

Hurricane Gracie: Sep 29, 1959

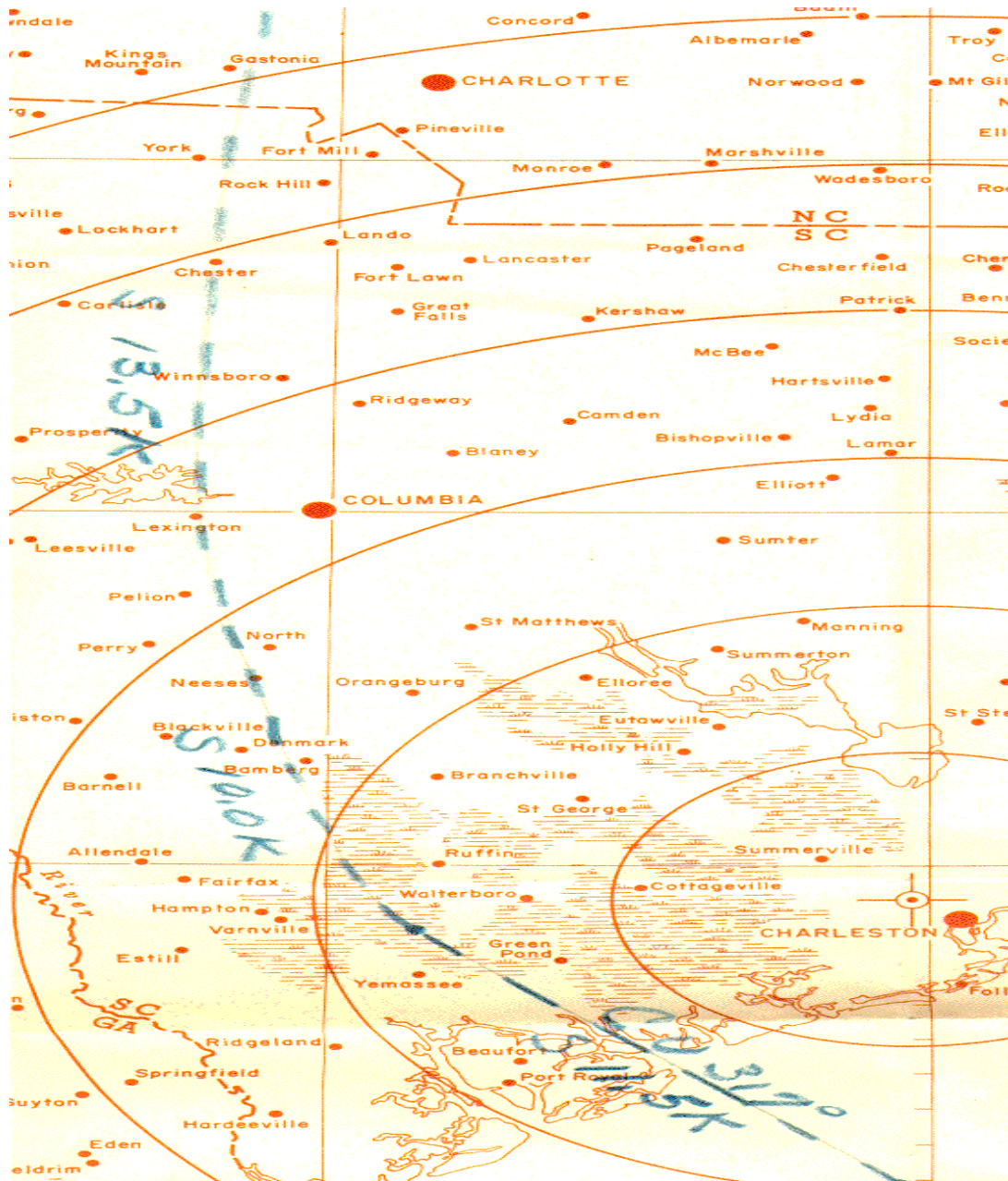
by NWS Charleston, SC

Summary

Prior to Hurricane Hugo in 1989, the last major hurricane to directly strike the South Carolina coast was Hurricane Gracie in 1959. Gracie was a Category 4 storm (originally classified a Category 3 storm but later [reanalyzed](#)) that was strengthening as it approached St. Helena Sound just before noon EST on Tuesday, September 29 with maximum sustained winds near 130 mph, minimum central pressure of 951 mb, tides of 6 feet or more above normal, and heavy rain. Unfortunately, 10 deaths occurred in South Carolina and Georgia. After landfall along the South Carolina coast, Gracie continued to push inland toward the northwest and then north while weakening but still producing heavy rain and tornadoes. Interestingly, Gracie was the second hurricane to make landfall in South Carolina in 1959 as Category 1 Hurricane Cindy pushed ashore near McClellanville on July 8.



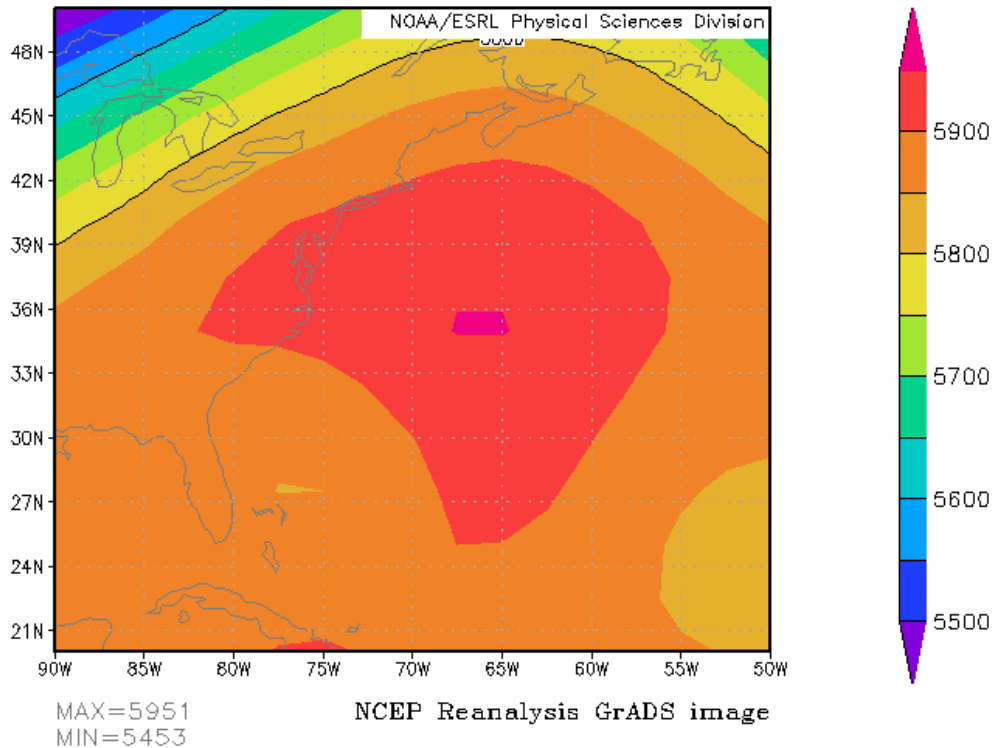
The track of Gracie, which developed near Hispaniola and eventually strengthened into a Major Hurricane (red points) before making landfall in South Carolina near Saint Helena Sound around noon on September 29, 1959. Image courtesy of [NOAA's Historical Hurricane Tracks website](#).



