

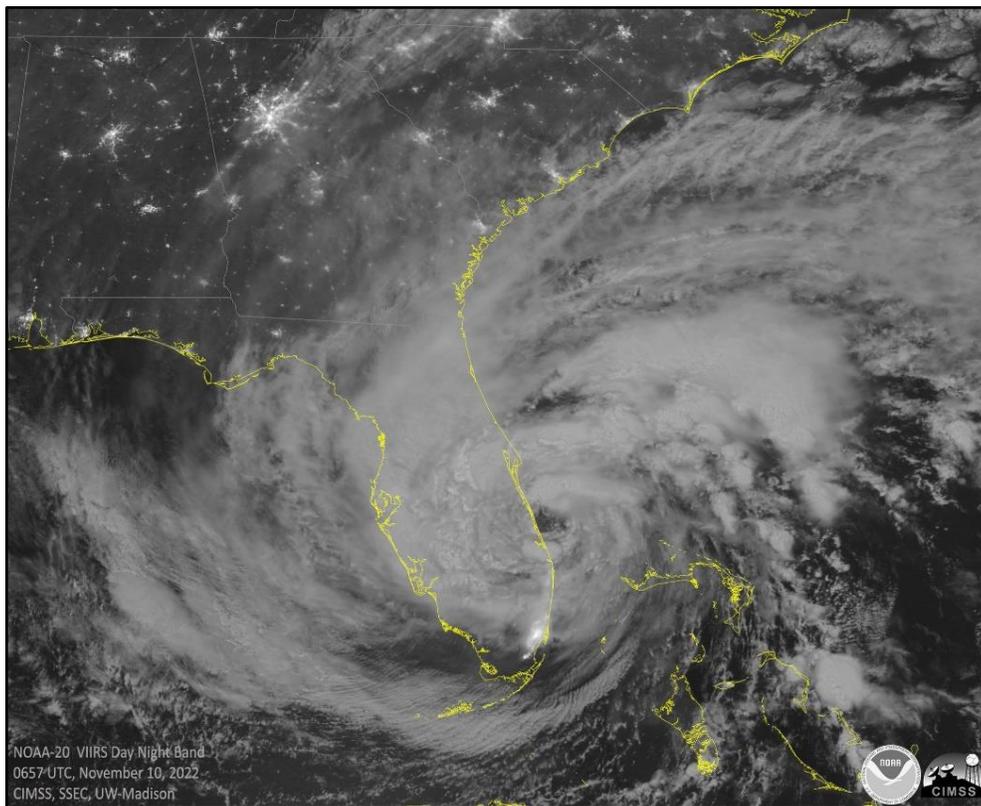


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

HURRICANE NICOLE (AL172022)

7–11 November 2022

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National Hurricane Center
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NOAA VIIRS DAY/NIGHT BAND IMAGE OF NICOLE AT 0657 UTC 10 NOVEMBER 2022. IMAGE COURTESY OF CIMSS

Nicole was a category 1 hurricane (on the Saffir-Simpson Hurricane Wind Scale) that made landfall in the northwestern Bahamas and on the east-central coast of Florida. It later made landfall as a tropical storm in the Florida Panhandle. Due to its large size, Nicole's impacts extended from the Bahamas and Florida northward to South Carolina.



Table of Contents

SYNOPTIC HISTORY.....	3
METEOROLOGICAL STATISTICS	4
Winds and Pressure	5
Storm Surge	6
Rainfall and Flooding.....	7
Tornadoes	7
CASUALTY AND DAMAGE STATISTICS	7
FORECAST AND WARNING CRITIQUE	8
Genesis	8
Track	8
Intensity	9
Wind Watches and Warnings.....	9
Storm Surge Watches and Warnings.....	10
Impact-based Decision Support Services (IDSS) and Public Communication	11
ACKNOWLEDGEMENTS	11
TABLES	12
FIGURES.....	48

Hurricane Nicole

7–11 NOVEMBER 2022

SYNOPTIC HISTORY

Nicole had a complex origin. The main contributing feature was a mid- to upper-level trough in the westerlies that moved from the U. S. Mid-Atlantic states into the western Atlantic on 3 November. This feature moved generally southward over the western Atlantic for the next two days, and during this time it gradually cut off from the westerlies to become a closed low. Upper-level divergence in the southeastern quadrant of this system interacted with the Intertropical Convergence Zone over northern South America on 4 November, and this combination caused a large area of convection over much of the eastern Caribbean Sea and the adjacent Atlantic north of the Virgin Islands and Puerto Rico. Surface observations and satellite imagery indicate that a broad low-pressure area formed over the Caribbean Sea south of Hispaniola on 5 November. This low re-developed north of Puerto Rico and became better defined on 6 November, and the associated winds increased to gale force later that day as the system moved north-northwestward closer to the upper-level low. A subsequent increase in convective organization led to the formation of a subtropical storm near 0600 UTC 7 November about 470 n mi south-southwest of Bermuda. The “best track” chart of Nicole’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 1¹.

Nicole moved erratically northwestward on 7 November as the low-level center became vertically stacked with the upper-level low, and as the merged system was steered by southeasterly flow on the west side of a low- to mid-level ridge. On 8 November, a cold front with a low- to mid-level anticyclone to the north of it moved into the western Atlantic north of Nicole, which caused the cyclone to turn westward and then west-southwestward. While this was happening, Nicole intensified as convection became more concentrated near the center, and the system transitioned to a tropical storm near 1800 UTC that day about 505 n mi east-northeast of Nassau in the Bahamas. The interaction of the cyclone’s circulation with the anticyclone caused the area of tropical-storm-force winds to grow in the northern semicircle, and by 10 November those winds extended over 400 n mi from the center in the northeastern quadrant.

The storm continued moving west-southwestward through the early part of 9 November with the maximum winds increasing to 60 kt. During the next several hours, though, mid- to upper-level dry air entrained into the core. This disrupted the central convection and caused a temporary weakening. The convection re-developed thereafter as Nicole turned westward, and the cyclone was again intensifying (winds of 60 kt) when the center made landfall at Marsh Harbor on Great Abaco Island in the northwestern Bahamas at 1700 UTC that day. Six hours later, Nicole

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.

reached hurricane strength with an intensity of 65 kt as the center made landfall on Grand Bahama Island.

The hurricane approached the western periphery of the low- to mid-level anticyclone, and it turned west-northwestward when it reached Grand Bahama Island. This motion brought the center across the northern end of the Straits of Florida and to landfall on the Florida coast at Vero Beach at 0745 UTC 10 November (cover image). No additional strengthening occurred as the center crossed the Gulf Stream due to disruption of the core convection by another intrusion of dry air, and the landfall intensity is estimated to be 65 kt with sustained hurricane-force winds limited to the waters off the east coast of Florida. After the Vero Beach landfall, Nicole weakened to a tropical storm as it moved northwestward across the Florida Peninsula, with the center passing between Orlando and Tampa before reaching the Gulf coast near Homosassa a little before 1800 UTC 10 November.

The center spent only a short time over the water before it made another landfall at Cedar Key, Florida, at 1900 UTC that day. After that, Nicole continued northwestward with the center near or just offshore of the coast of the Florida Big Bend. A final landfall occurred on the Florida coast near 0000 UTC 11 November at the mouth of the Aucilla River. The center then passed near Tallahassee before moving into southwestern Georgia, where it weakened to a tropical depression. Early on 11 November, Nicole turned northward over western Georgia between the Atlantic high and a mid-latitude trough and cold front approaching from the west. This was followed by a northeastward motion that brought the system across extreme western North Carolina into eastern Tennessee, where it was absorbed into the mid-latitude system just after 1800 UTC that day.

METEOROLOGICAL STATISTICS

Observations in Nicole (Figs. 2 and 3) include subjective satellite-based Dvorak and Hebert-Poteat technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB), 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 seven flights of the 53rd Weather Reconnaissance Squadron of the U.S. Air Force Reserve Command (USAFR) and six flights of the NOAA Aircraft Operations Center (AOC). There were also three synoptic surveillance missions of the NOAA AOC G-IV jet. 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 Nicole.

Ship reports of winds of tropical storm force associated with Nicole are given in Table 2, and selected surface observations from land stations and data buoys are given in Table 3. Selected additional rainfall observations are given in Table 4.

At the time of genesis, Nicole is assessed to have been a subtropical storm due to the proximity and influence of the mid- to upper-level baroclinic low and the broad nature of the surface wind field. By late on 8 November, the central convection had increased, and the system had developed an inner core more characteristic of a tropical cyclone. Thus, it is estimated the system transitioned into a tropical cyclone on that day. It should be noted that the intrusions of dry or cool air associated with the parent baroclinic cyclone continued even after Nicole became a tropical cyclone, as noted above.

Winds and Pressure

A USAFR Hurricane Hunter reported winds of 80 kt at 850 mb at 0006 UTC 10 November, while a NOAA Hurricane Hunter reported a wind of 78 kt at 700 mb at 2224 UTC 9 November. Standard reductions of these winds to the surface are the basis for the 65-kt peak intensity of Nicole. It should be noted that since these winds occurred very close to the islands of the northwestern Bahamas, the SFMR had trouble sampling the maximum surface winds at that time. The maximum reported SFMR wind was 68 kt at 1639 UTC 9 November when the center was near Great Abaco, but it is unclear how much wave shoaling in shallow water may have affected this measurement.

There were no reconnaissance aircraft in Nicole during the last few hours before landfall in Florida, and thus there were no in situ data about the strongest winds. Data from the WSR-88D Doppler radar in Melbourne showed patches of 70-75 kt winds near 10,000 ft in the northeastern eyewall until near the time of landfall, and based on these data Nicole is given a landfall intensity of 65 kt. However, this area of winds likely did not move onshore until after Nicole began weakening due to landfall, and by that time the winds were below hurricane force. Thus, although Nicole made landfall in Florida as a hurricane, it is unlikely that hurricane conditions actually affected any part of the Florida coast.

In the landfall area along the Florida east coast, the highest reported sustained wind was 54 kt at the House of Refuge WeatherStem station in Martin County at 0240 UTC 10 November, and the highest reported gust was 65 kt at the WeatherFlow station in New Smyrna Beach. Due to Nicole's large wind field (Fig. 4), sustained winds of 50 kt or greater with gusts of 60-65 kt were occasionally reported well away from the center along the Florida east coast as far north as the mouth of the St. Johns River near Jacksonville. Tropical-storm conditions occurred elsewhere over many portions of the Florida Peninsula along the track of Nicole, and wind gusts to tropical-storm-force were reported over the eastern Florida Panhandle and the Florida Big Bend region.

Hurricane conditions likely occurred on portions of Grand Bahama Island and the northern Abacos. However, there are no observations available from the area of the strongest winds. The Bahamas stations that reported from outside of the strongest winds noted sustained winds of 40-45 kt and peak gusts near 55 kt.

Wind gusts of tropical-storm-force occurred along the coasts of Georgia and South Carolina, as well as at a few inland locations over eastern Georgia. Gusts to gale force occurred along portions of the North Carolina coast, but these winds were more attributable to the strong pressure gradient in the high-pressure area north of Nicole than to the storm itself.

Nicole's large wind field on the north side of the cyclone caused a number of ships to encounter 35-45 kt winds (Table 2). However, shipping avoided the stronger core winds.

The minimum central pressure of Nicole has more uncertainty than normal. The NOAA Hurricane Hunter aircraft extrapolated central pressures of 976, 975, and 977 mb between 2200 UTC 9 November and 0100 UTC 10 November. However, no center dropsondes were available for those fixes. Subsequent USAFR center dropsondes suggested a central pressure of 981-982 mb. During the landfall in Florida several hours later, there were many reports of pressures in the 980-981 mb range, and a pressure of 978.8 mb was reported from the WeatherFlow station south of Melbourne Beach. This report was a significant distance from the center, and it is unclear whether this value is erroneous data or associated with a mesovortex in the northern eyewall. The minimum central pressure is set to 980 mb based on the available data and consideration for the various sampling issues.

Storm Surge²

Due to its large size and interaction with the anticyclone to the north, Nicole produced an impactful storm surge along a large portion of the east coast of Florida, battering beaches with elevated water levels and wave action. Florida was previously hit by Hurricane Ian in late September which caused beach erosion along the east coast and freshwater flooding from rainfall in rivers and canals. The impact of Ian likely left the area more vulnerable to storm surge from Nicole. Additionally, Nicole's large wind field and its initial subtropical characteristics increased the potential for widespread wave and storm surge impacts.

Table 3 and Figure 5 provide the peak storm surge observations from various National Ocean Service (NOS) tide gauges and United States Geological Survey (USGS) stream gauges along the U.S. east coast and the Florida Big Bend region. Sensors measured 3 to 4 ft of water above Mean Higher High Water (MHHW) from Jupiter Inlet, Florida, northward to St. Simons Island, Georgia. An NOS tide gauge at Trident Pier, near Cape Canaveral, measured 5.83 ft above normal tide levels, which resulted in a water level of 3.68 ft above MHHW. In addition, notable storm surge flooding occurred on the St. Johns River, where an NOS tide gauge at the I-295 Buckman Bridge measured a water level of 3.82 ft above MHHW.

A storm surge hindcast produced by the NHC Storm Surge Unit (not shown) indicates the maximum inundation along the northeast coast of Florida was up to 5 ft above ground level (AGL). Significant damage occurred where beach erosion encroached on nearby communities. For example, aerial imagery revealed that Wilbur-by-the-Sea, a community located just south of Daytona Beach, experienced beach erosion causing damage to beachfront structures.

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) or Mean Lower Low Water (MLLW). **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).

Storm surge inundation levels along the southeast coast of Florida were between 1 and 3 ft AGL. An NOS tide gauge at Lake Worth, near West Palm Beach, measured a water level of 2.58 ft above MHHW. Minor storm surge impacts extended as far south as Miami, where elevated water levels produced nuisance street flooding in beach communities.

The west coast of Florida, including the Big Bend and Tampa Bay, received minor storm surge impacts with water levels reaching 1 to 2 ft AGL. An NOS tide station at Cedar Key measured a 3.17 ft storm surge above normal tides, with this resulting in a water level of 1.93 ft above MHHW.

Rainfall and Flooding

Nicole produced rainfall totals of mainly 3-6 inches, with locally higher amounts, across portions of the Florida Peninsula (Fig. 6). The maximum reported storm total is 7.11 inches at a CoCoRaHS station near Orlando. Rainfall totals of 1-3 inches occurred farther north in the eastern Florida Panhandle, portions of Georgia, and portions of South Carolina. These rains caused minor freshwater flooding. The combination of the remnants of Nicole and the mid-latitude system caused locally heavy rains over portions of the eastern United States after Nicole's dissipation, with a storm total of 7.88 inches being reported near Foscoe, North Carolina.

Nicole produced locally heavy rains over the northwestern Bahamas. While the rainfall totals are incomplete, a CoCoRaHS station near Cherokee on Great Abaco reported a storm total of 5.82 inches.

The pre-Nicole disturbance caused heavy rains over the islands of the eastern Caribbean Sea from Hispaniola and Puerto Rico eastward to the Leeward Islands. In Puerto Rico (Fig. 6), amounts ranged generally from 3-7 inches with a maximum total of 12.94 inches in the Toro Negro Forest. These rains caused damaging flooding in some of these areas.

Tornadoes

There are no known tornadoes associated with Nicole. Two tornadoes over eastern Virginia late on 11 November might have been associated with the remnants of Nicole after the center dissipated.

CASUALTY AND DAMAGE STATISTICS

There are no reports of deaths³ directly associated with Nicole's winds, storm surges, 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.

rains, although there are five known indirect deaths in Florida. In Orange County, two people were electrocuted when they came into contact with live downed power lines. Two other people in Orange County died in Nicole-related traffic accidents. One person died in Duval County when high winds caused a bonfire to spread, leading to a home catching on fire.

Media reports indicate that six people died in the Dominican Republic due to flooding caused by heavy rains from the pre-Nicole disturbance.

Nicole caused extensive damage due to storm surge and beach erosion along the Florida east coast from the landfall area northward to the Jacksonville area. However, there currently are no figures available as to how many structures were damaged or destroyed. Minor wind and flooding damage occurred elsewhere in the area impacted by the storm, and media reports indicate over 300,000 homes and businesses in the affected region lost power. The National Centers for Environmental Information estimates the damage from Nicole at \$1 billion⁴.

FORECAST AND WARNING CRITIQUE

Genesis

The genesis of Nicole was adequately forecast (Table 5 and Fig. 7). The possibility that the system could develop was introduced into the 5-day Tropical Weather Outlook (TWO) 132 h before genesis with a low (<40%) chance of development. The 5-day chances were raised to the medium (40-60% chance) category 66 h before genesis and to the high (>60% chance) category 36 h before genesis. In the 2-day TWO, the system was introduced with a low chance 48 h before genesis. The probability was raised to the medium category 36 h before genesis and to the high category 18 h before genesis. The main issues with the genesis forecasts were primarily with the later-than-anticipated time of development and the nature of the system. However, there was high confidence a few days before genesis that a significant low-pressure area would develop and move westward toward the Bahamas and the southeastern United States. This was reflected in the excellent spatial forecasts of genesis (Fig. 7), and in statements in the TWOs describing potential impacts to land areas regardless of the exact nature of the low.

Track

A verification of NHC official track forecasts for Nicole is given in Table 6a. Official track forecast errors were lower than the mean official errors for the previous 5-yr period at the 12- through 72-h forecast periods, and greater than the 5-yr mean at 96 h (for a small number of forecasts). A homogeneous comparison of the official track errors with selected guidance models is given in Table 6b and Figure 8. The official track forecasts had lower average errors than most of the guidance. However, the HFIP Corrected Consensus (HCCA) model had lower average errors than the official forecasts at all forecast times, and the ECMWF model (EMXI) had lower average errors from 48-96 h. Examination of the individual forecasts (Fig. 9) indicates that they were generally correct in forecasting Nicole's path before landfall in Florida. After that, however,

⁴ NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2023). <https://www.ncei.noaa.gov/access/billions/>, DOI: [10.25921/stkw-7w73](https://doi.org/10.25921/stkw-7w73)

they had a right bias as they forecast the cyclone to turn more sharply northward and northeastward than what actually occurred.

