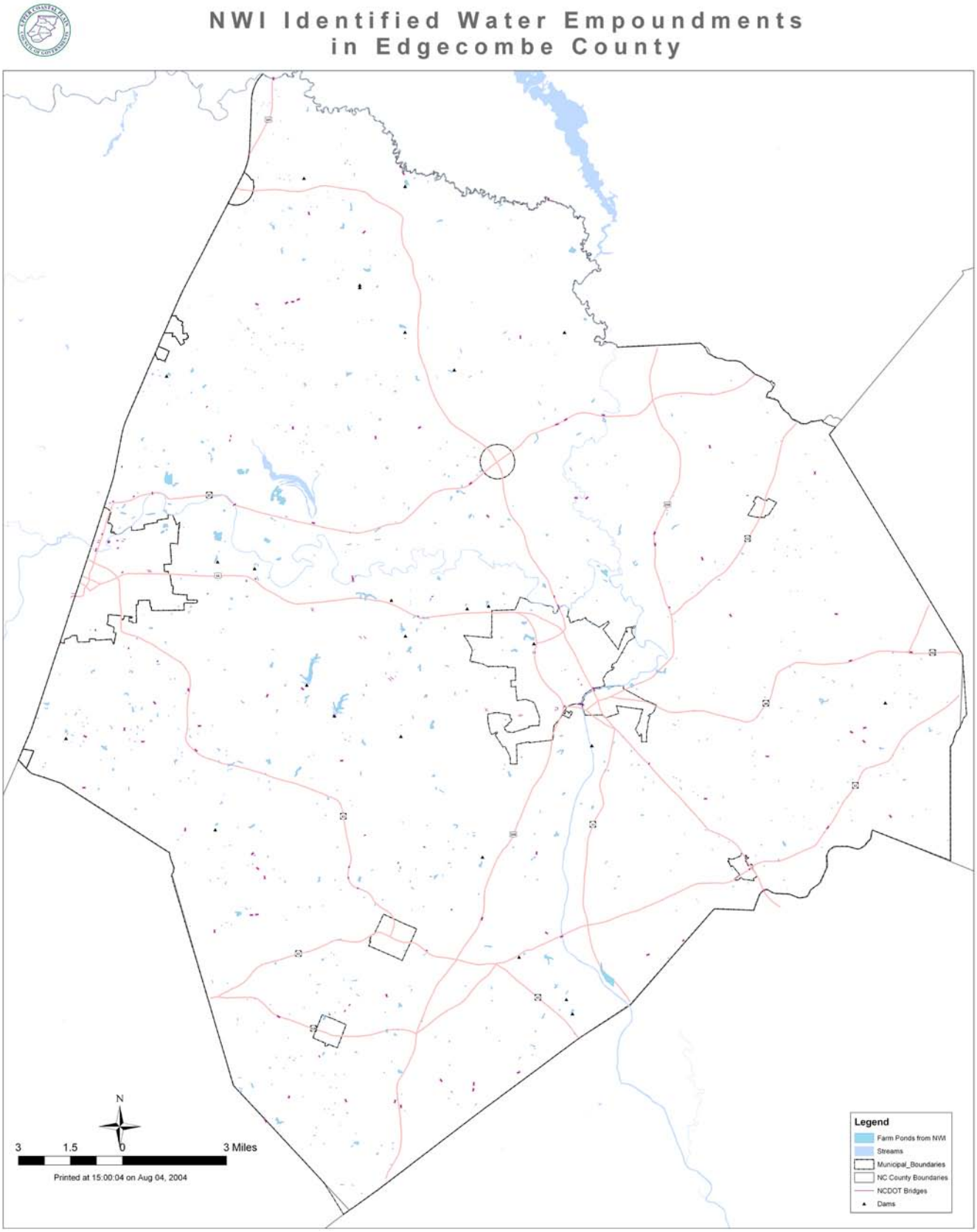
Dam and levee failure are generally caused by heavy precipitation events, and will result in flash flooding, covered in the flood section. In some high-magnitude general floods, levees can be breached but not destroyed, and this can result in a wider general flood rather than a flash flood. The general flood behind the levee can be prolonged as well, with the levee holding the water back on the "protected" side after the initial flood subsides.

The Army Corps of Engineers built a dike along the Tar River that protects Princeville form the high flood waters in most flood events. Edgecombe County maintains the dike with regular inspections and mowing, and the Corps performs an annual inspection as well. The high risk as deemed high because even though the likelihood of a breach is not high, the impact of a breach is catastrophic.

In addition, ponds of over 10 acre-feet (a water volume measurement equal to one foot of water on one acre of land) are regulated by the NC Department of Natural Resources' Land Management Division's Land Quality Section. This covers repairs to old dams and new dams not otherwise exempt (Corps of Engineer, TVA, SCS et cetera).

There are between 286 agricultural retention and irrigation ponds in Edgecombe County based on the National Wetlands Inventory. These are in various states of repair, but generally do not hold large volumes of water and are not near populated areas, and therefore they pose a low risk.

Figure 19: Impoundments and Levees from NWI.



3.13. Hazard Identification Synopsis

The Advisory Committee went through the background data for each hazard and reviewed the plan recommendation for potential risk based on the worksheet in Table 8: Hazard Identification Analysis Worksheet for the Town of Princeville. All other potential risks are generally in line with state's classifications.

Table 8: Hazard Identification Analysis Worksheet for the Town of Princeville.

