NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT[1]

HURRICANE FERNANDA

(EP072023)

12–17 August 2023

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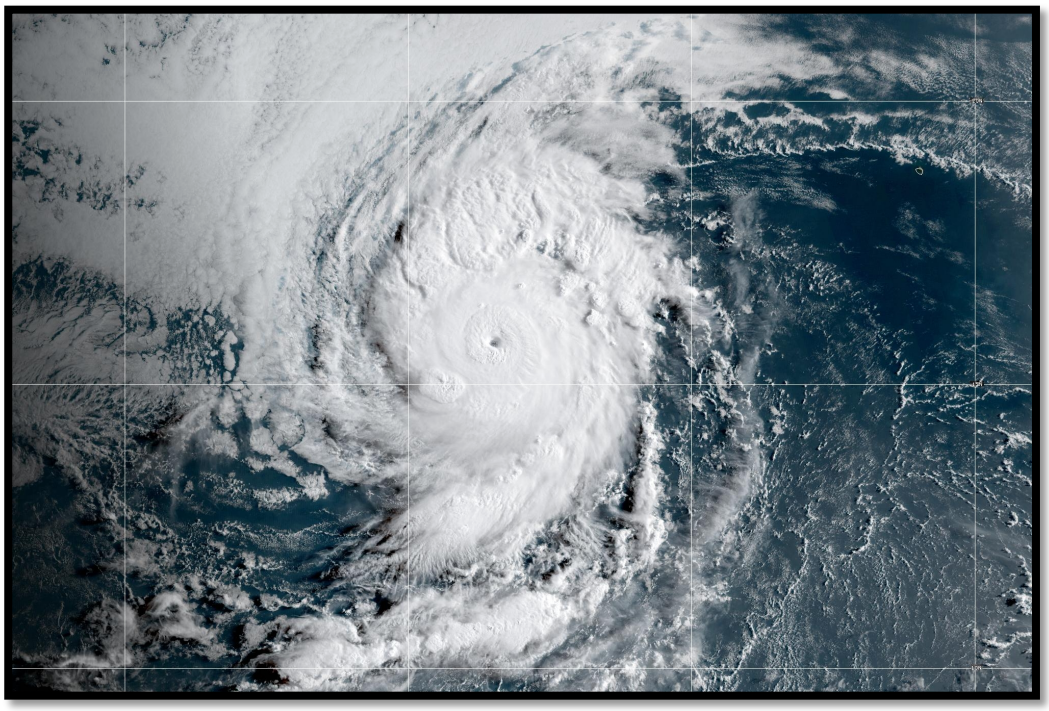
15 November 2023



GOES-18 GEOCOLOR VISIBLE SATELLITE IMAGE OF HURRICANE FERNANDA AT 1500 UTC 14 AUGUST 2023, WHILE IT WAS AT ITS PEAK INTENSITY AS A CATEGORY 4 HURRICANE (IMAGE COURTESY OF NOAA/NESDIS/STAR)

Fernanda rapidly intensified to a category 4 hurricane (on the Saffir-Simpson Hurricane Wind Scale) over the central part of the eastern Pacific basin and did not affect land.

[1] This is an abbreviated Tropical Cyclone Report since there were no coastal watches or warnings issued and no direct fatalities reported in association with Fernanda.

Hurricane Fernanda

12–17 AUGUST 2023

BEST TRACK

The "best track[2]" positions and intensities for Hurricane Fernanda are listed in Table 1. The best track chart of Fernanda's path is given in Fig. 1, with the wind and pressure histories along with available observations[3] shown in Figs. 2 and 3, respectively.

There were no ship or land-based reports of winds of tropical storm force associated with Fernanda.

Origin

Fernanda originated from a tropical wave that moved off the west coast of Africa on 28–29 July and crossed Central America into the eastern Pacific basin on 7 August.

Peak Intensity and Minimum Pressure

Fernanda's estimated peak intensity of 115 kt from 1200 to 1800 UTC 14 August is based on a blend of subjective Dvorak intensity estimates of T6.0/115 kt from TAFB and SAB, objective ADT estimates as high as T6.1/117 kt, and a SATCON value of 113 kt. Fernanda went through a period of rapid intensification from 1800 UTC 12 August through 1200 UTC 14 August, strengthening from a 30-kt tropical depression to a 115-kt category 4 hurricane over 42 h.

