NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

HURRICANE ETA

(AL292020)

31 October–13 November 2020

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National Hurricane Center
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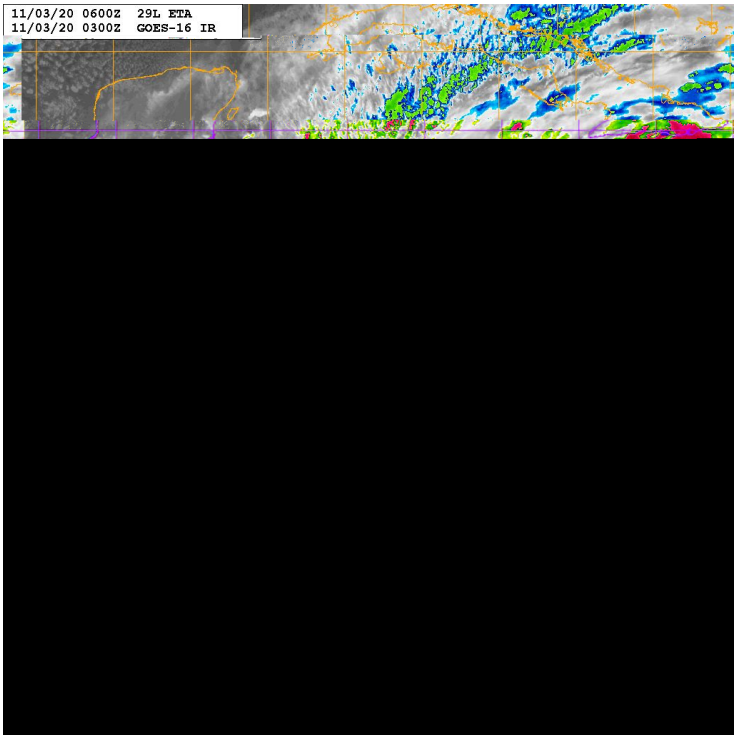

GOES-16 IR SATELLITE IMAGE OF HURRICANE ETA NEAR PEAK INTENSITY AT 0300 UTC 3 NOVEMBER 2020. IMAGE COURTESY OF NAVAL RESEARCH LABORATORY.

Eta struck Nicaragua as a category 4 hurricane (on the Saffir-Simpson Hurricane Wind Scale), and caused severe flooding over portions of Central America. It later redeveloped over the northwestern Caribbean Sea as a tropical storm, crossed Cuba and the Florida Keys and produced torrential rains and flooding over portions of South Florida.

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Hurricane Eta

31 OCTOBER–13 NOVEMBER 2020

SYNOPTIC HISTORY

Eta can be traced back to a tropical wave that is estimated to have moved off the west coast of Africa on 22 October. This system moved westward across the tropical Atlantic for about a week, accompanied by a large area of disorganized cloudiness, showers, and thunderstorms. Deep convection showed signs of organization when the disturbance reached the Windward Islands on 29 October. On 30 October, the disturbance moved west-northwestward into the eastern Caribbean Sea and gradually became better organized. Early on 31 October, the system's deep convection became more consolidated over the east-central Caribbean Sea, with some evidence of banding features. By 1800 UTC that day, a low-level circulation became sufficiently well-defined to denote the formation of a tropical depression centered about 190 n mi south of Pedernales, Dominican Republic. The "best track" chart of the tropical cyclone's path is given in Fig. 1, with the wind and pressure histories shown in Figs. 2 and 3, respectively. The best track positions and intensities are listed in Table 1[1].

A ridge of high pressure to the north caused the cyclone to move westward over the west-central and western Caribbean Sea for a couple of days, and the depression strengthened into a tropical storm by 0000 UTC 1 November when it was centered about 260 n mi southeast of Kingston, Jamaica. In an environment of low vertical shear and high oceanic heat content, Eta quickly intensified, becoming a 70-kt hurricane by 0600 UTC 2 November while centered about 270 n mi south of Grand Cayman. The hurricane strengthened extremely rapidly on 2 November as a distinct eye became apparent on visible satellite images around 1500 UTC that day. Eta's maximum winds increased to near 115 kt, category 4 intensity, by 1800 UTC 2 November, an increase of 45 kt over just 12 h. The hurricane reached its peak intensity of about 130 kt at 0000 UTC 3 November when it was centered about 55 n mi east-southeast of Puerto Cabezas, Nicaragua. A mid-level ridge then built over the western Gulf of Mexico and Mexico, which caused Eta to turn toward the southwest with a decrease in forward speed. Eta maintained an intensity near 130 kt through 0600 UTC 3 November, by which time the central pressure had fallen to 922 mb. Some weakening then took place, likely due to an eyewall replacement, while the system's forward speed slowed even further. Upwelling of cooler shelf waters near the east coast of Nicaragua by this slow-moving system may have also contributed to the weakening. After nearly stalling just off the coast of northeastern Nicaragua later on 3 November, the hurricane turned toward the west-northwest and made landfall in that country about 15 n mi south-southwest of Puerto Cabezas around 2100 UTC that day, with a category 4 intensity of 120 kt.

[1] A digital record of the complete best track, including wind radii, can be found on line at ftp://ftp.nhc.noaa.gov/atcf. Data for the current year's storms are located in the *btk* directory, while previous years' data are located in the *archive* directory.

After crossing the coast, the cyclone moved slowly westward over northern Nicaragua while steadily weakening to a tropical storm by 1200 UTC 4 November, and to a tropical depression by 0000 UTC 5 November while located well inland about 70 n mi east of Tegucigalpa, Honduras. The system's surface circulation appeared to dissipate by 0600 UTC 5 November, but an associated low- to mid-tropospheric circulation center or vorticity maximum was still present. This disturbance moved west-northwestward, northwestward, and northward over Honduras on 5 November, and then emerged over the Gulf of Honduras just before 0000 UTC 6 November. Meanwhile, the ridge over the Gulf of Mexico was replaced by a mid- to upper-level cyclone and trough which dug southeastward toward the disturbance, causing it to turn toward the east-northeast. It is estimated that the system re-acquired a surface circulation, and thus re-developed into a tropical depression, to the east of Belize around 0600 UTC 6 November. The cyclone regained tropical storm status by about 0600 UTC 7 November and briefly accelerated east-northeastward later that day. The storm strengthened to an intensity of 55 kt at 0000 UTC 8 November. Eta then moved on a counterclockwise trajectory, along the periphery of a broad deep-layer cyclonic circulation. This motion took the center of Eta across the south coast of central Cuba around 0900 UTC 8 November, and the center emerged off the north coast of Cuba and into the Straits of Florida by around 1500 UTC that day.

Eta continued to move along a counterclockwise path, turning northward, north-northwestward, and west-northwestward over the Straits through early on 9 November. The center of the tropical storm made landfall in the Florida Keys near Lower Matecumbe Key with an intensity of about 55 kt around 0400 UTC 9 November. Eta then moved westward into the southeastern Gulf of Mexico. Dry air entrainment caused some weakening, and the storm's winds decreased to 45 kt later on 9 November while the system turned west-southwestward and southwestward. The cyclone made a cyclonic loop to the north of the western tip of Cuba, with little change in strength, on 10 November. Eta moved northward on 11 November, and briefly regained hurricane intensity around 1200 UTC that day. This re-intensification may have been due to the system's interaction with the higher oceanic heat content of the Loop Current over the southeastern Gulf of Mexico. In any event, the cyclone's hurricane status was short-lived. Eta, having weakened back to a tropical storm, moved generally northward over the extreme eastern Gulf of Mexico later on 11 November, passing to the west of the southern and south-central Florida peninsula. At 0000 UTC 12 November, Eta's center passed about 40 n mi west of Clearwater, Florida. The system turned north-northeastward and made landfall near Cedar Key, Florida at about 0900 UTC that day, with its maximum winds weakening to near 45 kt due to strong west-southwesterly shear and some incursions of drier air. While continuing to weaken, Eta then moved northeastward and crossed northern Florida on 12 November, with most of the convection displaced to the east of the center due to strong shear.

The center of the cyclone emerged into the Atlantic just north of the Florida/Georgia border by 1800 UTC 12 November, having weakened further while over land. Eta re-intensified slightly once back over water and accelerated east-northeastward late that day and early on 13 November, passing offshore of the South Carolina and North Carolina coasts. By 1200 UTC 13 November, the system became embedded within a frontal zone and thus had been transformed into an extratropical cyclone. The cyclone was absorbed by another extratropical low offshore of the northeastern United States just after 0000 UTC November 14.

METEOROLOGICAL STATISTICS

Observations in Eta (Figs. 2 and 3) include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB), and objective Advanced Dvorak Technique (ADT) estimates and Satellite Consensus (SATCON) estimates from the Cooperative Institute for Meteorological Satellite Studies/University of Wisconsin-Madison. Observations also include flight-level, stepped frequency microwave radiometer (SFMR), and dropwindsonde observations from flights of the 53rd Weather Reconnaissance Squadron of the U.S. Air Force Reserve Command (AFRES) and WD-P3 aircraft of the NOAA Aircraft Operations Center. Data and imagery from NOAA polar-orbiting satellites including the Advanced Microwave Sounding Unit (AMSU), the NASA Global Precipitation Mission (GPM), the European Space Agency's Advanced Scatterometer (ASCAT), and Defense Meteorological Satellite Program (DMSP) satellites, among others, were also useful in constructing the best track of Eta.

There was a total of 21 aircraft missions into and around Eta, 11 from the AFRES, and 10 from NOAA (6 center fix missions, 3 synoptic surveillance flights, and 1 tail doppler radar mission). The AFRES transmitted 21 center fixes, and NOAA transmitted 16 fixes.

Ship reports of winds of tropical storm force associated with Eta are listed in Table 2. Selected surface observations from land stations and data buoys are given in Table 3.

Winds and Pressure

The estimated maximum intensity of Eta, 130 kt from 0000 to 0600 UTC 3 November, is based on AFRES observations, using a blend of the highest 700 mb flight-level winds of 137 kt, which adjusts to an intensity of 123 kt, and the peak SFMR-observed surface winds of 135 kt. The 130-kt intensity is also supported by a maximum eyewall dropsonde wind speed of 129 kt averaged over the lowest 150 m of the sounding at 0306 UTC. Eta's estimated minimum central pressure of 922 mb at 0600 UTC 3 November is based on an AFRES eye dropsonde measurement of 925 mb with splash winds of 14 kt at 0358 UTC 3 November, and the possibility that the pressure was still falling at that time.

The 130-kt intensity of Eta at landfall in Nicaragua is based on a blend of Dvorak estimates and earlier aircraft observations. Sustained winds of 94 kt and a gust to 118 kt were reported at the Puerto Cabezas, Nicaragua, airport, but these observations were incomplete. Peak sustained winds of 46 kt with a gust to 49 kt were measured at Cayo Coco, Cuba. A slightly elevated WeatherFlow observing site on Carysfort Reef Light in the upper Florida Keys measured maximum sustained winds of 55 kt with a gust to 61 kt. Sites near the standard 10-m elevation in Miami-Dade and Broward Counties in south Florida reported sustained winds close to 40 kt with gusts near 50 kt. Sustained winds of 35–40 kt with gusts to around 50 kt were measured in the Tampa Bay area. A sustained wind of 35 kt with a gust to 44 kt and a minimum pressure of 997 mb was reported at Cedar Key, Florida around the landfall near that location. The lowest pressure reported in Florida was about 992 mb in the mid-upper Florida Keys while the center moved through that area.

Storm Surge[2]

The meteorological service of Nicaragua reported a storm surge of 26 to 33 ft above normal near Eta's landfall location in Nicaragua.

Eta produced storm surge inundation levels of 3 to 4 ft above ground level (AGL) in the Tampa Bay area of Florida. National Ocean Service (NOS) tide gauges in the northern part of the bay, at Old Port Tampa and Tampa-East Bay, both measured peak water levels of 3.9 ft above Mean Higher High Water (MHHW). Also, the NOS gauge in St. Petersburg recorded a peak water level of 3.5 ft MHHW. Several stream gauges from the United States Geological Survey (USGS) confirmed these heights. For example, a gauge in Pinellas County on Lake Seminole recorded a peak water level of 4.1 ft MHHW, and a gauge on the Hillsborough River in Tampa measured 3.8 ft MHHW. Figure 4 shows observations from various tide stations and water level sensors along the Florida coast.

Storm surge inundation levels along the remainder of the Florida coast were generally 1 to 3 ft AGL, but some isolated areas were between 3 and 4 ft AGL. These areas include the upper part of Florida Bay, where a USGS gauge between U.S. 1 and Card Sound Road recorded a peak water level of 3.7 ft MHHW. Along Apalachee Bay, the USGS gauge at the Aucilla River measured 3.6 ft MHHW, and along the southwest coast of Florida, a gauge on the Peace River near Charlotte Harbor registered 3.1 ft MHHW. Otherwise, all other gauges along the Florida coast measured peak water levels less than 3 ft MHHW.

Rainfall and Flooding

International

Abundant moisture associated with Eta and its remnants, combined with the cyclone's slow motion before and after landfall in Nicaragua, resulted in an extended period of heavy rainfall across large portions of Central America. The highest reported rainfall totals occurred along the northern coast of Honduras (Fig. 5), with 31.63 inches (803.3 mm) in Tela and 29.25 inches (743.0 mm) at Golosón International Airport in La Ceiba from 1–7 November 2020. Over 20 inches of rainfall occurred in parts of northeastern Nicaragua (Fig. 6) as well, with a peak of 26.55 inches (674.3 mm) at Puerto Corinto. However, rainfall totals in Nicaragua are likely incomplete due to damage caused by the storm. In Guatemala (Fig. 7), heavy rain fell across the eastern and central portions of the country, with 21.06 inches (534.8 mm) reported at Cobán, Alta Verapaz and 19.10 inches (485.1 mm) in Puerto Barrios, Izabal. A swath of 10+ inches of rainfall occurred across the central portion of Belize (Fig. 8), with a topographically-enhanced maximum of 21.86 inches (555.2 mm) at Baldy Beacon. A maximum of 10.84 inches (275.4 mm) occurred in the northwestern part of El Salvador (Fig. 9) near Planes de Montecristo. In Costa Rica (Fig.

[2] Several terms are used to describe water levels due to a storm. **Storm surge** is defined as the abnormal rise of water generated by a storm, over and above the predicted astronomical tide, and is expressed in terms of height above normal tide levels. Because storm surge represents the deviation from normal water levels, it is not referenced to a vertical datum. **Storm tide** is defined as the water level due to the combination of storm surge and the astronomical tide, and is expressed in terms of height above a vertical datum, i.e. the North American Vertical Datum of 1988 (NAVD88). **Inundation** is the total water level that occurs on normally dry ground as a result of the storm tide, and is expressed in terms of height above ground level. At the coast, normally dry land is roughly defined as areas higher than the normal high tide line, or Mean Higher High Water (MHHW).

10), topography combined with moist flow from the Pacific focused the heaviest precipitation near the southern Pacific coast, with a maximum of 24.58 inches (624.4 mm) near Arunachala. Additionally, portions of southern Mexico (Fig. 11) received heavy rainfall from Eta and its remnants from 3–7 November, with the highest totals noted in the states of Chiapas and Tabasco and a maximum of 24.90 inches (632.5 mm) reported at Tzimbac, Chiapas.

Heavy rainfall from Eta also impacted portions of the Greater Antilles. Eta passed to the south of Jamaica on 1 November, and then passed northwest of the island on 7 November before making landfall in Cuba. As a result, Jamaica received several days of heavy rain, with 10–20 inches reported across the eastern parishes from 1–8 November and a maximum of 28.89 inches (733.8 mm) measured at Moore Town. Elsewhere, Grand Cayman received 9.87 inches (250.7 mm) of rainfall from 3–7 November as Eta made a close approach to the Cayman Islands. The storm's landfall in central Cuba resulted in 3–6 inches of rain across the region with isolated totals greater than 10 inches, including 17.71 inches (449.8 mm) at Topes de Collantes and 15.24 inches (387.2 mm) at La Piedra.

Maximum reported rainfall totals by country:

Honduras:	31.63 inches (803.3 mm) at Tela, Atlántida
Jamaica:	28.89 inches (733.8 mm) at Moore Town, Portland
Nicaragua:	26.55 inches (674.3 mm) at Puerto Corinto, Chinandega
Mexico:	24.90 inches (632.5 mm) at Tzimbac, Chiapas
Costa Rica:	24.58 inches (624.4 mm) at Arunachala
Belize:	21.86 inches (555.2 mm) at Baldy Beacon, Cayo
Guatemala:	21.06 inches (534.8 mm) at Cobán, Alta Verapaz
Cuba:	17.71 inches (449.8 mm) at Topes de Collantes
El Salvador:	10.84 inches (275.4 mm) at Planes de Montecristo
Cayman Islands:	9.87 inches (250.7 mm) at Grand Cayman

United States

South Florida was the focus of significant rainfall from Eta in the United States (Fig. 12). The highest reported storm total rainfall of 20.74 inches occurred in Broward County in Pembroke Pines, with 16–18 inches measured at several other locations in Pembroke Pines and nearby Miramar. In Miami-Dade County, 14.12 inches of rain fell near Biscayne Park, and 13.40 inches occurred in North Miami. Numerous other locations in Broward and Miami-Dade Counties received over 10 inches of rainfall, which resulted in widespread major flooding across the area (Fig. 13).

Elsewhere, much of the Florida Keys received 4–8 inches of rainfall during the event, as Eta made two separate approaches and one landfall early on 9 November in Lower Matecumbe Key. A storm total maximum of 8.98 inches occurred near Key West. Eta also produced heavy rainfall across the greater Tampa Bay area, with several locations reporting more than 8 inches of rain during the event and a maximum of 10.64 inches noted near Sun City Center in Hillsborough County.

Once Eta crossed northern Florida and emerged into the Atlantic Ocean, its interaction with a cold front moving across the Mid-Atlantic states produced heavy rains across portions of Georgia as well as eastern South Carolina and North Carolina from 11–13 November, before and during the cyclone's extratropical transition. Peak rainfall totals from each state, which may include some precipitation not directly related to Eta, are as follows: 5.51 inches near Washington, Georgia; 7.50 inches near Conway, South Carolina; and 12.50 inches near Rocky Mount, North Carolina.

Tornadoes

There was one EF0 tornado reported in Manatee County, Florida, that caused minor damage.

CASUALTY AND DAMAGE STATISTICS

International

Eta was responsible for at least 165 direct deaths[3] and over 100 missing people in Central America and southern Mexico, although these counts are uncertain and likely underdone due to inconsistent media reports. The extreme rainfall associated with Eta caused catastrophic flash flooding, river flooding, and deadly landslides across the region. Flooding or landslides contributed to at least 74 deaths in Honduras, 60 in Guatemala, 27 in Mexico, and 2 in both Nicaragua and Costa Rica. Incredibly, there was no reported loss of life near the landfall location on the coast of northeastern Nicaragua, although Eta must have caused very severe damage in that area. The United Nations (UN) estimates that 4.9 million people were adversely impacted by the torrential rainfall, strong winds, and storm surge produced by Eta. There was an estimated $6.8 billion (USD) worth of total damage from Eta in Central America, according to the Global Catastrophe Recap produced by Aon. Unfortunately, this devastation was soon to be followed by additional disastrous impacts from Hurricane Iota[4] just two weeks later.

UNICEF estimates that over 110,000 people displaced by Eta across Central America were evacuated to temporary shelters during the COVID-19 pandemic. Floodwaters destroyed many roads and bridges, which isolated numerous villages and communities and stranded people on roofs as they awaited rescue. Preliminary reports by the government of Nicaragua indicated that Eta damaged or destroyed at least 6,900 homes, 16 healthcare facilities, 45 schools, and 560 miles of roads and bridges across the country. In Honduras, at least 450 homes were damaged by floodwaters, and around 40 communities were isolated by washed-out roads and

[3] Deaths occurring as a direct result of the forces of the tropical cyclone are referred to as "direct" deaths. These would include those persons who drowned in storm surge, rough seas, rip currents, and freshwater floods. Direct deaths also include casualties resulting from lightning and wind-related events (e.g., collapsing structures). Deaths occurring from such factors as heart attacks, house fires, electrocutions from downed power lines, vehicle accidents on wet roads, etc., are considered "indirect" deaths.