It should be noted that the average track errors for the Climatology-Persistence model (OCD5) were very large for Nicole. Figure 10 shows the individual OCD5 track forecasts for the storm, which reflect that most tropical cyclones near Nicole's location in November quickly recurve northward and northeastward into the westerlies. Nicole's extended westward motion was thus anomalous. A preliminary check of the NHC Atlantic best tracks shows only two other tropical cyclones north of 20°N latitude with similar extended westward motions in November – Hurricane Nicole in the eastern Atlantic in 1998 and Hurricane Kate in the western Atlantic, Cuba, and Gulf of Mexico in 1985. One other somewhat analogous November storm was a hurricane in 1935 that passed north of Bermuda before turning southward and southwestward along a track that eventually made landfall in southeastern Florida.

Intensity

A verification of NHC official intensity forecasts for Nicole is given in Table 7a. Official intensity forecast errors were lower than the mean official errors for the previous 5-yr period at the 12- through 72-h forecast periods, and greater than the 5-yr mean at 96 h (again for a small number of forecasts). A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 7b and Figure 11. The official forecasts again generally had lower average errors than the intensity guidance. However, the Florida State Superensemble had lower average errors for the 24-96 h periods. Examination of the individual forecasts (Fig. 12) indicates that some of the earlier forecasts had a high bias at the longer forecast times. This is likely due to the track forecasts that had Nicole remaining closer to the Atlantic than what actually occurred.

Wind Watches and Warnings

Wind watches and warnings associated with Nicole are given in Table 8. In general, the watches and warnings had an adequate amount of lead time, which was necessary due to the large area of tropical-storm-force winds associated with the storm. In the northwestern Bahamas, the initial tropical storm watch was issued on the first advisory at 0900 UTC 7 November, which was about 56 h before the center reached Great Abaco and about 45 h before the estimated arrival of the tropical-storm-force winds in the area. A hurricane watch was issued for the area 6 h later. The subsequent hurricane and tropical storm warnings were issued about 44 h before the center reached Great Abaco and about 33 h before the estimated arrival of the tropical-storm-force winds.

On the Florida east coast, the initial hurricane and tropical storm watches were issued at 1500 UTC 7 November, which was about 65 h before the center made landfall and about 33 h before the estimated arrival of the systematic tropical-storm-force winds. The subsequent tropical storm warning was issued about 53 h before landfall and about 21 h before the estimated arrival of the systematic tropical-storm-force winds, and the hurricane warning for the area was issued 6 h later.

On the Florida Gulf coast, the initial tropical storm watch was issued at 0900 UTC 8 November, with the initial warning 24 h later. These times were roughly 48 and 24 h before the onset of tropical-storm conditions in the warned area. In Georgia and South Carolina, the watches and warnings had somewhat less lead time. Tropical storm watches were issued roughly 24 h before the estimated arrival of the systematic tropical-storm-force winds, with warnings issued about 12 h later.

It should be noted that in many portions of the warned area, bands of squalls with short-lived tropical-storm conditions preceded the winds directly associated with Nicole, and in some cases occurred a day in advance of the primary winds.

Storm Surge Watches and Warnings

Storm surge watches and warnings associated with Nicole are given in Table 9. The first issuance of the storm surge watch was at 1500 UTC 7 November, extending from the Altamaha Sound in Georgia southward to Hallandale Beach, Florida. The initial peak storm surge inundation forecast was for 3 to 5 ft AGL between the Altamaha Sound and North Palm Beach, Florida. This area, as well as the St. Johns River, was upgraded to a storm surge warning at 0300 UTC 8 November. The peak storm surge forecast was consistent at 3 to 5 ft AGL for the entirety of the event, and this verified well with the peak storm surge inferred from the observations and storm surge hindcast.

After the initial issuance of the storm surge warning, storm surge watches were extended northward along the east coast from the Altamaha Sound, Georgia, to the South Santee River South Carolina, as well as on the Florida west coast, from the Anclote River eastward to Indian Pass. A portion of the storm surge watch on the west coast of Florida, between the Ochlockonee River and the Anclote River, was upgraded to a storm surge warning at 1500 UTC 9 November. The peak storm surge forecast for this area was 3 to 5 ft AGL.

Figure 5 shows the maximum extent of the storm surge watch/warning areas (1500 UTC 9 November) overlaid with the observations. The storm surge warning along the east coast of Florida verified well with the observations of 3 ft or greater above MHHW (which NHC uses as a first-cut threshold for the storm surge watch/warning). The storm surge warning along the west coast of Florida did not verify, likely due to Nicole's track having less favorable wind directions for water build up in the Big Bend of Florida and the timing of the tides. The uncertainty of the forecast track and timing during the warning phase (36 h prior to onset of hazardous conditions) warranted the issuance of the storm surge warning.

In the Bahamas, the peak storm surge forecast was 4 to 6 ft above normal tides. Only a few observations are available from the affected area, and it is unclear whether the forecast verified for Great Abaco and Grand Bahama islands.

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

Through the FEMA Hurricane Liaison Team, the NHC provided 13 formal briefings for Nicole beginning on 7 November, including eight for the state of Florida and five for FEMA Headquarters. The Tropical Analysis and Forecast Branch provided seven briefings on the cyclone for the U. S. Coast Guard District 7 between 7-10 November in support of their life-saving mission.

NHC provided the first public live stream briefing from its Facebook, YouTube, and Twitter accounts on Sunday, 6 November. A limited media pool was activated from 7 AM to 7 PM EST on 7 November, extending to a full media pool from 8 November through 10 November. The media pool closed on 10 November at 6 PM EST. A total of 93 interviews were conducted. These included: 1) 39 network broadcast/cable weather outlets including Fox, NBC, The Weather Channel, Weather Nation, FOX Weather; 2) 29 local affiliate outlets including WPBF, Fox 35, CBS4, Palm Beach Post, and Fox Orlando; 3) 20 English and Spanish virtual interviews including CNN Español, Univision, Telemundo; and 4) 5 simultaneous live streams through NHC's Facebook, YouTube, and Twitter accounts.

One unusual IDSS aspect for Nicole involved the safety of NASA's Artemis rocket. The NHC provided information on the possibility that Nicole, or the low-pressure area it formed from, could affect the Cape Canaveral area as early as 3 November, when the rocket was rolled out to its launch pad. The NHC continued to provide information to the launch weather forecasters at the U.S. Air Force's 45th Weather Squadron as the storm developed and approached, which helped lead to the decision to keep the rocket at the launch pad when the storm moved through the area.

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TABLES

Table 1. Best track for Hurricane Nicole, 7 – 11 November 2022.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
06 / 1200	20.6	66.8	1005	30	low
06 / 1800	22.4	66.8	1005	35	“
07 / 0000	23.9	67.5	1005	35	“
07 / 0600	25.2	68.2	1004	40	subtropical storm
07 / 1200	25.9	69.3	1002	40	“
07 / 1800	26.4	70.3	1001	40	“
08 / 0000	26.8	70.7	998	40	“
08 / 0600	27.5	71.2	996	40	“
08 / 1200	27.7	72.1	993	45	“
08 / 1800	27.6	73.3	991	50	tropical storm
09 / 0000	27.2	74.3	984	60	“
09 / 0600	26.8	75.3	986	60	“
09 / 1200	26.5	76.2	985	55	“
09 / 1700	26.5	77.1	985	60	“
09 / 1800	26.5	77.3	985	60	“
09 / 2300	26.6	78.2	980	65	hurricane
10 / 0000	26.7	78.4	980	65	“
10 / 0600	27.3	79.8	980	65	“
10 / 0745	27.6	80.3	980	65	“
10 / 1200	28.0	81.6	984	55	tropical storm
10 / 1800	29.0	82.8	989	40	“
10 / 1900	29.2	83.0	989	40	“
11 / 0000	30.1	84.0	992	35	“
11 / 0600	31.2	84.6	996	30	tropical depression
11 / 1200	33.2	84.6	999	25	“
11 / 1800	35.4	83.8	1000	25	low
12 / 0000					dissipated



Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
09 / 2300	26.6	78.2	980	65	minimum pressure and maximum winds
09 / 1700	26.5	77.1	985	60	landfall at Marsh Harbor on Great Abaco Island, Bahamas
09 / 2300	26.6	78.2	980	65	landfall on Grand Bahama Island, Bahamas
10 / 0745	27.6	80.3	980	65	landfall at Vero Beach, Florida
10 / 1900	29.2	83.0	989	40	landfall at Cedar Key, Florida
11 / 0000	30.1	84.0	992	35	landfall at the mouth of the Aucilla River, Florida

Table 2. Selected ship reports with winds of at least 34 kt for Hurricane Nicole, 7 – 11 November 2022.

Date/Time (UTC)	Ship call sign	Latitude (°N)	Longitude (°W)	Wind dir/speed (kt)	Pressure (mb)
08 / 0000	V7TO3	27.7	63.8	150 / 36	1013.0
08 / 0300	ZCEW2	27.7	66.4	170 / 36	1009.3
08 / 0300	OUJS2	28.9	71.4	070 / 40	1010.0
08 / 0400	C6BI7	30.4	73.1	030 / 45	1014.3
08 / 0600	9V9111	29.6	76.8	050 / 35	1017.0
08 / 1300	WSEP	33.0	77.0	030 / 35	1021.4
08 / 1500	ZCEW2	24.1	66.4	210 / 35	1012.7
08 / 1900	9V5630	33.2	77.5	020 / 40	1025.2
08 / 2000	PDGW	22.9	78.6	010 / 35	1010.8
09 / 0000	WDM220	32.3	73.9	050 / 35	1017.8
09 / 0200	PDGW	23.2	79.6	010 / 38	1012.7
09 / 0800	C6ZJ4	25.7	79.5	050 / 37	1004.4
09 / 1100	C6ZJ4	24.7	79.5	050 / 35	1003.5
10 / 0600	D5ZH9	33.2	78.4	050 / 38	1018.5
11 / 1700	9V5997	34.1	76.5	180 / 35	1009.0

Table 3. Selected surface observations for Hurricane Nicole, 7 – 11 November 2022.

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)				
Buoys									
NOAA 41002 (31.76N 74.94W) (4.1m)	11/1900	1011.7	08/2358	39 (1-min)	47				
NOAA 41004 (32.50N 79.10W) (4.1m)	11/194	1008.0	09/1814	37 (1-min)	47				
NOAA 41008 (31.40N 80.87W) (4.9m)	10/1950	1004.2	09/2228	37 (1-min)	45				
NOAA 41009 (28.88N 78.49W) (4.1m)	10/0900	991.1	10/0654	51 (1-min)	64				
NOAA 41010 (28.88N 78.49W) (4.1m)	10/0740	1002.6	10/0212	47 (1-min)	54				
NOAA 41013 (33.44N 77.77W) (4.1m)	11/1930	1008.3	09/0005	37 (1-min)	43				
CORMP 41029 (32.80N 79.62W) (3.0m)			09/2008	29	43				
CORMP 41033 (32.28N 80.41W) (3.0m)	11/1908	1006.3	10/0308	29	41				
NOAA 41047 (27.47N 71.45W) (4.1m)	08/0820	995.8	07/0713	31 (1-min)	35				
CORMP 41066 (32.53N 79.66W) (3.0m)	11/2008	1007.4	10/0408	31	45				
COMPS 42013 (27.17N 82.92W) (3.1m)	10/1235	1090.9	10/1105	29	39				
COMPS 42022 (27.51N 83.74W) (3.1m)	10/1935	1002.4	10/1235	29	37				
NOAA 42036 (28.50N 84.51W) (4.1m)	10/2000	998.6	10/1523	33 (1-min)	39				
Bahamas									
International Civil Aviation Organization (ICAO) Sites									
Freeport (MYGF) (15.78N 96.27W)	10/0041	985.4	09/2209	41	53				
Coastal-Marine Automated Network (C-MAN) Sites									
Settlement Point (SPGF1) (26.70N 79.00W) (6.6m)	10/0200	985.3	09/2220	42 (10-min)	54				
WeatherFlow									
Elbow Cay (26.53N 76.96W) (1.8m)	09/1705	985.7	11/0000	41	56				
Public/Other									



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)				
Grand Bahama Island						3.0 (est)			
Hope Town, Great Abaco Island						3.9 (est)			
United States									
Florida									
International Civil Aviation Organization (ICAO) Sites									
Live Oak (K24J) (30.30N 83.02W)	10/2215	995.2	10/1615	24	35				
Palatka (K28J) (26.66N 81.69W)	10/1835	998.3	10/1535	31	44				
Clewiston (K2IS) (26.74N 81.05W)	10/0930	996.6	10/1035	28	35				
Quincy (K2J9) (30.60N 84.56W)	11/0215	995.9	10/2115		33				
Apalachicola (KAAF) (29.73N 85.02W)	11/0026	998.3	10/1500	22	33				
Boca Raton (KBCT) (26.38N 80.10W)			09/0300	30 ⁱ	40 ⁱ				
Brooksville (KBKV) (28.47N 82.45W)	10/1553	989.2	10/2011	22	39				
Bartow (KBOW) (27.94N 81.78W)			10/1135	25 ⁱ	42 ⁱ				
Crystal River (KCGC) (28.87N 82.57W)	10/1735	989.2	10/1255	21	33				
Clearwater (KCLW) (27.97N 82.76W)	10/1335	995.3	10/1335	32	45				
Patrick SFB (KCOF) (28.23N 80.59W)	10/1855	985.1	10/0610	46	59				3.41
Craig Arpt. (KCRG) (30.33N 81.52W)	10/1953	1000.9	10/1455	28	50				2.67
Cross City (KCTY) (29.62N 83.10W)			10/1615	27	40				
Daytona Beach Arpt. (KDAB) (29.18N 81.05W)	10/1035	996.6	10/1037	47	61				2.83
Deland (KDED) (29.07N 81.28W)	10/1310	993.6	10/1450	29	47				
Bunnell (KFIN) (29.47N 81.20W)	10/1215	998.9 ⁱ	10/1035	29 ⁱ	41 ⁱ				
Fort Lauderdale Intl. (KFLL) (26.07N 80.15W)	10/0553	998.9	10/0510	24	35				3.87
Fernandina Beach (KFHB) (30.61N 81.45W)	10/2035	1002.4	10/1515	33	43				
Ft. Pierce (KFPR) (27.50N 80.38W)	10/0743	982.7	10/1100	27	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)				
Perry (KFPY) (30.07N 83.58W)			10/1735	24	36				
Winter Haven (KGIF) (28.06N 81.75W)	10/1253	985.1	10/1653	24	43				2.02
Gainesville (KGNV) (29.68N 82.27W)	10/1853	995.0	10/1741	27	54				2.55
Inverness (KINF) (28.81N 82.32W)	10/1655	989.2	10/1415	23	35				
Kissimmee (KISM) (28.29N 81.43W)	10/1115	983.4	10/1156	31	45				
Jacksonville Intl. (KJAX) (30.49N 81.69W)	10/1956	1000.6	10/1425	34	52				2.17
Lakeland (KLAL) (27.99N 82.02W)			10/1135	30	41				
Leesburg (KLEE) (28.82N 81.81W)	10/1353	992.6	10/1125	31	43				2.37
Lantana (KLNA) (26.59N 80.09W)	10/0635	994.9	10/0155	27	41				
MacDill AFB (KMCF) (27.85N 82.52W)	10/1305	993.1	10/1145	24	39				2.26
Orlando Intl. (KMCO) (28.42N 81.31W)	10/1042	986.5	10/1004	41	55				3.92
Melbourne Arpt. (KMLB) (28.10N 80.64W)	10/0907	982.4	10/0808	45	63				2.99
Jacksonville NAS (KNIP) (30.24N 81.68W)	10/1853	999.5	10/1445	30	46				2.94
Mayport (KNRB) (30.39N 81.42W)	10/1952	1001.4	10/1511	39	53				
Okeechobee (KOBK) (27.26N 80.85W)	10/0915	988.8	10/1255	24	34				3.03
Ocala (KOCF) (29.18N 82.22W)	10/1751	992.0	10/1820	25	36				
Orlando Exe. (KORL) (28.54N 81.33W)	10/1110	989.5 ⁱ	10/1113	42 ⁱ	56 ⁱ				5.36
West Palm Beach Intl. (KPBI) (26.68N 80.12W)	10/0553	993.5	10/0635	29	39				
Plant City (KPCM) (28.00N 82.15W)	10/1315	989.5	10/1115	24	37				
St. Petersburg Intl. (KPIE) (27.91N 82.69W)	10/1353	994.9	10/1341	37	54				
Sebring (KSEF) (27.46N 81.34W)	10/1015	989.8	10/1215	27	37				
Sanford (KSFB) (28.77N 81.23W)	10/1040	992.2	10/1114	41	56				5.30
St. Augustine (KSGJ) (29.97N 81.33W)	10/1356	1001.2	10/1310	44	53				2.42



