NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

HURRICANE JOSE

(AL122017)

5–22 September 2017

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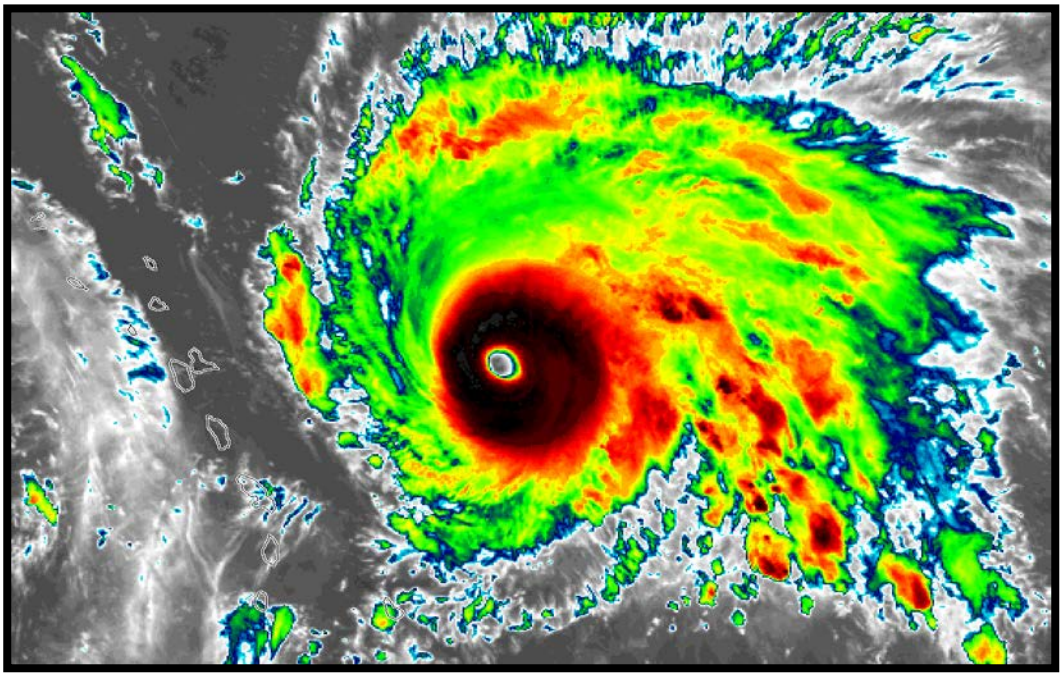

GOES-16 INFRARED SATELLITE IMAGE OF JOSE AT 1715 UTC 8 SEPTEMBER 2017 JUST AS THE HURRICANE WAS REACHING ITS PEAK INTENSITY. IMAGE COURTESY OF CIMSS AT THE UNIVERSITY OF WISCONSIN.

Jose was a classic, long-lived Cape Verde hurricane that reached category 4 strength (on the Saffir-Simpson Hurricane Wind Scale) east of the Leeward Islands but fortunately spared the Irma-ravaged islands of the northeastern Caribbean Sea. Jose made a clockwise loop over the southwestern Atlantic, and it then meandered off the coast of New England as a tropical storm for several days. Jose produced tropical-storm-force winds, as well as minor coastal flooding, along portions of the mid-Atlantic and southern New England coastline.

Hurricane Jose

5–22 SEPTEMBER 2017

SYNOPTIC HISTORY

Jose formed from a tropical wave that moved off the west coast of Africa on 31 August. The wave was accompanied by a large area of showers and thunderstorms when it moved off the coast, and the thunderstorm activity persisted for the next several days while the wave moved westward over the eastern tropical Atlantic Ocean south of the Cabo Verde Islands. A surface low formed along the wave axis by 0600 UTC 4 September while located about 615 n mi west-southwest of the Cabo Verde Islands, and the associated thunderstorm activity became sufficiently organized for the low to be designated as a tropical depression 24 h later. The cyclone was at the beginning of a quick strengthening trend, and it became a tropical storm by 1200 UTC 5 September when centered about 840 n mi west of the Cabo Verde Islands. The "best track" chart of Jose'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].

After its formation, Jose moved westward to west-northwestward across the tropical Atlantic Ocean through early on 9 September, steered by a mid-tropospheric ridge located to its north. During that time, warm sea surface temperatures and low vertical wind shear caused the cyclone to intensify and become a hurricane by 1800 UTC 6 September about 1000 n mi east of the Leeward Islands. In fact, a 60-h period of rapid intensification began at 0600 UTC 6 September, with Jose's intensity increasing from 50 kt to a peak of 135 kt by 1800 UTC 8 September. Jose reached its peak intensity when it was located only about 230 n mi east of the Leeward Islands (Fig. 4a), but a weakness in the subtropical ridge, partially produced by Hurricane Irma over Florida, caused Jose to turn northwestward late on 9 September. With that turn, Jose's center graciously passed 45 n mi to the northeast of Barbuda in the northern Leeward Islands (Fig. 4b), and the island narrowly missed a direct hit from a second major hurricane in a matter of days, after being pummeled by category 5 Hurricane Irma three-and-a-half days earlier. The northwestward track took Jose away from the northern Leeward Islands toward the southwestern Atlantic through early on 11 September, and an increase in northeasterly shear and a partial eyewall replacement caused the hurricane to weaken below major hurricane intensity by 0600 UTC that day. Microwave satellite data indicate that Jose's inner core completely collapsed in a matter of 6 to 12 h, leaving all deep convection focused in two bands removed from the center of circulation (Fig. 5).

By 12 September, Jose became trapped between the large cyclonic circulation associated with Irma and the flow on the back side of a large mid-latitude closed low centered off the coast of Atlantic Canada. The resulting steering pattern caused Jose to slow down considerably and

[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.

make a clockwise loop over the southwestern Atlantic through 16 September. At the same time, northerly shear, drier mid-level air, and a self-induced oceanic cold wake caused Jose's intensity to oscillate around 65 kt for about five days, with the cyclone weakening to a tropical storm early on 15 September. Although the vertical shear affecting Jose did not abate, warmer waters and increasing upper-level divergence allowed the cyclone to restrengthen back to hurricane strength by 1800 UTC that day. While turning northwestward and then northward over the western Atlantic around the periphery of a central Atlantic ridge, Jose strengthened some more and reached a secondary peak intensity of 80 kt by 1200 UTC 17 September. The hurricane continued to move slowly northward for the next two days, and stronger shear and colder waters north of the Gulf Stream caused the cyclone to weaken to a tropical storm by 1200 UTC 19 September while centered about 210 n mi east of Virginia Beach, Virginia. Jose also began to take on some extratropical characteristics by that time, with its radius of maximum winds increasing in distance from the center and satellite imagery showing cloud bands extending well to the north and east of the main part of the circulation (see evolution in Fig. 6). However, the cyclone continued to produce deep convection relatively close to its center.

After weakening to a tropical storm, Jose moved slowly northward and northeastward for the next two days, but it began to meander off the coast of southeastern New England on 21 September once it became situated to the south of a mid-latitude ridge which had developed over Quebec. Although vertical shear over Jose had weakened by that time, sea surface temperatures of 22–23°C caused the cyclone to gradually spin down and weaken. The last bit of deep convection near the center dissipated late on 22 September, and it is estimated that Jose became a post-tropical cyclone by 1800 UTC that day while centered about 105 n mi south-southeast of Nantucket, Massachusetts. The low continued to produce gale-force winds for another 12–18 h, and it also meandered off the coast of southern New England for several more days due to weak steering winds. The circulation gradually spun down, and the remnant low ultimately dissipated soon after 0600 UTC 25 September while located about 160 n mi south-southeast of Nantucket.

METEOROLOGICAL STATISTICS

Observations in Jose (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 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 15 flights of the 53rd Weather Reconnaissance Squadron of the U. S. Air Force Reserve Command and two flights of the NOAA Aircraft Operations Center (AOC) WP-3D aircraft. In addition, the NOAA AOC G-IV aircraft flew one synoptic surveillance mission around Jose.

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 Jose.

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

Winds and Pressure

Jose's estimated peak intensity of 135 kt from 1800 UTC 8 September to 0000 UTC 9 September is based on a blend of SFMR and flight-level aircraft data from two consecutive Air Force Reserve Hurricane Hunter missions. During the first mission, the aircraft measured peak 700-mb flight-level winds of 146 kt and 142 kt at 1208 UTC and 1356 UTC 8 September, respectively, which equate to an intensity of about 130 kt. The highest "unflagged" SFMR measurement during the same flight was 125 kt. On the next flight, the plane measured a slightly lower peak 700-mb flight-level wind of 135 kt at 0026 UTC 9 September. The highest SFMR measurement was 142 kt a few minutes later, however this observation was surrounded by multiple flagged values and data dropouts, making the measurement somewhat questionable. Without entirely discounting this measurement, Jose's maximum intensity is estimated to be 135 kt, which is a blend of the SFMR data and the highest flight-level-adjusted winds.

Jose's estimated minimum central pressure of 938 mb is based on data from a dropsonde released into the eye at 2347 UTC 8 September. The dropsonde recorded a splash pressure of 939 mb with a surface wind of 7 kt.

Due to Jose's close approach to the northern Leeward Islands, the hurricane may have produced sustained tropical-storm-force winds on Antigua, Barbuda, St. Barthelemy, Sint Maarten/St. Martin, and Anguilla. However, no wind observations were available from those islands during Jose since wind instruments were damaged or destroyed during Hurricane Irma.

Sustained tropical-storm-force winds were reported along some portions of the mid-Atlantic and New England coastlines from Jose. The highest measured sustained wind near land was 42 kt at a height of 25 m at the NOAA Coastal-Marine Automated Network (C-MAN) station at the entrance to Buzzards Bay. Over land, sustained tropical-storm-force winds were reported at locations along the coasts of Massachusetts, Rhode Island, and New Jersey. Sustained tropical-storm-force winds also likely occurred on the eastern end of Long Island.

Several NOAA buoys reported sustained hurricane- or tropical-storm-force winds during Jose's trek across the Atlantic. Of particular note was NOAA buoy 41043, located 170 n mi north-northeast of San Juan, Puerto Rico, which took a direct hit and measured a sustained one-minute wind of 78 kt and a gust to 95 kt in Jose's eyewall, as well as a minimum pressure of 949.6 mb in the eye. The buoy also measured a peak significant wave height (the average of the highest 1/3 of the waves) of 44 ft.