[4] Stewart, Stacy. "Tropical Cyclone Report: Hurricane Iota." National Oceanic and Atmospheric Administration / National Weather Service / National Hurricane Center, 18 May 2021, www.nhc.noaa.gov/data/tcr/AL312020_Iota.pdf

bridges. Hundreds of homes were also damaged or destroyed in Guatemala. A devastating landslide in the remote village of Quejá, Guatemala, buried numerous homes and approximately one hundred people according to media reports, many of whom remain missing but are likely not included in official death tolls since many victims were unable to be recovered. According to the UN, Guatemala lost over 119,000 hectares of crops and harvest during Eta, further contributing to the humanitarian crisis in the region. Major flooding impacts were also noted in Belize, Costa Rica, and El Salvador.

Elsewhere, floodwaters damaged infrastructure and thousands of homes in the states of Chiapas and Tabasco in southern Mexico. Jamaica experienced serious flooding that washed out roads and bridges and led to some landslides. Flash flooding was also reported in the Cayman Islands, along with some downed trees and power lines from strong winds. Cuba experienced coastal and river flooding that led to around 25,000 evacuations.

United States

There were 7 direct fatalities due to Eta in the United States, all drownings due to flash flooding in North Carolina; these occurred as moisture ahead of Eta interacted with a cold front that was moving across the Mid-Atlantic states. In Alexander County, 5 persons ranging in age from 1 to 76 drowned at a campground, and a 64-year-old man was killed when he drove his vehicle onto a collapsed bridge. An 11-year old child drowned in flood waters in Wake County. Additionally, there were 3 indirect deaths in the U.S. Two people died in weather-related traffic accidents in North Carolina and a 65-year-old man was electrocuted in floodwaters at his home in Bradenton Beach, Florida.

According to the NOAA National Centers for Environmental Information, Eta caused an estimated $1.5 billion worth of total damage in the United States, primarily in southern Florida. Major flooding was Eta's greatest impact in South Florida, with water entering some structures in parts of Broward County including Fort Lauderdale, Lauderhill, and Davie. Heavy rains resulted in standing water that made streets impassable in northern Miami-Dade County and portions of downtown Miami and Brickell. Floodwaters in the streets were slow to recede and lingered for several days after the storm. Over 290,000 customers in Miami-Dade, Broward, and Palm Beach Counties lost power due to downed trees and power lines. In the Florida Keys, the combination of rain and storm surge resulted in some flooding in North Key Largo and Upper Matecumbe Key. A large tree fell on and destroyed a residence in Key Largo, resulting in a minor injury. Downed trees and limbs caused about 1,000 customers to lose power, mainly in Key Largo. During Eta's passage to the west of the Keys, large wave action produced significant overwash along the Lower Keys and forced some road closures in Key West.

West-central Florida also received significant flooding impacts from storm surge and heavy rainfall. In Pinellas County, 33 people were rescued from flooded homes and stalled vehicles in Pass-a-Grille. Other areas between St. Pete Beach and Madeira Beach experienced up to a couple of feet of storm surge inundation. Several sailboats broke free of their moorings during the storm and became stuck under a bridge or were beached in Gulfport. Street flooding and road closures were also reported in coastal Hillsborough, Manatee, Sarasota, Charlotte, and Lee Counties. Wind impacts were generally minor, although a tractor-trailer crash in Hernando

County was attributed to strong wind. Over 40,000 customers lost power in the greater Tampa Bay area.

FORECAST AND WARNING CRITIQUE

Genesis

The timing and location of the genesis of Eta was not that well predicted. It was first noted in the Tropical Weather Outlook (TWO) that an area of low pressure was expected to form over the southwestern Caribbean Sea 66 h before Eta's genesis over the central Caribbean Sea, and the 5-day formation probability was set to low (<40%) at that time (Table 4). Subsequent TWOs closer to the time of genesis indicated a formation location farther east and closer to the actual genesis location. The 2-day formation probability was first set to low in the TWO 48 h before genesis. The 2- and 5-day formation probabilities were raised to medium (40%-60%) 30 and 54 h prior to genesis, respectively, and to high only 24 and 36 h before genesis, respectively.

Track

A verification of NHC official track forecasts for Eta is given in Table 5a. Official track forecast errors were a little higher than the mean official errors for the previous 5-yr period, a reasonably good performance considering the erratic nature of the tropical cyclone's track. A homogeneous comparison of the official track errors with selected guidance models is given in Table 5b. Several of the guidance models had lower mean errors than the official forecasts, but in most of those cases the NHC forecasts had comparable errors. However, the COAMPS-TC (CTCI) model had substantially lower errors than most of the other track guidance at 48 h and beyond. The official forecasts consistently predicted landfall in northeastern Nicaragua (Fig. 14). It should also be noted that the NHC forecasts began calling for Eta to move into, or reform over, the northwestern Caribbean Sea about 96 h in advance of that occurrence.

Intensity

A verification of NHC official intensity forecasts for Eta is given in Table 6a. Official intensity forecast errors were somewhat higher than the mean official errors for the previous 5-yr period for the 12- through 48 h-forecast intervals, and lower than the 5-yr means at 60 through 120 h. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 6b. HWFI was the best performer at the 36- and 48-h forecast intervals. In general, however, the mean official errors were comparable to or lower than those of the intensity guidance models. As is typical, forecasting Eta's rapid intensification before landfall in Nicaragua was problematic. Nonetheless, 30 h prior to Eta reaching peak intensity, the Deterministic to Probabilistic Statistical (DTOPS) model indicated a 71% chance of a 30-kt wind speed increase in 24 h, and the SHIPS Rapid Intensification Index showed a 53% chance of a 30-kt wind speed increase in 24 h one day before the hurricane's peak. The official intensity forecasts issued 30 h before the Nicaragua landfall showed significant strengthening, and indicated that the system would become a major hurricane by the time it reached the coast.

Storm Surge Forecasts and Warnings[5]

Storm surge watches and warnings associated with Eta are given in Table 7 and indicated in Fig. 15. A Storm Surge Watch was first issued for the southern part of the Florida peninsula from Golden Beach to Bonita Beach, the Florida Keys, Biscayne Bay, and Florida Bay at 2100 UTC 7 November. The part of the watch covering the Florida Keys and Florida Bay was upgraded to a Storm Surge Warning at 1500 UTC 8 November. While some minor coastal flooding did occur in these areas, there was only one observation of storm surge inundation of 3 ft or greater above normally dry ground (which NHC uses as a first-cut threshold for the storm surge watch/warning) in the upper part of Florida Bay. For the most part, then, the majority of the Storm Surge Warning for the Florida Keys and Florida Bay did not verify, and all watches and warnings were discontinued by 0900 UTC 9 November.

For the southern Florida peninsula and the Florida Keys, the initial peak storm surge inundation forecast issued at 0300 UTC 7 November was 2 to 3 ft above normally dry ground somewhere between North Miami Beach and Marco Island, as well as the Florida Keys. The forecast was raised slightly to 2 to 4 ft above normally dry ground for the same general area at 2100 UTC 7 November. The highest observation within this area was 3.7 ft MHHW by the USGS gauge in the upper part of Florida Bay between Homestead and Key Largo.

A Storm Surge Watch was issued for the west coast of Florida from Bonita Beach to the Steinhatchee River, including Tampa Bay and Charlotte Harbor, at 0300 UTC 11 November. The portion of the watch from Bonita Beach to the Suwanee River, including Tampa Bay and Charlotte Harbor, was upgraded to a Storm Surge Warning at 1500 UTC 11 November. Storm surge inundation of 3 ft or higher above ground level occurred within the warning area mainly within Tampa Bay and areas of Charlotte Harbor. There was very little lead time with this warning, as sustained tropical-storm-force winds are estimated to have begun in the Tampa Bay area later in the afternoon on 11 November. There were no observations of 3 ft or greater inundation along the open coast, although a storm surge simulation hindcast produced by the NHC Storm Surge Unit (not shown) suggests that at least 3 ft could have occurred along the beaches of Sarasota, Manatee, and Pinellas Counties.

For the west coast of Florida, the initial peak storm surge inundation forecast issued at 0300 UTC 11 November was 2 to 4 ft above normally dry ground somewhere between Bonita Beach and the Steinhatchee River, including Tampa Bay and Charlotte Harbor. The forecast was increased to 3 to 5 ft above normally dry ground between Boca Grande and Anclote River, including Tampa Bay, at 1500 UTC 11 November. The highest observations in this area were about 4 ft MHHW from several NOS and USGS gauges.

[5] Storm surge watches and warnings are currently only issued for the United States.

Wind Watches and Warnings

Wind watches and warnings associated with Eta are given in Table 8. A Hurricane Warning was issued for the northeast coast of Nicaragua about 36 h before the onset of tropical-storm-force winds over that area, and 54 h prior to landfall.

Impact-Based Decision Support Services (IDSS) and Public Communication

The NHC began communication with emergency managers on 6 November as Eta was in the northwestern Caribbean and continued through its multiple landfalls in Florida. This communication included daily briefings for Emergency Managers in Florida and Federal video-teleconferences with FEMA Headquarters. These decision support briefings were coordinated through the FEMA Hurricane Liaison Team, embedded at the NHC.

The Tropical Analysis and Forecast Branch of NHC provided 13 live briefings on Eta to the U.S. Coast Guard (USCG) District 7 in Miami between 5 and 12 November in support of USCG's life-saving mission.

ACKNOWLEDGMENTS

Much of the observed data in this report came from Post Tropical Cyclone (PSH) Reports issued by NWS Weather Forecast Offices (WFOs) in Miami, Key West, Melbourne, Tampa, and Jacksonville, Florida. Jose Rubiera of the meteorological service of Cuba provided surface observations from that country. Select surface observations and rainfall data were provided by the meteorological services of Belize, Cayman Islands, Costa Rica, El Salvador, Jamaica, Guatemala, Honduras, Mexico, and Nicaragua.

John P. Cangialosi produced the track map and assisted with the forecast verification. Zackary Taylor and David Roth of the NOAA Weather Prediction Center produced the rainfall map. Tiffany O'Connor and Matthew Green gave IDSS briefing information.

Table 1. Best track for Hurricane Eta, 31 October–13 November 2020.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
31 / 1800	14.9	72.4	1006	30	tropical depression
01 / 0000	14.9	73.6	1005	35	tropical storm
01 / 0600	14.9	75.1	1005	35	"
01 / 1200	14.9	76.7	1002	40	"
01 / 1800	14.9	78.2	992	50	"
02 / 0000	14.9	79.4	988	60	"
02 / 0600	14.9	80.4	982	70	hurricane
02 / 1200	14.8	81.2	972	90	"
02 / 1800	14.7	82.0	948	115	"
03 / 0000	14.3	82.5	929	130	"
03 / 0600	14.0	82.9	922	130	"
03 / 1200	13.6	83.1	936	125	"
03 / 1800	13.7	83.3	940	120	"
03 / 2100	13.8	83.5	940	120	"
04 / 0000	13.8	83.7	965	95	"
04 / 0600	13.8	84.3	980	70	"
04 / 1200	13.8	84.9	993	50	tropical storm
04 / 1800	13.9	85.4	998	40	"
05 / 0000	14.0	86.0	1002	30	tropical depression
05 / 0600	14.2	86.7	1006	25	disturbance
05 / 1200	14.5	87.5	1005	25	"
05 / 1800	15.3	87.8	1005	30	"
06 / 0000	16.2	87.8	1004	30	"
06 / 0600	16.7	87.6	1004	30	tropical depression
06 / 1200	16.9	87.4	1004	30	"
06 / 1800	17.1	87.1	1004	30	"
07 / 0000	17.5	86.4	1002	30	"
07 / 0600	18.2	85.1	1001	35	tropical storm
07 / 1200	19.1	83.2	997	45	"
07 / 1800	19.8	81.5	994	55	"

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
08 / 0000	20.4	80.2	991	55	"
08 / 0600	21.1	79.5	991	55	"
08 / 0855	21.5	79.2	991	55	"
08 / 1200	22.2	79.0	993	50	"
08 / 1800	23.5	79.2	993	55	"
09 / 0000	24.5	80.1	993	55	"
09 / 0400	24.9	80.7	993	55	"
09 / 0600	25.0	81.4	992	55	"
09 / 1200	24.9	82.9	992	50	"
09 / 1800	24.2	84.1	995	45	"
10 / 0000	23.4	85.0	995	45	"
10 / 0600	23.0	85.4	995	45	"
10 / 1200	22.6	85.3	992	50	"
10 / 1800	22.9	85.1	992	50	"
11 / 0000	23.5	84.6	990	55	"
11 / 0600	24.5	84.2	987	60	"
11 / 1200	25.8	83.9	983	65	hurricane
11 / 1800	26.8	83.7	990	60	tropical storm
12 / 0000	27.9	83.5	992	55	"
12 / 0600	28.7	83.2	994	50	"
12 / 0920	29.2	82.9	996	45	"
12 / 1200	29.7	82.5	1001	40	"
12 / 1800	30.9	81.3	1003	35	"
13 / 0000	31.9	79.9	1004	40	"
13 / 0600	32.7	78.0	1004	40	"
13 / 1200	34.0	75.3	1004	40	extratropical
13 / 1800	35.1	72.5	1005	40	"
14 / 0000	35.7	69.2	1006	35	"
14 / 0600					absorbed
03 / 0600	14.0	82.9	922	130	maximum winds and minimum pressure

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
03 / 2100	13.8	83.5	940	120	landfall 15 n mi south-southwest of Puerto Cabezas, Nicaragua
08 / 0855	21.5	79.2	991	55	landfall 25 n mi south-southeast of Sancti Spiritus, Cuba
09 / 0400	24.9	80.7	993	55	landfall near Lower Matecumbe Key, FL
12 / 0920	29.2	82.9	996	45	landfall near Cedar Key, FL

Table 2. Selected ship reports with winds of at least 34 kt for Eta, 31 October–13 November 2020.

Date/Time (UTC)	Ship call sign	Latitude (°N)	Longitude (°W)	Wind dir/speed (kt)	Pressure (mb)
03 / 0900	2IYH6	16.8	79.9	080 / 35	1006.6
04 / 1000	2IYH6	20.2	84.4	060 / 35	1010.6
04 / 1200	9VBP8	20.1	86.7	040 / 35	1014.1
04 / 1400	2IYH6	20.5	85.1	070 / 38	1012.1
04 / 1800	9VBP8	19.3	86.9	050 / 35	1013.1
07 / 0000	KCHV	24.6	84.8	080 / 35	1013.2
07 / 1300	6YRG6	16.4	84.8	260 / 35	1007.3
07 / 1400	KCHV	24.0	81.4	080 / 35	1013.2
07 / 1600	6YRG6	16.3	85.4	270 / 40	1010.0
07 / 1800	3FPS9	26.0	78.2	080 / 35	1011.5
07 / 1900	9HA463	25.4	79.2	100 / 42	1012.0
07 / 1900	HPYE	25.8	77.3	070 / 35	1012.8
07 / 2100	9HA463	25.3	79.5	090 / 38	1011.0
07 / 2300	9HA463	25.4	79.6	080 / 35	1011.0
07 / 2300	3FPS9	25.7	77.3	070 / 40	1011.4
08 / 0000	3EBL5	25.9	78.2	090 / 35	1011.2
08 / 0200	9HA366	25.7	77.1	070 / 35	1013.0
08 / 0200	C6DF6	26.2	77.7	090 / 38	1012.4
08 / 0300	C6XS7	24.1	74.7	110 / 35	1014.4
08 / 0400	3FPS9	25.6	76.5	080 / 40	1012.0
08 / 0400	9HA366	25.7	76.9	090 / 35	1012.1
08 / 0500	C6XS7	23.9	74.7	100 / 40	1009.1
08 / 0500	9HA463	25.6	79.5	090 / 35	1011.5
08 / 0600	HPYE	25.3	75.5	100 / 40	1012.8
08 / 0700	9HA366	25.7	76.6	080 / 40	1010.2
08 / 0700	9HA463	25.9	79.5	090 / 55	1010.0
08 / 0700	H3GR	26.1	77.8	090 / 40	1011.9
08 / 0700	J8AZ3	26.2	78.8	090 / 37	1010.2
08 / 0700	J8QX6	26.7	79.3	070 / 38	1011.7
08 / 0800	3FPS9	25.3	76.0	080 / 35	1009.0

Date/Time (UTC)	Ship call sign	Latitude (°N)	Longitude (°W)	Wind dir/speed (kt)	Pressure (mb)
08 / 0800	9HA366	25.6	76.4	090 / 40	1009.7
08 / 0900	9HA496	25.9	77.8	090 / 37	1009.0
08 / 0900	9HA463	26.2	79.3	090 / 50	1010.0
08 / 0900	9HA445	26.3	78.4	090 / 40	1011.0
08 / 0900	C6FN5	26.4	77.9	080 / 50	1010.7
08 / 1100	3FPS9	25.1	75.7	060 / 45	1009.5
08 / 1100	3EBL5	26.1	78.3	090 / 45	1008.5
08 / 1100	C6DF6	26.5	78.0	070 / 48	1010.4
08 / 1200	9HA496	25.5	77.5	090 / 43	1009.0
08 / 1200	3FZO8	26.5	78.3	080 / 40	1010.9
08 / 1300	9HA366	25.2	75.8	080 / 40	1010.4
08 / 1400	9HA366	25.4	75.7	080 / 45	1010.9
08 / 1500	9HA496	25.0	77.7	080 / 35	1009.0
08 / 1500	9HA366	25.0	75.6	100 / 40	1010.7
08 / 1500	H3GR	26.2	77.9	110 / 44	1013.5
08 / 1500	C6DF6	26.3	78.0	070 / 42	1010.2
08 / 1500	9HA463	26.4	78.3	080 / 38	1011.1
08 / 1600	3FPS9	24.8	75.1	110 / 35	1010.5
08 / 1600	9HA366	25.9	75.5	120 / 40	1010.6
08 / 1600	H3VU	26.3	76.1	080 / 35	1007.2
08 / 1700	3FZO8	26.5	78.0	090 / 40	1011.9
08 / 1700	9HA463	26.5	78.0	090 / 38	1011.1
08 / 1700	WGEH	27.5	84.4	070 / 35	1013.5
08 / 1800	9HA496	24.7	77.6	120 / 45	1005.0
08 / 1800	9HA366	24.8	75.3	120 / 35	1009.4
08 / 1800	3EBL5	26.3	78.4	090 / 50	1007.6
08 / 1800	H3GR	26.3	77.9	080 / 45	1010.9
08 / 1900	3FPS9	24.5	74.8	110 / 35	
08 / 1900	9HA366	24.8	75.3	110 / 35	1009.2
08 / 1900	9HA463	26.5	77.9	090 / 55	1010.0
08 / 2000	C6XS7	23.9	74.7	170 / 45	1008.7
08 / 2000	9HA366	24.7	75.2	120 / 35	1009.5

Date/Time (UTC)	Ship call sign	Latitude (°N)	Longitude (°W)	Wind dir/speed (kt)	Pressure (mb)
08 / 2000	H3GR	26.2	78.0	070 / 40	1009.9
08 / 2000	C6DF6	26.2	77.8	080 / 36	1007.5
08 / 2100	9HA496	24.5	77.4	120 / 45	1004.0
08 / 2100	9HA463	26.5	78.1	090 / 56	1009.0
08 / 2200	KCHV	30.4	79.4	080 / 38	1020.2
09 / 0000	9HA496	24.3	77.3	150 / 37	1007.0
09 / 0000	C6DF6	26.1	77.7	090 / 35	1008.1
09 / 0000	9HA463	26.5	78.0	090 / 35	1010.0
09 / 0100	9HA366	25.0	75.3	100 / 40	1011.2
09 / 0100	3EBL5	26.1	78.3	090 / 46	1007.4
09 / 0100	H3GR	26.1	77.8	080 / 46	1010.6
09 / 0200	9HA366	25.1	75.3	110 / 35	1012.0
09 / 0200	H3GR	26.1	77.9	050 / 40	1011.9
09 / 0300	C6XS7	23.9	74.8	160 / 37	1010.5
09 / 0300	9HA496	24.0	77.2	140 / 35	1009.0
09 / 0300	9HA366	25.2	75.3	120 / 35	1011.7
09 / 0300	H3GR	26.0	77.9	080 / 38	1011.0
09 / 0400	9HA366	25.2	75.3	100 / 40	1011.0
09 / 0500	C6XS7	24.1	74.9	120 / 35	1010.2
09 / 0500	3FZO8	26.5	78.2	090 / 42	1009.9
09 / 0500	9HA463	26.5	78.1	090 / 40	1011.1
09 / 0600	9HA366	25.4	75.3	090 / 41	1010.5
09 / 0600	H3GR	26.1	78.1	120 / 40	1011.9
09 / 0700	9HA366	25.5	75.3	120 / 41	1011.2
09 / 0700	9HA463	26.5	78.0	090 / 42	1010.0
09 / 0800	C6XS7	24.1	74.7	110 / 35	1007.8
09 / 0800	C6SE3	25.6	76.4	100 / 35	1007.0
09 / 0800	9HA366	25.6	75.3	110 / 40	1011.4
09 / 0800	H3GR	26.2	78.0	100 / 40	1010.6
09 / 0900	9HA463	26.5	78.1	090 / 45	1009.0
09 / 1000	3FZO8	26.5	78.2	090 / 40	1008.9
09 / 1100	3EBL5	26.1	78.6	090 / 45	1008.1

