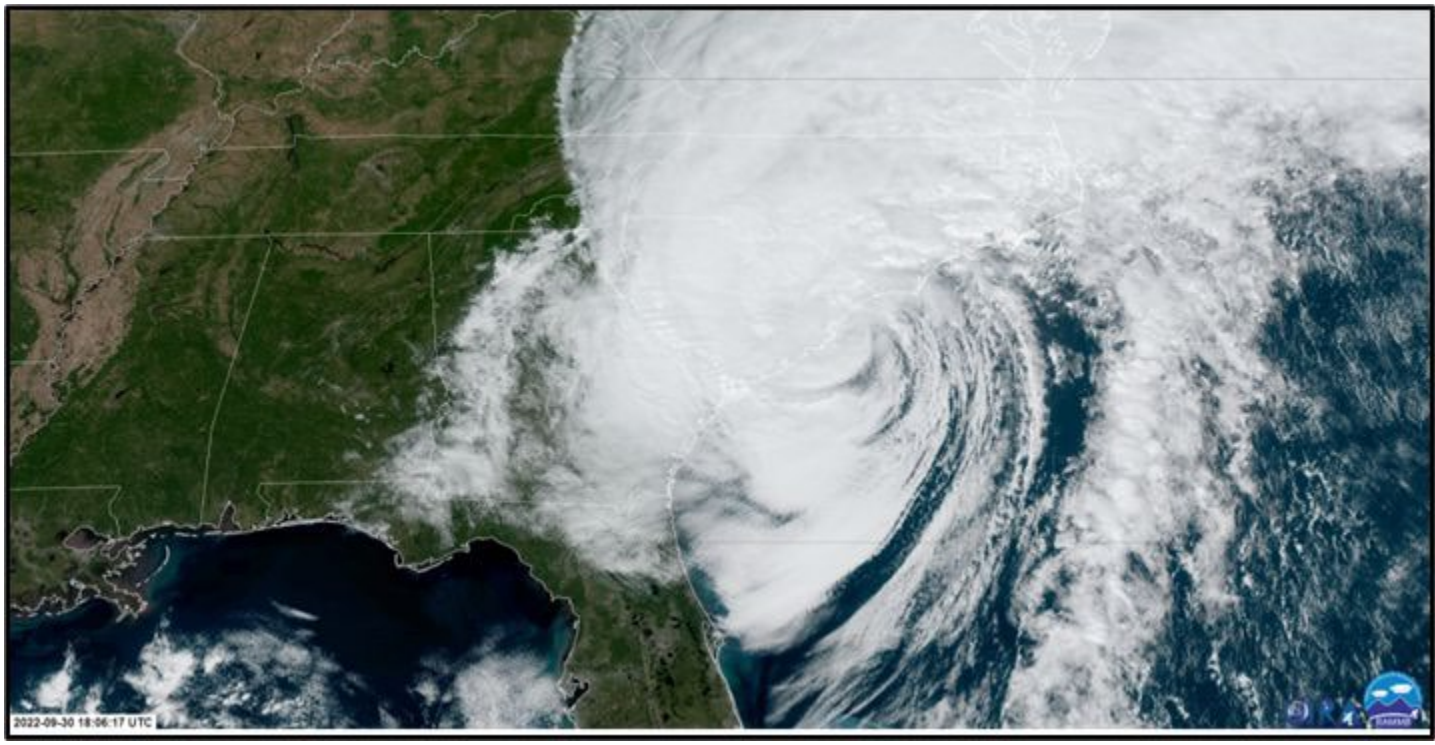
SC HURRICANES COMPREHENSIVE SUMMARY

Last Updated June 18, 2025



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

SOUTH CAROLINA STATE CLIMATOLOGY OFFICE

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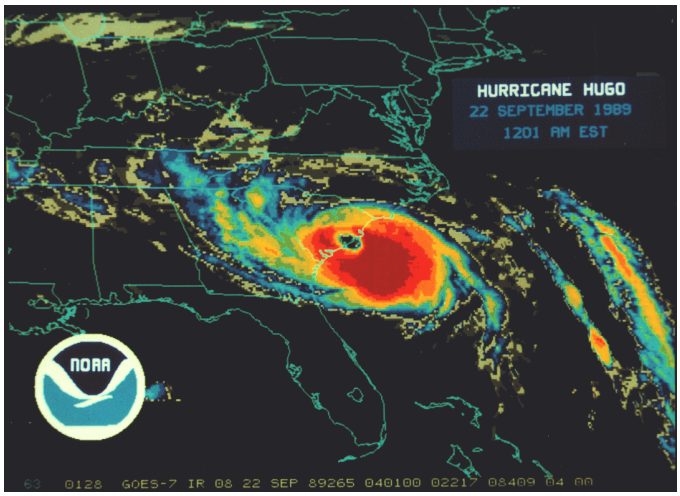
SOUTH CAROLINA TROPICAL CYCLONE CLIMATOLOGY

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



From 1851 to 2024, 45 tropical cyclones have made landfall on the South Carolina coast. Of these that have hit the state's 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 1 and ends on November 30, tropical cyclones sometimes form outside these dates, mainly in May and December. Thirteen tropical cyclones have affected South Carolina during May, seven of which have occurred since 2007.

This summary includes a statistical analysis of the historical tropical cyclones affecting 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

88%

ANNUAL CHANCE OF A TROPICAL CYCLONE IMPACT BASED ON THE LAST 50 YEARS

(AT LEAST ONE IMPACT IN 44 OF 50 YEARS FROM 1975 TO 2024)

THE BREAKDOWN:

(based on the 1851-2024 period of record)

288	TROPICAL OR FORMERLY TROPICAL CYCLONES HAVE IMPACTED SC
135	STORM CENTERS HAVE TRACKED THROUGH SC
45	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.

No tropical cyclone impacted South Carolina earlier than February 3 or later than December 2.

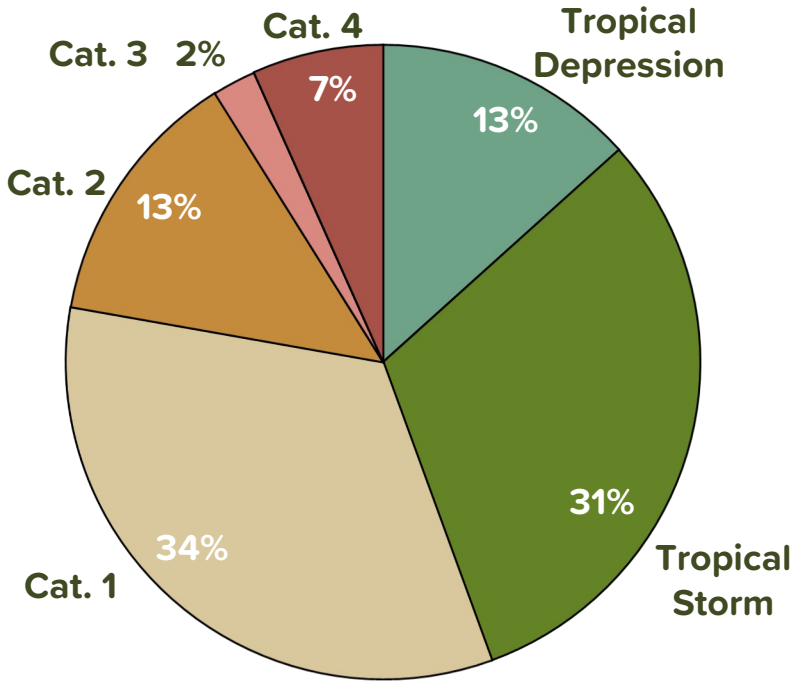
A tropical storm or hurricane has never made landfall in South Carolina later than October 31. No major hurricane (Category 3 or higher) on record has made landfall before mid-August or after mid-October.

	EARLIEST RECORD	LATEST RECORD
Tropical Storm Impact	February 3, 1952	November 21, 1985
Category 1 Impact	June 22, 1867	October 8, 2016
Category 2 Impact	July 14, 1916	October 31, 1899
Category 3 Impact	August 28, 1893	October 13, 1893
Category 4 Impact	September 21, 1989	October 15, 1954
Named Storm Landfall	May 10, 2015	October 31, 1899

LANDFALLS IN SOUTH CAROLINA

Landfall of a tropical cyclone occurs when its center crosses a coastline. Because the strongest winds in a tropical cyclone are not located precisely at the center, a tropical cyclone's strongest winds can be over land, even if landfall does not occur.

