NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

TROPICAL STORM ISELLE

(EP142020)

26–30 August 2020

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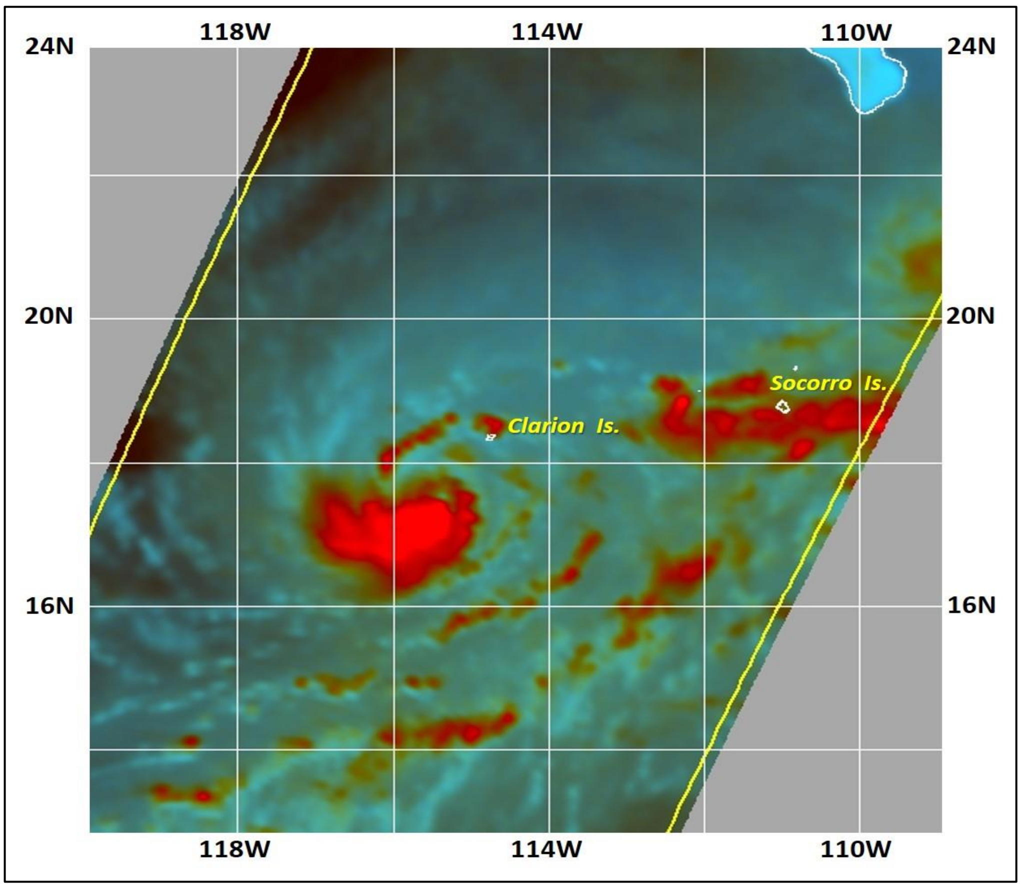

NASA GLOBAL PRECIPITATION MEASUREMENT (GPM) 89-GHZ MICROWAVE IMAGE AT 0330 UTC 28 AUGUST 2020 WHEN ISELLE WAS NEAR ITS PEAK INTENSITY. IMAGE COURTESY U.S. NAVAL RESEARCH LABORATORY, MONTEREY, CA.

Iselle was a moderate tropical storm that produced tropical-storm-force winds on Clarion Island, Mexico, before dissipating over the eastern portion of the basin just west of Baja California Sur.

Tropical Storm Iselle

26–30 AUGUST 2020

SYNOPTIC HISTORY

The incipient disturbance from which Iselle formed was a westward-moving tropical wave. This disturbance triggered the development of a small low-pressure system on 23 August within the southern and convectively active portion of a large cyclonic monsoon gyre that covered much of the eastern North Pacific basin. However, the wave continued its westward motion into the central Pacific basin, leaving behind an ill-defined low-level cyclonic circulation. By 25 August, an eastward-moving convectively coupled Kelvin wave (CCKW) interacted with the fledgling low, causing an increase in the depth and amount of the associated deep convection. Despite strong east-northeasterly vertical wind shear in excess of 25 kt (Fig. 1), convection continued to increase and became better organized, causing the low-level circulation to strengthen and become better defined by early 26 August (Fig. 2). By 1200 UTC that day, it is estimated that a tropical depression formed a little more than 600 n mi southwest of the southern tip of the Baja California peninsula. The system strengthened into a tropical storm 6 h later. The "best track" chart of the tropical cyclone's path is given in Fig. 3, with the wind and pressure histories shown in Figs. 4 and 5, respectively. The best track positions and intensities are listed in Table 1[1].