Date/Time (UTC)	Ship call sign	Latitude (°N)	Longitude (°W)	Wind dir/speed (kt)	Pressure (mb)
09 / 1200	D5WI8	24.7	89.4	050 / 66	1012.0
09 / 1200	3FZO8	26.5	78.4	100 / 35	1009.9
09 / 1200	3FZO8	26.5	78.3	100 / 35	1010.9
09 / 1200	C6FN5	26.5	78.1	100 / 35	1011.3
09 / 1500	9HA463	26.5	78.1	110 / 37	1012.8
09 / 1700	V7KD8	26.0	76.4	090 / 49	1011.0
09 / 1700	9HA463	26.5	78.0	110 / 37	1012.1
09 / 1800	H3GR	26.0	78.2	100 / 40	1011.9
09 / 1900	9HA463	26.5	78.0	090 / 42	1012.0
09 / 2100	9HA463	26.5	78.0	090 / 36	1012.0
10 / 0000	H3VU	26.2	77.9	090 / 35	1013.0
10 / 0000	3EBL5	26.4	78.3	060 / 40	1011.1
10 / 0900	9HA445	26.1	79.4	100 / 35	1012.0
10 / 1200	C6FN5	25.5	79.6	120 / 35	1010.7
10 / 1700	V7KD8	24.6	79.8	130 / 49	1009.0
11 / 0500	9HA366	26.1	78.1	120 / 35	1013.4
11 / 0500	C6XS7	26.3	77.9	130 / 35	1014.1
11 / 0600	HPYE	26.3	77.9	140 / 35	1014.8
11 / 0700	9HA463	26.4	78.3	150 / 38	1011.3
11 / 0900	9HA496	26.0	80.1	170 / 35	1012.0
11 / 0900	9HA463	26.4	78.2	140 / 36	1011.3
11 / 1400	C6YT4	20.5	82.8	230 / 38	1011.3
11 / 1800	V7KD8	23.6	82.7	120 / 56	1008.0
11 / 1800	WLIY	27.4	83.9	130 / 35	998.9
11 / 1800	WLIY	27.4	83.8	090 / 35	1002.0
11 / 2200	9HA366	25.9	78.2	150 / 35	1012.1
11 / 2300	9HA366	25.9	78.2	140 / 35	1013.0
12 / 0100	9HA366	25.8	78.3	140 / 35	1014.6
12 / 0500	9HA366	25.9	78.3	150 / 35	1014.3
12 / 0700	9HA366	25.9	78.3	170 / 35	1013.5
12 / 0700	9HA463	26.3	78.0	150 / 36	1013.3
12 / 1300	WDJ659	29.9	80.7	170 / 40	1006.8

Date/Time (UTC)	Ship call sign	Latitude (°N)	Longitude (°W)	Wind dir/speed (kt)	Pressure (mb)
12 / 1400	J8QY1	29.9	75.1	040 / 38	1017.0
12 / 1800	WDJ659	28.7	79.1	200 / 40	1009.4
13 / 0100	WMKA	32.9	78.3	050 / 35	1012.0
13 / 0500	J8QY1	27.6	78.7	080 / 35	1012.7
13 / 0500	WMHA	33.0	76.6	050 / 55	1006.6
13 / 0600	WMHA	33.3	76.4	080 / 45	1007.3
13 / 0700	WMHA	33.5	76.2	050 / 40	1009.4
13 / 0800	WMHA	33.8	76.0	080 / 42	1009.1
13 / 0900	WMHA	34.0	75.8	100 / 50	1005.9
13 / 1800	VRGE7	35.5	69.9	160 / 48	1011.9

Table 3. Selected surface observations for Hurricane Eta, 31 October–13 November 2020.

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Jamaica									
Kingston – Norman Manley Intl. AP (MKJP) (17.93N 76.78W)			01/1325	23	33				11.09
Moore Town (18.08N 76.43W)									28.89
Comfort Castle (18.05N 76.41W)									28.15
Norris (17.92N 76.58W)									23.24
Ramble (17.97N 76.61W)									20.33
New Yarmouth (17.88N 77.28W)									18.58
Sherwood Forest (18.15N 76.38W)									18.41
Fruitful Vale (18.14N 76.55W)									17.44
Spring Gardens (18.22N 76.63W)									14.81
Bachelor's Hall (17.95N 76.32W)									13.37
Bois Content (18.01N 77.16W)									12.86
Caswell Hill (17.87N 77.27W)									11.81
Old Yarmouth Quarry (17.87N 77.29W)									11.81
Old Yarmouth Fisher (17.85N 77.29W)									11.02
Hordley Estate (17.95N 76.27W)									10.95
Bybrook (18.18N 76.64W)									10.34
Colombia									
International Civil Aviation Organization (ICAO) Sites									
San Andrés – Gustavo Rojas Pinilla Intl. AP (SKSP) (12.58N 81.72W)		1001	03/0900	19	40				
Nicaragua									
International Civil Aviation Organization (ICAO) Sites									

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Puerto Cabezas AP (MNPC) (14.04N 83.38W)			03/2124	94 I	118 I				
Other Sites									
Puerto Corinto (640001) (12.48N 87.17W)									26.55
Las Lomas (69255) (12.54N 86.21W)									23.46
Sahsa (51005) (14.07N 83.99W)									10.12
Puerto Cabezas (47002) (14.05N 83.78W)									9.95
Tola (70002) (11.44N 85.94W)									9.42
Waspam (45007) (14.75N 83.97W)									9.24
Rivas (69070) (11.44N 85.83W)									8.51
La Cruz de Río Grande (550119) (13.11N 84.19W)									7.71
Bismuna (47008) (14.75W 83.42W)									6.11
Honduras									
International Civil Aviation Organization (ICAO) Sites									
Roatán – Juan Manuel Gálvez Intl. AP (MHRO) (16.32N 86.53W)			03/2200	20 I	35 I				9.71
La Ceiba – Golosón Intl. AP (MHLC) (15.75N 86.84W)			02/2000	14 I	27 I				29.25
Other Sites									
Roatán – Jonesville Point Road (16.38N 86.38W)	04/2129	1005.7	04/0118	23	37				
Tela (15.78N 87.47W)									31.63
Jaremar, Tibombo (15.59N 87.80W)									24.87
Balfate (15.78N 86.38W)									24.69
Honducaribe, Baracoa (15.75N 87.84W)									22.73
Omoa (15.78N 88.04W)									21.25
Trujillo (15.93N 85.94W)									19.56

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Yoro (15.12N 87.13W)									15.97
Las Galeras (14.94N 88.24W)									15.75
Olanchito (15.47N 86.55W)									15.39
Puente Pimienta (15.27N 87.97W)									10.74
Sabana Grande (13.80W 87.26W)									10.20
Santa Rosa de Copán (14.78N 88.77W)									8.64
Lepaguare (14.62N 86.45W)									8.37
Puerto Lempira (15.26N 83.78W)									8.20
Gracias (14.57N 88.59W)									8.11
Costa Rica									
Arunachala (9.41N 83.83W)									24.58
Santa Marta de Hojancha (9.93N 85.43W)									23.51
Rio Claro (8.67N 83.06W)									22.51
Coto 49, Ciudad Neily (8.63N 82.97W)									22.20
Laguna, Fraijanes (10.13N 84.18W)									20.24
Guapil, Baru (9.27W 83.88W)									20.03
Fundación Neotrópica en Rincón de Osa (8.75N 83.17W)									19.62
Laguna Volcán Poás (10.19N 84.23W)									18.31
Sitio Arqueológico Las Esferas (8.91N 83.48W)									18.20
Finca Damas (9.48N 84.20W)									18.09
Finca El Patio, Puerto Jimenez (8.60N 83.43W)									17.61
Montecarlo (9.35N 83.60W)									17.51
Cerro Chitaria, Santa Ana (9.89N 84.19W)									17.04

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Marina, Pez Vela (9.43N 84.17W)									16.69
Finca La Ligia, Parrita (9.51N 84.33W)									16.56
Mangarica, Llano La Cruz, Liberia (10.60N 85.45W)									15.01
Finca Nora, Chaguites (10.08N 84.16W)									14.69
Las Brisas, Sabalito (8.87N 82.88W)									14.37
Cafetalera El Indio, San Vito, Puntarenas (8.83N 82.95W)									14.35
Rodeo, Tarrazú (9.68N 84.02W)									14.34
Altamira (9.02N 83.00W)									14.34
El Salvador									
International Civil Aviation Organization (ICAO) Sites									
San Salvador – Ilopango Intl. AP (MSSS) (13.69N 89.11W)			04/1850	15[l]	29[l]				
Other Sites									
Planes de Montecristo									10.84
Concepcíon de Oriente									9.61
Volcán Conchagua									7.65
Las Pilas									7.00
Atalaya									6.83
Chiltiupán									6.77
Los Naranjos									6.46
Guatemala									
Cobán, Alta Verapaz									21.06
Puerto Barrios, Izabal									19.10
Las Vegas, Livinston, Izabal									18.09
Mariscos, Los Amates, Izabal									13.41

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Belize									
International Civil Aviation Organization (ICAO) Sites									
Ladyville – Philip S.W. Goldson Intl. AP (MZBZ) (17.53N 88.31W)	06/0955	1003.9	06/1306	17 [I]	28 [I]				14.90
Other Sites									
Baldy Beacon (17.00N 88.79W)									21.86
Gales Point (17.17N 88.33W)									16.17
Savannah (16.55N 88.45W)									11.70
Punta Gorda (16.10N 88.81W)									10.83
Melinda (17.00N 88.32W)									9.95
Belmopan (17.25N 88.78W)									9.68
Mexico									
WeatherFlow Sites									
Cancun (XCCN) (21.06N 86.78W)	10/0959	999.6	05/2258	31 (11 m)	38				
Cozumel (XCOZ) (20.53N 86.94W)	10/1933	1001.0	10/2218	28 (11 m)	33				
Other Sites									
Tzimbac (17.23N 93.41W)									24.90
Emiliano Zapata (17.22N 93.34W)									22.94
El Escalón (17.37N 92.83W)									22.43
Sayula (17.42N 93.38W)									22.08
Ángel Albino Corzo (17.45N 93.46W)									18.64
Peñitas (17.45N 93.46W)									18.60
Túneles Juan de Grijalva (17.36N 93.38W)									17.38
Oxolotán (17.38N 92.75W)									17.00
Tapijulapa (17.46N 92.78W)									13.98
Puyacatengo (17.57N 92.94W)									13.02

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Pichucalco (17.51N 93.11W)									12.24
Teapa (17.57N 92.97W)									11.11
Nezahualcóyotl (17.18N 93.60W)									9.71
Malpaso (17.20N 93.61W)									9.71
Cayman Islands									
International Civil Aviation Organization (ICAO) Sites									
Grand Cayman – Owen Roberts Intl. AP (MWCR) (19.29N 81.36W)			07/1337	35 I					9.87
Cayman Brac – Kirkconnell Intl. AP (MWCB) (19.69N 79.88W)			07/1700	24 I	36 I				
Other Sites									
North Side (FW5906) (19.37N 81.27W)			07/1301	37	53				
Cayman Brac – Bliss Beach House (19.72N 79.76W)	08/0126	998.9	08/0156	25	32				
West Bay – Lalique Pt. (19.35N 81.37W)	07/1400	999.3	07/1410	22	34				
Cuba									
International Civil Aviation Organization (ICAO) Sites									
Venezuela (MUCA – 78346) (22.03N 78.79W)	08/1058	994.0	08/0955	26	37				6.16
Trinidad (MUTD – 78337) (21.78N 79.98W)	08/0950	997.5		14	29				8.17
Other Sites									
Cayo Coco (78339) (22.52N 78.45W)	08/1330	998.2	08/1308	46	49				4.79
El Jíbaro (78341) (21.72N 79.22W)	08/0940	994.3	08/0945	35	40				10.63
Florida (78350) (21.52N 78.23W)	08/1200	994.0	08/1100	30	42				2.63
Sancti Spíritus (78349) (21.93N 79.45W)	08/0950	997.2	08/0725	28	33				3.57
Camilo Cienfuegos (78347) (22.15N 78.75W)	08/1130	991.0	08/1155	25	32				6.02
Santa Cruz del Sur (78351) (20.72N 78.00W)	08/1200	1002.6	08/1205	23	40				3.62

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Camagüey (78355) (21.40N 77.85W)	08/1200	988.1	08/1100	22	36				3.22
El Yabú (78343) (22.43N 79.98W)	08/2100	1002.7	10/0910	21	32				4.54
Esmeralda (78352) (21.85N 78.12W)	08/1200	996.8	08/1200	19	31				2.15
Nuevitas (78353) (21.53N 77.25W)	08/1200	1002.7	08/1055	19	32				0.83
Topes de Collantes (78342) (21.92N 80.02W)				18	26				17.71
Júcaro (78345) (21.62N 78.85W)	08/1100	996.0	08/1015	16	33				6.42
Caibarién (78348) (22.52N 79.45W)	08/1200	1001.8	08/0600	16	39				4.27
La Piedra (78308)	08/0500	1003.5							15.24
The Bahamas									
International Civil Aviation Organization (ICAO) Sites									
San Salvador Intl. AP (MYSM) (24.07N 74.52W)			08/0001		35				
Nassau – Lynden Pindling Intl. AP (MYNN) (25.05N 77.47W)			07/2103		34				
Coastal-Marine Automated Network (C-MAN) Sites									
Settlement Point, GBI (SPGF1) (26.70N 79.00W)	08/2200	1007.6	08/2300	33 (7 m, 10 min)	42				
Florida									
International Civil Aviation Organization (ICAO) Sites									
Boca Raton Airport (KBCT) (26.37N 80.11W)			08/1953	38 [l]	48 [l]				
St. Petersburg – Albert Whitted Airport (KSPG) (27.77N 82.63W)	11/2253	1001.2	12/0153	36	50				5.76
Pompano Beach Air Park (KPMP) (26.25N 80.12W)	09/0753	1004.7	09/0113	36	49				8.53
Ft. Lauderdale – Hollywood Intl. Airport (KFLL) (26.07N 80.15W)	09/0653	1003.5	08/2312	35	44				9.73
Miami Intl. Airport (KMIA) (25.80N 80.29W)	09/0353	1003.0	09/0433	35	44				7.56
Hollywood North Perry Airport (KHWO) (26.00N 80.24W)	09/0848	1004.3	09/0158	34	46				8.30

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
West Palm Beach Intl. Airport (KPBI) (26.68N 80.09W)	09/0753	1006.0	09/0108	34	46				6.57
St. Pete – Clearwater Intl. Airport (KPIE) (27.91N 82.69W)	11/2253	1002.1	12/0133	33	50				6.41
Sarasota – Bradenton Intl. Airport (KSRQ) (27.40N 82.55W)	11/2053	1002.1	11/2121	33	47				7.38
Miami Executive Airport (KTMB) (25.65N 80.43W)	09/0453	1001.7	08/2224	33	45				
Opa Locka Airport (KOPF) (25.91N 80.28W)	09/0628	1003.9	09/0526	33	43				
Naples Municipal Airport (KAPF) (26.15N 81.77W)	09/0826	1001.6	09/0705	32	48				2.29
Ft. Lauderdale Executive Airport (KFXE) (26.20N 80.17W)	09/0705	1004.3	08/2356	32	45				6.84
Key West Intl. Airport (KEYW) (24.56N 81.76W)	09/0653	998.3	11/1303	32	39				5.13
North Palm Beach County Airport (KF45) (26.84N 80.22W)	09/0850	1007.1	09/0410	31	42				
Jacksonville – Mayport Naval Station (KNRB) (30.39N 81.42W)	12/1552	1005.5	12/1312	31	40				0.76
Key West Naval Air Station (KNQX) (24.58N 81.68W)	09/0653	997.8	11/1259	31	38				6.87
Melbourne Intl. Airport (KMLB) (28.10N 80.64W)	09/0758	1007.8	09/0510	30	36				1.61
Ft. Pierce – Treasure Coast Intl. Airport (KFPR) (27.50N 80.38W)	09/0909	1007.8	09/0408	29	43				5.13
Stuart – Witham Field Airport (KSUA) (27.18N 80.22W)	09/0815	1007.8	08/2348	29	42				
Vero Beach Regional Airport (KVRB) (27.65N 80.41W)	09/0928	1008.1	09/0334	29	41				1.80
Florida Keys/Marathon Intl. Airport (KMTH) (24.73N 81.05W)	09/0453	993.4	09/2012	28	46				4.14
Palm Beach County Park Airport (KLNA) (26.59N 80.08W)	09/0735	1006.1	09/0415	28	38				

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Immokalee Regional Airport (KIMM) (26.43N 81.40W)	09/0755	1003.4	09/0215	27	38				
Leesburg Intl. Airport (KLEE) (28.82N 81.80W)	12/0914	1006.1	12/1032	27	38				3.61
Airglades Airport (K2IS) (26.73N 81.05W)	09/0855	1005.4	09/0455	27	35				
Punta Gorda Airport (KPGD) (26.92N 81.99W)	11/1953	1005.9	11/2019	26	52				3.62
Homestead Air Reserve Base (KHST) (25.48N 80.38W)	09/0500	1001.3	09/0332	26	41				4.37
Cape Canaveral AFS Skid Strip (KXMR) (28.46N 80.56W)	12/1856	1009.4	09/1156	26	41				2.40
Tampa Intl. Airport (KTPA) (27.97N 82.53W)	11/2253	1003.6	12/0501	26	39				4.99
Patrick Air Force Base (KCOF) (28.23N 80.59W)	12/1857	1010.2	09/0239	26	38				1.80
Ft. Myers – SW Florida Intl. Airport (KRSW) (26.54N 81.76W)	11/1953	1006.6	11/1710	25	46				4.86
Ft. Myers – Page Field Airport (KFMY) (26.58N 81.87W)	11/1953	1006.3	11/1722	23	43				3.97
Lakeland Regional Airport (KLAL) (27.99N 82.02W)			12/0635	23	38				
Gainesville Regional Airport (KGNV) (29.68N 82.27W)	12/1140	1003.4	12/0753	23	37				1.60
Jacksonville Executive at Craig Airport (KCRG) (30.33N 81.52W)	12/1553	1005.8	12/1253	22	40				1.25
St. Augustine – NE Florida Regional Airport (KSGJ) (29.97N 81.33W)	12/1156	1007.0	12/1154	22	35				0.85
Jacksonville Naval Air Station (KNIP) (30.24N 81.68W)	12/1353	1005.1	12/1153	21	34				1.23
DeLand Municipal Airport (KDED) (29.07N 81.28W)	12/1035	1008.0	12/1255	21	34				2.57
Winter Haven Regional Airport (KGIF) (28.06N 81.75W)			11/1735	19[l]	36[l]				1.89
Coastal-Marine Automated Network (C-MAN) Sites									