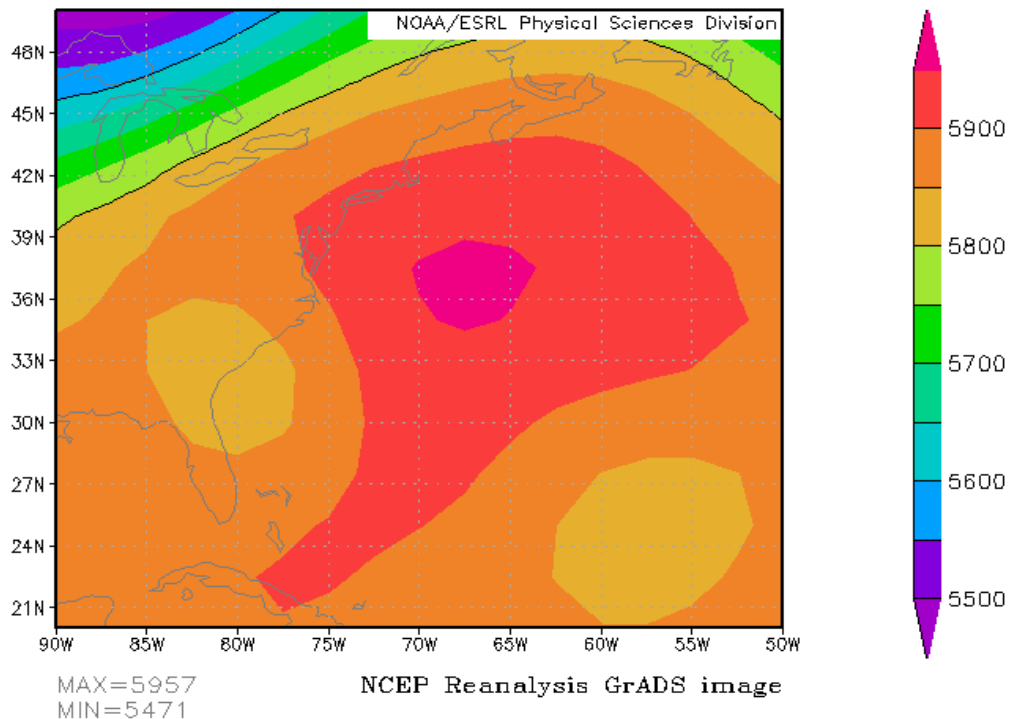
Hand drawn chart of Gracie's path through SC. Image courtesy of NOAA/NHC.

Synoptic Overview

Gracie was originally under the influence of a weak steering flow until high pressure strengthened northeast of the storm on September 28 and steered it on a steady west-northwest path toward the South Carolina coast. A Hurricane Watch was issued by midday from Savannah, GA, to Wilmington, NC. This was quickly upgraded to a Warning that afternoon.



