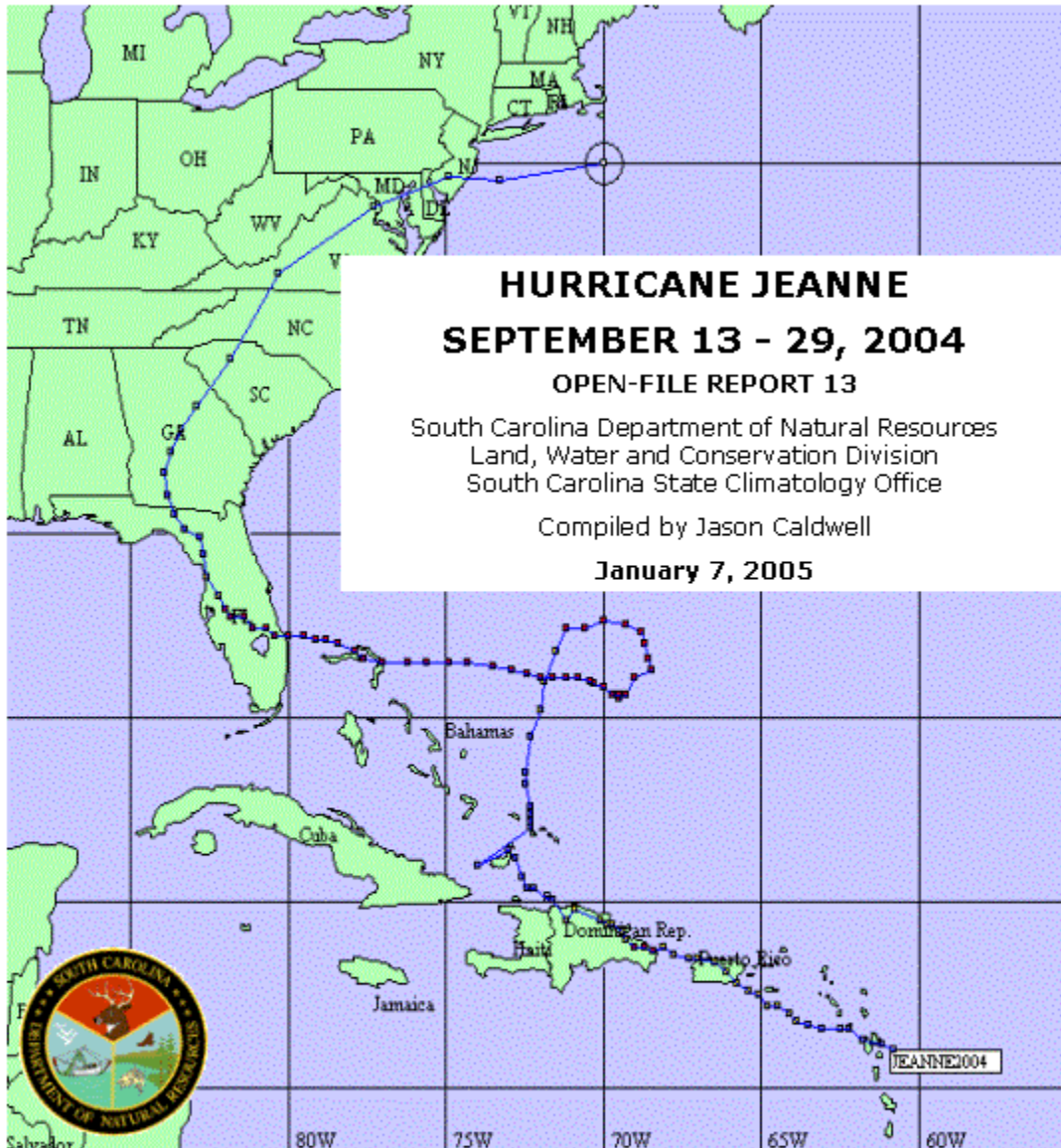


# Hurricane Jeanne



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# HURRICANE JEANNE

September 13 - 29, 2004

## EVENT SUMMARY

On September 13, 2004, a tropical wave to the east of the Leeward Islands developed into a tropical depression and became the tenth named tropical cyclone, Tropical Storm Jeanne, on the following day. Moving slowly to the west-northwest, Jeanne traversed the Virgin Islands and Puerto Rico on September 15 (Figure 1) and slowly meandered along the northern coast of Haiti and the Dominican Republic over the next two days. The mountainous terrain on the island of Hispaniola restricted any notable strengthening of Jeanne; however, for a brief time over the Mona Passage, the storm did reach minimal hurricane strength. The weakened tropical storm turned north over the southeastern Bahamas on September 18 and again became a hurricane on September 20. Slowly