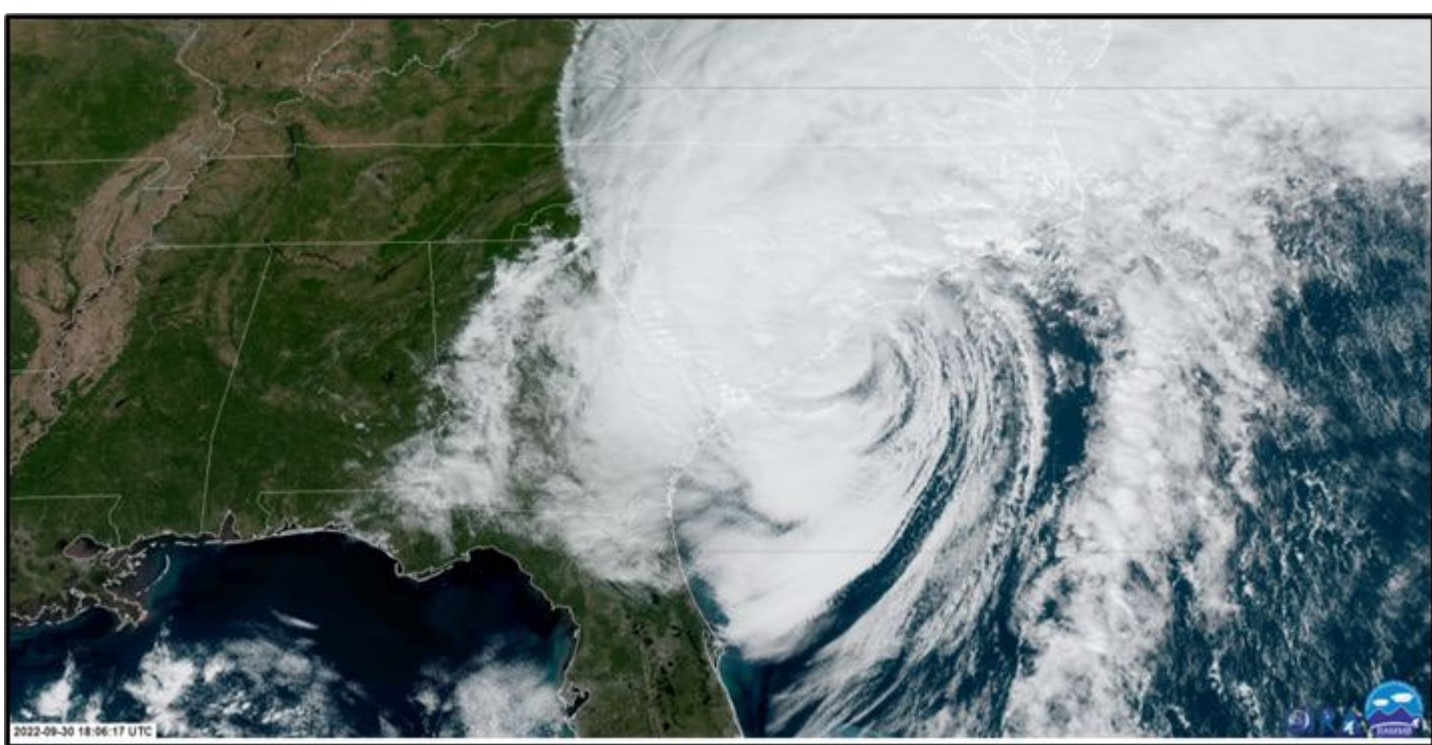




SC HURRICANES COMPREHENSIVE SUMMARY

LAST UPDATED: JANUARY 3, 2024



*Visible Satellite Image of Hurricane Ian Landfall Near Georgetown,
2:05 p.m. EDT, September 30, 2022*

SOUTH CAROLINA STATE CLIMATOLOGY OFFICE

Hope Mizzell, State Climatologist: MizzellH@dnr.sc.gov

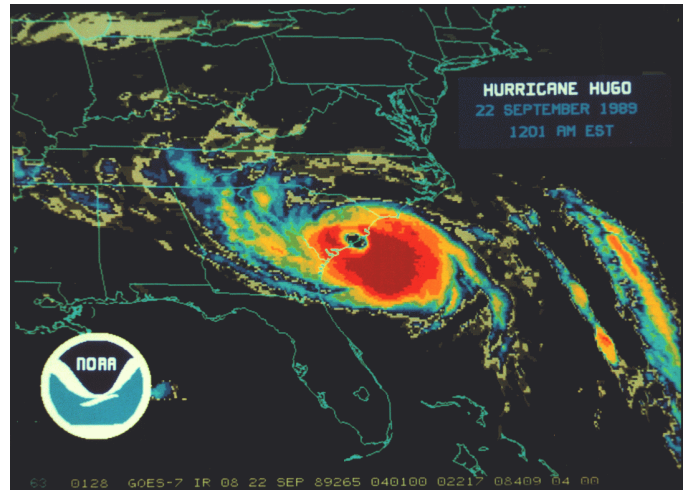
Melissa Griffin, Assistant State Climatologist: GriffinM@dnr.sc.gov

Frank Strait, Severe Weather Liaison: StraitF@dnr.sc.gov

SOUTH CAROLINA TROPICAL CYCLONE CLIMATOLOGY

An understanding of tropical cyclones is essential for an understanding of South Carolina's climatology, especially when considering the growth of coastal communities. However, impacts from these systems are not limited to the coast. Inland areas have been affected by flooding rain, high winds, and tornadoes.

From 1851 to 2023, 44 tropical cyclones have made landfall on the South Carolina coast. Of these that have directly hit the coast, only four made landfall as major (Category 3+) hurricanes. They are the 1893 Great Charleston Hurricane, Hurricane Hazel of 1954, Hurricane Gracie of 1959, and Hurricane Hugo of 1989. There are no Category 5 hurricane landfalls on record in South Carolina. One other hurricane, the 1893 Sea Islands hurricane, had the impact of a major hurricane in South Carolina after making landfall in Georgia.



While the official Atlantic Hurricane Season begins each year on June 1st and ends on November 30th, tropical cyclones sometimes form outside of these days, mainly in May and December.



This summary includes a statistical analysis of the historical tropical cyclones that have affected the Palmetto State. It also contains an overview of tropical cyclone hazards, brief narratives of notable hurricanes that have impacted South Carolina, and a timeline of tropical cyclones that have hit the state since 1851.