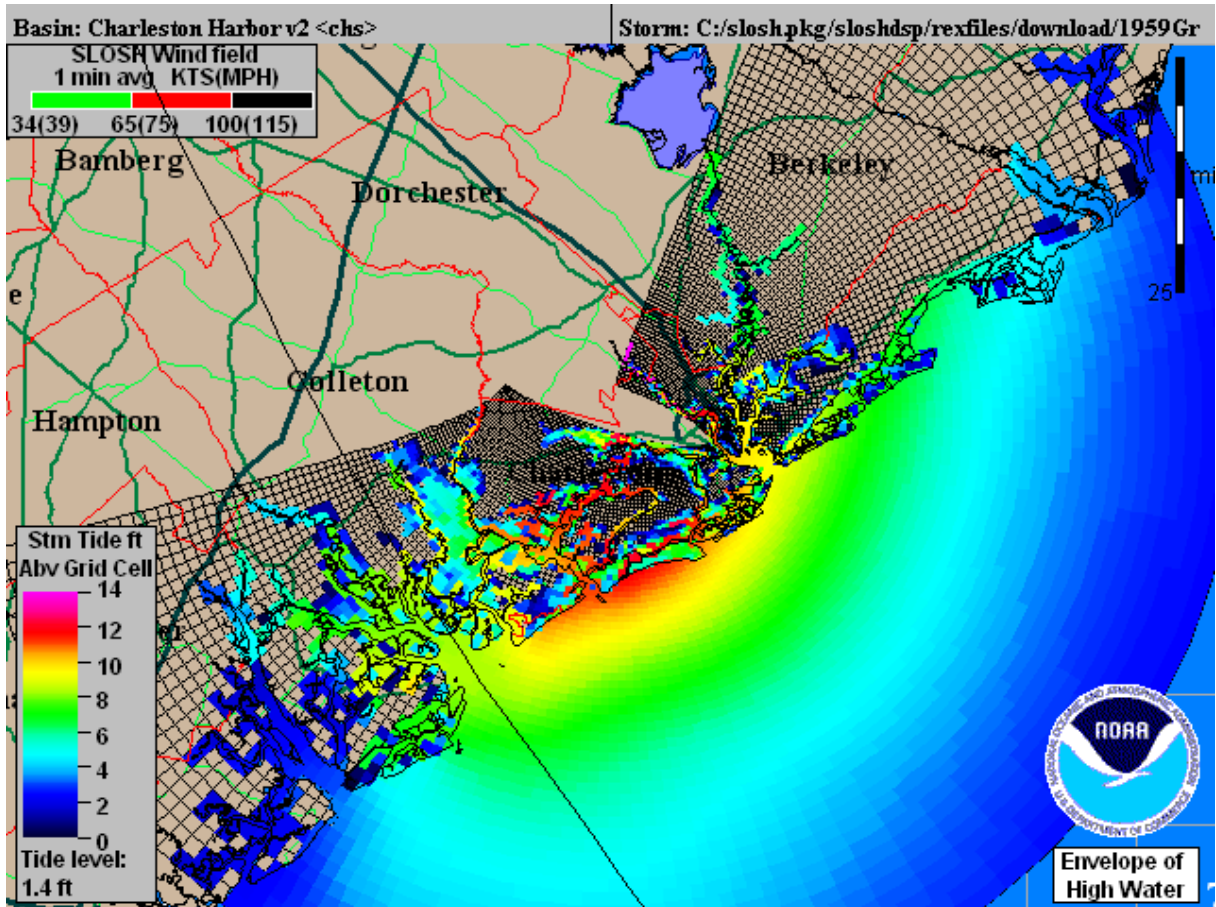
500-mb pattern at 12 UTC (7 am EST/8 am EDT) on September 28, 1959 showing the strong upper-level high pressure to the northeast of Gracie, which was just north of the Bahamas. Image courtesy of NOAA/ESRL.



500-mb pattern at 12 UTC (7 am EST/8 am EDT) on September 29, 1959 showing strong upper-level high pressure northeast of Gracie, which was just offshore of the SC coast. Image courtesy of NOAA/ESRL.

Storm Surge/Tide

Gracie struck the coast at low tide, which greatly reduced the storm tide. However, the surge still produced an impressive water rise. The most reliable water level was 8.14 feet above mean lower low water (MLLW) at Charleston Harbor early in the afternoon on September 29. Landfall at high tide would have pushed storm tides to catastrophic levels.



NOAA Sea, Lake and Overland Surge from Hurricane (SLOSH) model simulation of inundation (e.g., water depth above ground) from a storm similar to Hurricane Gracie.