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Fowey Rock (FWYF1) (25.59N 80.10W)	09/0200	1002.4	09/0420	44 (44 m, 10 min)	55				
Venice (VENF1) (27.07N 82.45W)	11/2000	1003.4	11/2100	40 (12 m, 10 min)	52				
Sand Key (SANF1) (24.46N 81.88W)	09/0720	999.2	07/1136	39 (16 m, 1 min)	43				
St. Augustine (SAUF1) (29.86N 81.27W)	12/1200	1006.9	12/1240	35 (8 m, 10 min)	47				
Cedar Key (CDRF1) (29.14N 83.03W)	12/0900	998.2	12/0650	32 (10 m, 10 min)	43				
National Ocean Service (NOS) Sites									
South Port Everglades (PEGF1) (26.08N 80.12W)	09/0618	1004.3	08/1930	47 (45 m)	61	1.90	2.10	1.5	
Lake Worth Pier (LKWF1) (26.61N 80.03W)	09/0800	1005.1	08/2042	38 (12 m)	48	1.21	1.70	1.1	
Clearwater Beach (CWBF1) (27.98N 82.83W)	11/2336	1000.9	12/0424	35 (8 m)	45	3.20	3.63	2.7	
Cedar Key (CKYF1) (29.13N 83.03W)	12/0836	997.2	12/0724	35 (12 m)	44	2.94	3.65	2.1	
Middle Tampa Bay (MTBF1) (27.66N 82.59W)	11/2200	1001.8	12/0206	35 (7 m)	47				
St. Petersburg (SAPF1) (27.76N 82.63W)	11/2218	1002.8	12/0000	33 (9 m)	42	3.69	4.26	3.5	
Virginia Key (VAKF1) (25.73N 80.16W)	09/0412	1002.8	08/2212	31 (12 m)	41	2.25	2.16	1.9	
Old Port Tampa (OPTF1) (27.86N 82.55W)	11/2254	1002.9	12/0706	28 (18 m)	41	4.19	4.65	3.9	
Sparkman Channel Entrance (SKCF1) (27.92N 82.45W)			12/0654	28 (15 m)	37				
East Bay Causeway (TSHF1) (27.93N 82.43W)			12/0736	28 (13 m)	35				
Key West (KYWF1) (24.55N 81.81W)	09/0718	998.4	11/1448	25 (17 m)	36	1.41	1.54	1.5	
Trident Pier (TRDF1) (28.42N 80.59W)	11/2130	1010.5	09/1524	25 (10 m)	41	1.98	2.58	1.5	
Vaca Key (VCAF1) (24.71N 81.11W)	09/0442	993.9	09/0354	25 (10 m)	33	1.64	1.30	1.7	
TPA Cruise Terminal 2 (TPAF1) (27.93N 82.43W)			12/0518	25 (23 m)	38				
Mayport - Bar Pilots Dock (MYPF1) (30.40N 81.43W)	12/1548	1006.0	09/0348	23 (11 m)	31	1.96	3.40	1.4	
Naples (NPSF1) (26.13N 81.81W)	09/0800	1002.4	11/2112	23 (10 m)	36	3.39	2.90	2.3	

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Blount Island Command (BLIF1) (30.39N 81.52W)	12/1542	1006.4	12/1254	22 (10 m)	33				
Apalachicola (APCF1) (29.73N 84.98W)	12/0912	1007.9	09/1712	20 (9 m)	29	2.19	2.67	1.8	
Panama City Beach (PCBF1) (30.21N 85.88W)	11/2036	1009.1	09/1612	20 (16 m)	26	1.72	2.22	1.4	
Fernandina Beach (FRDF1) (30.68N 81.47W)	12/1624	1005.3	12/1336	19 (9 m)	33	2.29	3.81	1.1	
Fort Myers (FMRF1) (26.65N 81.87W)	09/0830	1004.1	11/1706	19 (8 m)	33	3.64	3.01	2.7	
Panama City (PACF1) (30.15N 85.67W)			09/1536	15 (10 m)	27	1.74	2.15	1.4	
Pensacola (PCLF1) (30.40N 87.21W)	11/1954	1009.8	12/0830	12 (10 m)	18	1.65	2.33	1.4	
Port Manatee (PMAF1) (27.64N 82.56W)	11/2142	1002.9				3.30	3.62	3.0	
Tampa - East Bay (EBEF1) (27.92N 82.42W)	11/2230	1003.6				4.29	4.70	3.9	
Jacksonville – Dames Point (DMSF1) (30.39N 81.56W)						1.55	2.91	1.5	
Jacksonville – Southbank Riverwalk (MSBF1) (30.32N 81.66W)						1.36	2.41	1.8	
WeatherFlow Sites									
Carysfort Reef Light (XCFL) (25.23N 80.21W)	08/2313	1000.8	09/0241	55 (15 m, 1 min)	61				
Port Everglades (XPEG) (26.08N 80.12W)	09/0105	997.2	08/2245	51 (41 m, 1 min)	59				
Government Cut (XGVT) (25.75N 80.10W)	09/0649	998.6	09/1046	49 (23 m, 1 min)	54				
St. Lucie Plant (XSTL) (27.35N 80.24W)	09/0852	1005.4	08/2342	46 (10 m, 1 min)	52				
Skyway Fishing Pier (XSKY) (27.60N 82.65W)	11/2121	1000.1	12/0152	44 (16 m, 1 min)	51				
Melbourne Beach (XMBI) (27.90N 80.47W)	09/0734	1004.9	09/0613	44 (10 m, 1 min)	48				
Boynton Beach (XBOY) (26.55N 80.05W)	09/0515	1003.9	09/0205	43 (10 m, 1 min)	51				
Alligator Reef Light (XALG) (24.85N 80.62W)	09/0321	992.1	09/0145	42 (8 m, 1 min)	50				
Morningside Park (XMSP) (25.82N 80.18W)	09/0622	1000.7	09/0454	42 (10 m, 1 min)	47				
Smith Shoal Light (XSMS) (24.72N 81.92W)	09/0756	994.3	11/1134	41 (19 m, 1 min)	46				

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Dinner Key Light 1 (XDIN) (25.71N 80.21W)	09/0448	1001.4	08/2216	40 (5 m, 1 min)	48				
Huguenot Park (XHUP) (30.42N 81.41W)	12/1557	1004.3	09/0152	40 (12 m, 1 min)	45				
Biscayne Bay Harbor Pilots (XBBH) (25.77N 80.15W)	09/0429	999.8	09/0437	40 (12 m, 1 min)	45				
Tampa Bay Cut J (XTAM) (27.77N 82.57W)	11/2246	1002.4	12/0216	39 (15 m, 5 min)	51				
Sarasota Bay Marker 17 (XSRB) (27.34N 82.57W)	11/2153	1001.1	11/2130	39 (5 m, 1 min)	48				
Juno Beach Pier (XJUP) (26.89N 80.06W)	09/0758	1005.6	09/0102	39 (6 m, 1 min)	47				
New Pass Shoal Light (XLID) (27.32N 82.60W)	11/2110	999.5	11/2003	39 (5 m, 1 min)	47				
Turkey Point (XTKY) (25.43N 80.35W)	09/0243	998.6	11/0539	39 (20 m, 1 min)	45				
Crandon (XCRN) (25.72N 80.15W)	08/2349	1001.2	08/2211	39 (8 m, 1 min)	44				
North Miami (XNMI) (25.91N 80.16W)	09/0613	1000.7	08/2214	37 (17 m, 1 min)	47				
Clam Bayou Nature Park (XCBN) (27.74N 82.69W)	11/2130	1000.4	12/0106	37 (10 m, 1 min)	45				
Hillsboro Inlet L1 (XHBI) (26.25N 80.08W)	08/1755	1003.6 I	08/1315	36 I (5 m, 5 min)	45 I				
Dania Pier (XDAN) (26.06N 80.11W)	09/0652	1002.5	08/2022	36 (9 m, 5 min)	49				
Boca Raton (XBOC) (26.37N 80.09W)	09/0042	1001.2	09/0113	36 (21 m, 1 min)	49				
Boca Grande (XBCG) (26.72N 82.26W)			11/1529	36 (10 m, 1 min)	43				
Biscayne Bay Light 20 (XKBS) (25.66N 80.19W)	09/0423	1002.6	09/0420	36 (6 m, 1 min)	42				
Oakes Substation (XOAK) (26.91N 80.07W)	09/0823	1004.9	08/2224	35 (15 m, 1 min)	47				
Tarpon Point (XTRP) (26.54N 82.00W)			11/1618	35 (10 m, 1 min)	43				
Terminal Channel (XTRM) (30.34N 81.63W)	12/1451	1004.9	12/0110	35 (9 m, 1 min)	43				
Jacksonville (XJAK) (30.39N 81.48W)	12/1535	1003.8	12/1247	35 (10 m, 1 min)	41				
New Smyrna Beach (XNSB) (29.05N 80.90W)	12/1712	1006.0	09/0948	35 (10 m, 1 min)	39				
Port Everglades South (XPES) (26.06N 80.13W)	09/0646	1002.3	09/0113	34 (10 m, 1 min)	44				

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Charlotte Harbor YC (XCHL) (26.96N 82.08W)	09/0923	1003.2	11/2012	34 (10 m, 1 min)	41				
Sanibel DB 4 (XSBI) (26.47N 82.05W)	09/0821	1002.6 I	11/1546	33 I (5 m, 1 min)	42 I				
Sarasota (XSAR) (27.35N 82.52W)	11/2232	998.0	12/0200	33 (20 m, 1 min)	42				
Weeki Wachee (XWKI) (28.52N 82.57W)	12/0449	998.0	12/0423	33 (23 m, 1 min)	42				
South Miami (XSOM) (25.63N 80.30W)	09/0433	1001.1	09/0401	33 (10 m, 1 min)	41				
Rocky Point (XRPT) (27.98N 80.55W)	09/0923	1008.3	09/0503	33 (6 m, 1 min)	40				
Indian River DB27 (XIND) (27.96N 80.53W)	09/0811	1008.8	09/0241	33 (5 m, 1 min)	40				
Mangonia Park (XMGN) (26.76N 80.07W)	09/0819	1000.7	09/0102	32 (23 m, 1 min)	43				
Cocoa Beach Club (XCOA) (28.31N 80.63W)	09/0937	1007.5	09/1126	32 (10 m, 1 min)	41				
Banana River – 520 (XCCB) (28.36N 80.65W)	09/0953	1008.8	09/0545	32 (5 m, 1 min)	40				
Cocoa Beach Pier (XCCO) (28.37N 80.60W)	09/1658	1007.6	09/0644	32 (12 m, 1 min)	38				
Jewfish Substation (XJFS) (25.17N 80.38W)	09/0309	996.2	09/0407	31 (11 m, 1 min)	46				
Hobe (XHOB) (27.05N 80.17W)	09/0812	1004.4	08/2231	31 (15 m, 1 min)	41				
Lewis (XLWS) (29.92N 81.33W)	12/1148	1004.3	12/1201	31 (15 m, 1 min)	39				
Parrish Park North (XPAR) (28.63N 80.81W)	12/0903	1008.5	09/1110	30 (5 m, 1 min)	38				
Capri (XCAP) (26.04N 81.70W)	09/0749	999.3	11/1701	30 (15 m, 1 min)	37				
Grove City (XGRV) (26.90N 82.32W)	11/1844	1001.2	11/1619	29 (20 m, 1 min)	41				
Marathon Key (XKEY) (24.74N 80.98W)	09/0451	992.0	09/0308	29 (13 m, 1 min)	38				
Bellaire (XBLA) (27.94N 82.80W)	11/2315	996.7	12/0430	28 (21 m, 1 min)	39				
Flamingo – Miramar (XFLM) (25.97N 80.31W)	09/0741	1000.7	09/0534	28 (15 m, 1 min)	38				
Dairy (XDAI) (28.04N 80.64W)	09/0830	1005.4	09/0942	28 (15 m, 1 min)	37				
Key West CG (XKYW) (24.57N 81.80W)	09/0730	996.0	08/1650	28 (10 m, 1 min)	36				
Tavernier Substation (XTVS) (25.01N 80.52W)	09/0322	992.8	09/0446	26 (12 m, 1 min)	42				
Doral (XURB) (25.85N 80.37W)	09/0420	1000.7	09/0503	26 (15 m, 1 min)	37				

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Conservation (XCVN) (26.19N 80.30W)	09/0715	1002.5	09/0144	26 (10 m, 1 min)	36				
Rock Harbor Substation (XRHS) (25.08N 80.45W)	09/0304	992.9	09/0423	25 (11 m, 1 min)	41				
Vero City (XVER) (27.63N 80.39W)	09/0816	1006.9	09/0047	24 (10 m, 1 min)	37				
Grove City (XGRV) (26.90N 82.31W)	11/1844	1001.2	09/0353	24 (20 m, 1 min)	36				
Islamorada Substation (XISS) (24.91N 80.65W)	09/0343	991.6	09/0504	24 (11 m, 1 min)	34				
West Palm Beach (XWPB) (26.66N 80.14W)	09/0758	1003.6	08/2359	23 (10 m, 1 min)	37				
Remote Automated Weather Stations (RAWS)									
Cache/Everglades NP (LPIF1) (25.39N 80.68W)			09/0523	30 (6 m, 10 min)	53				
Loxahatchee (LOHF1) (26.48N 80.43W)			09/0232	23 (6 m, 10 min)	35				
Ochopee (OCOF1) (25.89N 81.32W)			11/1932		46 (6 m)				
Florida Automated Weather Network (FAWN)									
Homestead (STDF1) (25.51N 80.50W)			09/0345	27 (6 m, 15 min)	37				
Alachua (ALHF1) (29.81N 82.41W)	12/1045	995	12/0900	18 (6 m, 15 min)	37				
Immokalee (IMKF1) (26.46N 81.44W)			11/1830		41 (6 m)				
USF Coastal Ocean Monitoring and Prediction System (COMPS) Sites									
Tarpon Springs – Fred Howard Park (FHPF1) (28.15N 82.80W)	12/0312	1002.3	12/0206	36 (9 m)	45				
Big Carlos Pass (BGCF1) (26.40N 81.88W)			11/1648	33 (17 m)	48				
Clam Bayou (CLBF1) (27.74N 82.69W)	11/2242	1001.5	12/0630	21 (11 m)	36				
WeatherSTEM Sites									
House of Refuge (27.20N 80.17W)	09/0705	1007.1	09/0239		56[l]				
Jensen Beach Oceanfront (27.25N 80.20W)	09/0831	1007.4	09/0244		40[l]				
United States Geological Survey (USGS) Stream Gauges									
Seminole – Lake Seminole (27.84N 82.78W)							4.84	4.1	

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Hillsborough River at Tampa (HPLF1) (27.94N 82.46W)							4.90	3.8	
Alafia River at Gibsonton (GBSF1) (27.86N 82.38W)							4.67	3.7	
Manatee Bay Creek near U.S. 1 (25.26N 80.42W)							3.07	3.7	
Aucilla River at Nutall Rise (NUTF1) (30.11N 83.98W)							5.47	3.6	
Peace River at Harbor Heights (26.99N 81.99W)							3.58	3.1	
Venice Inlet (CNMF1) (27.11N 82.47W)							3.02	2.5	
Loxahatchee River at Jupiter (26.95N 80.09W)							2.31	2.2	
Spring Creek (SBIF1) (30.07N 84.33W)							3.44	1.8	
Yankeetown (WCIF1) (29.00N 82.76W)							3.29	1.8	
Homosassa River (28.77N 82.70W)							2.76	1.8	
Suwannee River (SUWF1) (29.34N 83.09W)							3.33	1.7	
Crystal River (SISF1) (28.93N 82.69W)							3.03	1.7	
Chassahowitzka River (CHMF1) (28.69N 82.64W)							2.80	1.5	
Everglades NP – Garfield Bight (ACNF1) (25.18N 80.79W)							1.27	1.5	
Bayport (28.53N 82.65W)							2.77	1.4	
Chatham River near Watson Place (CHTF1) (25.71N 81.25W)							1.87	1.3	
Everglades NP – Lake Ingraham (25.14N 81.06W)							1.44	1.0	
Everglades Depth Estimation Network (EDEN)									
Mud Creek at Alligator Bay (25.20N 80.58W)							1.20	2.1	
Taylor River at Little Madeira Bay (25.19N 80.64W)							1.12	2.0	

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)*
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Trout Creek at Trout Cove (25.21N 80.53W)							1.11	2.0	
East Creek at Little Madeira Bay (25.20N 80.62W)							1.00	1.9	
South Florida Water Management District (SFWMD) Gauges									
St. Lucie River at Stuart (SLRF1) (27.20N 80.26W)							2.46	2.8	
St. Lucie River at Steele Point (SPTF1) (27.20N 80.21W)							2.12	2.6	
Plantation 7 W (WSTF1) (26.13N 80.37W)									12.31
El Portal (ELPF1) (25.85N 80.19W)									11.95
Carol City 2 NW (LLUF1) (25.97N 80.30W)									11.46
Davie 1 SE (DVIF1) (26.07N 80.21W)									11.20
Lauderdale Lakes 1 E (LDLF1) (26.17N 80.18W)									10.68
Miramar 10 W (NWDF1) (25.96N 80.43W)									10.54
Miami Springs 2 ESE (MINF1) (25.81N 80.26W)									10.50
Miami Lakes (MMLF1) (25.91N 80.32W)									10.45
Ft. Lauderdale 4 W (FTDF1) (26.14N 80.19W)									10.42
Sunrise (SNRF1) (26.16N 80.30W)									10.37
Plantation 2 SE (PLAF1) (26.09N 80.23W)									10.14
Coral Springs 3 SW (CSGF1) (26.23N 80.30W)									8.99
Boca Raton 12 W (WBCF1) (26.36N 80.30W)									8.73
Leisure City 2 WNW (LSCF1) (25.50N 80.47W)									8.67
North Miami Beach (NOMF1) (25.93N 80.15W)									8.50
St. Johns River Water Management District Gauges									
Haulover Canal at Mims (28.74N 80.76W)							1.18	1.8	
Indian River at Wabasso (IRWF1) (27.75N 80.43W)							1.00	1.7	

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Suwannee River Water Management District Gauges									
Steinhatchee (STIF1) (29.67N 83.38W)								1.5	
Everglades National Park Water Quality Stations									
Thursday Point (THRF1) (25.20N 80.37W)							2.00	2.6	
Blackwater Sound (BWSF1) (25.18N 80.44W)							1.91[l]		
Long Sound (LSNF1) (25.24N 80.46W)							1.32		
NWS Cooperative Observer Program (COOP) Sites									
Ft. Lauderdale (FTLF1) (26.10N 80.20W)									14.04
N Miami Beach #2 (NMBF1) (25.95N 80.22W)									11.96
Ft. Lauderdale Beach (FLBF1) (26.14N 80.11W)									11.05
Homestead 5 WNW (HAPF1) (25.50N 80.55W)									10.74
Hydrometeorological Automated Data System (HADS) Sites									
Site 63 near Andytown (ADYF1) (26.18N 80.53W)									15.83
North Archie Creek near Tampa (NACF1) (27.90N 82.35W)									9.47
Delaney Creek near Tampa (DLNF1) (27.93N 82.36W)									9.37
Little Manatee River near Wimauma (WIMF1) (27.67N 82.35W)									8.52
Citizen Weather Observing Program (CWOP)									
Islamorada Fire Station 20 (DW1872) (24.92N 80.64W)			09/0545	21 (15 m)	38				
Marathon – Stirrup Key (FW8363) (24.74N 81.04W)			08/1620	29	37				
Cudjoe Key (CW0925) (24.65N 81.48W)			09/0333	27 (16 m)	37				
Public/Other									
Islamorada/Theiss	09/0345	991.5							
Indian River Shores – S Camelia Court (27.69N 80.37W)	09/0822	1010.6	09/0051	36 (2 m)	51				

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Rock Harbor – N Jade Drive (25.06N 80.48W)			09/0238	36	50				
Sailfish Point – Martin County (27.18N 80.17W)	09/0815	1005.4	09/0730	34	49				
USAF Tower 19 (KSC0019) (28.74N 80.70W)			09/1410	32 [I] (16 m, 5 min)	45 [I]				
Sebastian Inlet (SIPF1) (27.86N 80.44W)	09/0906	1007.6	09/0526	30 (11 m)	44				
Lake Okeechobee Center (LZ40) (26.90N 80.79W)			09/0145	30 (6 m, 15 min)	36				
Plantation Key – Stromboli Dr (24.96N 80.59W)	09/0402	994.7	09/0501	30	43				
Lake Okeechobee South End (L006) (26.82N 80.78W)			09/0245	29 (6 m, 15 min)	36				
Lake Okeechobee North End (L001) (27.13N 80.79W)			09/0345	27 (6 m, 15 min)	36				
North Key Largo – Ocean Reef (25.33N 80.26W)	09/0220	1001.9	09/0450	27	39				
Marathon – Grouper Dr (24.73N 81.06W)	09/0446	993.9	08/2348	27	37				
Key Largo – Rock Harbor (25.08N 80.46W)	09/0323	998.1	09/0151	24	36				
Plantation Key – S Coconut Palm Blvd (25.00N 80.54W)	09/0326	994.4	09/0506	24	45				
Marathon/Stirrup Point (24.74N 81.04W)								2.3[E]	
Pembroke Pines 1 W (26.01N 80.36W)									20.74
Miramar 3 WNW (25.99N 80.39W)									18.10
U.S. Hwy 27/Sheridan Intersection 3 ENE (26.03N 80.39W)									17.86
Community Collaborative Rain, Hail, & Snow Network (CoCoRaHS) Sites									
Miramar 2.1 W (FL-BW-103) (25.97N 80.37W)									17.20
Miramar 2.3 W (FL-BW-131) (25.98N 80.37W)									16.79

