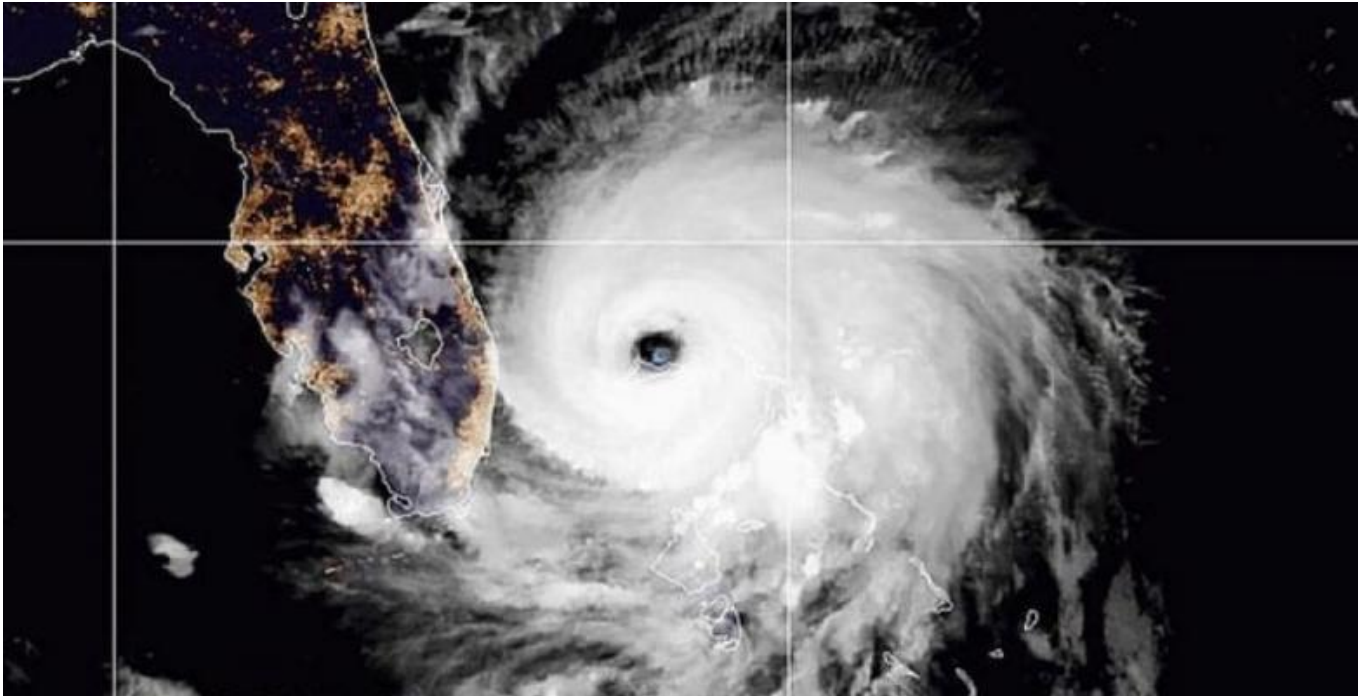

Hurricane Dorian Inches Closer To Florida After Pounding Bahamas

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Hurricane Dorian is beginning a much-advertised turn to the north-northwest, away from the Bahamas but toward the U.S. mainland, where it is expected to bring significant impacts.

As of Tuesday morning, the storm was moving northwest at 1 mph just to the north of Grand Bahama Island and was continuing its historic onslaught in the northwestern Bahamas.

Dorian, which has weakened some to a still-formidable Category 3 storm, slammed into the northwestern Bahamas over the weekend with the historic full fury of its 185-mile-per-hour winds and 23-foot storm surge. Video and images emerging from the Bahamas show a toll of absolute devastation on Abaco and Grand Bahama Islands, two locations where the eye of the storm made landfall.

Grand Bahama Island has suffered an onslaught from this storm that few places on Earth have experienced, remaining in the eyewall of a major Category 4 or 5 storm for 24 hours or more. The eyewall is the region of the storm surrounding its center that contains its strongest winds and generates the most destructive storm-surge flooding.

This is a storm that may have reshaped the northwestern Bahamas, particularly Abaco and Grand Bahama Island, for decades.

On Tuesday, attention turns to U.S. mainland impacts, with hurricane warnings and watches hoisted from the Florida coastline northward to South Carolina. Hurricane conditions, with

sustained winds of greater than 74 mph, are forecast to move into the warning area of Florida on Tuesday evening and affect areas farther north beginning Wednesday.