making a clockwise loop to the east of the Bahamas, Hurricane Jeanne headed west on September 23 toward the peninsula of Florida with sustained winds of 105 mph (Figure 2). On September 25, the eye of Jeanne passed directly over Great Abaco Island in the Bahamas and continued west toward Florida (Figures 3 and 4).

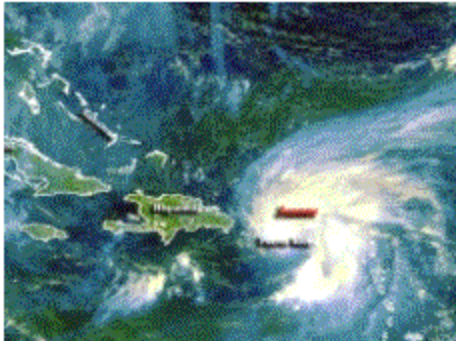


Figure 1

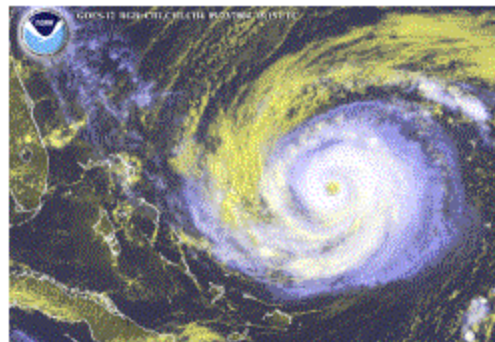


Figure 2

JEANNE

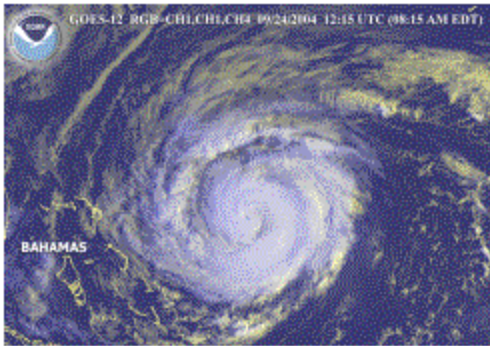


Figure 3

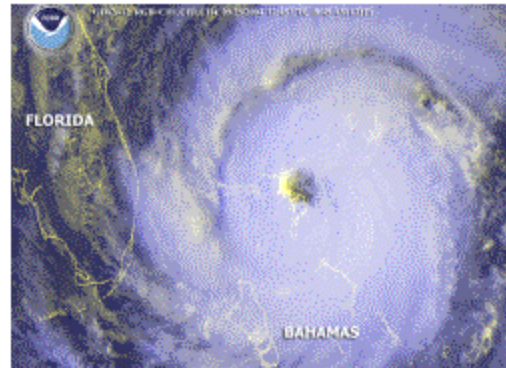


Figure 4

### EVENT SUMMARY (cont.)

Hurricane Jeanne became a category 3 storm on the Saffir-Simpson scale later that day as the storm approached within 200 miles of the eastern coast of Florida (Figure 5). Jeanne made landfall on September 25, 2004, near Stuart and Port Saint Lucie on the eastern coastline of Florida (Figure 6) where only twenty days earlier, Hurricane Frances had tracked across the same location.