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)*
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Miramar 3.0 WNW (FL-BW-13) (25.99N 80.38W)									16.68
Pembroke Pines 1.0 ENE (FL-BW-4) (26.01N 80.33W)									16.26
Weston 2.8 SE (FL-BW-99) (26.07N 80.37W)									16.00
Biscayne Park 0.3 E (FL-MD-33) (25.88N 80.18W)									14.12
North Miami 0.8 SE (FL-MD-104) (25.89N 80.16W)									13.40
Davie 2.6 WSW (FL-BW-67) (26.06N 80.33W)									13.20
Plantation 3.4 E (FL-BW-76) (26.11N 80.21W)									12.11
Sunrise 0.4 NNE (FL-BW-151) (26.16N 80.30W)									11.83
Plantation 1.2 SSW (FL-BW-106) (26.11N 80.27W)									11.51
Plantation 1.3 WNW (FL-BW-150) (26.13N 80.28W)									11.16
Homestead 3.0 NW (FL-MD-69) (25.49N 80.49W)									11.05
Cooper City 1.3 NE (FL-BW-155) (26.06N 80.28W)									10.96
Plantation 2.3 WNW (FL-BW-116) (26.14N 80.30W)									10.92
Pompano Beach 1.2 NNE (FL-BW-137) (26.25N 80.12W)									10.86
Sun City Center 1.0 NE (FL-HB-17) (27.73N 82.34W)									10.64
Miami 5.7 N (FL-MD-79) (25.84N 80.18W)									10.48

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Key Largo 6.2 NE (FL-MN-25) (25.17N 80.37W)									9.94
Sun City Center 1.8 NNE (FL-HB-134) (27.74N 82.34W)									9.89
Coral Gables 4.1 NNW (FL-MD-95) (25.76N 80.28W)									9.85
South Miami 0.9 SSE (FL-MD-42) (25.70N 80.29W)									9.68
Apollo Beach 2.7 ENE (FL-HB-130) (27.78N 82.36W)									9.61
Margate 0.4 W (FL-BW-79) (26.24N 80.22W)									9.49
Riverview 2.1 NNW (FL-HB-150) (27.90N 82.32W)									9.47
Deerfield Beach 2.5 ESE (FL-BW-26) (26.30N 80.08W)									9.43
Pompano Beach 3.1 NE (FL-BW-121) (26.27N 80.10W)									9.42
Miami Lakes 0.3 NNW (FL-MD-26) (25.91N 80.32W)									9.38
South Miami 0.5 N (FL-MD-30) (25.72N 80.30W)									9.35
Sun City Center 1.1 N (FL-HB-153) (27.74N 82.35W)									9.30
Sun City Center 0.9 S (FL-HB-139) (27.71N 82.35W)									9.19
Sunrise 2.1 N (FL-BW-139) (26.18N 80.30W)									9.12
St. Petersburg 1.6 WNW (FL-PN-74) (27.77N 82.67W)									9.11
Sun City Center 0.9 SSE (FL-HB-107) (27.71N 82.35W)									9.05

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Key West 0.5 SW (FL-MN-24) (24.56N 81.78W)									8.98
Valrico 1.6 NNW (FL-HB-160) (27.97N 82.25W)									8.90
Brandon 2.8 SW (FL-HB-136) (27.90N 82.33W)									8.77
Riverview 2.1 W (FL-HB-69) (27.87N 82.35W)									8.77
Riverview 4.8 SSW (FL-HB-98) (27.80N 82.34W)									8.76
Ruskin 1.8 ESE (FL-HB-44) (27.71N 82.40W)									8.72
Riverview 0.9 ENE (FL-HB-114) (27.87N 82.30W)									8.67
Buckingham 1.7 SE (FL-LE-6) (26.66N 81.71W)									8.13
Sunset 2.4 SW (FL-MD-7) (25.68N 80.38W)									8.05
Miami NWS (FL-MD-28) (25.76N 80.38W)									8.01
Palm City 4.0 SW (FL-MT-1) (27.12N 80.32W)									8.00
Georgia									
International Civil Aviation Organization (ICAO) Sites									
St. Simons Island Airport (KSSI) (31.15N 81.38W)	12/1853	1004.8	12/1453	15	29				0.31
WeatherFlow Sites									
Jekyll Island (XJEK) (31.05N 81.41W)	12/1758	1002.6	12/1433	35 (10 m, 1 min)	39				
Remote Automated Weather Stations (RAWS)									
Helen 7 N (BRSG1) (34.80N 83.71W)									5.26
NWS Cooperative Observer Program (COOP) Sites									

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)*
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Washington 2 ESE (WSHG1) (33.73N 82.71W)									4.79
Hydrometeorological Automated Data System (HADS) Sites									
Little River near Washington (WTNG1) (33.59N 82.73W)									5.51
Oconee River at Lake Sinclair (SNCG1) (33.14N 83.20W)									4.29
Oconee River at Milledgeville (MLGG1) (33.09N 83.22W)									4.24
Community Collaborative Rain, Hail, & Snow Network (CoCoRaHS) Sites									
Milledgeville 6.5 SSE (GA-BD-1) (33.00N 83.20W)									5.49
Rabun Gap 2.1 SW (GA-RB-4) (34.94N 83.42W)									4.67
Kathleen 2.5 NW (GA-HS-16) (32.53N 83.63W)									4.08
Hiawassee 4.8 SE (GA-TW-1) (34.89N 83.71W)									4.08
South Carolina									
Coastal-Marine Automated Network (C-MAN) Sites									
Folly Island (FBIS1) (32.69N 79.89W)	12/2300	1008.7	13/0010	40 (10 m, 10 min)	49				
WeatherFlow Sites									
Folly Beach Pier (XFOL) (32.65N 79.94W)	12/2240	1006.8	13/0017	45 (11 m, 1 min)	54				
Fort Sumter Range Front Light (XSUM) (32.75N 79.87W)	12/2239	1005.1	12/2354	42 (12 m, 1 min)	48				
Isle of Palms Pier (XIOP) (32.78N 79.79W)	12/2350	1007.3	12/2359	40 (8 m, 1 min)	47				
Shutes Folly (XSHF) (32.77N 79.91W)	12/2320	1002.6	13/0009	37 (13 m, 1 min)	46				
Murrells Inlet (XMUR) (33.52N 79.03W)	13/0035	1008.2	13/0020	35 (7 m, 5 min)	43				
Sullivan's Island 28.5 (XSUL) (32.77N 79.82W)	12/2218	1006.1	13/0004	32 (13 m, 1 min)	43				
Georgetown (XGEO) (33.37N 79.27W)	12/2152	1003.5	13/0015	31 (10 m, 1 min)	37				

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Charleston (XCHA) (32.76N 79.95W)	12/2250	1006.6	13/0003	26 (10 m, 1 min)	37				
Community Collaborative Rain, Hail, & Snow Network (CoCoRaHS) Sites									
Conway 9.2 NNE (SC-HR-71) (33.97N 79.02W)									7.50
McClellanville 0.2 ESE (SC-CR-10) (33.08N 79.46W)									6.73
Pawleys Island 2.6 N (SC-GT-24) (33.46N 79.12W)									6.46
Myrtle Beach 8.9 WSW (SC-HR-119) (33.64N 79.03W)									6.36
Georgetown 13.3 NW (SC-GT-44) (33.52N 79.43W)									6.33
Dillon 3.8 NW (SC-DL-4) (34.46N 79.41W)									6.29
Grover 4.4 SE (SC-CL-28) (33.07N 80.54W)									6.16
Lockhart 5.4 N (SC-CK-8) (34.87N 81.48W)									6.14
Orangeburg 3.2 NW (SC-OR-17) (33.52N 80.91W)									6.13
Socastee 3.3 SW (SC-HR-111) (33.65N 79.05W)									6.01
North Carolina									
Community Collaborative Rain, Hail, & Snow Network (CoCoRaHS) Sites									
Rocky Mount 9.2 SW (NC-NS-21) (35.85N 77.91W)									12.50
Wilson 3.3 NNW (NC-WN-17) (35.78N 77.94W)									10.64
Danbury 4.6 NNW (NC-SK-2) (36.47N 80.26W)									10.52
Lumberton 2.6 ESE (NC-RB-7) (34.62N 78.97W)									10.39

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
Rocky Mount 5.9 SW (NC-NS-10) (35.90N 77.88W)									10.10
Taylorsville 3.4 SSE (NC-AX-11) (35.87N 81.16W)									9.84
Tabor City 3.5 NE (NC-CL-26) (34.19N 78.84W)									9.67
Millersville 1.2 SW (NC-AX-9) (35.84N 81.20W)									9.17
Sims 4.0 SW (NC-WN-6) (35.72N 78.11W)									9.07
Tarboro 0.7 S (NC-ED-15) (35.90N 77.55W)									8.41
Yadkinville 0.2 E (NC-YD-4) (36.13N 80.66W)									8.32
Hiddenite 1.5 SE (NC-AX-6) (35.89N 81.07W)									8.20
Hickory 5.3 NE (NC-CT-27) (35.79N 81.25W)									8.20
Roseboro 6.5 SW (NC-CM-93) (34.89N 78.59W)									8.10
Winston-Salem 5.9 W (NC-FR-27) (36.11N 80.37W)									8.04
Offshore									
NOAA Buoys									
41004 – Edisto (32.50N 79.10W)	12/2320	1006.3	13/0043	45 (4 m, 1 min)	49				
42056 – Yucatan Basin (19.82N 84.95W)	07/0830	1005.0	04/0542	37 (4 m, 1 min)	43				
41013 – Frying Pan Shoals (33.44N 77.76W)	13/0450	1007.7	12/2228	35 (4 m, 1 min)	41				
41009 – Canaveral (28.51N 80.19W)	09/0850	1009.9	09/1610	33 (4 m, 1 min)	44				
42003 – East Gulf (25.93N 85.62W)	10/1940	1003.9	10/0307	33 (4 m, 1 min)	41				
41010 – Canaveral East (28.91N 78.47W)	09/0830	1012.9	09/0730	31 (4 m, 1 min)	42				

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft)[c]	Storm tide (ft)[d]	Estimated Inundation (ft)[e]	Total rain (in)[*]
	Date/ time (UTC)	Press. (mb)	Date/ time (UTC)[a]	Sustained (kt)[b]	Gust (kt)				
41008 – Grays Reef (31.40N 80.87W)	12/1950	1004.4	12/1646	29 (5 m, 1 min)	33				
42036 – West Tampa (28.50N 84.52W)	11/2250	1004.5	11/1732	25 (4 m, 1 min)	29				
USF Coastal Ocean Monitoring and Prediction System (COMPS) Buoys									
42023 – C13 South Buoy (26.01N 83.09W)	11/1130	1000.6	11/1000	44 (3 m)	57				
42026 – C22 Loop Current (25.17N 83.48W)	11/0930	993.4	11/0930	43 (3 m)	56				
42013 – C10 Central Buoy (27.17N 82.92W)	11/2030	999.6	12/0100	37 (3 m)	51				
42022 – C12 Central Buoy (27.51N 83.74W)	11/2200	992.8	11/1330	28 (3 m)	38				
UNCW Coastal Ocean Research and Monitoring Program (CORMP) Buoys									
41029 – Capers Nearshore (32.80N 79.62W)	12/2308	1008.6	13/0008	34 (3 m)	48				
41033 – Fripp Nearshore (32.28N 80.41W)	12/2208	1006.7	13/0108	26 (3 m)	39				

[a] Date/time is for sustained wind when both sustained and gust are listed.
[b] Except as noted, sustained wind averaging periods for C-MAN and land-based reports are 2 min; buoy averaging periods are 8 min.
[c] Storm surge is water height above normal astronomical tide level.
[d] Storm tide is water height above the North American Vertical Datum of 1988 (NAVD88).
[e] Estimated inundation is the maximum height of water above ground. For NOS tide gauges and USGS water level sensors, the height of the water above Mean Higher High Water (MHHW) is used as a proxy for inundation. Values marked with two asterisks (**) are from non-tidal stations, and the water level is referenced above Mean Sea Level (MSL).
[E] Estimated
[I] Incomplete
[*] International rainfall totals cover the following periods:
Belize: 1 to 6 November 2020, Cayman Islands: 3 to 7 November 2020, Costa Rica: 1 to 6 November 2020, El Salvador: 3 to 11 November 2020, Jamaica: 1 to 8 November 2020, Guatemala: 2 to 8 November 2020, Honduras: 1 to 7 November 2020, Mexico: 3 to 7 November 2020, Nicaragua: 1 to 5 November 2020

Table 4. Number of hours in advance of formation associated with the first NHC Tropical Weather Outlook forecast in the indicated likelihood category. Note that the timings for the "Low" category do not include forecasts of a 0% chance of genesis.

	Hours Before Genesis	
	48-Hour Outlook	**120-Hour Outlook**
Low (<40%)	48	66
Medium (40%-60%)	30	54
High (>60%)	24	36

Table 5a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Hurricane Eta, 31 October–13 November 2020. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	25.2	42.2	64.3	91.0	104.8	123.9	142.0	171.9
OCD5	59.0	146.7	242.1	327.0	385.8	412.9	426.2	402.7
Forecasts	43	39	37	35	33	31	27	25
OFCL (2015-19)	24.1	36.9	49.6	65.1	80.7	96.3	133.2	171.6
OCD5 (2015-19)	44.7	96.1	156.3	217.4	273.9	330.3	431.5	511.9

Table 5b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Hurricane Eta, 31 October–13 November 2020. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here is smaller than that shown in Table 5a due to the homogeneity requirement.

Model ID	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	26.1	43.6	65.0	93.5	110.7	128.5	149.5	144.5
OCD5	58.7	142.2	230.1	317.6	370.8	385.8	415.2	404.7
GFSI	29.7	47.6	**63.6**	**81.2**	112.2	148.0	198.4	171.9
EMXI	30.1	49.9	67.8	**89.8**	**109.1**	131.1	**143.7**	181.3
CMCI	36.5	66.7	86.0	109.3	113.2	**119.2**	156.1	213.5
NVGI	37.4	65.2	90.6	116.8	129.9	138.0	164.9	211.1
HWFI	28.3	50.8	73.3	95.1	131.6	150.3	197.6	202.4
HMNI	32.8	56.1	78.0	114.3	152.2	187.0	247.0	202.9
CTCI	30.2	47.0	**62.4**	**60.6**	**76.7**	**95.6**	**136.5**	**112.2**
HCCA	**25.1**	**36.7**	**56.3**	**80.7**	115.1	141.7	166.7	**133.3**
AEMI	30.9	53.0	80.3	101.4	123.1	157.7	204.9	144.7
GFEX	27.2	**43.4**	**62.2**	**79.7**	**101.0**	**122.5**	**144.1**	146.7
TVCA	27.0	**42.3**	**63.4**	**86.1**	**106.0**	132.3	164.7	**142.5**
TVCX	26.3	**42.0**	**61.8**	**84.7**	**103.6**	**128.2**	154.8	**138.0**
TVDG	27.3	**42.7**	**64.5**	**90.5**	**108.4**	137.3	165.8	148.5
TABS	50.0	100.5	141.3	202.1	267.3	325.9	446.6	590.2
TABM	43.4	82.9	117.2	172.3	237.0	288.8	405.5	630.5
TABD	47.5	87.3	128.0	190.6	249.8	292.0	437.5	862.1
Forecasts	39	36	34	30	28	26	19	15

Table 6a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Hurricane Eta, 31 October–13 November 2020. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	6.0	11.2	13.9	14.7	**10.0**	**6.6**	**8.7**	**9.4**
OCD5	9.0	16.6	21.2	19.7	15.9	13.7	16.2	19.1
Forecasts	43	39	37	35	33	31	27	25
OFCL (2015-19)	5.2	7.7	9.4	10.7	11.9	13.0	14.4	15.5
OCD5 (2015-19)	6.8	10.8	14.1	17.0	18.8	20.6	22.5	24.6

Table 6b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Hurricane Eta, 31 October–13 November 2020. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here is smaller than that shown in Table 6a due to the homogeneity requirement.

Model ID	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	6.2	10.4	13.7	14.5	10.5	7.2	8.3	8.5
OCD5	9.3	16.1	20.3	19.9	16.6	13.4	16.3	18.2
HWFI	7.8	10.8	**11.6**	**11.8**	11.2	10.2	8.6	15.9
HMNI	10.9	18.7	20.4	20.4	18.1	15.0	11.4	15.5
CTCI	9.5	13.8	15.6	17.0	16.9	14.3	8.6	16.9
DSHP	7.1	10.6	13.7	**13.5**	**10.1**	**6.7**	12.1	18.1
LGEM	7.4	12.4	16.9	18.0	13.1	11.1	13.4	17.1
ICON	7.6	11.6	13.8	14.5	11.5	9.1	10.6	15.1
IVCN	7.8	11.9	**13.6**	**14.3**	12.4	9.1	8.5	12.8
IVDR	8.4	12.8	14.2	14.9	13.6	10.1	**8.2**	12.5
HCCA	7.9	11.9	14.1	**13.3**	11.0	9.3	8.6	9.1
GFSI	10.7	16.1	18.9	19.9	19.3	16.4	11.9	18.1
EMXI	11.5	19.2	22.9	23.2	20.6	17.4	9.2	13.2
Forecasts	39	36	34	31	29	27	21	17

Table 7. Storm surge watch and warning summary for Hurricane Eta.

Date/Time (UTC)	Action	Location
7 / 2100	Storm Surge Watch issued	Golden Beach to Bonita Beach, FL, including Biscayne Bay
7 / 2100	Storm Surge Watch issued	Florida Keys from Ocean Reef to Dry Tortugas, FL, including Florida Bay
8 / 1500	Storm Surge Warning issued	Florida Keys from Ocean Reef to Dry Tortugas, FL, including Florida Bay
8 / 2100	Storm Surge Watch discontinued	Card Sound Bridge to Golden Beach, FL, including Biscayne Bay
9 / 0900	Storm Surge Warning discontinued	All
9 / 0900	Storm Surge Watch discontinued	All
11 / 0300	Storm Surge Watch issued	Bonita Beach to the Steinhatchee River, FL, including Tampa Bay and Charlotte Harbor
11 / 1500	Storm Surge Warning issued	Bonita Beach to the Suwannee River, FL, including Tampa Bay and Charlotte Harbor
12 / 0900	Storm Surge Warning discontinued	Bonita Beach to Middle of Longboat Key, FL, including Charlotte Harbor
12 / 1200	Storm Surge Warning discontinued	All

Table 8. Wind watch and warning summary for Hurricane Eta, 31 October–13 November 2020.