Although the relatively large magnitude of the 850–200-mb vertical wind shear would typically be considered unfavorable, the east-northeasterly upper-level flow was strongly diffluent, which helped to offset the hostile shear conditions and aided in the development of deep convection near the low-level center. This pattern resulted in gradual strengthening over the next few days while Iselle moved north-northeastward around the eastern periphery of the larger monsoon gyre in which the cyclone was embedded (Fig. 2). The cyclone reached its peak intensity of 50 kt around 0600 UTC 28 August and maintained that strength for the next 6 h while it was located about 380 n mi southwest of the southern tip of Baja California. Thereafter, slow but steady weakening began and continued through 31 August due to increasing vertical wind shear to near 30 kt in conjunction with steadily decreasing sea-surface temperatures (Fig. 1) and atmospheric instability. Iselle weakened to a tropical depression by 0600 UTC 30 August and degenerated into a remnant low 12 h later, with the system dissipating by 1800 UTC 31 August less than 60 n mi west of western Baja California Sur.

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[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.

METEOROLOGICAL STATISTICS

Observations in Iselle (Figs. 4 and 5) include subjective satellite-based Dvorak and intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB), and objective Advanced Dvorak Technique (ADT) estimates and Satellite Consensus (SATCON) estimates from the Cooperative Institute for Meteorological Satellite Studies/University of Wisconsin-Madison. 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 Iselle.

Iselle's estimated peak intensity of 50 kt is based on an average of ASCAT surface wind data that showed maximum winds 46 kt and 47 kt, subjective Dvorak satellite intensity estimates of 45 kt and 55 kt from TAFB and SAB, respectively, plus the brief appearance of a mid-level eye feature around that same time (cover photo). The estimated minimum central pressure of 997 mb is based on the Knaff-Zehr-Courtney (KZC) pressure-wind relationship.

An observing site at Clarion Island, Mexico, reported a sustained wind of 35 kt and a gust to 42 kt around 1930 UTC 28 August when Iselle was located about 40 n mi west-northwest of the island. There were no ship reports of tropical-storm-force winds associated with Iselle.

CASUALTY AND DAMAGE STATISTICS

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

FORECAST AND WARNING CRITIQUE

The genesis of Iselle was not anticipated very well. The incipient disturbance from which Iselle formed was introduced in the Tropical Weather Outlook in the low (<40%) category only 30 h prior to genesis in both the 48- and 120-h periods (Table 2). Genesis probabilities were raised to the medium (40% – 60%) category 18 h prior to Iselle's development in both the 2-day and 5-day periods. Probabilities didn't reach the high (>60%) category until 6 h and 12 h before genesis for the 48-h and 120-h forecast periods, respectively. The very poor genesis forecasts were due to the expectation that strong vertical wind shear that had hindered development during the previous few days would continue. Although the hostile shear persisted and even increased, the beneficial role that the strongly diffluent upper-level flow played was underestimated.

A verification of NHC official track forecasts for Iselle is given in Table 3a. Official forecast track (OFCL) errors were slightly greater than the mean official errors for the previous 5-yr period through 48 h, but were lower than average from 60–96 h. There was initially an eastward bias to the OFCL track forecasts, followed by a westward bias when Iselle was expected to weaken and be steered more westward by the northeasterly to easterly low-level trade wind flow (Fig. 6). However, OCD5 climatological-persistence errors were nearly twice the 5-year average errors, an indication that Iselle was much more difficult than normal to forecast and that NHC OFCL track forecasts were quite skillful despite the aforementioned biases. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. The OFCL forecasts were bested slightly by some of the global and consensus models. However, none of the available track model guidance outperformed OFCL at all forecast times.

A verification of NHC official intensity forecasts for Iselle is given in Table 4a. Official forecast intensity errors were lower than the mean official errors for the previous 5-yr period at all available times. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. NHC intensity forecasts were comparable to or better than the majority of the available intensity guidance, and correctly anticipated the timing and magnitude of Iselle's peak intensity, along with the cyclone's rate of weakening.

No coastal watches or warnings were issued in association with Iselle.

Table 1. Best track for Tropical Storm Iselle, 26–30 August 2020.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
25 / 1800	15.0	117.5	1006	25	low
26 / 0000	15.1	117.4	1006	25	"
26 / 0600	15.2	117.3	1005	30	"
26 / 1200	15.3	117.1	1004	30	tropical depression
26 / 1800	15.5	116.8	1004	35	tropical storm
27 / 0000	15.8	116.5	1003	35	"
27 / 0600	16.3	116.2	1001	40	"
27 / 1200	16.7	116.0	1001	40	"
27 / 1800	17.1	115.8	999	45	"
28 / 0000	17.4	115.7	999	45	"
28 / 0600	17.7	115.6	997	50	"
28 / 1200	18.1	115.5	997	50	"
28 / 1800	18.5	115.4	999	45	"
29 / 0000	19.0	115.2	1000	45	"
29 / 0600	19.5	115.0	1001	40	"
29 / 1200	20.0	114.8	1001	40	"
29 / 1800	20.6	114.5	1002	40	"
30 / 0000	21.4	114.2	1003	35	"
30 / 0600	22.1	113.8	1004	30	tropical depression
30 / 1200	22.7	113.5	1005	30	"
30 / 1800	23.4	113.3	1006	25	low
31 / 0000	24.0	113.3	1008	20	"
31 / 0600	24.5	113.2	1010	15	"
31 / 1200	24.8	113.2	1010	15	"
31 / 1800					dissipated
28 / 0600	17.7	115.6	997	50	minimum pressure & maximum wind