Type of Hazard & Associated Elements	Likelihood of Occurrence (Highly Likely, Likely, Possible, Unlikely)	Intensity Rating (Intensity Scales or Relative Terms)	Potential Impact (Catastrophic, Critical, Limited, Negligible)	Conclusions (Rank the Seriousness of the Hazard)
Hurricane/Tropical Storm	Likely	Severe	Catastrophic	High
Nor'easters	Likely	Mild	Negligible	Low
Flooding	Highly Likely	Severe	Catastrophic	Very High
Coastal/Riverine Erosion	Unlikely	Mild	Negligible	Low
Freezes/Severe Winter Storms	Likely	Moderate	Limited	Moderate
Tornadoes/Strong Storms	Likely	Mild	Limited	Moderate
Wildfires/Forest Fires	Unlikely	Mild	Negligible	Low
Earthquakes	Unlikely	Mild	Negligible	Low
Drought	Unlikely	Mild	Limited	Low
Heat Wave	Likely	Moderate	Negligible	Moderate
Landslides/Sink Holes	Unlikely	Mild	Negligible	Low
Tsunamis	Unlikely	Mild	Negligible	Low
Dam/Levee Failure	Likely	Severe	Catastrophic	High

4. AREA VULNERABILITY ASSESSMENT

4.1. Residential Development Trends

There is no significant development and current population trends reflect a net population loss in Edgecombe County overall. In spite of this, there are pockets of development at the same time other parts of the county are "hollowing out." The numbers are relatively small and difficult to track. Princeville is conducting a special census to adjust their official population numbers; the 2000 Census was done while a number of residents were living in temporary housing due to Hurricane Floyd and the Town believes the 2000 count to be low.

4.2. Future Residential Development

There is no significant development and current population trends reflect a net population loss in Edgecombe County. Princeville had a spike in building permits due to rebuilding from Hurricane Floyd, but one reconstruction is complete that is expected to level off and trend similarly to the rest of the County. The Town anticipates around 24 new single family homes and one multi-family complex in the near future that will eventually house nearly 120 persons.

4.3. Commercial and Industrial Trends

Edgecombe County is ranked as a Tier 1 (most economic distress) county by the NC Department of Commerce. Unemployment is high and investment is slow compared to the booming metro areas of the Piedmont. To stimulate new enterprise, the County and Town work with the Carolinas Gateway Partnership to recruit new businesses to the area.

4.4. Future Commercial and Industrial Development

After Floyd, the Economic Development Administration help fund infrastructure improvements that resulted in some growth, notably the QVC distribution center outside of Tarboro. The Town will continue to work with the County and the Partnership to attract new businesses and industries.

4.5. Critical Facilities and Infrastructure Development Trends

4.5.1. Sewerage Treatment

The Town of Princeville has a collection system but purchases treatment capacity from Tarboro.

4.5.2. Public Water System

The Town obtains water from the Town of Tarboro, but maintains its own distribution system.

4.5.3. Municipal Electric System

Princeville is served by Edgecombe Martin Cooperative.

4.5.4. Schools

Schools are a County function.

4.5.5. Police

The Town has a police department with 2 officers.

4.5.6. Fire/EMS

The Town is served by a volunteer fire company.
EMS Services are provided by Edgecombe County.

4.5.7. Roads and Bridges

Most major bridges are NCDOT maintained.

4.5.8. Medical or Nursing Homes

none.

4.5.9. Dams

The Edgecombe County maintains an Army Corps of Engineers dike system along the Tar River that protects the Town

4.5.10. Shelters

none.

4.6. Future Critical Facility and Infrastructure Development

4.6.1. Public Water System
Edgecombe County is working to tie the systems together to share water resources in times of need. Otherwise no improvements are planned.

4.6.2. Sewerage Treatment Plants
The Town purchases sewer from the Town of Tarboro. No sewer system is planned at this time.

4.6.3. Schools. Etc.
Schools are a County function, no new schools are planned in the Princeville area in the near future.

4.7. Worksheet 2: Geographic Planning Area Vulnerability Assessment.

Geographic Planning Area: The Town of Princeville
Hazard: Flood and Steep Slope

Current Conditions The Town does not contain steep slope or floodplain.				Potential Future Conditions		
Type of Development	Number of Existing Private Buildings	Current Value	Current Number of People	Projected Number of Private Buildings	Projected Value (If developed under existing policies)	Projected Number of People (If developed under existing policies)
Residential	769	$23,271,887	1,780	25	$3,680,000	117
Commercial	16	$387,989	410			
Industrial	1	$69,857	-			
Institutional (non-government)	27	$3,468,523	-			
Other	-	-	-			
Subtotal	789	$27,198,256	1,990	25	$3,680,000	117

Data was collected from the County Tax Office for areas that intersect with Hydrologic Soil types. Data was collected and totaled by County, Category, and Conditions.

Worksheet #2 Continued on next page…

Worksheet #2, continued from previous page.

