Meteorological history of Hurricane Dorian

Plotting the track & the intensity of the storm, according to the Saffir–Simpson scale.

August 19, 2019, the N. H. C. identified a tropical wave—an elongated trough of low air pressure within a monsoon trough over Guinea and Senegal in western Africa. Convective activity associated with the wave was limited by an abundance of Saharan dust in the region. Propagating west over the tropical Atlantic Ocean, the system remained disorganized for several days. On August 23, a defined area of low pressure consolidated at the surface and thunderstorm activity increased. The system acquired sufficient organized convection to be classified as Tropical Depression Five.

At 15:00 UTC on August 24. At this time the system was situated 805 mi (1,300 km) east-southeast of Barbados. A deep ridge imparted continued westward movement of the depression, steering it toward the Lesser Antilles. A small cyclone, it soon developed a defined inner-core with a 12 mi (18 km) wide eye-like feature. This marked the system's intensification into a tropical storm, at which time it was assigned the name *Dorian* by the NHC. Thereafter, moderate wind shear and surrounding dry air limited further organization. Rain-bands gradually wrapped more around Dorian on August 25–26, though convection remained inconsistent.

Strongest landfalling Atlantic hurricanes†				
Rank	Hurricane	Season	Wind speed	
			mph	km/h
1	"Labor Day"	1935	185	295
	Dorian	2019		
3	Irma	2017	180	285
4	Janet	1955	175	280
	Camille	1969		
	Anita	1977		
	David	1979		
	Dean	2007		
9	"Cuba"	1924	165	270
	Andrew	1992		
	Maria	2017		
Source: HURDAT,[13] AOML/HRD[14]				
†Strength refers to maximum sustained wind speed upon striking land.				

Dorian continued moving west and came extremely close to Barbados, bringing tropical storm-force winds and heavy rain. It then started moving northwestward toward Saint Lucia.

At 10:00 UTC on August 27, Dorian made landfall on the island of Saint Lucia as a tropical storm, briefly disrupting the core of the storm, before entering the Caribbean Sea. The storm underwent a center relocation further north, to the west of Martinique, causing the island to experience tropical storm-force winds as well. Dorian had been predicted to travel northwest and pass over or near the Dominican Republic or Puerto Rico, possibly allowing their mountainous terrain to weaken the tropical storm. At that time, dry air and wind shear were expected to prevent Dorian from attaining hurricane status—although just barely. However, Dorian took a more northerly track than expected, causing it to pass to the east of Puerto Rico and hit the US Virgin Islands.

On August 28, Dorian intensified into a Category 1 hurricane as it approached Saint Thomas in the US Virgin Islands, where hurricane-force winds were recorded; at 18:00 UTC that day, Dorian made landfall on Saint Thomas at Category 1 intensity. However, the hurricane's small size prevented mainland Puerto Rico from experiencing hurricane- or tropical storm-force winds, although this was not the case for the Spanish Virgin Islands.

Once the system moved north past the Virgin Islands, the storm entered a more favorable environment. However, dry air was still in the system from its journey through the Caribbean Sea and the Lesser Antilles, and this gave the storm an erratic, lopsided

look. There was no more dry air afterwards, so the storm began to mix out the dry air, and on the next day, the system started to rapidly intensify, reaching Category 2 status early on August 30. Rapid intensification continued, and the storm eventually reached major hurricane status several hours later, on the same day. This strengthening trend came to a halt for the remainder of the day, but soon resumed.

On August 31, the system continued strengthening, and Dorian attained Category 4 major hurricane status. Dorian reached Category 5 intensity on the following day.

On the morning of September 1, a dropsonde deployed by a NOAA aircraft measured a wind gust of 203 mph at the surface. With one-minute sustained winds of 180 mph and a minimum pressure of 913 mbar (27.0 inches of Hg), the NHC noted that Dorian was the strongest hurricane in modern records to affect the northwestern Bahamas.

Hurricane Dorian as seen from the International Space Station on September 2, 2019

At 16:40 UTC on September 1, Hurricane Dorian made landfall on Great Abaco Island in the Bahamas, with one-minute sustained winds of 185 mph, wind gusts over 220 mph and a central barometric pressure of 26.9 inches of Hg. The storm's central pressure bottomed out at 26.87 inches of Hg within a few hours, as Dorian reached its peak intensity during landfall. Storm chaser Josh Morgerman observed a pressure of 26.97 inches of Hg in Marsh Harbor. Hurricane Dorian's forward speed decreased around this time, slowing to a westward crawl of 5 mph (8.0 km/h).

At 02:00 UTC on September 2, Dorian made landfall on Grand Bahama near the same intensity, with the same sustained wind speed. Afterward, Dorian's forward speed slowed to just 1 knot (1.2 mph; 1.9 km/h), as the Bermuda High that was steering the storm westward weakened. Later that day, the storm began to undergo an eyewall replacement cycle to the north of Grand Bahama; the Bermuda High to the northeast of Dorian also collapsed, causing Hurricane Dorian to stall just north of Grand Bahama. Around the same time, the combination of the eyewall replacement cycle and upwelling of cold water caused Dorian to begin weakening, with Dorian dropping to Category 4 status at 06:00 UTC. Due to the absence of steering currents, Hurricane Dorian stalled north of Grand Bahama for about a day.