Jeanne weakened to a strong tropical storm with 70 mph sustained winds across central Florida on September 26 (Figure 7) and to depression status on September 27 as the cyclone crossed Georgia (Figure 8). Moving to the north-northeast, Jeanne exited the Mid-Atlantic coast on September 29 and headed rapidly into the Canadian Maritimes as an extratropical system.

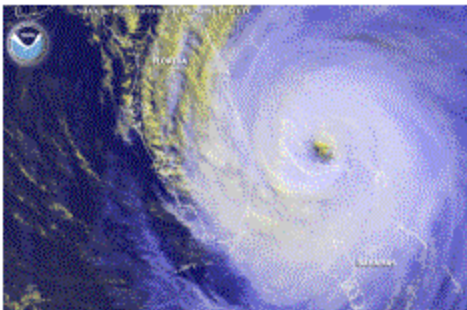


Figure 5

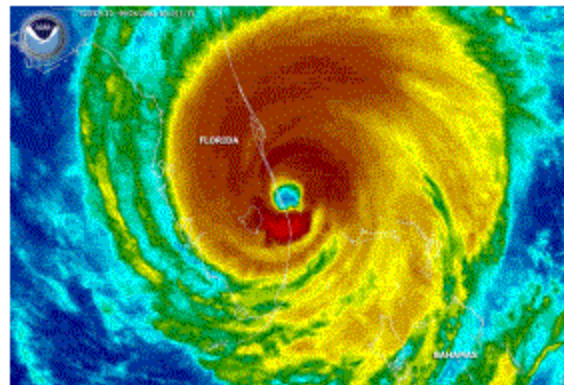


Figure 6

**JEANNE**

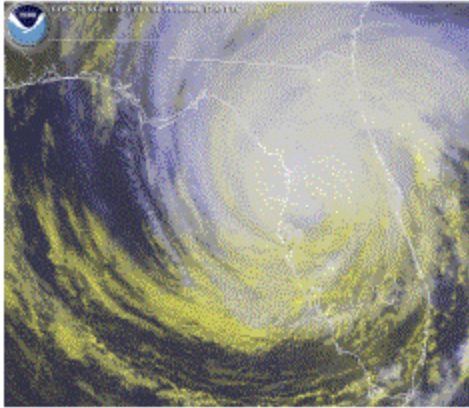


Figure 7

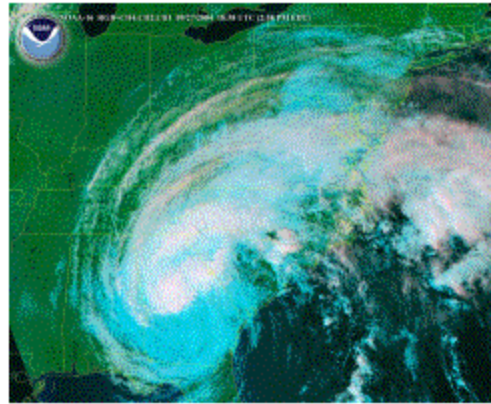


Figure 8

### FORECAST CONSIDERATIONS

Upper level conditions over Jeanne during the initial stages of development were quite favorable for strengthening; however, the close proximity to the mountainous terrain of Hispaniola disrupted significant inflow into the storm and failed to allow significant development during the first week. The high pressure aloft also hindered any definitive direction of motion until the influence of an upper-level trough passing to the north began to lift the storm northward. Once the southwesterly flow aloft halted as the trough passed to the east, the storm turned in a clockwise motion and headed west under the easterly flow. This motion was poorly forecast by the models with indications that Jeanne may move out to sea (Figure 9). As the storm trekked west toward the Bahamas and Florida, the timing of the next trough dropping in from the Midwest United States became of critical concern to residents along the Southeast coastline from Florida to North Carolina. Several model forecasts from September 23 (Figure 10), only two days before official landfall in Florida, indicated a potential north or northeasterly track along the coastline of the Carolinas.