Current Conditions				Potential Future Conditions		
Public Buildings and Critical Facilities						
Type of Facility	Number of Existing Public Buildings and Critical Facilities	Current Replacement Value	Current Number of People	Projected Number of Public Buildings and Critical Facilities	Projected Value	Projected Number of People
Sewage Treatment Plant	-	-	-	-	-	-
Water Treatment Plant	-	-	-	-	-	-
Hospital	-	-	-	-	-	-
Schools	-	-	-	-	-	-
Infrastructure (roads, bridges, drainage, etc.)	Data Unavailable	Data Unavailable	n/a	-	-	n/a
Police Station	-	-	-	-	-	-
Fire Station	-	-	-	-	-	-
Hazardous Materials Facilities	-	-	-	-	-	-
Government Offices	-	-	-	-	-	-
Emergency Shelters	-	-	-	-	-	-
Public Housing	-	-	-	-	-	-
Subtotal	-	-	-	-	-	-
Total	-	-	-	-	-	-

4.8. ANALYSIS OF ALL CRITICAL FACILITIES

There are 182 critical facilities identified countywide in the vulnerability analysis database, compiled from county parcel data and outlined in the Appendix of the County Plan. Many of the critical facilities throughout the county were improved and raised to an elevation above that of the highest level of the Hurricane Floyd flooding event. Despite these improvements, those facilities that flooded during Hurricane Floyd may be considered vulnerable. It is important to note that these buildings may not lie within the 100-year floodplain but their vulnerability during the most recent natural hazard requires attention. Ten of the 182 critical facilities experienced some level of flooding during the Hurricane Floyd event in the fall of 1999. These ten flooded facilities are:

Edgecombe County Flooded Facilities	
1. Princeville Volunteer Fire Department	6. Edgecombe County Courthouse
2. Conetoe Volunteer Fire Department	7. Town of Tarboro Fire Department
3. Tarboro Wastewater Treatment Plant	8. Ray Center (Town of Tarboro)
4. Edgecombe County Administration Building	9. Warehouse (Town of Tarboro)
5. Edgecombe County Maintenance Building	10. Garage (Town of Tarboro)

Additionally, the following Princeville facilities are located within the flood zone as identified by the mapping analysis:

1. Town Hall
2. Fire Department
3. Public Housing Units
4. Two Flash Flood prone areas as indicated on the map

5. CAPABILITY ASSESSMENT

This portion of the Plan assesses Town of Princeville's current capacity to mitigate the effects of the natural hazards identified in the Risk Assessment Chapter of the Plan. The assessment includes a comprehensive examination of the following local government capabilities:

- Staff & Organizational Capability
- Technical Capability
- Policy & Program Capability
- Fiscal Capability
- Legal Authority
- Political Climate

The purpose of conducting this capabilities assessment is to identify potential hazard mitigation opportunities available to Town of Princeville through its operation as a local government. Careful analysis should detect any existing gaps, shortfalls or weaknesses within existing government activities that could exacerbate community vulnerability. The assessment will also highlight the positive measures already in place or being done at the Town level, which should continue to be supported and enhanced if possible through future mitigation efforts.

The capabilities assessment serves as the foundation for designing an effective hazard mitigation strategy. It not only helps establish the goals and objectives for Town of Princeville to pursue under this Plan, but ensures that those goals and objectives are realistically achievable under given local conditions.

5.1. STAFF & ORGANIZATIONAL CAPABILITY

Town of Princeville has limited staff and organizational capability to implement hazard mitigation strategies.

Town of Princeville is governed by a 5-member Board of Commissioners who bear the responsibility of serving the people and improving the quality of life in the county. A Town Clerk hired by the commissioners, acts on their behalf and manages Town finances and services.

The Town has 4 departments to serve the residents of Town of Princeville and to carry out day-to-day administrative activities. These include the following:

- Administration (5 persons with an annual budget of $214, 047)
- Finance (2 persons with an annual budget of $142,698)
- Police (2 persons with an annual budget of $117,881)
- Public Works (1 person with an annual budget of $146,872).

5.2. TECHNICAL CAPABILITY

Town of Princeville has limited technical capability to implement hazard mitigation strategies.

Technical Expertise

Town of Princeville does have a full-time manager and a full-time clerk. The Town does not have a licensed engineer or related technical expert on staff, and has in the past relied upon outside contractors/consultants to perform a majority of any required technical work.

Information Technology (IT)
Town of Princeville does not have a department or person responsible for Information Technology (IT); the Town Manager handles technology concerns for the Town.

Geographic Information Systems (GIS)
GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially-referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations.

Town of Princeville currently has no GIS capability, but can draw on the resources of its contract engineer and the Upper Coastal Plain Council of Governments, of which the Town is a member.

Internet Access
The Town has email and staff access to the internet.

It is believed that Internet access will help further the Town's hazard mitigation awareness programs, but should be supplemented with more traditional (and less technical) means as well.