Date/Time (UTC)	Action	Location
1 / 0300	Hurricane Watch issued	Puerto Cabezas to Punta Patuca
1 / 1500	Tropical Storm Warning issued	Hon/Nic Border to Punta Patuca
1 / 1500	Hurricane Watch modified to	Hon/Nic Border to Punta Patuca
1 / 1500	Hurricane Warning issued	Sandy Bay Sirpi to Hon/Nic Border
1 / 2100	Tropical Storm Watch issued	Punta Patuca to Punta Castilla
3 / 1500	Tropical Storm Warning issued	Laguna de Perlas to Sandy Bay Sirpi
3 / 2100	Hurricane Watch changed to Tropical Storm Warning	Hon/Nic Border to Punta Patuca
3 / 2100	Tropical Storm Watch discontinued	All
4 / 1200	Tropical Storm Warning modified to	Laguna de Perlas to Punta Patuca
4 / 1200	Tropical Storm Warning modified to	Laguna de Perlas to Punta Patuca
4 / 1200	Hurricane Warning discontinued	All
4 / 1800	Tropical Storm Warning discontinued	All
5 / 2100	Tropical Storm Watch issued	Cayman Islands
6 / 1500	Tropical Storm Watch changed to Tropical Storm Warning	Cayman Islands
6 / 1500	Tropical Storm Watch issued	Pinar del Rio to Camaguey

Date/Time (UTC)	Action	Location
6 / 1500	Tropical Storm Watch issued	Isle of Youth
6 / 2100	Tropical Storm Watch modified to	Pinar del Rio to Mayabeque
6 / 2100	Tropical Storm Warning issued	Matanzas to Camaguey
7 / 0300	Tropical Storm Watch issued	Bonita Beach to Jupiter Inlet
7 / 0300	Tropical Storm Watch issued	Northwestern Bahamas
7 / 0900	Tropical Storm Watch changed to Tropical Storm Warning	Northwestern Bahamas
7 / 0900	Tropical Storm Watch modified to	Bonita Beach to Sebastian Inlet
7 / 1500	Tropical Storm Watch issued	Golden Beach to Volusia/Brevard CL
7 / 1500	Tropical Storm Watch issued	Englewood to Chokoloskee
7 / 1500	Tropical Storm Warning issued	Chokoloskee to Golden Beach
7 / 2100	Tropical Storm Watch modified to	Jupiter Inlet to Volusia/Brevard CL
7 / 2100	Tropical Storm Watch modified to	Englewood to Bonita Beach
7 / 2100	Tropical Storm Watch modified to	Englewood to Bonita Beach
7 / 2100	Tropical Storm Warning discontinued	Chokoloskee to Golden Beach
7 / 2100	Tropical Storm Warning issued	Bonita Beach to Jupiter Inlet
7 / 2100	Hurricane Watch issued	Bonita Beach to Deerfield Beach
8 / 0000	Tropical Storm Warning discontinued	Cayman Islands

Date/Time (UTC)	Action	Location
8 / 0300	Tropical Storm Watch discontinued	Jupiter Inlet to Volusia/Brevard CL
8 / 0300	Tropical Storm Watch modified to	Anna Maria Island to Englewood
8 / 0300	Tropical Storm Warning discontinued	Bonita Beach to Jupiter Inlet
8 / 0300	Tropical Storm Warning issued	Englewood to Volusia/Brevard CL
8 / 1500	Tropical Storm Warning modified to	Englewood to Blackwater Sound
8 / 1500	Hurricane Watch modified to	Bonita Beach to Blackwater Sound
8 / 1500	Hurricane Warning issued	Dry Tortugas to Ocean Reef
8 / 2100	Tropical Storm Warning discontinued	Matanzas to Camaguey
8 / 2100	Hurricane Watch modified to	Ocean Reef to Golden Beach
9 / 0900	Tropical Storm Watch discontinued	Anna Maria Island to Englewood
9 / 0900	Tropical Storm Warning discontinued	Englewood to Blackwater Sound
9 / 0900	Tropical Storm Warning modified to	Anna Maria Island to Volusia/Brevard CL
9 / 0900	Hurricane Watch discontinued	All
9 / 0900	Hurricane Warning discontinued	All
9 / 1200	Tropical Storm Warning discontinued	Northwestern Bahamas

Date/Time (UTC)	Action	Location
9 / 1500	Tropical Storm Warning discontinued	Anna Maria Island to Volusia/Brevard CL
9 / 1500	Tropical Storm Warning issued	Dry Tortugas
9 / 1800	Tropical Storm Warning discontinued	All
10 / 2100	Tropical Storm Watch issued	Suwannee River to Englewood
10 / 2100	Tropical Storm Warning issued	Dry Tortugas
11 / 0300	Tropical Storm Watch modified to	Aucilla River to Suwannee River
11 / 0300	Tropical Storm Warning issued	Suwannee River to Bonita Beach
11 / 0900	Hurricane Watch issued	Yankeetown to Anna Maria Island
11 / 1500	Tropical Storm Watch discontinued	Pinar del Rio to Mayabeque
11 / 1500	Tropical Storm Watch discontinued	Isle of Youth
11 / 2100	Tropical Storm Warning discontinued	Dry Tortugas
11 / 2100	Hurricane Watch discontinued	All
12 / 0300	Tropical Storm Warning modified to	Suwannee River to Boca Grande
12 / 0300	Tropical Storm Warning issued	Flagler/Volusia CL to Saint Andrews Sound
12 / 0600	Tropical Storm Warning modified to	Suwannee River to Englewood

Date/Time (UTC)	Action	Location
12 / 0900	Tropical Storm Warning modified to	Suwannee River to Longboat Key
12 / 1200	Tropical Storm Watch discontinued	All
12 / 1200	Tropical Storm Warning discontinued	Suwannee River to Longboat Key
12 / 1800	Tropical Storm Warning discontinued	All

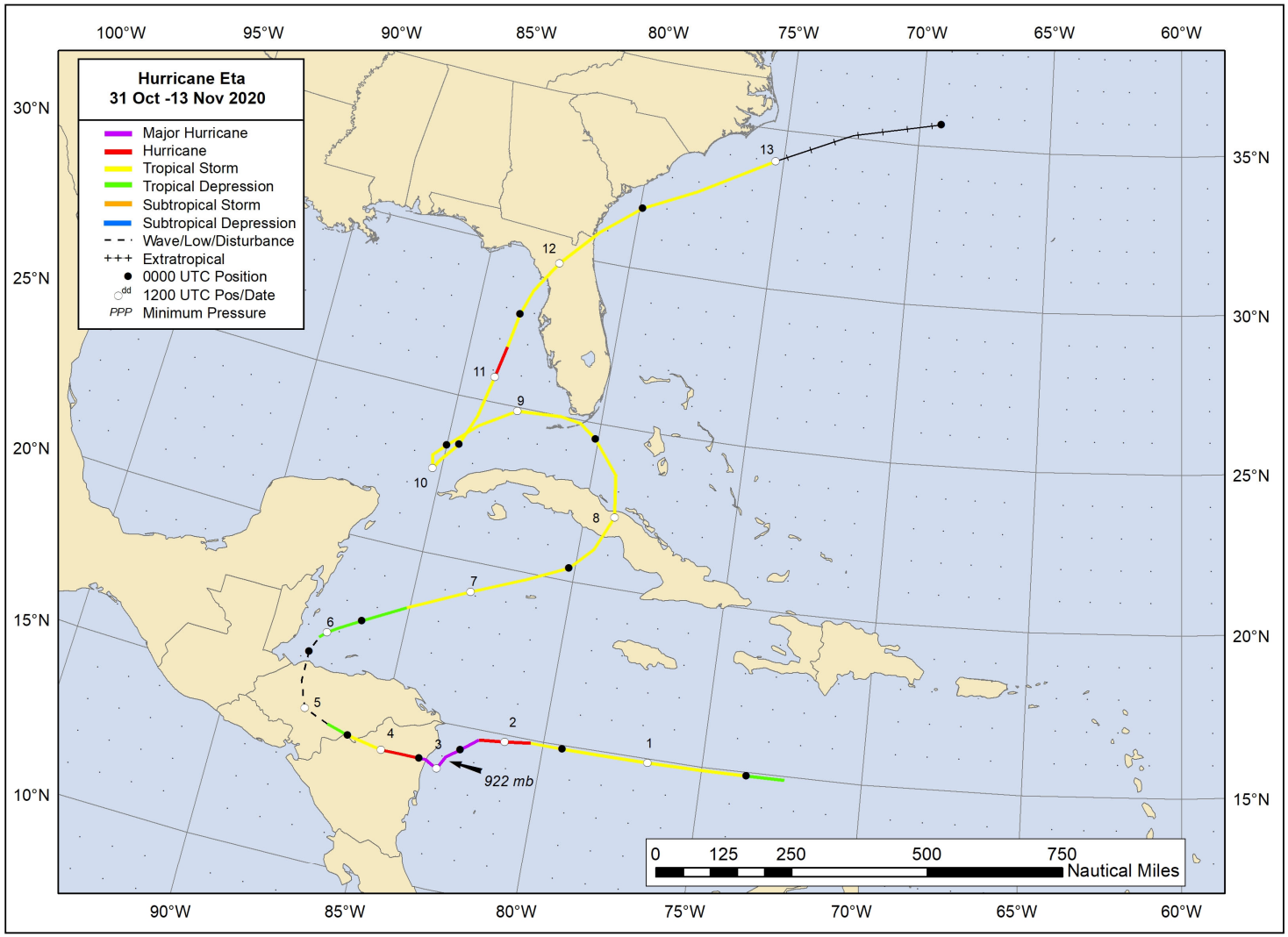


Figure 1. Best track positions for Hurricane Eta, 31 October–13 November 2020.

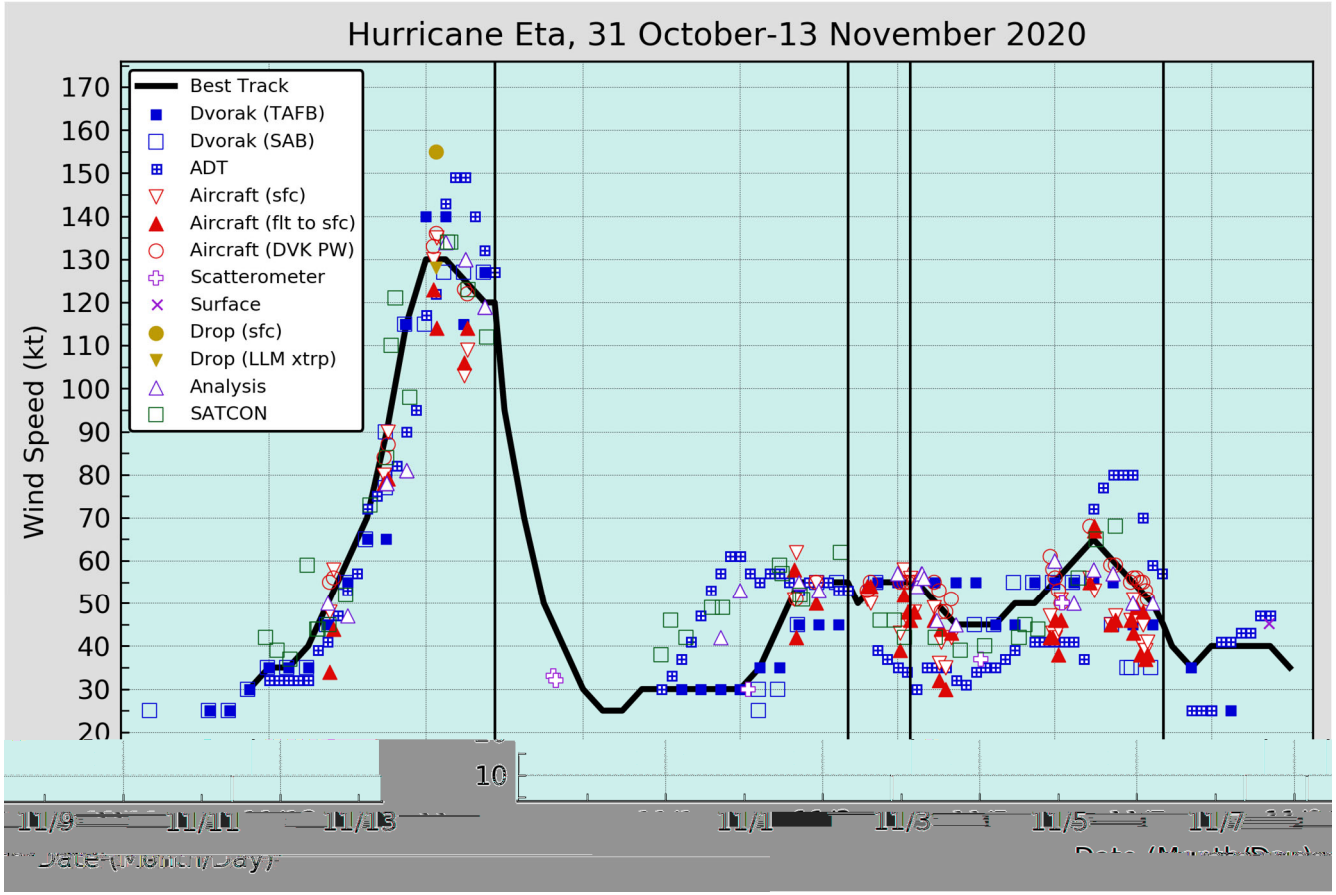


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Eta, 31 October–13 November 2020. Aircraft observations have been adjusted for elevation using 90%, 80%, and 80% adjustment factors for observations from 700 mb, 850 mb, and 1500 ft, respectively. Dropwindsonde observations include actual 10 m winds (sfc), as well as surface estimates derived from the mean wind over the lowest 150 m of the wind sounding (LLM). Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC, and solid vertical lines correspond to landfalls.

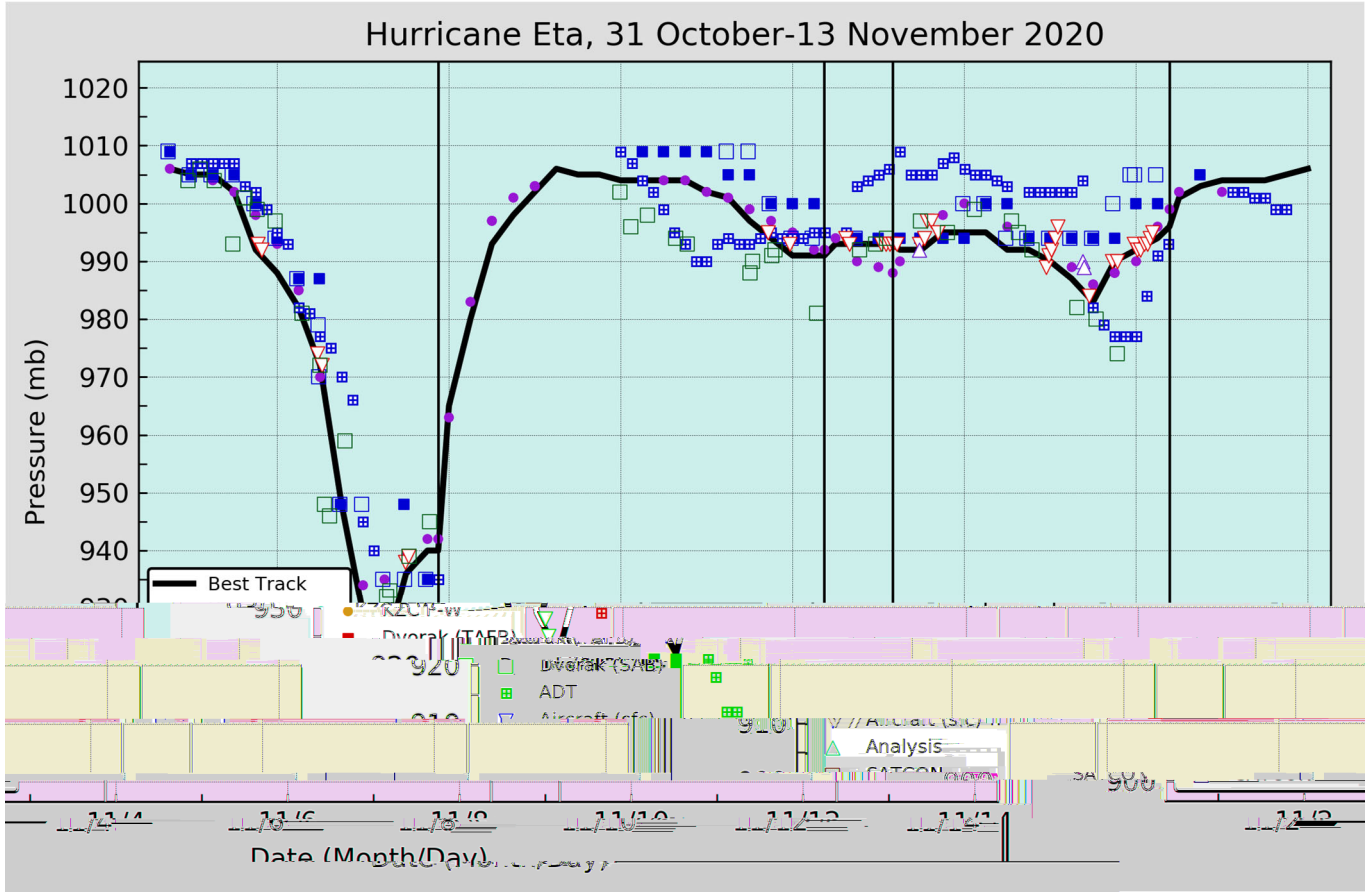


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Eta, 31 October–13 November 2020. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC, and solid vertical lines correspond to landfalls.

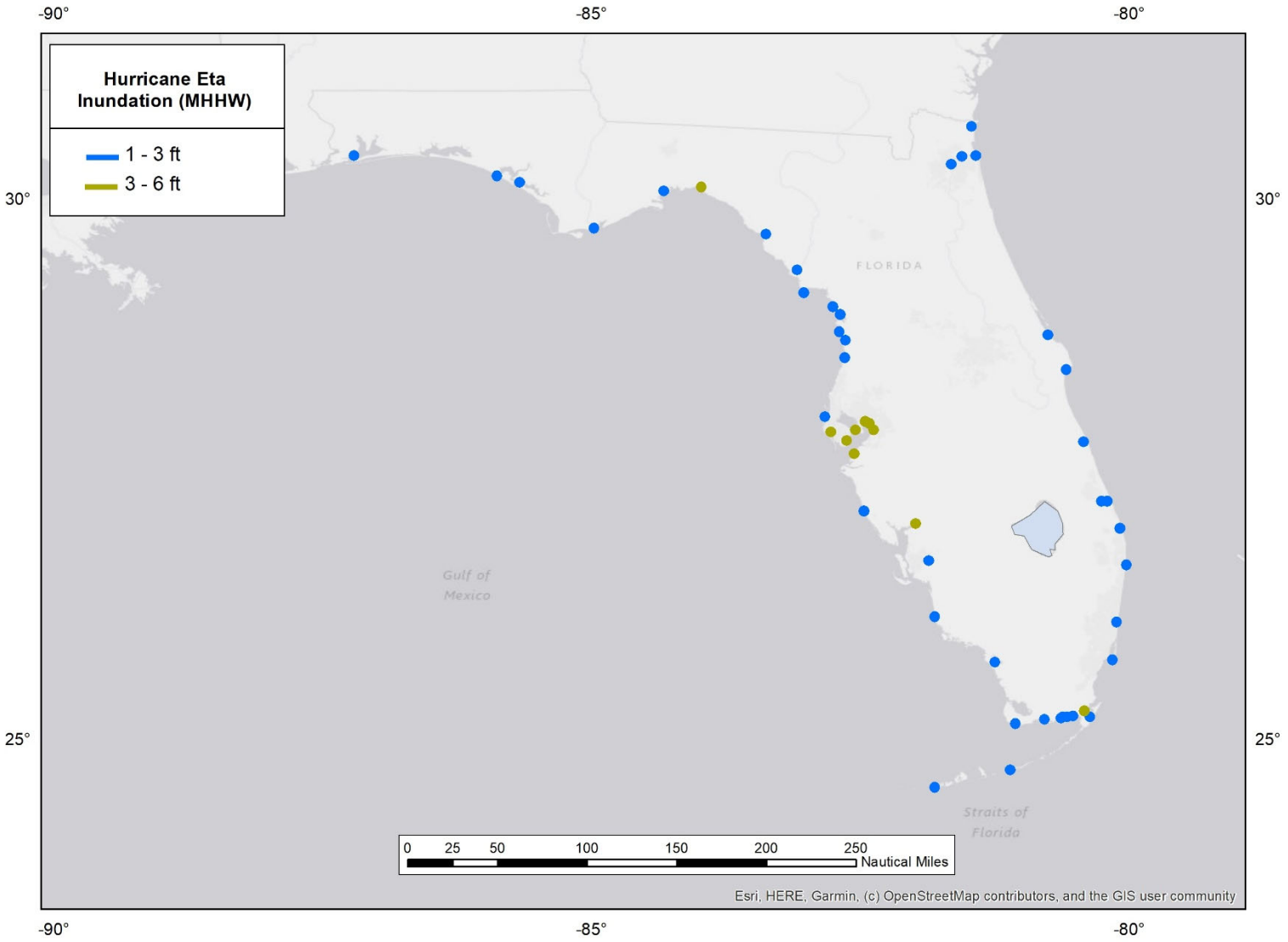


Figure 4. Maximum water levels measured from tide and stream gauges (circles) from Hurricane Eta. Water levels are referenced as feet above Mean Higher High Water (MHHW), which is used as a proxy for inundation (above ground level) on normally dry ground along the immediate coastline.