Rainfall

Heavy rainfall from Jose was limited to portions of extreme southeastern Massachusetts. Figure 7 shows an analysis of total rainfall accumulations produced by Jose over New England between 18–23 September. The maximum reported storm-total rainfall was 6.48 inches at Nantucket Memorial Airport, and a storm-total amount of 4.00 inches was reported at Chilmark on Martha's Vineyard. On the mainland, a total of 3.49 inches was measured in Barnstable, Massachusetts.

Storm Surge[2]

Minor coastal flooding occurred along portions of the mid-Atlantic and southern New England coastlines due to Jose. The highest measured storm surge was 3.14 ft above normal tide levels at a National Ocean Service (NOS) gauge at Wachapreague, Virginia. The combined effect of storm surge and the tide produced maximum inundation levels of less than 3 ft above ground level. The highest water levels measured by NOS gauges were 2.8 ft above Mean Higher High Water (MHHW) at Duck, North Carolina; 2.7 ft MHHW at Wachapreague; and 2.6 ft MHHW at Lewes, Delaware. Near Jose's closest approach to New England, the NOS gauge at Chatham, Massachusetts, measured a maximum water level of 2.1 ft MHHW. Figure 8 shows storm tide observations above MHHW from NOS gauges, which provide rough approximations of inundation above normally dry ground.

CASUALTY AND DAMAGE STATISTICS

There were no reports of casualties associated with Jose. After Hurricane Irma had hit Barbuda on 6 September, destroying about 95% of the infrastructure and leaving more than half of the island's residents homeless, the government of Antigua and Barbuda issued a mandatory evacuation of Barbuda two days later, on 8 September, due to the threat posed by Jose. Media reports indicated that about 1700 people were evacuated to Antigua, leaving Barbuda uninhabited for the first time in 300 years.

In the northeastern United States, damage was primarily limited to numerous trees and electrical lines being downed by strong winds in portions of southeastern Massachusetts and Rhode Island. On Nantucket, four sailboats sank in Nantucket Harbor, primarily due to heavy rainfall, and four other boats washed ashore. Minor-to-moderate coastal flooding and moderate beach erosion occurred along portions of the coast from North Carolina to Massachusetts.

FORECAST AND WARNING CRITIQUE

The genesis of Jose was well anticipated in NHC's five-day Tropical Weather Outlooks (TWOs), but the disturbance became a tropical cyclone sooner than expected in the two-day

[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).

forecast period. Table 4 provides the number of hours in advance of formation associated with the first NHC TWO forecast in each likelihood category. The incipient tropical wave was introduced in the TWO and given a low (<40%) chance of genesis during the ensuing five days 108 h (4.5 days) before Jose became a tropical cyclone. The five-day genesis probabilities were raised to the medium (40-60%) category 102 h (4.25 days) before formation and to the high (>60%) category 72 h (3 days) before formation. However, the chances were lowered to the medium category 42 h (1.75 days) before formation and then raised back to the high category 24 h (1 day) before genesis. For the two-day genesis probabilities, the disturbance was given a low and medium chance of formation only 24 h and 12 h before it became a tropical depression, respectively. The two-day formation chance never reached the high category before genesis occurred.

A verification of NHC official track forecasts for Jose is given in Table 5a. Official forecast track errors were lower than the mean official errors for the previous 5-yr period at all forecast times, especially between 72–120 h. A homogeneous comparison of the official track errors with selected guidance models is given in Table 5b. NHC's official track forecasts were quite good compared to the individual global model guidance, and were only beaten by the Global Forecast System (GFSI) model between 12-36 h. The best-performing track guidance was the TVCA multi-model consensus, which beat the official forecast at all times except 72 and 96 h. The HFIP Corrected Consensus Approach (HCCA) also performed well, beating the official forecasts between 12 and 48 h.

NHC's official intensity forecasts for Jose were stellar compared to the mean official errors for the previous 5-yr period (Table 6a) and compared to model guidance (Table 6b). Official forecast intensity errors were lower than the mean official errors for the previous 5-yr period at all forecast times, even though OCD5 errors were higher than their respective 5-yr means at most forecast times. The NHC intensity forecasts beat the intensity guidance overwhelmingly, only being bested by the ICON and IVCN consensus models and the Florida State Superensemble (FSSE) at 12 h, and the FSSE at 120 h. Despite these results, however, neither the guidance nor the official forecasts were able to accurately predict Jose's rapid intensification. At the start of the rapid intensification phase (0600 UTC 6 September), only the Hurricane Weather Research and Forecasting model (HWFI) and the FSSE explicitly showed at least a 30-kt increase in winds over the next 24 hours (not shown), but even then the rate of intensification was not fast enough to accurately capture the 135-kt peak intensity 60 h later.

Coastal watches and warnings associated with Jose are given in Table 7. For the United States, a Tropical Storm Watch was issued for St. Thomas and St. John in the U.S. Virgin Islands at 1500 UTC 8 September, but the watch was discontinued a day later after Jose turned toward the northwest, avoiding the islands. A Tropical Storm Warning was issued at 1500 UTC 18 September from Watch Hill, Rhode Island, to Hull, Massachusetts, including Block Island, Nantucket, and Martha's Vineyard, and sustained tropical-storm-force winds were observed within that area. A Tropical Storm Watch was also issued for other portions of the coast between Fenwick Island, Delaware, and Watch Hill, Rhode Island (excluding the New York City metropolitan area), and sustained tropical-storm-force winds were only observed at a couple of sites on the barrier island along the coast of New Jersey near Long Beach Island and Barnegat Light.

ACKNOWLEDGMENTS

Data in Table 3 were compiled from Post Tropical Cyclone Reports issued by the NWS Forecast Offices (WFOs) in Taunton, Massachusetts; Upton, New York; and Mt. Holly, New Jersey. Data from the Weather Prediction Center, National Data Buoy Center, the NOS Center for Operational Oceanographic Products and Services, and the United States Geological Survey were also used in this report.

Table 1. Best track for Hurricane Jose, 5–22 September 2017.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
04 / 0600	9.3	33.5	1010	20	low
04 / 1200	10.0	34.9	1010	25	"
04 / 1800	10.6	36.0	1010	25	"
05 / 0000	11.1	37.0	1009	25	"
05 / 0600	11.6	37.9	1008	30	tropical depression
05 / 1200	12.0	38.8	1008	35	tropical storm
05 / 1800	12.2	40.0	1006	40	"
06 / 0000	12.2	41.3	1004	45	"
06 / 0600	12.5	42.6	1001	50	"
06 / 1200	13.1	43.9	998	55	"
06 / 1800	13.7	45.2	995	65	hurricane
07 / 0000	14.1	46.7	993	70	"
07 / 0600	14.4	48.3	986	80	"
07 / 1200	14.7	49.9	977	90	"
07 / 1800	15.1	51.5	969	100	"
08 / 0000	15.5	53.2	964	105	"
08 / 0600	15.9	54.9	955	115	"
08 / 1200	16.1	56.4	940	130	"
08 / 1800	16.4	57.8	939	135	"
09 / 0000	16.7	58.9	938	135	"
09 / 0600	17.2	59.9	940	130	"
09 / 1200	17.9	60.8	941	125	"
09 / 1800	18.6	61.8	942	120	"
10 / 0000	19.4	62.9	943	115	"
10 / 0600	20.3	64.0	945	115	"
10 / 1200	21.2	65.3	948	115	"
10 / 1800	22.2	66.5	956	105	"
11 / 0000	23.3	67.6	962	100	"

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
11 / 0600	24.3	68.6	968	90	"
11 / 1200	25.4	69.4	972	85	"
11 / 1800	26.5	69.5	974	80	"
12 / 0000	27.2	69.4	977	75	"
12 / 0600	27.6	69.1	979	70	"
12 / 1200	27.7	68.3	979	70	"
12 / 1800	27.4	67.4	980	70	"
13 / 0000	26.8	66.7	981	70	"
13 / 0600	26.3	66.2	981	70	"
13 / 1200	25.8	65.8	981	70	"
13 / 1800	25.4	65.6	981	70	"
14 / 0000	25.1	65.7	981	70	"
14 / 0600	24.9	65.9	981	70	"
14 / 1200	24.8	66.3	983	65	"
14 / 1800	25.0	66.9	985	65	"
15 / 0000	25.4	67.6	988	60	tropical storm
15 / 0600	25.8	68.2	988	60	"
15 / 1200	26.3	69.0	986	60	"
15 / 1800	26.8	69.9	983	65	hurricane
16 / 0000	27.2	70.7	983	65	"
16 / 0600	27.7	71.4	983	65	"
16 / 1200	28.2	71.8	980	65	"
16 / 1800	28.6	72.0	973	65	"
17 / 0000	29.1	72.0	971	70	"
17 / 0600	29.8	72.0	969	75	"
17 / 1200	30.5	71.9	967	80	"
17 / 1800	31.2	71.8	967	80	"
18 / 0000	31.9	71.6	972	80	"
18 / 0600	32.7	71.4	974	75	"
18 / 1200	33.5	71.2	976	70	"

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
18 / 1800	34.2	71.2	975	65	"
19 / 0000	34.9	71.4	972	65	"
19 / 0600	35.6	71.6	971	65	"
19 / 1200	36.3	71.7	973	60	tropical storm
19 / 1800	37.0	71.5	973	60	"
20 / 0000	37.6	71.2	973	60	"
20 / 0600	38.1	70.8	975	60	"
20 / 1200	38.7	70.2	976	60	"
20 / 1800	39.2	69.4	976	60	"
21 / 0000	39.4	68.5	979	55	"
21 / 0600	39.7	68.1	982	55	"
21 / 1200	39.7	68.0	984	55	"
21 / 1800	39.5	68.0	984	50	"
22 / 0000	39.5	68.2	986	45	"
22 / 0600	39.6	68.6	989	45	"
22 / 1200	39.7	69.0	992	40	"
22 / 1800	39.7	69.1	996	40	low
23 / 0000	39.7	69.3	999	35	"
23 / 0600	39.5	69.6	1002	35	"
23 / 1200	39.1	69.7	1004	30	"
23 / 1800	38.7	69.1	1007	30	"
24 / 0000	38.7	68.7	1009	25	"
24 / 0600	38.9	68.4	1010	25	"
24 / 1200	38.9	68.0	1011	20	"
24 / 1800	38.7	68.2	1011	15	"
25 / 0000	38.7	68.7	1012	15	"
25 / 0600	38.7	69.2	1013	15	"
25 / 1200					dissipated
09 / 0000	16.7	58.9	938	135	minimum pressure and maximum winds

Table 2. Selected ship reports with winds of at least 34 kt for Hurricane Jose, 5–22 September 2017. Note that many wind observations are taken from anemometers located well above the standard 10 m observation height.