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	Date/time (UTC)	Press. (mb)	Date/time (UTC) ^a	Sustained (kt) ^b	Gust (kt)				
St. Petersburg (KSPG) (27.77N 82.63W)	10/1353	994.7	10/1803	25	47				
Sarasota Intl. (KSRQ) (27.40N 82.55W)	10/1253	997.3	10/1303	32	47				
Stuart (KSUA) (27.18N 80.22W)	10/0655	987.8	10/0255	29	42				
Tallahassee (KTLH) (30.40N 84.35W)	11/0155	994.6	10/2058	24	35				
Tampa Intl. (KTPA) (27.97N 82.53W)	10/1353	992.9	10/1153	25	49				2.38
Shuttle Landing Facility (KTTS) (28.61N 80.69W)	10/0945	990.5	10/0800	38	52				4.19
Tampa Exe. (KVDF) (28.01N 82.35W)	10/1335	991.2	10/1855	23	34				
Vero Beach (KVRB) (27.65N 80.41W)	10/0759	981.7	10/0408	36	51				
Lake Wales (KX07) (27.89N 81.62W)	10/1135	985.4	10/1555	26	39				
Sebastien (KX26) (27.81N 80.50W)	10/0815	981.0	10/0415	33	47				
Williston (KX60) (29.36N 82.47W)	10/1835	991.2	10/2155	23	36				
Cape Canaveral Skid Strip (KXMR) (28.46N 80.56W)	10/0911	989.2	10/1305	43	54				4.95
Zephyrhills (KZPH) (28.23N 82.16W)	10/1415	987.8	10/1135	28	39				2.14
Coastal-Marine Automated Network (C-MAN) Sites									
East Point NEERS (APXF1) (29.77N 84.88W) (5.0m)	10/2200	998.3	10/1715	23	32				
Cedar Key (CDRF1) (29.14N 83.03W) (10m)	10/1900	990.6	10/1500	22 (10-min)	36				
Fowey Rocks (FWYF1) (25.59N 80.10W) (44m)	10/1400 ⁱ	1007.0 ⁱ	08/2230 ⁱ	35 ⁱ (10-min)	42 ⁱ				
Matanzas NEERS (GTXF1) (32.03N 80.90W) (3.1m)			10/1130	22	37				
Keaton Beach (KTNF1) (29.82N 83.59W) (10m)	10/2200	991.2	10/2310	21 (10-min)	32				
St. Augustine (SAUF1) (29.86N 81.27W) (16m)	19/1900	1000.8	10/1210	45 (10-min)	61				
Tyndall Tower (SGOF1) (29.41N 84.86W)	10/2200	996.9							



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)				
Venice (VENF1) (27.07N 82.45W) (12m)	10/1200	990.0	10/1050	37 (10-min)	44				
National Ocean Service (NOS) Sites									
Apalachicola (APCF1) (29.72N 84.98W) (7.0m)	10/2342	998.5	10/1748	25	32	1.20			
Buckman Bridge (BKBF1) (30.19N 81.69W) (9.7m)	10/1836	999.6	10/1424	36	46	3.43	4.21	3.82	
Cedar Key (CKYF1) (29.14N 83.03W)	10/1900	989.5	11/0000	28	37	3.17			
Clearwater Beach (CWBF1) (27.98N 82.83W) (6.7m)	10/1354	995.7	10/1324	44	52	1.77			
Dames Point (DMSF1) (30.39N 81.56W)						3.72	4.92	3.5	
East Bay (EBEF1) (27.92N 82.42W) (6.6m)	10/1330	991.7				2.55			
Fernandina Beach (FRDF1) (30.68N 81.47W) (6.6m)	10/1924	1002.4	10/0900	24	38	4.65	6.55	3.81	
Gadsden Cut (CGTF1) (27.77N 82.52W)	10/1300	992.6							
Lake Worth (LKWF1) (26.61N 80.03W) (6.0m)	10/0542	993.6	09/1648	43	50	2.63			
South Riverwalk (MSBF1) (30.32N 81.66W)						3.46	3.94	3.29	
Middle Tampa Bay (MTBF1) (27.66N 82.60W) (6.7m)			10/1418	39	49				
Mayport (MYPF1) (30.40N 81.43W) (5.7m)	10/1930	1001.9	10/1454	37	47	3.75	5.54	3.57	
Navy Fuel Depot (NFDF1) (30.40N 81.61W) (8.6m)	10/2006	1000.8	10/1400	32	43				
Old Port Tampa (OPTF1) (27.86N 82.55W) (6.7m)	10/1342	994.2	10/1212	41	51	1.90			
Port Everglades (PEGF1) (26.08N 80.12W)	10/0442	999.4	09/0324	31	39	2.03			
Port Manatee (PMAF1) (27.64N 82.56W)	10/1306	995.5				2.05			
St. Petersburg (SAPF1) (27.76N 82.63W) (7.2m)	10/1330	995.6	10/1800	24	34	1.78			



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)				
Sparkman Channel Entrance (SKCF1) (27.92N 82.45W) (7.6m)			10/1318	24	36				
Trident Pier (TRDF1) (28.42N 80.59W) (6.7m)	10/0854	988.5	10/0918	35	52	5.83	4.78	3.68	
East Bay Causeway (TSHF1) (27.93N 82.43W) (11m)			10/1136	25	39				
Uni. Of South Florida COMPS									
Aripeka (ARPF1) (28.43N 82.67W) (11m)	10/1612	990.2	10/1654	21	39				
Fred Howard Park (FHFP1) (28.15N 82.80W) (9.4m)	10/1442	993.6	10/1318	43	59				
Shell Point (SHPF1) (30.06N 84.29W) (5.7m)	11/0000	993.0	10/1748	23	34				
South Florida Water Management									
Lake Okeechobee N (L001) (27.14N 80.79W) (6.0m)	10/0900	991.3	10/1145	34	44				
Lake Okeechobee W (L005) (26.96N 80.94W) (6.0m)	10/0945	994.4	10/1115	30	44				
Lake Okeechobee S (L006) (26.82N 80.78W) (6.0m)	10/0830	993.5	10/0630	32	37				
Lake Okeechobee C (LZ40) (26.90N 80.79W) (6.0m)	10/0830	991.9	10/0745	33	39				
S75WX (27.20N 81.12W)			10/1145	24	34				
NASA/USSF Cape Canaveral Mesonet Stations									
Shuttle Landing S (KSC01) (28.60N 80.68W) (9.1m)			10/0803	41	58				
Shuttle Landing N (KSC02) (28.63N 80.70W) (9.1m)			10/0923	33	53				
Shuttle Landing C (KSC03) (28.62N 80.69W) (9.1m)			10/1006	36	54				
Tower 714 (KSC08) (28.64N 80.75W) (16m)			10/0837	36	57				
Tower 1 (KSC09) (28.43N 80.57W) (16m)			10/0919	50	65				



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)				
Tower 3 (KSC10) (28.46N 80.53W) (16m)			10/0905	58	69				
Mosquito Lagoon (KSC11) (28.74N 80.70W) (16m)			10/0946	52	63				
Tower 21 (KSC13) (28.44N 80.56W) (16m)			10/1003	46	63				
Launch Complex 41 (KSC16) (28.58N 80.58W) (15m)			10/0700	49	62				
Tower 61 (KSC17) (28.51N 80.56W) (16m)			10/0901	44	61				
Tower 108 (KSC19) (28.54N 80.57W) (16m)			10/0919	46	64				
Tower 211 (KSC20) (28.61N 80.62W) (16m)			10/0819	40	59				
Tower 303 (KSC22) (28.46N 80.57W) (16m)			10/0758	42	61				
Tower 311 (KSC23) (28.46N 80.59W) (16m)			10/0910	45	63				
Tower 403 (KSC28) (28.60N 80.64W) (16m)			10/0917	44	62				
Tower 412 (KSC29) (28.61N 80.67W) (16m)			10/1007	46	59				
Tower 415 (KSC30) (28.66N 80.70W) (16m)			10/0824	37	55				
Tower 418 (KSC31) (28.71N 80.73W) (16m)			10/1015	36	56				
Tower 506 (KSC33) (28.52N 80.64W) (16m)			10/0927	41	64				
Tower 509 (KSC34) (28.56N 80.67W) (16m)			10/0927	41	64				
Tower 803 (KSC35) (28.47N 80.67W) (16m)			10/0921	37	57				
Tower 805 (KSC36) (28.52N 80.70W) (16m)			10/0915	40	61				
Tower 1000 (KSC38) (28.41N 80.76W) (16m)			10/1009	34	57				
Tower 1007 (KSC39) (28.53N 80.77W) (16m)			10/0809	50	60				
Tower 1101 (KSC41) (28.57N 80.59W) (16m)			10/0912	46	67				
Tower 3132 (KSC48) (28.63N 80.66W) (16m)			10/0919	47	60				
Launch Complex 39B (KSC52) (28.63N 80.62W) (40m)			10/0913	56	68				6.45
Florida Automated Weather Network Stations									



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)				
Alachua (ALHF1) (29.80N 82.41W) (10m)			10/1700		40				2.71
Clewiston (AIRGL) (27.23N 81.84W) (10m)			10/1045		34				2.17
Arcadia (ARCAD) (27.23N 81.84W) (10m)			10/1100		35				3.31
Balm (BALM) (27.76N 82.22W) (10m)			10/1130		36				2.94
Belle Glade (BLDF1) (26.66N 80.63W) (10m)			10/0745		36				1.78
Babson Park (BSPFL) (28.47N 82.44W)			10/1030	25	44				2.76
Ocklawaha (CKHF1) (29.02N 81.97W) (10m)			10/1630		37				2.66
Dade City (DACFL) (28.35N 82.20W) (10m)			10/1130		33				5.47
Dover (DOVF1) (28.02N 82.23W) (10m)			10/1215		27				4.07
Pierson (EPRF1) (29.22N 81.46W) (10m)			10/1100		31				4.21
Joshua (JSHFL) (27.26N 81.61W) (10m)			10/1015		36				3.02
Lake Alfred (KALF1) (28.10N 81.71W) (10m)			10/1045		38				2.89
Okahumpka (KHPF1) (28.68N 81.89W) (10m)			10/1130		43				3.03
Live Oak (LIOF1) (30.30N 82.90W) (10m)			10/1630		35				2.52
Okeechobee (OKSF1) (27.33N 80.85W) (10m)			10/1200		37				3.40
Fort Pierce (PCEF1) (27.43N 80.41W) (10m)			10/0445		37				2.18
Putnam Hall (PHAF1) (29.70N 81.99W) (10m)			10/1630		34				3.03
Poinciana (PNAFL) (28.08N 81.41W) (10m)			10/0900		42				3.53
Apopka (POPF1) (28.64N 81.55W) (10m)			10/1045	29	46				5.41
Sebring (SEBF1) (27.42N 81.40W) (10m)			10/1000		30				3.10
Hastings (STNF1) (26.69N 81.45W)			10/1245	28	42				4.23
Umatilla (UMLF1) (28.93N 81.65W) (10m)			10/1715		33				3.32
Avalon (VLNF1) (28.48N 81.65W) (10m)			10/1100	27	39				6.27
Wellington (WELFL) (26.68N 80.30W) (10m)			10/0630		32				3.24
WeatherFlow									



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)				
Boca Raton (XBOC) (26.37N 80.08W) (21m)			09/0258	28	47				
Boynton Beach (XBOY) (26.55N 80.05W) (10m)									
Banana River (XCCB) (28.36N 80.66W) (4.9m)	10/0844	988.4	10/0959	44	63				
Cocoa Beach (XCOA) (28.31N 80.63W) (10m)	10/0858	983.2	10/0848	41	59				
Dairy Road (XDAI) (28.04N 80.64W) (15m)			10/0809	29	51				
Dania Pier (XDAN) (26.06N 80.11W) (9.1m)			09/0850	37	51				
Biscayne Bay Harbor Pilots (XDGE) (25.77N 80.15W) (12m)			09/0816	23	34				
Miami Government Cut (XGVT) (25.75N 80.10W) (23m)			08/2215	36	51				
Hillsboro Beach (XHBI) (26.26N 80.08W) (5.8m)			09/0303	35	44				
Hobe Sound (XHOB) (27.05N 80.17W) (15m)	10/0630	986.4	10/0145	27	39				
Crescent Beach (XHSE) (29.72N 81.23W) (5.2m)			10/2015	31	50				
Huguenot Park (XHUP) (30.42N 81.41W) (12m)			10/1456	50	63				
Grant (XIND) (27.96N 80.53W) (4.9m)			10/0359	39	56				
Buck Island (XJAK) (30.40N 81.47W) (10m)			10/1515	39	54				
Jensen Beach (XJEN) (27.22N 80.20W) (4.9m)	10/0629	985.3	10/0249	38	52				
Juno Beach (XJUP) (26.89N 80.06W) (6.1m)	10/0528	988.9	10/0153	47	57				
Biscayne Bay Light (XKBS) (25.66N 80.19W) (6.1m)			08/2228	28	37				
Melbourne Beach (XMBI) (27.90N 80.47W) (12m)	10/0801	978.7	10/0651	49	64				
Magnolia Park (XMGN) (26.76N 80.07W) (23m)			10/0150	26	43				
Miami Morningside (XMPS) (25.82N 80.19W) (10m)	10/0515	1000.8	08/2210	29	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)				
WeatherSTEM									
Lafayette HS (0112W) (30.05N 83.17W)	10/2040	992.0	10/2001	30	35				
Blountstown Elem. (0191W) (30.45N 85.05W)	11/0244	995.8	10/2131	24	37				
Miami Medical District (0235W) (25.79N 80.22W) (57m)			08/2220		36				
Challenger Learning Center (0344W) (30.44N 84.28W)	11/0130	992.7	10/1950	24	34				
St. George Island (0569W) (29.71N 84.89W) (57m)	10/2310	995.8	10/1926	37	42				
Jefferson Cnty. EOC (0880W) (30.50N 83.88W)	11/0007	993.1	10/2004	28	34				
NE Tallahassee (1296W) (30.49N 84.25W)	11/0137	992.2	10/2129	29	36				
Marineland (1423W) (29.67N 81.21W) (2.7m)	10/1230	998.5	10/1120	50	63				
St. John's Cnty. (1426W) (29.99N 81.32W) (3.9m)			10/1330	52	62				
Franklin Cnty. EOC (1448W) (29.99N 81.32W)	10/2337	995.9	10/2043	30	35				
Horseshoe Beach (1462W) (29.44N 83.30W) (7.0m)	10/2005	989.9	10/1540	41	45				
Florida A&M Univ. (1463W) (30.43N 84.28W)	11/0140	990.8	10/2049		37				
Ochlockonee Boat Ramp (1478W) (29.96N 84.38W)	11/0004	995.3	10/2034	30	34				
Jensen Beach (1512W) (27.24N 80.24W)			10/0340	43	52				
House of Refuge (1534W) (27.20N 80.17W)			10/0240	54	63				
St. Marks Lighthouse (1560W) (30.07N 84.18W) (3.4m)	10/0042	993.7	10/1809	36	38				
Tampa Raymond James (1754W) (27.98N 82.50W) (11m)			10/1210		54				



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)				
Delray Beach Atlantic Dunes (1840W) (26.44N 80.06W) (18m)			09/1710		36				
Delray Beach N (1847W) (26.47N 80.06W) (18m)			10/0155	27	44				
Moore Haven (1918W) (26.84N 81.08W)			10/1050		34				
Coastal Carolina University Stations									
Fish Flower Farm 1 (IRFFC) (27.53N 80.35W)	10/0814	981.0							
IRL-LP (LBILP) (27.53N 80.34W) (3.0m)	10/0800	982.4	10/0400	36					
IRL-SB (LBISB) (27.84N 81.47W) (3.0m)			10/0700	37					
IRL-VB (LBIVB) (27.59N 80.36W) (3.0m)	10/0800	982.0	10/1100	36					
IRL-TS (RLSWV) (28.60N 80.79W)	10/1000	991.5	10/1400	37					
IRL-MB (RLYLU) (27.98N 80.54W)	10/0900	982.0	10/1000	37					
IRL-BR (RLZBI) (28.45N 80.64W)	10/1000	989.8	10/0900	39					
Cape Canaveral Community Center (SSCVJ) (28.39N 80.60W)	10/0917	986.1	10/0542	38					
SBA 25 (SSHLD) (27.87N 80.59W)	10/0856	981.0							
Devils Garden 9WNW (USS03) (26.66N 81.26W) (10m)									3.29
US Sugar 5 (USS05) (26.80N 80.47W) (10m)			10/0423	41					
Public/Other Stations									
Bartow (AP769) (27.98N 81.82W)			10/1028		55				
Davenport (AS292) (28.25N 81.65W)	10/1140	986.8	10/1045	29	40				5.13
Orlando (AV251) (28.49N 81.27W)	10/1031	988.1	10/1116		54				4.02
Orange Park 1NW (AW004) (30.18N 81.73W)	10/1824	998.0	10/1839		30				3.20
Boca Raton (C6162) (26.34N 80.21W)	10/0539	993.9	10/0534		30				4.44



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)				
Kissimmee (D1133) (28.43N 81.56W)	10/1115	988.4	10/1501		34				4.00
Viera (D1247) (28.25N 80.70W)	10/0917	984.4	10/0847		36				3.41
Daytona Beach (D1929) (29.07N 81.03W)	10/1710	998.0							5.64
Sanford (D2481) (28.83N 81.36W)	10/1100	993.6	10/1020		42				4.75
Interlachen 5NW (D9112) (29.67N 81.95W)	10/1745	995.3							3.31
Windermere (E1632) (28.51N 81.55W)	10/1115	989.5	10/1200		41				5.30
Boynton Beach (E2553) (26.55N 80.18W)	10/0628	993.9	10/0413		38				3.30
Gainesville 5NW (E3527) (29.73N 82.42W)	10/1846	994.2	10/1846		32				3.22
Port St. John (E4411) (28.49N 80.81W)	10/0936	989.5	10/1038		65				4.89
Bellair (E6508) (27.95N 82.81W)	10/1330	994.9	10/1330		59				
Mount Dora (E7685) (28.80N 81.62W)	10/1300	992.5	10/1019		40				3.11
Lake Nona (E8669) (28.39N 81.18W)	10/1015	986.1	10/1105	31	50				4.25
Melbourne (E9455) (28.39N 81.18W)	10/0910	984.4	10/0720		49				3.10
Clearwater (E9739) (28.01N 82.72W)	10/1330	992.5							3.16
Clearwater Beach (F1789) (27.98N 82.82W)	10/1340	994.2	10/1405		57				
Orange City (F2418) (28.94N 81.27W)	10/1123	993.2							4.63
Winter Springs (F3708) (28.68N 81.24W)	10/1021	991.2							6.23
St. Cloud (F4573) (28.20N 81.28W)	10/1030	985.4	10/0940		39				3.20
Hollywood (F4708) (26.01N 80.22W)	10/0418	1001.0							3.10
Wellington (F5300) (26.66N 80.29W)	10/0645	994.6							3.11
Ocoee (F5421) (28.55N 81.51W)	10/1115	991.2							6.83
Deltona (F5958) (28.94N 81.19W)	10/1046	994.2	10/1522		37				5.98