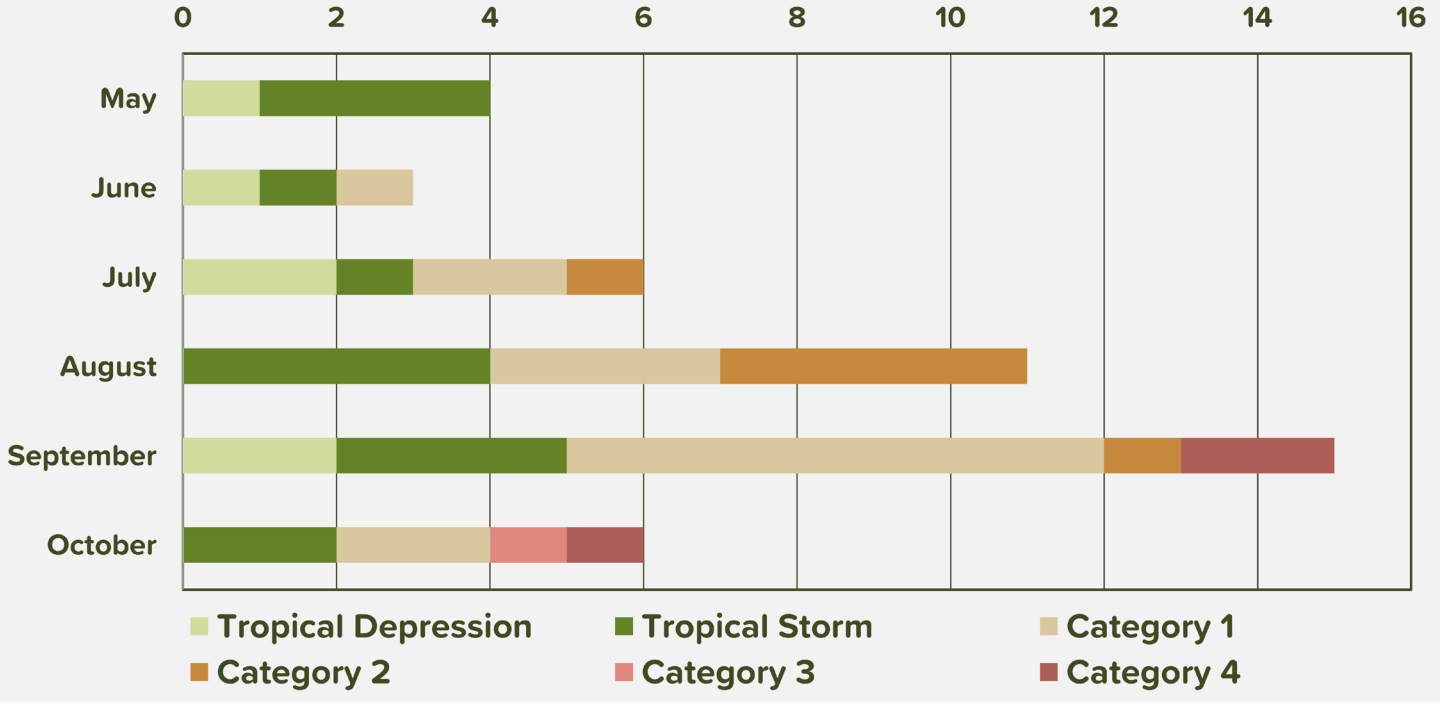
Tropical Cyclone Category At Landfall in South Carolina



Landfalling Tropical Cyclones in South Carolina, 1851-2024:

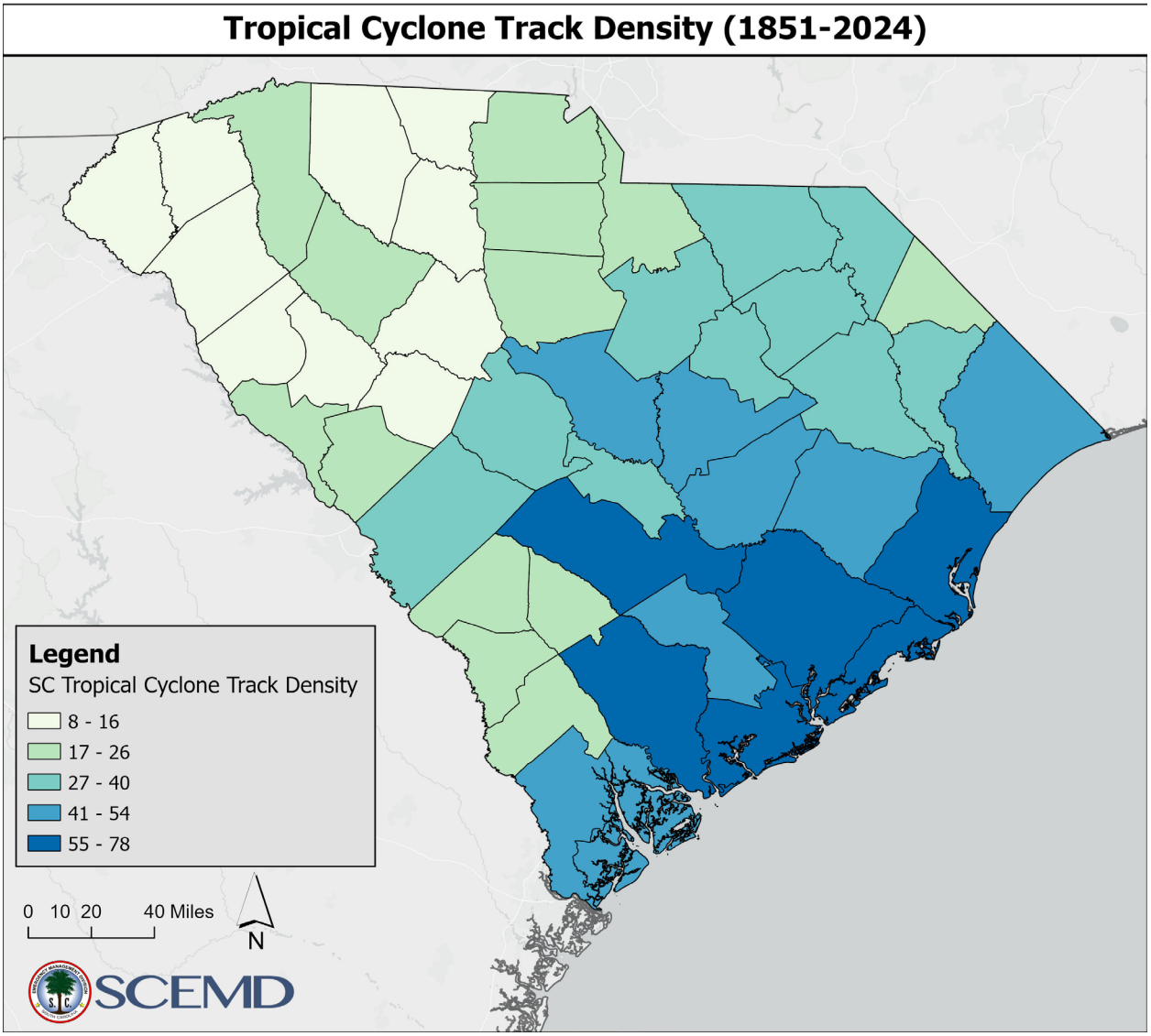
6	Tropical Depression
14	Tropical Storm
15	Category 1
6	Category 2
1	Category 3
3	Category 4
0	Category 5

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 depressions, tropical storms, or hurricanes that have passed into or through the state from any direction, not just those making landfall on the coastline. This map does not include the tracks of remnants from tropical cyclones or far-reaching impacts of tropical cyclones that tracked outside the state. The map clearly shows that the counties close to the coast are more regularly affected by tropical cyclones than counties in the Upstate.