The estimated minimum central pressure of 949 mb is mostly based on the Knaff-Zehr-Courtney pressure-wind relationship. Pressure estimates based on subjective and objective satellite intensity estimates were a couple of millibars lower.

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[2] 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.

[3] Observations include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and 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. 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 Fernanda.

CASUALTY AND DAMAGE STATISTICS

There were no reports of damage or casualties associated with Fernanda.

FORECAST AND WARNING VERIFICATION

Table 2 provides the number of hours in advance of formation with the first NHC Tropical Weather Outlook (TWO) forecast in each likelihood category. Figure 4 shows composites of 7-day TWO genesis areas for each category prior to the formation of Fernanda. Fernanda's genesis location occurred within all potential formation areas depicted by NHC.

A verification of NHC official track forecasts for Fernanda is given in Table 3a. Official track forecast errors were lower than the mean official errors for the previous 5-yr period at all applicable forecast times. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b.

A verification of NHC official intensity forecasts for Fernanda is given in Table 4a. Official intensity forecast errors were greater than the mean official errors for the previous 5-yr period for the 12- through 60-h forecasts due to NHC not predicting the magnitude of the rapid intensification episode. Figure 5 shows that the NHC official intensity forecasts made during the first couple of days after Fernanda formed were too low and depicted a peak intensity later than what occurred. In addition, many of the official forecasts did not predict the fast weakening that occurred on 16 August. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b.

There were no coastal watches or warnings issued for Fernanda.

Table 1. Best track for Hurricane Fernanda, 12–17 August 2023.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
12 / 1200	14.2	111.8	1008	25	tropical depression
12 / 1800	14.7	112.6	1007	30	"
13 / 0000	15.0	113.6	1005	35	tropical storm
13 / 0600	15.2	114.6	1004	45	"
13 / 1200	15.3	115.4	1000	50	"
13 / 1800	15.3	116.1	995	65	hurricane
14 / 0000	15.4	116.8	975	85	"
14 / 0600	15.5	117.4	963	105	"
14 / 1200	15.6	118.0	949	115	"
14 / 1800	15.8	118.7	951	115	"
15 / 0000	16.2	119.4	955	110	"
15 / 0600	16.5	120.2	962	100	"
15 / 1200	16.8	121.2	967	95	"
15 / 1800	17.1	122.2	972	90	"
16 / 0000	17.2	123.4	977	85	"
16 / 0600	17.2	124.8	985	70	"
16 / 1200	17.0	126.1	994	55	tropical storm
16 / 1800	16.8	127.3	1000	45	"
17 / 0000	16.6	128.6	1002	40	"
17 / 0600	16.5	129.9	1004	35	low
17 / 1200	16.4	131.4	1005	35	"
17 / 1800	16.3	132.9	1005	35	"
18 / 0000	16.2	134.2	1005	35	"
18 / 0600	16.1	135.4	1006	35	"
18 / 1200	16.0	136.8	1006	35	"
18 / 1800	16.0	138.2	1007	35	"
19 / 0000	16.0	139.4	1008	30	"
19 / 0600	16.0	140.8	1008	30	"
19 / 1200	15.9	142.3	1008	30	"
19 / 1800	15.8	143.7	1008	30	"
20 / 0000	15.8	145.2	1008	30	"
20 / 0600	15.8	146.7	1009	25	"

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
20 / 1200	15.7	148.0	1009	25	"
20 / 1800	15.4	149.2	1009	25	"
21 / 0000	15.0	150.3	1009	25	"
21 / 0600	14.6	151.4	1009	25	"
21 / 1200	14.3	152.6	1009	25	"
21 / 1800	14.1	153.8	1009	25	"
22 / 0000	13.9	155.0	1009	25	"
22 / 0600	13.6	156.1	1009	25	"
22 / 1200	13.3	157.2	1009	25	"
22 / 1800	13.2	158.4	1009	25	"
23 / 0000	13.4	159.7	1009	25	"
23 / 0600	13.4	161.0	1009	25	"
23 / 1200	13.2	162.4	1009	25	"
23 / 1800	13.1	163.9	1009	25	"
24 / 0000	13.1	165.3	1009	25	"
24 / 0600	13.1	166.7	1009	25	"
24 / 1200	13.0	168.1	1009	25	"
24 / 1800					dissipated
14 / 1200	15.6	118.0	949	115	maximum winds and minimum pressure