Date/Time (UTC)	Ship call sign	Latitude (°N)	Longitude (°W)	Wind dir/speed (kt)	Pressure (mb)
11 / 0300	WTOI	19.4	67.2	130 / 41	1016.9
11 / 0600	WTOI	20.6	68.2	130 / 43	1011.9
11 / 0600	WDE443	28.1	76.1	140 / 35	1016.0
11 / 1200	WTOI	21.3	70.0	130 / 38	1011.5
12 / 0600	WTOI	25.8	75.0	150 / 38	1010.7
17 / 0800	2IYG8	29.6	68.4	130 / 42	1010.3
17 / 1100	2IYG8	29.2	68.6	150 / 47	1009.7
17 / 1200	2IYG8	29.1	68.7	150 / 51	1010.2
17 / 2000	2IYG8	28.2	69.1	180 / 40	1008.7
18 / 0500	C6FT7	32.3	64.8	130 / 35	1015.0
18 / 1800	WZZF	29.3	66.2	110 / 44	1011.1
18 / 2100	WZZF	29.5	67.0	110 / 48	1009.8
18 / 2200	C6FT7	32.3	64.8	150 / 36	1010.8
18 / 2300	H3VU	33.3	76.6	350 / 35	1011.5
19 / 0400	C6FT7	32.3	64.8	170 / 42	1012.8
19 / 0500	WDD612	35.5	75.1	360 / 40	1007.8
19 / 0600	H3VU	33.1	73.9	300 / 40	1006.9
19 / 0600	VRGH3	34.4	74.6	350 / 46	997.0
19 / 0600	WDD612	35.7	75.1	360 / 45	1007.7
19 / 0700	WDD612	35.9	75.2	010 / 50	1007.2
19 / 0800	ZCDN2	40.3	72.0	050 / 36	1014.5
19 / 0900	H3VU	33.1	72.8	280 / 35	1006.7
19 / 1200	VRGH3	35.8	74.8	350 / 40	1008.0
19 / 1200	WMMK	38.4	74.4	050 / 35	1012.1
19 / 1400	ONHA	37.2	76.1	320 / 37	1014.1
19 / 1500	WMMK	37.7	74.8	360 / 36	1008.2
19 / 1800	H3VU	32.9	69.4	230 / 35	1010.9
19 / 1800	VRGH3	36.9	74.6	350 / 45	1007.0
19 / 2000	ZCDN2	41.9	69.7	050 / 36	1012.5
20 / 0000	DGOH2	34.0	70.6	330 / 35	1008.3

Date/Time (UTC)	Ship call sign	Latitude (°N)	Longitude (°W)	Wind dir/speed (kt)	Pressure (mb)
20 / 0000	VRGH3	37.8	74.4	350 / 35	1008.0
20 / 0600	VRGH3	38.7	73.9	360 / 40	1009.0
20 / 0900	DGOH2	36.1	71.4	260 / 50	1002.9
20 / 1200	WDD612	36.5	72.9	300 / 35	1009.1
20 / 1200	VRGH3	39.6	73.6	350 / 38	1010.0
20 / 1400	ZCEK6	37.2	62.6	150 / 36	1014.9
20 / 1800	WDD612	36.3	70.6	280 / 40	1007.9
20 / 2200	ZCEK6	36.0	65.5	200 / 36	1009.8
21 / 0000	ZCEF6	39.8	61.0	190 / 42	1012.1
21 / 0200	ZCEK6	36.0	66.7	240 / 40	1008.8
21 / 0600	PHDL	42.2	69.2	040 / 40	1007.3
21 / 0600	C6FN4	43.2	65.2	050 / 35	1008.0
21 / 0900	ZCEK6	36.3	68.8	260 / 40	1008.8
21 / 0900	C6FT7	43.1	62.8	060 / 48	1012.6
21 / 1000	ZCEF6	39.0	64.4	170 / 57	1003.6
21 / 1000	C6FT7	43.4	63.1	060 / 48	1013.6
21 / 1100	ZCEK6	36.5	69.5	240 / 35	1009.6
21 / 1400	C6FT7	43.3	64.8	050 / 38	1014.7
21 / 1500	PHDL	40.8	69.2	040 / 45	1002.3
21 / 1600	ZCEK6	37.2	70.5	280 / 41	1010.3
21 / 1800	WGAX	37.0	66.2	230 / 35	1009.1
21 / 1800	C6FT7	43.1	66.3	070 / 42	1014.2
21 / 2000	ZCDN2	42.7	67.9	050 / 40	1012.6
21 / 2100	ZCEK6	38.6	71.8	350 / 40	1010.3
21 / 2200	ZCEF6	39.2	69.6	340 / 50	997.5
22 / 0300	C6FT7	42.9	69.1	060 / 37	1015.0
22 / 0500	C6FT7	42.8	69.6	060 / 37	1015.0
22 / 0600	V7SX3	38.9	71.7	360 / 35	1009.4
22 / 0700	C6FT7	42.6	70.1	030 / 40	1015.0
22 / 0800	C6FT7	42.4	70.5	030 / 45	1015.0
22 / 0900	C6FT7	42.4	70.6	030 / 45	1015.0
22 / 1000	C6VG8	41.3	69.3	050 / 50	1004.0
22 / 1500	C6FN4	40.8	67.1	140 / 44	1008.0

Table 3. Selected surface observations for Hurricane Jose, 5–22 September 2017.

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)				
Massachusetts									
International Civil Aviation Organization (ICAO) Sites									
Nantucket (KACK) (41.25N 70.06W)	20/2053	1003.6	21/2300	35	51				6.48
Plymouth (KPYM) (41.90N 70.73W)	20/2152	1009.7	21/1923		44				3.42
Martha's Vineyard (KMVY) (41.39N 70.61W)	21/0653	1006.9	21/2224		43				3.70
Milton (KMQE) (42.21N 71.11W)	22/0756	1016.1	21/1745		42				1.65
Falmouth (KFMH) (41.65N 70.52W)			22/1035		40[l]				
Hyannis (KHYA) (41.66N 70.28W)	21/0056	1006.8	21/2136		39				2.16
Boston (KBOS) (42.36N 71.01W)	22/0754	1015.7	21/1816		38				0.50
Chatham (KCQX) (41.68N 69.99W)	21/0652	1006.8	22/0200		38				2.11
New Bedford (KEWB) (41.67N 70.96W)	22/0153	1000.0	22/2354		38				1.91
Taunton (KTAN) (41.87N 71.02W)	20/1952	1009.0	21/1859		36				2.96
Provincetown (KPVC) (42.07N 70.22W)	20/1756	1008.3	22/0901		36				
Non-METAR Sites									
Aquinnah (41.30N 70.80W)			21/2213		54				
Nantucket (41.30N 70.10W)			22/0718		54				
New Bedford (41.60N 70.90W)			21/2145		52				
East Falmouth (41.60N 70.60W)			22/0511	35	50				
Woods Hole (41.50N 70.70W)			22/1625		49				
Fall River (41.70N 71.10W)			22/0624		47				
Edgartown (41.40N 70.50W)			22/1603		46				
Barnstable (41.70N 70.30W)			21/2132		46				
Hyannis Park (41.60N 70.30W)			21/2030		43				

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)				
Rockport (42.60N 70.60W)			22/1500		43				
Fairhaven (41.60N 70.80W)			21/2041		41				
Brewster (41.80N 70.10W)			22/1613		41				
Plymouth (42.00N 70.70W)			22/0758		40				
National Ocean Service (NOS) Sites									
Chatham, Lydia Cove (8447435) (41.69N 69.95W)						2.46	4.80	2.1	
Nantucket Island (NTKM3) (41.29N 70.10W)	20/1906	1004.3	21/2100	34 (11 m)	44	2.59		1.6	
Woods Hole (BZBM3) (41.52N 70.67W)	20/1942	1006.5				1.14	2.03	1.2	
Coastal-Marine Automated Network (C-MAN) Sites									
Buzzards Bay (BUZM3) (41.40N 71.03W)	20/1700	1006.2	21/2040	42 (25 m, 10 min)	53				
Weatherflow Sites									
Duxbury (XDUX) (42.06N 70.65W)	22/0830	1011.5	22/1135	35 (12 m, 1 min)	42				
Wellfleet (XWEL) (41.93N 69.98W)	22/0725	1006.0	22/0635		45 (6 m)				
Hatch Beach (XHCH) (41.82N 70.02W)	22/0700	1006.8	22/0100		44 (10 m)				
Kalmus (XKAL) (41.63N 70.28W)	22/0730	1009.4	21/2030		43 (10 m)				
Rhode Island									
ICAO Sites									
Block Island (KBID) (41.16N 71.58W)	20/0456	1000.0	22/0555		46				
Newport (KUUU) (41.53N 71.28W)	20/1653	1007.5	22/0211		45				
North Kingston (KOQU) (41.59N 71.41W)			22/0250		45[l]				
Providence (KPVD) (41.72N 71.43W)	20/1651	1009.5	21/1822		39				0.47
Westerly (KWST) (41.34N 71.80W)	20/0853	1008.5	22/0730		37				0.39
Non-METAR Sites									
Block Island (41.20N 71.60W)			22/0716		53				

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)				
Jamestown (41.50N 71.40W)			22/0224		46				
Charlestown (41.40N 71.70W)			22/0640		44				
Bristol (41.70N 71.30W)			22/0600		41				
Portsmouth (41.60N 71.30W)			22/0158		37				
NOS Sites									
Potter Cove, Prudence Island (PTCR1) (41.64N 71.34W)	22/0806	1012.8	22/0224	35 (21 m)	46				
Newport (NWPR1) (41.50N 71.33W)	20/1700	1007.5	22/0154	27 (11 m)	37	1.14	3.23	1.4	
Quonset Point (QPTR1) (41.59N 71.41W)	20/1654	1008.0	22/0236	35 (9 m)	45	1.11		1.3	
Conimicut Light (CPTR1) (41.72N 71.35W)	20/1654	1008.2	22/0306	34 (21 m)	45	1.13		1.2	
Providence (FOXR1) (41.81N 71.40W)	20/1700	1009.0	22/0348	29 (21 m)	38	1.31	3.58	1.2	
Weatherflow Sites									
University of Rhode Island (XURI) (41.49N 71.42W)	22/0659	1008.6	22/0159	37 (10 m, 1 min)	47				
Halfway Rock (XHLF) (41.56N 71.33W)	22/0645	1011.5	22/0255	34 (9 m, 1 min)	46				
Point Judith (XJUD) (41.36N 71.50W)	22/0931	1010.0	22/0236		43 (16 m)				
Fogland (XFOG) (41.56N 71.22W)	22/0813	1009.4	22/0218		39 (12 m)				
Connecticut									
ICAO Sites									
Groton-New London (KGON) (41.32N 72.05W)	20/0911	1007.1	20/0402		37				0.18
Windsor Locks (KBDL) (41.93N 72.68W)	20/0851	1011.3	22/1344		35				0.01
New Haven (KHVN) (41.26N 72.89W)									0.25
Danbury (KDXR) (41.37N 73.48W)									0.25