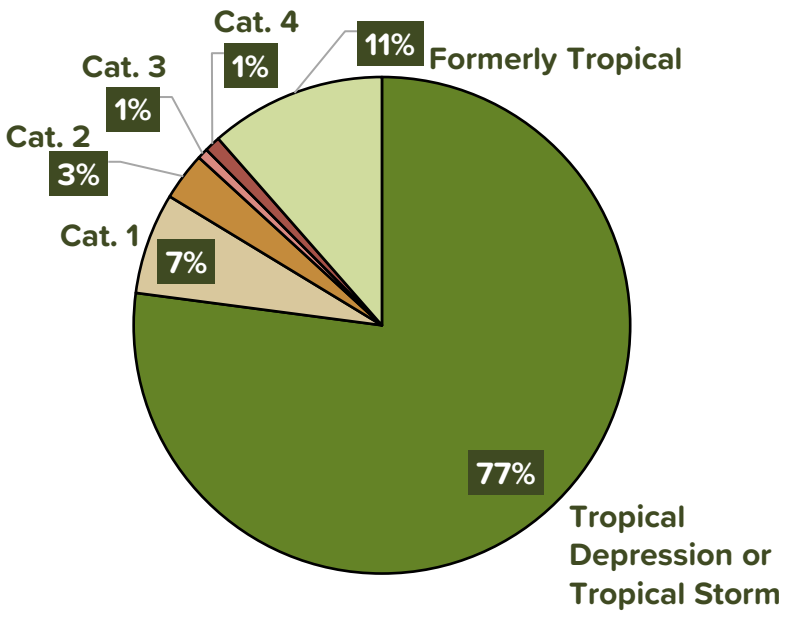


Tropical cyclones can be hazardous for residents all over the state, even if landfall does not occur along the South Carolina coast. As a tropical cyclone moves inland, it loses its strength since it is no longer over its fuel source, the warm ocean water. Even in a weakened state, the remnants of these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

STORM IMPACTS ON SOUTH CAROLINA

A typical hurricane is about 300 miles in diameter. In some cases, South Carolina will still experience the far-reaching impacts of high winds, heavy rain, tornadoes, and coastal surge from a storm that does not make landfall in South Carolina. The impact category describes the storm's effect on South Carolina. The impact category can be different for near-miss storms than a storm's intensity as rated by the National Hurricane Center.

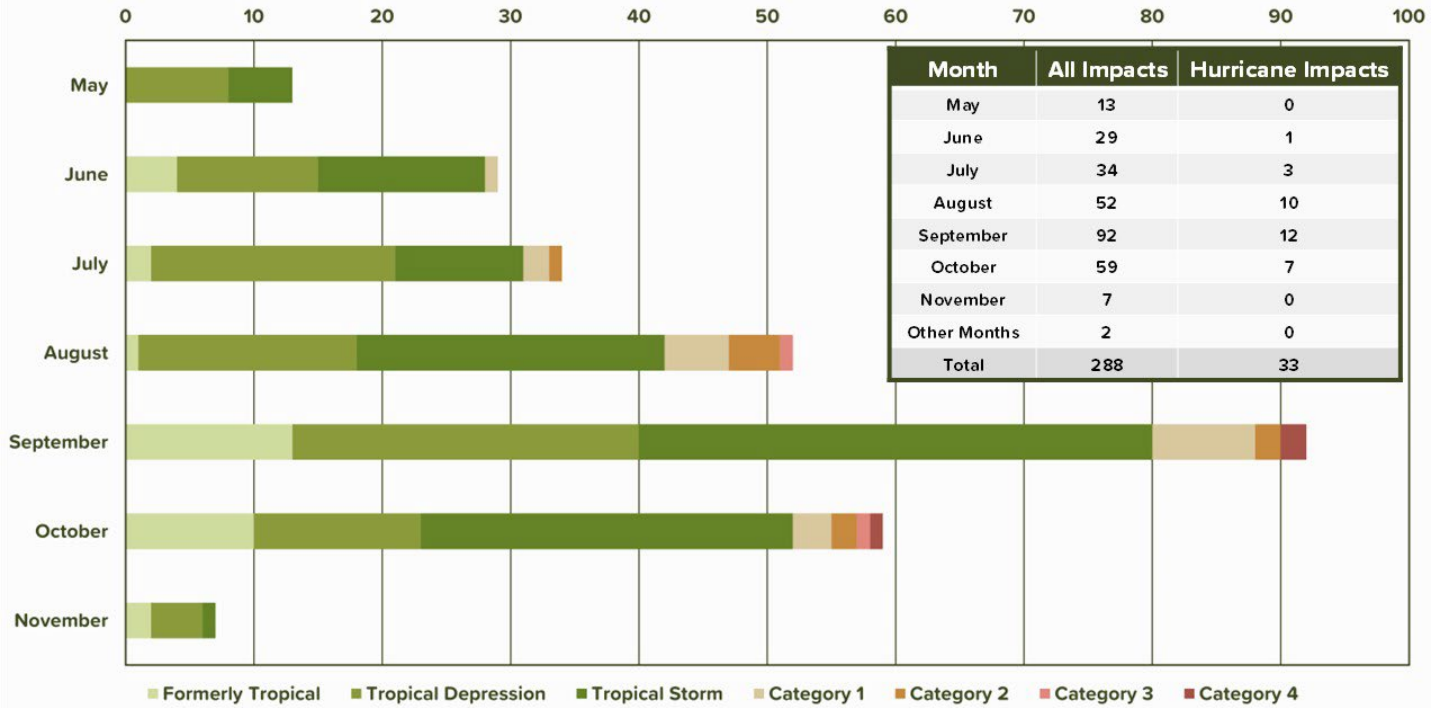
Tropical Cyclone Impact Category For South Carolina



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

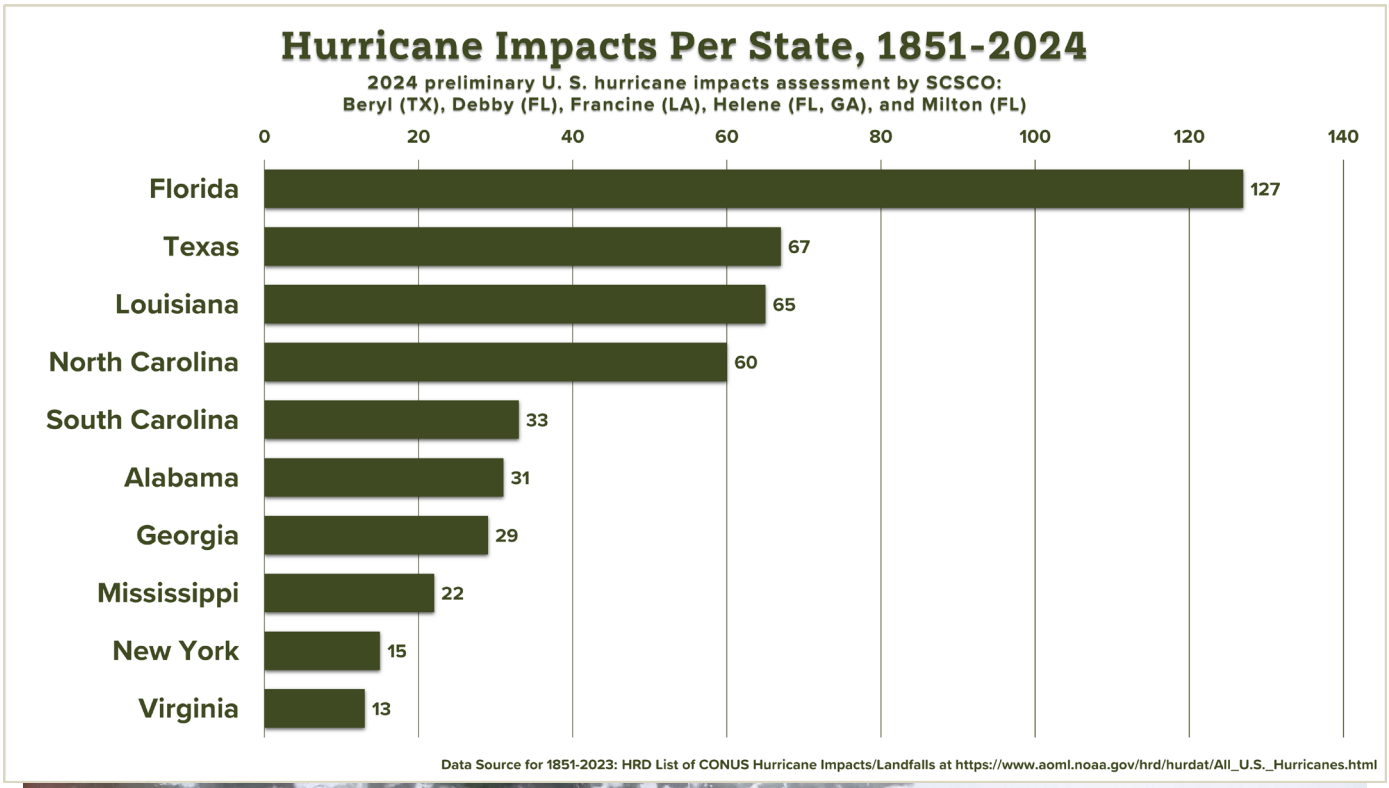
223	Tropical Depression or Tropical Storm
19	Category 1 Hurricane
9	Category 2 Hurricane
2	Category 3 Hurricane
3	Category 4 Hurricane
0	Category 5 Hurricane
33	Formerly Tropical

Category Breakdown Of Tropical Cyclone Impacts To South Carolina By Month 1851-2024



Month	All Impacts	Hurricane Impacts
May	13	0
June	29	1
July	34	3
August	52	10
September	92	12
October	59	7
November	7	0
Other Months	2	0
Total	288	33

Over the last 50 years, at least one tropical cyclone has impacted South Carolina, on average, about seven out of every eight years. 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.