Table 2. 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	**168-Hour Outlook**
Low (<40%)	78	126
Medium (40%-60%)	24	102
High (>60%)	0	60

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Hurricane Fernanda, 12–17 August 2023. 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	**17.1**	**28.4**	**35.7**	**40.2**	**40.0**	**41.6**	**60.7**	
OCD5	33.6	67.7	93.6	97.9	94.7	107.0	210.4	
Forecasts	16	14	12	10	8	6	2	
OFCL (2018-22)	22.1	34.0	45.4	56.0	70.9	78.7	100.5	117.8
OCD5 (2018-22)	36.7	73.4	114.0	156.9	193.2	244.5	317.0	376.0

Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Hurricane Fernanda, 12–17 August 2023. 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 3a due to the homogeneity requirement.

Model ID	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	17.7	30.6	35.1	37.0	40.7	43.0	68.2	
OCD5	35.2	65.9	80.1	83.8	97.1	112.2	213.2	
GFSI	18.5	**28.7**	**33.5**	43.1	68.7	86.2	150.0	
EMXI	20.7	35.9	43.7	50.1	57.0	60.8	**33.2**	
EGRI	21.6	45.5	71.7	97.4	122.1	149.5	198.0	
CMCI	18.4	32.0	43.4	56.8	73.8	88.8	74.9	
NVGI	39.0	59.2	67.1	81.8	119.0	163.8	285.6	
HWFI	21.3	32.5	44.4	55.8	69.0	82.2	120.2	
HMNI	22.4	36.3	44.4	48.2	60.5	64.8	204.5	
HFAI	21.0	31.5	38.8	45.3	60.3	75.9	142.7	
HFBI	21.6	31.4	38.3	38.9	49.6	54.4	91.6	
CTCI	23.9	42.6	51.4	62.3	87.0	119.4	206.5	
TVCE	18.6	**30.2**	36.5	41.2	52.3	50.7	83.1	
TVCX	19.0	**30.3**	35.6	41.6	51.1	51.4	**51.4**	
TVDG	19.2	**29.2**	36.3	42.3	50.2	50.7	72.2	
GFEX	19.0	**28.5**	**33.2**	37.1	46.8	51.6	84.8	
HCCA	**14.9**	**22.0**	**26.2**	**33.7**	**36.7**	**31.1**	**36.5**	
FSSE	**17.6**	**27.6**	**31.6**	**34.8**	43.6	**36.7**	**45.4**	
AEMI	18.3	**28.7**	**29.4**	**27.8**	**39.4**	46.6	74.8	
TABS	26.2	52.6	71.0	109.4	152.3	189.3	300.6	
TABM	22.8	34.1	41.0	46.1	67.8	95.4	155.7	
TABD	25.0	40.6	59.6	86.0	121.7	158.4	195.0	
Forecasts	13	11	9	8	7	5	1	

Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Hurricane Fernanda, 12–17 August 2023. 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	10.0	15.7	17.1	17.5	15.6	15.8	**7.5**	
OCD5	12.6	25.1	33.2	37.2	34.5	24.5	11.0	
Forecasts	16	14	12	10	8	6	2	
OFCL (2018-22)	5.4	8.9	11.0	12.8	14.3	15.8	17.0	17.6
OCD5 (2018-22)	6.9	12.1	15.9	18.6	18.7	21.0	22.3	22.1

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Hurricane Fernanda, 12–17 August 2023. 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 4a due to the homogeneity requirement.