The track of Jeanne across the Carolinas was particularly difficult to forecast and resulted in multiple scenarios for potential impacts across the state. A more eastern track along the coastal sections of South Carolina was originally favored on September 24 with the wind, rain, and tornado threats highest from the Midlands to the coast (Figure 11) . This forecast was consistent with the Hydrometeorological Prediction Center (HPC) forecast for precipitation (Figure 12).

**JEANNE**

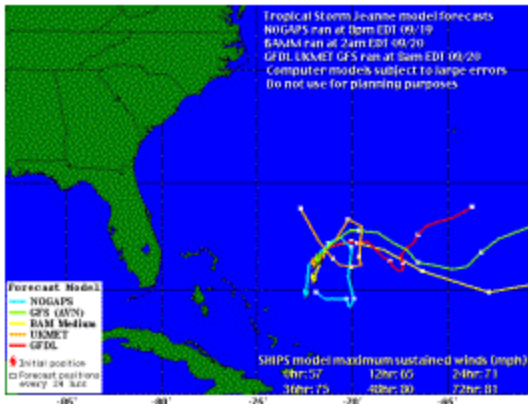


Figure 9

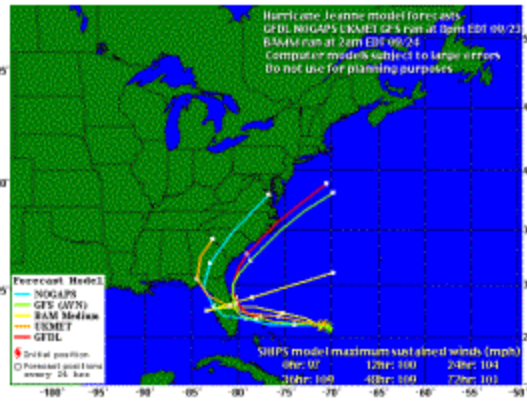


Figure 10

**SC ANTICIPATED EFFECTS FROM HURRICANE JEANNE  
(based on the 11am NHC Forecast 09/24/04)**

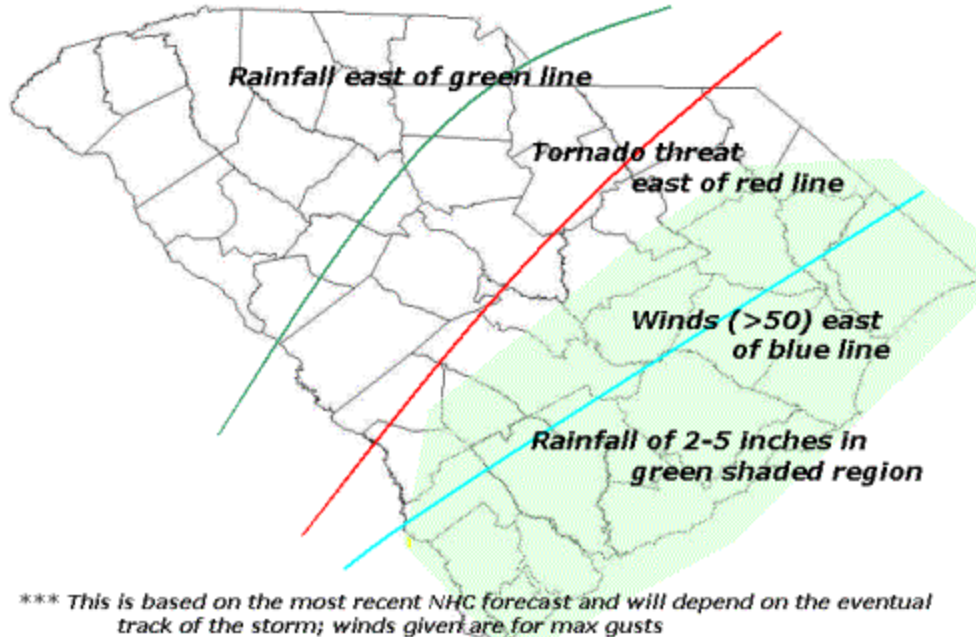


Figure 11

JEANNE

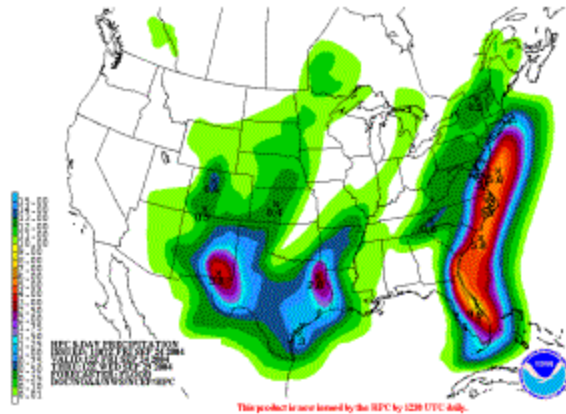


