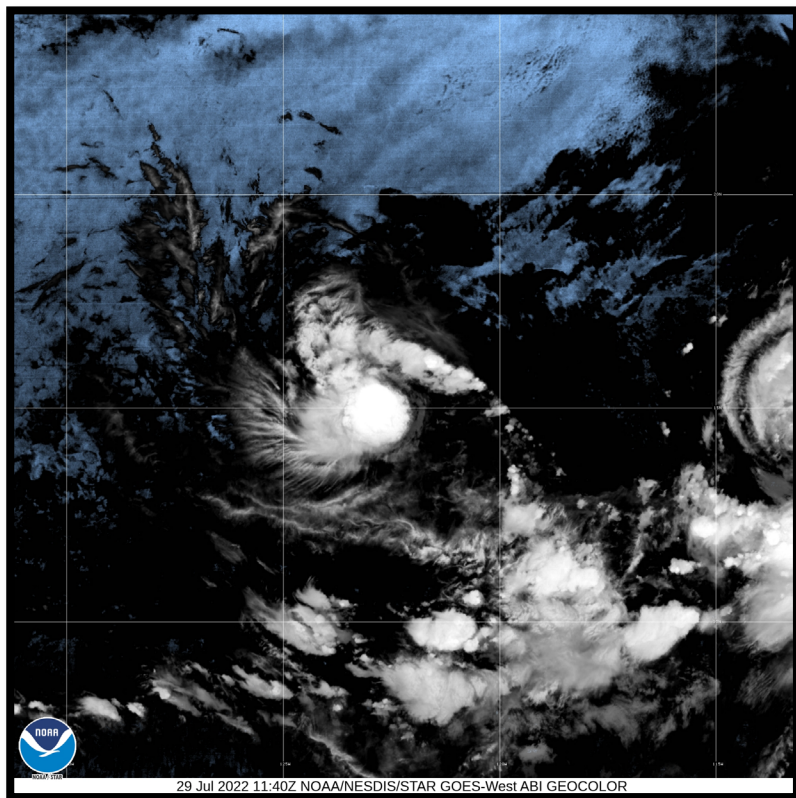# NATIONAL HURRICANE CENTER
TROPICAL CYCLONE REPORT

TROPICAL STORM GEORGETTE
(EP082022)

27 July – 3 August 2022

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National Hurricane Center
15 November 2022

GOES-17 GEOCOLOR SATELLITE IMAGE OF TROPICAL STORM GEORGETTE AT 1140 UTC 29 JULY 2022, NEAR THE TIME OF ITS PEAK INTENSITY (IMAGE COURTESY OF NOAA/NESDIS/STAR)

Georgette was a small tropical storm over the central part of the eastern North Pacific basin that had a winding track due to binary interaction with Hurricane Frank to its east.

Tropical Storm Georgette

27 JULY – 3 AUGUST 2022

SYNOPTIC HISTORY

Georgette appears to have originated from a tropical wave that moved off the west coast of Africa on 10 July. The wave was fairly well defined while it moved westward across the tropical Atlantic Ocean, although it never produced much in the way of significant shower and thunderstorm activity. The wave reached the Lesser Antilles on 17 July but then became less defined by the time it reached the far eastern North Pacific waters on 21 July. Some re-amplification of the wave began on 23 July, possibly due to a weak upper-level trough located to its north, and a small but persistent area of deep convection formed along the northern end of the wave axis by 25 July. A well-defined circulation is analyzed to have developed early on 27 July, and it is estimated that a tropical depression formed by 1200 UTC that day about 465 n mi south-southwest of the southern tip of the Baja California peninsula. The depression strengthened into a tropical storm 6 h later. The "best track" chart of Georgette's path is given in Fig. 1, with the wind and pressure histories shown in Figs. 2 and 3, respectively. The best track positions and intensities are listed in Table 1[1].