Model ID	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	11.2	17.3	15.0	15.6	14.3	15.0	10.0	
OCD5	14.2	27.5	31.7	34.1	33.1	22.8	14.0	
HWFI	**9.9**	**16.5**	**14.8**	**13.0**	**12.1**	**9.4**	13.0	
HMNI	**9.8**	**14.9**	**14.2**	**14.0**	**12.6**	**9.0**	**5.0**	
HFAI	**10.7**	**15.3**	15.3	**12.8**	**5.3**	**3.4**	**7.0**	
HFBI	**9.9**	**16.6**	**11.1**	**11.1**	**8.1**	**11.4**	**3.0**	
CTCI	**9.2**	**14.7**	17.6	16.9	15.0	**13.8**	14.0	
DSHP	12.7	23.2	23.4	21.4	18.9	15.6	22.0	
LGEM	11.8	21.4	20.7	18.5	16.1	**13.6**	20.0	
ICON	**10.2**	18.3	16.2	15.9	14.6	**11.8**	15.0	
IVCN	**10.1**	**16.5**	**14.4**	**13.9**	**12.1**	**9.6**	**8.0**	
IVDR	**10.2**	**16.0**	**14.4**	**13.6**	**11.7**	**9.0**	**6.0**	
HCCA	**8.9**	**13.2**	**10.9**	**8.6**	**6.1**	**14.4**	14.0	
FSSE	**9.2**	**14.5**	**12.4**	**12.8**	**11.6**	**9.6**	**4.0**	
GFSI	12.4	21.8	23.1	21.6	18.1	**11.4**	**0.0**	
EMXI	15.7	27.6	30.4	27.1	21.0	15.4	**7.0**	
Forecasts	13	11	9	8	7	5	1	