SOUTH CAROLINA BY THE NUMBERS

86%

**ANNUAL CHANCE
OF BEING
IMPACTED BY A
TROPICAL
SYSTEM BASED
ON THE LAST 50
YEARS**

**(AT LEAST ONE IMPACT IN
43 OF THE LAST 50 YEARS)**

THE BREAKDOWN: (based on the 1851-2023 period of record)

286

TROPICAL OR FORMERLY TROPICAL CYCLONES
HAVE IMPACTED SC

133

STORM CENTERS HAVE TRACKED THROUGH SC

44

TROPICAL CYCLONES HAVE MADE LANDFALL
ALONG THE SC COAST

31

WERE CATEGORY 1 OR HIGHER WHILE IN SC

25

HURRICANES MADE LANDFALL ON THE SC COAST

5

MAJOR (CAT. 3+) HURRICANE IMPACTS

4

MAJOR (CAT. 3+) HURRICANE LANDFALLS

This table outlines the earliest and latest tropical storms or hurricanes that have impacted South Carolina since 1851.

South Carolina has never been impacted by a tropical cyclone earlier than February 3rd or later in the year than December 2nd.

A tropical storm or hurricane has never made landfall in South Carolina later than October 31st. No major hurricane (Category 3 or higher) on record has made landfall before mid-August or after mid-October.

**EARLIEST
RECORD**

**LATEST
RECORD**

TROPICAL STORM

February 3, 1952

December 2, 1925

CATEGORY 1

May 27, 1908

October 20, 1853

CATEGORY 2

July 14, 1916

October 31, 1899

CATEGORY 3

August 18, 1879

October 13, 1893

CATEGORY 4

August 26, 1958

October 15, 1954

LANDFALL

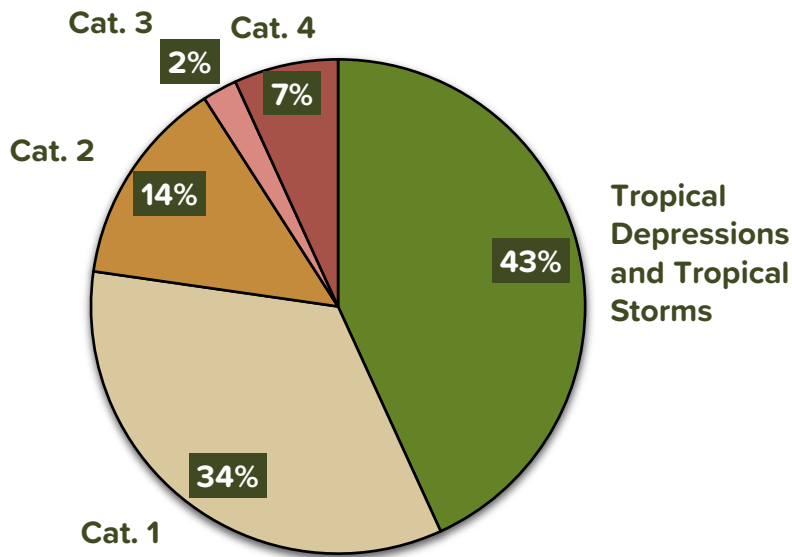
May 7, 2015

October 31, 1899

LANDFALLS IN SOUTH CAROLINA

A tropical cyclone makes landfall when the center of the storm intersects or crosses with a coastline. Because the strongest winds in a tropical cyclone are not located precisely at the center, a cyclone's strongest winds can be over land even if landfall does not occur.

Tropical Cyclone Category at Landfall in South Carolina



Tropical Storms and Hurricanes That Made Landfall in South Carolina, 1851-2023:

19 Tropical Depressions and Tropical Storms

15 Category 1

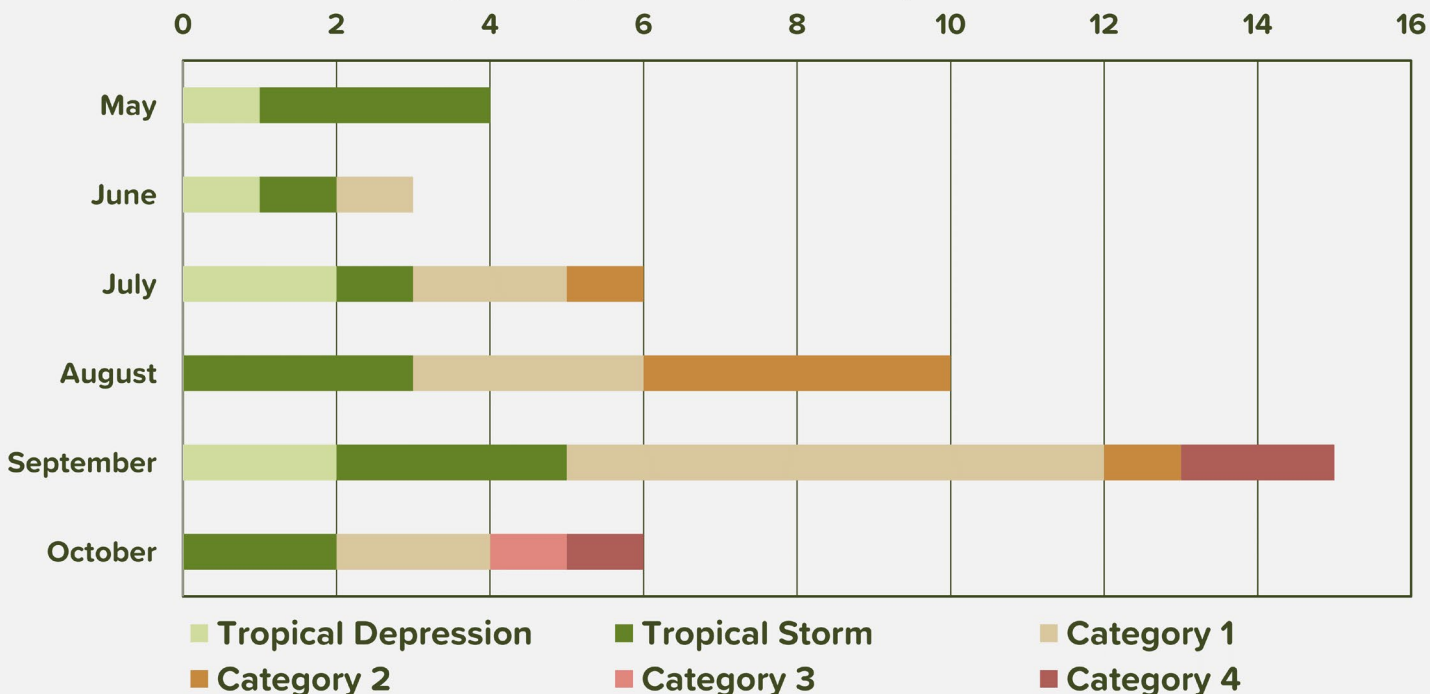
6 Category 2

1 Category 3

3 Category 4

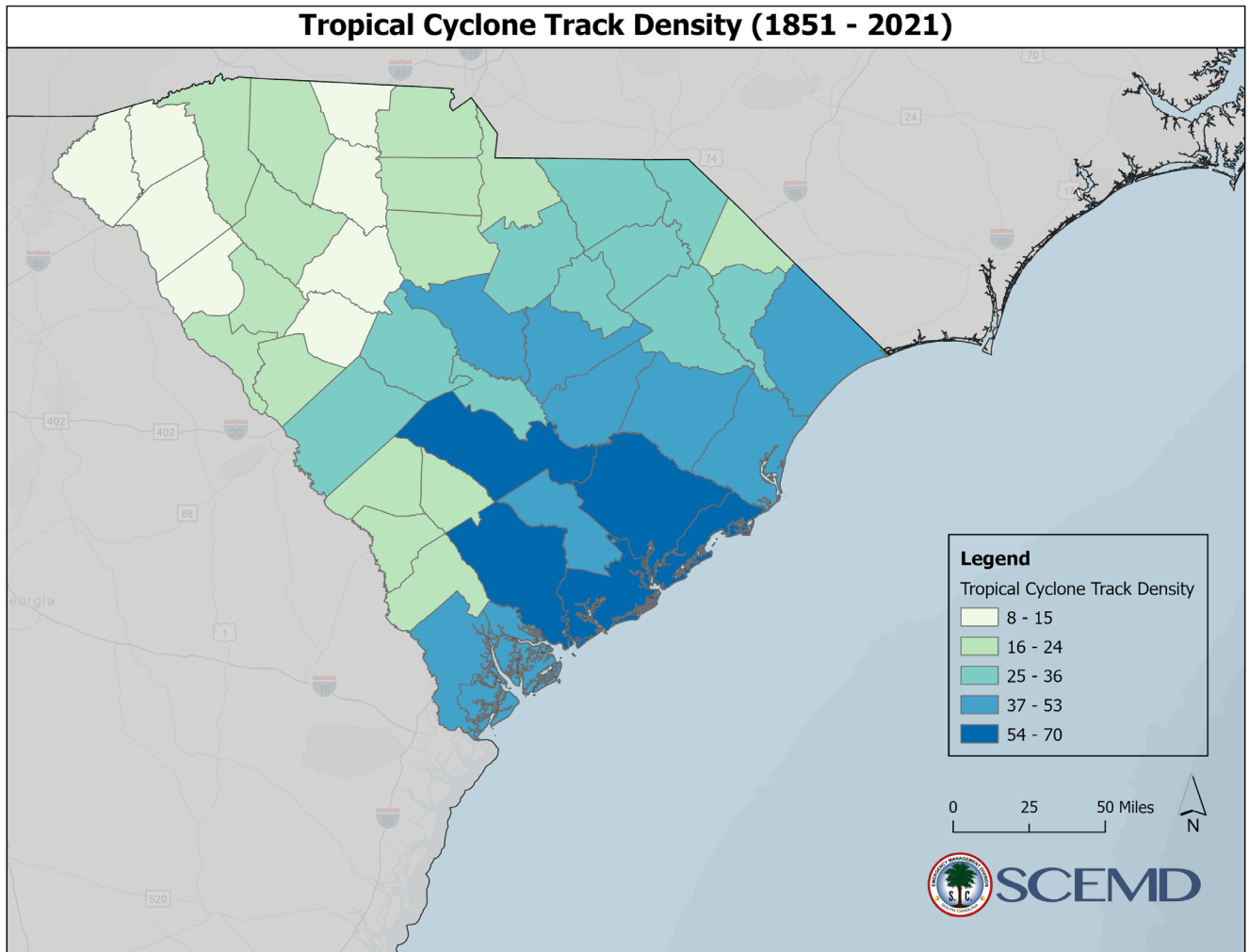
0 Category 5

Category Breakdown of South Carolina Tropical Cyclone Landfalls by Month



SOUTH CAROLINA TROPICAL CYCLONE TRACK DENSITY

This map includes the counts of the storms categorized by the National Hurricane Center as either formerly tropical extratropical storms, tropical storms, or hurricanes that have passed into/through each county of the state from any direction, not simply making landfall on the coastline. This map does not consider the track of any remnants from tropical cyclones or far-reaching impacts of tropical cyclones that tracked outside of the state boundary.

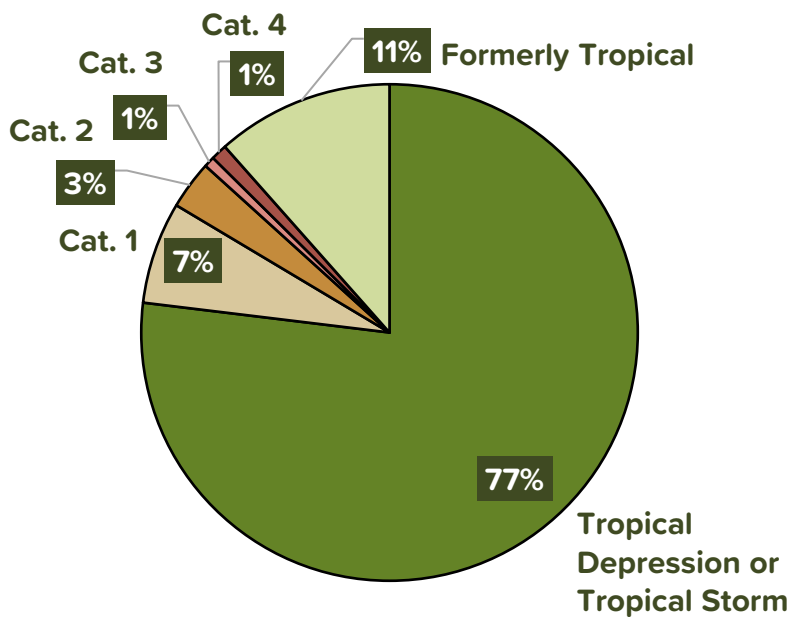


Tropical systems can be hazardous for residents all over the state, even if they do not make landfall along the South Carolina coast. As a tropical cyclone moves inland, it loses its strength since it is no longer over its fuel source, the warm ocean water. Even in a weakened state, the remnants of these storms can produce heavy rain, tornadoes, and strong winds to interior portions of the area.

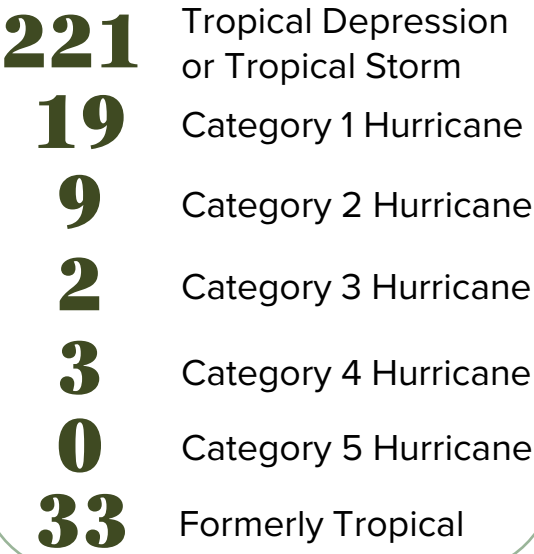
STORM IMPACTS ON SOUTH CAROLINA

The average size of a tropical system is approximately 300 miles in diameter. While a storm might not make landfall in South Carolina, it can still have far-reaching impacts in the form of high winds, heavy rain, tornadoes, and coastal surge. The impact category is intended to describe the effect that the storm had on South Carolina. This can be different than a storm's intensity as rated by the National Hurricane Center for near-miss storms.