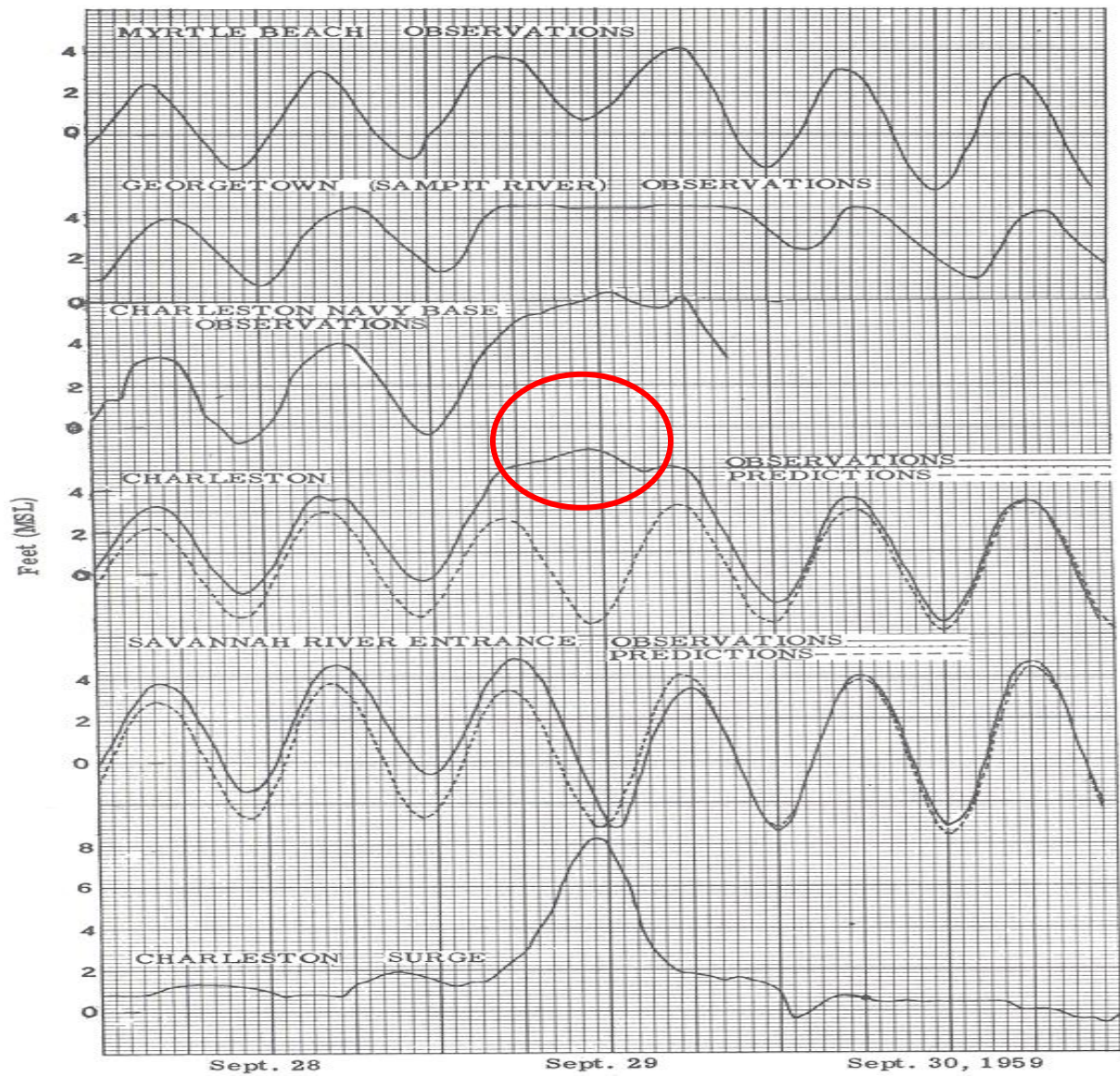