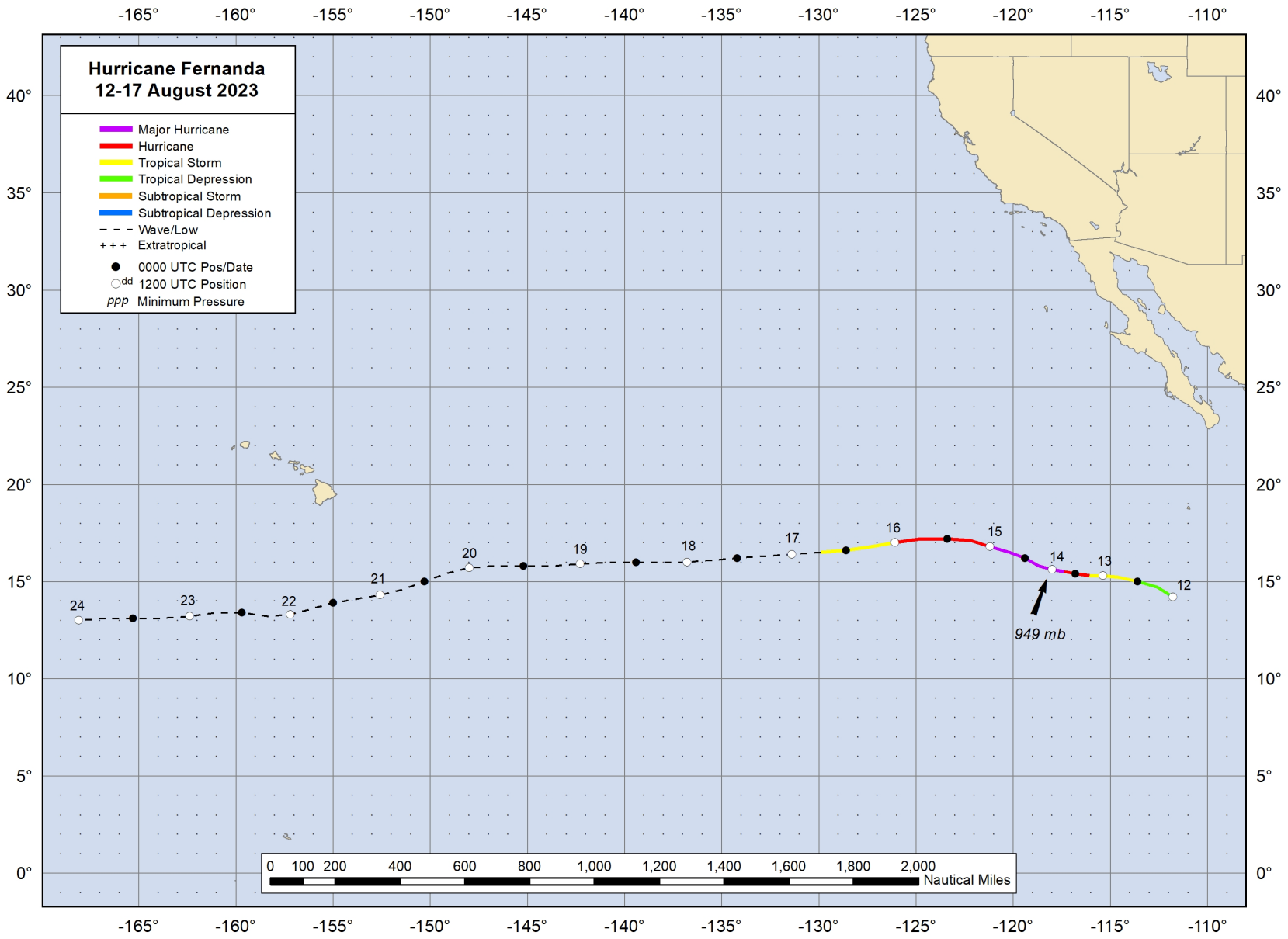

Figure 1. Best track positions for Hurricane Fernanda, 12–17 August 2023.

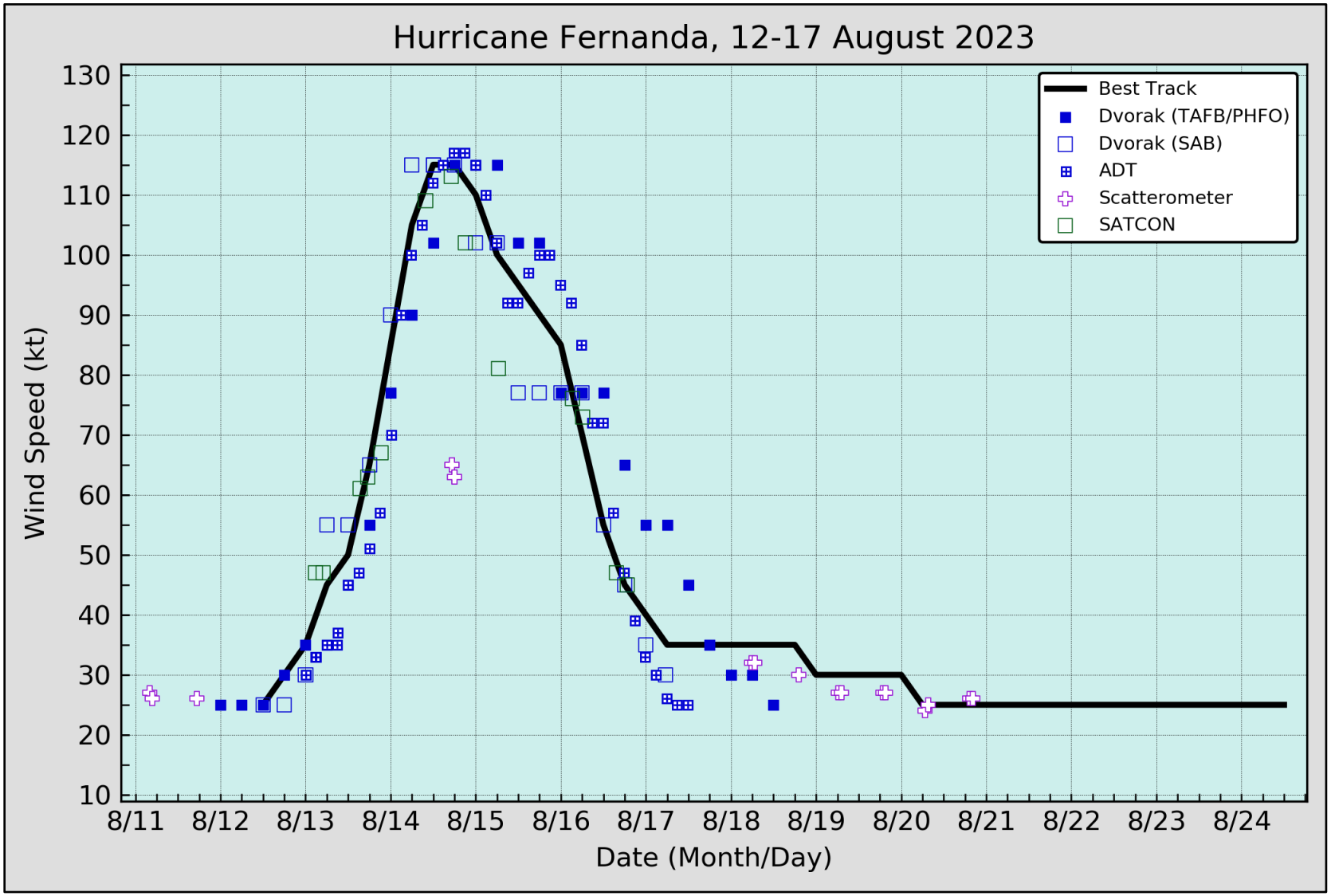

Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Fernanda, 12–17 August 2023. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