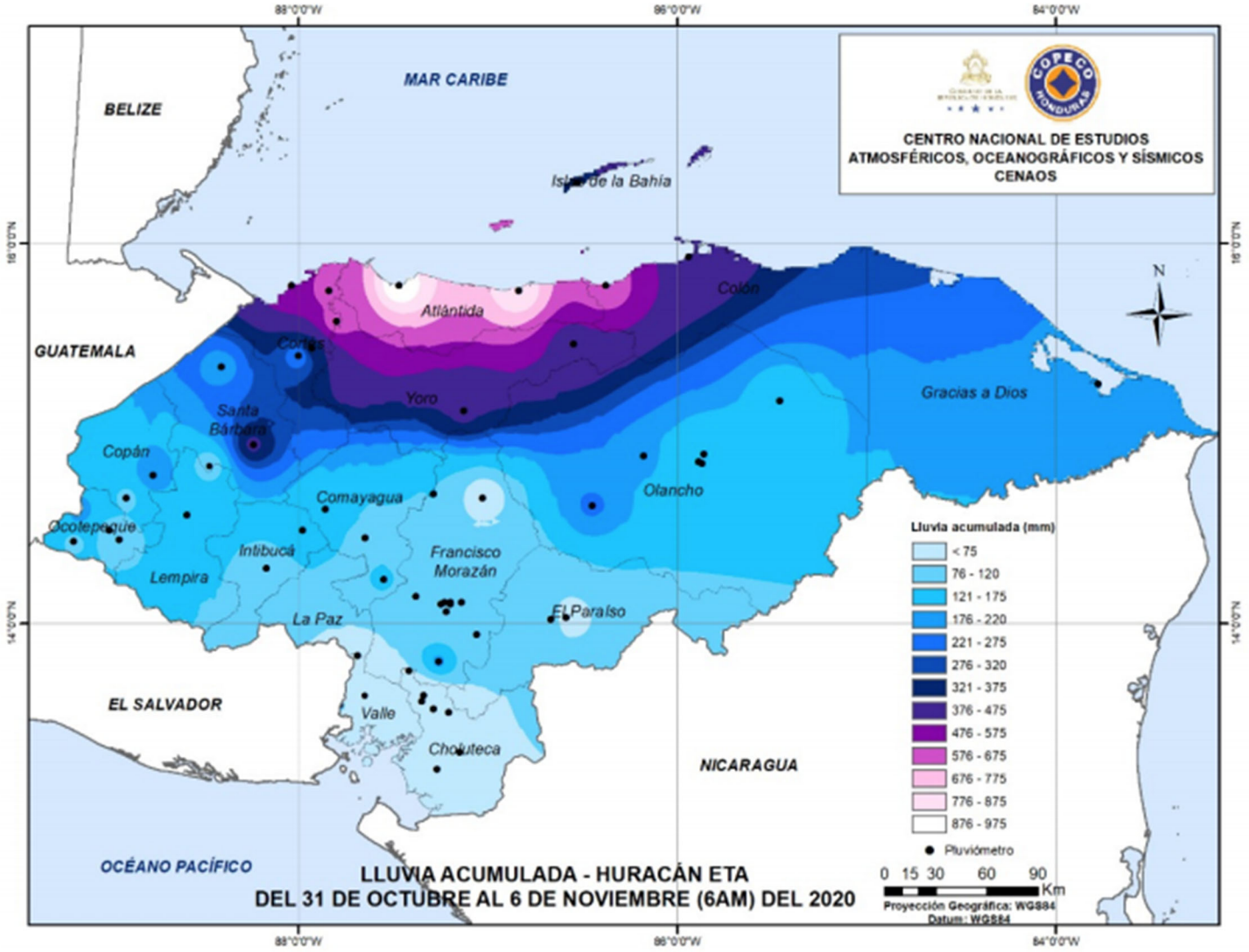


Figure 5. Honduras rainfall totals (mm) associated with Eta during the period 31 October–6 November 2020. Graphic courtesy of the Centro Nacional de Estudios Atmosféricos, Oceanográficos y Sísmicos (CENAOS).

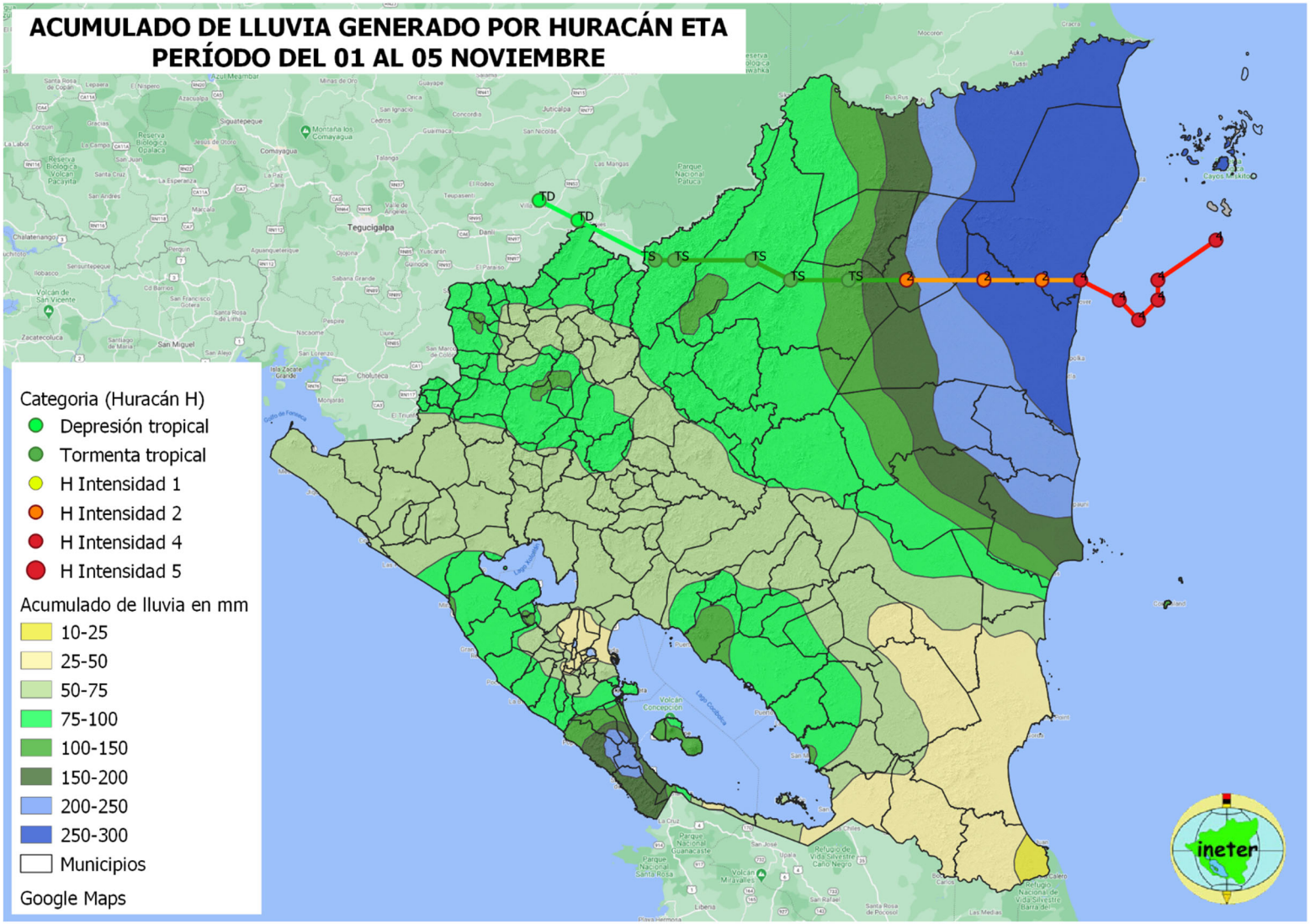
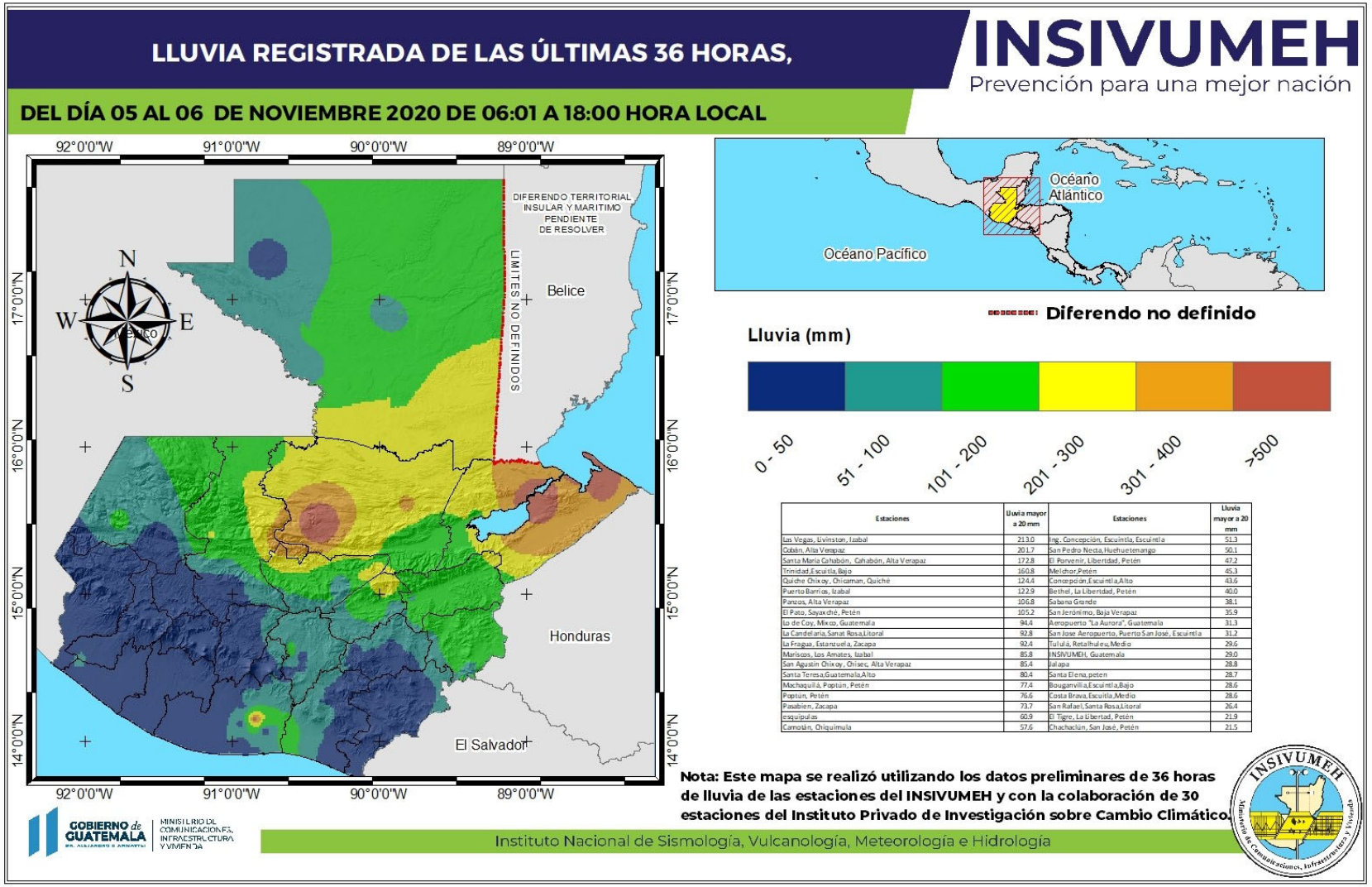


Figure 6. Nicaragua rainfall totals (mm) associated with Eta during the period 1–5 November 2020. Graphic courtesy of the Instituto Nicaraguënse de Estudios Territoriales (INETER).



Estaciones	Lluvia mayor a 20 mm	Estaciones	Lluvia mayor a 20 mm
Las Vegas, Livinston, Izabal	213.0	Ing. Concepción, Escuintla, Escuintla	51.3
Cobán, Alta Verapaz	201.7	San Pedro Necta, Huehuetenango	50.1
Santa María Cahabón, Cahabón, Alta Verapaz	172.8	El Porvenir, Libertdad, Petén	47.2
Trinidad,Escuitla,Bajo	160.8	Melchor,Petén	45.3
Quiche Chixoy, Chicaman, Quiché	124.4	Concepción,Escuintla,Alto	43.6
Puerto Barrios, Izabal	122.9	Bethel, La Libertdad, Petén	40.0
Panzos, Alta Verapaz	106.8	Sabana Grande	38.1
El Pato, Sayaxché, Petén	105.2	San Jerónimo, Baja Verapaz	35.9
Lo de Coy, Mixco, Guatemala	94.4	Aeropuerto "La Aurora", Guatemala	31.3
La Candelaria,Sanat Rosa,Litoral	92.8	San Jose Aeropuerto, Puerto San José, Escuintla	31.2
La Fragua, Estanzuela, Zacapa	92.4	Tulula, Retalhuleu,Medio	29.6
Mariscos, los Amates, Izabal	85.8	INSIVUMEH, Guatemala	29.0
San Agustín Chixoy, Chisec, Alta Verapaz	85.4	Jalapa	28.8
Santa Teresa,Guatemala,Alto	80.4	Santa Elena,peten	28.7
Machaquilá, Poptún, Petén	77.4	Bouganvilla,Escuintla,Bajo	28.6
Poptún, Petén	76.6	Costa Brava, Escuitla,Medio	28.6
Pasabien, Zacapa	73.7	San Rafael,Santa Rosa,Litoral	26.4
esquipulas	60.9	El Tigre, La Libertad, Petén	21.9
Camotán, Chiquimula	57.6	Chachaclún, San José, Petén	21.5

Figure 7. Guatemala rainfall totals (mm) associated with Eta during the period 5–6 November 2020. Graphic courtesy of the Instituto Nacional de Sismología, Vulcanología, Meteorología e Hidrología (INSIVUMEH).

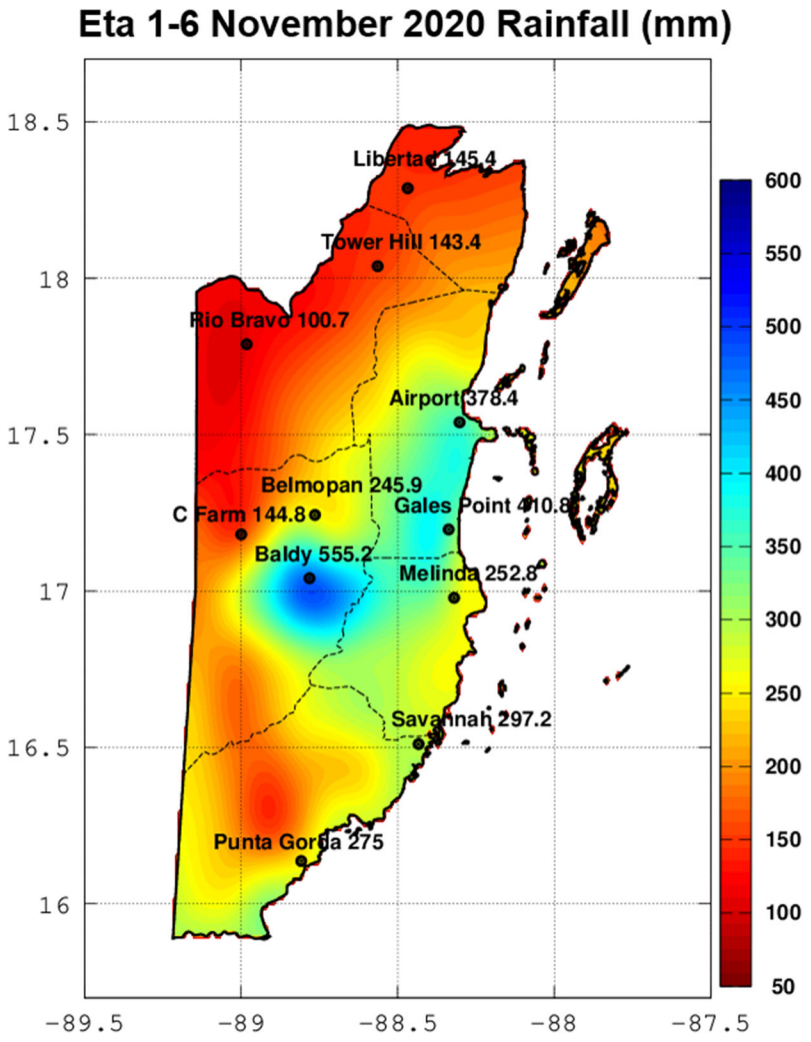


Figure 8. Belize rainfall totals (mm) associated with Eta during the period 1–6 November 2020. Graphic courtesy of the National Meteorological Service of Belize.

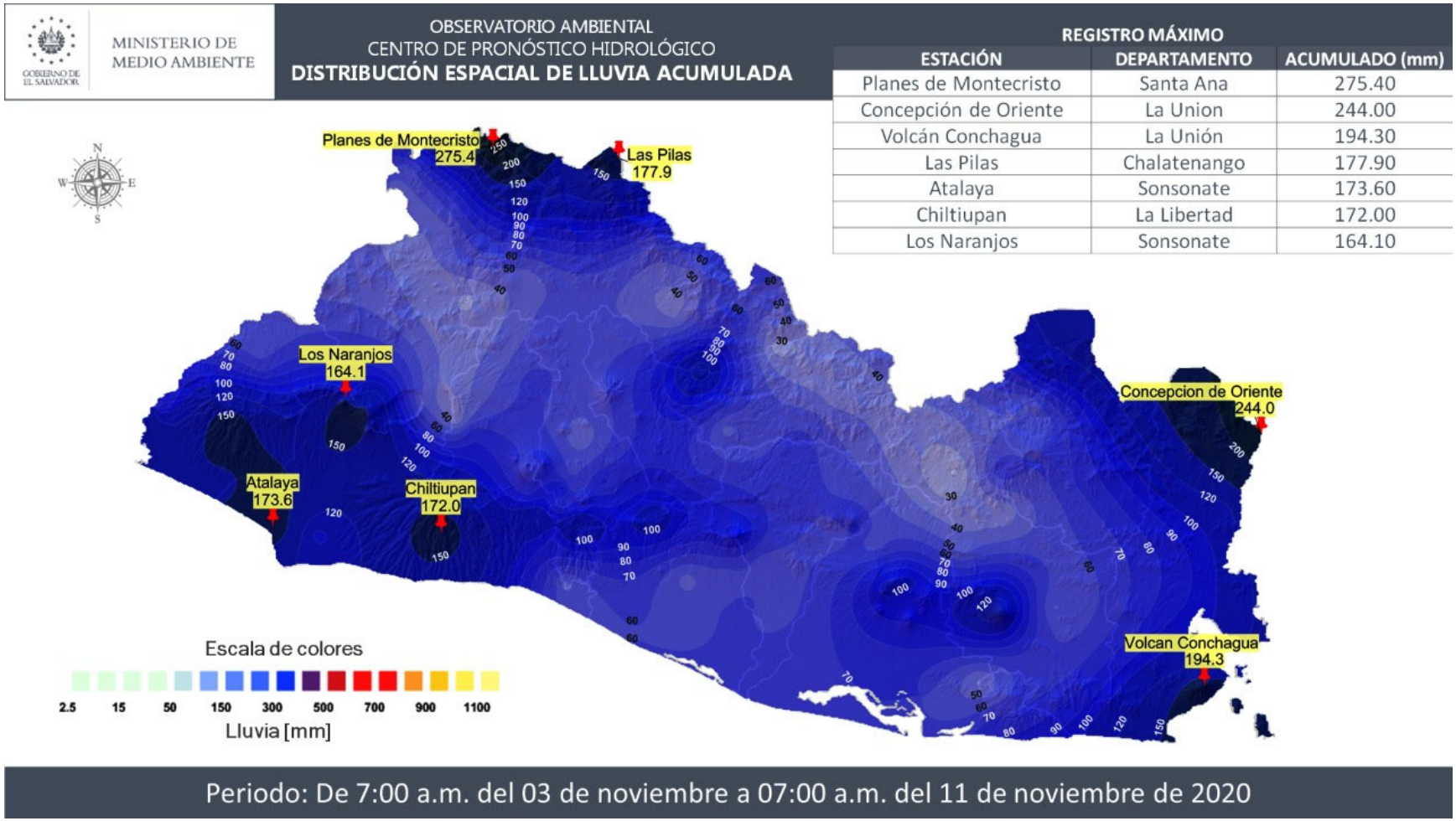


Figure 9. El Salvador rainfall totals (mm) associated with Eta during the period 3–11 November 2020. Graphic courtesy of the Centro de Pronóstico Hidrológico de El Salvador.