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)				
NOS Sites									
Bridgeport (BRHC3) (41.17N 73.18W)	20/0912	1008.2	19/1624	19 (10 m)	27	1.45	5.16	1.7	
New Haven (NWHC3) (41.28N 72.91W)	20/0900	1008.1	22/2018	27 (10 m)	34	1.35		1.6	
New London (NLNC3) (41.36N 72.09W)	20/1012	1008.2	22/1506		22	1.24	2.44	1.2	
Weatherflow Sites									
Stonington Outer Breakwater 4 (XSTO) (41.31N 72.03W)	20/1700	1006.5	22/1030		42 (11 m)				
USCG Academy – New London (XCGA) (41.37N 72.09W)	20/1714	1006.3	22/2124		42 (17 m)				
New York									
ICAO Sites									
Islip (KISP) (40.80N 73.10W)									0.71
Farmingdale (KFRG) (40.73N 73.41W)									0.42
NOS Sites									
The Battery (BATN6) (40.70N 74.01W)	20/0742	1007.9				1.89	4.20	1.9	
Bergen Point West Reach (BGNN4) (40.64N 74.15W)	20/0736	1009.3				1.97		1.9	
Kings Point (KPTN6) (40.81N 73.77W)	20/0800	1009.6	20/1554	18 (11 m)	24	1.91		1.8	
Montauk (MTKN6) (41.05N 71.96W)	20/0854	1007.1				1.49	2.52	1.6	
National Estuarine Research Reserve System (NERRS) Sites									
Turkey Point Hudson River (TKPN6) (42.01N 73.94W)	20/0806	1012.5	22/1524	17 (9 m)	22	1.48		0.9	
Weatherflow Sites									
Napeague (XNAP) (41.00N 72.06W)	20/0926	1006.8	22/1131		40 (10 m)				
Shinnecock Light (XSHN) (40.83N 72.48W)	20/0925	1004.7	20/0320		38 (12 m)				
Great Gull Island (XGUL) (41.20N 72.20W)	20/1100	1005.6	22/0750		38 (16 m)				

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)				
Fire Island (XFIR) (40.62N 73.26W)	20/0734	1004.9	19/1654		36 (10 m)				
Jones Beach (XJON) (40.59N 73.56W)	20/0758	1005.0	19/1723		35 (10 m)				
Blue Point (XBLU) (40.73N 73.03W)	20/0910	1006.0	20/0005		35 (12 m)				
Eaton's Neck (XEAT) (40.95N 73.39W)	20/0745	1003.6	19/2205		35 (22 m)				
Bayville (XBAY) (40.90N 73.63W)	20/0804	1006.9	19/2205		35 (14 m)				
USGS Sites									
Hudson Bay at Freeport						2.36	3.97		
Reynolds Channel at Point Lookout						2.11	4.09		
Hog Island Channel at Island Park						2.03	4.38		
Peconic River at County Hwy 105 at Riverhead						1.84	3.17		
Great South Bay at Lindenhurst						1.67	2.49		
Moriches Bay at East Moriches						1.63	2.80		
East Rockaway						1.59	4.06		
West Sayville						1.47	2.29		
Great South Bay at Watch Hill on Fire Island						1.42	2.00		
Flax Pond at Old Field						1.40	5.33		
Orient Harbor at Orient						1.13	2.51		
West Pond at Glen Cove						1.00	5.31		
NWS Cooperative Observer (COOP) Sites									
Bridgehampton 1 N (BDGN6) (40.95N 72.31W)									0.52
Centerport (CTPN6) (40.88N 73.37W)									0.48
Riverhead 5NNW (RRHN6) (40.96N 72.72W)									0.47

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)				
New Jersey									
NOS Sites									
Atlantic City (ACYN4) (39.36N 74.42W)	20/0724	1007.8				2.05	4.41	2.4	
Cape May (CMAN4) (38.97N 74.96W)	20/0724	1008.5	20/1130	17 (13 m)	27	2.56	4.80	2.4	
Sandy Hook (SDHN4) (40.47N 74.01W)	20/0748	1009.4	19/1354	17 (7 m)	27	2.16	4.59	2.2	
Ship John Shoal (SJSN4) (39.31N 75.38W)	20/0748	1009.5	19/1624	25 (21 m)	30	2.01		1.9	
Burlington, Delaware River (BDRN4) (40.08N 74.87W)	20/0718	1009.5	19/1730	15 (10 m)	20	1.50		1.3	
Weatherflow Sites									
Barnegat Inlet Light (XBRN) (39.76N 74.09W)			19/1851	37 (12 m, 1 min)	44				
LBI Island Surf (XLBI) (39.64N 74.21W)			19/1913	34 (5 m, 1 min)	46				
Kite Island (XKIT) (39.79N 74.16W)			19/1855		41 (6 m)				
Rutgers (XRUT) (39.52N 74.32W)			19/1552		40 (12 m)				
Trixies (XTRX) (39.87N 74.14W)			19/1851		39 (10 m)				
Tuckerton (XTUK) (39.52N 74.32W)			19/1428		38 (10 m)				
Seaside Heights (XSEA) (39.94N 74.07W)			19/2015		36 (14 m)				
Ludlam Bay (XLUD) (39.18N 74.70W)			19/1528		34 (6 m)				
HADS Sites									
Morristown (MSTN4) (40.80N 74.42W)									1.92
Ironia (IRON4) (40.83N 74.63W)									0.84
Folsom (GEHN4) (39.60N 74.85W)									0.44
Morris Plains (MSPN4) (40.83N 74.52W)									0.40

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)				
Pennsylvania									
NOS Sites									
Marcus Hook (MRCP1) (39.81N 75.42W)	20/0836	1010.1				1.66		1.6	
Philadelphia (PHBP1) (39.93N 75.14W)	20/0900	1009.7				1.63	5.02	1.4	
Bridesburg (BDSP1) (39.98N 75.08W)	20/0854	1010.3				1.48		1.4	
Newbold (NBLP1) (40.14N 74.75W)	20/0724	1010.1	19/1636	15 (11 m)	23	2.02		1.2	
Delaware									
NOS Sites									
Lewes (LWSD1) (38.78N 75.12W)	20/0718	1009.2	19/2142	31 (12 m)	35	2.91	4.61	2.6	
Brandywine Shoal Light (BRND1) (38.99N 75.11W)	20/0730	1009.5	19/1842	35 (23 m)	42	2.38		2.3	
Delaware City (DELD1) (39.58N 75.59W)	20/0724	1010.7	20/0218	20 (10 m)	26	1.74		1.6	
Reedy Point (RDYD1) (39.56N 75.57W)	20/0848	1010.3				1.86	4.40	1.5	
Weatherflow Sites									
Dewey Beach (XDEW) (38.68N 75.08W)			19/2206		38 (11 m)				
Lewes (XLEW) (38.79N 75.16W)			19/1910		36 (15 m)				
Maryland									
NOS Sites									
Ocean City Inlet (OCIM2) (38.33N 75.09W)	19/1854	1009.2	19/1824	25 (11 m)	37	2.12	2.83	2.0	
Bishops Head (BISM2) (38.22N 76.04W)	19/2300	1011.1	19/1836	17 (8 m)	25	1.62	2.66	1.9	
Solomons Island (SLIM2) (38.32N 76.45W)	19/2018	1011.0	19/1518	19	25	1.61	2.44	1.8	
Cambridge (CAMM2) (38.57N 76.07W)	20/0730	1011.8				1.73	2.66	1.7	
Annapolis (APAM2) (38.98N 76.48W)	19/2036	1011.1				1.73	2.39	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)				
Chesapeake City (CHCM2) (39.53N 75.81W)	20/0724	1011.2	20/0248	13 (9 m)	21	1.73		1.7	
Tolchester Beach (TCBM2) (39.21N 76.24W)	20/0730	1011.8	19/1000	16 (10 m)	21	1.48		1.6	
Baltimore (BLTM2) (39.27N 76.58W)	19/2054	1011.4	19/1836	16 (8 m)	20	1.66	2.38	1.6	
Weatherflow Sites									
Ocean City (XOCN) (38.33N 75.08W)			19/1613		42 (10 m)				
District of Columbia									
NOS Sites									
Washington, DC (WASD2) (38.87N 77.02W)	22/2218	1015.2	19/2018	12 (11 m)	17	1.68	3.42	1.7	
Virginia									
NOS Sites									
Wachapreague (WAHV2) (37.61N 75.69W)	19/1942	1009.7	18/1412	18 (9 m)	24	3.14	4.58	2.7	
Chesapeake Bay Bridge Tunnel (CHBV2) (37.03N 76.08W)	19/1906	1010.3	19/1448	33	37	2.50		2.6	
Money Point (MNPV2) (36.78N 76.30W)	19/1942	1010.5	19/0900	14 (9 m)	22	2.42		2.5	
Sewells Point (SWPV2) (36.94N 76.33W)	19/1930	1010.9				2.49	3.62	2.5	
Kiptopeke (KPTV2) (37.17N 75.99W)			19/1724	27 (10 m)	33	2.22	3.34	2.3	
Yorktown USCG Training Center (YKTV2) (37.23N 76.48W)	19/2236	1010.8	19/1800	20 (13 m)	27	1.94	3.31	2.2	
Lewisetta (LWTV2) (38.00N 76.47W)	19/2112	1011.3	19/1442	15 (8 m)	23	1.73	2.57	1.9	
Windmill Point (8636580) (37.62N 76.29W)						1.60		1.9	
Dahlgren (NCDV2) (38.32N 77.04W)	19/2218	1010.9	19/1912	12 (14 m)	17	1.71	2.75	1.9	