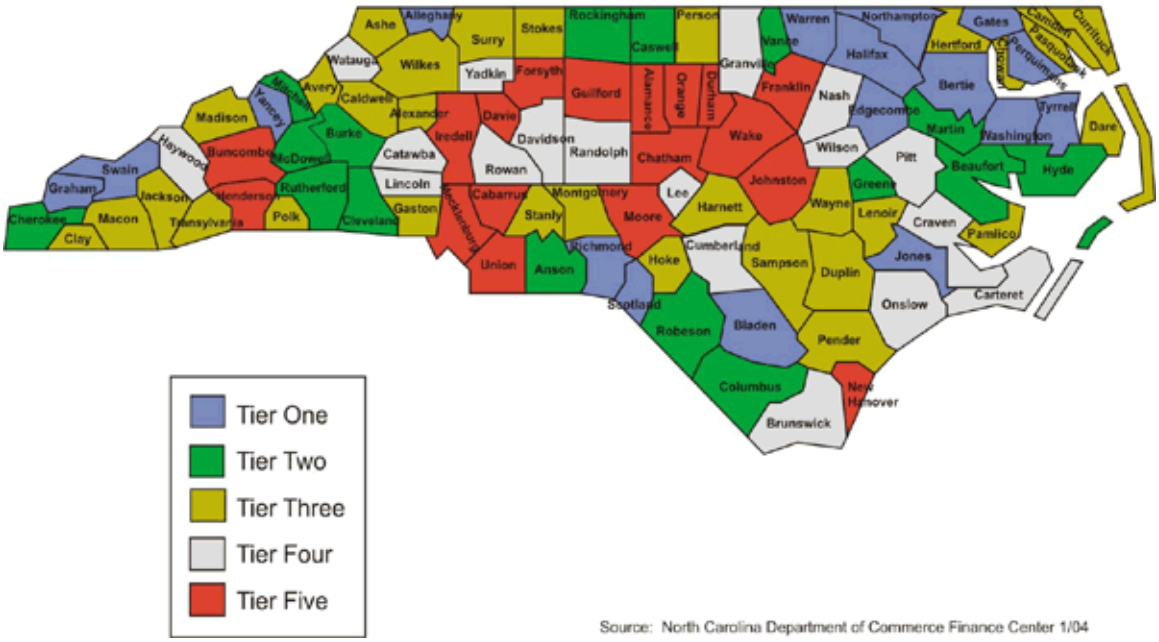
5.3. FISCAL CAPABILITY

Town of Princeville has very limited fiscal capability to implement hazard mitigation strategies.

It is highly unlikely that Town of Princeville could afford to provide the local match for the existing hazard mitigation grant programs if the State of North Carolina did not do so itself. Considering the current budget deficits at both the State and local government level, in North Carolina, combined with the apparent increased reliance on local accountability by the Federal government, this is a significant and growing concern for Town of Princeville.

The North Carolina Department of Commerce classifies counties into one of five tiers, with Tier 1 representing the most economically disadvantaged and Tier 5 the most prosperous. Tiers 1, 2 and 3 are considered "distressed" based on various economic and demographic characteristics. Northampton County is currently classified as a Tier 1 county, which makes it easier for the Town access to a special utilities fund, priority status for Community Development Block Grant funds for economic development, and a waiver of local matching fund requirements for CDBG funds and Industrial Development Fund loans and grants.

2004
NORTH CAROLINA TIER DESIGNATIONS



5.4. POLICY AND PROGRAM CAPABILITY

This part of the capabilities assessment includes the identification and evaluation of existing plans, policies, practices, programs, or activities that either increase or decrease the community's vulnerability to natural hazards. Positive activities, which decrease hazard vulnerability, should be sustained and enhanced if possible. Negative activities, which increase hazard vulnerability, should become targeted for reconsideration and be thoroughly addressed within Mitigation Strategy for Town of Princeville.

Included in this section are Plans, Ordinances, Laws, Policies, and Political Climate.

5.5. MITIGATION CAPABILITIES ASSESSMENT

5.5.1. Emergency Operations Plan

Town of Princeville does not have an Emergency Operations plan.

5.5.2. Floodplain Management Plan

Town of Princeville has a Flood Damage Prevention Ordinance as part of their participation in the National Flood Insurance Program (NFIP).

5.5.3. Stormwater Management Plan

Town of Princeville does not currently have an adopted stormwater management plan.

5.6. INVENTORY OF LOCAL ORDINANCES RELEVANT TO HAZARD MITIGATION

Town of Princeville has adopted several ordinances that are relevant to hazard mitigation. The following worksheet provides an inventory of these ordinances, along with specific information to be considered when developing this Plan's Mitigation Strategy. For each ordinance, the purpose is identified, a condensed description is provided, and a quantification of its "mitigation effectiveness" is listed (i.e. high, moderate or low). Additional information regarding each ordinance's mitigation effectiveness is provided under a notes column. This worksheet will continue to be revisited by Town of Princeville when considering how to strengthen its existing mitigation program through local ordinances.

5.6.1. Zoning Ordinance

The Town of Princeville adopted their Zoning Ordinance as part of their Municipal Code (Title XV: Land Usage, Chapter 150. Zoning). The Ordinance was passed on July 24, 1989.

Generally, this ordinance regulates land use and intensity of use throughout the jurisdiction. (LOW)

5.6.2. Manufactured Housing and Travel Trailer Park Ordinance

The Town regulates manufactured homes in the Zoning Ordinance and does not have a separate Manufactured Housing Ordinance.

5.6.3. State of Emergency Ordinance

The Town does not have a State of Emergency Ordinance.

5.7. LEGAL AUTHORITY

Local governments in North Carolina have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of North Carolina, which are (a) Regulation; (b) Acquisition; (c) Taxation; and (d) Spending.

The scope of this local authority is subject to constraints, however, as all of North Carolina's political subdivisions must not act without proper delegation from the State. Under a principle known as "Dillon's Rule," all power is vested in the State and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize North Carolina's enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

5.7.1. Regulation

5.7.1.1. General Police Power

North Carolina's local governments have been granted broad regulatory powers in their jurisdictions. North Carolina General Statutes (N.C.G.S.) bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances).

Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities and counties may include requirements for hazard mitigation in local ordinances. Local governments may also use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard (N.C.G.S. Ch. 160A Art. 8 (Delegation and Exercise of the General Police Power to Cities and Towns); Ch 153A, Art. 6 (Delegation and Exercise of the General Police Power to Counties)).

Town of Princeville has enacted and enforces regulatory ordinances designed to promote the public health, safety and general welfare of its citizenry. These ordinances are listed and further discussed in Worksheet 3 of this Section.