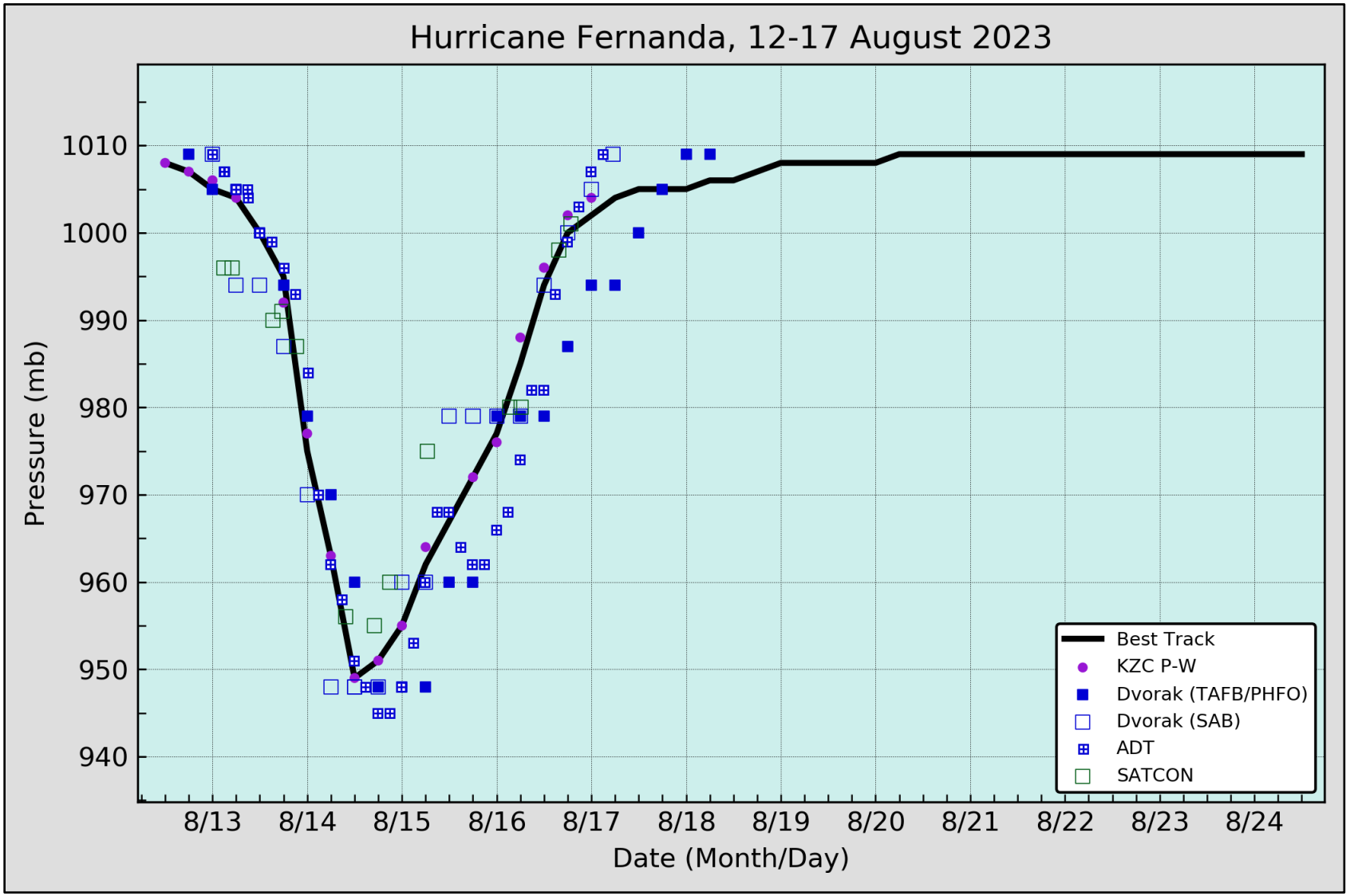

Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Fernanda, 12–17 August 2023. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological 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.