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	**120-Hour Outlook**
Low (<40%)	30	30
Medium (40%-60%)	18	18
High (>60%)	6	12

Table 3a. Preliminary NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Iselle, 26–30 August 2020. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	24.1	39.1	51.8	55.8	**57.3**	**68.8**	**89.8**	
OCD5	25.4	51.9	79.6	127.6	187.5	261.0	564.3	
Forecasts	15	13	11	9	7	5	1	
OFCL (2015-19)	21.8	34.0	44.9	55.3	66.2	77.1	99.1	
OCD5 (2015-19)	34.3	69.9	108.7	146.8	181.4	216.0	268.7	

Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Iselle, 26–30 August 2020. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here are 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	25.7	43.6	57.7	54.8	42.4	77.4		
OCD5	**21.4**	45.8	73.5	121.9	180.5	234.2		
GFSI	35.8	68.0	97.8	114.1	82.4	**49.7**		
EMXI	**18.6**	**31.0**	**48.7**	56.9	**32.6**	114.2		
EGRI	**24.1**	**39.5**	61.6	86.6	122.2	199.2		
NVGI	**23.9**	55.0	85.5	109.4	105.6	202.9		
CMCI	35.3	54.5	72.0	90.0	116.3	201.3		
HWFI	28.4	**43.4**	**50.7**	62.4	**40.4**	98.9		
HMNI	27.2	**39.3**	**55.1**	83.3	119.9	225.1		
CTCI	33.9	57.1	69.6	70.5	**39.7**	121.4		
TVCE	**25.0**	**40.4**	**52.0**	**53.9**	55.1	127.9		
HCCA	**25.0**	**42.2**	**56.6**	59.3	**27.3**	**56.1**		
FSSE	**23.7**	**37.2**	**55.1**	57.8	**34.7**	**70.6**		
AEMI	39.9	77.3	106.3	108.0	52.7	**70.5**		
TABS	26.1	57.6	80.4	102.7	114.0	**76.6**		
TABM	29.1	54.6	79.7	104.9	147.0	175.0		
TABD	51.7	121.4	191.9	257.5	334.7	394.3		
Forecasts	12	10	8	6	4	2		

Table 4a. Preliminary NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Iselle, 26–30 August 2020. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	**3.3**	**4.6**	**4.5**	**4.4**	**4.3**	**6.0**	**0.0**	
OCD5	3.1	6.0	9.8	13.7	19.7	22.0	26.0	
Forecasts	15	13	11	9	7	5	1	
OFCL (2015-19)	6.0	9.9	12.1	13.5	14.5	15.4	15.6	
OCD5 (2015-19)	7.8	13.0	16.6	18.9	20.2	21.4	22.6	

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Iselle, 26–30 August 2020. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here are slightly 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	3.2	4.6	4.0	3.1	2.5	5.0		
OCD5	3.2	6.4	10.7	15.2	21.0	23.0		
HWFI	3.6	5.2	5.6	3.9	5.2	6.5		
HMNI	3.9	**4.1**	5.0	6.5	5.7	6.0		
DSHP	3.9	5.6	5.9	4.4	3.5	5.0		
LGEM	3.6	6.0	6.8	7.4	9.0	10.8		
ICON	**2.7**	**4.1**	4.9	5.0	3.8	**4.0**		
IVCN	**2.6**	**4.2**	5.1	4.5	3.3	**4.2**		
CTCI	**2.4**	5.6	7.4	5.1	2.8	5.8		
GFSI	**2.9**	5.0	6.3	5.1	2.7	**4.5**		
EMXI	3.8	5.8	6.7	7.0	6.3	7.5		
HCCA	**2.4**	**4.2**	6.0	4.8	3.8	**4.0**		
FSSE	**2.4**	**3.6**	4.6	4.8	4.5	5.8		
Forecasts	14	12	10	8	6	4		