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)				
Enterprise (E6069) (28.86N 81.22W)	10/1048	993.2							3.95
Apoka (F6921) (28.70N 81.44W)	10/1120	986.5							4.55
Fruit Cove 1NE (F6950) (30.11N 81.61W)	10/1835	1000.3							4.14
Mandarin 1ENE (F6993) (30.16N 81.63W)	10/1852	1002.4							4.12
Fellsmere (F7044) (27.75N 80.61W)	10/0845	982.0							3.71
Palm Beach Gardens (F7274) (26.79N 80.23W)	10/0538	995.9							3.28
Bakersville 4NE (F8076) (29.94N 81.44W)	10/1802	1002.4							3.67
Miami Shores (F8130) (25.87N 80.20W)	10/0415	1001.0							3.34
Winter Garden (F8625) (28.52N 81.63W)	10/1137	991.5	10/1052		37				5.20
North Miami (F8795) (25.89N 80.18W)	10/0430	1000.7							3.45
Auburndale (F9119) (28.13N 81.79W)			10/1114		37				3.78
Sebastien (G0131) (27.77N 80.46W)	10/0815	981.4	10/0400		58				3.16
Orlando (G0693) (28.54N 81.18W)	10/1035	990.5	10/1105		36				4.72
Jupiter (G1460) (26.90N 80.12W)	10/0537	993.2							3.88
Melbourne (G1945) (28.07N 80.66W)	10/0900	983.7							3.58
Royal Palm Beach (G2218) (26.77N 80.26W)	10/0700	992.5							3.90
Palm Shores (G2418) (28.19N 80.70W)	10/0908	982.0							4.89
Casselberry (G2440) (28.67N 81.29W)	10/1015	993.2							6.15
San Antonio (G2574) (28.32N 82.30W)	10/1445	988.5							4.03
Sebastien Inlet FIT (SIPF1) (27.86N 80.45W)	10/0715	992.0 ^f							
Remote Automated Weather Stations (RAWS)									



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)				
Avon Park (APRF1) (27.60N 81.21W)			10/1322	23	41				2.49
Central (CRAF1) (27.60N 81.21W)			10/1357		33				3.63
Brighton (GHTF1) (27.12N 81.08W) (6.1m)			10/0632		30				3.70
Lake George (LGRF1) (29.40N 81.81W) (6.1m)			10/1157		32				3.25
Lake Wales (LWEF1) (27.84N 81.58W) (6.1m)			10/1246		30				3.25
Lake Woodruff (LWQF1) (29.10N 81.37W) (6.1m)			10/1117		41				4.20
Merritt Island (MRFF1) (28.64N 80.73W) (6.1m)			10/1015	23	47				2.56
Paisley (TS959) (29.00N 81.54W)			10/1048	20	42				3.96
Panther Portable (TS738) (28.02N 81.48W)									3.26
Avon Park (TT601) (27.69N 81.33W)			10/0901	21	41				2.41
US Geological Survey (USGS) Stream Gauges									
Jupiter (26.95N 80.08W)							3.26	3.2	
Stuart (27.20N 80.21W)							3.64	4.1	
Wabasso Indian River (27.75N 80.43W)							3.30	4.0	
Georgia									
International Civil Aviation Organization (ICAO) Sites									
Donaldsonville (K17J) (31.01N 84.88W)	11/0355	997.3	10/2315	22	31				
Albany (KABY) (31.54N 84.18W)	11/0234	997.6	10/2016	20	32				
Bacon Cnty. (KAMG) (31.54N 82.50W)	10/2253	1001.6	11/0132		37				
Atlanta Intl. (KATL) (31.54N 82.50W)	11/1152	1000.0	11/0115	22	35				
Waycross (KAYS) (31.25N 82.40W)	10/2215	1000.8	10/2155	20	35				
Bainbridge (KBGE) (30.97N 84.63W)	11/0355	996.6	10/2135	25	31				
Blakely (KBIJ) (31.40N 84.90W)	11/0555	996.9	10/2255		22				
Brunswick (KBQK) (31.15N 81.47W)	10/2215	1004.0	10/2255	22	36				



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)				
Stafford (NCIG1) (30.92N 81.43W) (6.1m)			10/0919		34				
Oakland (TT667) (32.47N 84.56W) (6.1m)			11/0458		35				1.56
Public/Other									
Homer (F2849) (34.42N 83.47W)			11/0455		35				2.49
US Geological Survey (USGS) Stream Gauges									
St. Mary's Cumberland Sound (30.76N 81.47W)							6.82	4.0	
St. Simon Island (31.13N 81.40W)							6.64	3.6	
South Carolina									
International Civil Aviation Organization (ICAO) Sites									
Charleston (KCHS) (32.90N 80.04W)	11/1956	1006.1	11/1556	22	34				2.48
Coastal-Marine Automated Network (C-MAN) Sites									
Folly Island (FBIS1) (32.69N 79.89W) (9.8m)	11/2000	1007.1	10/1140	27 (10-min)	34				
National Ocean Service (NOS) Sites									
Charleston (CHTS1) (32.78N 79.92W) (8.8m)	11/1942	1005.3	10/2154	26	32	3.00			
Springmaid Pier (MROS1) (33.66N 78.92W) (6.9m)	11/2206	1007.1	11/0454	32	39	2.25			
WeatherFlow									
Beaufort (XBUF) (32.34N 80.59W) (10m)			10/2318	22	35				
Battery Point (XCHA) (32.76N 79.95W) (10m)			11/0207	20	43				
Calibogue Sound (XCLB) (32.11N 80.84W) (5.8m)			10/1428	35	45				
Isle of Palms (XIOP) (32.78N 79.79W) (8.2m)			11/0157	29	36				
Shute's Folly (XSHF) (32.77N 79.91W) (13m)			11/0208	27	36				



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)				
Sullivan's Island (XSUL) (32.77N 79.82W) (9.9m)			11/0157	26	35				
Fort Sumter (XSUM) (32.75N 79.87W) (12m)			10/1439	27	35				
Folly South End (32.64N 79.97W) (11m)			11/0202	29	39				
Murrells Inlet (33.52N 79.03W) (7.2m)			11/0450	25	36				
Winyah Bay Range (33.19N 79.18W) (15m)			09/2333	34	43				

- ^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 For most locations, storm tide is water height above the North American Vertical Datum of 1988 (NAVD88). Storm tide is water height above Mean Lower Low Water (MLLW) for NOS stations in Puerto Rico, the U.S. Virgin Islands, and Barbados.
- ^e Estimated inundation is the maximum height of water above ground. For some USGS storm tide pressure sensors, inundation is estimated by subtracting the elevation of the sensor from the recorded storm tide. For other USGS storm tide sensors and USGS high-water marks, inundation is estimated by subtracting the elevation of the land derived from a Digital Elevation Model (DEM) from the recorded and measured storm tide. For NOS tide gauges, the height of the water above Mean Higher High Water (MHHW) is used as a proxy for inundation.
- ⁱ Incomplete record.

Table 4. Selected storm-total rainfalls from various networks for Hurricane Nicole, 7 – 11 November 2022. When possible, stations are sorted by station identifier.

Location	Total Rainfall (in)	Location	Total Rainfall (in)
Bahamas			
Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) Sites			
Alice Town (BHS-BI-2) (27.73N 79.30W)	3.12	Hope Town 3NNE (BHS-HT-1) (26.53N 76.97W)	4.59
Cherokee 6NW (BHS-CO-4) (26.32N 77.10W)	5.82		
United States			
Florida			
Earth Networks Stations			
Forest City (APKSC) (28.67N 81.44W)	4.22	The Acreage 4NE (PBWFL) (26.81N 80.21W)	3.63
Florida Atlantic Univ. 1SW (BCBRC) (26.36N 80.12W)	4.17	Pompano Beach 2N (PMPNO) (26.27N 80.12W)	3.55
Boca West 2NE (BCRSR) (26.40N 80.14W)	3.29	Sea Ranch Lakes (PMPSC) (26.22N 80.10W)	3.88
Boynton Beach FR (BYNBC) (26.53N 80.06W)	4.87	Lake Mary 2ESE (SNWCH) (28.74N 81.30W)	6.25
Coconut Creek 1N (CCNTC) (26.26N 80.19W)	3.64	Central Florida Zoo 2SSW (SNWSR) (28.81N 81.34W)	4.31
Deerfield Beach (DEERF) (26.31N 80.10W)	3.89	Universal (TREXX) (28.46N 81.47W)	3.57
Fort Lauderdale 1SSE (FBGMC) (26.10N 80.14W)	3.35	Lake Buena Vista 1WNW (WDW01) (28.42N 81.60W)	5.31
Wilton Manners 1SW (FLDRD) (26.15N 80.15W)	3.17	Sea World (WNT15) (28.41N 81.47W)	4.64
Dania Beach 1NNW (FORTL) (26.07N 80.15W)	3.22	University Park 2NNW (WNT19) (28.61N 81.19W)	4.73
Lauderhill 1W (FTLAU) (26.15N 80.22W)	3.20	Azalea Park 1NW (WNT20) (28.56N 81.31W)	4.91
Pembroke Park 1E (HLL0D) (25.99N 80.16W)	3.26	Conway 2ESE (WNT21) (28.48N 81.29W)	4.76
Hollywood 1 SW (HLLYW) (26.00N 80.16W)	4.34	Orlando OCFR 81 (WNT26) (28.53N 81.25W)	6.27
Wekiva Springs (LNGWD) (28.70N 81.42W)	3.84	Aloma 1SE (WNT36) (28.58N 81.29W)	5.02
Longwood (LONGW) (28.70N 81.35W)	5.44	Pine Castle (WNT37) (28.47N 81.37W)	4.54
Sand Lake (ORLFL) (28.44N 81.47W)	3.03	Union Park 1SE (WNT40) (28.55N 81.21W)	5.65
Goldenrod 2ENE (OVDFL) (28.62N 81.25W)	5.14	Winter Springs 2NW (WNTRS) (28.70N 81.30W)	4.79



Location	Total Rainfall (in)	Location	Total Rainfall (in)
Oviedo (OVIDO) (28.67N 81.19W)	4.29	Florida Gardens 2N (WSTPB) (26.65N 80.16W)	3.02
Volusia County Network			
Tiger Bay SF (DLND2) (29.14N 81.14W)	3.27	Osteen (DYTV3) (28.85N 81.16W)	5.22
Duke Energy (DLVL3) (28.90N 81.33W)	4.58		
Public/Other Stations			
Apollo Beach (APBF1) (27.77N 82.39W)	3.08	Providence 6NW (PRVF1) (28.23N 82.03W)	3.71
Odessa 3S (CLKF1) (28.15N 82.58W)	3.07	Palmetto 4NE (RUBF1) (27.58N 82.55W)	3.30
Dade City 2E (DCYF1) (28.36N 82.14W)	4.68	Pinellas Park 2SE (SAWF1) (27.84N 82.67W)	3.77
Floral City 3E (LESF1) (28.75N 82.23W)	3.16	Land O' Lakes (SPEF1) (28.18N 82.52W)	3.10
Lakeland 2N (LKGF1) (28.10N 81.95W)	3.67	Tampa (TBBF1) (27.95N 82.37W)	3.02
Thonotosassa 2E (LKTF1) (28.05N 82.28W)	4.72	Tarpon Springs (TRPF1) (28.15N 82.75W)	3.15
Polk City (PLKF1) (28.18N 81.83W)	3.14	Old Town 3ESE (28.59N 82.94W)	3.16
NWS Cooperative Observer Program (COOP) Sites			
Deerfield Beach (BORF1) (26.32N 80.13W)	3.83	Okeechobee 12WNW (KSDF1) (27.31N 81.02W)	3.16
Boynton Beach (BYBF1) (26.54N 80.06W)	3.36	Kissimmee WTP 2S (KSSF1) (28.42N 81.42W)	3.93
Palm Beach Gardens 9WNW (CALF1) (26.87N 80.25W)	3.53	Lauderdale Lakes (LDLF1) (26.17N 80.18W)	3.15
Canal Point (CNRF1) (26.86N 80.63W)	3.00	Loxahatchee NWR (LOXF1) (26.50N 80.22W)	3.59
Pompano Beach (CCRF1) (26.22N 80.17W)	3.14	Melbourne WFO 1SE (MLBF1) (28.10N 80.63W)	3.43
Chiefland 5SE (CHIF1) (29.41N 82.82W)	3.38	N Miami Beach (NMBF1) (25.95N 80.22W)	4.42
Clermont 7S (CLRF1) (28.46N 81.72W)	3.20	Windermere (ORWF1) (28.51N 81.55W)	5.65
Cross City (CRSF1) (28.63N 83.11W)	4.60	Mt. Plymouth 3NW (PLTF1) (28.73N 81.57W)	3.37
Delray Beach (DBCF1) (26.42N 80.07W)	3.89	Ponce Inlet (PONF1) (29.04N 80.92W)	3.31
DeLand (DELF1) (29.02N 81.31W)	4.95	Port Salerno 6SW (PTSF1) (27.09N 80.33W)	3.91



Location	Total Rainfall (in)	Location	Total Rainfall (in)
Hollywood (HLWF1) (26.03N 80.13W)	5.45	Scottsmoor 2NW (SCMF1) (28.79N 80.88W)	3.95
Hastings 4NE (HTGF1) (29.77N 81.47W)	4.07	Sanford 1NE (SFNF1) (28.80N 81.27W)	5.06
Inverness 3SE (INVF1) (28.80N 82.31W)	3.50	Saint Leo (STLF1) (28.34N 82.26W)	5.72
Buckhead Ridge 15W (IPRF1) (27.12N 81.16W)	3.20	Titusville WTP (TITF1) (28.63N 80.83W)	6.01
Juno Beach (JUBF1) (28.86N 80.06W)	3.35	Stuart 6W (TPKF1) (27.21N 80.34W)	3.59
Kenansville (KENF1) (27.88N 81.00W)	3.26	Hillsborough River SP (ZPHF1) (28.15N 82.23W)	6.36
Kissimmee Prairie SP (KPPF1) (27.58N 81.05W)	3.07		
Hydrometeorological Automated Data System (HADS) Sites (NWS)			
Dunedin (CCKF1) (28.02N 82.74W)	3.57	Bradenton 22E (MKHF1) (27.47N 82.21W)	3.43
Delaney Creek (DLNF1) (27.93N 82.36W)	3.77	Northport 6NNE (NPOF1) (27.12N 82.19W)	3.25
Geneva 5ESE (GNEF1) (28.72N 81.04W)	4.90	Oldsmar 3ENE (OLDF1) (28.05N 82.63W)	3.46
Knights 4NW (KNTF1) (28.14N 82.15W)	4.80	Tampa (NACF1) (27.90N 82.35W)	3.47
Lithia 4W (LITF1) (27.87N 82.21W)	3.12	Pinellas Park (PSBF1) (27.87N 82.74W)	4.34
Lake Sylvan Park (LSPF1) (28.80N 81.39W)	5.32	Trilby 2NE (TRBF1) (28.48N 82.18W)	3.97
Myakka River SP (MKCF1) (27.24N 82.31W)	4.13		
Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) Sites			
Archer 6E (FL-AL-2) (29.53N 82.43W)	3.64	Oakland 3SSE (FL-OR-62) (28.52N 81.61W)	6.08
High Springs 3SW (FL-AL-17) (29.79N 82.63W)	3.70	Meadow 1SSE (FL-OR-74) (28.37N 81.36W)	3.88
Micanopy 2NNE (FL-AL-51) (29.53N 82.27W)	3.62	Apoka 3ENE (FL-OR-81) (28.70N 81.47W)	4.46
Hawthorne 5WNW (FL-AL-71) (29.62N 82.17W)	3.14	Campbell 1NNW (FL-OS-31) (28.27N 81.46W)	3.45
Gainesville 2NW (FL-AL-85) (29.70N 82.36W)	3.70	Kissimmee 4SW (FL-OS-33) (28.26N 81.45W)	3.60
Palm Bay 3NNW (FL-BV-5) (28.02N 80.69W)	4.63	Pine Grove 1ESE (FL-OS-36) (28.25N 81.16W)	3.04
Rockledge 1WSW (FL-BV-13) (28.31N 80.75W)	3.04	St. Cloud 6NNE (FL-OS-38) (28.31N 81.24W)	3.67