September 3 Hurricane Dorian subsequently weakened to a Category 2 storm, before beginning to move northwestward at 15:00 UTC, parallel to the east coast of Florida, with Dorian's wind field expanding during this time. While moving northwestward, Dorian gradually reorganized.

At 06:00 UTC on September 5, Dorian moved over the warm waters of the Gulf Stream and completed its eyewall replacement cycle, re-intensifying into a Category 3 hurricane off the coast of South Carolina. But several hours later, high wind shear began to take its toll, causing the storm to weaken to a Category 2 hurricane, and later to Category 1.

On September 7, Dorian transitioned into an extratropical cyclone and re-strengthened, generating Category 2-equivalent winds before making landfall in Nova Scotia, Canada.

The effects of Hurricane Dorian in the Bahamas were among the worst experienced for any natural disaster in the country.

Hurricane Dorian struck the Abaco Islands as a Category 5 hurricane on September 1, and a day later hit Grand Bahama Island at the same category. Damage was estimated at over US$7 billion, and there were at least 43 deaths in the country reported so far.

As early as August 26, the National Hurricane Center (NHC) warned for the potential of then-Tropical Storm Dorian to affect The Bahamas within five days, noting uncertainty due to potential interaction with Hispaniola.

By August 28, the NHC was forecasting for Dorian to pass near the northern Bahamas as a major hurricane.

On August 30, the government of The Bahamas issued a hurricane watch, and later that day a hurricane warning, for the northwestern Bahamas, including the Abacos, Berry Islands, Bimini, Eleuthera, Grand Bahama Island, and New Providence. A hurricane watch was also issued for Andros Island. The advisory meant that hurricane conditions were likely within 48 hours. The warnings were downgraded after Dorian moved away from the country on September 3.

Hurricane Dorian's destruction in the Bahamas

On September 1, the eye of Hurricane Dorian made landfall on the Abaco Islands with maximum sustained winds of 185 mph (295 km/h), making it the strongest hurricane on record to affect the northwestern Bahamas.

On September 2, the eye of Dorian moved over the eastern end of Grand Bahama Island, and drifted across the island. Bahamian Minister of Agriculture Michael Pintard reported an estimated storm tide of 20 to 25 ft (6.1 to 7.6 m) at his home on Grand Bahama.

Hurricane Dorian killed at least 43 people in The Bahamas. Damage was preliminarily estimated at more than US$7 billion. Across the Bahamas, the storm left at least 70,000 people homeless.

Abacos

For several days, Marsh Harbor Airport on Great Abaco was underwater, and the control tower was damaged by the waters.[14] The airport was closed on September 4.[15] About 90% of the infrastructure in Marsh Harbor was damaged. In central and northern Abaco, Dorian severely damaged roadways, and thousands of houses,[12] with 60% of homes in northern Abaco damaged or destroyed. The power grid serving the entirety of Great Abaco was destroyed. The terminal building of Treasure Cay Airport suffered significant damage.

Grand Bahama

There was an island-wide power outage on Grand Bahama Island. About 300 homes on the island were destroyed or severely damaged. At 7:00 (UTC) on September 2, 2019, Grand Bahama International Airport was underwater. Floodwaters and sewage contaminated Rand Memorial Hospital.

Elsewhere

Around 11:24 UTC on September 2, 2019, total power was lost on the island of New Providence, the following day at 1:50 (UTC) 40% of power had been restored.

Aftermath

In the days after Dorian affected The Bahamas, officials surveyed the damage by air. Residents in the Abacos and Grand Bahama suffered from water shortages, power outages, and a lack of telecommunications; these conditions created difficulty in handling the logistics of the disaster. After the storm, at least 2,000 people stayed in government shelters. Hundreds of people left Abaco by boat in the days after the storms. The Royal Bahamas Defence Force and the Royal Bahamas Police Force were deployed to Grand Bahama and Abaco via boat.

On September 5, the Central Emergency Response Fund of the United Nations provided US$1 million for initial emergency aid. The World Food Program sent a team of 15 experts to coordinate emergency operations, as well as 14,700 ready-to-eat meals, and power generators. The Caribbean Catastrophe Risk Insurance Facility paid The Bahamas about US $10.9 million on September 6, due to the country's insurance policy being activated. Télécoms Sans Frontières was the first non-governmental organization (NGO) on Abaco, which worked to re-establish satellite connection. The Pan American Health Organization sent a team of doctors, nurses, and 34 tons of medical equipment for a three-month stay in the country. The International Organization for Migration provided 1,000 tarpaulins to the country.

The United Kingdom pledged £1.5 million to support the RFA Mounts Bay, which delivered emergency supplies and a helicopter. The government of the British Virgin Islands pledged US$100,000 to The Bahamas. The United States provided four helicopters to assist in search and rescue operations.