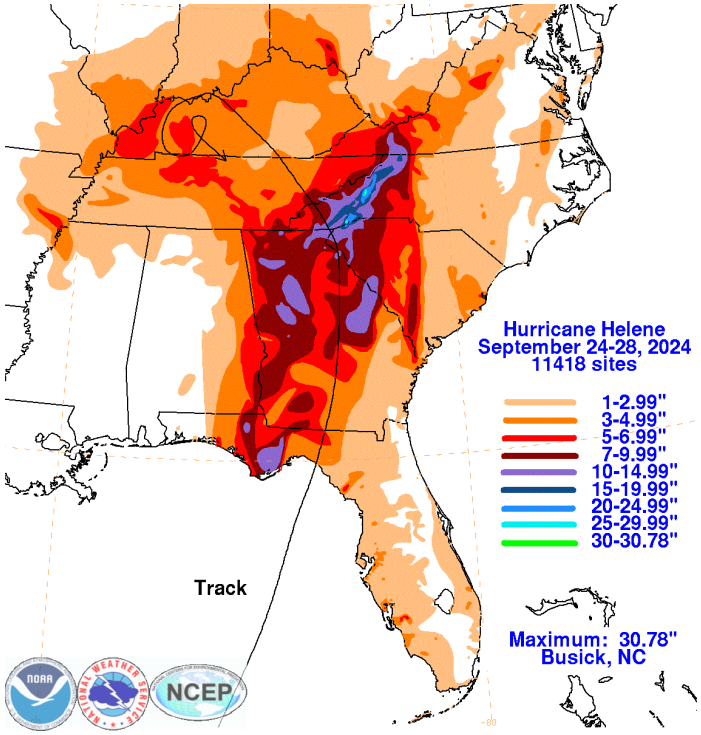


Storm surge from Hurricane Ian in 2022 caused widespread flooding around Pawley's Island. Photo Credit: Pawleys Island Police Department

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 Florence of 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. Helene and Debby of 2024 produced historic rainfall in the state, resulting in record river crests in their wake.



Highest Rainfall Totals In South Carolina From Tropical Cyclones and Their Remnants (1956 – 2024)

Rainfall Total	Tropical Cyclone	Dates	Location
23.68”	Florence	September 15-18, 2018	**Loris 2.9 WSW**
22.02”	Debby	August 5-9, 2024	**Moncks Corner 6.6 SW**
19.69”	Helene	September 26-29, 2024	Jocassee 8 WNW
17.45”	Beryl	August 13-18, 1994	Jocassee 8 WNW
16.92”	Matthew	October 7-8, 2016	Edisto Island Middleton
16.80”	Floyd	September 15-16, 1999	Myrtle Beach
15.21”	Dorian	September 5-6, 2019	**Pawleys Island 5.6 NNE**
15.13”	Jerry	August 23-28, 1995	Hilton Head
14.17”	Hermine	September 1-3, 2016	**Georgetown 6.0 S**
14.11”	Tropical Depression Eight	August 15-18, 1971	Sullivans Island
13.96”	Marco/Klaus	October 10-13, 1990	Pageland

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

HAZARDS

Storm Surge

Storm Surge Damage from Hurricane Hugo
SCDNR Photo

Residents of coastal communities must understand the impacts of a tropical cyclone's storm surge. Hurricane Hugo (1989) caused the highest storm tide on record along the South Carolina coast. From Sewee Bay to McClellanville, the storm surge was about 20 feet, sweeping away anything in its push inland.

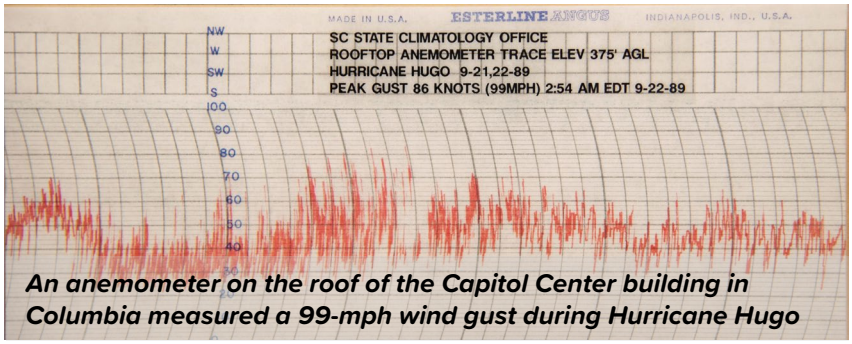
The storm surge went 10 miles inland up the Cooper, Ashley, and Santee Rivers, destroyed piers and oceanfront property, and caused significant beach erosion in Georgetown and Horry counties. Although Hurricane Irma (2017) made landfall in southwest Florida, it produced maximum inundation levels of 3 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

Trees Snapped in Francis Marion National Forest by Hurricane Hugo in 1989. SCDNR Photo.

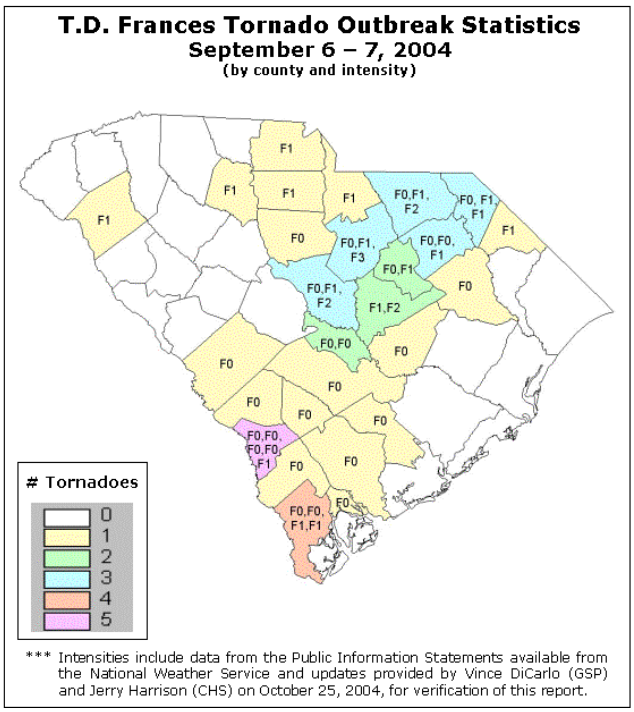


An anemometer on the roof of the Capitol Center building in Columbia measured a 99-mph wind gust during Hurricane Hugo

Tropical cyclones are known for damaging wind, and meteorologists use the Saffir-Simpson Hurricane Wind Scale to classify hurricanes based on the maximum sustained winds, not the maximum wind gusts. Tropical-storm-force wind (38-73 mph) can reach hundreds of miles from the storm's center, though the strongest winds usually occur near the center. Winds can stay at hurricane strength (74 mph or higher) well after landfall. As Hurricane Hugo moved through South Carolina in 1989, hurricane-force winds occurred over much of the state. For example, Shaw Air Force Base recorded a wind gust of 109 mph.

Tornadoes

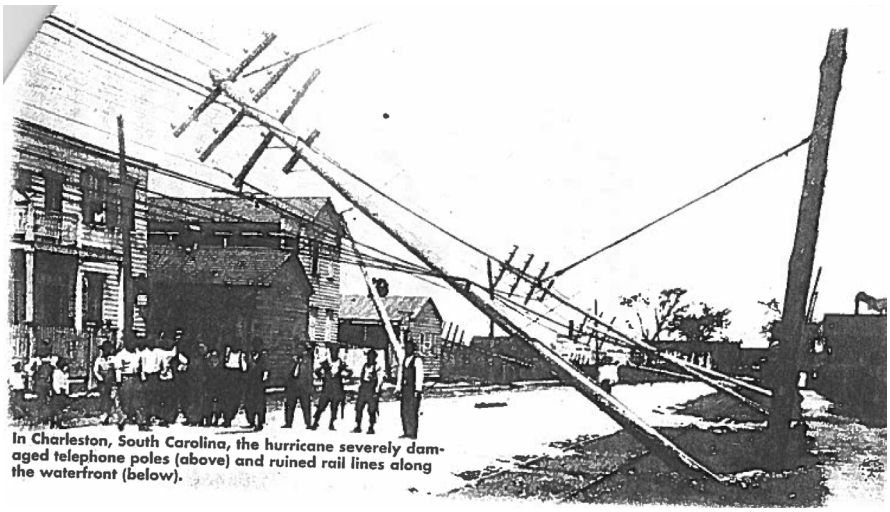
Tornadoes produced by tropical cyclones form in the outer rainbands, which can be hundreds of miles away from the storm's center and are most likely to occur in the northeastern quadrant of the storm. More than half of landfalling hurricanes produce at least one tornado. One of the most significant tornado 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 46 in South Carolina. Most of the tornadoes were relatively weak, rated F-0 or F-1 on the Fujita Scale in use at the time, but one in Kershaw County was an F-3 that destroyed buildings and mobile homes near Camden.