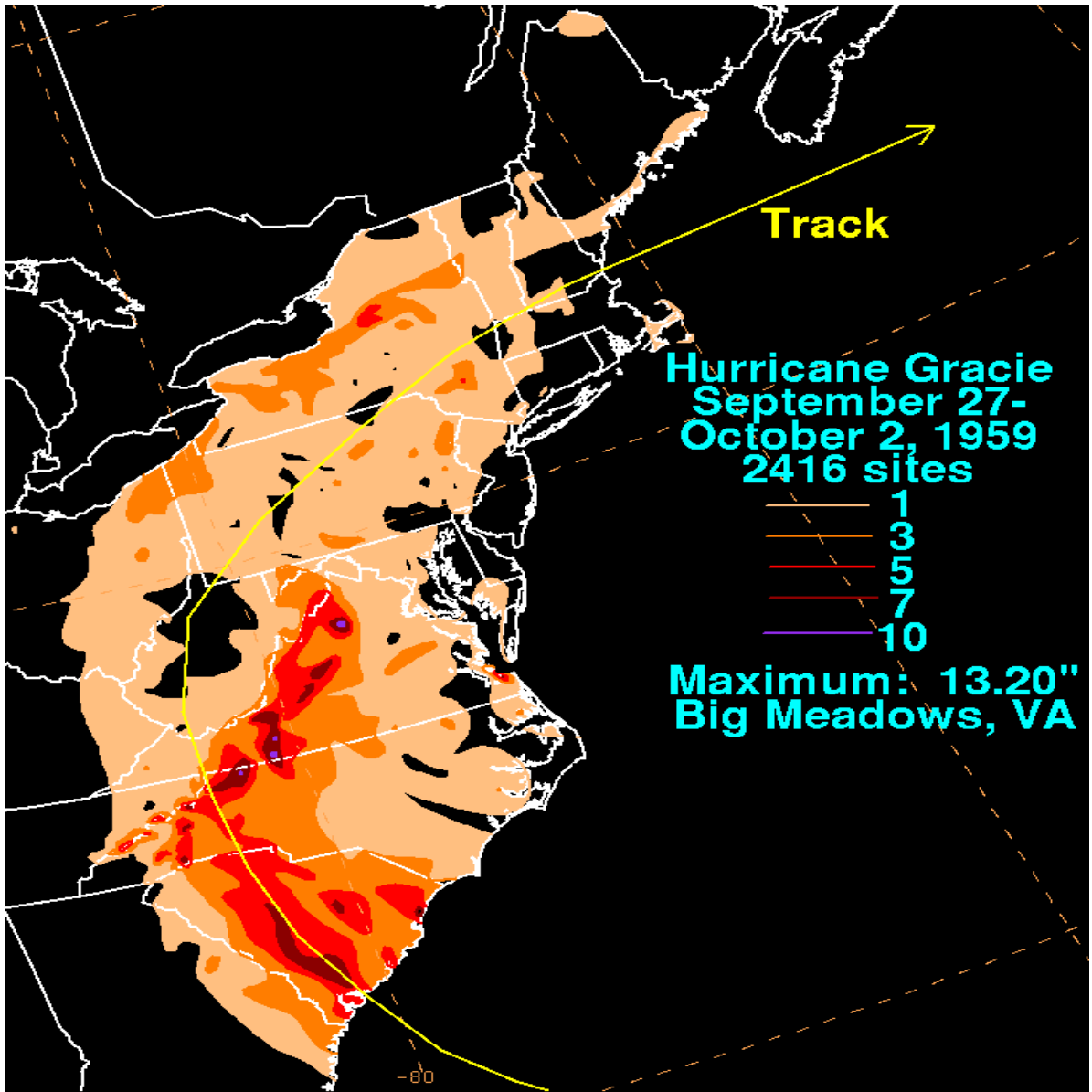


