

### 3.1 IDENTIFYING HAZARDS

Horry County is vulnerable to a wide variety of natural hazards that threaten life and property. The Natural Hazards that affect Horry County are summarized in the following table.

HAZARD	HOW IDENTIFIED	WHY IDENTIFIED
<b>Hurricane</b>	<ul style="list-style-type: none"> <li>* Review of Past Disaster Damage from FEMA</li> <li>* Local Emergency Management Office Records</li> <li>* Review of Hazard Data from the NCDC Website.</li> </ul>	<ul style="list-style-type: none"> <li>* 1989 thru 2004 five Presidential Disaster Declarations</li> <li>* The Coastal location of Horry County in the Southeastern United States</li> </ul>
<b>Flooding</b>	<ul style="list-style-type: none"> <li>* Review of Past Disaster Damage from FEMA</li> <li>* Local Emergency Management Office Records</li> <li>* Public Input</li> <li>* Review of FIRM Maps</li> </ul>	<ul style="list-style-type: none"> <li>* Varied Impacts – Severe to Minor</li> <li>* The Geographical Features show many streams, rivers</li> <li>* Maps show many flood prone areas</li> <li>* Review of Existing Reports</li> </ul>
<b>Tornados</b>	<ul style="list-style-type: none"> <li>* Review of Past Disaster Damage</li> <li>* Review of Hazard data from The NCDC website</li> <li>* Public Input</li> <li>* Wind Zone Map of United States</li> </ul>	<ul style="list-style-type: none"> <li>* Numerous Past Events</li> <li>* The NCDC website show All of Horry County affected</li> <li>* Local Records identified events</li> <li>* Wind Zone Maps identifies region in the Zone III Wind Area of + 200mph.</li> </ul>
<b>Severe Thunderstorms and Wind</b>	<ul style="list-style-type: none"> <li>* Review of Past Disaster Data from the NCDC website</li> <li>* Hazard Assessment Survey</li> <li>* Local Emergency Management Records</li> </ul>	<ul style="list-style-type: none"> <li>* Many documented past events in the county</li> <li>* NCDC data shows extensive property damage</li> </ul>
<b>Severe Winter Storms</b>	<ul style="list-style-type: none"> <li>* Review of Past Disaster Damages from FEMA</li> <li>* Hazard Assessment Survey</li> <li>* Local Emergency Management Records</li> </ul>	<ul style="list-style-type: none"> <li>* Severe past events in County</li> <li>* Variety of events including</li> <li>* Snow and Ice Storms</li> </ul>
<b>Storm Surge</b>	<ul style="list-style-type: none"> <li>* Review of coastal repetitive loss properties</li> <li>* Local Emergency Management Records</li> <li>* Review of Hazard data from NCDC website</li> <li>* Hazard Assessment Survey</li> </ul>	<ul style="list-style-type: none"> <li>* The Coastal location of Horry County</li> <li>* Storm Surge Maps show a moderate risk area</li> <li>* Many repetitive loss properties in the storm surge risk area</li> </ul>

<b>HAZARD</b>	<b>HOW IDENTIFIED</b>	<b>WHY IDENTIFIED</b>
<b>Earthquake</b>	* Review of the South Carolina Earthquakes by the SC Seismic Network * Hazard Assessment Survey	* The location of a fault line through Charleston, South Carolina * The PGA shows Horry County as a PGA of 5%
<b>Wildfire</b>	* Local Emergency Management Records * Hazard Assessment Survey * County Fire Records	* Past Presidential Declaration * Large part of the county is Prime Forestland * 95% of the soils in Horry County have high or Moderate soil productivity potential.
<b>Lightning</b>	* Review of NCDC Website * Local Emergency Management Records	* Records indicate a high number of events with significant human and property loss.
<b>Drought</b>	* Review of Past Disaster Damage	* NCDC data shows 6 events from 1950-2004
<b>Extreme Heat</b>	* Hazard Assessment Survey * Review of NCDC website	* Local input identified the potential effect to the water table in the County.
<b>Tsunami</b>	*Tsunami hazard maps *Review of NCDC website	* Identified threat from Canary Islands & Puerto Rico
<b>MAN MADE HAZARDS THAT SIGNIFICANTLY IMPACT HORRY COUNTY</b>		
<b>HAZARD</b>	<b>HOW IDENTIFIED</b>	<b>WHY IDENTIFIED</b>
<b>HazMat</b>	* Hazard Assessment Survey * Local Emergency Management Records	* Several Hazardous Material Sites throughout Horry County * National Response Center (NRC)
<b>Terrorism (CBRNE)</b>	* Hazard Assessment Survey * Local Explosive Ordnance Disposal Team Records	* Heightened sense of security since September 2001
<b>Cyber Terrorism</b>	* Information Technology records	* Several attacks on Horry County IT department

The Horry County Mitigation Task Force identified these Hazards based on the historical evidence gathered from the South Carolina State Climatologic Center, the National Climatic Data Center, FEMA’s Hazard Mapping website, and the South Carolina Geological Survey. GIS information and historical data was also gathered and provided to the local jurisdictions. The local jurisdictions also had a wide range of data that identified what hazards affected the region based on the past experiences.

Through this process, there were hazards that were determined to not significantly affect Horry County, and therefore are not discussed further in the plan. This determination does not preclude the plan from including these hazards in future updates of the plan as new information is discovered concerning these types of hazards. The Mitigation Task Force will include any new information on hazard identification in future updates of this plan.

<b>HAZARDS THAT DO NOT SIGNIFICANTLY AFFECT HORRY COUNTY</b>		
<b>HAZARD</b>	<b>HOW IDENTIFIED</b>	<b>WHY IDENTIFIED</b>
<b>Dams/Levees</b>	* Review the State Hazard Assessment * DHEC Regulated Dams	* No Historical Damages * No High Hazard Dams in Horry County
<b>Hail</b>	* Review of NCDC website * Local Emergency Management Records	* NCDC data shows numerous events but very minor associated property and crop Damage

The hazards that do affect Horry County were split into two different categories: spatially defined hazards and non-spatially defined hazards. Spatially defined hazards are characterized by their ability to affect a certain area without affecting others due to the topography of the land. The spatially defined hazards identified by the Mitigation Task Force are flooding; storm surge; wildfire; and tsunami. Therefore, when addressing the non-spatially defined hazards in the risk assessment, all information presented will include the unincorporated Horry County and the participating jurisdictions while being referred to as “Horry County”.

### **3.2 PROFILING HAZARDS**

The following section provides a profile of each identified Hazard in Horry County. This portion of the plan identifies the following information:

1. A description of each identified hazard in the planning area and the location and extent that this hazard can affect the area.
2. A historical background on each identified hazard in the planning area and the probability of future hazard events occurring.
3. Maps of the locations and areas of the planning area affected by Hazard events.

The following Hazard Profiles have been created using the best available data from a variety of resources, including but not limited to the National Climatic Data Center, FEMA Hazard Mapping website, National Response Center (NRC), Environmental Protection Agency (EPA), Homeland Security Department (DHS), National Weather Service, National Hurricane Center, NASA, United States Landfall Probability Webpage, Federal Emergency Management, National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, South Carolina State Climate Office, South Carolina Department of Health and Environmental Control, Horry County Flood Mitigation Plan, newspaper articles, and personal accounts. Emergency Management staff researched and provided GIS hazard maps and historical documentation to the Mitigation Task Force and the LEPC for review.

The succeeding hazard maps were provided to the Mitigation Task Force for review and approval. Each jurisdiction reviewed and updated their maps pertaining to each individual hazard and jurisdictional risk assessment, as they deemed suitable. As hazards were addressed past events were also discussed focusing on how those events affected and impacted the community at that particular time. These events are documented throughout the plan with statistical background information from a variety of resources noted but not limited to the above.

The probability of future events is identified throughout the document according to the following chart. The chart is not an actual prediction, but based on regional data and local historical evidence. The Mitigation Task force and the Hazard Mitigation Plan Questionnaire guided the Emergency Management Staff to create the chart based on frequency of occurrence.

<b>Likelihood</b>	<b>Frequency of Occurrence</b>
<i>Highly Likely</i>	Probably will occur in the next 5-years
<i>Likely</i>	Probably will occur in the next 10-years
<i>Possible</i>	Probably will occur least once in the next 10-years
<i>Unlikely</i>	Less than 1% probability of occurring in the next 100-years
<i>Highly Unlikely</i>	Little to no probability of occurring in the next 100-years

### 3.2.1 HURRICANE

#### *Definition*

A hurricane is a tropical cyclone with winds that exceed 64 knots (74 mi/hr) and circulate counter-clockwise about the center in the Northern Hemisphere (clockwise in the Southern Hemisphere). A hurricane develops over warm waters and is caused by atmospheric instability created by the collision of warm air with cooler air.

Hurricane intensity is measured using the Saffir-Simpson Scale, ranging from 1 (minimal) to 5 (catastrophic). The scale categorizes hurricane intensity linearly based upon maximum sustained winds; minimum barometric pressure and storm surge potential, which are combined to estimate the potential flooding and damage to property given a hurricane's estimated intensity (see Saffir-Simpson Scale below).