Figure 12

**FORECAST CONSIDERATIONS (cont.)**

As Jeanne's track continued to shift westward on September 27, 2004, the threat for heavy rain shifted into the Upstate of South Carolina where upslope flow along the eastern escarpment of the mountains was expected to enhance precipitation rates (Figure 13). The tornado threat remained over the eastern two-thirds of the state where dry air at mid-levels enhanced instability and low-level wind shear was the highest as the wind direction changed from easterly at the surface to southerly aloft (Figure 14). High wind impacts were expected to be confined to the locations that experienced thunderstorms and tornadoes.

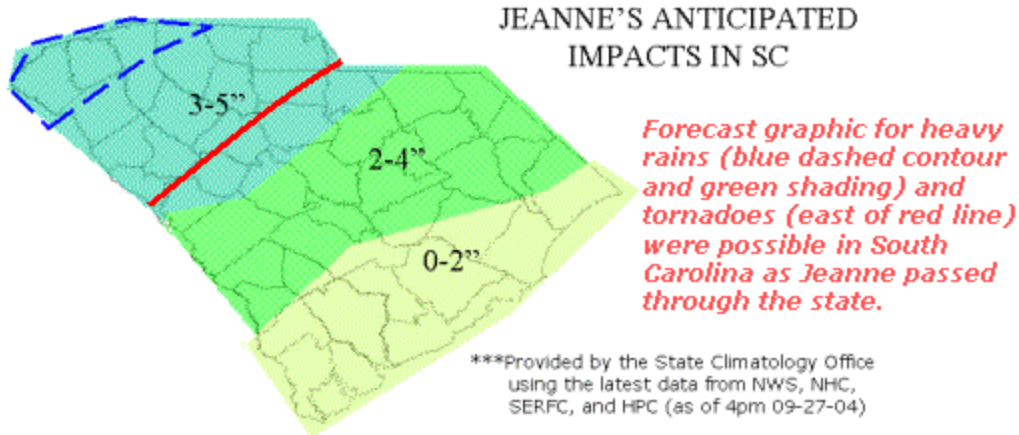
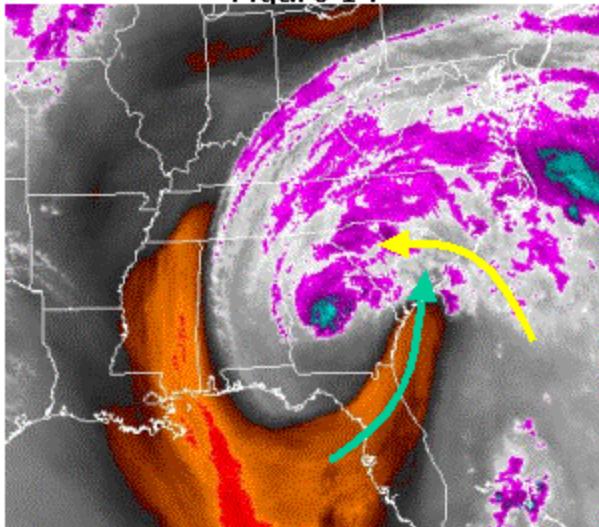