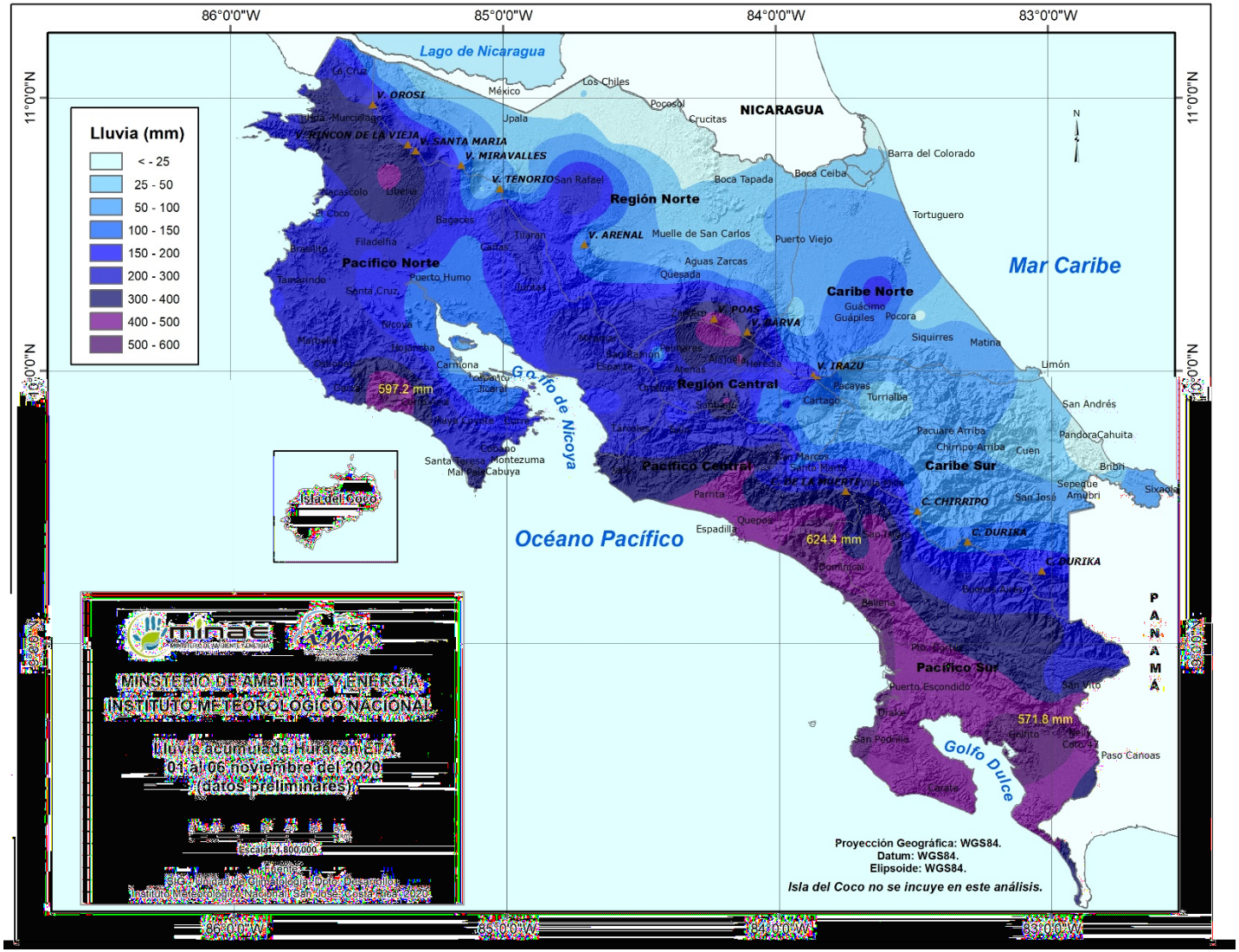


Figure 10. Costa Rica rainfall totals (mm) associated with Eta during the period 1–6 November 2020. Graphic courtesy of Ministerio de Ambiente y Energía Instituto Meteorológico Nacional (MINAE/IMN).

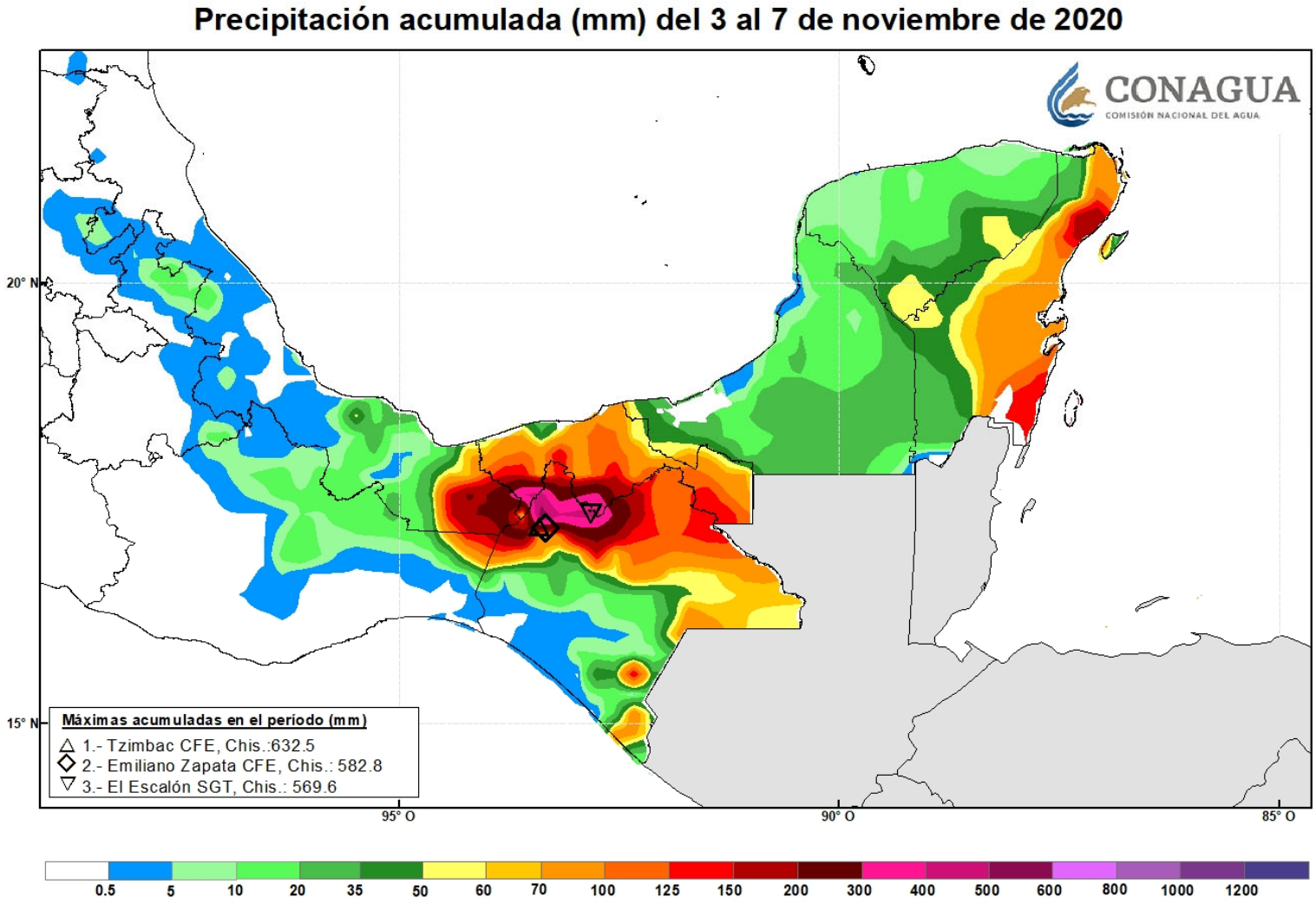


Figure 11. Southern Mexico rainfall totals (mm) associated with Eta during the period 3–7 November 2020. Graphic courtesy of Comisión Nacional del Agua (CONAGUA).

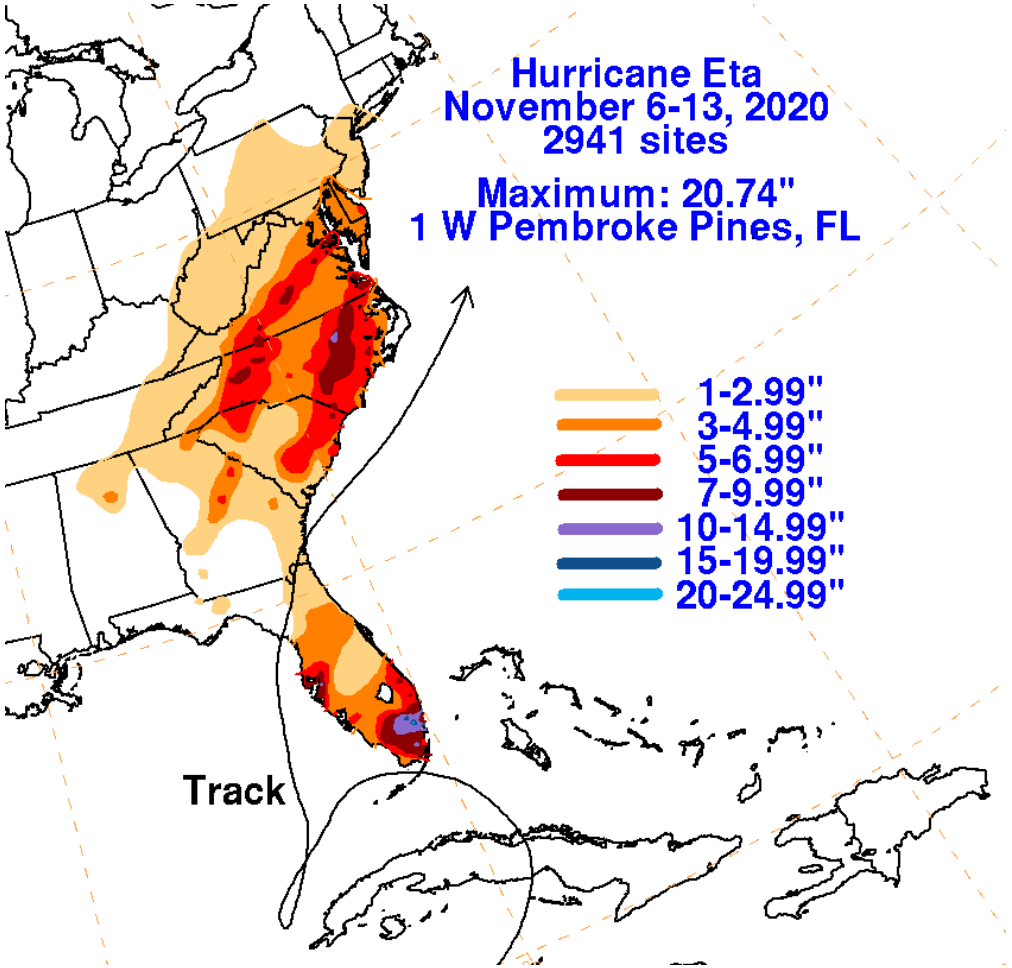


Figure 12. United States rainfall totals (inches) associated with Eta during the period 6–13 November 2020. Figure courtesy of Zackary Taylor and David Roth of the NOAA Weather Prediction Center.

Figure 13. Flooding from Eta in Southwest Ranches, Florida, in Broward County. Image courtesy of Daniel P. Brown, National Hurricane Center.

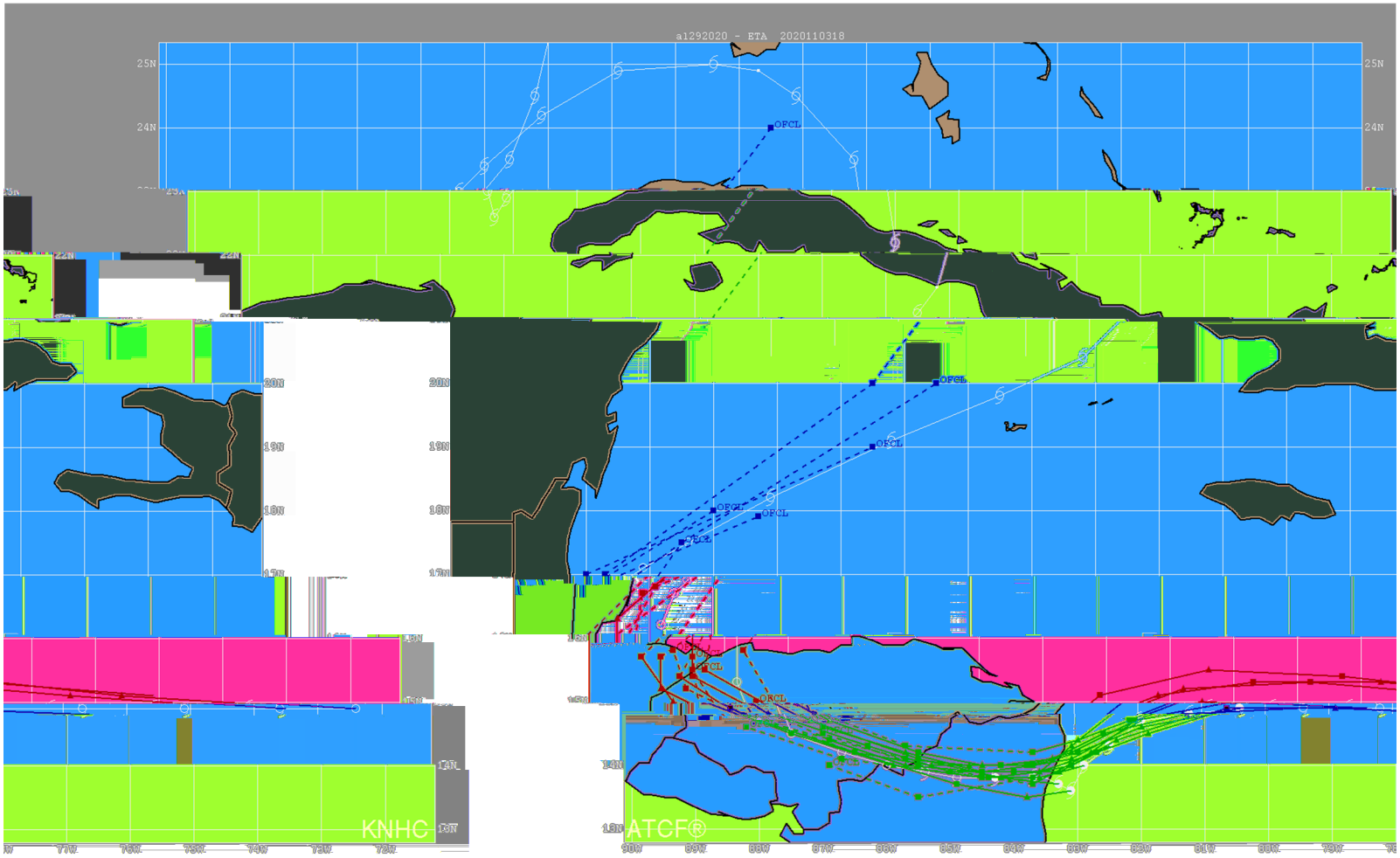


Figure 14. Official track forecasts for Hurricane Eta, 31 October 1800 UTC to 3 November 1800 UTC 2020. The best track is shown by the white curve.

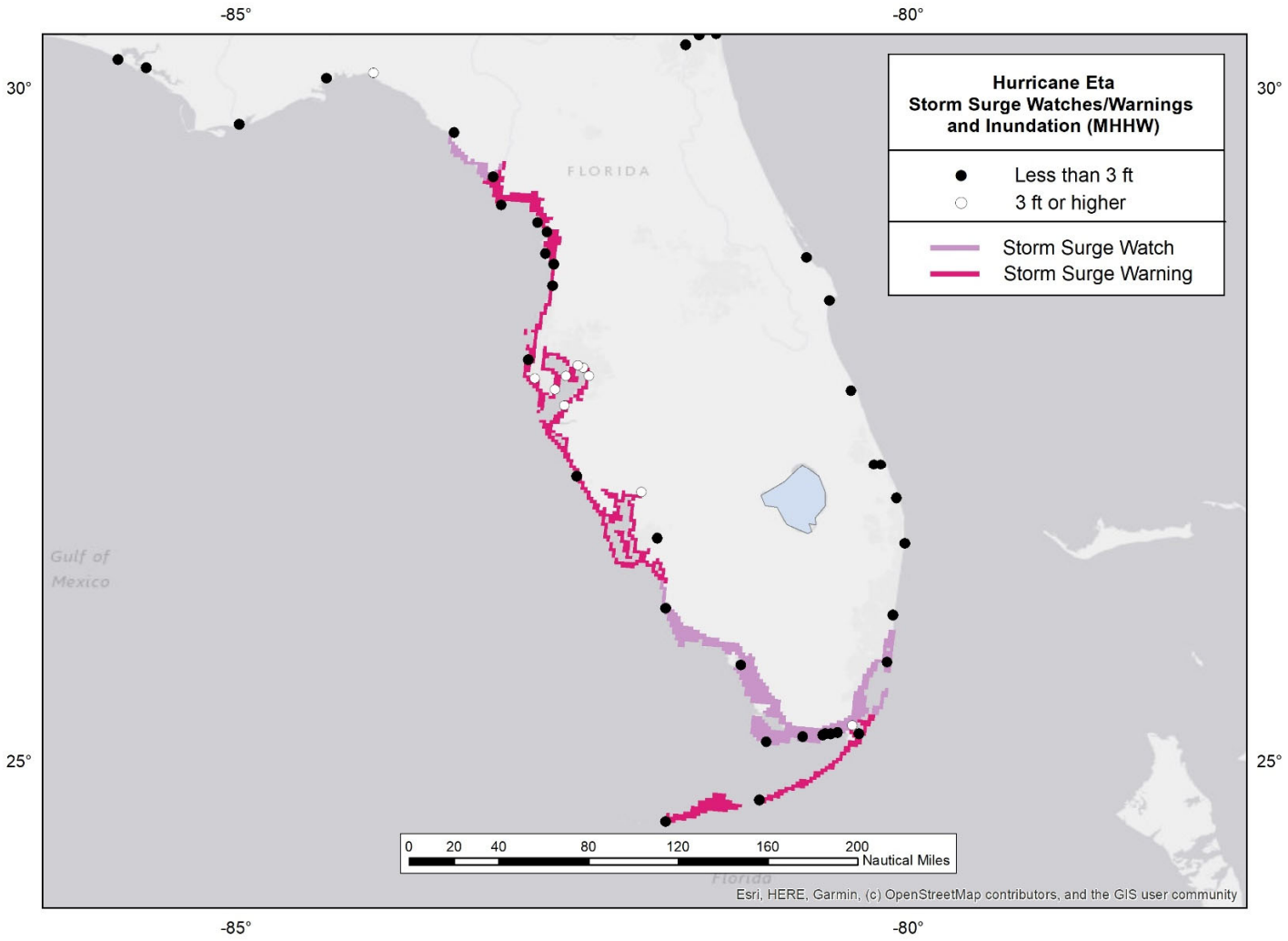


Figure 15. Maximum water levels measured during Hurricane Eta from tide and stream gauges (circles), as well as areas covered by storm surge watches (lavender) and warnings (magenta). Water levels are referenced as feet above Mean Higher High Water (MHHW), which is used as a proxy for inundation (above ground level) on normally dry ground along the immediate coastline. Black markers denote water levels less than 3 ft above ground level, and white markers denote water levels 3 ft or higher above ground level.