Location	Total Rainfall (in)	Location	Total Rainfall (in)
Palm Shores 4NNW (FL-BV-20) (28.24N 80.68W)	4.50	Jupiter 8W (FL-PB-9) (26.95N 80.23W)	3.73
Micco 1NW (FL-BV-20) (27.89N 80.53W)	3.00	Florida Gardens 1S (FL-PB-12) (26.61N 80.17W)	3.73
Titusville 3NW (FL-BV-38) (28.63N 80.86W)	3.48	Royal Palm Beach 5W (FL-PB-31) (26.71N 80.31W)	3.39
Cocoa 5NW (FL-BV-78) (28.42N 80.82W)	3.34	Pahokee 2NE (FL-PB-34) (26.84N 80.65W)	4.17
Satellite Beach 1ESE (FL-BV-89) (28.16N 80.59W)	3.67	Wellington 1SE (FL-PB-37) (26.65N 80.25W)	4.77
Indiatlantic 2NNW (FL-BV-107) (28.12N 80.58W)	3.54	Highland Beach (FL-PB-44) (26.40N 80.07W)	4.00
Melbourne 2S (FL-BV-125) (28.08N 80.63W)	4.30	Delray Beach 2SW (FL-PB-61) (26.44N 80.11W)	3.56
Lighthouse Point 1WNW (FL-BW-7) (26.29N 80.10W)	3.35	Boynton Beach 6WNW (FL-PB-72) (26.55N 80.18W)	3.16
Hillsborough Beach 1NNW (FL-BW-26) (26.30N 80.08W)	4.81	Aberdeen 1WNW (FL-PB-77) (26.56N 80.17W)	3.68
Plantation 2WNW (FL-BW-116) (26.14N 80.30W)	3.01	Golden Lakes 2SSW (FL-PB-87) (26.67N 80.18W)	3.28
Pompano Beach 1NNE (FL-BW-137) (26.25N 80.12W)	3.65	Greenacres City 3SW (FL-PB-117) (26.60N 80.18W)	3.56
Oakland Park 2WNW (FL-BW-145) (26.89N 80.17W)	3.18	Polk City 2WSW (FL-PK-55) (28.17N 81.85W)	3.55
Lauderdale by the Sea (FL-BW-159) (26.19N 80.11W)	3.94	Davenport 2NW (FL-PK-67) (28.18N 81.62W)	3.25
Margate 1NNW (FL-BW-162) (26.26N 80.21W)	3.46	Loughman 2ESE (FL-PK-78) (28.22N 81.54W)	3.68
Deerfield Beach (FL-BW-167) (26.31N 80.09W)	4.18	Lakeland 6NE (FL-PK-87) (28.10N 81.89W)	3.38
Hollywood 1ESE (FL-BW-170) (26.01N 80.14W)	3.95	S Pasadena 1E (FL-PN-17) (27.75N 82.73W)	5.00
Hernando 2N (FL-CT-11) (28.93N 82.37W)	3.64	Dunedin 3ESE (FL-PN-36) (28.03N 82.76W)	3.35
Inverness 4NW (FL-CT-31) (28.88N 82.40W)	3.61	Gulfport 1NNW (FL-PN-35) (27.76N 82.72W)	4.39
Citrus Springs 1WNW (FL-CT-37) (29.01N 82.49W)	3.30	St. Petersburg 5NW (FL-PN-60) (27.80N 82.70W)	5.84
Fleming Island 2S (FL-CY-37) (30.06N 81.71W)	3.53	Palm Harbor 1S (FL-PN-71) (28.07N 82.77W)	3.79
Keystone Heights 10NE (FL-CY-38) (29.86N 81.90W)	4.10	Seminole 3WNW (FL-PN-77) (27.86N 82.83W)	4.27
Green Cove Springs 3WNW (FL-CY-42) (30.01N 81.72W)	3.42	Pinellas Park 2ENE (FL-PN-90) (27.87N 82.68W)	5.17
Orange Park 1SSW (FL-CY-51) (30.16N 81.71W)	3.43	Largo 3SE (FL-PN-94) (27.88N 82.74W)	4.70
Fruit Cove 6E (FL-DV-98) (30.11N 81.52W)	3.68	Clearwater 3SE (FL-PN-96) (27.95N 82.74W)	5.19



Location	Total Rainfall (in)	Location	Total Rainfall (in)
Jacksonville 14SSE (FL-DV-117) (30.14N 81.57W)	3.57	Port Richey 2NNE (FL-PS-4) (28.30N 82.71W)	3.30
Newberry 4NW (FL-GC-3) (29.68N 82.67W)	3.36	Lutz 3NE (FL-PS-6) (28.17N 82.42W)	3.84
Plant City 6NW (FL-HB-1) (28.07N 82.21W)	4.37	Zephyrhills 3NNW (FL-PS-7) (28.27N 82.19W)	4.63
University West 2WNW (FL-HB-44) (28.08N 82.46W)	3.05	Dade City 2WSW (FL-PS-10) (28.35N 82.22W)	6.11
Greater Northdale (FL-HB-48) (28.11N 82.51W)	3.67	Lacoochee 1NE (FL-PS-49) (28.48N 82.16W)	5.21
Tampa 5NNE (FL-HB-55) (28.01N 82.42W)	3.56	Holiday 1E (FL-PS-51) (28.19N 82.73W)	3.62
Riverview 2W (FL-HB-69) (27.87N 82.35W)	3.76	Eifers 6ESE. (FL-PS-65) (28.19N 82.62W)	3.45
Lutz 1WSW (FL-HB-116) (28.13N 82.47W)	3.44	New Port Richey 2SW (FL-PS-68) (28.22N 82.74W)	3.89
Thonotosassa 4NE (FL-HB-123) (28.09N 82.26W)	5.12	Land o' Lakes 4E (FL-PS-72) (28.23N 82.39W)	4.62
Brandon 3SW (FL-HB-136) (27.90N 82.33W)	3.59	Wesley Chapel 2ESE (FL-PS-73) (28.18N 82.34W)	3.78
Sun City Center 1S (FL-HB-139) (27.71N 82.35W)	3.68	Satsuma (FL-PT-4) (29.55N 81.66W)	3.45
Sefner (FL-HB-154) (27.99N 82.27W)	4.05	E Palatka 4NNW (FL-PT-8) (29.70N 81.63W)	3.95
Valrico 2NNW (FL-HB-160) (27.97N 82.25W)	3.50	Florahome 4NNE (FL-PT-12) (29.78N 81.85W)	3.23
Carrollwood Village (FL-HB-168) (28.07N 82.56W)	3.50	San Mateo 2SE (FL-PT-24) (29.59N 81.55W)	3.33
Apollo Beach 1W (FL-HB-173) (27.77N 82.42W)	3.87	Interlachen 4NNE (FL-PT-26) (29.66N 81.87W)	3.72
Ruskin 3W (FL-HB-178) (27.71N 82.48W)	3.37	Hollister 1NW (FL-PT-27) (29.63N 81.82W)	3.84
Sylvan Shores 9NE (FL-HL-12) (27.41N 81.25W)	3.51	Palatka 4SW (FL-PT-29) (29.64N 81.72W)	3.05
Sebring 5WNW (FL-HL-13) (27.52N 81.53W)	3.35	St. Augustine 12WNW (FL-SJ-16) (29.94N 81.51W)	4.49
Brooksville 4SE (FL-HN-22) (28.52N 82.34W)	3.50	Palm Valley 5SSW (FL-SJ-31) (30.12N 81.43W)	3.28
Labelle (FL-HY-8) (26.76N 81.44W)	3.98	Fruit Cove 3E (FL-SJ-46) (30.10N 81.57W)	4.26
Devils Garden 2ENE (FL-HY-12) (26.62N 81.10W)	3.30	Fort Pierce (FL-SL-11) (27.39N 80.33W)	3.21
Fellsmere 4N (FL-IR-51) (27.82N 80.59W)	3.56	Port St. Lucie 5SSW (FL-SL-53) (27.21N 80.38W)	3.47
Vero Beach 12NW (FL-IR-54) (27.76N 80.53W)	3.46	Altamonte Springs 1N (FL-SM-26) (28.68N 81.40W)	5.36
Mt. Plymouth (FL-LK-5) (28.80N 81.54W)	3.37	Casselberry 2ESE (FL-SM-35) (28.65N 81.29W)	6.63



Location	Total Rainfall (in)	Location	Total Rainfall (in)
Oakland 3WSW (FL-LK-27) (28.54N 81.68W)	5.47	Chuluota 1WSW (FL-SM-37) (28.64N 81.13W)	5.84
Fruitland Park 1NNW (FL-LK-28) (28.87N 81.928W)	3.25	Winter Springs 2SSE (FL-SM-38) (28.66N 81.26W)	6.65
Leesburg 3NW (FL-LK-30) (28.84N 81.91W)	4.09	Maitland 1NE (FL-SM-44) (28.64N 81.35W)	5.49
Lady Lake 6S (FL-LK-31) (28.85N 81.94W)	3.22	Sanford 2W (FL-SM-47) (28.79N 81.32W)	5.34
Paisley 2E (FL-LK-44) (28.98N 81.50W)	4.16	Oviedo 2W (FL-SM-48) (28.66N 81.22W)	5.67
Mt. Dora 2E. (FL-LK-50) (28.80N 81.62W)	3.43	Longwood 1N (FL-SM-50) (28.72N 81.35W)	5.30
Clermont 1SE (FL-LK-51) (28.54N 81.75W)	4.54	Sarasota Springs 4E (FL-SS-73) (27.32N 82.41W)	3.46
Groveland 5NE (FL-LK-52) (28.61N 81.79W)	3.69	Lake Sarasota 8ESE (FL-SS-81) (27.26N 82.31W)	3.56
Ellenton 7E (FL-MA-6) (27.54N 82.42W)	3.01	North Port 5 NNE (FL-SS-84) (27.12N 82.16W)	3.86
Palmetto 6NW (FL-MA-22) (27.56N 82.48W)	4.60	The Villages 3ESE (FL-ST-26) (28.90N 81.97W)	3.03
Parrish 6SE (FL-MA-40) (27.52N 82.37W)	4.77	Edgewater 2N (FL-VL-6) (29.00N 80.91W)	3.69
Madison 1ENE (FL-MS-3) (30/47N 83.40W)	4.35	Oak Hill 3WSW (FL-VL-38) (28.86N 80.87W)	4.61
Palm City 4SW (FL-MT-1) (27.12N 80.32W)	3.58	Daytona Beach Shores 2SSE (FL-VL-42) (29.15N 80.97W)	3.12
Jensen Beach 2NW (FL-MT-19) (27.25N 80.26W)	4.11	DeBary 2NE (FL-VL-51) (28.90N 81.29W)	6.13
Indiantown (FL-MT-26) (27.03N 80.47W)	4.06	Ormond-by-the-Sea 1SSE (FL-VL-81) (29.33N 81.06W)	3.80
Stuart 8S (FL-MT-35) (27.07N 80.26W)	4.49	Ormond Beach 4ESE (FL-VL-82) (29.27N 81.03W)	3.39
Palm City 1SW (FL-MT-39) (27.15N 80.28W)	3.66	DeLand 2NE (FL-VL-83) (28.98N 81.28W)	5.05
Hobe Sound 1WNW (FL-MT-42) (27.08N 80.15W)	3.82	DeLeon Springs (FL-VL-86) (29.11N 81.33W)	4.61
Port Salerno 2SW (FL-MT-46) (27.12N 80.21W)	3.68	Port Orange 1 NNW (FL-VL-87) (29.12N 81.01W)	4.90
Okeechobee 18NNW (FL-OB-5) (27.47N 80.98W)	3.24	New Smyrna Beach 8W (FL-VL-89) (29.05N 81.06W)	5.35
Union Park 1E (FL-OR-19) (28.56N 81.22W)	6.20	Lake Helen 1S (FL-VL-90) (28.97N 81.23W)	5.80
Orlando 5NNW (FL-OR-26) (28.57N 81.40W)	7.11	Orange City 1ENE (FL-VL-103) (28.95N 81.27W)	5.07
Ocoee 1N (FL-OR-34) (28.59N 81.53W)	5.28	Pierson 1ENE (FL-VL-105) (29.24N 81.45W)	3.27
Bay Lake 4WSW (FL-OR-35) (28.36N 81.63W)	6.42		



Location	Total Rainfall (in)	Location	Total Rainfall (in)
Georgia			
Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) Sites			
Kingsland 3NE (GA-CM-4) (30.82N 81.63W)	3.75	Waycross 3NNW (GA-WR-7) (31.24N 82.38W)	3.15
Ellaville 5ENE (GA-SY-3) (32.25N 84.23W)	3.01		
South Carolina			
NWS Cooperative Observer Program (COOP) Sites			
Caesars Head (CAES1) (35.11N 82.63W)	3.68	Jocassee 8WNW (JOCS1) (34.99N 83.07W)	5.08
Hydrometeorological Automated Data System (HADS) Sites (NWS)			
Tyron 5SW (TRYS1) (35.16N 82.28W)	3.50		
Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) Sites			
Huger 8S (SC-BK-86) (32.98N 79.80W)	3.14	Hampton (SC-HM-15) (32.87N 81.11W)	3.86
Charleston 3NNW (SC-CR-226) (32.8N 80.01W)	3.30		

Table 5. Number of hours in advance of formation of Nicole 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	132
Medium (40%-60%)	36	66
High (>60%)	18	36

Table 6a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Hurricane Nicole, 7 – 11 November 2022. 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	18.9	22.6	31.4	37.2	38.3	71.4	184.2	
OCD5	58.9	148.1	277.3	431.0	608.0	833.1	1277.3	
Forecasts	16	14	12	10	8	6	2	
OFCL (2017-21)	23.6	35.5	47.6	61.4	78.2	91.3	125.6	
OCD5 (2017-21)	45.5	98.3	156.7	213.7	252.4	316.9	403.6	

Table 6b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Hurricane Nicole, 7 – 11 November 2022. Errors smaller than the NHC official forecast are shown in boldface type.

Model ID	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	18.9	22.6	31.4	37.2	38.3	71.4	184.2	
OCD5	58.9	148.1	277.3	431.0	608.0	833.1	1277.3	
GFSI	22.6	33.4	42.6	44.7	44.6	79.1	247.4	
HWFI	21.6	36.2	54.6	51.9	49.0	71.6	207.9	
HMNI	29.3	48.9	64.7	91.2	109.7	112.1	78.3	
EGRI	26.8	33.6	50.9	53.1	48.2	71.2	122.2	
EMXI	19.4	29.4	33.4	32.4	34.9	63.6	147.0	
UEMI	22.1	27.8	41.5	49.7	58.3	83.2	156.1	
CMCI	20.9	26.3	40.2	55.3	60.0	87.3	198.6	
CTCI	16.7	34.1	52.9	69.4	82.7	124.1	242.6	
TVCA	18.0	24.5	35.7	38.6	35.3	67.8	183.4	
HCCA	17.4	20.3	24.6	27.5	33.7	65.3	179.6	
FSSE	18.2	24.7	26.5	30.4	44.7	81.1	187.3	
AEMI	18.8	26.0	33.0	42.1	61.2	96.4	221.6	
TABS	31.6	49.4	69.2	92.4	113.5	133.3	180.5	
TABM	28.3	42.5	59.3	65.5	78.6	80.2	197.7	
TABD	37.7	75.3	113.6	129.8	126.4	121.6	139.8	
Forecasts	16	14	12	10	8	6	2	

Table 7a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Hurricane Nicole, 7 – 11 November 2022. 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	3.1	4.6	3.8	4.5	3.8	5.0	17.5	
OCD5	5.1	7.3	8.4	13.4	17.6	16.2	27.0	
Forecasts	16	14	12	10	8	6	2	
OFCL (2017-21)	5.4	8.0	9.5	10.9	11.0	12.1	13.1	
OCD5 (2017-21)	7.0	11.1	14.5	17.1	18.0	20.2	21.9	

Table 7b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Hurricane Nicole, 7 – 11 November 2022. Errors smaller than the NHC official forecast are shown in boldface type.

Model ID	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	3.1	4.6	3.8	4.5	3.8	5.0	17.5	
OCD5	5.1	7.3	8.4	13.4	17.6	16.2	27.0	
HWFI	4.3	5.6	8.2	7.7	6.8	11.3	20.0	
HMNI	4.1	5.1	3.4	5.7	7.5	6.8	7.0	
DSHP	4.2	5.4	5.2	4.9	5.2	3.0	5.5	
LGEM	3.9	5.4	5.8	6.3	5.0	2.7	8.5	
ICON	3.6	4.7	4.6	5.8	5.1	5.0	10.5	
IVCN	3.6	4.2	4.2	5.3	5.1	4.8	12.0	
CTCI	4.6	3.2	3.8	4.0	6.1	5.3	16.5	
GFSI	4.3	5.6	7.7	9.3	9.8	7.8	19.5	
EMXI	4.8	9.6	12.6	12.4	11.0	8.7	1.5	
HCCA	3.4	3.9	2.2	4.5	5.0	5.5	16.5	
FSSE	3.6	4.1	1.7	3.1	3.5	3.2	14.0	
Forecasts	16	14	12	10	8	6	2	

Table 8. Wind watch and warning summary for Hurricane Nicole, 7 – 11 November 2022.