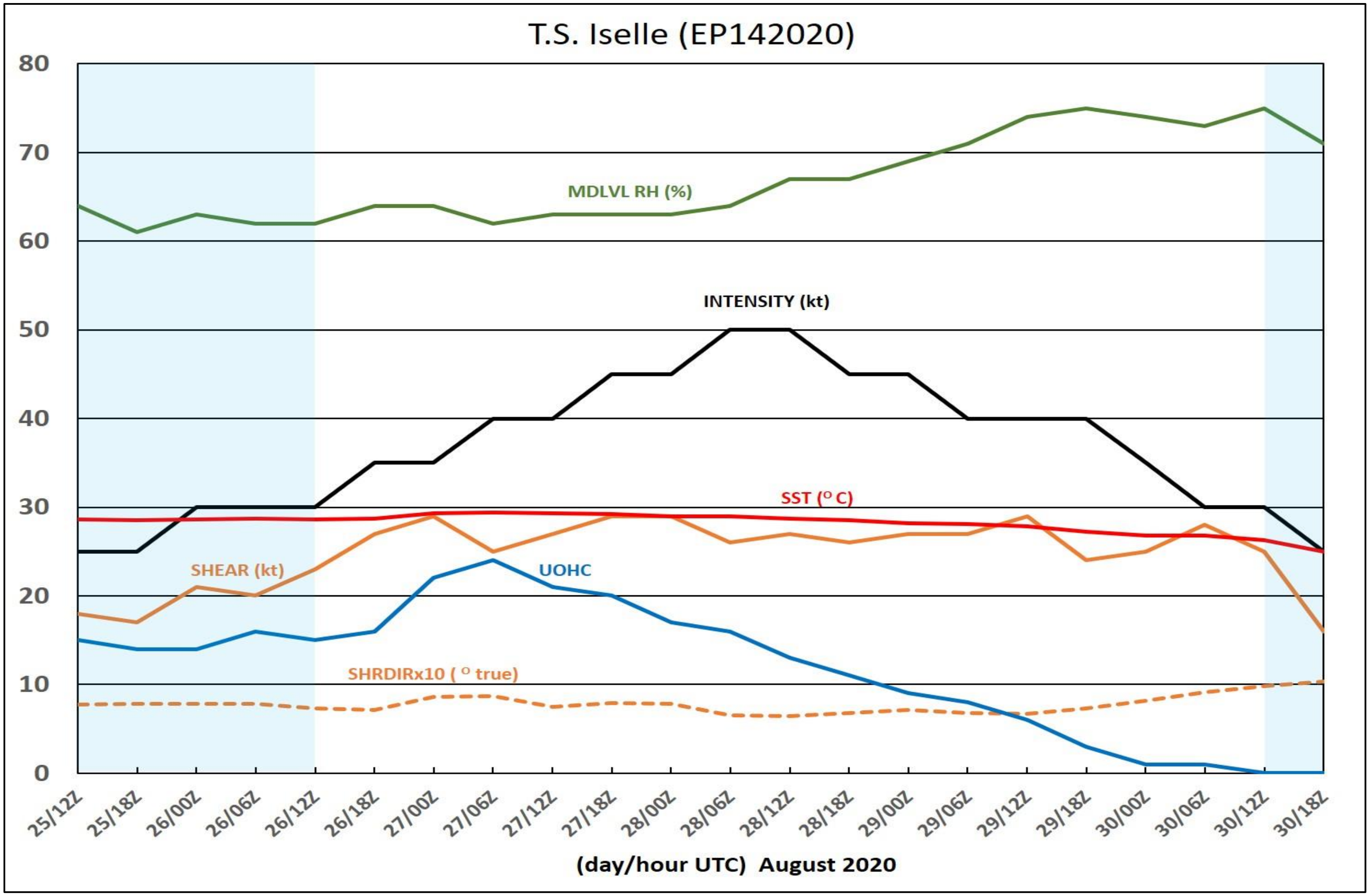

Figure 1. Graph of intensity (kt) versus GFS-based SHIPS model parameters for Tropical Storm Iselle during the period 25–30 August 2020. SHEAR is 850–200 mb vertical wind shear (kt); SHRDIRx10 is the shear direction (dashed line; degrees true) multiplied by 10; SST is sea-surface temperature (°C); UOHC is upper ocean heat content (KJ cm^{-2},); MDLVL RH is 700–500–mb average relative humidity (%). Light-blue shaded regions represent the pre-genesis (left) and post-tropical (right) periods.