A subtropical ridge extending from the U.S.-Mexico border westward over the eastern Pacific initially steered Georgette steadily westward over waters of 27 to 28°C. In an environment of low to moderate deep-layer easterly shear but marginal mid-level moisture, Georgette only slowly strengthened, and it reached an estimated peak intensity of 50 kt by 0600 UTC 29 July while located about 780 n mi west-southwest of the southern tip of the Baja California peninsula (Fig. 4 and cover photo). The 50-kt peak intensity was short lived, however, as easterly shear began to increase and caused Georgette to weaken slightly later that day. Georgette was located about 550 n mi to the west of soon-to-be Hurricane Frank, and the proximity of the two cyclones caused a binary interaction, with Georgette turning toward the west-southwest. For the next two days, Georgette maintained a west-southwestward motion and weakened further due to an additional increase in shear, becoming a tropical depression by 1800 UTC 31 July about 1275 n mi west-southwest of the southern tip of the Baja California peninsula.

By 1 August, Frank had carved out a weakness in the subtropical ridge and moved far enough away to cause Georgette to make a slow and tight hairpin turn, eventually moving northward by 2 August. Georgette maintained its tropical depression status for a few days in an environment of moderate deep-layer shear and marginal thermodynamics, but the cyclone eventually lost its organized deep convection and became a remnant low by 1800 UTC 3 August about 1135 n mi west-southwest of the southern tip of the Baja California peninsula. The remnant low turned west-northwestward and then westward and dissipated soon after 1200 UTC 5 August.

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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 Georgette (Figs. 2 and 3) include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and 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 Georgette.

Georgette's estimated peak intensity of 50 kt from 0600 to 1200 UTC 29 July is based on a blend of subjective satellite intensity estimates of T3.0/45 kt from TAFB and SAB, and objective ADT and SATCON estimates of 51-52 kt. The estimated minimum pressure of 998 mb is based on the Knaff-Courtney-Zehr (KZC) pressure-wind relationship.

There were no ship reports of winds of tropical storm force associated with Georgette.

CASUALTY AND DAMAGE STATISTICS

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

FORECAST AND WARNING CRITIQUE

Georgette's genesis was not well forecast. Table 2 provides the number of hours in advance of formation with the first NHC Tropical Weather Outlook (TWO) forecast in each likelihood category. A low (<40%) chance of genesis during the next 5 days was first indicated in the TWO at 0600 UTC 18 July, 222 h (9.25 days) before Georgette formed, and during the next 2 days at 0000 UTC 21 July, 156 h (6.5 days) before Georgette formed. However, the potential for the disturbance's development appeared to wane, and the genesis probabilities were lowered to near 0% at 1200 UTC 23 July, 96 h (4 days) before Georgette formed. As shown in Fig. 5, genesis did not occur in the initial genesis areas depicted by NHC off the southern coast of Mexico.

After showing some signs of organization on 25 July, the disturbance was re-introduced into the TWO with a low chance of development during the next 2 and 5 days 42 h before Georgette formed, and chances were raised to the medium (40–60%) category 18 h before formation. Formation chances only reached the high (>60%) category at the time that Georgette is analyzed to have become a tropical depression. Georgette formed within the smaller potential genesis areas depicted by NHC for these later forecasts (black star, Fig. 5). Georgette was small

in size, and global models did not pick up on the cyclone's potential genesis in the days beforehand. This is likely related to the formation of larger Hurricane Frank a little more than a day before Georgette's formation not too far to the east.

A verification of NHC official track forecasts for Georgette is given in Table 3a. Official track forecast errors were higher than the mean official errors for the previous 5-year period at all forecast times, and significantly so from 48 h and beyond. However, climatology-persistence (OCD5) errors were also higher than their respective 5-year means after 12 h, suggesting that Georgette's track was more difficult to forecast than for a typical eastern Pacific tropical cyclone.

A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b and Fig. 6. Due to the homogeneity requirement, the UKMET (EGRI), NAVGEM (NVGI), and COAMPS-TC (CTCI) models, as well as the GEFS ensemble mean (AEMI), were not included in the verification. During the first couple of days of Georgette's existence, those particular models showed the cyclone dissipating within the 5-day forecast period, and thus did not provide enough forecasts (especially at 120 h) for a homogenous verification with the other guidance. The ECMWF model (EMXI) was the best-performing global model, generally having lower errors than the NHC official forecasts. The HMON model (HMNI) performed well for Georgette's track, as did the simple and corrected consensus aids. The GFS (GFSI) and Canadian (CMCI) models both performed poorly, having much higher errors than the other models and the official forecasts. Much of the source of forecast track error was related to Georgette's binary interaction with Hurricane Frank. As shown in Fig. 7, the NHC official track forecasts during the first few days of Georgette's existence anticipated that the storm would get pulled northward toward (and potentially absorbed by) Frank's circulation, but it instead was eventually far enough away from Frank that it was pushed in the opposite direction, toward the west-southwest.