Date/Time (UTC)	Action	Location
7 / 0900	Tropical Storm Watch issued	Northwestern Bahamas, including Andros Island, New Providence, Eleuthera, Abacos Islands, Berry Islands, Grand Bahama Island, and Bimini
7 / 1500	Tropical Storm Watch changed to Hurricane Watch	Northwestern Bahamas, including Andros Island, New Providence, Eleuthera, Abacos Islands, Berry Islands, Grand Bahama Island, and Bimini
7 / 1500	Hurricane Watch issued	Florida Atlantic coast from Hallandale Beach to the Volusia/Brevard county line, and Lake Okeechobee
7 / 1500	Tropical Storm Watch issued	Florida Atlantic coast from Ocean Reef to Hallandale Beach
7 / 1500	Tropical Storm Watch issued	Florida Atlantic coast and Georgia coast from the Volusia/Brevard county line to Altamaha Sound, Georgia
7 / 2100	Hurricane Warning issued	Northwestern Bahamas, including Abacos Islands, Berry Islands, Grand Bahama Island, and Bimini
7 / 2100	Tropical Storm Warning issued	Northwestern Bahamas, including Andros Island, New Providence, Eleuthera
8 / 0300	Tropical Storm Warning issued	Florida Atlantic coast and Georgia coast from Hallandale Beach, Florida to Altamaha Sound, Georgia, and Lake Okeechobee
8 / 0900	Tropical Storm Watch issued	Florida Gulf coast from the Ochlockonee River to Bonita Beach
8 / 1500	Hurricane Warning issued	Florida Atlantic coast from Boca Raton to the Flagler/Volusia county line
8 / 1500	Hurricane Watch issued	Florida Atlantic coast from Flagler/Volusia CL to Ponte Vedra Beach
8 / 1500	Tropical Storm Watch issued	Georgia coast from the Altamaha Sound to the Savannah River
8 / 2100	Tropical Storm Watch issued	South Carolina coast from the Savannah River to the South Santee River
9 / 0900	Tropical Storm Warning issued	Florida Gulf coast from Indian Pass to Bonita Beach



Date/Time (UTC)	Action	Location
9 / 0900	Tropical Storm Warning issued	Altamaha Sound, Georgia to South Santee River, South Carolina
9 / 0900	Hurricane Watch discontinued	Florida Atlantic coast from the Flagler/Volusia county line to Ponte Vedra Beach
9 / 1500	Tropical Storm Warning discontinued	Northwestern Bahamas, including Andros Island, New Providence, Eleuthera
9 / 1500	Hurricane Warning changed to Tropical Storm Warning	Bimini
9 / 1800	Tropical Storm Watch discontinued	Florida Atlantic coast south of Hallandale Beach
10 / 0300	Hurricane Watch discontinued	Florida Atlantic coast from Hallandale Beach to Boca Raton
10 / 0900	Hurricane Warning changed to Tropical Storm Warning	Florida Atlantic coast from Boca Raton to the Flagler/Volusia county line
10 / 0900	All warnings discontinued	Northwestern Bahamas
10 / 0900	All warnings discontinued	Florida Atlantic coast south of Boca Raton
10 / 0900	Hurricane Watch discontinued	Lake Okeechobee
10 / 1200	Tropical Storm Warning discontinued	Florida Atlantic coast south of Jupiter
10 / 1500	Tropical Storm Warning discontinued	Florida Atlantic coast south of Sebastien Inlet, including Lake Okeechobee
10 / 1500	Tropical Storm Warning discontinued	Florida Gulf coast south of Englewood
10 / 1800	Tropical Storm Warning discontinued	Florida Gulf coast south of the middle of Longboat Key
10 / 2100	Tropical Storm Warning discontinued	Florida Atlantic coast south of the Flagler/Volusia county line
10 / 2100	Tropical Storm Warning discontinued	Florida Gulf coast south of Aripeka
10 / 2100	Tropical Storm Warning discontinued	Coasts of Georgia and South Carolina north of Altamaha Sound
11 / 0300	All coastal watches and warnings discontinued	

Table 9. Storm Surge watch and warning summary for Hurricane Nicole, 7 – 11 November 2022.

Date/Time (UTC)	Action	Location
7 / 1500	Storm Surge Watch issued	Altamaha Sound GA to Hallandale Beach FL
7 / 2100	Storm Surge Watch issued	Mouth of the St. Johns River south to East Palatka
8 / 0300	Storm Surge Warning issued	North Palm Beach FL northward to Altamaha Sound GA, including Mouth of St. Johns River to Georgetown
8 / 1500	Storm Surge Watch issued	Altamaha Sound GA to the Savannah River and from Anclote River FL to Suwannee River FL
8 / 2100	Storm Surge Watch issued	Savannah River to the South Santee River SC and from the Suwannee River FL to the Ochlockonee River FL
9 / 0300	Storm Surge Watch issued	Ochlockonee River FL to Indian Pass FL
9 / 1500	Storm Surge Warning issued	Anclote River FL to Ochlockonee River FL
10 / 0900	Storm Surge Warning discontinued	North Palm Beach FL to Jupiter Inlet FL
10 / 0900	Storm Surge Watch discontinued	North Palm Beach FL to Hallandale Beach FL
10 / 1500	Storm Surge Warning discontinued	Jupiter Inlet FL to Sebastian Inlet FL
10 / 2100	Storm Surge Warning discontinued	Sebastian Inlet FL to Flagler/Volusia County Line
10 / 2100	Storm Surge Watch discontinued	South Santee River SC to the Altamaha Sound GA and from the Ochlockonee River FL to Indian Pass FL
11 / 0300	Storm Surge Warning discontinued	All

FIGURES

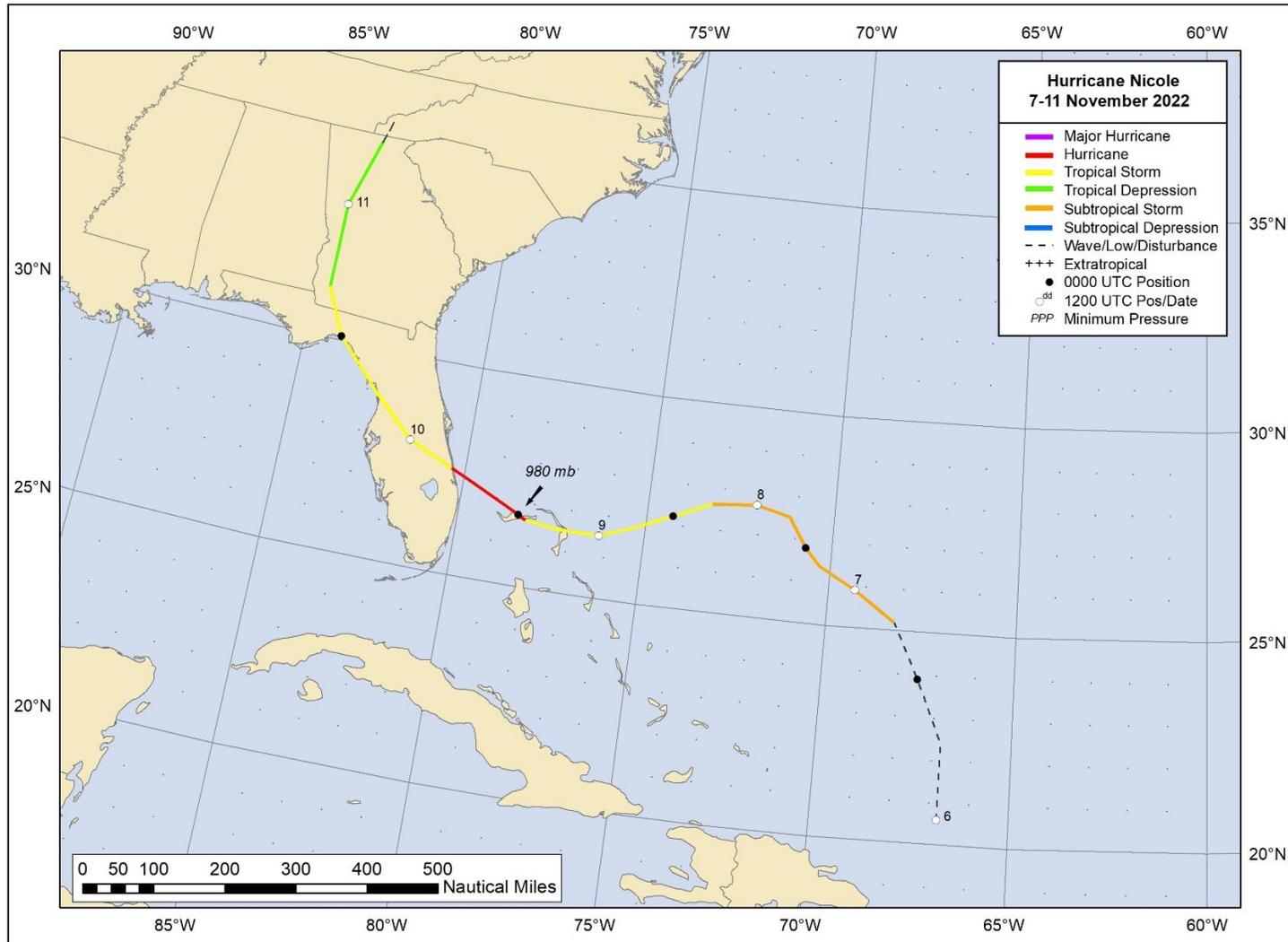


Figure 1. Best track positions for Hurricane Nicole, 7 – 11 November 2022. Tracks over the United States are partially based on analyses from the NOAA Weather Prediction Center.

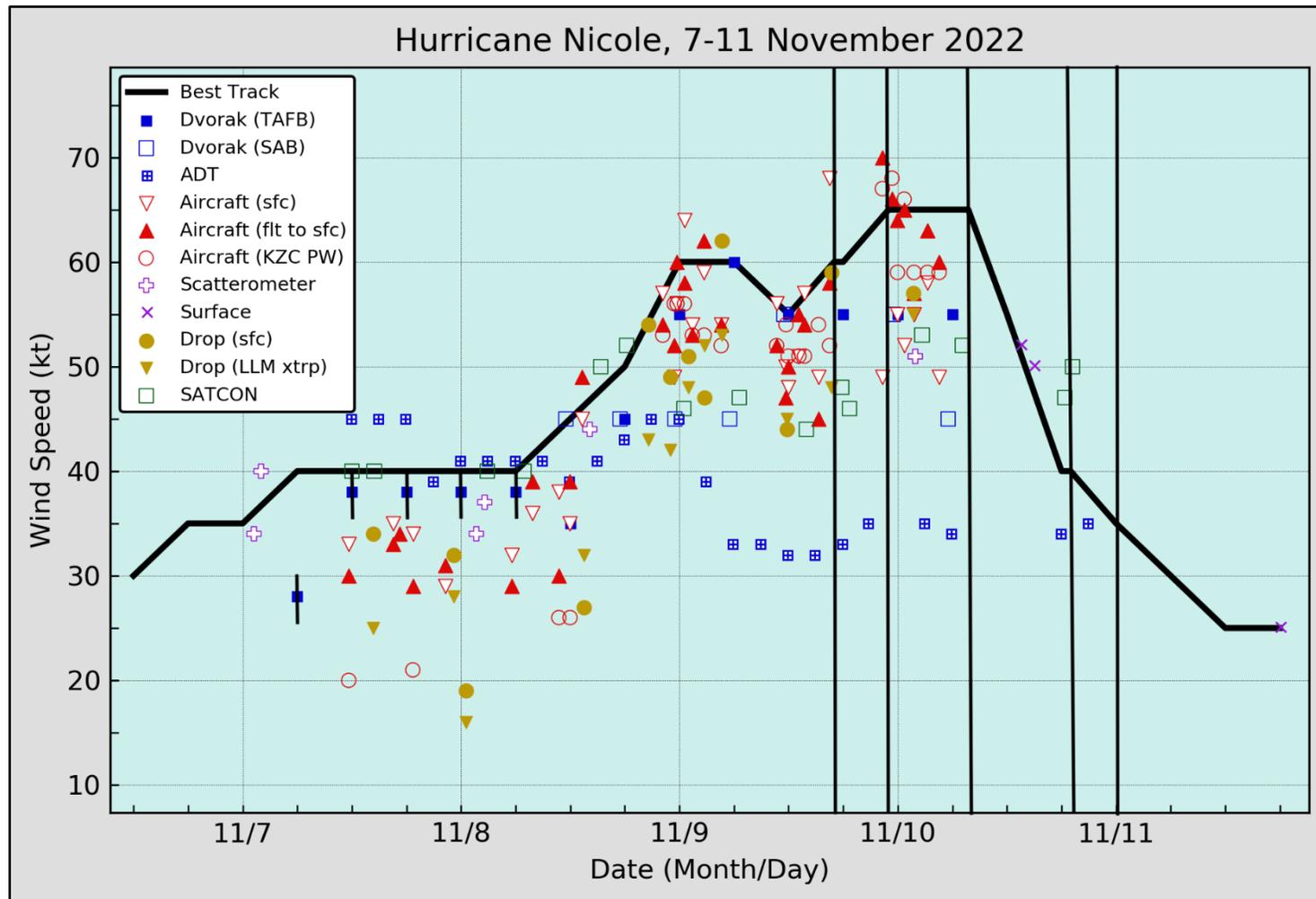


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Nicole, 7 – 11 November 2022. Aircraft observations have been adjusted for elevation using 90%, 80%, and 75% adjustment factors for observations from 700 mb, 850 mb, and 925 mb, respectively. 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 long vertical lines correspond to landfalls. Short vertical lines represent subtropical cyclone intensity estimates.

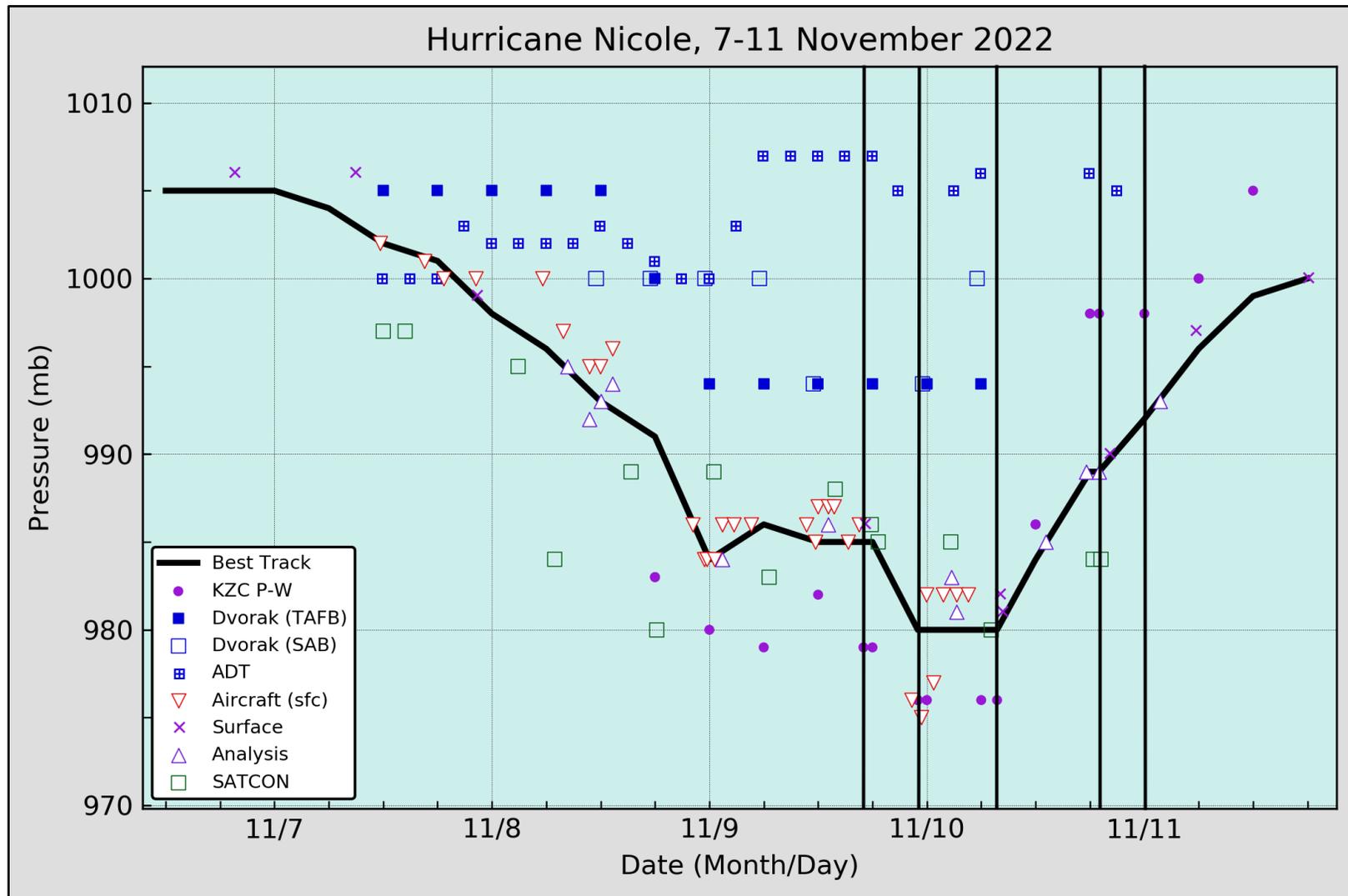


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Nicole, 7 – 11 November 2022. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological 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.