FIGURE 4.—Observed and predicted tides along the South Carolina coast preceding, during, and following hurricane Gracie, September 1959.

Observed and predicted (astronomical) tides from Gracie. The red circle highlights the observed tide peaking during low astronomical tide. Image courtesy of the Monthly Weather Review, December, 1959.

Rainfall

Gracie produced at least 7 inches of rain across southeast South Carolina, including 4.9 inches at the Marine Corps Auxiliary Air Station in Beaufort between 6:50 am and 12:50 pm EST on September 29.



Rainfall from Gracie. Image courtesy of NWS/Weather Prediction Center.

Additional Impacts

Wind gusts measured 138 mph near Beaufort and estimated near 150 mph along coastal sections of Beaufort, Colleton and Charleston Counties downed many trees and power lines and damaged numerous structures. A September 30 report filed from the Weather Bureau in Charleston described damage as "...widespread and extensive, estimated to be 5 to 10 million dollars and perhaps more." The preliminary U.S. Weather Bureau report published in October, 1959, stated, "Wind damage from Gracie was the worst from a hurricane in the history of Beaufort, South Carolina." In an *Island Packet* article ("Residents Recall Hurricane Gracie", published May 26, 2009), Marti Covington described a post-hurricane Beaufort County landscape where downed trees and power lines prevented travel, and where electricity and clean drinking water remained unavailable for "weeks". The National Guard helped clean up the extensive damage in Beaufort County. Across St. Helena Sound on Edisto Island, the beach was destroyed and was later rebuilt with "shell hash" which remains in place to this day. The fact that the storm came ashore at low tide limited the impact of the storm surge and could have prevented an epic storm surge disaster along the South Carolina coast.