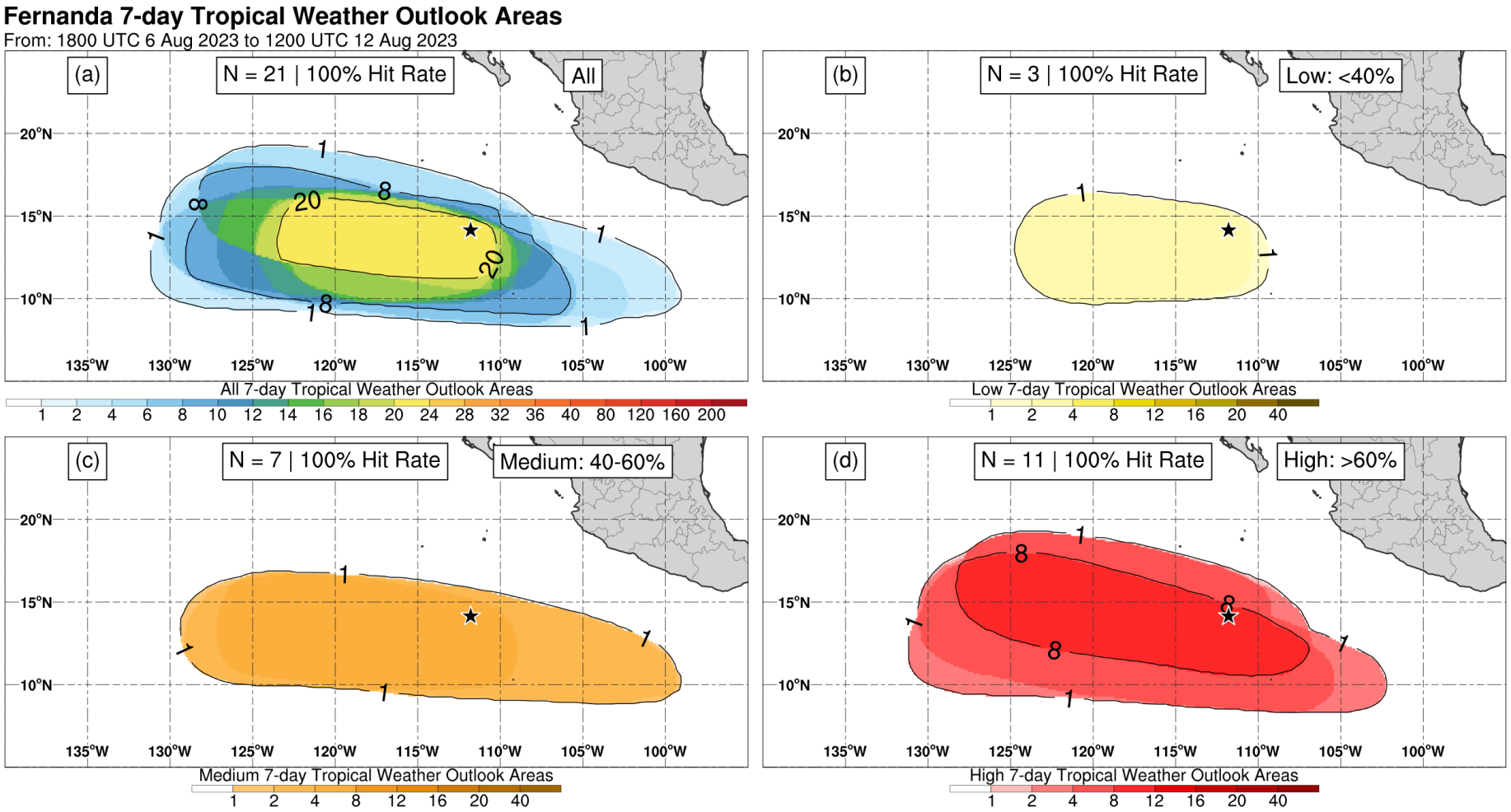

Figure 4. Composites of 7-day tropical cyclone genesis areas depicted in NHC's Tropical Weather Outlooks prior to the formation of Hurricane Fernanda for (a) all probabilistic genesis categories, (b) the low (<40%) category, (c) medium (40–60%) category, and (d) high (>60%) category. The location of genesis is indicated by the black star.