A verification of NHC official intensity forecasts for Georgette is given in Table 4a. Official intensity errors were lower than the mean official errors for the previous 5-year period at all forecast times. Climatology-persistence (OCD5) errors were lower than their respective 5-year means at some forecast times and higher at others, suggesting that Georgette's intensity was of typical difficulty to forecast.

A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b and Fig. 8. Due to the homogeneity requirement, the COAMPS-TC (CTCI) model and the ICON consensus aid were not included in the verification. The NHC official intensity forecasts had a fair amount of skill and were competitive with some of the best-performing intensity models. The HFIP Corrected Consensus aid (HCCA) and Florida State Superensemble (FSSE) had some of the lowest errors, especially from 48 hours and beyond. Conversely, the GFS and Decay-SHIPS (DSHP) both performed quite poorly beyond 48 hours.

There were no coastal watches or warnings issued in association with Georgette.

Table 1.   Best track for Tropical Storm Georgette, 27 July–3 August 2022.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
27 / 1200	16.2	114.2	1007	30	tropical depression
27 / 1800	16.3	115.2	1005	35	tropical storm
28 / 0000	16.2	116.2	1002	40	"
28 / 0600	16.1	117.2	1000	45	"
28 / 1200	16.0	118.2	1000	45	"
28 / 1800	15.8	119.2	1000	45	"
29 / 0000	15.6	120.2	1000	45	"
29 / 0600	15.4	121.3	998	50	"
29 / 1200	15.1	122.4	998	50	"
29 / 1800	14.9	123.5	1000	45	"
30 / 0000	14.6	124.6	1000	45	"
30 / 0600	14.3	125.5	1000	45	"
30 / 1200	14.0	126.4	1000	45	"
30 / 1800	13.7	127.3	1000	45	"
31 / 0000	13.5	128.2	1000	45	"
31 / 0600	13.3	128.9	1002	40	"
31 / 1200	13.0	129.4	1004	35	"
31 / 1800	12.8	129.7	1006	30	tropical depression
01 / 0000	12.7	130.0	1006	30	"
01 / 0600	12.8	130.4	1006	30	"
01 / 1200	13.0	130.8	1006	30	"
01 / 1800	13.1	131.0	1006	30	"
02 / 0000	13.3	131.1	1006	30	"
02 / 0600	13.6	130.9	1006	30	"
02 / 1200	13.9	130.7	1006	30	"
02 / 1800	14.4	130.4	1006	30	"
03 / 0000	15.0	130.0	1006	30	"
03 / 0600	15.7	129.6	1006	30	"
03 / 1200	16.4	129.3	1007	30	"
03 / 1800	17.2	129.2	1008	30	low
04 / 0000	17.9	129.5	1008	30	"
04 / 0600	18.3	129.9	1009	30	"

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
04 / 1200	18.7	130.4	1009	30	"
04 / 1800	19.0	131.0	1010	30	"
05 / 0000	19.3	131.7	1010	30	"
05 / 0600	19.4	132.5	1011	25	"
05 / 1200	19.5	133.5	1011	25	"
05 / 1800					dissipated
29 / 0600	15.4	121.3	998	50	maximum winds and minimum pressure

Table 2.   Number of hours in advance of formation associated with the first NHC Tropical Weather Outlook (TWO) forecast in the indicated likelihood category. In the low category, the numbers in parentheses indicate the number of hours in advance of formation when the disturbance was re-introduced into the TWO. 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%)	156 (42)	222 (42)
Medium (40%-60%)	18	18
High (>60%)	0	0