**Saffir/Simpson Hurricane Scale**

Category	Wind Speeds	Effects	Surge (ft. above normal sea level)
One	Winds 74-95 mph	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal road flooding and minor pier damage.	4-5 feet
Two	Winds 96-110 mph	Some roofing material, door, and window damage to buildings. Considerable damage to vegetation, mobile homes, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of center. Small craft in unprotected anchorages break moorings.	6-8 feet
Three	Winds 111-130 mph	Some structural damage to small residences and utility buildings with a minor amount of curtain wall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures with larger structures damaged by floating debris. Terrain continuously lower than 5 feet ASL may be flooded inland 8 miles or more.	9-12 feet
Four	Winds 131-155 mph	More extensive curtain wall failures with some complete roof structure failure on small residences. Major erosion of beach. Major damage to lower floors of structures near the shore. Terrains continuously lower than 10 feet ASL may be flooded requiring massive evacuation of residential areas inland as far as 6 miles.	13-18 feet
Five	Winds greater than 155 mph	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Major damage to lower floors of all structures located less than 15 feet ASL and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5 to 10 miles of the shoreline may be required.	>18 feet

Scale: National Hurricane Center Website

***History of Hurricanes***

Horry County is subject to Hurricanes and Tropical Storms frequently throughout the tropical season, and although many tropical systems have effected Horry County, the last time the eye of a hurricane directly impacted Horry County was in 1954, Hurricane Hazel, a Category 4 Hurricane. Hurricane Hazel affected the northern portion Horry County the hardest, destroying buildings and infrastructure, as well as negatively impacting the local economy.



FEMA, Hurricane Hazel

Hurricane Hugo, a category three hurricane, graced South Carolina’s coast on September 22, 1989 and the statistics are staggering: 264,000 people evacuated, \$2 billion in agricultural damage, and 20 dead in South Carolina alone. Damage from Hurricane Hugo dwarfs all other disasters in South Carolina’s history. The entire storm itself lasted roughly 12hours; however the impact has lasted years. This disaster was the second largest claim event in the history of the National Flood Insurance Program, etc. Luckily its worst fury was spent on a relatively undeveloped area north of Charleston and area south of Conway.

August 26, 1998, the center of Hurricane Bonnie came within 70 miles of the Horry County coast as the storm tracked north during the afternoon and early evening. Highest wind reports were from the NNW, ranging as high as 82 MPH at the Cherry Grove pier, while at the Myrtle Beach Pavilion the highest gust was 76 MPH. Rainfall ranged as from 2 to nearly 4 inches. Widespread damage was heaviest in the northeast part of the county - mainly downed trees, wires and structural damage. Property damage was estimated at \$3.8 million. Ocean levels rose 2-3 feet above normal with no overwash. The area was declared a Federal Disaster.

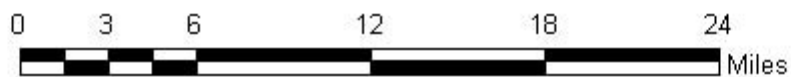
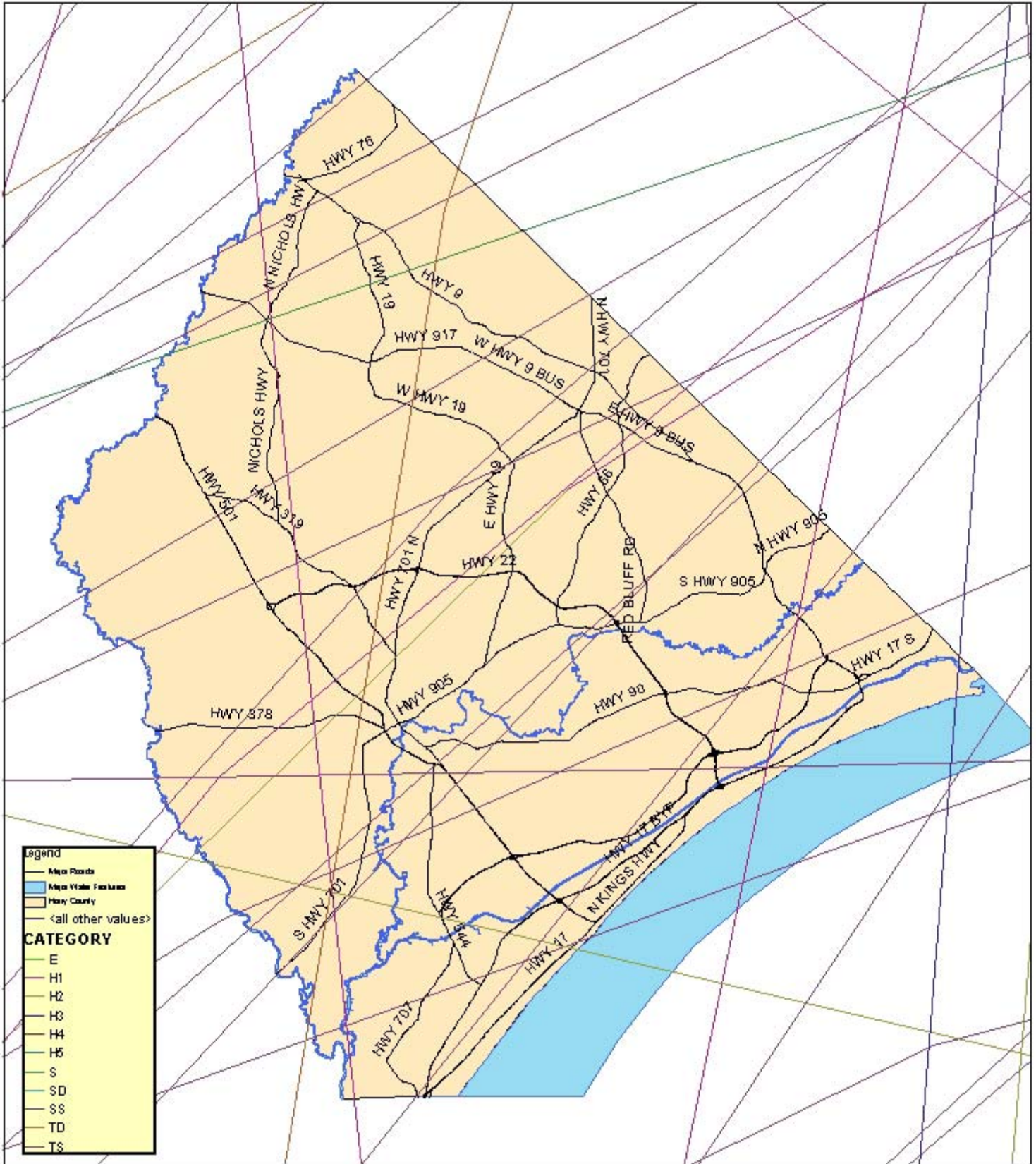
The following chart shows the category and number of hurricanes that have had a direct hit to South Carolina since 1900. Four out of the sixteen hurricanes hit Horry County directly. The two maps following this section provide insight to tropical systems that have affected Horry County. The first map illustrates all tropical systems that have affected Horry County, while the second shows only hurricanes that have had a direct hit to Horry County.

Area	Category Number					All (1-5)	Major (3-5)
	1	2	3	4	5		
South Carolina	8	4	2	2	0	16	4

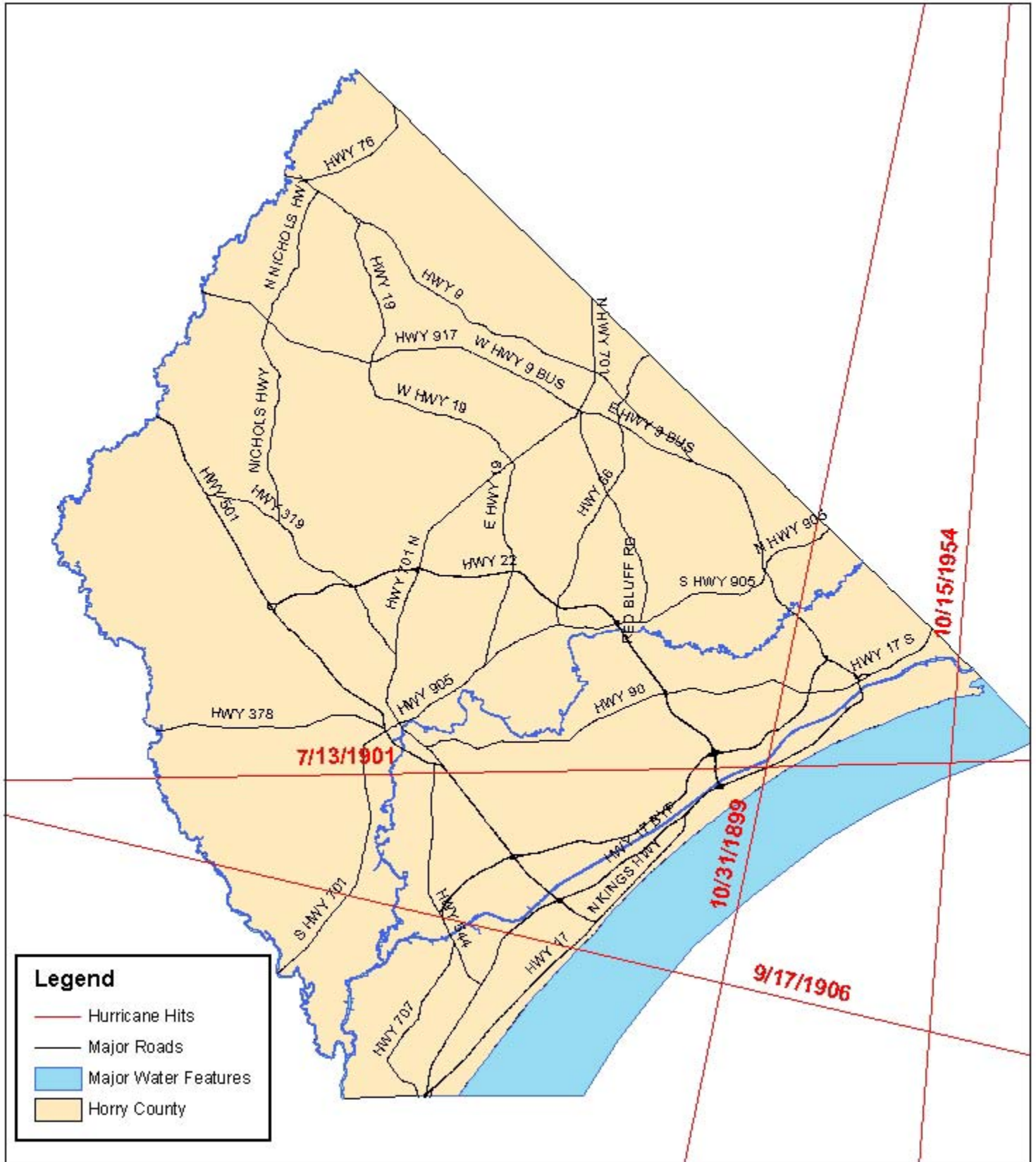
Source: National Weather Service (1900-2007)