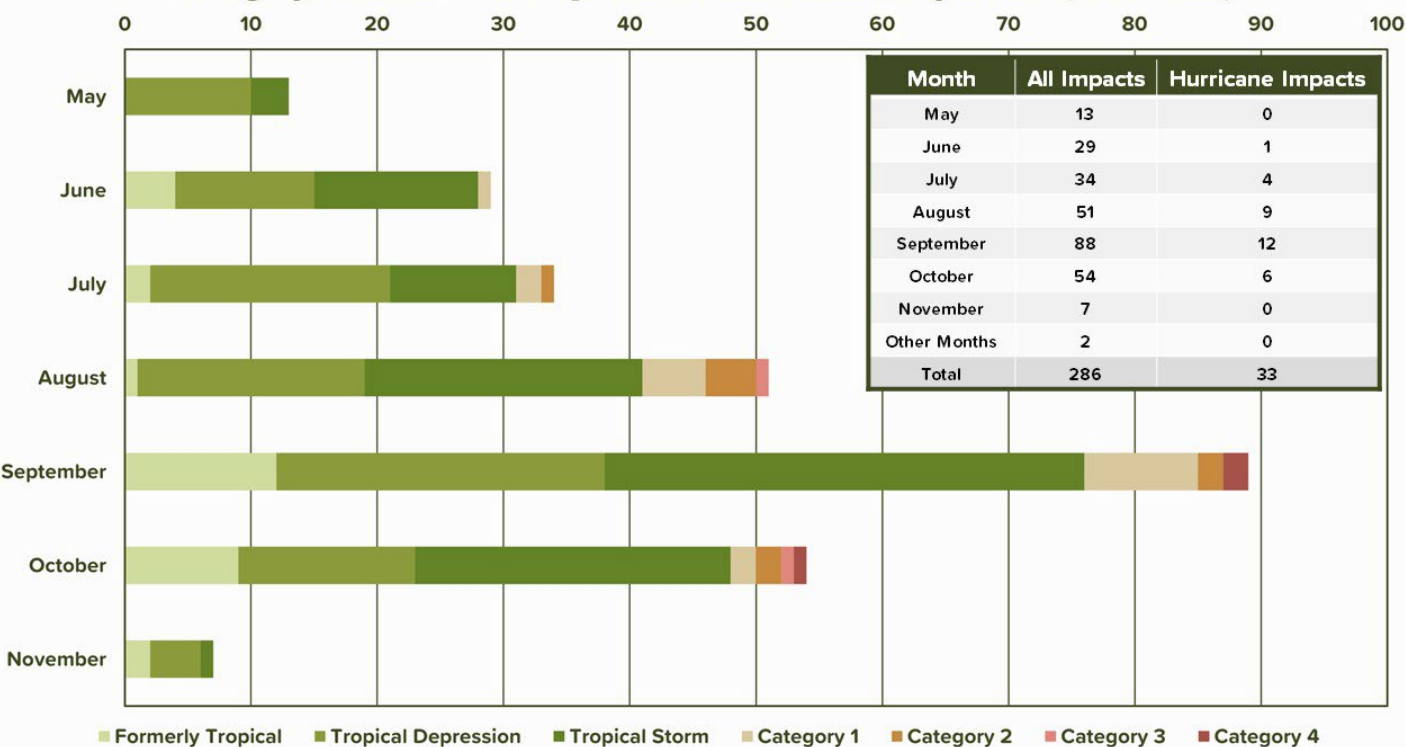
Tropical Cyclone Impact Category For South Carolina



Tropical Storms and Hurricanes That Had An Impact On South Carolina:

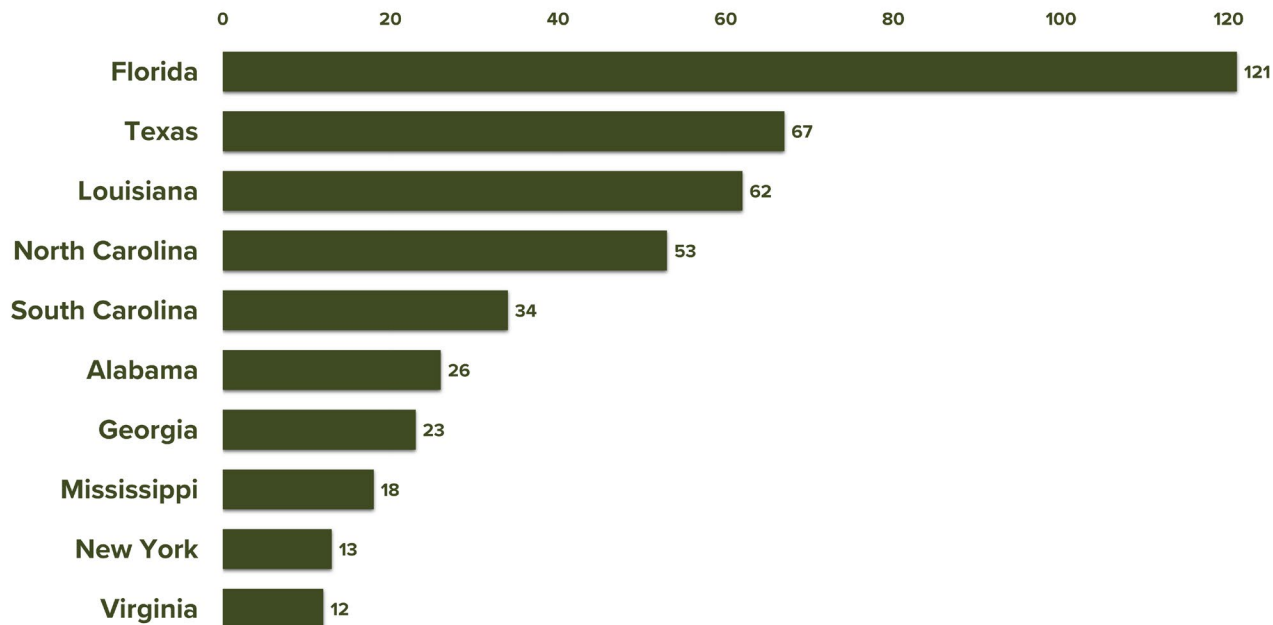


Category Breakdown of Impacts to South Carolina by Month (1851-2023)



Over the last 50 years, at least one tropical cyclone has impacted South Carolina about seven years out of every eight on average. South Carolina ranks fifth among the states for having the most hurricane impacts over the entire historical record for Atlantic hurricanes stretching back to 1851.