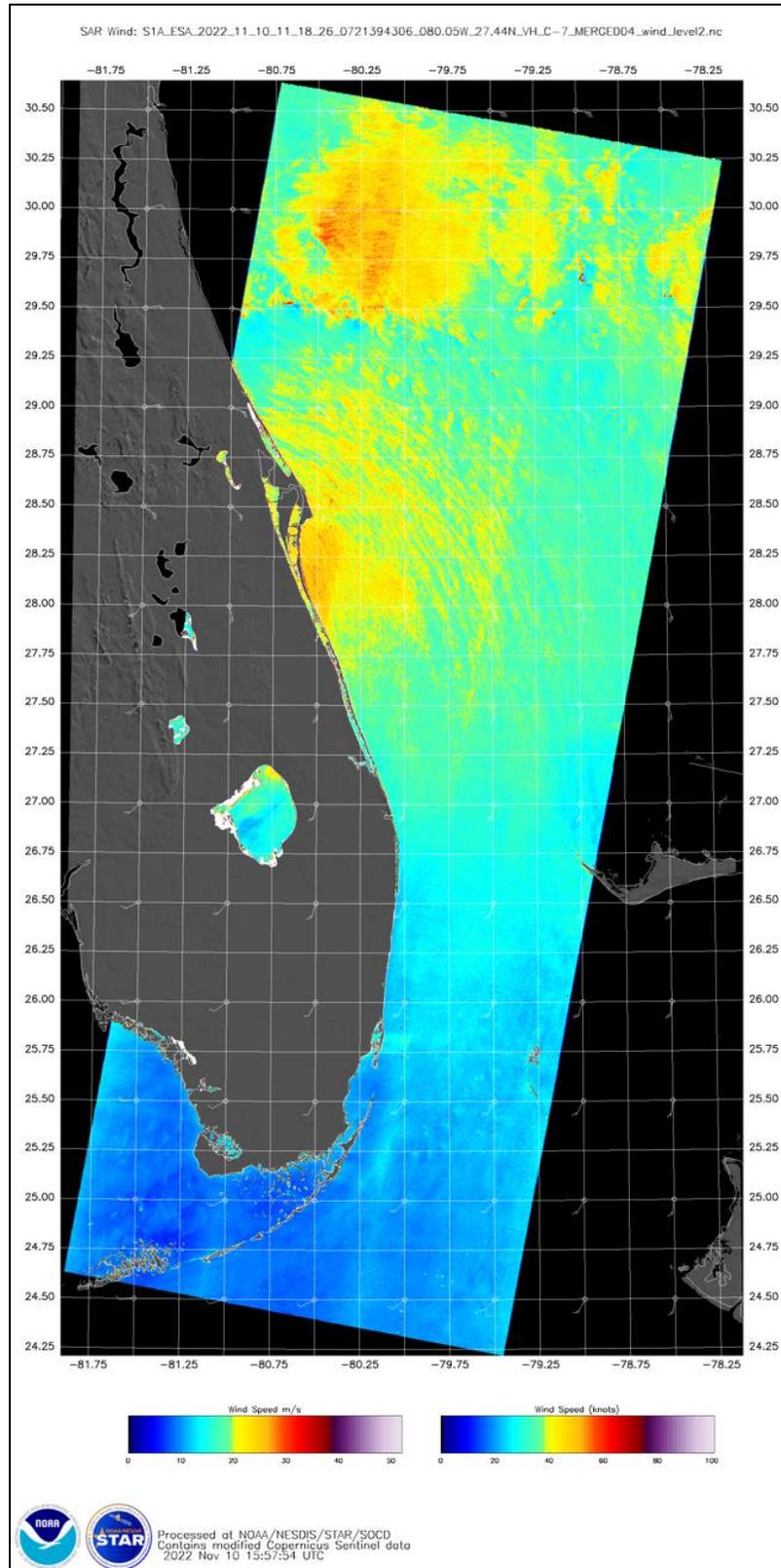


Figure 4. Sentinel 1A Synthetic Aperture Radar image of wind velocities (m/s and kt) associated with Nicole at 1118 UTC 10 November 2023. Image courtesy of the European Space Agency and NESDIS STAR.

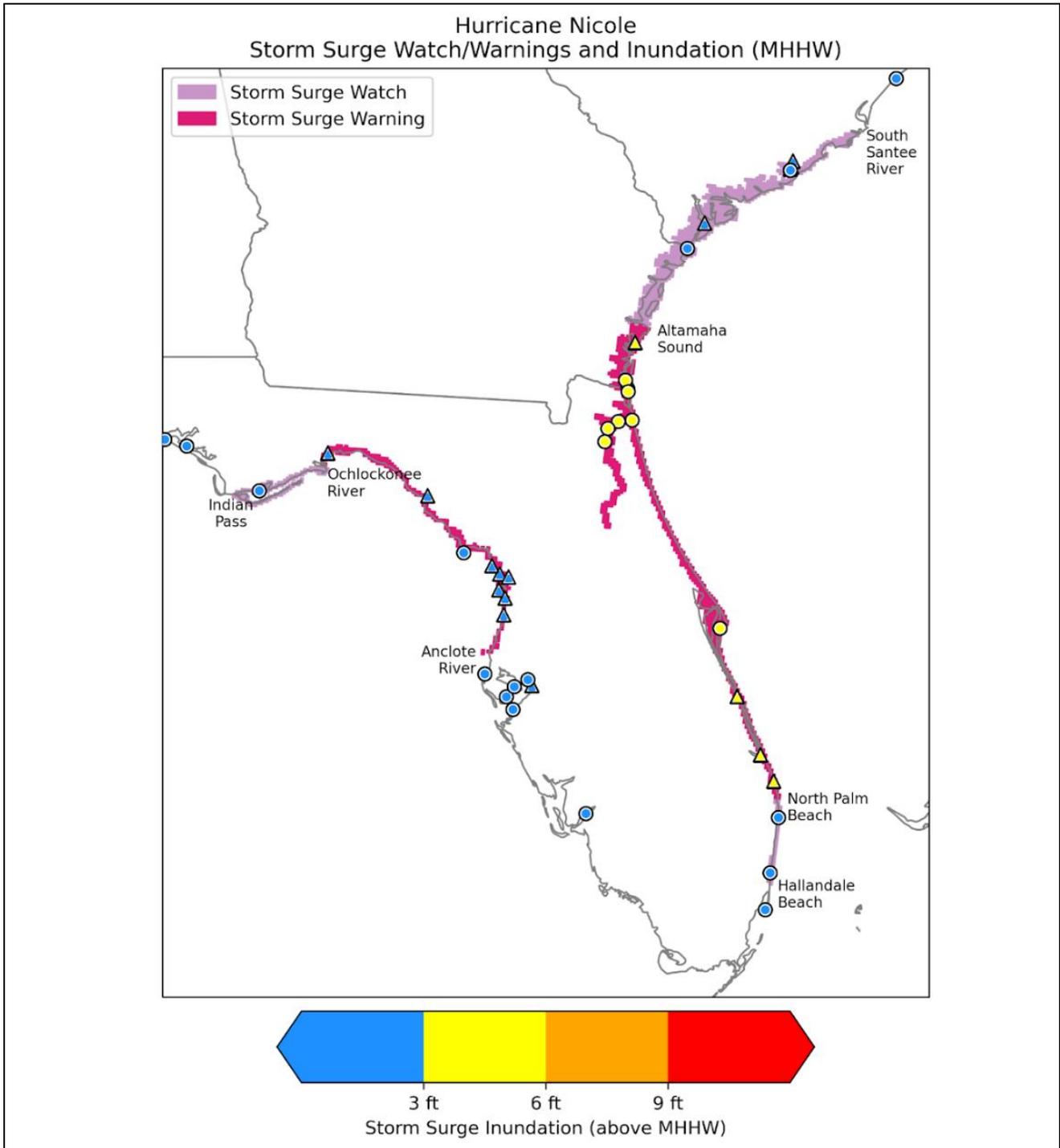


Figure 5. Maximum water levels measured during Hurricane Nicole from NOS tide gauges (circles) and USGS stream gauges (triangles), as well as areas covered by storm surge watches (lavender) and warnings (magenta) issued at 1500 UTC 9 November. Water levels are referenced as feet above Mean Higher High Water (MHHW), which is used as a proxy for inundation (above ground level) on normally dry ground along the immediate coastline.

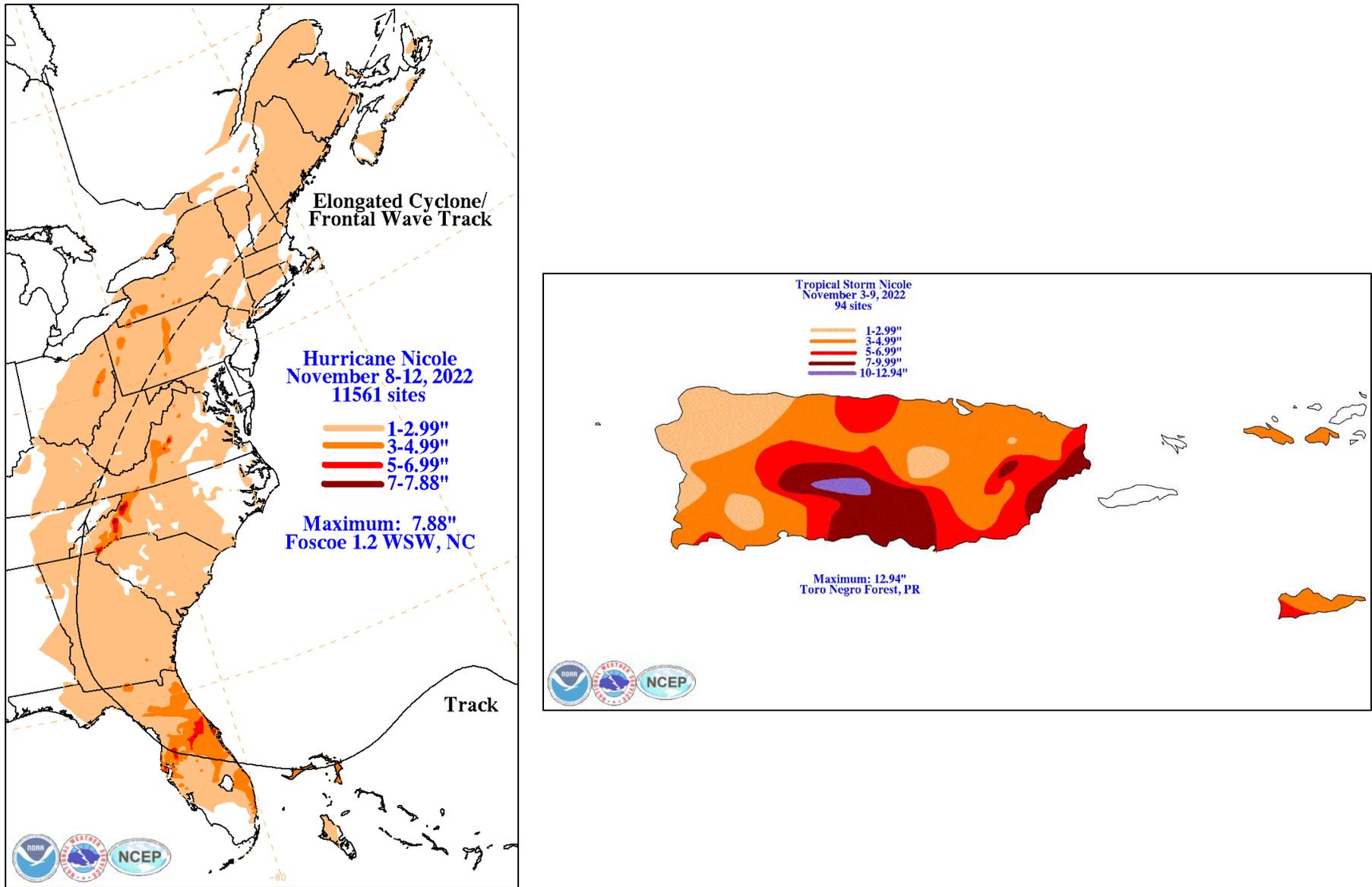


Figure 6. Analysis of storm total rainfall (inches) for Hurricane Nicole over the Bahamas and United States (left) and Puerto Rico and the U.S. Virgin Islands (right). Images courtesy of David Roth of the NOAA Weather Prediction Center.

Nicole 5-day Tropical Weather Outlook Areas

From: 1800 UTC 1 Nov 2022 to 0600 UTC 7 Nov 2022

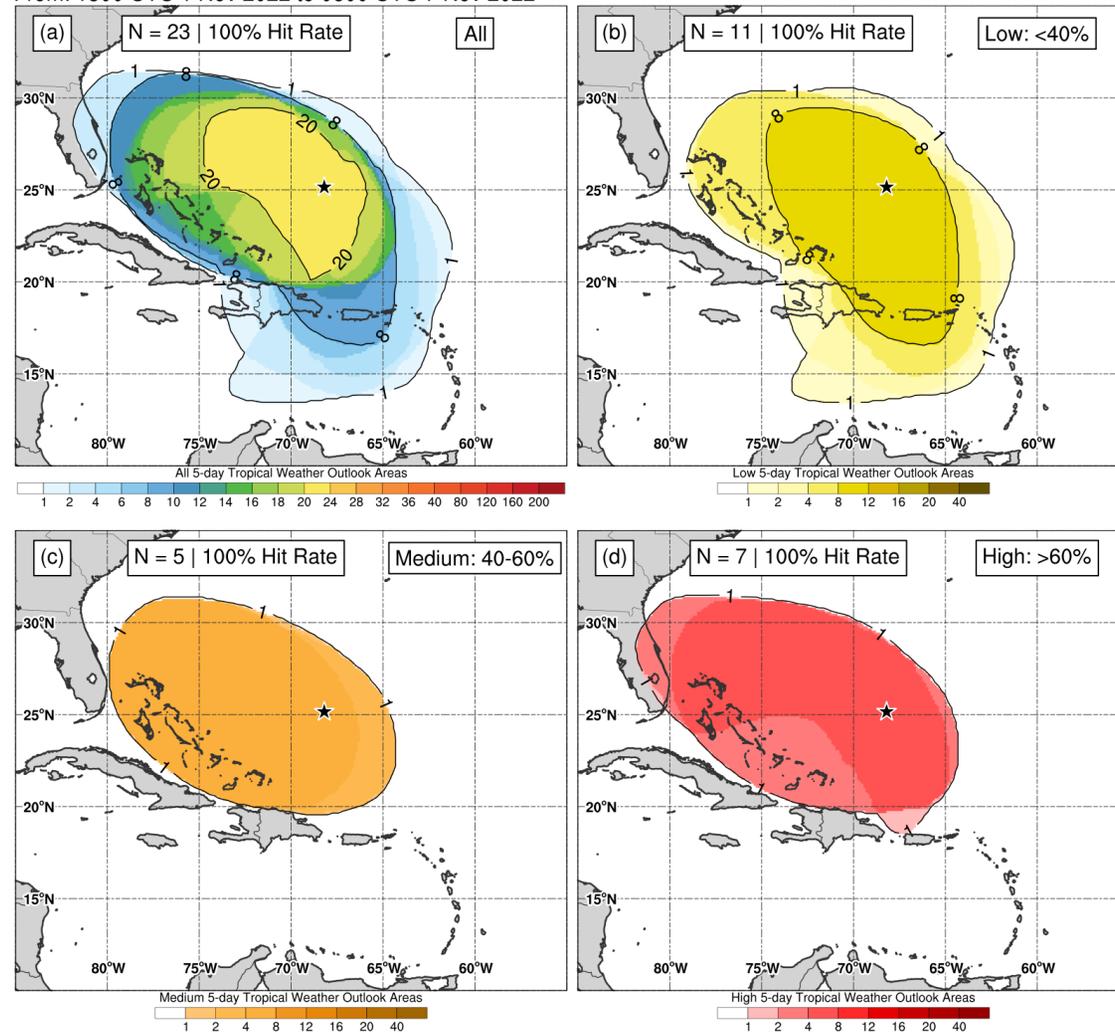


Figure 7. 5-day Tropical Weather Outlook genesis areas associated with the disturbance that developed into Hurricane Nicole for (a) all probability areas (10–100%, multi-color shading), (b) low probability areas (< 40%, yellow shading), (c) medium probability areas (40–60%, orange shading), and (d) high probability areas (> 60%, red shading). The black star in each panel indicates the genesis location of Nicole. Hit rate indicates the percentage of outlook areas where the genesis location was captured within.

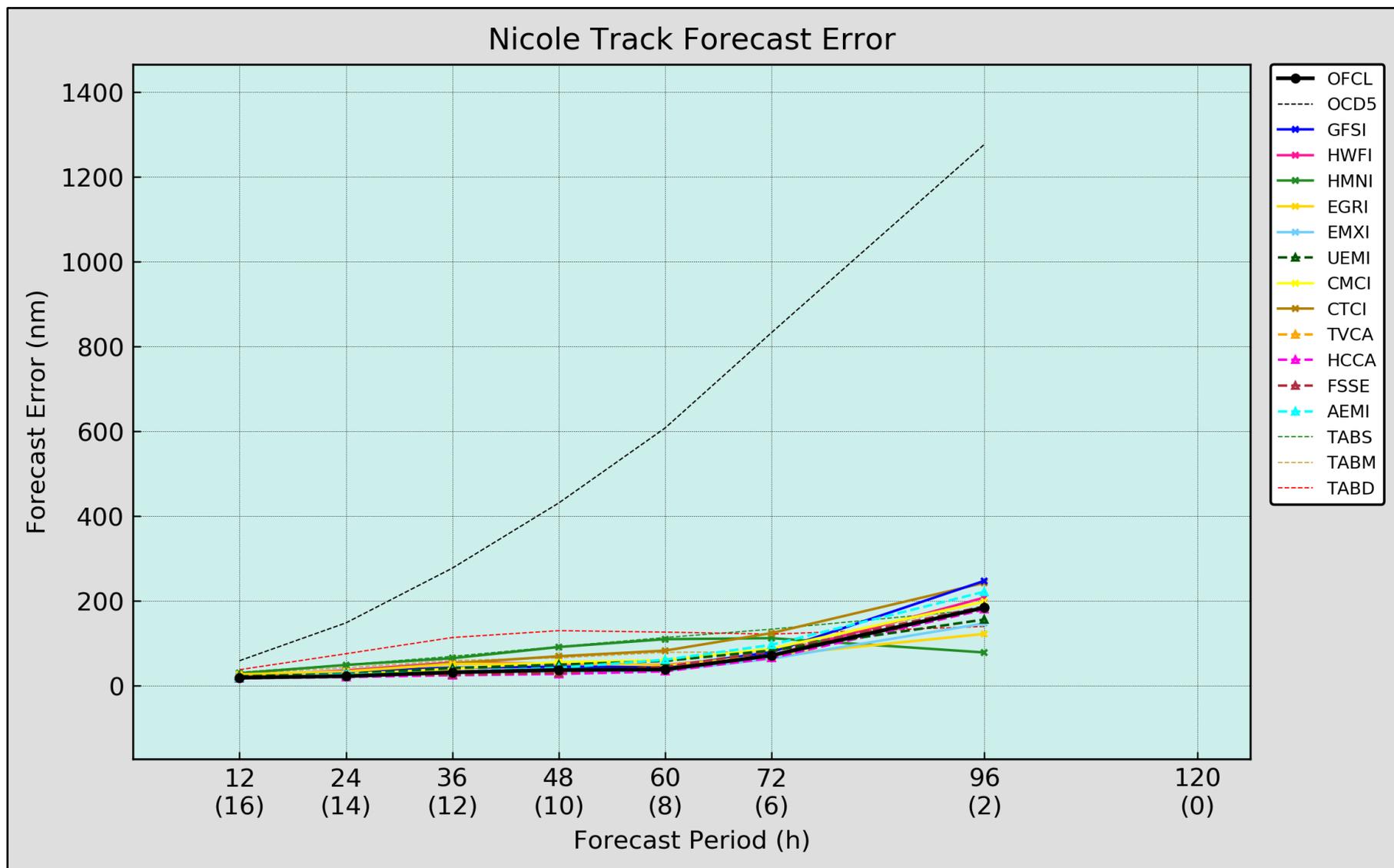


Figure 8. Homogeneous comparison of selected track forecast guidance model errors (in n mi) for Hurricane Nicole, 7 - 11 November 2022. Official NHC track errors are denoted by the thick black line.