Reconnaissance aircraft measured the lowest pressure in Gracie's eye as 951 mb (28.08 inches) at 10:30 am EST – shortly before landfall. The Marine Corps Auxiliary Air Station in Beaufort measured a minimum pressure of 951 mb at about 12:30 pm EST. The 951 mb pressure establishes Gracie as one of the 50 strongest hurricanes to make landfall in the U.S. since 1851 (*NOAA Technical Memorandum TPC-5, updated 15 April 2007*).

The weather observer at Churn Station at Edisto Beach evacuated the beach (as did the rest of the community) and gathered observations from a location 6 miles northeast of the beach. Here, the observer measured a lowest pressure of 965 mb (28.49 inches) between 11:35 and 11:40 am EST. The observer also reported peak winds near 150 mph – an estimation, since the anemometer was damaged. The Meteorologist-in-Charge of the Charleston Weather Bureau office also reported, "No casualties known to observer but wind damage worst known. Reports warnings and advisories well timed and well heeded".

Well north of the eye of the hurricane, a Navy ship on Charleston Harbor reported a peak wind gust of 71 mph at 1:48 pm EST.

In a report filed November 12, 1959, the Commanding Officer of the Marine Corps Auxiliary Air Station in Beaufort relayed this graphic description of Gracie's eye as provided by the Beaufort County sheriff:

"The eye of Gracie passed over my home located on Coffin Point near the town of Frogmore, South Carolina. A dead calm lasted 35 minutes. During this time, there was absolutely no wind. It quit as suddenly as it began and the sun appeared and was extremely hot. There was a thin veil of cirrostratus covering the entire sky. As the rear of the eye approached, you would see a very dark cloud filled with dust and flying debris."

The publication, "A History of Storms on the South Carolina Coast", by Laylon Wayne Jordan, Robert Dukes and Ted Rosengarten of the South Carolina Sea Grant Consortium, provides details of storm impacts outside Beaufort County. Because of strong winds, three-quarters of Charleston County lost power, and the power failed at the Charleston city waterworks. On Folly Beach, "...200 people 'rode out' the hurricane, and all front row houses were damaged. Roads on the east side of the island were washed away". Inland, 100 mph winds lashed Walterboro. Farther north, a tornado damaged homes in Garden City, near Myrtle Beach. The publication also related details of a Red Cross Areal Survey conducted October 2: "...Between Beaufort and Charleston, inland as far as Walterboro, 48 homes were destroyed, 349 homes suffered major damage and 4,115 homes suffered minor damage".

SPECIAL STATEMENT FOR PRESS RADIO AND TELEVISION ON HURRICAN GRACIE

HURRICANE GRACIE HAS GROWN INTO AN EXTREMELY DANGEROUS HURRICANE AND ISLAND BEACHES AND WATERFRONT AREAS MUST BE COMPLETELY EVACUATED ALL ALONG THE SOUTH CAROLINA COAST IF LOSS OF LIFE IS TO BE AVOIDED.

THE GREATEST DANGER WILL BE NEAR AND NORTHWARD OF THE CENTER WHERE TIDES OF NEAR 12 FEET ABOVE MEAN LOW WATER AND WINDS UP TO 125 MILES PER HOUR ARE EXPECTED SOMETIME BETWEEN DAYLIGHT AND NOON TUESDAY

J. A. CUMMINGS
WEATHER BUREAU OFFICE
CHARLESTON S.C.

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TIDE STATEMENT CHARLESTON SAXXX S.C. 2.30 PM SEPT 29 1959

THE CREST OF THE STORM TIDE ALONG THE COAST IN THE VICINITY OF CHARLESTON S.C. HSXXX HAS BEEN REACHED. FROM 120 NOON TO 2.30 P.M. THE HIEHGT OF TIDE IN THE CHARLESTON AREA WAS APPROXIMATELY 9 AND 1/2 FEET ABOVE MEAN LOW WATER. THIS WAS THE HIGHEST TIDE FOR CHARLESTON SINCE 1940 WHEN A HEIGHT OF 10.7 ABOVE MEAN LOW WATER WAS REACHED AT THE CUSTOM HOUSE.