# Horry County, South Carolina Historical Tropical Systems



# Horry County, South Carolina Historical Hurricane Direct Hits





*Summary and Conclusions of the Hurricane Profile*

The probability of a hurricane affecting our area is highly likely. Predictions for this year place the east coast at having a 49% chance for at least one major (category 3-5) hurricane landfall. The table below shows landfall probability for Horry County, including the participating jurisdictions, according to the predictions by William M. Gray and Philip J. Koltzback, of Colorado State University, for the 2005 Atlantic Hurricane Season. The probabilities were calculated by analyzing storms land falling wind speeds, central pressures (if available), and minimum sea level pressures at landfall, resulting from the total number of named storms from 1900-1999.

<b>Name</b>	<b>County - Prob. TS Force</b>	<b>County - Prob. TS Vicinity</b>	<b>County - 50 Year TS Prob.</b>	<b>County - Prob. H Force</b>	<b>County - Prob. H Vicinity</b>	<b>County - 50 Year H Prob.</b>	<b>County - Prob. IH Force</b>	<b>County - Prob. IH Vicinity</b>	<b>County - 50 Year IH Prob.</b>
Horry SC	2.2% (1.3%)	33.4% (20.5%)	46.7%	0.6% (0.3%)	10.7% (6.2%)	16.0%	<0.1%(<0.1%)	1.2% (0.7%)	1.8%

Source: The E-Transit Organization

### 3.2.2 FLOODING

#### *Definition*

Floods are one of the greatest natural disasters known to mankind. Flooding occurs when water accumulates faster than soil can absorb it or rivers can carry it away. Floods are a temporary overflow of water onto lands not normally covered by water and that are used or usable by man, producing measurable property damage/destruction or forcing evacuation of people and vital resources. The Horry County Flood Mitigation Plan was incorporated throughout this section of the plan.

Generally floods are the result of excessive precipitation, and are classified under two categories: **Flash flood which is** heavy localized precipitation in a short time period over a particular location and **general flooding**, which is caused by precipitation over a longer time period and over a given geographical area. The severity of a flooding event is determined by a combination of stream and river basin topography, precipitation and weather patterns, recent soil moisture conditions and the degree of vegetative clearing from the streams and rivers.

**Flood discharges and elevation:** The USGS network of stream flow gaging stations continuously provided information on the rising floodwaters from the rain associated with Hurricane Floyd. This real-time information was indispensable for Horry County Emergency Management and the rapid communication of flood information to National Weather Service river forecast centers, the U.S. Army Corps of Engineers, and the Federal Emergency Management Agency.

There are three flood gages used by the National Weather Service that collect data regarding the river levels in Horry County.

1. USGS 02110704 – Conway, SC  
Hydrologic Unit Code-03040206  
Latitude 33°49'47", Longitude 79°02'38"NAD27  
Gage datum -5.06 feet above sea level NGVD29
2. USGS 02110500 – Longs, SC  
Hydrologic Unit Code-03040206  
Latitude 33°54'45", Longitude 78°42'55"NAD27  
Drainage area-1,110.00square miles  
Gage datum 5.28 feet above sea level NGVD29
3. USGS 02110802 – Bucksport, SC  
Hydrologic Unit Code-03040206  
Latitude 33°38'56", Longitude 79°05'40"NAD27  
Gage datum -14.36 feet above sea level NGVD29

*Stream flow* is the discharge that occurs in a natural channel. Although the term “discharge” can be applied to the flow of a canal, the word “stream flow” uniquely describes the discharge in a surface stream course. The term “stream flow” is more general than “runoff” as stream flow may be applied to discharge whether or not it is affected by diversion or regulation.

*Gage depth* (G.H.) is the water-surface elevation referenced to the gage datum. Gage depth is often used interchangeably with the more general term “stage,” although gage depth is more appropriate when used with a reading on a gage. Below is a table describing floodwater effects, which is based on the Conway river gauge on the Waccamaw River, obtained from the National Weather Service in Wilmington.

STAGE	Areas Affected
4.50	Bankfull stage, no damage.
7.00	Minor flooding. Flooding of swamps and natural boat lands will occur.
8.00	Moderate flooding. Flooding occurs at some warehouse and at the city along the south portion of the right bank. Swamps heavily flooded.
9.00	Moderate flooding of secondary road/Business 501 and highway 905 to the east. Floodwaters will affect 20 homes in the Savannah Bluff area with water 1 foot deep in some. Floodwaters will also affect a few homes on Oak Street and Pitch Landing.
10.00	Major flooding. Floodwaters affect residences and roads in the Lees Landing, Savannah Bluff, Pitch Landing, Jackson Bluff, and Bucksville areas.
11.00	Major flooding. Flooding will worsen in residential areas while flooding also occurs in the basement of the Government Building at 4 <sup>th</sup> Avenue and Kingston. Conway Marina will flood and railroad trestles will flood at 11.5 feet.

Source: National Weather Service

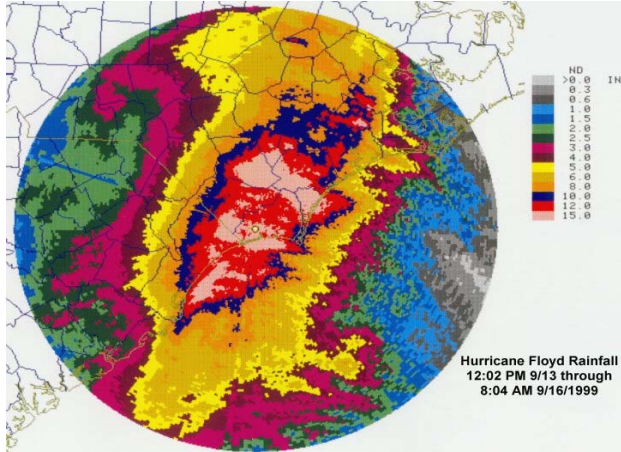
### ***History of Flooding***

According to the NCDC, Horry County and the participating jurisdictions have experienced 31 flood events since 1950. One of the most diverse was Hurricane Floyd, which brought three different floods to Horry County. During the storm, the intense rainfall could not drain away faster than it collected, flooding yards, parks, intersections, parking lots, building entrances and low lying areas. This water drained away as the rainfall intensity decreased.



The second flooding event occurred in mostly the City of Conway on the following day as the Crabtree Swamp watershed responded to the large rainfall. Because this is a relatively small watershed, the runoff from Floyd’s rain caused water to rise quickly. Since the Waccamaw was still low, Crabtree Swamp drained quickly. Homes along the Swamp in the north part of the City were only flooded for a few hours. (Conway, FHMP-1999)

The third flooding event started a few days after the storm when the runoff from the Waccamaw River watershed caused the river to rise. Because the Waccamaw's watershed is so large and flat, it took days for the storm water runoff to collect and flow into the river. This flood had the added hazard of water that had been polluted by farm runoff that included livestock waste. The water was much dirtier and more noxious than the water in the other two floods. And it stayed in or under buildings for up to 45 days. It also flooded several sewer pump stations, including those that serve the Horry County Emergency Operations Center and the County Dispatch Center.



Hurricane Floyd brushed the eastern South Carolina coast and made landfall near Cape Fear, North Carolina on *September 16, 1999*. Up to 18-inches of rainfall was recorded in parts of Horry County. Record flooding was documented at gaging station 02110500 (Waccamaw River near Longs, S.C.) with the peak discharge about 1.6 times higher than the 100-year flood recurrence interval discharge.

**Flood losses:** The full extent of the impact of Hurricane Floyd can never be completely measured due to secondary impacts that may never be recorded, but following is an overview of the impact this storm had in Horry County.