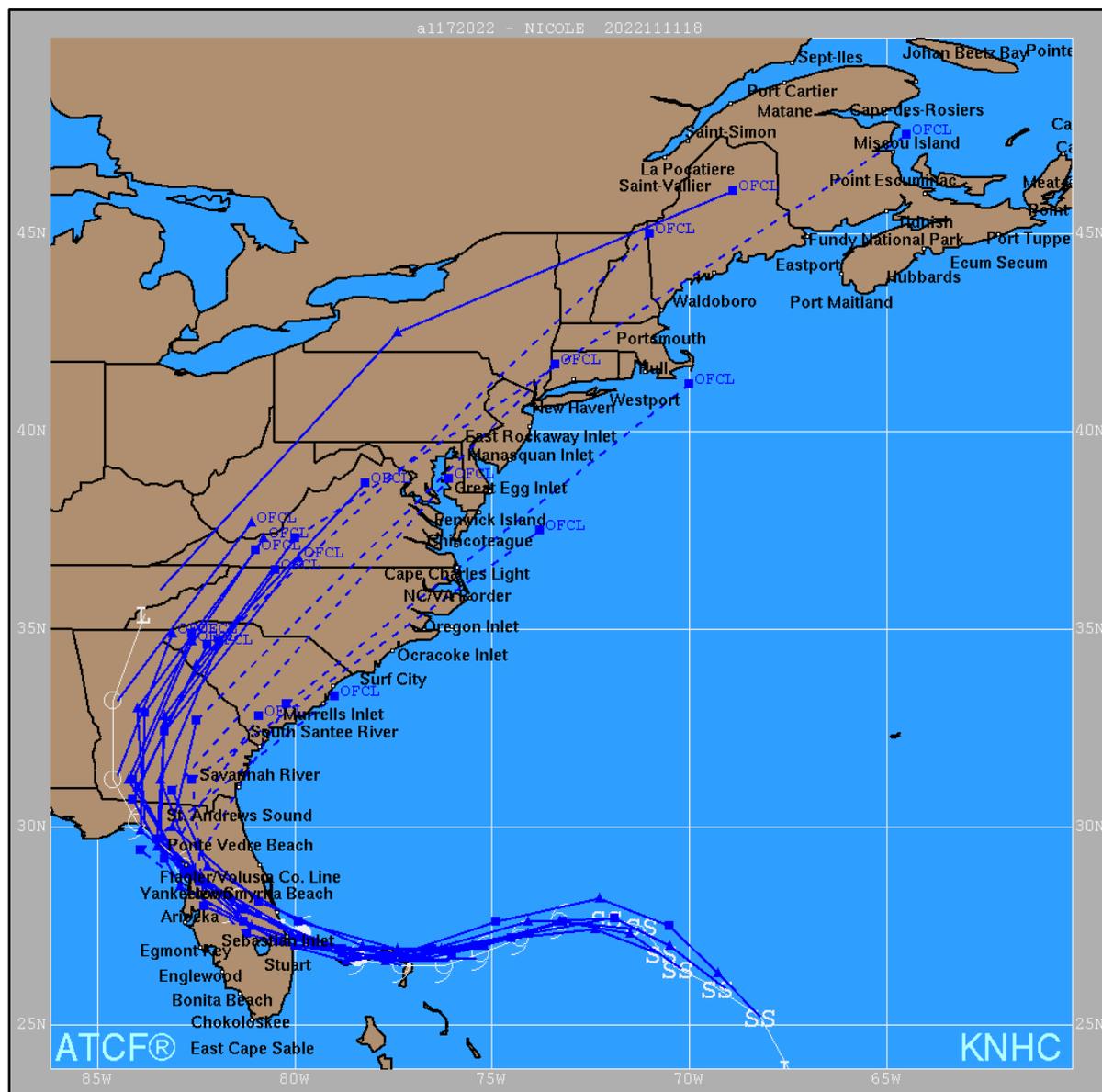


Figure 9. Selected official track forecasts (blue lines, with 0, 12, 24, 36, 48, 60, 72, 96, and 120 h positions indicated) for Hurricane Nicole 7 – 11 November 2022. The best track is given by the thick solid line with positions given at 6 h interval.

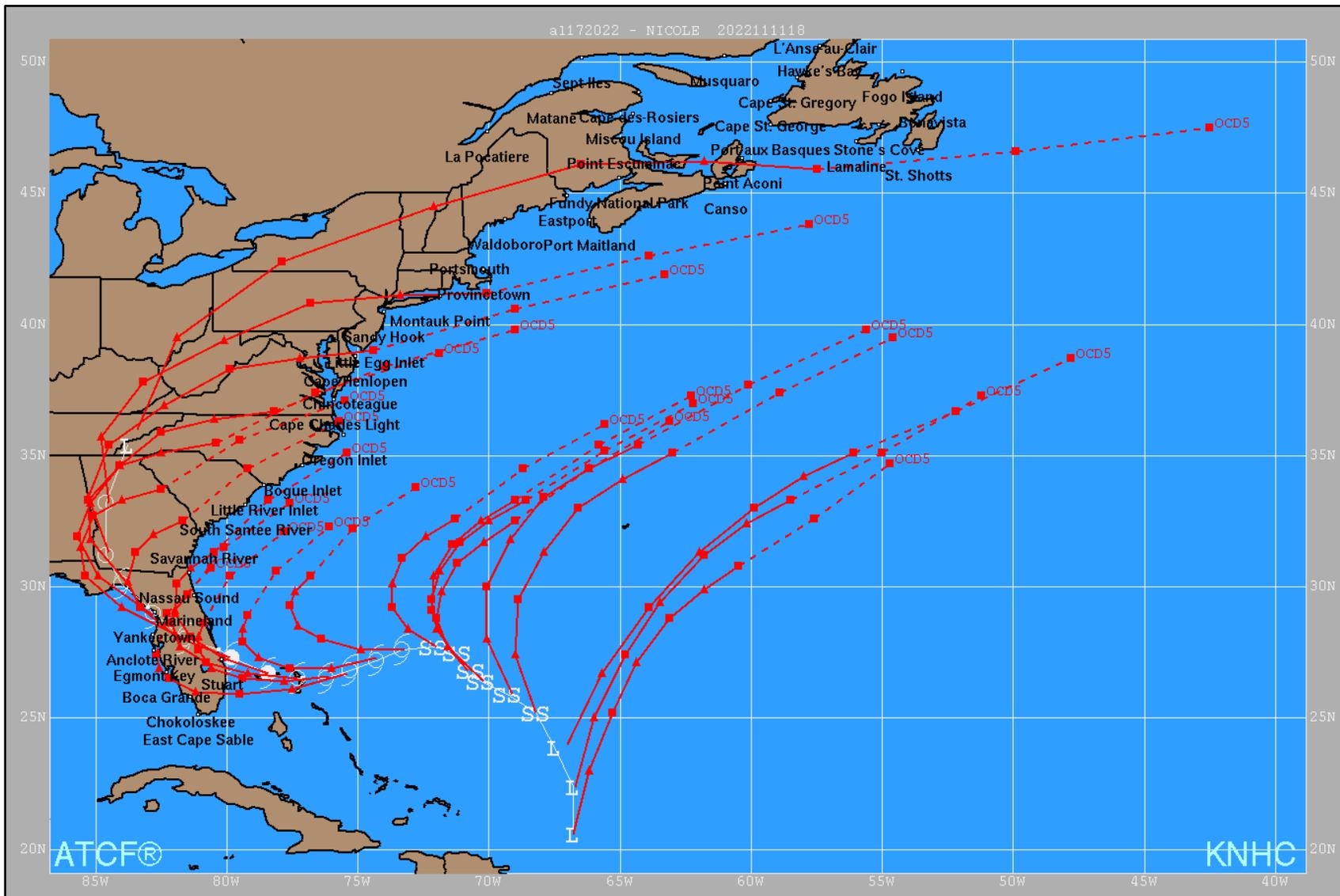


Figure 10. Selected OCD5 track forecasts (red lines, with 0, 12, 24, 36, 48, 60, 72, 96, and 120 h positions indicated) for Hurricane Nicole, 7 – 11 November 2022. The best track is given by the thick solid line with positions given at 6-h interval.

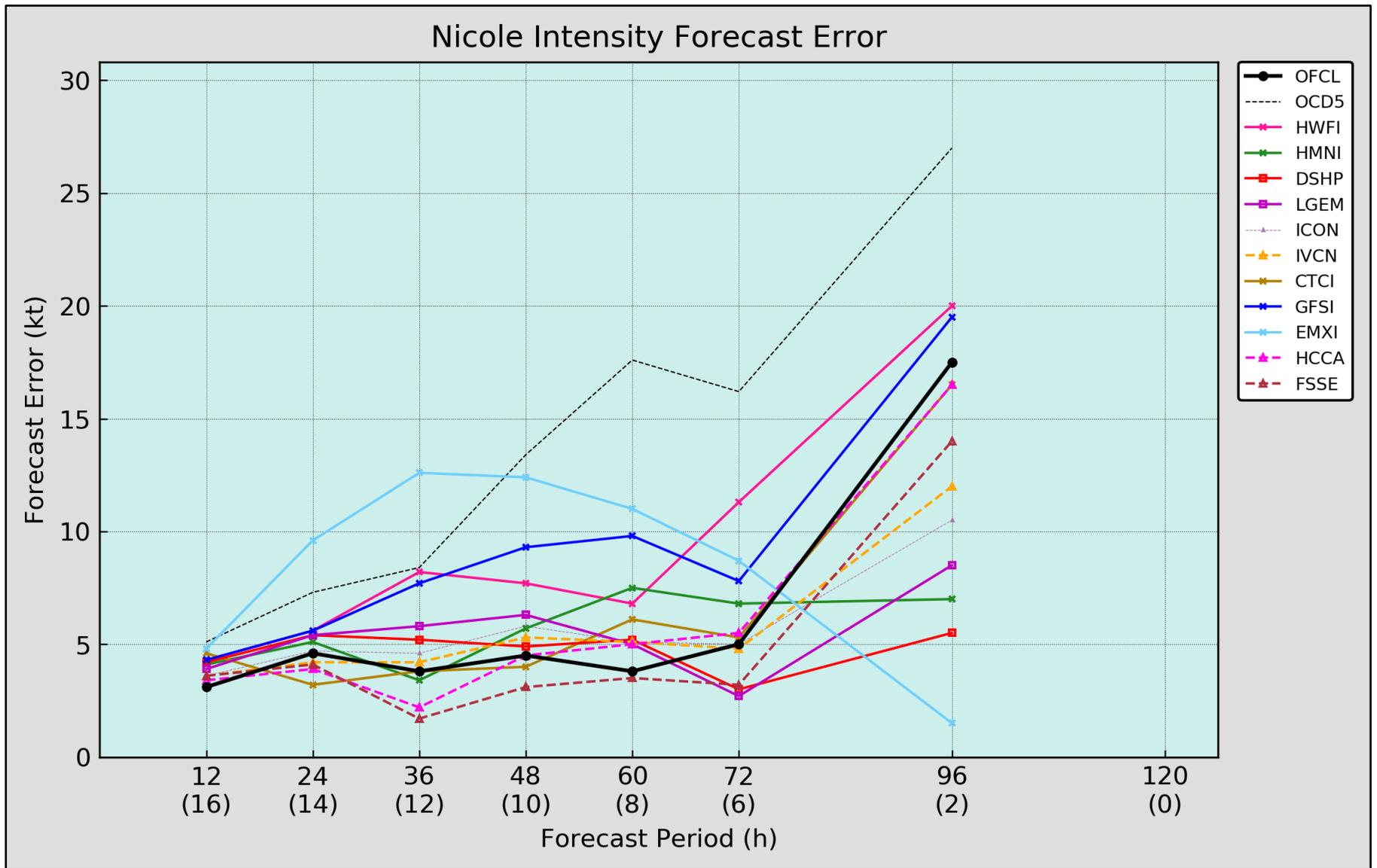


Figure 11. Homogeneous comparison of selected intensity forecast guidance model errors (in kt) for Hurricane Nicole, 7 - 11 November 2022. Official NHC track errors are denoted by the thick black line.

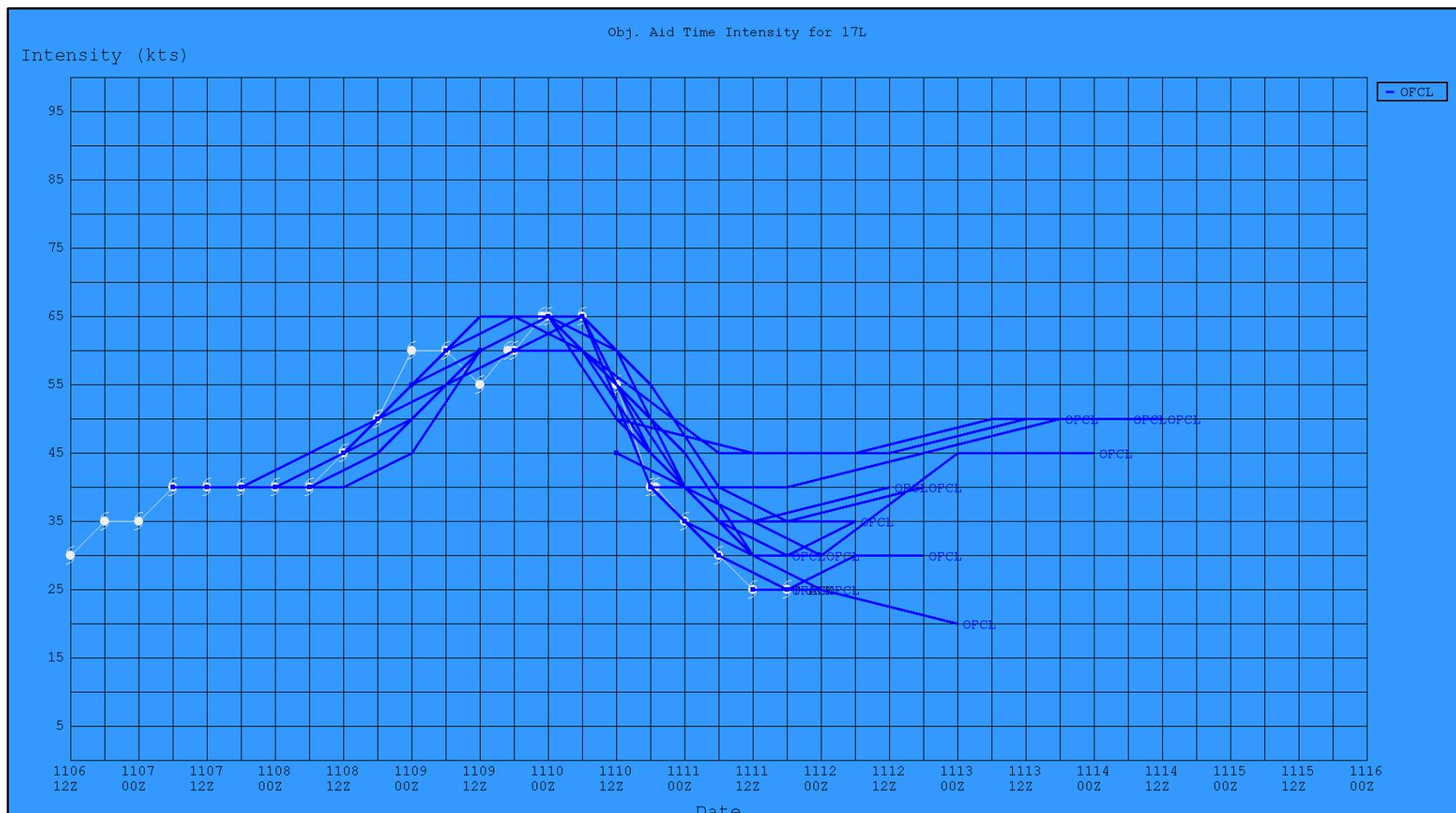


Figure 12. Selected official intensity forecasts (blue lines) for Hurricane Nicole 7 – 11 November 2022. The best track is given by the thick solid line with intensities given at 6-h interval.