5.7.1.2. Building Codes And Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed through the building code.

North Carolina has a state mandatory building code, which applies throughout the state (N.C.G.S. 143-138(c)). However, municipalities and counties may adopt codes for their respective areas if approved by the state as providing "adequate minimum standards" (N.C.G.S. 143-138(e)). Local regulations cannot be less restrictive than the state code. Exempted from the state code are: public utility facilities other than buildings; liquefied petroleum gas and liquid fertilizer installations; and farm buildings outside municipal jurisdictions. No state permit may be required for structures under $20,000. (Note that exemptions apply only to state, not local, permits).

Local governments in North Carolina are also empowered to carry out building inspections. N.C.G.S. Ch. 160A, Art. 19. Part 5; and Ch. 153A Art. 18, Part 4 empower cities and counties to create an inspection department, and enumerates its duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, heating systems, etc.; building maintenance; and other matters. Town of Princeville has adopted the state building code, and contracts with Edgecombe County to carry out its building inspections.

5.7.1.3. Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls.
Each local community possesses great power to prevent unsuitable development in hazard-prone areas. See N.C.G.S. Ch. 160A, Art. 8. (Delegation and Exercise of the General Police Powers to Cities and Towns); Art. 19 (Planning); Part 3 (Zoning); and Ch. 153A. Art. 6 (Delegation and Exercise of the General Police Power to Counties); Art. 18 (Planning and Regulation of Development); Part 2 (Subdivision Regulation); and Part 3 (Zoning).

5.7.1.4. Planning

In order to exercise the regulatory powers conferred by the General Statutes, local governments in North Carolina are required to create or designate a planning agency (N.C.G.S. 160A-387). The planning agency may perform a number of duties, including: make studies of the area; determine objectives; prepare and adopt plans for achieving those objectives; develop and recommend policies, ordinances, and administrative means to implement plans; and perform other related duties (N.C.G.S. 160A-361). The importance of the planning powers of local governments is emphasized in N.C.G.S. 160A-383, which requires that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted "in accordance with a plan", the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community.
The Town of Princeville designates the Town Manager as the planning officer for the Town. The Town has a Land Use Plan which is referenced in the Town Code of Ordinances §150, page 1.

5.7.1.5. Zoning

Zoning is the traditional and most common tool available to local governments to control the use of land. Broad enabling authority for municipalities in North Carolina to engage in zoning is granted in N.C.G.S. 160A-381; and for counties in N.C.G.S. 153A-340 (counties may also regulate inside municipal jurisdiction at the request of a municipality (N.C.G.S. 160A-360(d)). The statutory purpose for the grant of power is to promote health, safety, morals, or the general welfare of the community. Land "uses" controlled by zoning include the type of use (e.g., residential, commercial, industrial) as well as minimum specifications for use such as lot size, building height and set backs, density of population, etc. Local governments are authorized to divide their territorial jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts (N.C.G.S. 160A-382). Districts may include general use districts, overlay districts, and special use districts or conditional use districts. Zoning ordinances consist of maps and written text.
Town of Princeville has adopted zoning.

5.7.1.6. Subdivision Regulations

Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Flood-related subdivision controls typically require that subdividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas.

Subdivision regulations require that subdivision plans be approved prior to the division/sale of land. Subdivision regulations are a more limited tool than zoning and only indirectly affect the type of use made of land or minimum specifications for structures.

Broad subdivision control enabling authority for municipalities is granted in N.C.G.S. 160-371, and in 153-330 for counties outside of municipalities and municipal extraterritorial planning jurisdictions (ETJs). Subdivision is defined as all divisions of a tract or parcel of land into two or more lots and all divisions involving a new street (N.C.G.S. 160A-376). The definition of subdivision does not include the division of land into parcels greater than 10 acres where no street right-of-way dedication is involved (N.C.G.S. 160A-376(2)).

The Town of Princeville has no adopted a Subdivision Ordinance, but works with the County and rules in the Zoning Ordinance to insure orderly development.

5.7.1.7. Floodplain Regulation

In the Summer of 2000, the North Carolina General Assembly adopted Senate Bill 1341, entitled "An Act to Prevent Inappropriate Development in the One Hundred-Year Floodplain and to Reduce Flood Hazards." This act was proposed through the North Carolina Department of Environment and Natural Resources in the wake of Hurricane Floyd and the catastrophic flooding that followed.

Under the Act, the North Carolina General Statutes regulating development within floodways were rewritten to include floodplain regulation (N.C.G.S. 143- 214.51-214.61). The purpose of the new law is to (1) minimize the extent of floods by preventing obstructions that inhibit water flow and increase flood height and damage; (2) prevent and minimize loss of life, injuries, property damage and other losses in flood hazard areas; and (3) promote the public health, safety and welfare of citizens of North Carolina in flood hazard areas.

The new statute affects local governments by directing, not mandating, that local government entities: (1) designate a one hundred-year floodplain; (2) adopt local ordinances to regulate uses in flood hazard areas; (3) enforce those ordinances, and (4) grant permits for use in flood hazard areas that are consistent with the ordinance. The act also makes certain that local ordinances meet the minimum requirements of participation in the National Flood Insurance Program (NFIP).

The incentive for local governments adopting such ordinances is that they will afford their residents the ability to purchase flood insurance through the NFIP. In addition, communities with such ordinances in place will be given priority in the consideration of applications for loans and grants from the Clean Water Revolving Loan and Grant Fund. Additional points may be awarded for actions taken toward the implementation of a comprehensive land-use plan, such as the adoption of a zoning ordinance or any other measure that significantly contributes to the implementation of the comprehensive land-use plan and the flood hazard prevention ordinance.