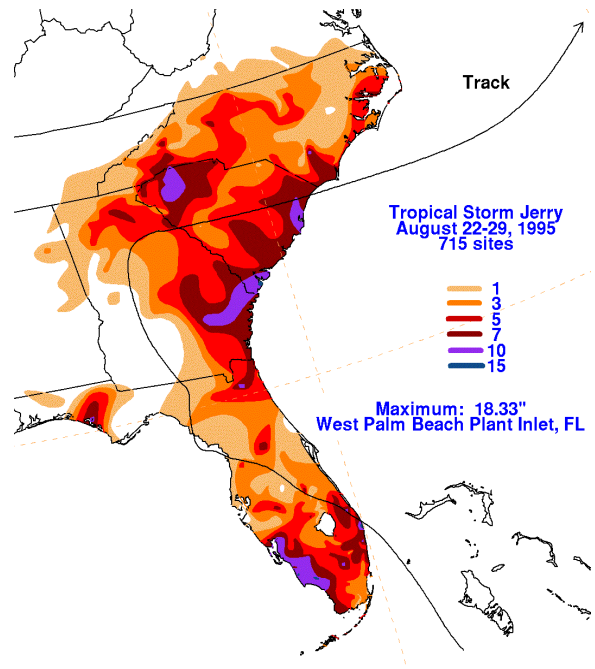
Hurricane Impacts Per State, 1851-2023



HAZARDS

INLAND FLOODING

Flooding from heavy rain has been the leading cause of hurricane-related deaths since 2013. Flooding rain from tropical cyclones does not correlate with the intensity of the tropical storm or hurricane but rather the storm's forward speed; slower-moving tropical cyclones cause heavier rainfall. Heavy torrential rains can occur hundreds of miles away from the center of the storm. Slow-moving Tropical Storm Florence (2018) dropped more than 30 inches of rain across portions of eastern North Carolina and over 20 inches in Horry County, the most on record for a tropical cyclone in South Carolina. The rain caused extensive flooding within the Pee Dee watershed that lasted weeks. Tropical Storm Jerry of 1995 made landfall on the Florida coast before slowly moving into the Upstate. Downpours dumped up to 15 inches of rain, leading to dam breaks and extensive flooding along the Saluda, Broad, Congaree, and Edisto rivers.



Highest Rainfall Totals Per Tropical Cyclones And Their Remnants (1956-2023) In South Carolina

Rainfall Total	Tropical Cyclone	Dates	Location
23.68"	Florence	Sep 15-18, 2018	Loris 2.9 WSW
17.45"	Beryl	Aug 13-18, 1994	Jocassee 8 NW
16.92"	Matthew	Oct 7-8, 2016	Edisto Island Middleton
16.80"	Floyd	Sep 15-16, 1999	Myrtle Beach
15.21"	Dorian	Sep 5-6, 2019	Pawleys Island 5.6 NNE
15.13"	Jerry	Aug 23-28, 1995	Hilton Head
14.17"	Hermine	Sep 1-3, 2016	Georgetown 6.0 S
14.11"	T. D. Eight	Aug 15-18, 1971	Sullivans Island
13.96"	Marco/Klaus	Oct 10-13, 1990	Pageland
13.80"	Gladys	Oct 17-20, 1968	Marion

Stations operated by the National
Weather Service or **CoCoRaHS**

HAZARDS

STORM SURGE



Coastal communities must understand the impacts of storm surges and local tides, which can combine to create hurricane storm tides. One of the highest storm tides on record along the South Carolina Coast occurred during Hurricane Hugo (1989). From Sewee Bay to McClellanville, the storm tide exceeded 20 feet, sweeping away anything in its push inland.

The storm surge went 10 miles inland up the Cooper, Ashley, and Santee Rivers, destroyed piers and oceanfront property, and caused significant beach erosion in Georgetown and Horry counties. Although Hurricane Irma (2017) made landfall in southwest Florida, it produced maximum inundation levels of 3 to 5 feet above ground level along the Georgia and South Carolina coast. More recently, Hurricane Ian (2022) made landfall near Pawleys Island with a peak storm surge of about seven feet. Historically, storm surge is the leading cause of death in landfalling tropical cyclones.

*Sand pushed onto SC Highway 174 (Palmetto Boulevard) in Edisto Beach by Hurricane Matthew's storm surge in 2016.
SCDNR Photo*

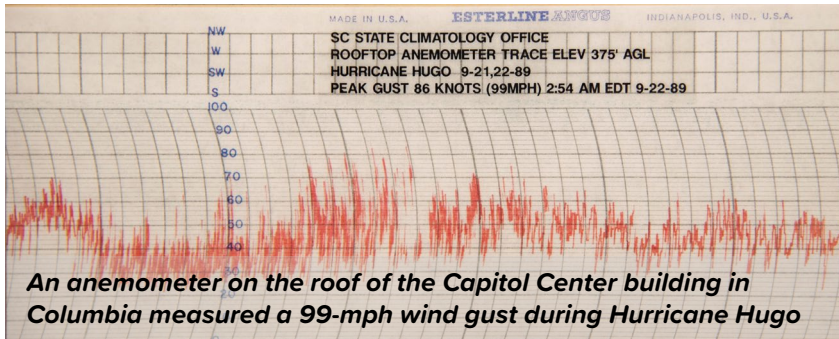


HAZARDS

WIND



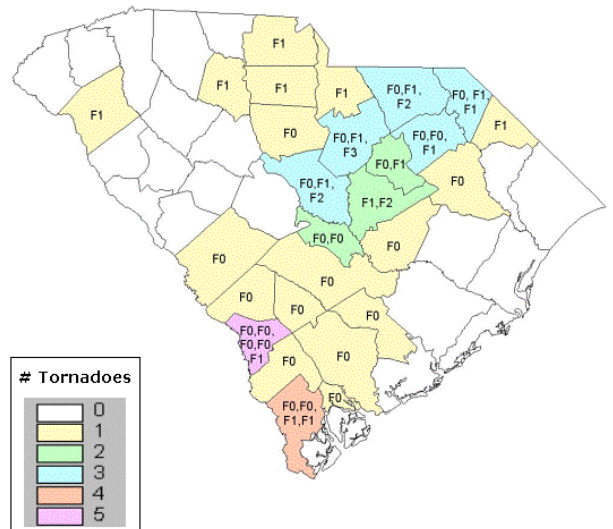
Tropical cyclones are known for damaging wind and are categorized on the Saffir-Simpson scale based on the maximum sustained winds, not the maximum wind gusts. The size of a tropical cyclone wind field can expand out hundreds of miles from the storm's center, with the concentration of strongest winds usually found near the storm's center. Winds can stay at hurricane strength well inland of the coast. As Hurricane Hugo (1989) moved through the state, hurricane-force winds (74 mph or higher) were observed at Shaw Air Force Base, located 80 miles from the coast. The station recorded a wind gust of 109 mph.