NOTABLE HURRICANES

August 28, 1893: The Sea Islands Hurricane

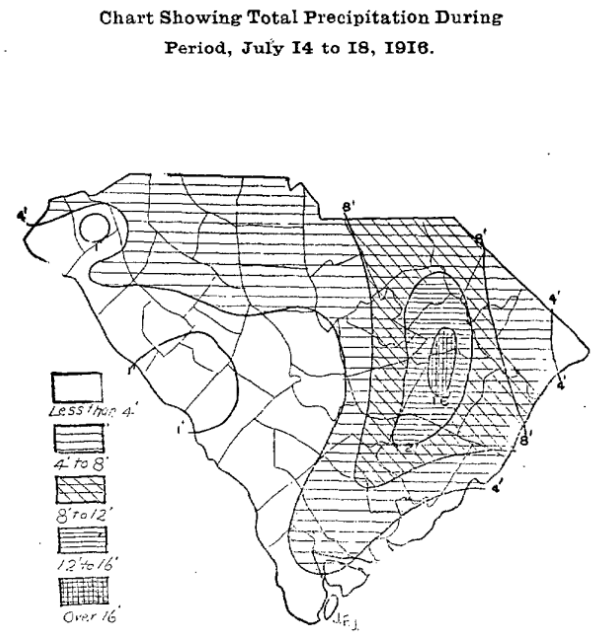
Telegraph and telephone communication capabilities rapidly grew during the late 19th Century, which meant warnings of incoming harsh weather conditions could reach areas with large populations. However, warnings could not reach more isolated populations, such as those residing on the Sea Islands of Georgia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



In Charleston, South Carolina, the hurricane severely damaged telephone poles (above) and ruined rail lines along the waterfront (below).

On August 28, 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. Winds estimated at 125 mph hit the Beaufort area, while winds were estimated to be near 120 mph in Charleston. At least 2,000 South Carolinians died, and the hurricane caused $334.1 million (inflation-adjusted to 2023) of damage. It was the first of two major hurricanes to affect South Carolina in 1893. The 1893 Charleston Hurricane hit 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

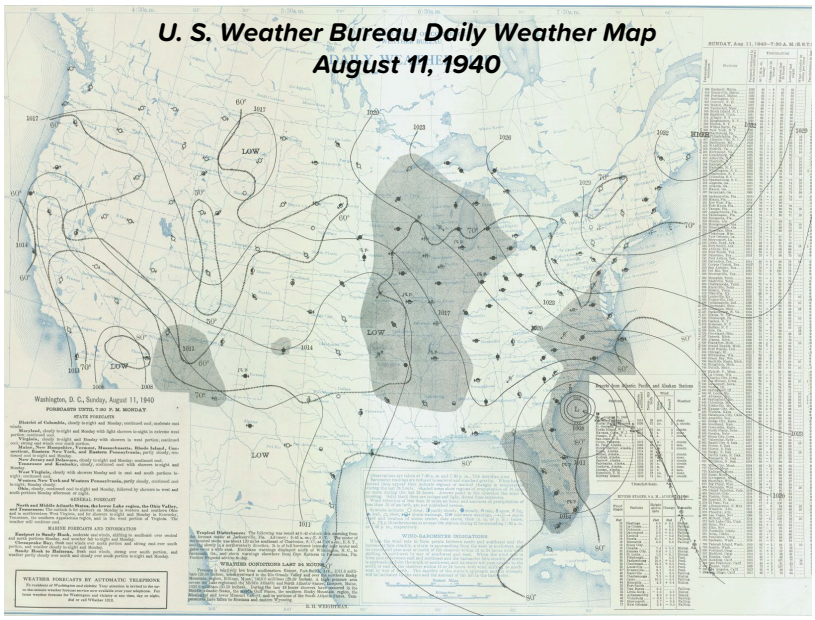


This was a Category 2 hurricane at landfall near Awendaw, with winds estimated at 105 mph. It crawled to the northwest over eastern South Carolina, which resulted in record rainfall for the time and widespread flooding. A weather station in Effingham (Florence County) recorded 13.25 inches of rain in 24 hours. This hurricane caused about $282 million (inflation-adjusted to 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 were also historic in western North Carolina. The flood damaged the original Catawba Dam in York County. It was rebuilt as the Lake Wylie Dam in 1924.

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. The storm surge caused damage along the coast from Folly Beach to Beaufort, including the U.S. Marine Corps base on Parris Island and Port Royal. The storm tide at Charleston was 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 50 miles inland.



U. S. Weather Bureau Daily Weather Map
August 11, 1940

October 15, 1954: Hurricane Hazel

Damage from Hurricane Hazel
Photo courtesy of National Weather Service

Hurricane Hazel's landfall as a Category 4 storm occurred near Little River, SC, near the South Carolina - North Carolina state line. 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 South Carolina and an 18-foot surge across the state line in Calabash, NC. Damage reports from across the Grand Strand state that Hazel destroyed 80% of the oceanfront buildings in Pawley's Island, and only 2 of 275 buildings were left standing in Garden City.

Significant wind and storm surge damage occurred in Georgetown and Horry counties. Rainfall ranged from under an inch over the state's western half to over eight inches along the Grand Strand. Hazel killed one person, and the total damage costs in South Carolina were an estimated $453 million (inflation-adjusted to early 2025). Hazel moved fast; after hitting the Carolinas, it sped north at 50 mph, with damaging wind reported as far north as Toronto, Canada. While many hurricanes have hit farther north along the East Coast, Hazel remains the farthest north Category 4 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 over Chester County. Widespread wind damage occurred along the South Carolina coast from Beaufort to Charleston. Gracie destroyed crops in the Lowcountry and Midlands, including a significant loss of the unpicked cotton crop. Despite landfall at low tide, a storm tide of up to 10 feet occurred along the coast. Rainfall totals were over six inches along the path of the storm. Gracie caused ten deaths in South Carolina. It 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 21-22, 1989: Hurricane Hugo

Damage from Hurricane Hugo
SCDNR Photo

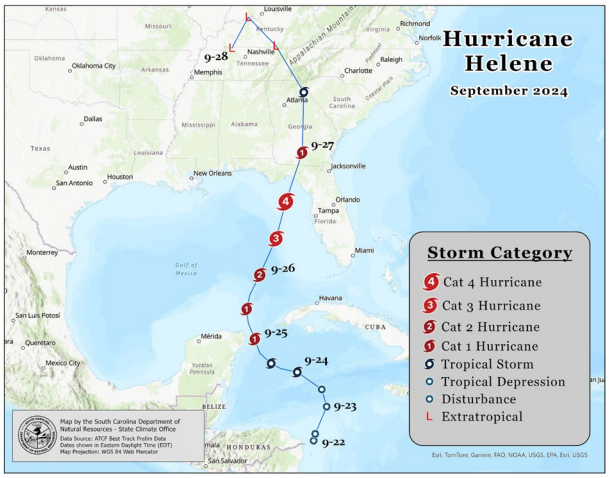
Damage from Hurricane Hugo
SCDNR Photo

Hurricane Hugo was one of the worst natural disasters in South Carolina's history. Its landfall was at Sullivan's Island as a Category 4 hurricane with estimated maximum sustained winds of 140 mph around midnight on September 22, 1989. Hugo moved at 25-30 mph across South Carolina. It maintained sustained hurricane-force winds (74 mph or higher) as far inland as Sumter, where gusts reached 109 mph. Gusts reached 87 mph in Charlotte, NC. Forested areas in 36 counties along the storm's path sustained significant damage. Hugo produced the highest storm tide height in history along the U.S. East Coast, around 20 feet at Bulls Bay. Hugo is still the costliest storm in South Carolina history. At the time, it was the nation's costliest hurricane, as it caused about $18.3 billion (inflation-adjusted to early 2025) in damage. Over $10 billion of this was in South Carolina. Hugo also killed 35 South Carolinians.