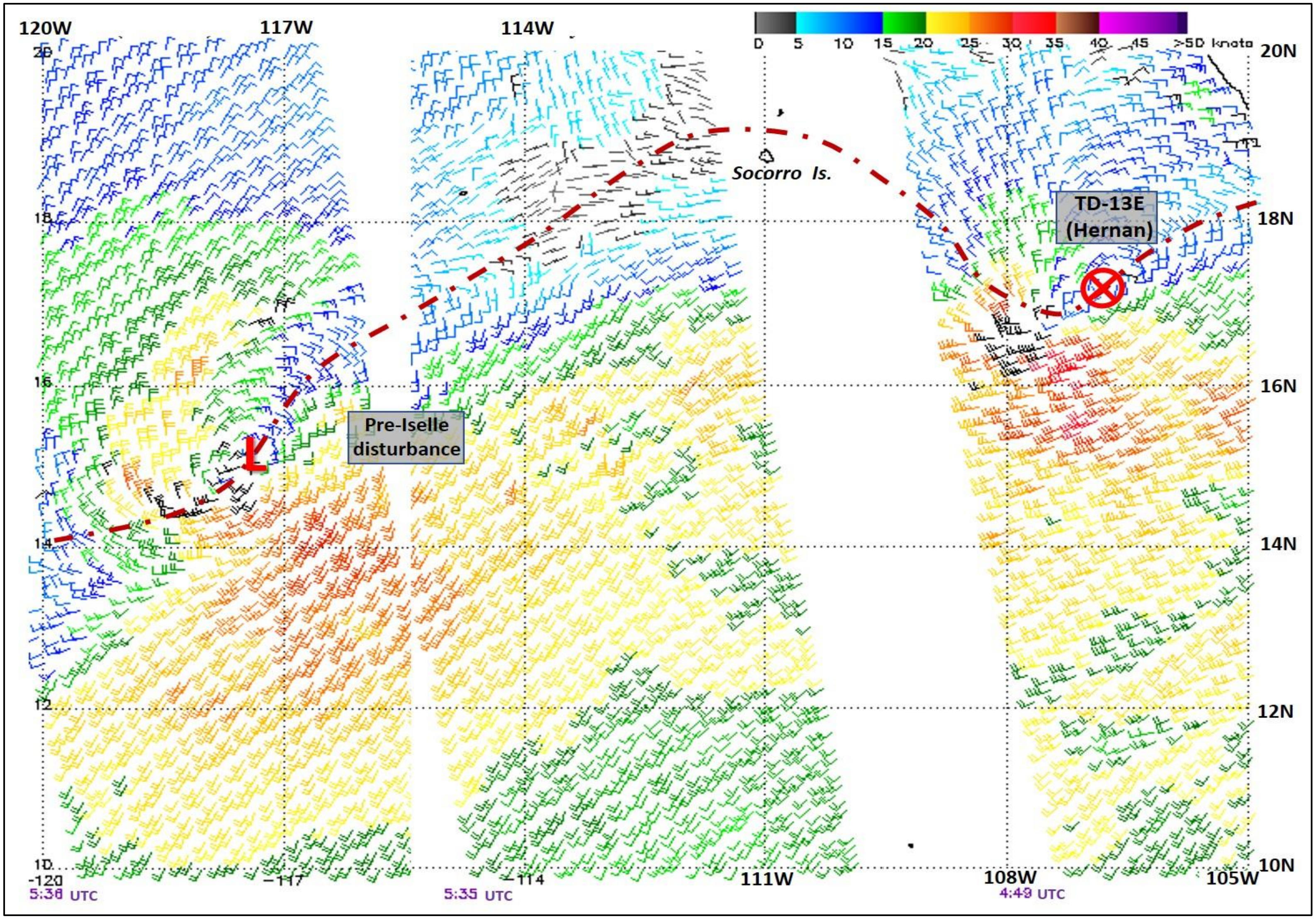

Figure 2. Composite of ASCAT-A (center), -B (left), and -C (right) scatterometer surface wind data (kt) from 0449–0536 UTC 26 August 2020. The pre-Iselle disturbance is labeled with a red L and TD-13E (Hernan) is denoted with a red circled X. The eastern North Pacific monsoon trough axis is depicted by the dotted-dashed line. Image courtesy NOAA NESDIS.