The statute establishes minimum standards for local ordinances and provides for variances for prohibited uses as follows:

A flood hazard prevention ordinance adopted by a county or city pursuant to this Part shall, at a minimum:

- Meet the requirements for participation in the National Flood Insurance Program and of this section.

- Prohibit new solid waste disposal facilities, hazardous waste management facilities, salvage yards, and chemical storage facilities in the 100-year floodplain except as authorized under subsection (b) of this section.
- Provide that a structure or tank for chemical or fuel storage incidental to a use that is allowed under this section or to the operation of a water treatment plant or wastewater treatment facility may be located in a 100-year floodplain only if the structure or tank is either elevated above base flood elevation or designed to be watertight with walls substantially impermeable to the passage of water and with structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy.

A flood hazard prevention ordinance may include a procedure for granting variances for uses prohibited under N.C.G.S. 143-215.54(c). A county or city shall notify the Secretary [of Crime Control and Public Safety] of its intention to grant a variance at least 30 days prior to granting the variance. A county or city may grant a variance upon finding that all of the following apply:

- The use serves a critical need in the community.
- No feasible location exists for the location of the use outside the 100-year floodplain.
- The lowest floor of any structure is elevated above the base flood elevation or is designed to be watertight with walls substantially impermeable to the passage of water and with structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy.
- The use complies with all other applicable laws and regulations.

The Town of Princeville has significant flood zone areas and a Flood Damage Prevention Ordinance.

5.7.1.8. Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely “hazardproofing” a particular piece of property or area is to acquire the property (either in fee or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. North Carolina legislation empowers cities, towns, counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain (N.C.G.S. Ch 153A. Art. 8; Ch. 160A. Art. 11).

Town of Princeville has not used acquisition as a local mitigation tool, but worked with Edgecombe County for the post-Floyd buyout process.

5.7.1.9. Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by North Carolina law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the power to set preferential tax rates for areas which are more suitable for development in order to discourage development in otherwise hazardous areas.

Local units of government also have the authority to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving beach erosion control or flood and hurricane protection works within a designated area

(N.C.G.S. §160A-238). This can serve to increase the cost of building in such areas, thereby discouraging development.

Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing to the new property owners the costs of the infrastructure required by new development.

Table 9 Edgecombe County Tax Rates (Source: NC Dept. of Revenue).

Entity	Last Re-evaluation	2003-2004 Tax Rate per $1000 Valuation	Other ($)	City ($)	Total ($)	*Special district rates for each County are given in the notes. Noted also are district rates levied by municipalities*
Edgecombe County	2001	0.91			0.91	12 Fire Districts: S. Edgecombe, $0.03
Conetoe		0.91	0.07	0.20	1.18	Conetoe, Heartsease, Speed: $0.07
Leggett		0.91		0.25	1.16	Davenport, Leggett, Lewis: $0.04
Macclesfield		0.91		0.45	1.36	Harrison, Macclesfield, W. Edgecombe: $0.05
Pinetops		0.91		0.36	1.27	Sharp Point, Tri-County: $0.06
Princeville		0.91		0.78	1.69	Princeville: $0.08
Rocky Mount						
In Edgecombe		0.91		0.50	1.41	
In Nash		0.66	***	0.50	1.36	*** Rocky Mount downtown municipal service district: $0.20
Sharpsburg						
In Edgecombe		0.91	0.05	0.45	1.41	
In Nash		0.66		0.45	1.11	
In Wilson		0.72	0.05	0.45	1.22	
Speed		0.91		0.25	1.16	Conetoe, Heartsease, Speed: $0.07
Tarboro		0.91		0.42	1.33	
Whitakers						
In Edgecombe		0.91		0.69	1.60	
In Nash		0.66		0.69	1.35	

Town of Princeville does levy property taxes, but does not use any preferential tax districts or special assessments for purposes of guiding growth and development.

5.7.1.10. Spending

The fourth major power that has been delegated from the North Carolina General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles can be made a routine part of all spending decisions made by the local government, including the adoption annual budgets and a Capital Improvement Plan (CIP).

A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive.

In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools can also influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs.

5.8. POLITICAL WILLPOWER

Most Town of Princeville residents are quite knowledgeable about the potential hazards that their community faces, and in recent years, they have become more familiar with the practices and principles of mitigation. Flood prone structures in neighboring communities have been elevated or acquired through buyout programs associated with the fallout from Hurricane Floyd. It is strongly believed that such tangible and visual changes within the community have created a greater sense of awareness among local residents, and that hazard mitigation is a concept that they readily accept and support. Because the residents and constituents understand the importance of mitigating the effects of a Floyd- or Hazel-scale disaster, it is expected that the current and future political climates are favorable for supporting and advancing future hazard mitigation strategies.

6. HAZARD MITIGATION GOALS

The strategies and goals of this Plan are primarily in the public education and policy realm. The goals are broad in scope and are followed by specific measures to put the goals into practice. Implementation measures are the steps taken to carry out the goals While goals are broad in scope—the ends, the implementation measures are more specific—the means to achieve the ends.

6.1. Mitigation Goal 1—General

6.1.1. Continue to use and administer existing policies such as North Carolina Building Code and the Flood Damage Prevention Ordinance.