TORNADOES

Tornadoes produced by tropical cyclones form in the outer rainbands, which can be hundreds of miles away from the storm's center and are more likely to occur in the right-front quadrant of the storm. More than half of landfalling hurricanes produce at least one tornado. One of the most significant tornado outbreaks recorded in South Carolina was Hurricane Frances (2004), which made landfall along the east coast of Florida. Thunderstorms in the far-reaching outer rainbands spawned over 100 tornadoes across the Southeast, including 47 in South Carolina. While most of the tornadoes are on the lower end of the Enhanced Fujita Scale, one was an F3 (winds between 158 – 206 mph) in Kershaw County that destroyed buildings and mobile homes near the city of Camden.

T.D. Frances Tornado Outbreak Statistics September 6 – 7, 2004 (by county and intensity)

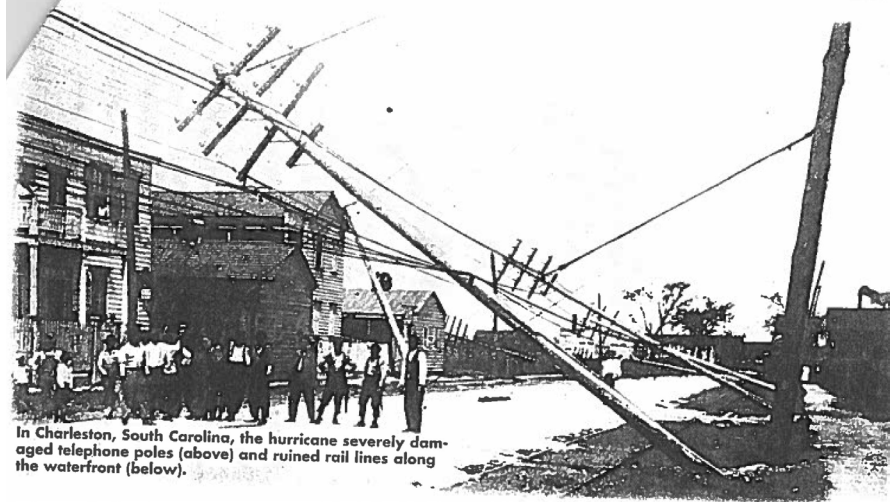


*** Intensities include data from the Public Information Statements available from the National Weather Service and updates provided by Vince DiCarlo (GSP) and Jerry Harrison (CHS) on October 25, 2004, for verification of this report.

NOTABLE HURRICANES

August 28, 1893: The Sea Islands Hurricane

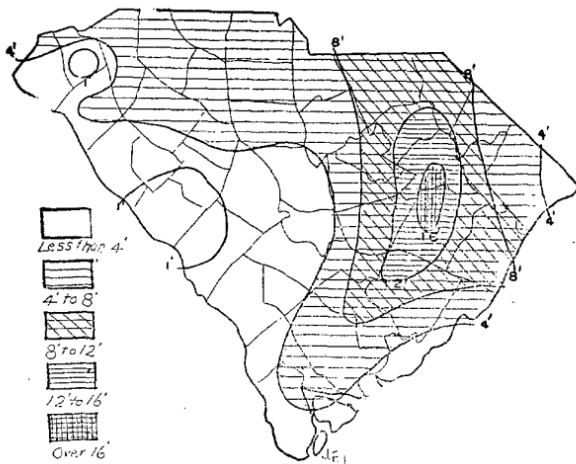
Telegraph communication capabilities were growing rapidly during the late 19th Century, which meant that areas with large coastal populations could be warned of incoming harsh weather conditions. However, warnings could not reach more isolated populations, such as those residing on the Sea Islands of Georgia and South Carolina.



On August 28th, 1893, a Category 3 hurricane made landfall at Ossabaw Island, Georgia at high tide before moving into South Carolina. It created an enormous storm surge that submerged many of the Sea Islands. Maximum winds in the Beaufort area were estimated at 125 miles per hour (mph), and winds in Charleston were estimated to be near 120 mph. At least 2,000 South Carolinians died, and the hurricane caused \$334.1 million (inflation-adjusted to 2023) of damage. This was the first of two major hurricanes to affect South Carolina in 1893. The 1893 Charleston Hurricane made landfall as a Category 3 storm near McClellanville on October 18, causing more extensive damage in the Palmetto State.

July 14, 1916: The 1916 Charleston Hurricane

Chart Showing Total Precipitation During
Period, July 14 to 18, 1916.

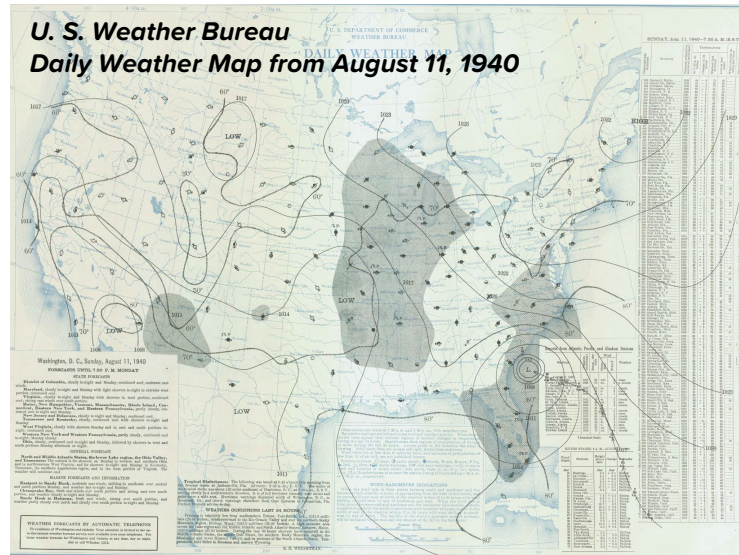


When this hurricane made landfall at Awendaw, it was a Category 2, with winds estimated at 105 mph. It crawled to the northwest over eastern South Carolina, which resulted in record rainfall for the time and widespread flooding. A weather station in Effingham (Florence County) recorded 13.25 inches of rain in only 24 hours. This hurricane caused about \$10 million (\$281.6 million in 2023) in damages, destroying over 700,000 acres of crops and causing the most extensive flooding of the Santee River System since records began in 1840. A tropical cyclone that had affected the state a few days prior was partly responsible for historic flooding in the Upstate. Rainfall and flooding was also historic in western North Carolina. The original Catawba Dam was wrecked by the flood waters and rebuilt as the Lake Wylie Dam in 1925.