- More than 1,700 homes were damaged. Of those over 200 homes were substantially damaged which qualified them for assistance under the Hazard Mitigation Grant Program.
- An estimated 300 more homes had water in or near the crawlspaces but did not suffer any structural damage. However, many received damage to their outside air conditioning units, garages, and/or landscaping.
- Several sewer lift stations were damaged by flooding, in spite of a major sandbagging effort
- Over 25 streets and bridges were closed. Backups of several miles were common on the state highways during the flood.
- An untold number of families and businesses were disrupted due to direct flood damage or closing of the streets.
- There were very few reports of health problems, in spite of the heavily polluted water.
- An estimated \$45 million in adverse economic impact to Horry County in tourism and business dollars. (*Myrtle Beach Chamber of Commerce*)

<b>Floods in Horry County and Surrounding Jurisdictions</b>							
Source: The National Climatic Data Center							
Location or County	Date	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 Horry & Georgetown	05/22/1994	Flooding	N/A	0	0	500K	0
2 SCZ034>039>042 - 046	10/13/1994	Flash Flooding	N/A	0	0	2.0M	8K
3 Coastal Sc	10/13/1994	Coastal Flooding	N/A	0	0	25.0M	50K
4 Countywide	12/22/1994	Heavy Rains/flooding	N/A	0	0	80K	50K
5 HORRY	06/03/1995	Flash Flood	N/A	0	0	15K	0
6 HORRY	06/05/1995	Flash Flood	N/A	0	0	2K	0
7 SCZ34 - 46 - 50 - 49 - 48 - 47 -	08/14/1995	Beach Erosion & Coastal Flood	N/A	0	0	0	0
8 Myrtle Beach	08/24/1995	Urban Flood	N/A	0	0	0	0
9 Conway	07/10/1996	Flash Flood	N/A	0	0	0	0
10 Surfside Beach	08/27/1996	Flash Flood	N/A	0	0	200K	0
11 Garden City	10/08/1996	Flash Flood	N/A	0	0	0	0
12 Myrtle Beach	01/23/1998	Flash Flood	N/A	0	0	0	0
13 Garden City	02/03/1998	Flash Flood	N/A	0	0	0	0
14 Aynor	02/17/1998	Flash Flood	N/A	0	0	0	0
15 Myrtle Beach	07/31/1998	Flash Flood	N/A	0	0	0	0
16 Surfside Beach	08/20/1998	Flash Flood	N/A	0	0	0	0
17 Conway	09/03/1998	Flash Flood	N/A	0	0	0	0
18 Myrtle Beach	06/15/1999	Flash Flood	N/A	0	0	25K	0
19 Allsbrook	07/06/1999	Flash Flood	N/A	0	0	0	0
20 Socastee	09/07/1999	Flood	N/A	0	0	0	0
21 North Myrtle Beach	09/15/1999	Flood	N/A	0	0	0	0
22 North Myrtle Beach	10/17/1999	Flood	N/A	0	0	0	0
23 Socastee	07/13/2000	Flood	N/A	0	0	2.0M	0
24 Myrtle Beach	09/05/2000	Flash Flood	N/A	0	0	0	0
25 Myrtle Beach	09/18/2000	Flash Flood	N/A	0	0	10K	0
26 North Myrtle Beach	09/18/2000	Flash Flood	N/A	0	0	75K	0
27 Garden City	09/18/2000	Flash Flood	N/A	0	0	25K	0
28 Surfside Beach	03/20/2001	Flash Flood	N/A	1	0	50K	0
29 Conway	06/25/2001	Flood	N/A	0	0	0	0
30 Myrtle Beach	07/02/2001	Flood	N/A	0	0	0	0
31 North Myrtle Beach	09/01/2006	Flash Flood	N/A	0	0	0	0
Totals:				1	0	29.982M	108K
<b>Limitation of Dataset:</b>							
◦ Data Set is limited to 1950 – 2007							

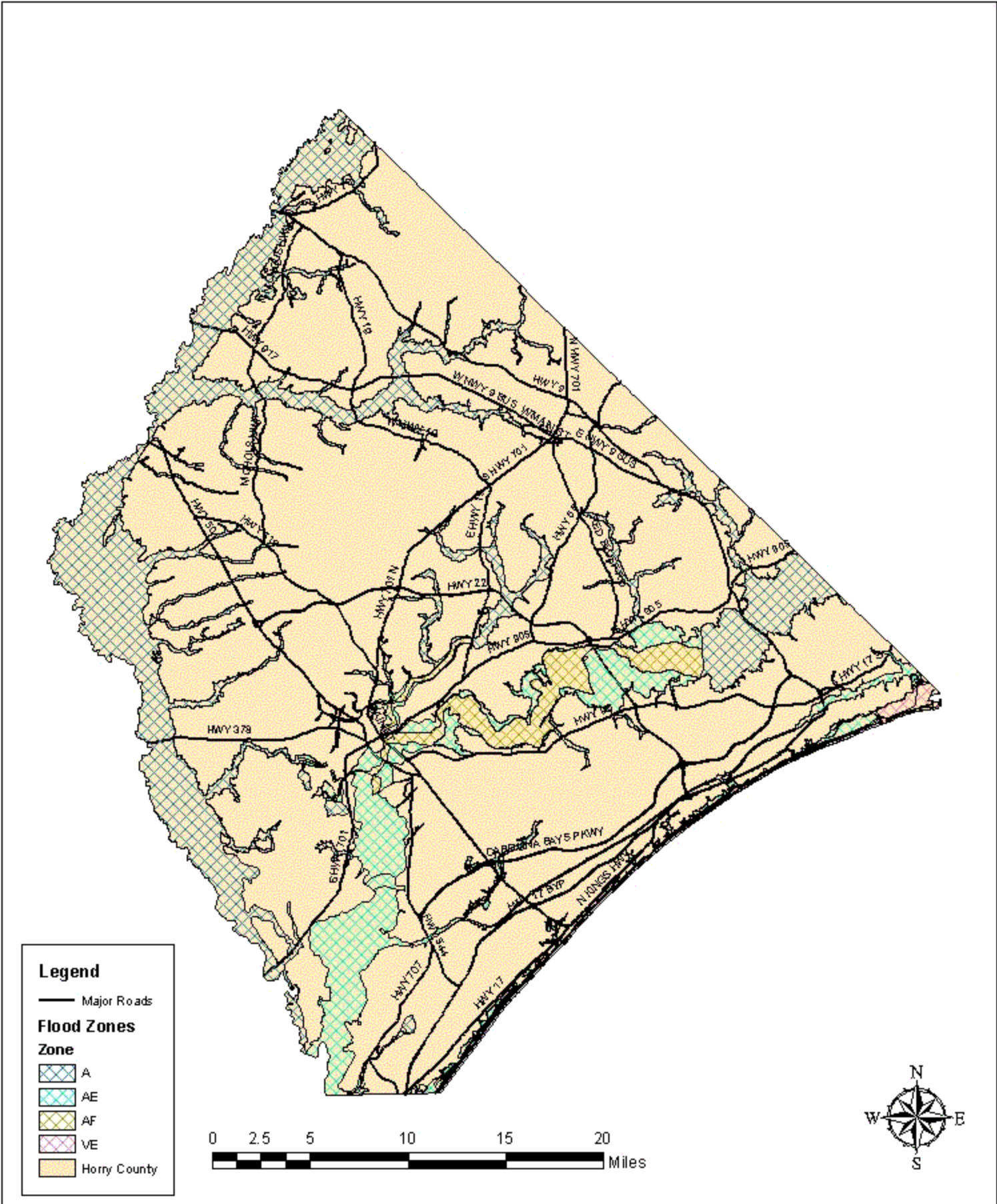


*Summary and Conclusions of the Flooding Profile*

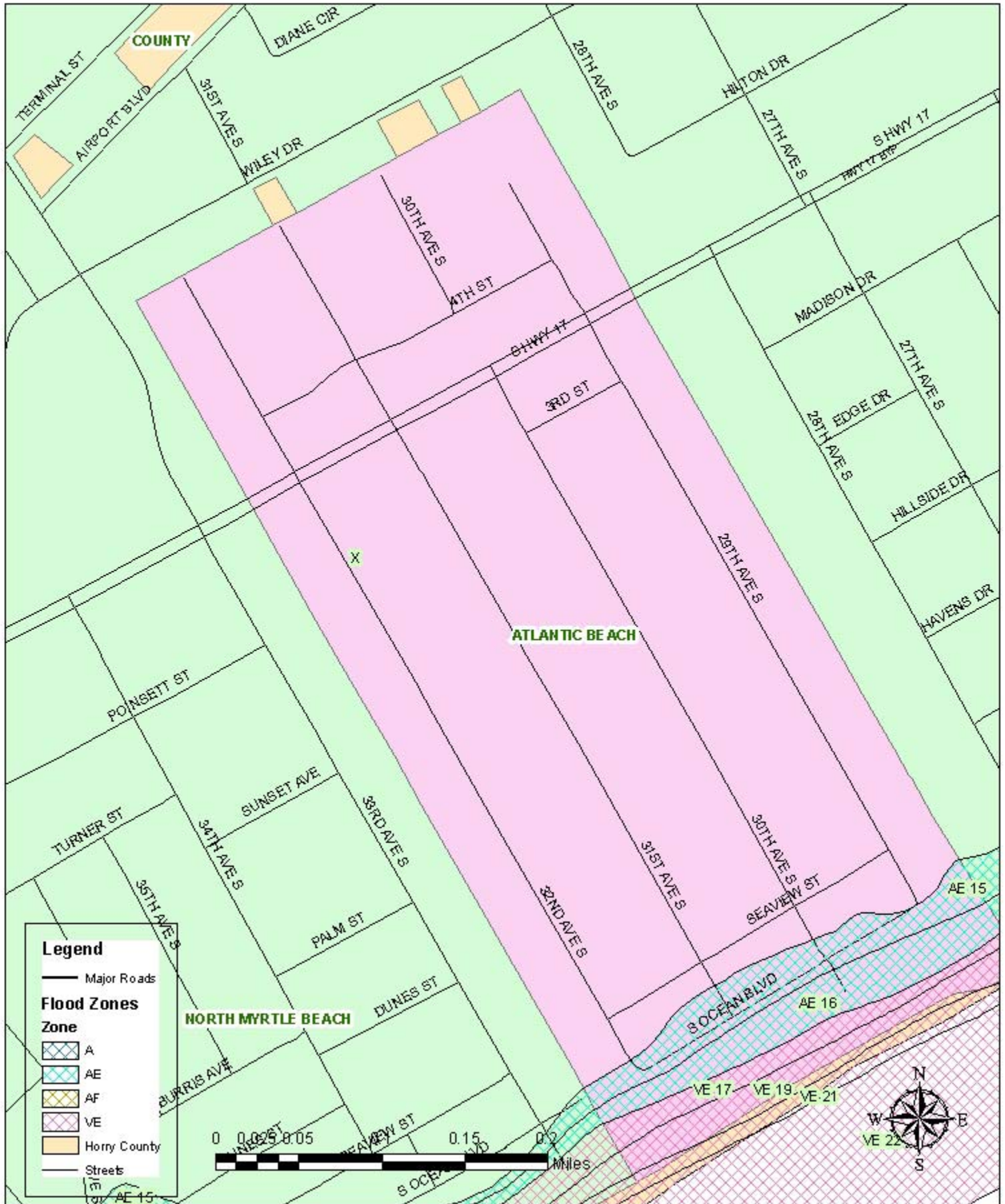
According to the NCDC, Horry County and the participating jurisdictions have had \$29.982 million in property damage and \$108 thousand in crop damage from flood occurrence in the last 57 years. Therefore the probability of flooding is highly likely with a 55% chance a year. Probability is determined by the frequency of past events in the county. A flood is likely to occur every 1.8 years in Horry County, that number is calculated by years on record and number of events.