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)				
North Carolina									
NOS Sites									
Duck (DUKN7) (36.18N 75.75W)	19/0936	1007.5	19/1248	37 (16 m)	42	2.78	4.33	2.8	
Offshore									
NOAA Buoys									
NE Puerto Rico 170 NM NNE (41043) (21.13N 64.86W)	10/1000	949.6	10/0925	78 (4 m, 1 min)	95				
North Equatorial Two – 890 NM E Martinique (41041) (14.33N 46.08W)	6/2150	1000.9	6/2208	60 (4 m, 1 min)	70				
East Bahamas 335 NM E (41046) (23.83N 68.42W)	11/0340	974.8	11/0427	54 (4 m, 1 min)	72				
NE Bahamas 350 NM ENE (41047) (27.52N 71.53W)	16/0540	986.1	16/0653	51 (4 m, 1 min)	60				
Bermuda 240 NM W (41048) (31.86N 69.59W)	18/0640	998.0	17/2217	49 (5 m, 1 min)	56				
Nantucket 54 NM SE (44008) (40.50N 69.25W)	21/0250	994.0	21/2003	43 (5 m, 1 min)	49				
Texas Tower #4 – 75 NM E Long Beach NJ (44066) (39.57N 72.59W)	20/0750	1000.3	20/0900	35 (5 m, 10 min)	45				
Virginia Beach 64 NM E (44014) (36.61N 74.84W)	19/1150	1004.9	19/0449	35 (5 m, 1 min)	43				
Delaware Bay 26 NM SE Cape May NJ (44009) (38.46N 74.70W)	19/1850	1007.2	19/1720	34 (5 m, 10 min)	45				
Nantucket Sound (44020) (41.44N 70.19W)	20/1950	1004.3	21/2320	34 (5 m, 10 min)	45				
Boston 16 NM E (44013) (42.35N 70.65W)	20/1950	1009.7	22/1340	30 (5 m, 10 min)	37				
Long Island 30 NM S (44025) (40.25N 73.16W)	20/0750	1005.7	19/1425		37 (5 m)				

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)				
Georges Bank (44011) (41.10N 66.62W)	21/0750	997.5							
Montauk Point 23 NM SSW (44017) (40.69N 72.05W)	20/0750	1005.5							
North Equatorial One – 470 NM E Martinique (41040) (14.56N 53.07W)	7/2200	1006.0	8/0359	31 (4 m, 1 min)	35				

[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).
[e] Estimated inundation is the maximum height of water above ground. For NOS tide gauges, the height of the water above Mean Higher High Water (MHHW) is used as a proxy for inundation.
[l] Incomplete data

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%)	24	108
Medium (40%-60%)	12	102
High (>60%)	-	72

Table 5a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Hurricane Jose, 5–22 September 2017. 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	72	96	120
OFCL	**19.1**	**25.3**	**31.7**	**41.5**	**66.0**	**86.0**	**125.6**
OCD5	37.2	90.0	149.9	199.2	285.9	381.5	458.3
Forecasts	67	65	63	61	57	53	49
OFCL (2012-16)	24.9	39.6	54.0	71.3	105.8	155.4	208.9
OCD5 (2012-16)	47.3	103.9	167.8	230.3	343.1	442.6	531.0

Table 5b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Hurricane Jose, 5–22 September 2017. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 5a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	16.9	22.8	29.6	41.2	66.5	79.4	100.9
OCD5	33.6	80.8	129.0	165.1	214.6	304.9	372.5
GFSI	**16.3**	**21.0**	**28.9**	44.8	67.8	92.8	142.8
EMXI	20.6	30.9	41.4	55.5	87.6	110.7	130.8
EGRI	17.1	26.6	37.8	52.8	103.2	145.6	169.0
NVGI	24.5	36.9	53.7	74.5	132.0	149.5	152.7
CMCI	23.0	40.0	58.4	79.7	123.2	197.4	299.8
HWFI	19.6	29.6	39.4	54.4	94.4	135.4	152.9
HMNI	21.2	30.4	38.6	53.2	67.6	85.2	125.8
CTCI	**16.8**	28.6	47.8	65.9	102.7	134.3	169.0
TCON	**15.9**	**21.4**	**28.9**	42.9	76.5	98.8	113.5
TVCA	**15.5**	**21.9**	**29.4**	**41.1**	68.8	83.7	**90.0**
TVCX	**16.0**	22.9	30.8	42.0	69.5	82.4	**90.3**
GFEX	16.9	23.2	31.1	42.6	68.4	**77.7**	107.1
HCCA	**15.6**	**21.4**	**27.5**	**40.7**	68.0	88.2	128.0
FSSE	17.2	24.9	31.9	44.8	73.1	81.7	119.4
AEMI	17.1	25.7	36.5	50.1	78.6	109.6	159.6
TABS	46.9	83.8	106.5	96.7	91.4	121.0	150.3
TABM	22.1	36.4	51.1	60.7	82.1	94.4	153.4
TABD	24.6	38.7	50.5	64.2	103.6	148.0	194.5
Forecasts	47	44	42	41	37	34	32

Table 6a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Hurricane Jose, 5–22 September 2017. 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	72	96	120
OFCL	**5.0**	**6.5**	**7.7**	**8.9**	**10.5**	**11.6**	**10.8**
OCD5	6.9	10.9	13.9	16.3	19.9	19.7	14.1
Forecasts	66	64	62	61	57	53	49
OFCL (2012-16)	5.5	8.2	10.5	12.0	13.4	14.0	14.5
OCD5 (2012-16)	7.1	10.5	13.0	15.1	17.4	18.2	20.6

Table 6b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Hurricane Jose, 5–22 September 2017. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 6a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	5.2	6.5	7.5	7.9	9.1	10.5	10.4
OCD5	7.0	10.8	13.5	15.1	17.6	17.6	13.0
DSHP	5.4	8.5	9.9	10.3	11.5	12.6	11.0
LGEM	5.7	8.5	10.3	10.7	11.5	11.2	10.6
HWFI	6.1	8.8	10.7	12.4	12.4	13.4	16.2
HMNI	6.3	9.6	10.6	10.4	11.8	12.4	14.0
CTCI	6.8	9.8	11.5	11.4	12.5	13.0	17.7
ICON	**5.1**	7.7	8.7	9.4	10.4	11.8	10.5
IVCN	**5.0**	7.7	9.0	9.5	9.8	11.0	11.2
HCCA	5.2	8.0	9.8	10.3	10.5	10.8	10.2
FSSE	**4.7**	6.8	7.8	8.1	9.5	10.9	**9.6**
GFSI	7.2	11.0	13.7	15.2	17.1	17.1	14.0
EMXI	7.1	10.9	14.1	15.4	16.8	19.6	21.7
Forecasts	63	61	59	58	54	50	46

Table 7. Watch and warning summary for Hurricane Jose, 5–22 September 2017.

Date/Time (UTC)	Action	Location
7 / 1500	Hurricane Watch issued	Antigua / Barbuda / Anguilla
7 / 1500	Tropical Storm Watch issued	Montserrat / St. Kitts / Nevis
7 / 1500	Tropical Storm Watch issued	Saba / Sint Eustatius
8 / 0000	Hurricane Watch issued	Sint Maarten
8 / 0000	Hurricane Watch issued	St. Martin
8 / 0300	Tropical Storm Warning issued	Antigua / Barbuda / Anguilla
8 / 0900	Hurricane Watch issued	St. Barthelemy
8 / 1500	Tropical Storm Watch issued	St. Thomas / St. John
8 / 1500	Tropical Storm Watch issued	British Virgin Islands
8 / 1500	Tropical Storm Warning issued	St. Martin / St. Barthelemy
8 / 1500	Tropical Storm Warning issued	Sint Maarten
8 / 1800	Tropical Storm Warning issued	Saba / Sint Eustatius
8 / 2100	Tropical Storm Warning changed to Hurricane Warning	Barbuda / Anguilla
8 / 2100	Tropical Storm Warning changed to Hurricane Warning	St. Martin / St. Barthelemy
8 / 2100	Tropical Storm Warning changed to Hurricane Warning	Sint Maarten
9 / 1200	Hurricane Warning changed to Tropical Storm Warning	Barbuda / Anguilla
9 / 1200	Hurricane Watch discontinued	Antigua
9 / 1200	Tropical Storm Warning changed to Tropical Storm Watch	Antigua
9 / 1200	Tropical Storm Watch discontinued	Montserrat / St. Kitts / Nevis
9 / 1500	Tropical Storm Watch discontinued	St. Thomas / St. John
9 / 1500	Tropical Storm Watch discontinued	Antigua / British Virgin Islands
9 / 1800	Hurricane Warning changed to Tropical Storm Warning	Sint Maarten
9 / 1800	Hurricane Warning changed to Tropical Storm Warning	St. Martin / St. Barthelemy
9 / 1800	Tropical Storm Warning discontinued	Saba / Sint Eustatius
9 / 2100	Tropical Storm Warning discontinued	Barbuda / Anguilla
10 / 1200	Tropical Storm Warning discontinued	St. Martin / St. Barthelemy
10 / 1200	Tropical Storm Warning discontinued	Sint Maarten

Date/Time (UTC)	Action	Location
17 / 2100	Tropical Storm Watch issued	Fenwick Island, DE to Sandy Hook, NJ
17 / 2100	Tropical Storm Watch issued	Delaware Bay South
17 / 2100	Tropical Storm Watch issued	East Rockaway Inlet, NY to Plymouth, MA
17 / 2100	Tropical Storm Watch issued	Block Island, RI
17 / 2100	Tropical Storm Watch issued	Martha's Vineyard and Nantucket, MA
18 / 1500	Tropical Storm Warning issued	Watch Hill, RI to Hull, MA
18 / 1500	Tropical Storm Warning issued	Block Island
18 / 1500	Tropical Storm Warning issued	Martha's Vineyard and Nantucket
18 / 2100	Tropical Storm Watch discontinued	Fenwick Island to Sandy Hook
18 / 2100	Tropical Storm Watch discontinued	Delaware Bay South
18 / 2100	Tropical Storm Watch discontinued	East Rockaway Inlet to Fire Island Inlet
18 / 2100	Tropical Storm Watch modified to	New Haven, CT to Watch Hill, RI
18 / 2100	Tropical Storm Watch modified to	Fire Island Inlet to Port Jefferson, NY
19 / 1500	Tropical Storm Watch discontinued	New Haven to Watch Hill
19 / 2100	Tropical Storm Warning discontinued	Watch Hill to Woods Hole, MA
19 / 2100	Tropical Storm Warning discontinued	Sagamore Beach, MA to Hull
20 / 0900	Tropical Storm Watch discontinued	Fire Island Inlet to Port Jefferson
22 / 2100	Tropical Storm Warning discontinued	Woods Hole to Sagamore Beach / Block Island / Martha’s Vineyard / Nantucket