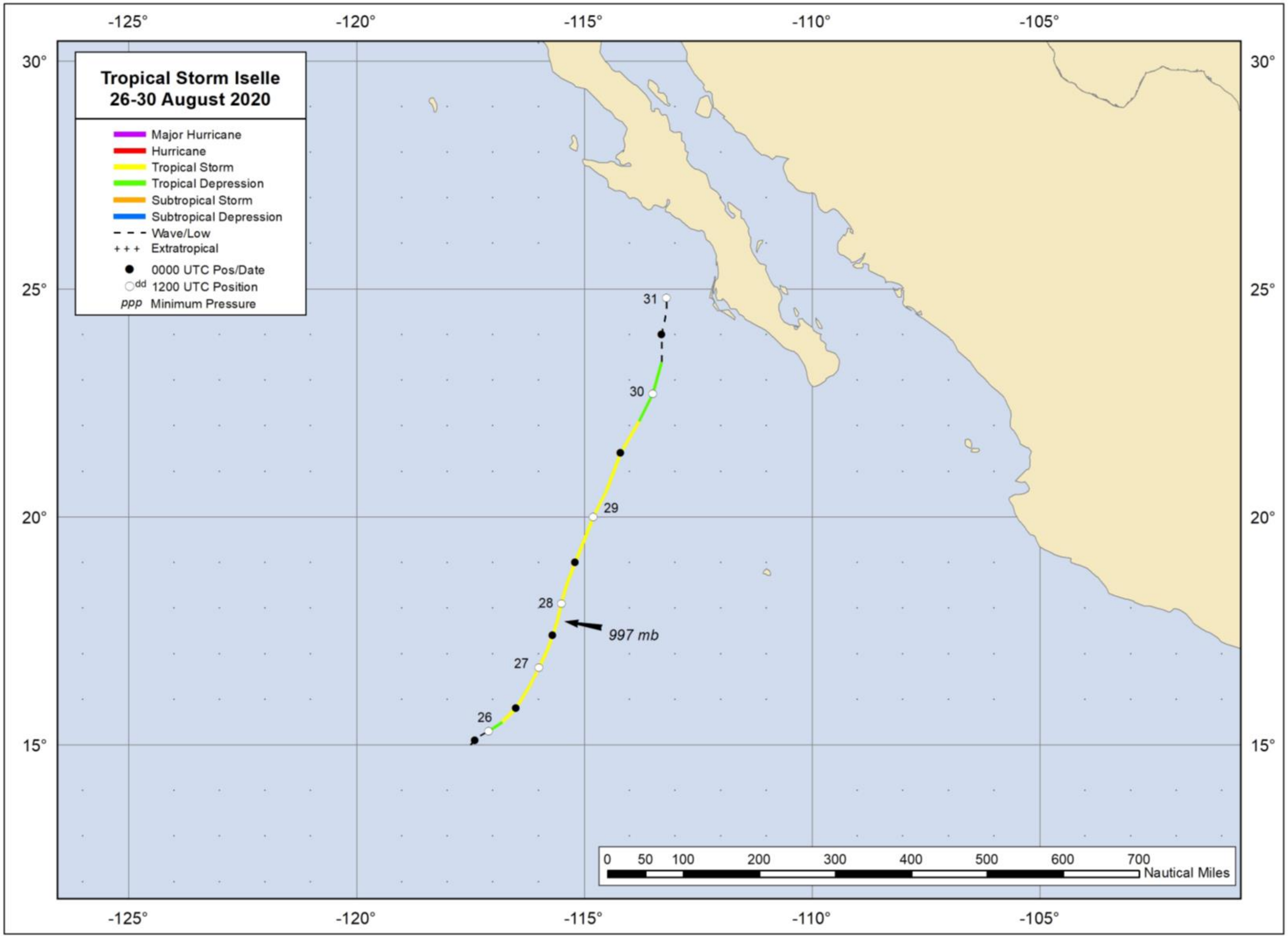

Figure 3. Best track positions for Tropical Storm Iselle, 26–30 August 2020.