6.2. Mitigation Goal 2—Existing Structures

6.2.1. Continue to work with the Army Corps on Engineers for dike maintenance

6.3. Mitigation Goal 3—Natural Resources Protection/Future Development

6.3.1. Continue to use the Tar-Pamlico 50' undisturbed riparian vegetative buffer rule for new development.

6.4. Mitigation Goal 4—Education

6.4.1. Complete the formal adoption of new flood elevation maps

6.4.2. Educate the public about various hazards and steps they can take to protect themselves.

7. HAZARD MITIGATION POLICIES

7.1. Policy 1—General Hazard Mitigation/All Hazards Addressed

7.1.1. Continue to contract with Edgecombe County to enforce the North Carolina Building Code (Wind loads for Tornado, Operable Heat for Winter Storms/Freezes)

7.1.1.1.Continue to administer Municipal ordinances and codes

7.2.Policy 2—Flooding (also includes Severe Storms, Hurricanes, Tropical Storms, and Nor'easters)

7.2.1. Work with responsible agencies to maintain Dikes and Dams

7.2.2. Improve bridges and culverts/drainage on NCDOT roads

7.3.Policy 3—Heat Wave

7.3.1. Work with the County to designate and publicize cooling stations

7.3.2. Coordinate with the County and the Area Agency on Aging for their Elderly Fan Distribution Program

7.4.Policy 4—Severe Weather (including Strong Storm and Tornado)

7.4.1. Continue enforcement of North Carolina Building Code.

8. MITIGATION GOALS AND POLICIES—UPDATES AND MONITORING

The Town of Princeville will work with the County by continuing to update and monitor the plan in a variety of ways:

- Continued annual meetings of the Advisory Committee as arranged by the Town Manager, with a regular review of progress on implementation policies;
- Annual Advisory Committee meeting will meet during a designated month that will be proposed as an agenda item on the planning board;
- The Advisory Committee can choose to add new goals and policies as the need arises in order to respond quickly to changing conditions;
- Incorporate an update of man-made hazard types from the 2001 plan into this plan;
- Continued work on lowering the Community Flood Rating score and submittal of CFR reports to FEMA and the State Hazard Mitigation Officer (SHMO) by the staff at least annually. The public will be able to access the plan on the internet or at the Planning Department in City Hall during business hours.

In five (5) years from the adoption of this plan, the Town of Princeville with cooperation from the County will revisit this plan to assess progress, evaluate existing programs, and add new goals as needed. The Advisory Committee will evaluate progress annually as part of the CFR process and forward report to the SHMO.

At the regular five-year updates required by the Disaster Mitigation Act of 2000 (DMA2K) the Town will use the following questions as criteria for assessing the effectiveness and appropriateness of their plan:

- Do the goals and objectives address current and expected conditions?
- Has the nature or magnitude of risks changed?
- Are the current resources appropriate for implementing the plan?
- Are there implementation problems, such as technical, political, legal or coordination issues with other agencies?
- Have the outcomes occurred as expected?
- Did the agencies and other partners participate in the plan and planning process as proposed?

This evaluation will include how well the goals address current and expected conditions, the nature and magnitude of the risks and if there has been change in either, current resources, problems, outcomes from successfully completed goals, and how other partners may be involved to maximize benefit and minimize cost. The five year update will also be submitted to the SHMO for approval by the State and FEMA.