NOTABLE HURRICANES

September 27, 2024: Hurricane Helene

Hurricane Helene made landfall in Florida late in the evening of September 26, 2024. It raced northward across Georgia and into North Carolina after striking Florida. A combination of a forward speed of over 30 mph and a weather pattern reminiscent of that in place when Hurricane Hugo struck in 1989 allowed Helene to maintain its high winds far inland. Helene caused widespread wind damage across the western side of South Carolina, with wind gusts estimated by National Weather Service storm surveys to be over 100 mph over a part of McCormick and Edgefield Counties. Helene also brought extreme rainfall to the same area, with a peak of 19.69 inches near Lake Jocassee. Helene's rains, combined with an extreme rain event the day before Helene arrived, resulted in major flash flooding and river flooding. In addition, Helene spawned 21 tornadoes in South Carolina, the most in one event since 2020.



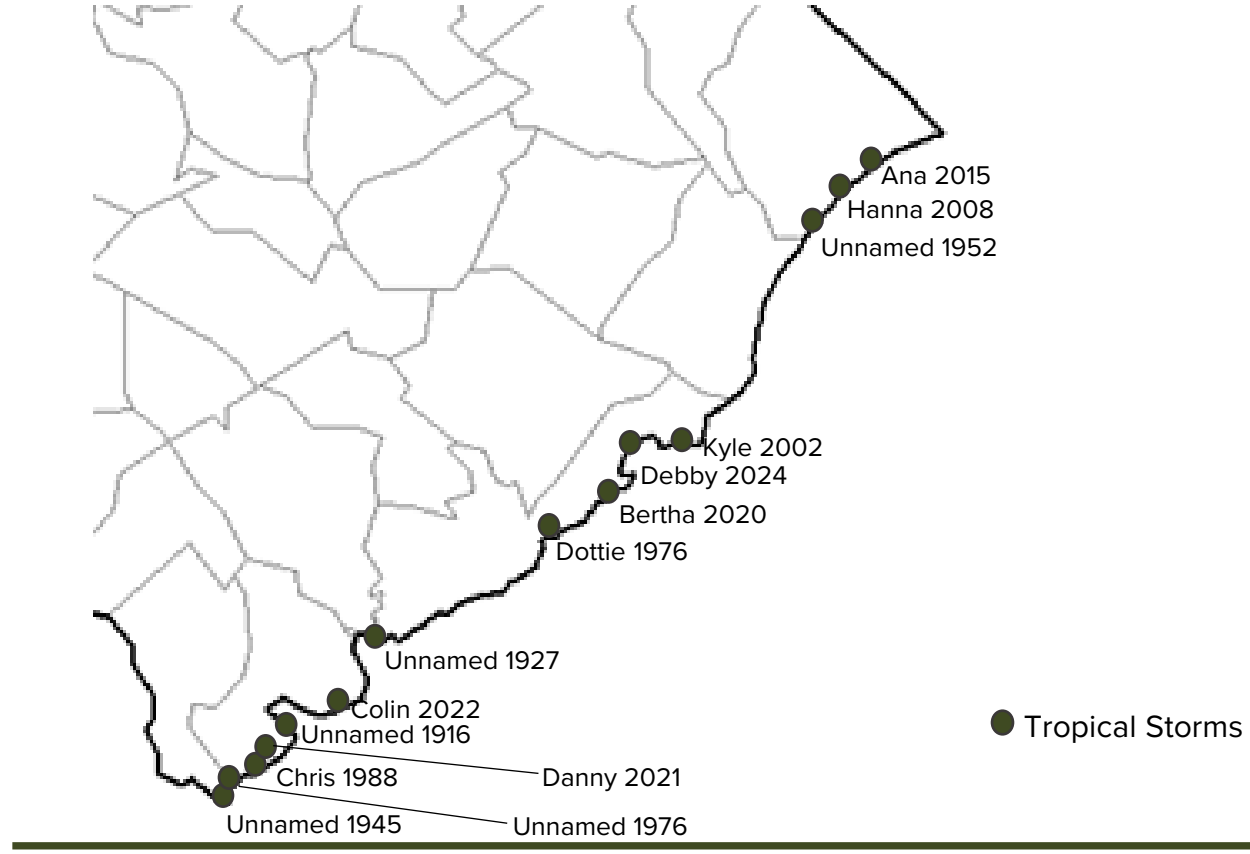
Helene's track, showing it intensify rapidly to a Category 4 Hurricane over the Gulf of Mexico before landfall in Florida.

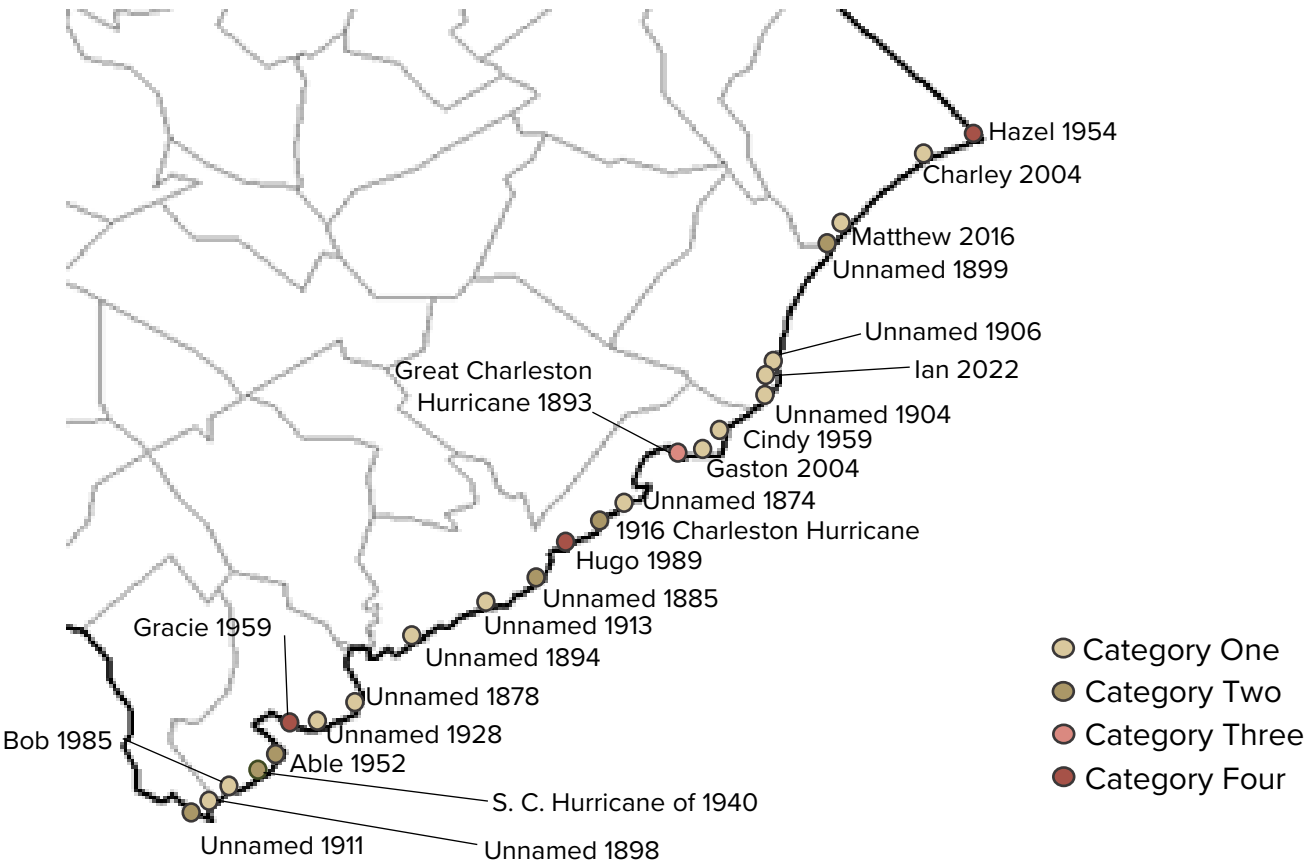
Helene's impacts in the Palmetto State were staggering. Over 1.3 million electric customers in the state lost power, and the power was out for two weeks or more in the hardest-hit areas. Downed trees and other debris closed 912 of the state's roads, and nearly 5,000 homes sustained damage or were destroyed by Helene's wind, rain, and tornadoes. Total insured losses from Helene in South Carolina was $1.2 billion, making it the costliest weather-related disaster in the state since Hugo hit in 1989. With 50 deaths in South Carolina, Helene was also the deadliest tropical cyclone in South Carolina in over 100 years, and possibly since the 1893 Sea Islands Hurricane.

Tree damage like this example from North Augusta was a common scene across the Central Savannah River Area, Upstate and Midlands after Helene.

Flood waters induced by Helene's rainfall washed out this section of U. S. Highway 276 (Geer Highway) just west of Cleveland.