The proceeding maps show the existing flood zones for Horry County and participating jurisdictions according to FEMA's Flood Insurance Rate Map (FIRM). In addition to the data from FEMA, the Mitigation Task Force members recognized flooding problem areas that exist outside of the Special Flood Hazard Areas. The City of Conway, the City of Loris and Grand Strand Water and Sewer Authority all identified flood prone areas based on past experiences that are illustrated in the maps following this section. Task Force members know from the history of these areas that these problem areas also need to be considered when developing strategies and goals related to flood mitigation projects. These areas primarily pertain to flash flooding and riverine flooding that occurs and damages roadways, bridges, and personal property.

# Horry County, South Carolina Existing Flood Hazard

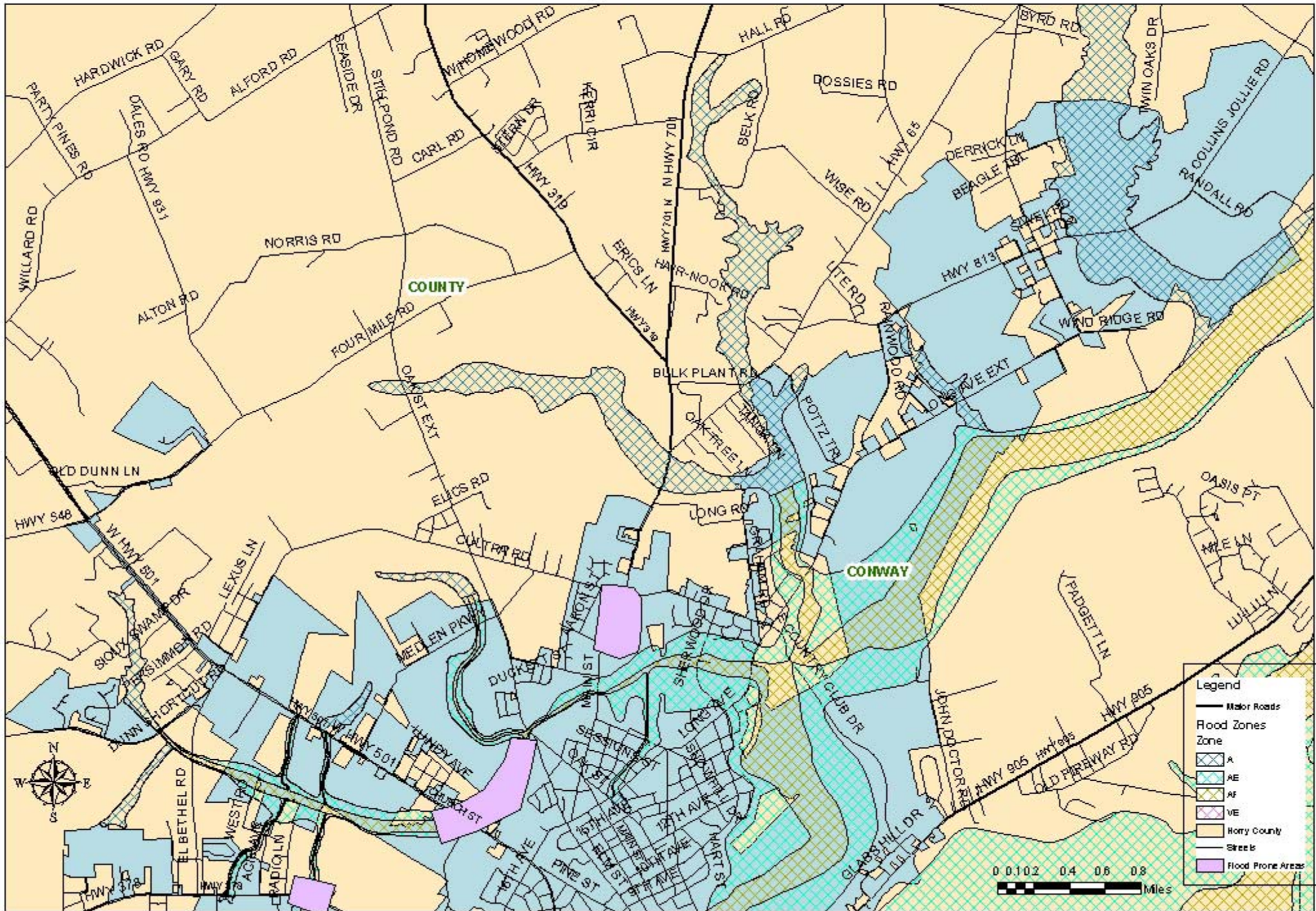


# Atlantic Beach, South Carolina Existing Flood Hazard



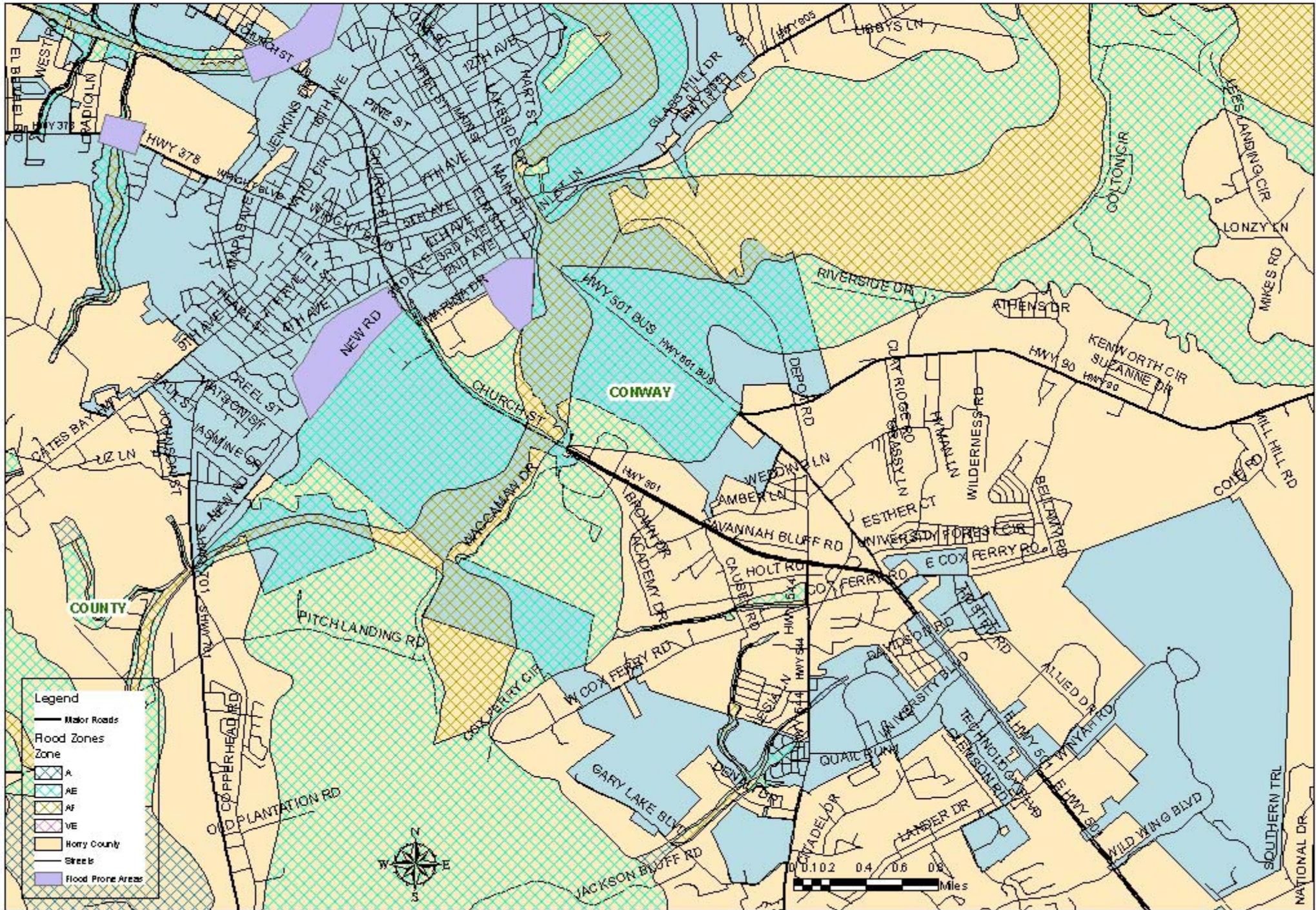


# North Conway, South Carolina Existing Flood Hazard



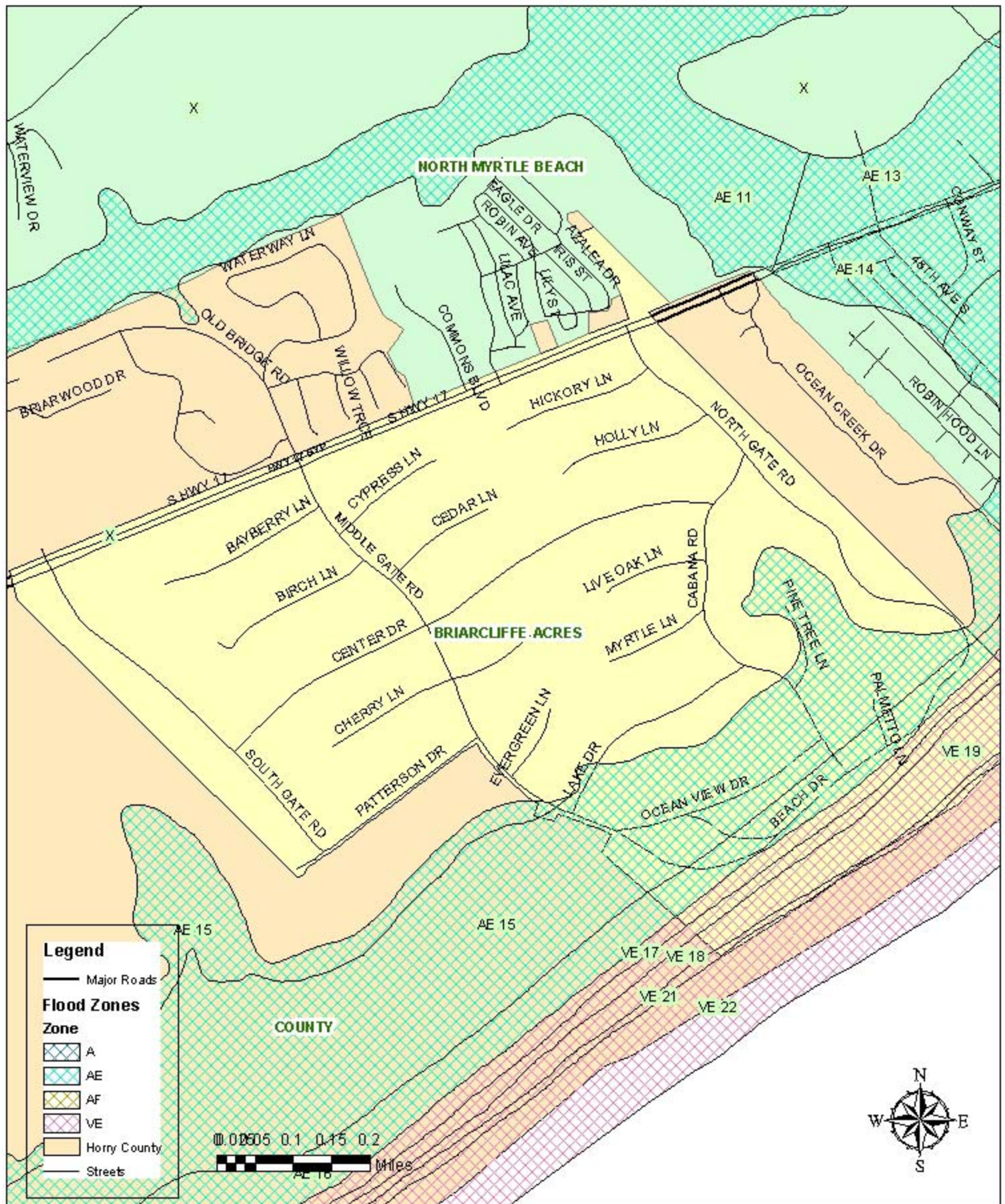


# South Conway, South Carolina Existing Flood Hazard



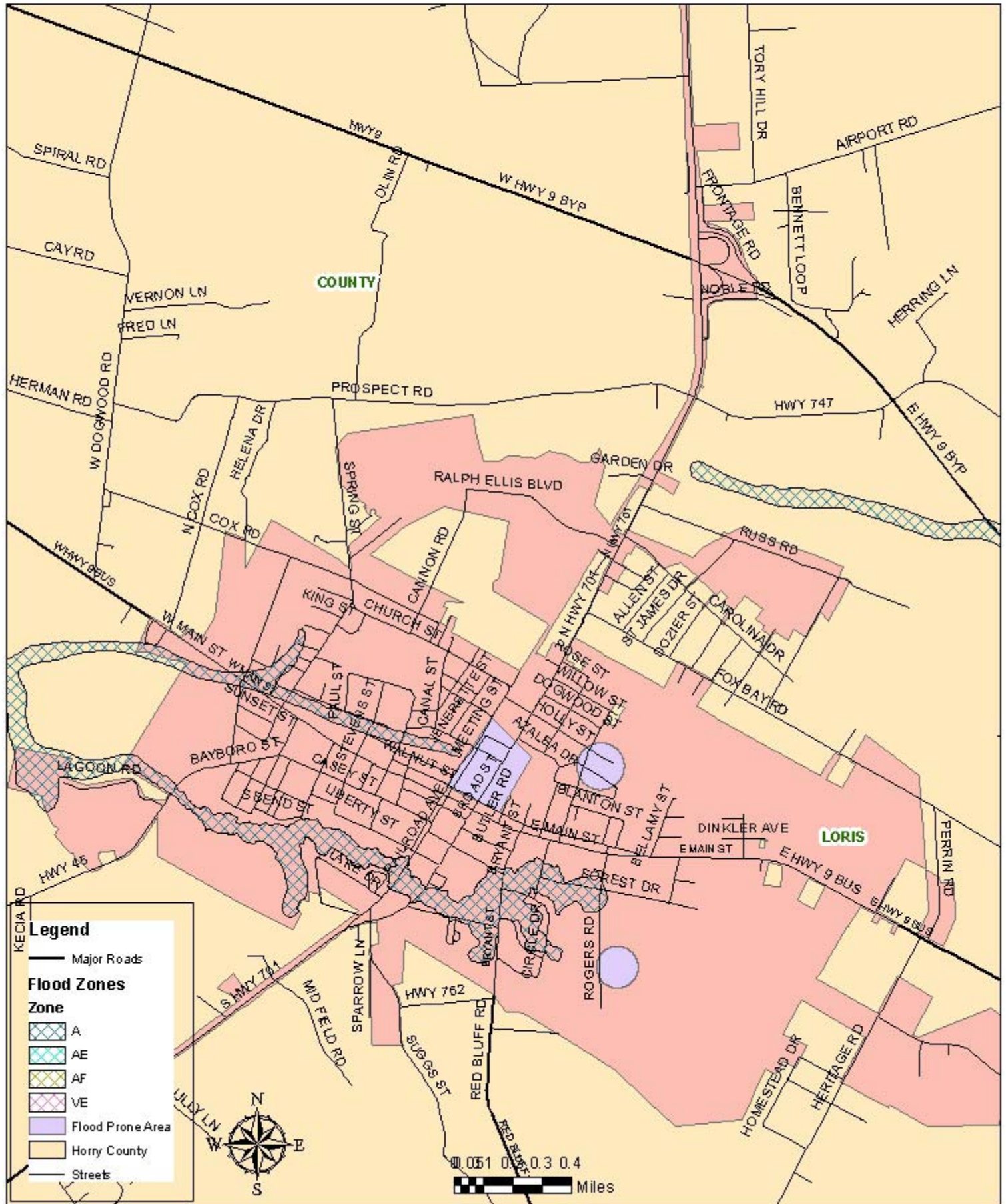


# Briarcliffe Acres, South Carolina Existing Flood Hazard



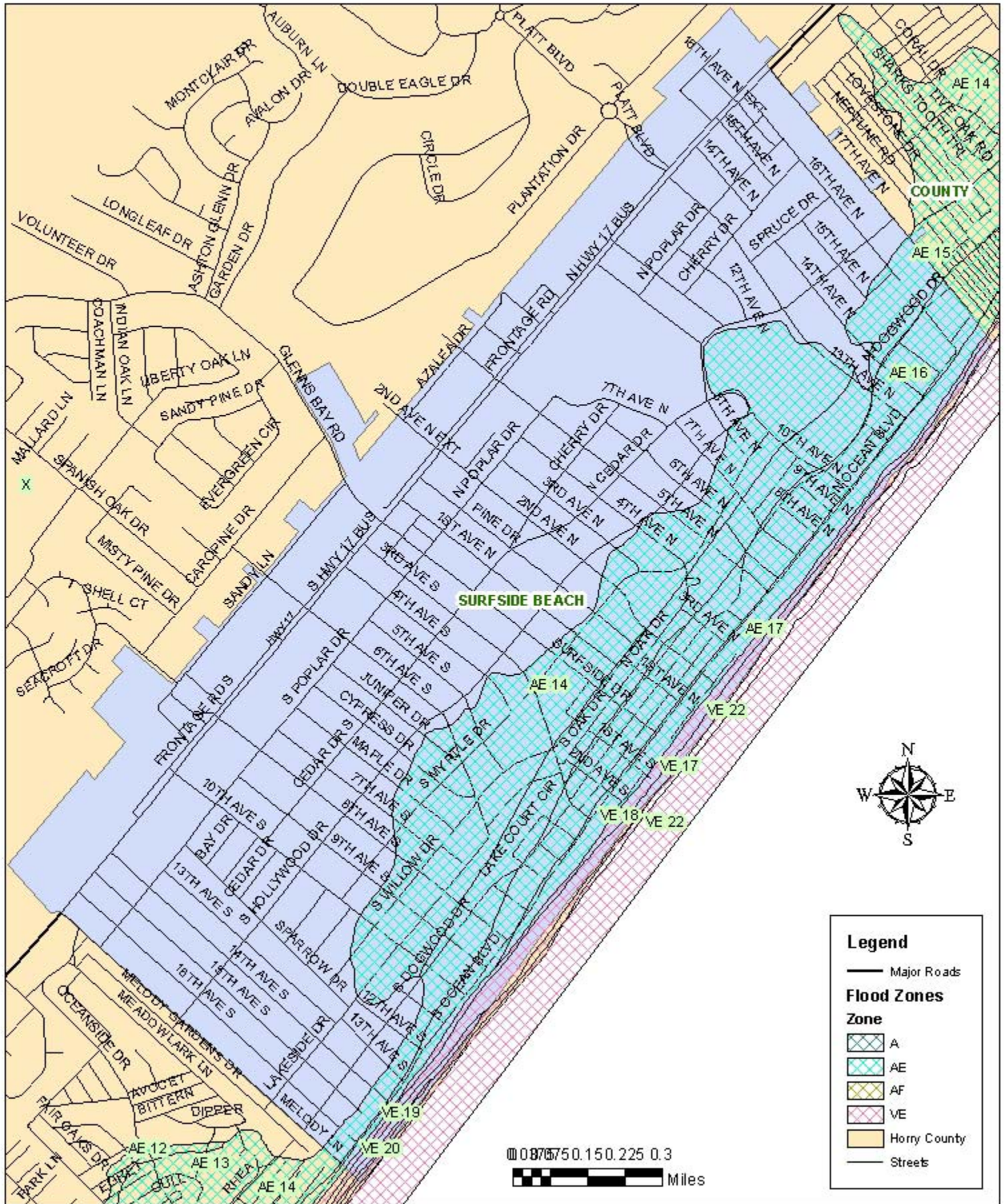


# Loris, South Carolina Existing Flood Hazard



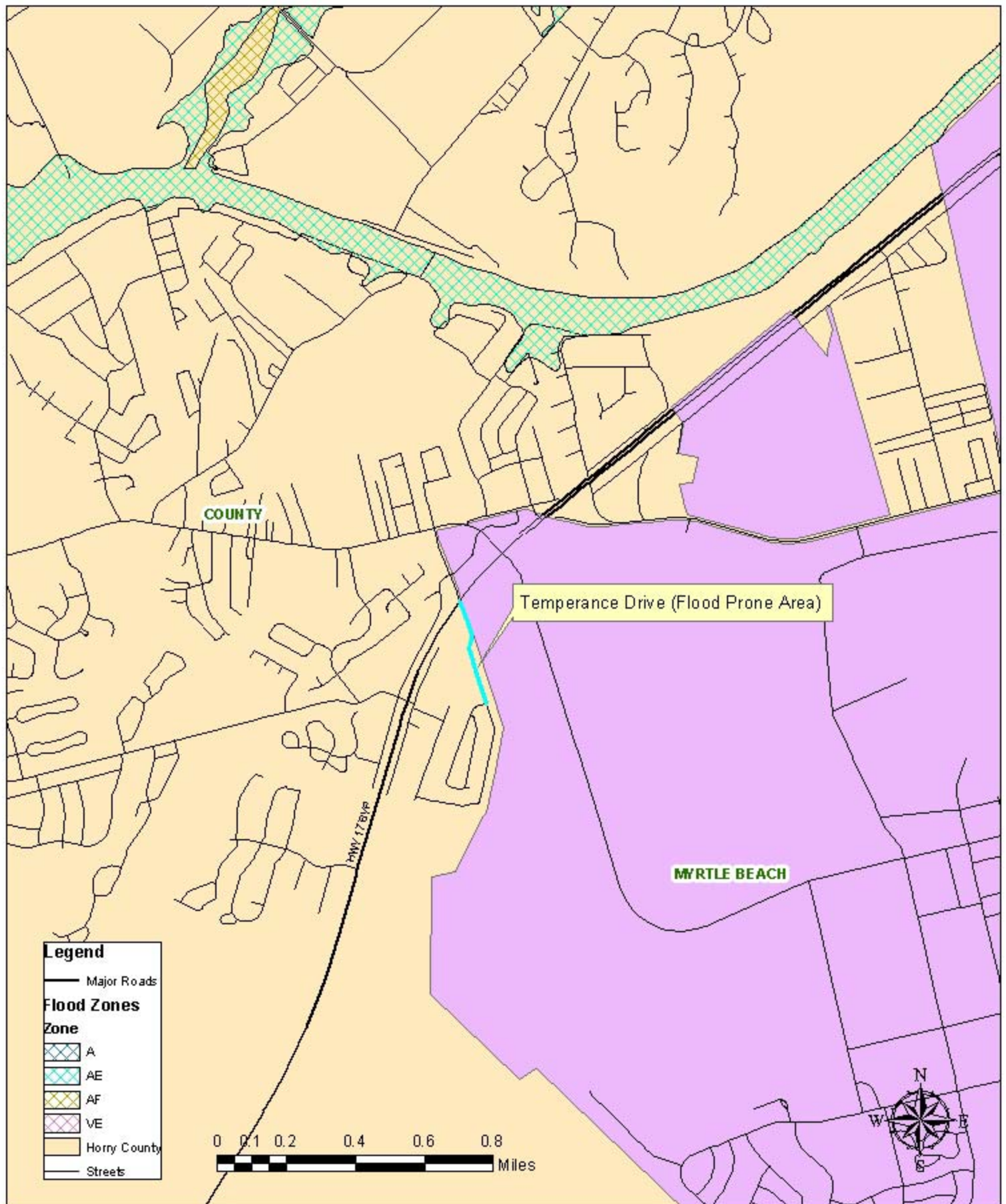


# Surfside Beach, South Carolina Existing Flood Hazard



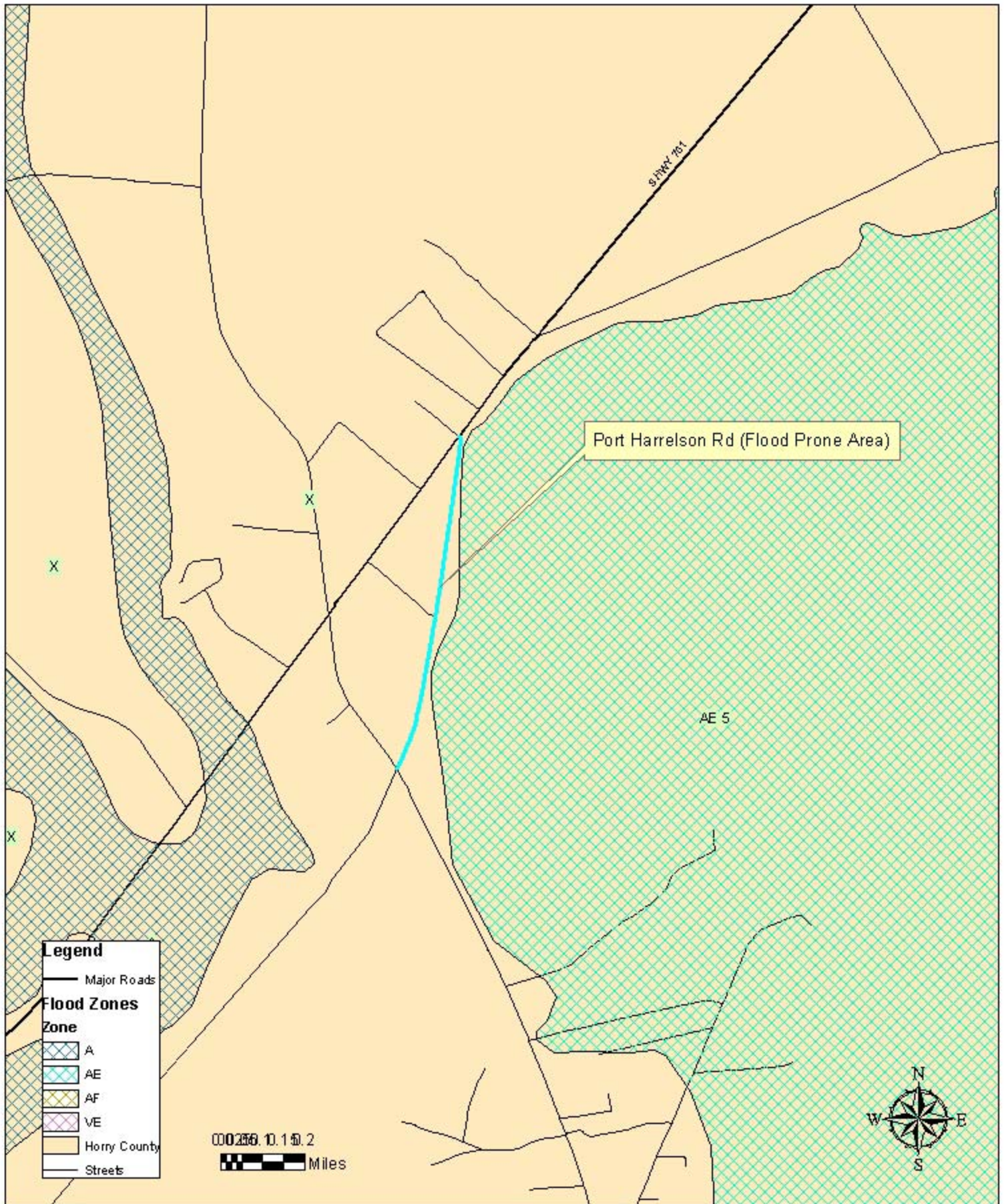