NOTABLE HURRICANES

August 11, 1940: The 1940 S. C. Hurricane

This Category 2 hurricane made landfall near Hilton Head with winds of 105 mph, then tracked into central Georgia before curving to the north and heading into East Tennessee. Parts of the Lowcountry recorded more than ten inches of rain. High tides caused property damage along the southern coast from Folly Beach to Beaufort, including the U.S. Marine corps base on Parris Island and Port Royal. The extreme high tide at Charleston was determined as 10.71 feet above mean low water. Crop losses, including corn, hay, cotton, and truck crops, were severe in the coastal sections, and trees and roofs were damaged to some extent 50 miles inland.



October 15, 1954: Hurricane Hazel



Hurricane Hazel made landfall as a Category 4 storm near Little River, SC, close to the South Carolina/North Carolina border. Myrtle Beach, SC, reported a peak wind gust of 106 mph at landfall. Hazel made landfall during the highest lunar tide of the year, with a storm surge of at least 10 feet in SC with an 18-foot surge just across the NC border at Calabash. Damage reports from across the Grand Strand state that 80% of the oceanfront buildings in Pawley's Island were destroyed, and only 2 of 275 buildings were left standing in Garden City.

Significant wind and surge damage occurred in Georgetown and Horry counties. Rainfall totals ranged from less than an inch on the western half of the state to over eight inches along the Grand Strand. One person was killed, and the total damage costs in South Carolina were estimated to be \$27 million (~\$308.2 million in 2023). Hazel was a swift-moving storm, heading north at almost 50 mph. After moving through the Carolinas, Hazel moved north into Toronto, Ontario. While many hurricanes have occurred farther north along the East coast of the United States, Hazel remains the strongest, farthest north hurricane landfall on record.

NOTABLE HURRICANES

September 29, 1959: Hurricane Gracie

Hurricane Gracie made landfall on St. Helena Island near Beaufort as a Category 4 hurricane with winds of 130 mph. It tracked to the north-northwest through the Midlands, maintaining hurricane strength before weakening to a tropical storm near Charlotte area. Substantial wind damage occurred along the South Carolina coast from Beaufort to Charleston. Crop damage was reported in the Lowcountry and Midlands, including a significant loss of the unpicked cotton crop. While the storm made landfall at low tide, storm surge up to 10 feet was measured along the coast. The low tide landfall helped mitigate disastrous flooding from the surge. Rainfall totals were greater than six inches along the path of the storm. Ten storm-related fatalities were reported in SC. Gracie was South Carolina's second landfalling hurricane of 1954; Category 1 Hurricane Cindy hit near Awendaw on July 9.



*Damage from Hurricane Gracie
Photo courtesy of Beaufort County Library*

NOAA's Hurricane Re-analysis Project upgraded Gracie from a Category 3 to a Category 4 hurricane in June 2016.

September 21, 1989: Hurricane Hugo



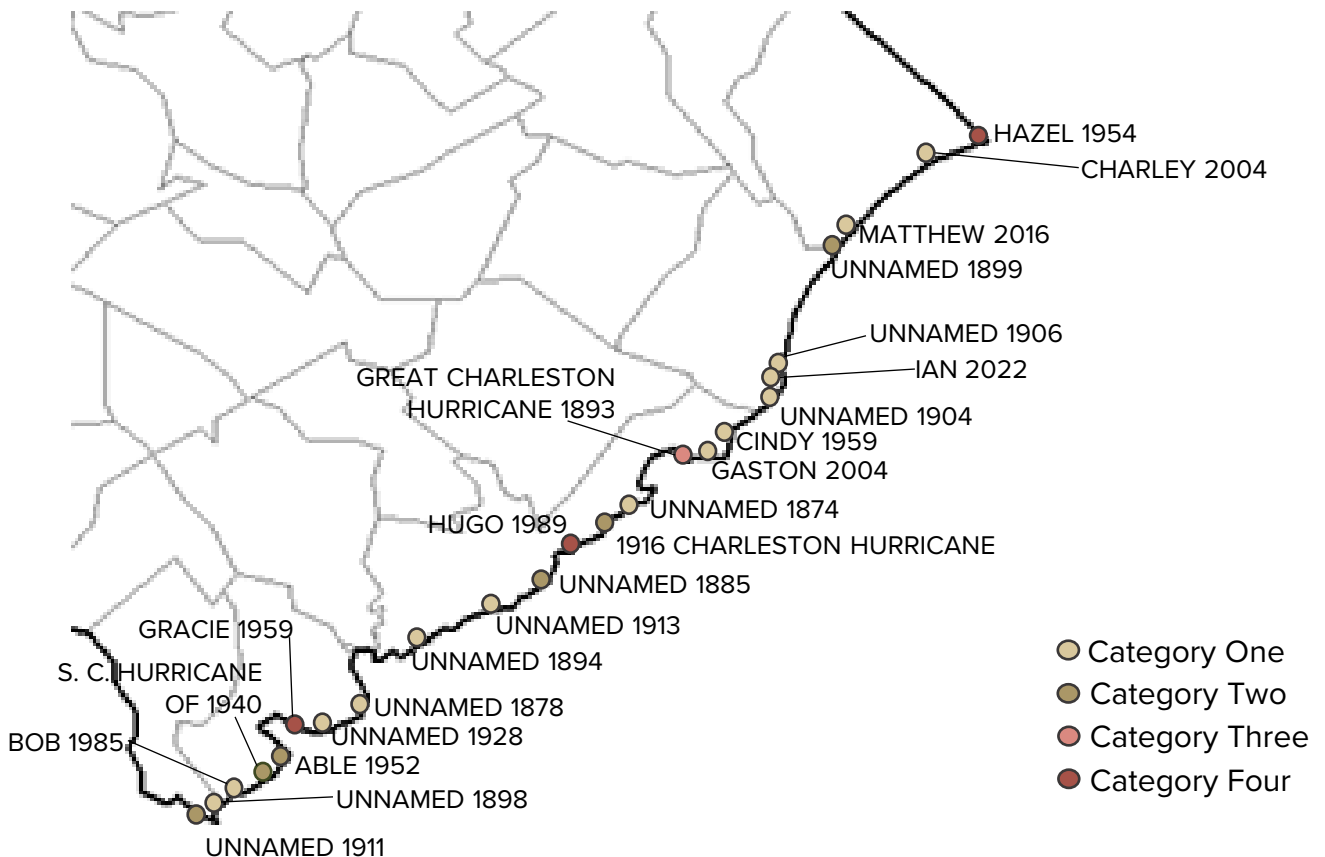
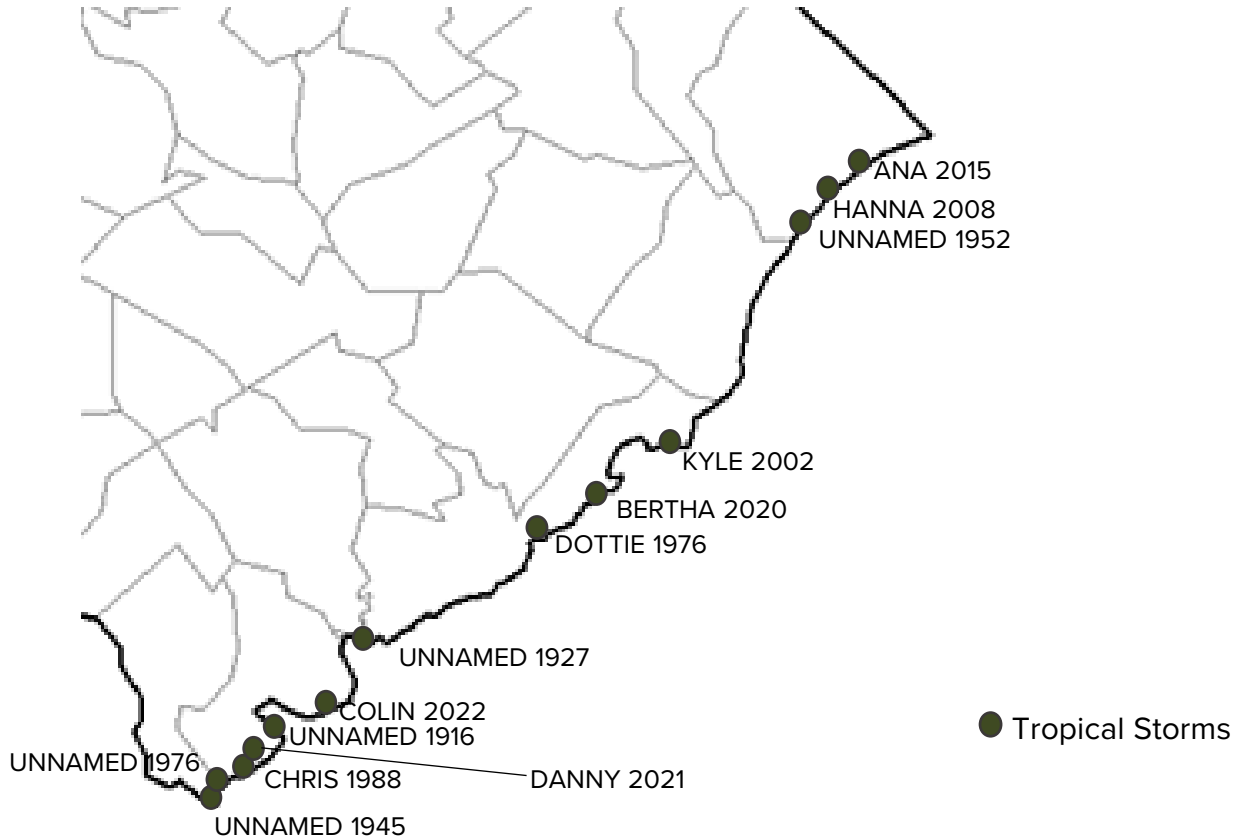
*Damage from Hurricane Hugo
SCDNR Photo*