SOUTH CAROLINA LANDFALLS





SC Landfalls: 1851-2024

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 18, 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: 1851-2024

Date	Name	Category At SC Landfall	Landfall Location
August 30, 1952	Able	Hurricane 2	Pritchards Island
August 15, 1954	Hazel	Hurricane 4	Little River Inlet
July 9, 1959	Cindy	Hurricane 1	Awendaw
September 29, 1959	Gracie	Hurricane 4	St. Helena Sound
September 11, 1971	T. D. Fifteen	Tropical Depression	James Island
August 21, 1976	Dottie	Tropical Storm	Kiawah Island
September 15, 1976	Unnamed	Subtropical Storm	Hilton Head
June 16, 1979	T. D. One	Tropical Depression	Kiawah Island
July 3, 1981	Unnamed	Tropical Depression	St. Helena Island
July 25, 1985	Bob	Hurricane 1	Pritchards Island
September 8, 1987	T. D. Nine	Tropical Depression	Little River Inlet
August 28, 1988	Chris	Tropical Storm	Jones Island
September 21, 1989	Hugo	Hurricane 4	Sullivan’s Island
July 20, 1994	T. D. Two	Tropical Depression	Winyah Bay
October 11, 2002	Kyle	Tropical Storm	Bulls Bay
August 14, 2004	Charley	Hurricane 1	Cape Romain
August 29, 2004	Gaston	Hurricane 1	Awendaw

SC Landfalls: 1851-2024

Date	Name	Category At SC Landfall	Landfall Location
September 6, 2008	Hanna	Tropical Storm	N. Myrtle Beach
May 7, 2015	Ana	Tropical Storm	Myrtle Beach
May 29, 2016	Bonnie	Tropical Depression	Isle of Palms
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
August 8, 2024	Debby	Tropical Storm	Bulls Bay

SC Hurricane Impacts: 1851-2024

#	Date	Storm Name Or Number	Areas Impacted With Hurricane Conditions	Major (Cat. 3+)	Landfall State
1	September 8-9, 1854	Eight	Lowcountry and CSRA		GA
2	June 22, 1867	One	Northern Lowcountry		SC
3	September 28, 1874	Six	Coastal Plain		FL, SC
4	September 12, 1878	Five	Lowcountry, southern and eastern Midlands		FL, SC
5	August 27-28, 1881	Five	Lowcountry		GA
6	September 11, 1883	Three	Pee Dee		NC
7	August 25, 1885	Five	Coastal Plain		SC
8	August 28, 1893	Six 'Sea Islands'	Most of SC	✓	GA
9	October 13, 1893	Nine	Coastal Plain	✓	SC
10	September 27, 1894	Four	Coastal Plain		FL, SC
11	September 29, 1896	Four 'Cedar Keys'	Coastal Plain, CSRA, Midlands		FL
12	August 31, 1898	Two	Southern Lowcountry		SC
13	October 30-31, 1899	Nine	Pee Dee		SC
14	September 14, 1904	Two	Pee Dee		SC
15	September 17, 1906	Five	Pee Dee		SC
16	August 27-28, 1911	Three	Lowcountry		SC
17	October 8, 1913	Five	Charleston and Georgetown Counties		SC
18	July 13-14, 1916	Four	Lowcountry and Pee Dee		SC
19	September 18, 1928	Four 'Great Okeechobee'	Coastal Plain		FL, SC
20	August 11, 1940	Three	Lowcountry		SC
21	October 15, 1947	Nine 'King'	Lowcountry		NC
22	August 30-31, 1952	Able	Lowcountry and southern Midlands		SC

SC Hurricane Impacts: 1851-2024

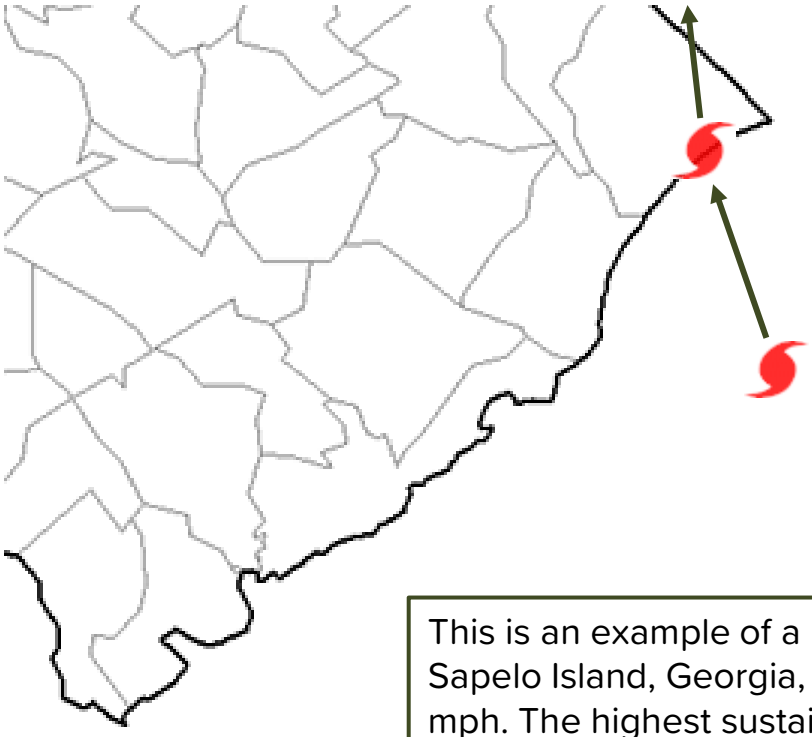
#	Date	Storm Name Or Number	Areas Impacted With Hurricane Conditions	Major (Cat. 3+)	Landfall State
23	October 15, 1954	Hazel	Pee Dee	✓	SC, NC
24	July 8-9, 1959	Cindy	Charleston and Georgetown Counties		SC
25	September 29, 1959	Gracie	Lowcountry and Midlands	✓	SC
26	September 4, 1979	David	Lowcountry		FL, GA
27	July 24, 1985	Bob	Lowcountry		FL, SC
28	September 21-22, 1989	Hugo	Most of SC	✓	SC
29	August 14, 2004	Charley	Charleston, Georgetown and Horry Counties		FL, SC
30	August 29, 2004	Gaston	Charleston and Georgetown Counties		SC
31	October 8, 2016	Matthew	Coastal Areas		SC
32	August 4, 2020	Isaias	Horry County		NC
33	September 30, 2022	Ian	Charleston and Georgetown Counties		FL, SC

Appendix: Methodology For Determining Tropical Cyclone Impacts

When the center of a tropical cyclone moves onto land, the storm's landfall occurs at that location. However, tropical cyclones are large weather features with a typical diameter of about 300 miles. Because of their size, tropical cyclones can have major impacts on areas far from where landfall occurs. A tropical cyclone impact is a term used to describe the effect that a tropical cyclone has, which is independent of where the storm made landfall or its intensity at the time. Some storms, such as Hurricane Helene of 1958, do not make landfall in the United States but still impact one or more states. Helene had a Category 3 impact on North Carolina and a tropical storm impact on South Carolina.

Judging the impact of a tropical cyclone on a given state can be challenging, sometimes requiring in-depth research. It is often tough to determine the impact of a weaker storm or one that occurred in the distant past.

Researchers at the Hurricane Research Division of the Atlantic Oceanographic and Meteorological Laboratory in Virginia Key, Florida, have already done some of this work. They have analyzed the hurricanes that have affected the United States and assigned hurricane landfall points and impacts for each state for every hurricane in the historical records. They have also generated a list of landfalling tropical storms in the United States.