# Horry County, South Carolina Grand Strand Water and Sewer





# Horry County, South Carolina Grand Strand Water and Sewer





### 3.2.3 TORNADO

#### *Definition*

A tornado is a violently rotating column of air in contact with the ground and extending from the base of a thunderstorm. A condensation funnel *does not need to reach to the ground* for a tornado to be present; a debris cloud beneath a thunderstorm is all that is needed to confirm the presence of a tornado, even in the total absence of a condensation funnel.

Most tornadoes are just a few dozen yards wide and touch down only briefly, but highly destructive tornadoes may carve out a path over a mile wide and several miles long. The destruction caused by tornadoes may range from light to inconceivable depending on the intensity, size and duration of the storm. Typically, tornadoes cause the greatest damages to structures of light construction, such as residential homes, and are quite localized in impact.

Each year an average of 800-1000 tornadoes are reported nationwide and they are more likely to occur during the spring and early summer months of March through June. Tornadoes can occur at any time of day but are mostly likely to form in late afternoons and early evenings.

The Enhanced Fujita Scale for tornados was developed to measure tornado strength, and is shown below.

Scale	Wind Speed (mi/h)	Possible Damage	Path Length (miles)
<b>EF0</b>	65 - 85	Minor roof, tree and sign damage	< 1
<b>EF1</b>	86 - 109	Roofs damaged; barns torn apart; weak trailers flipped and torn apart; cars thrown from roads; sheet metal buildings destroyed.	1 – 3.1
<b>EF2</b>	110 - 137	Strongly built schools, homes and businesses unroofed; concrete block buildings, weak homes and schools destroyed; trailers disintegrated.	3.2 – 9.9
<b>EF3</b>	138 - 167	Strongly built schools, homes and businesses have outside walls blown away; weaker homes completely swept away.	10 – 31