A man driving a stalled car is pushed by a truck through a flooded street after the effects of Hurricane Dorian arrived in Nassau, Bahamas

In the Southeast, the impacts from Hurricane Dorian do not look nearly as dire as what the Bahamas experienced, with computer models in agreement on keeping the most destructive core of the storm offshore, parallel to the coastline. However, it would not take much of a deviation to bring the highest winds and flooding ashore, and the storm will be capable of inflicting significant damage, depending on its exact track.

"Although the official forecast does not show Dorian making landfall along the Florida east coast, users are reminded not to [focus] on the exact forecast track," the Hurricane Center stated on Tuesday morning. "A relatively small deviation to the left of this track could bring the core of the hurricane near or over the coastline."

As of 8 a.m. on Tuesday, the storm was 40 miles northeast of Freeport on Grand Bahama Island and moving northwest at 1 mph. The storm's peak sustained winds were 120 mph, making it a Category 3 storm. Dorian is expected to maintain its current intensity through much of the day on Tuesday.

Radar from South Florida showed Dorian's outermost rain bands pivoting inland producing gusty showers. Around 5 a.m., Juno Beach pier, just north of West Palm Beach, recorded a wind gust to 61 mph as tropical storm conditions continue to spread into Florida.

The storm has grown larger over time, and hurricane-force winds extend outward up to 45 miles from the center and tropical-storm-force winds extend outward up to 160 miles. The latest forecast from the Hurricane Center calls for Dorian to remain a Category 3 storm until Tuesday night before slowly weakening, but remaining a formidable hurricane, as it makes its closest pass to Florida (around a Category 3) and northward to the Carolinas (around a Category 1 or 2).

The forecast track keeps the storm's most dangerous winds and highest levels of storm-surge flooding from coming ashore in the Sunshine State, but brings the storm close enough to bring heavy rains, damaging winds and storm surge flooding to the east coast of Florida.

However, hurricanes do not always behave as forecast. Despite being Earth's most massive and powerful storms, they're remarkably sensitive to internal and external hiccups. These storms can wobble east or west as they move generally north, for example, like a spinning top

on a table.

It wouldn't take much of a wobble to bring the core of the storm ashore over Florida, especially along the Space Coast, where land featuring expensive infrastructure juts out a few more miles to the east of the rest of the Peninsula.

Hurricane warnings are in effect from Jupiter Inlet to Ponte Vedra Beach in Florida, while hurricane watches extent northward to South Santee River, South Carolina.

The National Hurricane Center is warning that "life-threatening storm surge and dangerous hurricane-force winds are expected along portions of the Florida east coast and the coasts of Georgia and South Carolina, regardless of the exact track of Dorian's center." In addition, water levels along the coast are forecast to rise "well in advance of the arrival of strong winds."

Areas that are especially vulnerable to storm-surge flooding, such as Jacksonville, Florida, could once again see significant flooding depending on the exact track and timing of the storm.

According to the Weather Service office in Jacksonville, if the storm tracks close enough to northeastern Florida, the result could be particularly severe. Among the possible effects, it listed: "Large areas of deep inundation with storm surge flooding accentuated by battering waves. Structural damage to buildings, with several washing away. Damage compounded by floating debris. Locations may be uninhabitable for an extended period."

The latest storm-surge forecast shows that if the peak surge occurs at the time of high tide, the area from Lantana (just south of West Palm Beach) to the Charleston area of South Carolina could see four to seven feet of water above ground, while the region from Deerfield Beach to Lantana could experience two to four feet.

Conditions are expected to deteriorate Tuesday night in coastal Georgia, and by Wednesday in South Carolina and by Thursday in North Carolina. Where and whether Dorian makes landfall will depend on the exact trajectory of its turn relative to the coast as it turns north and then starts to bend northeastward.

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Residents watch as watch the heavy surf during a mandatory evacuation as Hurricane Dorian inches closer to Florida

The Weather Service is urging residents to prepare for "life-threatening surge having possible extensive impacts across across the coastal counties of Southeast South Carolina and Southeast Georgia."

Scenarios involving a direct hit, a scrape and a graze are possible in Georgia and the Carolinas based on available forecasts. A direct hit is most likely in North Carolina because its coast sticks out into the ocean farthest east.

"There is an increasing likelihood of strong winds and dangerous storm surge along the coasts of Georgia, South Carolina, and North Carolina later this week," the Hurricane Center wrote. "Residents in these areas should continue to monitor the progress of Dorian and listen to advice given by local emergency officials."