*Damage from Hurricane Hugo
SCDNR Photo*

Hurricane Hugo was one of the worst natural disasters in South Carolina's history. It made landfall near Sullivan's Island as a Category 4 hurricane with estimated maximum sustained winds of 135-140 mph during the night of the 21st to the early morning of the 22nd. Hugo was moving northwest at 25 mph when it made landfall. Due to this accelerated speed, Hugo maintained hurricane-force winds (74 mph or higher) as far inland as Sumter, where gusts reached 109 mph. Gusts reached 90 mph in Charlotte, NC. Forested areas in 36 counties along the storm's path sustained significant damage. Hugo produced the highest storm tide heights ever recorded along the US East Coast, around 20 feet in Bulls Bay, SC, near Cape Romain. Hugo is the costliest storm in South Carolina history and, at the time, was the nation's costliest hurricane (about \$7 billion in damage to the U. S. mainland, about \$17.2 billion in 2023).

SOUTH CAROLINA LANDFALLS



SC LANDFALLS: 1851-2023

DATE	NAME	CATEGORY AT SC LANDFALL	LANDFALL LOCATION
June 22, 1867	Unnamed	Hurricane 1	Isle of Palms
September 28, 1874	Unnamed	Hurricane 1	Seabrook Island
September 12, 1878	Unnamed	Hurricane 1	Edisto Beach
August 25, 1885	Unnamed	Hurricane 2	Kiawah Island
October 13, 1893	Unnamed	Hurricane 3	McClellanville
September 27, 1894	Unnamed	Hurricane 1	Hilton Head
August 31, 1898	Unnamed	Hurricane 1	Hilton Head
October 31, 1899	Unnamed	Hurricane 2	Myrtle Beach
September 14, 1904	Unnamed	Hurricane 1	Winyah Bay
September 17, 1906	Unnamed	Hurricane 1	Winyah Bay
August 28, 1911	Unnamed	Hurricane 2	Hilton Head
October 8, 1913	Unnamed	Hurricane 1	McClellanville
May 16, 1916	Unnamed	Tropical Storm	Fripp Island
July 14, 1916	Unnamed	Hurricane 2	McClellanville
October 3, 1927	Unnamed	Tropical Storm	Seabrook Island
September 19, 1928	Unnamed	Hurricane 1	Pritchards Island
August 11, 1940	Unnamed	Hurricane 2	Daufuskie Island
September 17, 1945	Unnamed	Tropical Storm	Jones Island
August 28, 1952	Unnamed	Tropical Storm	Myrtle Beach

SC LANDFALLS: 1851-2023

DATE	NAME	CATEGORY AT SC LANDFALL	LANDFALL LOCATION
August 30, 1952	Able	Hurricane 2	Pritchards Island
August 15, 1954	Hazel	Hurricane 4	NC-SC State Line
July 9, 1952	Cindy	Hurricane 1	Awendaw
September 29, 1959	Gracie	Hurricane 4	St. Helena Sound
August 21, 1976	Dottie	Tropical Storm	Kiawah Island
September 15, 1976	Unnamed	Subtropical Storm	Hilton Head
July 25, 1985	Bob	Hurricane 1	Pritchards Island
August 28, 1988	Chris	Tropical Storm	Jones Island
September 21, 1989	Hugo	Hurricane 4	Sullivan's Island
October 11, 2002	Kyle	Tropical Storm	Bulls Bay
August 14, 2004	Charley	Hurricane 1	Cape Romain
August 29, 2004	Gaston	Hurricane 1	Awendaw
September 6, 2008	Hanna	Tropical Storm	N. Myrtle Beach
May 7, 2015	Ana	Tropical Storm	Myrtle Beach
October 8, 2016	Matthew	Hurricane 1	McClellanville
May 27, 2020	Bertha	Tropical Storm	Capers Island
June 27, 2021	Danny	Tropical Storm	Pritchards Island
July 1, 2022	Colin	Tropical Storm	Hunting Island
September 30, 2022	Ian	Hurricane 1	North Island