Figure 13



Figure 14



*Dry air moving into South Carolina at mid-levels (orange shading) created increased instability over the region as Jeanne marched through Georgia on September 27, 2004. Low-level (yellow arrow) and mid-level winds (green arrow) provided additional support for the development of tornadoes.*

### **SOUTH CAROLINA EFFECTS**

Although Hurricane Jeanne made landfall in central Florida, the impact of Jeanne on the state of South Carolina was quite extensive with flooding rainfall across the Upstate and in the Charleston area. Rainfall totals (Table 1) ranged from less than one-half inch across the northern coastal sections to over four inches in the northwest corner of the state. Isolated amounts in excess of six inches were reported in locations near Rabun Creek in Laurens County. Locations in the Charleston National Weather Service county warning area generally received one to two inches of rainfall. Significant flooding in downtown Charleston on September 27, 2004, occurred as a strong band of thunderstorms from Jeanne moved inland at the time of high tide with unofficial reports of over three inches reported. Storm surge along the coast was minimal with one to three feet experienced in Charleston Harbor and Fripp Island.

The tornado outbreak associated with Jeanne was expected to rival the extreme event that occurred with Frances three weeks earlier. Although fewer tornadoes were reported, Jeanne did spawn 17 tornadoes including ten rated as F0, six as F1, and 1 as an F2 tornado (Table 2 and Figure 15). The F2 tornado occurred in Fairfield County approximately 4 miles north-northeast of Ridgeway and resulted in 13 injuries and the loss of one person's life. Photographs of the damage are shown in Figure 16.

Table 1

<b>Jeanne Rainfall Summary September 26-29, 2004</b>	
<b>Location</b>	<b>Precip.</b>
Conway	0.34
Loris	0.78
Dillon	0.82
Charleston Ap	1.03
Jamestown	1.05
Allendale	1.48
Cheraw	1.58
Sumter	1.59
Florence	2.03
Beaufort	2.07
Chester	2.10
Union	2.44
Aiken	2.63
Columbia Ap	2.85
Effingham	3.22
Orangeburg	3.27
Table Rock	3.62
Clinton	3.85
Greenville Spartanburg	3.93
Walhalla	4.15
Anderson Ap	4.29
Laurens	4.32
Johnston	4.38
Calhoun Falls	4.44
Travelers Rest	4.60

Table 2

South Carolina Tornadoes  
Associated with Jeanne

27-Sep	Aiken	F0	Jeanne
27-Sep	Berkeley	F0	Jeanne
27-Sep	Cherokee	F1	Jeanne
27-Sep	Chesterfield	F0	Jeanne
27-Sep	Clarendon	F1	Jeanne
27-Sep	Dillon	F0	Jeanne
27-Sep	Fairfield	F2	Jeanne
27-Sep	Florence	F1	Jeanne
27-Sep	Georgetown	F1	Jeanne
27-Sep	Hampton	F0	Jeanne
27-Sep	Lee	F0	Jeanne
27-Sep	Lexington	F0	Jeanne
27-Sep	Marion	F1	Jeanne
27-Sep	Marlboro	F0	Jeanne
27-Sep	Newberry	F0	Jeanne
27-Sep	Newberry	F1	Jeanne
27-Sep	Saluda	F0	Jeanne

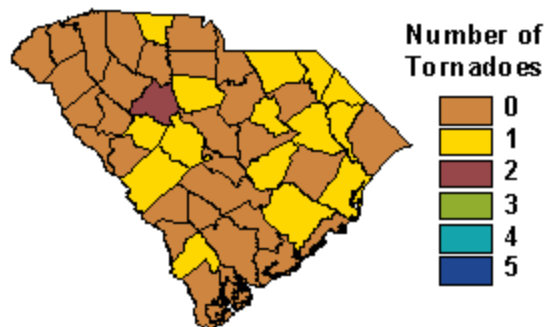


Figure 15

JEANNE

### SOUTH CAROLINA EFFECTS (cont.)

Wind speeds across the state were nearly tropical storm force, particularly along the coast where the two-minute, maximum sustained wind speed at the Charleston Airport was 32 mph with a peak gust to 41 mph. Even locations farther inland, such as Pineville, experienced sustained winds over 30 mph with gusts to over 50 mph.