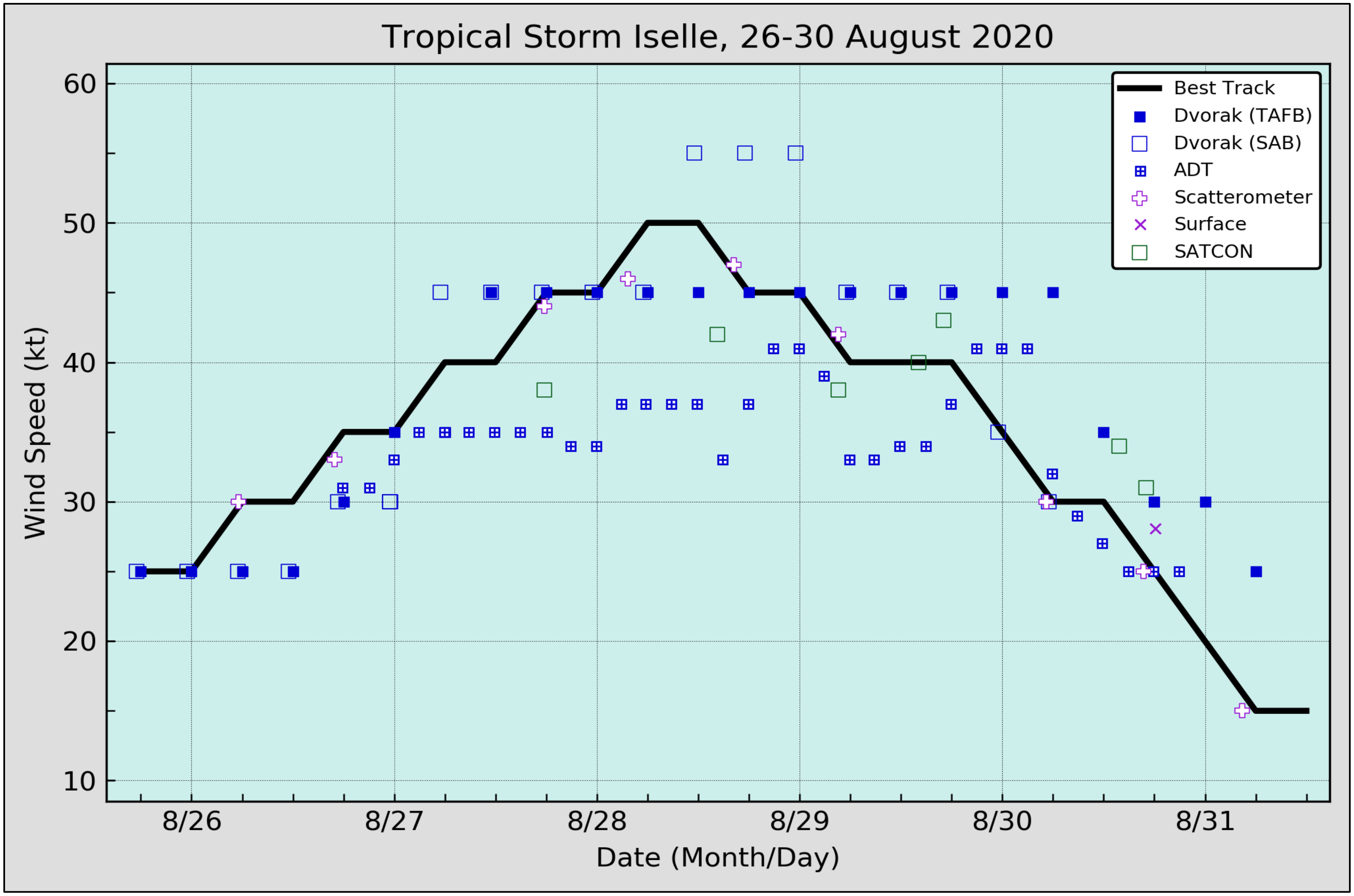

Figure 4. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Iselle, 26–30 August 2020. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

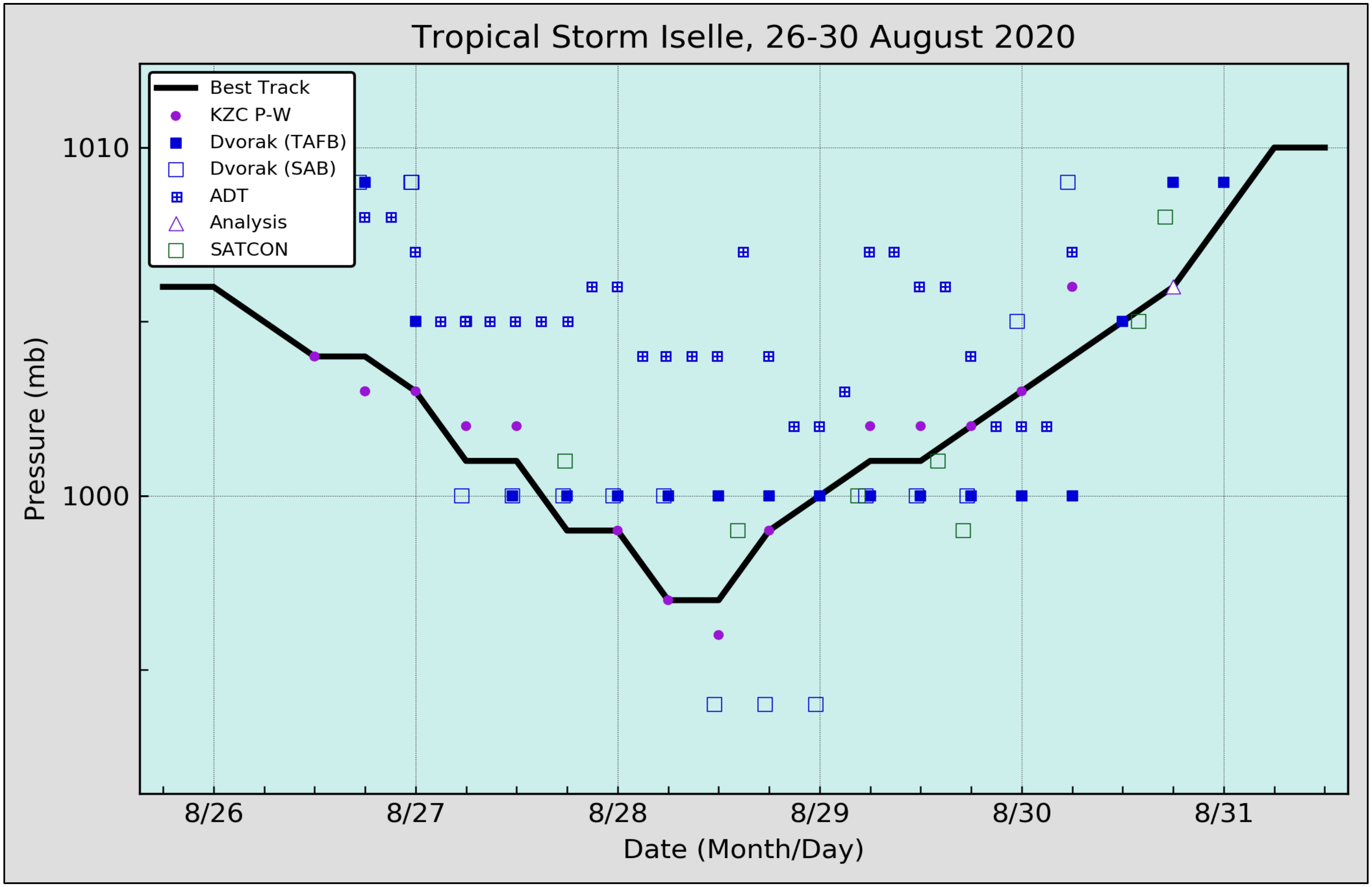

Figure 5. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Iselle, 26–30 August 2020. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC.