9. APPENDIX

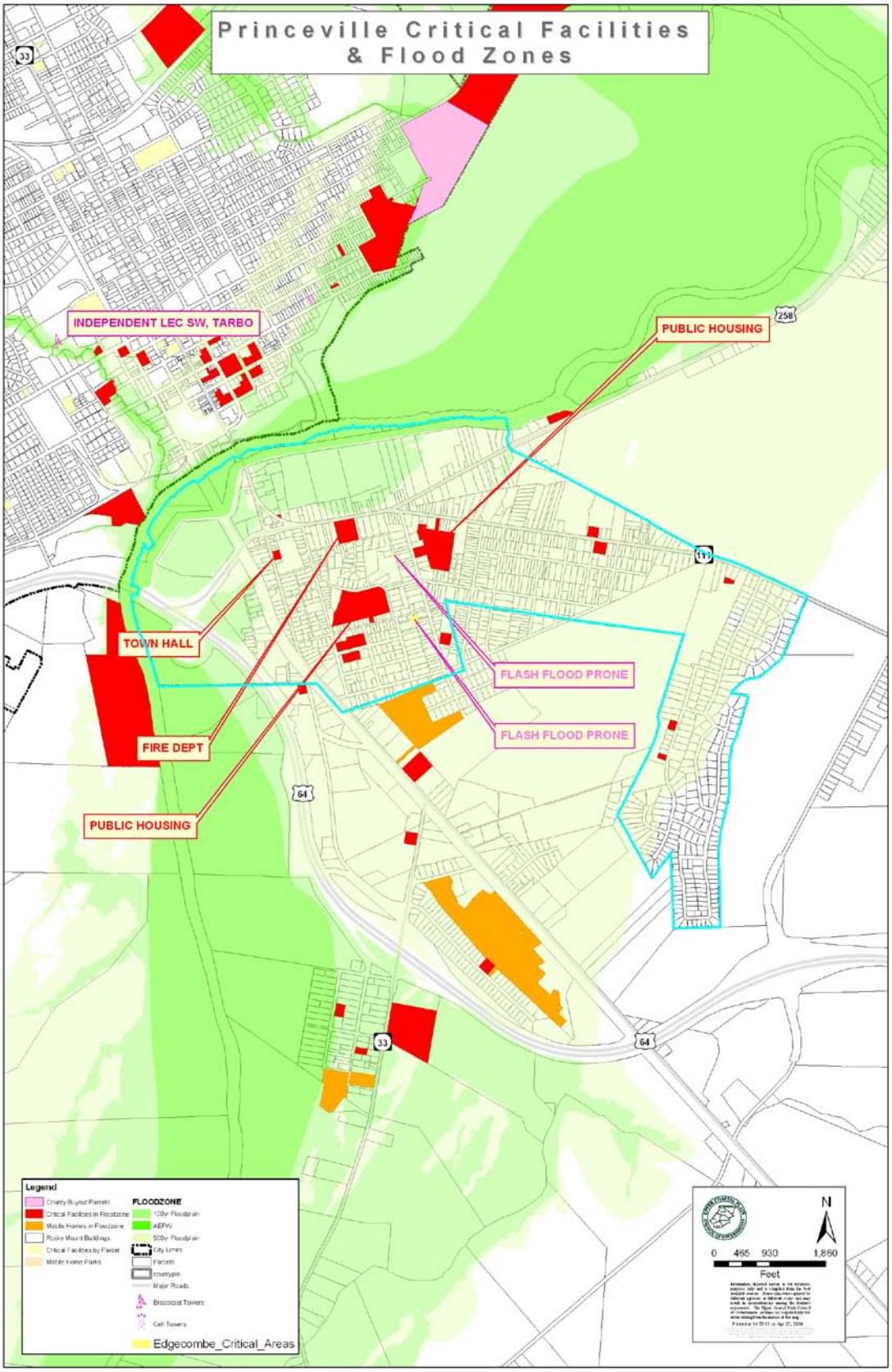

Princeville Critical Facilities
& Flood Zones
INDEPENDENT LEC SW, TARBO
PUBLIC HOUSING
TOWN HALL
FIRE DEPT
PUBLIC HOUSING
FLASH FLOOD PRONE
FLASH FLOOD PRONE
33
258
64
Legend
County Buyout Parcels
Critical Facilities in Floodzone
Mobile Homes in Floodzone
Rocky Mount Buildings
Critical Facilities by Parcel
Mobile Home Parks
FLOODZONE
100yr Floodplain
AEFW
500yr Floodplain
City Limits
Parcels
countypin
Major Roads
Broadcast Towers
Cell Towers
Edgecombe_Critical_Areas
N
0 465 930 1,860
Feet

Table 10 Worksheet #4: Community Goals.

Goal Category	Goal Statements	New or Existing Goal?		Hazard Threat Addressed
Existing structures	Continued cooperation with the Army Corps of Engineers for dike maintenance will help continue the prevention of major flooding in flood prone areas.	New	**Existing**	Flooding; Hurricane; Tornado; Tropical Storm; Severe Storm; Freezes / Severe Winter Storms; Nor'easters
Natural Resources Protection	A 50' undisturbed riparian vegetation buffer through the Tar-Pamlico River Watershed for new development will help to protect commercial forest, along with Livestock Operations and Agricultural Lands, from flooding which could severely damage lands and such operations.	New	**Existing**	Flooding
Future Development	With a designated buffer zone for new development damaged property can be reduced or even eliminated.	New	**Existing**	Flooding
Public Education	Adoption of the new flood maps will educate the public as to areas which are more prone to Flooding. This as an effect will help identify areas less suitable for development and other land usage.	New	**Existing**	Flooding
General	Continued use of the North Carolina Building Code and Flood Damage Prevention Ordinance will help guide land use and Hazard Mitigation.	New	**Existing**	All emergencies
Public Education Outreach	Educate the public by providing information on various Hazards which will also provide steps the public can take to help better prepare and deal with Hazards.	New	**Existing**	Various ones, Heat Wave

Table 11 Worksheet # 5: Geographic Planning Area Policies.

Geographic Planning Area: Princeville

Policy (classify each as a new initiative, a continuation and support of existing policies, or a recommended change to an existing policy)	**Type(s) of Hazard Targeted**	**Funding** (amount and source; local match required?)	**Responsible Party/Start & Completion Dates**	**Benchmarks and Indicators of Progress** (Monitoring and Evaluation)	**Priority** (high, medium, low)
(New) Work with the County to establish and publicize Cooling Stations	Heat Wave	N/A – Existing Revenue Stream	Coordinate with County	Continued participation with county agencies	Medium
(New) Elderly Fan Distribution Program	Heat Wave	N/A – Existing Revenue Stream	Coordinate with County	Continued participation with county agencies	Medium
(Continuation) Continue enforcement of North Carolina Building Code	Severe Weather and Winter Weather, Strong Storm and Tornado	N/A – Existing Revenue Stream	Coordinate with County	Enforce Building Codes	Medium
(Continuation) Maintain ordinances and Codes	All	N/A – Existing Revenue Stream	Coordinate with County	Enforce Ordinances and Codes	Medium
(Continuation) Work with responsible agencies to maintain Dikes and Dams	Flood	N/A – Existing Revenue Stream	Coordinate with County	Dikes and Dams are maintained with out failure	Medium
(Continuation) Improve bridges and culverts/drainage on NCDOT roads	Flood	N/A – Existing Revenue Stream	Coordinate with County	Bridges and Culverts/Drainage maintained	Medium
(New) Work with the County to establish and publicize Cooling Stations	Heat Wave	N/A – Existing Revenue Stream	Coordinate with County	Continued participation with county agencies	Medium