Figure 16

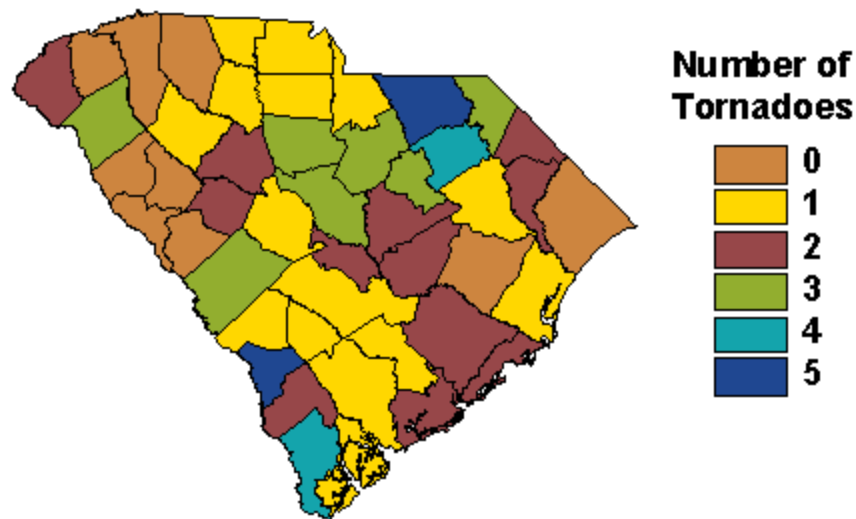
### SOUTH CAROLINA RESPONSE

Until Jeanne made a final turn to the west, decision makers in South Carolina continued to monitor the expected path of the storm. Numerous conference calls were conducted with discussion on activation of the State Emergency Operations Center (SEOC) which occurred at 0800 ET on September 25, 2004. The path of Jeanne did not mandate an evacuation in South Carolina. However, some initial planning stages were conducted as the State monitored the situation for the potential of severe weather conditions associated with rain-induced flooding and tornadoes.

### CLIMATOLOGICAL PERSPECTIVE

Jeanne was the sixth and final tropical system to affect South Carolina in 2004. Heavy rains and tornadoes were the most remarkable events from the storm. The 17 tornadoes spawned by Jeanne brought the total number of tornadoes from tropical cyclones in South Carolina to 76 – breaking the old record of 55 as the most tornadoes in a single calendar year set in 1995 (Figure 17). Most surprisingly, this total accumulated in only 47 days. The year of 2004 will definitely be remembered for the onslaught of tropical storms from the Atlantic Ocean.

**Figure 17**  
**Tropical Cyclone-Induced Tornadoes in South Carolina:**  
**The 2004 Atlantic Basin Tropical Season**



Maps produced by SC State Climate Office  
\*Based on preliminary data

### **ACKNOWLEDGMENTS**

*A special thanks to the National Oceanic and Atmospheric Administration (NOAA) and its many divisions for the wealth of weather and climate data made available to prepare this report. (<http://www.noaa.gov>)*

#### ***PARTICULARLY TO THOSE EMPLOYEES AT THE LOCAL NATIONAL WEATHER SERVICE OFFICES COVERING SOUTH CAROLINA***

Each office has provided important weather information to the public with regard to the impact of Jeanne on South Carolina. Additional information may be found at their websites using the following links:

National Weather Service Forecast Office – Wilmington, NC

<http://www.erh.noaa.gov/er/ilm/>

National Weather Service Forecast Office – Charleston, SC

<http://www.erh.noaa.gov/chs/>

National Weather Service Forecast Office – Columbia, SC

<http://www.erh.noaa.gov/cae/>

National Weather Service Forecast Office – Greenville-Spartanburg, SC

<http://www.erh.noaa.gov/gsp/>

*The State Climatology Office website is  
<http://www.dnr.state.sc.us/climate/sco>*