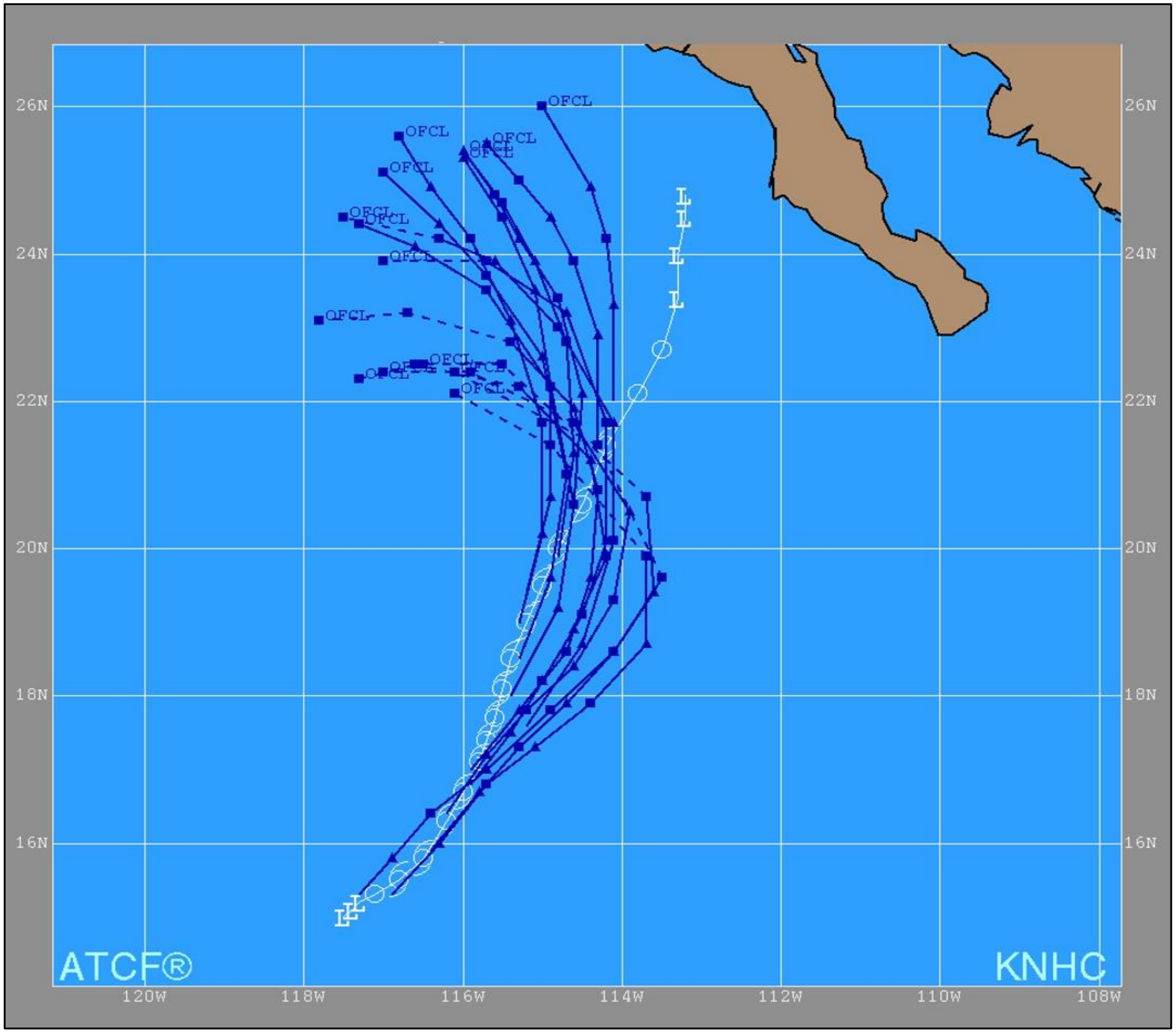

Figure 6. Selected NHC official track forecasts (OFCL — solid blue lines at 0, 12, 24, 36, 48, 60, 72 h intervals, and dashed blue lines at 96 and 120 h forecast intervals) for Tropical Storm Iselle, 26–30 August 2020. The best track is given by the solid white line with positions provided at 6-h intervals.