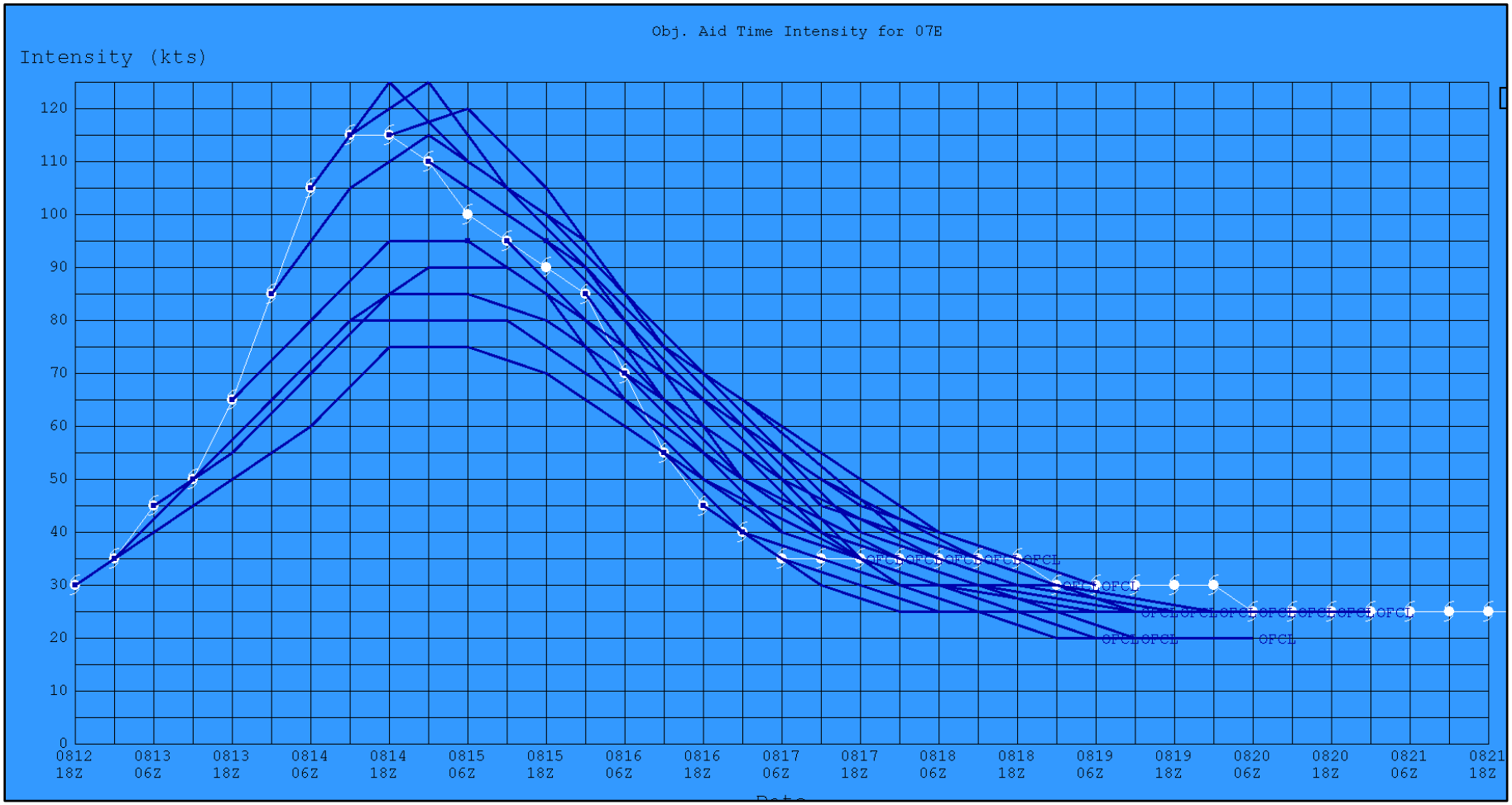

Figure 5. NHC official intensity forecasts (dark blue lines) for Hurricane Fernanda from 1800 UTC 12 August through 0000 UTC 17 August relative to Fernanda's best track intensities (white line with symbols).