FLOODING WILL PRESIST FOR SEVERAL MORE HOURS AND PROBABLY WILL NOT FALL BELOW THE FLOOD PLANE OF 7 FEET MEAN LOW XXXX MEAN LOW WATER UNTIL AFTER 7 P.M. TNOXXX TONIGHT.

WEATHER BUREAU CHARLESTON S.C. DEVERAUX

LOCAL STATEMENT
WEATHER BUREAU
CHARLESTON S.C.

HURRICANE GRACIE CROSSED THE COAST OVER ST. HELENA SOUND AT THE SOUTH END OF EDISTO ISLAND AT 11.25 A.M. EST. THIS ABOUT 25 MILES STOR TO THE LEFT OF THE COURSW WHICH OUR 8.30 A.M. STATEMENT GAVE. EXPECT FOR THIS MORE SOUTHERLY POINT OF CROSSING THE COAST THE PATHE OF OUR 8.30 A.M. STATEMENT VERY WELL COVERS THE COURSE OF THIS STORM ACROSS THE STATE. THE CENTER WILL NOW PASS OVER OR NEAR COLUMBIA S. C. AND GASTONIA N.C.

*Various statements on Gracie issued by the Weather Bureau office in Charleston, SC.
Image courtesy of NOAA/NHC.*

COORDINATION SHEET

Hurricane Grace # 29
 Date and Time Sept 29, 1959 1100E

INITIAL PREFERENCE OF CENTERS			
WFO Miami	Coord		FWC Miami
Present Position <u>32.5 N 80.2 W</u>	<u>32.5 N 80.2 W</u>	_____ N _____ W	<u>32.4 N 80.4 W</u>
Present Movement	Course <u>NW</u>	Course _____	Course <u>NW NNW</u>
	Speed <u>12</u> mph	Speed _____ mph	Speed <u>14</u> mph
	Speed _____ kts	Speed _____ kts	Speed <u>14</u> kts
Maximum Winds	<u>125</u> mph	_____ mph	_____ mph
	_____ kts	_____ kts	_____ kts
Present Radius of 75 mph Winds	<u>75-N</u>		
	<u>50-S</u>		
Present Radius of 40 mph Winds	<u>200-N</u>		
	<u>125-S</u>		
Forecast:			
12-hours	_____ mph	_____ mph	<u>015° 10</u> mph
12-hour position	<u>34 N 80.5 W</u>	_____ N _____ W	<u>34.5 N 79.5 W</u>
24-hour position	<u>36.5 N 78.5 W</u>	_____ N _____ W	<u>36.5 N 77.5 W</u>

Coordinated data for warnings

Present Position _____ N _____ W. Present Course and Speed _____

Maximum Winds: Present _____ Forecast _____

Radius of hurricane winds: Present _____ Forecast _____

Radius of 40 mph winds: Present _____ Forecast _____

Course and speed next 12 hours _____ ° _____ mph _____ kts

12-hour position at _____ Time _____ N _____ W

Present radius of 50 knot winds for Air Force _____

24-hour forecast at _____ Time _____ N _____ W

Forecast radius of 50 knot winds for Air Force _____

Coordination began _____ Completed _____

Comments: _____

400-8/20/58

Weather Bureau coordination sheet just before landfall on September 29. Image courtesy of NOAA/NHC.



Damage at Parris Island, SC from Gracie. Image courtesy of U.S. Marine Corps, Parris Island, SC.



Damage at Parris Island, SC from Gracie. Image courtesy of U.S. Marine Corps, Parris Island, SC.



Damage to Sheriff Ed McTeer's Coffin Point Plantation Home from Hurricane Gracie. Image courtesy of Beaufort County Library, SC.



Damage to the Edward Means House from Hurricane Gracie. Image courtesy of Beaufort County Library, SC.



Damage to the GW Trask packing shed from Hurricane Gracie. Image courtesy of Beaufort County Library, SC.

Additional Information

- [National Hurricane Center Archive](#)
- [NOAA Atlantic Hurricane Database Reanalysis \(1956-60\)](#)