<b>EF4</b>	168 - 199	Strongly built homes have all interior and exterior walls blown away; cars thrown 300 yards or more in the air.	32 – 99
<b>EF5</b>	200 - 234	Strongly built homes completely blown away.	> 100

Source: National Oceanic and Atmospheric Administration

### ***History of Tornadoes***

Horry County and the participating jurisdictions have been impacted by 35 tornadoes, 8 funnel clouds and waterspouts according to data received from the NCDC. That data is limited to the years of 1950-2007. Most of those tornadoes were the result of a cold front meeting the warm coastal air; which produced heavy thunderstorms, finally developing into tornadoes.

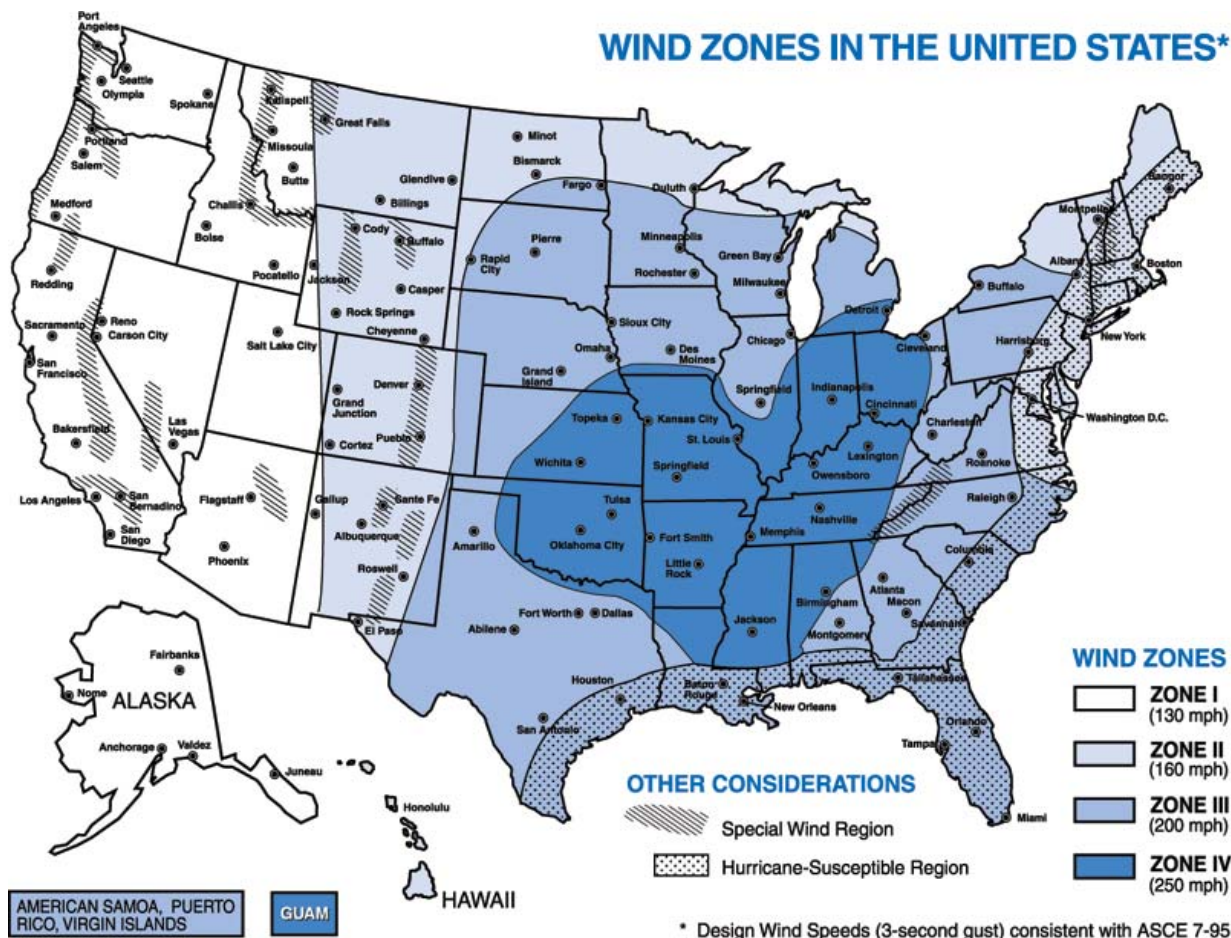
A tornado touched down in Socastee on *October 8, 1996*, causing spotty damage, including down trees and power lines. The National Weather Service described the tornado as a F0. The National Climatic Data Center estimated property damage from two subdivisions, Brandy Mill and Lakewood Park at \$250 thousand. The Weather radio was alerted two minutes after the tornado occurred.

Paul Donovan of Springfield, Va., took this picture around 4:30 p.m. July 6, 2001, from the ninth floor of the Sandcastle Inn on Ocean Boulevard. It shows the funnel cloud as it moved south along the beach. The National Weather Service defined the tornado as F2. Five separate tornadoes spawned, and about 3 miles of beachfront were affected, but the epicenter of damage was among the high-rise beachfront hotels along Ocean Boulevard between 2<sup>nd</sup> Ave N and 2<sup>nd</sup> Ave S, where enough evidence was found to support F2 tornado strength. Tornadoes or funnel clouds were sighted as far inland as U.S. 17 Bypass near Broadway at the Beach, and a touchdown occurred at MYR, Myrtle Beach Airport, near 29<sup>th</sup> Ave S.