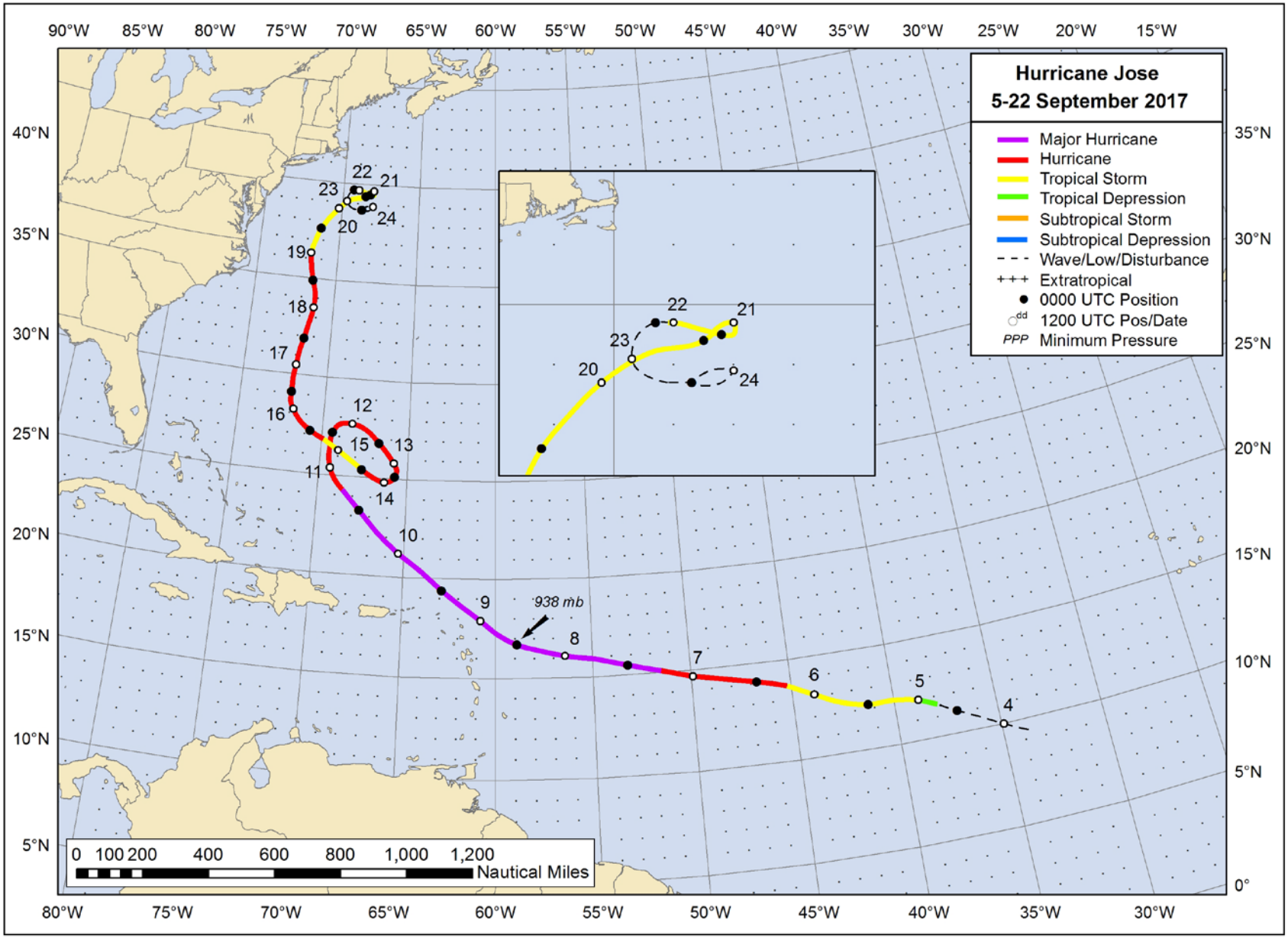

Figure 1. Best track positions for Hurricane Jose, 5–22 September 2017.

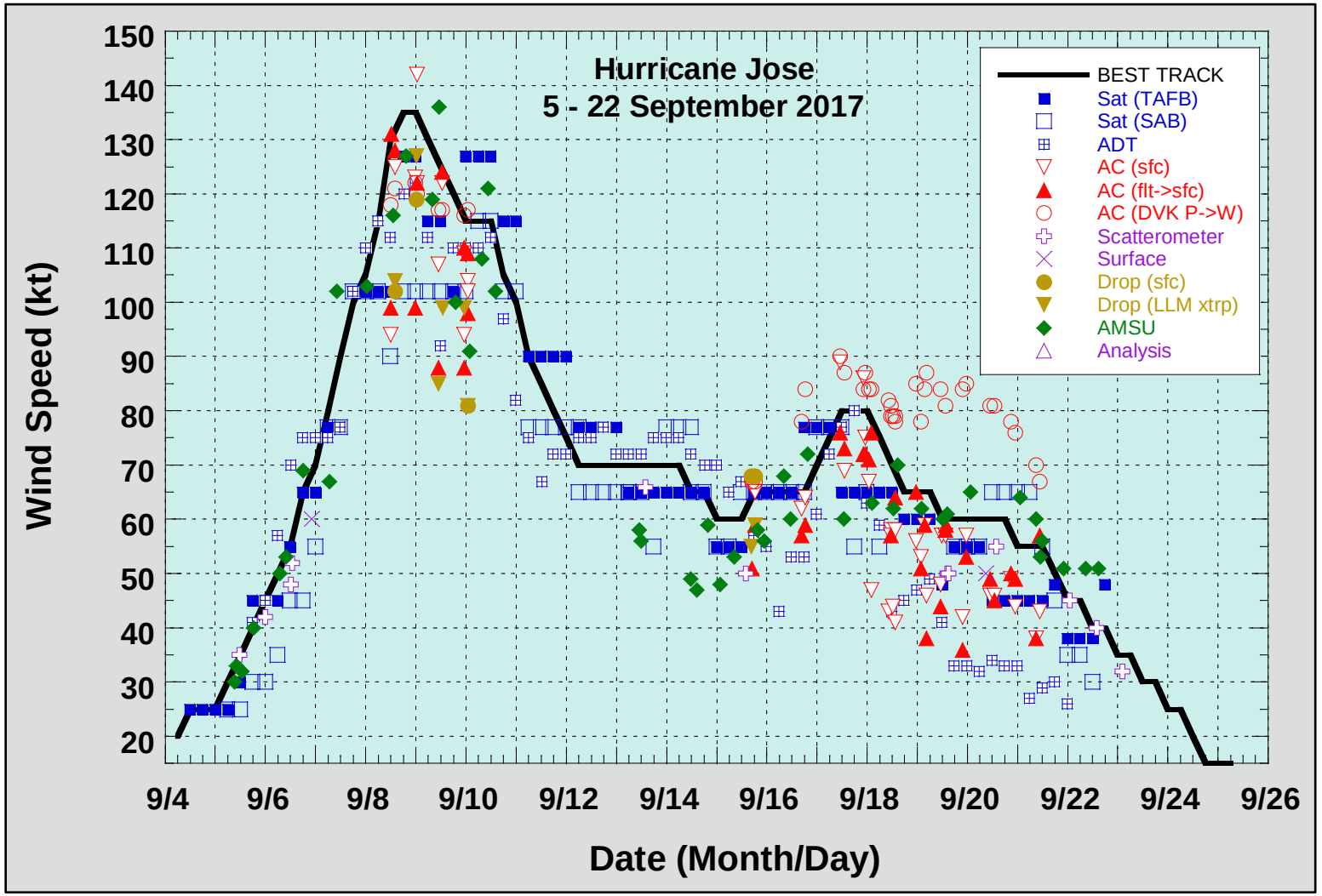

Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Jose, 5–22 September 2017. Aircraft observations have been adjusted for elevation using 90% and 80% adjustment factors for observations from 700 mb and 850 mb, respectively. Dropwindsonde observations 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. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. Dashed vertical lines correspond to 0000 UTC.

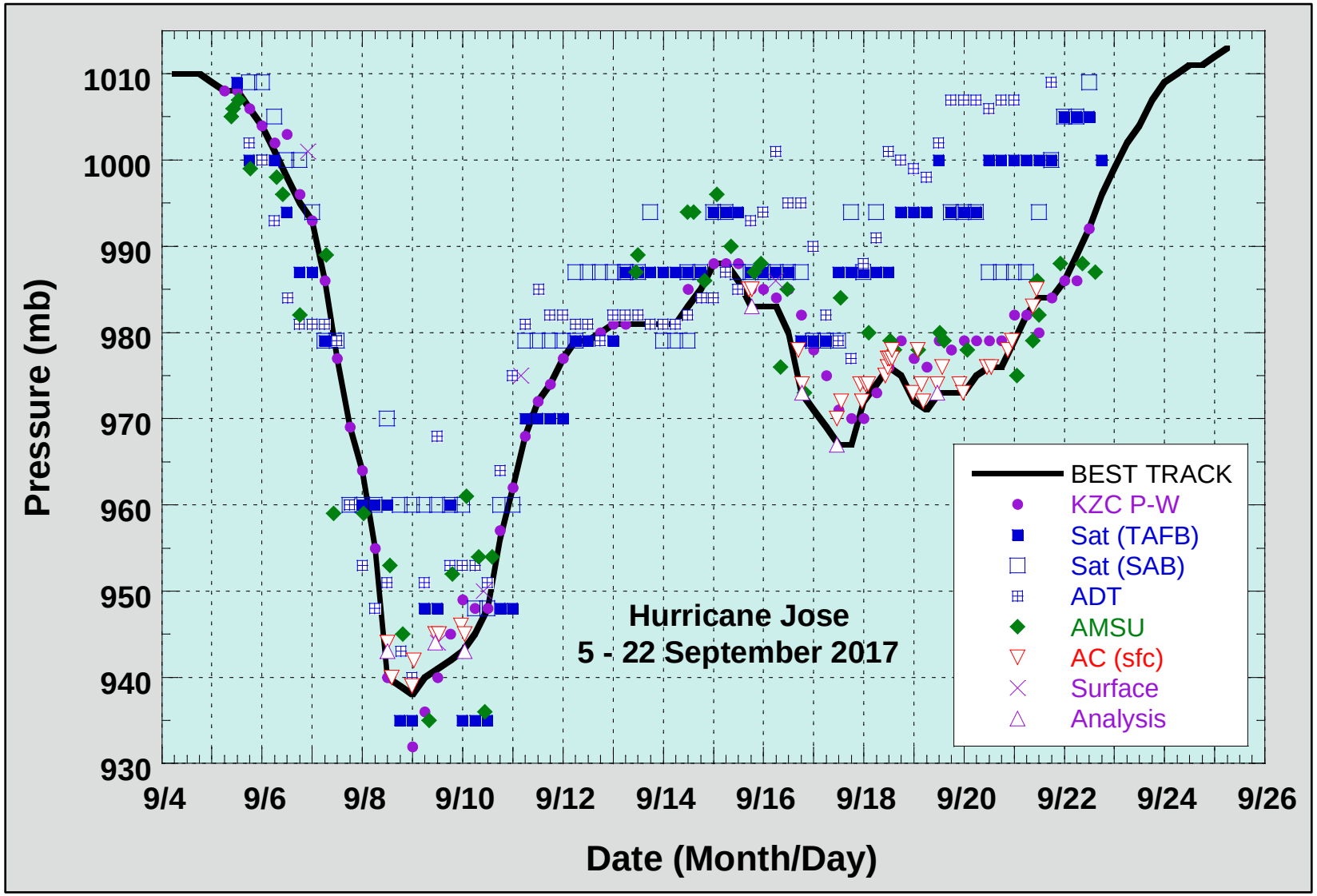

Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Jose, 5–22 September 2017. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC.