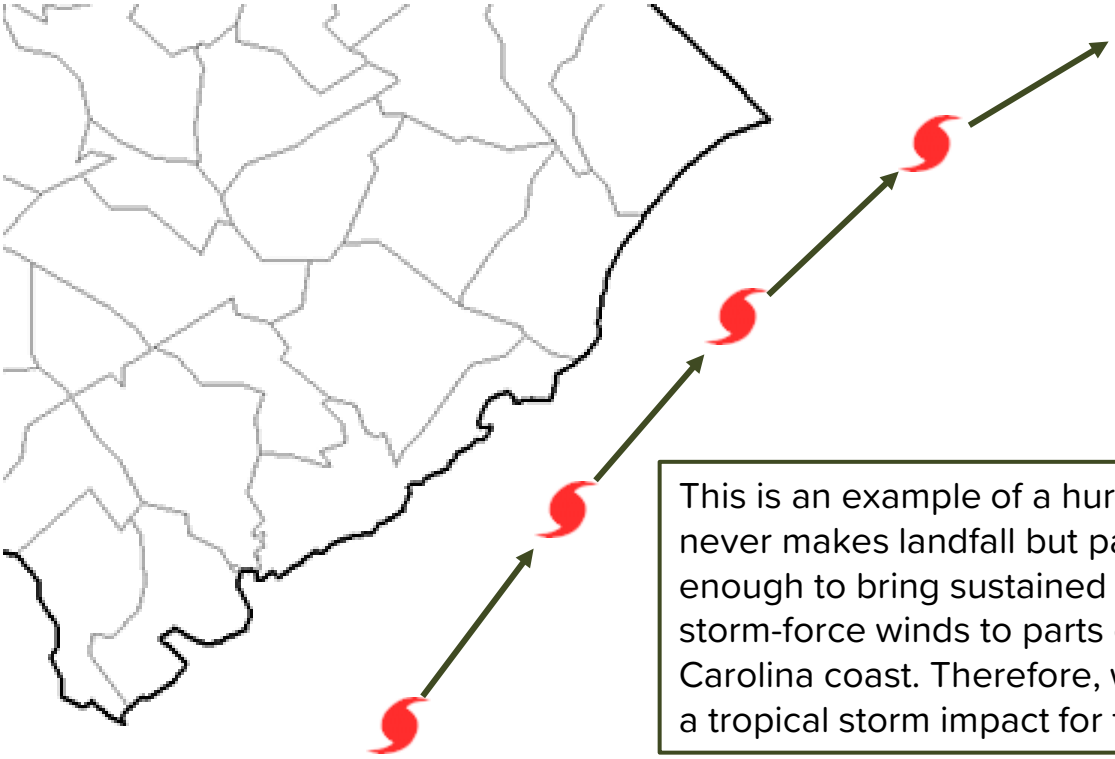
This is an example of a hurricane making landfall at Myrtle Beach, with the highest reported sustained wind of 100 mph at N. Myrtle Beach. This is a Category 2 landfall and impact for South Carolina.

This is an example of a hurricane making landfall at Sapelo Island, Georgia, with sustained winds of 115 mph. The highest sustained wind reported in South Carolina was 60 mph at Hilton Head, so while this is not a South Carolina landfall, it is a tropical storm impact for South Carolina (it is a Category 3 landfall and impact for Georgia).

The State Climatology Office accepts this work as the best documentation on hurricanes that have made landfall in South Carolina or have had the impact of a Category 1 or higher hurricane in the state. We also accept this work as the best documentation for landfalling tropical storms. However, this dataset only covers about 15 percent of the tropical cyclones and formerly tropical extratropical storms known to have impacted South Carolina.

A project that began in 2018 with the work of a Climatology Office intern has been expanded to provide a more reliable and well-documented list of tropical cyclone impacts for tropical storm-level events, tropical depression-level events, and formerly tropical extratropical storms that had an impact in South Carolina.

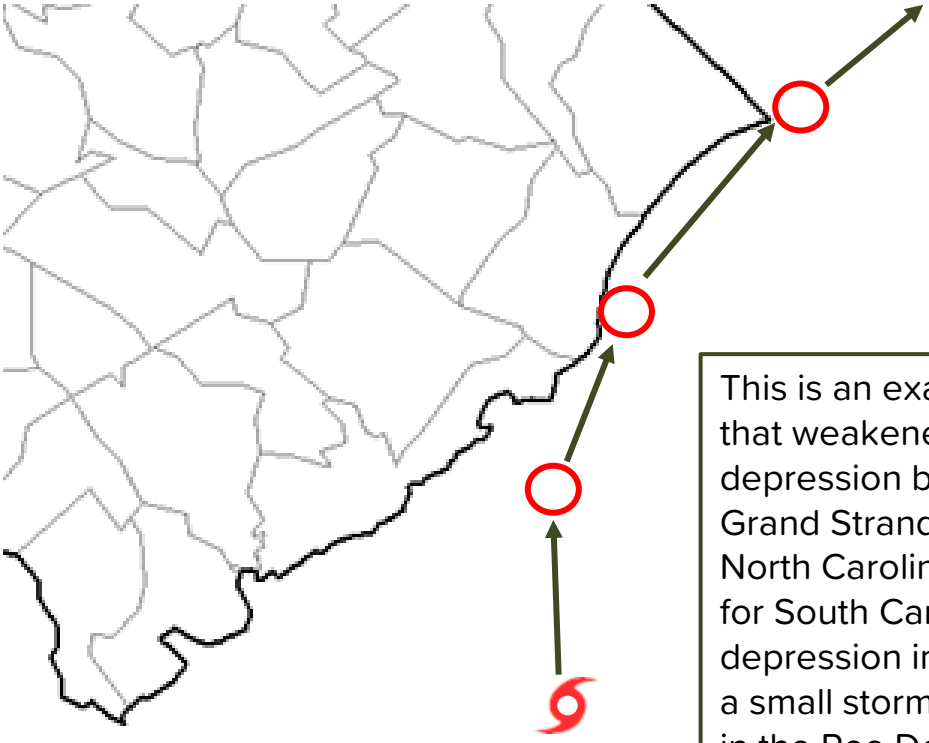
There are a few criteria for crediting a storm as having caused a tropical storm impact on South Carolina. The first is that it made landfall as a tropical storm in South Carolina or that the storm's track in the HURDAT2 database had a point of tropical storm intensity within South Carolina. The second is that research found by or conducted by the SC State Climatology Office showed that sustained tropical storm force winds occurred in South Carolina as the storm passed through or near the state. A third is that the storm's radius of tropical storm force winds in the HURDAT2 database, where available, covers a part of the state. Another criterion, mainly used for storms before 1950, is that the tropical cyclone passed within 20 nautical miles of South Carolina while a tropical storm, or that a hurricane's center passed within 60 nautical miles of South Carolina.



This is an example of a hurricane that never makes landfall but passes close enough to bring sustained tropical storm-force winds to parts of the South Carolina coast. Therefore, we count it as a tropical storm impact for the state.

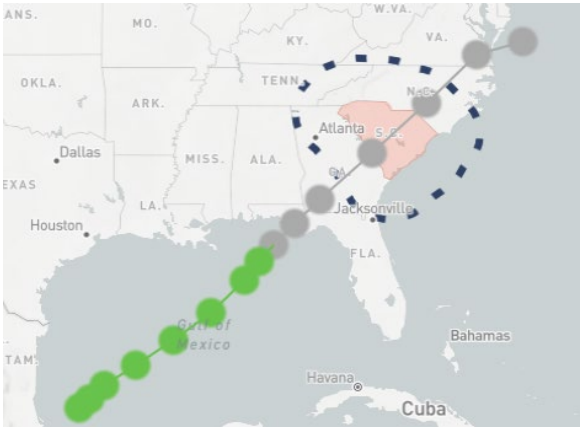
There is also a category for tropical depression impacts. We have defined this as a tropical cyclone that affects South Carolina but does not cause sustained winds of tropical storm force or higher. The criteria for this are similar to those for tropical storm impacts. A tropical depression impact can be a landfalling tropical depression in South Carolina, a tropical cyclone that passes over the state at tropical depression intensity after making landfall elsewhere, or one that passes near South Carolina but causes notable impacts in terms of storm surge flooding, flooding rainfall, or tornadoes.

Some subjectivity becomes involved when a tropical cyclone passes at a greater distance from South Carolina. Some of these were counted as impacts because they had clear and notable effects on the state, such as heavy rainfall and resultant flooding or a tornado outbreak. Those with limited impacts, such as causing less than an inch of rainfall, were not counted as an impact. One special case is Hurricane Joaquin of 2015, which was counted as a tropical depression impact due to its role in the historic flooding in October of that year, even though its closest approach to the state was about 600 miles away.



This is an example of a tropical storm that weakened to a tropical depression before brushing the Grand Strand and making landfall in North Carolina. It was not a landfall for South Carolina but a tropical depression impact because it caused a small storm surge and heavy rainfall in the Pee Dee and Lowcountry.

Our database has one more category of impacts: the impacts from extratropical storms that were previously tropical cyclones. Such storms can still have widespread impacts like those of tropical cyclones. Flooding rainfall and tornadoes are the most common effects that a formerly tropical cyclone can have when they cross South Carolina, but a few cause damaging wind and a storm surge. The criteria for this is like that for the tropical storm or tropical depression; their center must pass over or near the state while causing significant impacts from one or more of a tropical cyclone's hazards: damaging wind, heavy rainfall, storm surge, and tornadoes. The most recent example of such a storm was Tropical Storm Nestor of 2019. It became an extratropical storm before landfall in Florida on October 19 and crossed Georgia and South Carolina. South Carolina's impacts included winds gusting as high as 47 mph, rainfall of up to four inches, a small storm surge of about 1.5 feet, and one tornado in Horry County.



The track of Tropical Storm Nestor of 2019.
Green: Tropical Storm
Gray: Extratropical Storm