Many automobiles and multi-story hotels had their windows blown out. Several structures had damage to their roofs and stucco walls, and one wooden structure had its roof completely removed. Power lines were down and some large billboards were damaged. The most severe damage occurred when several vehicles were actually flipped over by the tornadoes, including two tourist trolleys. There was \$8 million in damage to the area and about 12 people had minor injuries.

The figure below shows the strength potential of extreme windstorms across the United States. This map was produced by the Federal Emergency Management Agency and is based on 40 years of tornado history and over 100 years of hurricane history. Horry County and the participating jurisdictions are located in Zone III with a special consideration for the hurricane susceptible region. The tornado hazard in Zone III is significant with winds potentially reaching 200 miles per hour.



Source: Federal Emergency Management Agency

*Summary and Conclusion of the Tornado Profile*

According to the NCDC, from 1950 to 2007, tornados in Horry County and the participating jurisdictions have accounted for 104 injuries and \$20.64 million in property damages. The probability of future tornados is highly likely with a 64.8% a year. Probability is determined by the frequency of past events in the county. A tornado is likely to occur every 1.54 years in Horry County, that number is calculated by years on record and number of events. In 54 years Horry County and the participating jurisdictions have a record of 35 tornados that have touched down throughout the county as seen in jurisdictional the map below.