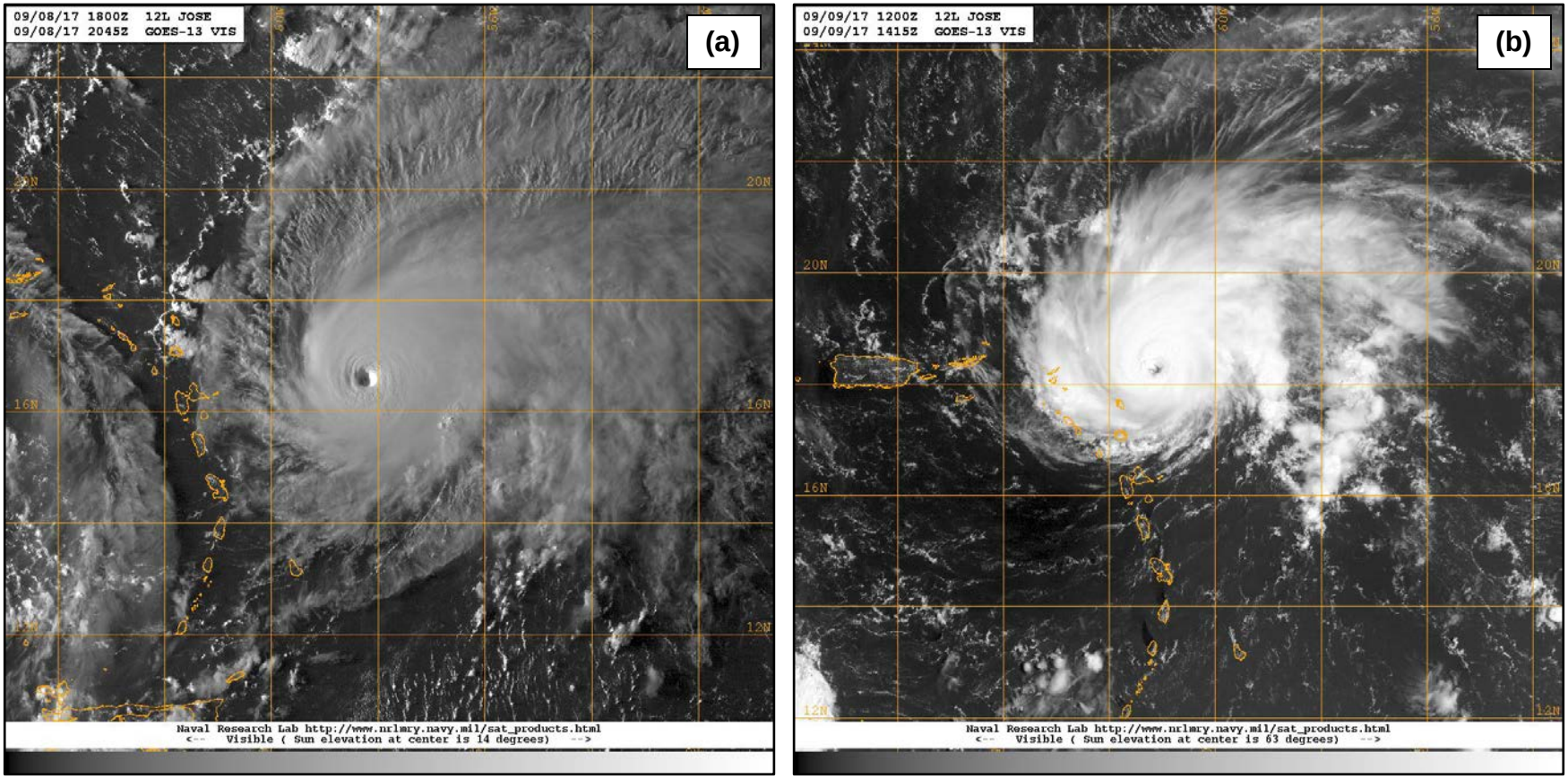

Figure 4. GOES-13 visible satellite images of Hurricane Jose (a) at its peak intensity of 135 kt east of the Leeward Islands at 2045 UTC 8 September and (b) at its closest approach to Barbuda at 1415 UTC 9 September with an intensity of 125 kt. Images courtesy of the Naval Research Laboratory.

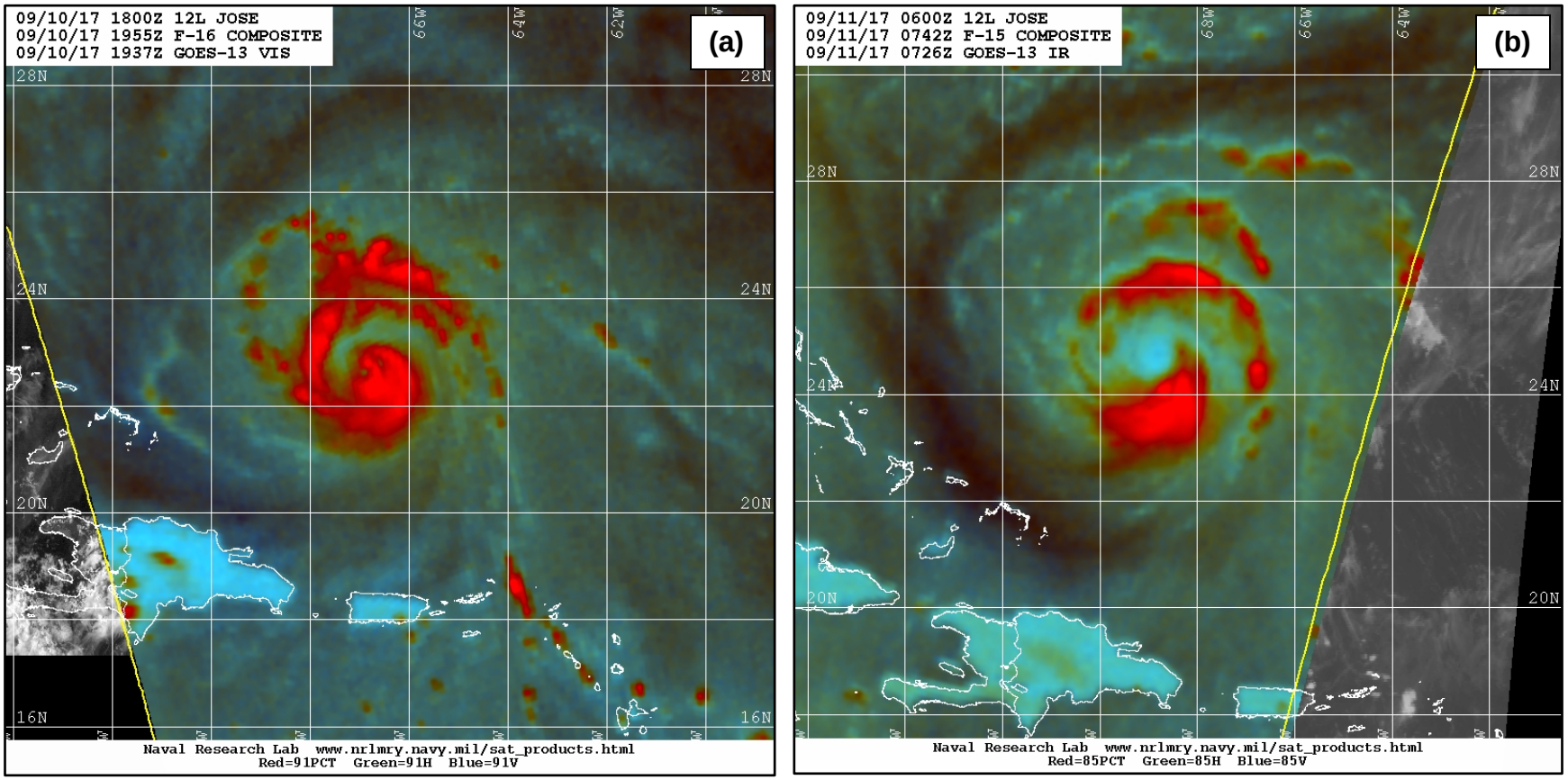

Figure 5. 85-GHz color composite microwave images of Hurricane Jose at (a) 1955 UTC 10 September and (b) 0742 UTC 11 September, showing that Jose's eye and inner core convection dissipated within the span of 12 hours. Images courtesy of the Naval Research Laboratory.