The Georgia and South Carolina coastlines are particularly vulnerable to storm surge flooding, even from a storm that does not make landfall, due to the shape of the land on and just offshore, as well as the effects of sea level rise and land subsidence over time.

Locations even farther north from Virginia Beach to the Delmarva and even up to Cape Cod could get brushed by the storm Friday and Saturday, with heavy rains and gusty, tropical storm force winds.

While computer model projections all show that Hurricane Dorian will remain just off the East Coast of the U.S., there is still uncertainty involved in that forecast, especially since the storm has yet to begin its northward trek.

The track is especially dependent on the intensity and orientation of a trough of low pressure, or dip in the jet stream that is helping to draw the storm northward and eventually shunt it northeast out into the North Atlantic. If that weather feature or any others currently on the map, such as a weakening high to the storm's east, do not evolve as anticipated, the storm could pull a wild card turn toward or further away from land.

In particular, the timing of its next two turns over the coming days becomes crucial. In order to avoid making landfall along the East Coast, the storm will need to turn to the north, and eventually northeast, at just the right moments.

Computer models are in agreement that the timing will work out, and there will be no landfall, but there is very little room for error, given that the track forecast is so close to the coast.

This is a formidable storm that coastal residents are eyeing especially warily, hoping that the forecasts are right. It's also a turning point in meteorology, in which the science has advanced to the point where local officials in southern Florida, who saw a buzzsaw of a hurricane moving west, directly at them, made the decision not to evacuate the coastline due to the forecast guidance that the storm would turn away.

As Dorian approached over the weekend, the Hurricane Center used dire language to describe the threat, including the word "catastrophic." Unfortunately, it appears that was the result, particularly in the Abaco Islands and on Grand Bahama Island.

On Grand Bahama, parts of the island were exposed to the full fury of the storm's eyewall for an unimaginable 20-plus hours. Typically such storms move fast enough to expose one spot to their full fury for a few hours or less. But in this case, the storm reached Grand Bahama and stopped moving, with Hurricane Hunter aircraft finding essentially no movement each time they got to the storm's center.

While grim news is emerging from Abaco, it may take longer to get a detailed picture of how Grand Bahama Island, where Freeport, a city of about 27,000, is located, fared in the storm. On Monday evening, the Hurricane Center released a statement saying it expected additional "extreme destruction" on the island overnight due to a combination of extreme winds and storm surge flooding.

The overwhelming majority of computer model forecasts keep the center of Dorian just to the east of the Florida coast, as well as Georgia and South Carolina, rather than bringing the eye of the storm ashore. However, it appears it will be a close call as to whether the storm makes landfall in eastern North Carolina on Friday.

The NWS is forecasting heavy rains to overspread areas from coastal Florida toward the Mid-Atlantic this week, with the potential for 15-inch amounts to occur in far eastern North Carolina in particular.

Dorian is tied for the second-strongest storm (as judged by its maximum sustained winds) ever recorded in the Atlantic Ocean, behind Hurricane Allen of 1980, and, after striking the northern Bahamas, tied with the 1935 Labor Day Hurricane for the title of the strongest Atlantic hurricane at landfall.

It is only the second Category 5 hurricane to make landfall in the Bahamas since 1983, according to Phil Klotzbach of Colorado State University. The only other is Hurricane Andrew in 1992. The international hurricane database goes back continuously only to 1983.

[Hurricane Dorian has smashed all sorts of intensity records in the Atlantic Ocean]

The storm's peak sustained winds rank as the strongest so far north in the Atlantic Ocean east of Florida on record. Its pressure, which bottomed out at 910 millibars, is significantly lower than

Hurricane Andrew's when it made landfall in South Florida in 1992 (the lower the pressure, the stronger the storm).

With Dorian attaining Category 5 strength, this is the first time since the start of the satellite era (in the 1960s) that Category 5 storms have developed in the tropical Atlantic for four straight years, according to Capital Weather Gang tropical weather expert Brian McNoldy.

The unusual strength of Dorian and the rate at which it developed is consistent with the expectation of more intense hurricanes in a warming world. Some studies have shown increases in hurricane rapid intensification, and modeling studies project an uptick in the frequency of Category 4 and 5 storms.

Dorian may have also set a record for the longest period of Category 4 and 5 conditions to strike one location in the North Atlantic Basin since the dawn of the satellite era, but historical data is relatively sparse.