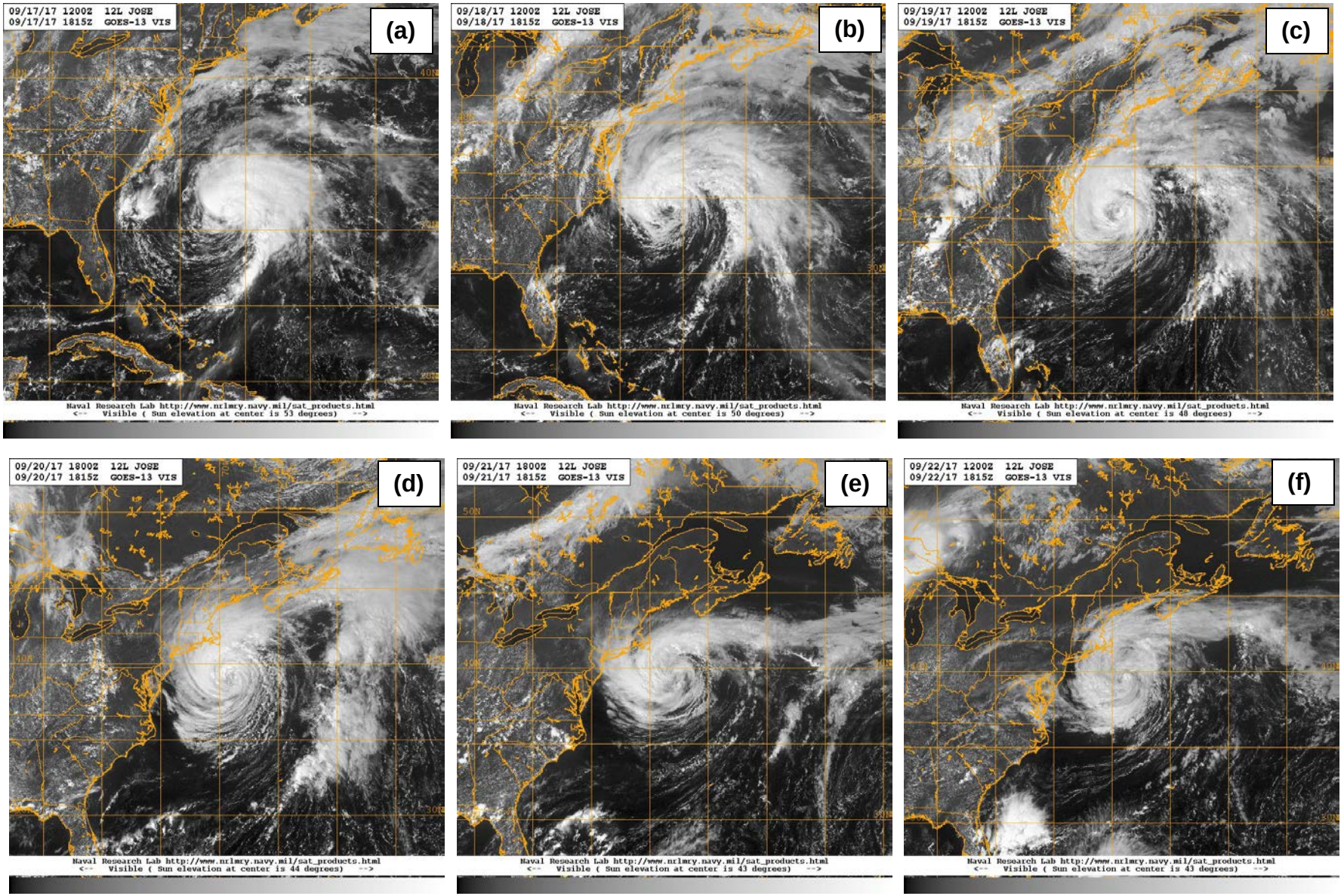

Figure 6. GOES-13 visible satellite images of Jose at 1815 UTC on each day from 17-22 September, showing its evolution from a hurricane (a) to a tropical storm (c) to a post-tropical cyclone (f). Images courtesy of the Naval Research Laboratory.

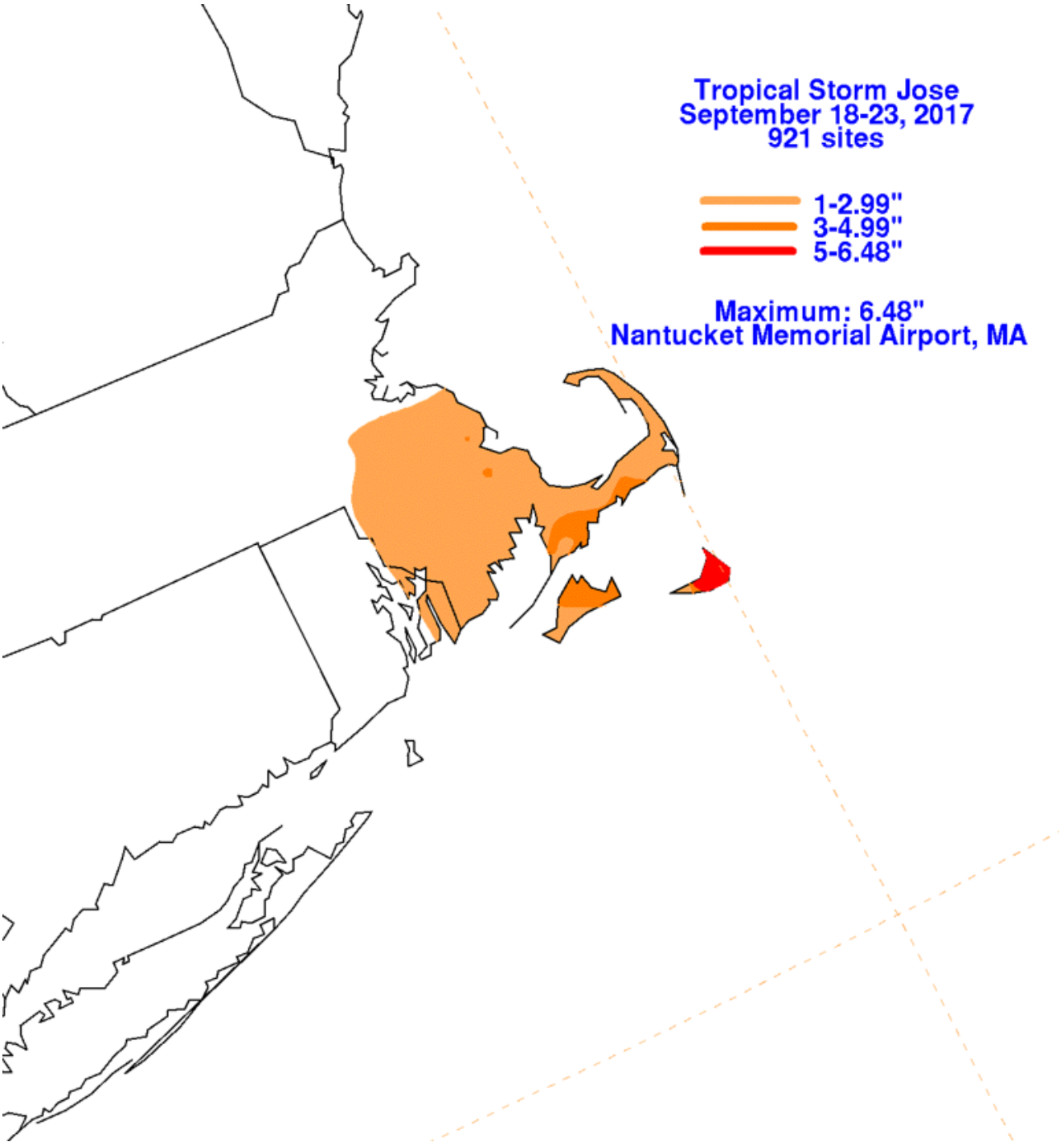

Figure 7. Rainfall accumulations (inches) between 18–23 September 2017 from Jose, while it was a tropical storm near the coast of New England. Image courtesy of the NOAA Weather Prediction Center.

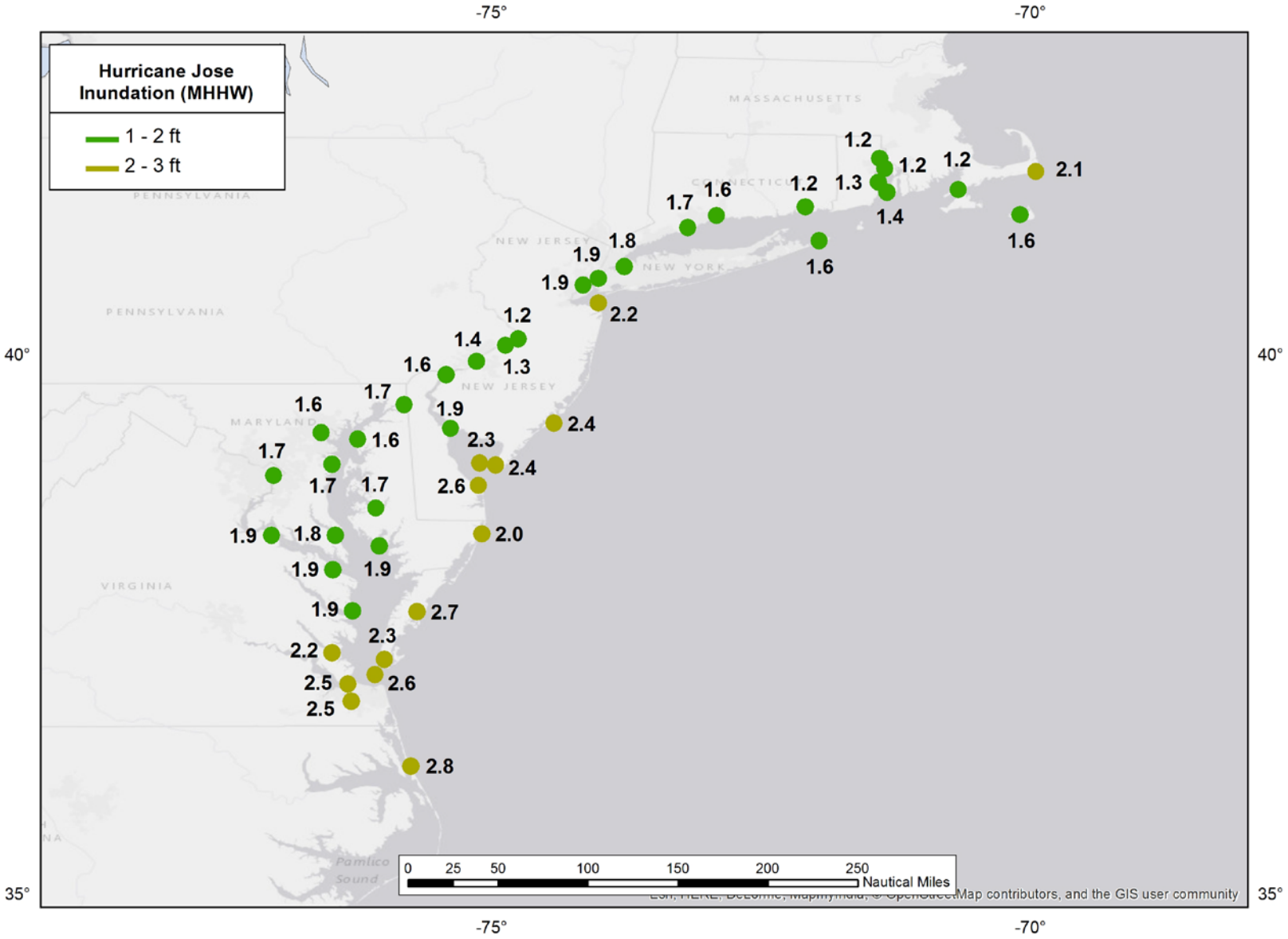

Figure 8. Storm tide measurements in feet above Mean Higher High Water (MHHW) from NOS gauges during Hurricane Jose. MHHW is used as a proxy for inundation, or storm surge covering normally dry ground.