Table 3a.   NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Georgette, 27 July–3 August 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	22.3	43.6	71.7	108.8	166.6	232.5	378.5	563.8
OCD5	34.4	82.6	145.0	213.4	296.9	375.0	491.1	459.8
Forecasts	27	25	23	21	19	17	12	3
OFCL (2017-21)	21.9	33.8	45.6	56.9	74.8	79.9	99.5	121.3
OCD5 (2017-21)	35.8	72.3	112.7	155.0	198.7	239.0	309.2	372.2

Table 3b.   Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Georgette, 27 July–3 August 2022. 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	21.3	45.0	82.3	125.5	170.1	195.6	314.0	612.4
OCD5	29.4	70.8	125.5	197.4	281.9	395.9	547.6	**474.0**
GFSI	24.5	61.2	120.7	200.2	287.8	341.3	559.3	675.3
EMXI	**18.2**	**38.1**	**66.2**	**93.2**	**127.3**	**148.6**	342.4	707.8
CMCI	28.4	60.2	104.0	167.4	243.2	309.0	453.7	**525.1**
HWFI	22.9	47.3	**82.1**	126.1	180.7	203.4	328.9	791.2
HMNI	**20.1**	**43.5**	**76.3**	**119.7**	171.7	**175.5**	**287.1**	**606.0**
HCCA	**21.1**	45.5	**80.2**	**119.8**	**162.9**	**175.4**	**287.1**	**546.8**
FSSE	**19.9**	47.6	85.0	133.4	174.1	**183.1**	**294.9**	**594.4**
GFEX	**19.4**	45.3	83.0	133.3	187.0	208.4	381.4	668.9
TVCE	21.4	47.1	**81.5**	**121.3**	**163.8**	**168.7**	**291.3**	650.2
TVCX	**20.4**	45.1	**78.8**	**116.2**	**154.8**	**160.9**	306.2	696.4
TVDG	**20.8**	46.6	**81.3**	**122.8**	**165.0**	**173.5**	314.2	679.8
TABD	**21.1**	**30.5**	**43.8**	**64.2**	**96.1**	**138.3**	**199.9**	**489.3**
TABM	**19.9**	45.4	**81.4**	138.8	217.4	304.2	536.3	946.8
TABS	27.0	54.4	91.4	138.9	210.4	289.9	534.4	947.8
Forecasts	16	16	16	16	16	14	7	1

Table 4a.   NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Georgette, 27 July–3 August 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	**1.7**	**2.4**	**3.0**	**5.7**	**5.8**	**6.5**	**5.8**	**8.3**
OCD5	3.7	5.4	8.0	10.6	16.2	17.9	24.4	17.3
Forecasts	27	25	23	21	19	17	12	3
OFCL (2017-21)	5.5	9.1	11.1	12.9	15.3	15.6	16.4	17.0
OCD5 (2017-21)	7.0	12.2	15.8	18.6	20.4	21.2	22.3	21.8

Table 4b.   Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Georgette, 27 July–3 August 2022. 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	2.5	3.1	4.1	6.9	6.6	6.8	4.4	10.0
OCD5	4.2	5.8	9.0	11.6	17.6	19.3	26.2	15.0
HWFI	6.4	7.7	8.5	8.4	7.6	**4.8**	**2.7**	**1.0**
HMNI	5.6	7.4	8.6	6.9	7.6	**6.4**	6.9	12.0
DSHP	3.1	3.9	6.2	9.8	13.1	15.3	16.3	18.0
LGEM	3.4	4.0	5.4	6.9	8.1	7.8	6.4	**7.0**
IVCN	3.9	5.0	5.7	**6.2**	6.7	7.6	5.9	10.0
IVDR	4.3	5.9	6.4	**6.5**	6.6	7.8	5.1	10.0
HCCA	3.6	4.1	5.1	**6.8**	6.9	**6.2**	**3.7**	**6.0**
FSSE	3.5	4.8	5.6	**5.8**	**6.1**	**6.7**	**3.7**	10.0
GFSI	4.8	6.9	7.1	7.8	13.3	13.1	9.7	22.0
EMXI	3.3	4.1	**4.0**	**3.2**	**3.6**	**3.7**	6.1	**1.0**
Forecasts	16	16	16	16	16	14	9	1
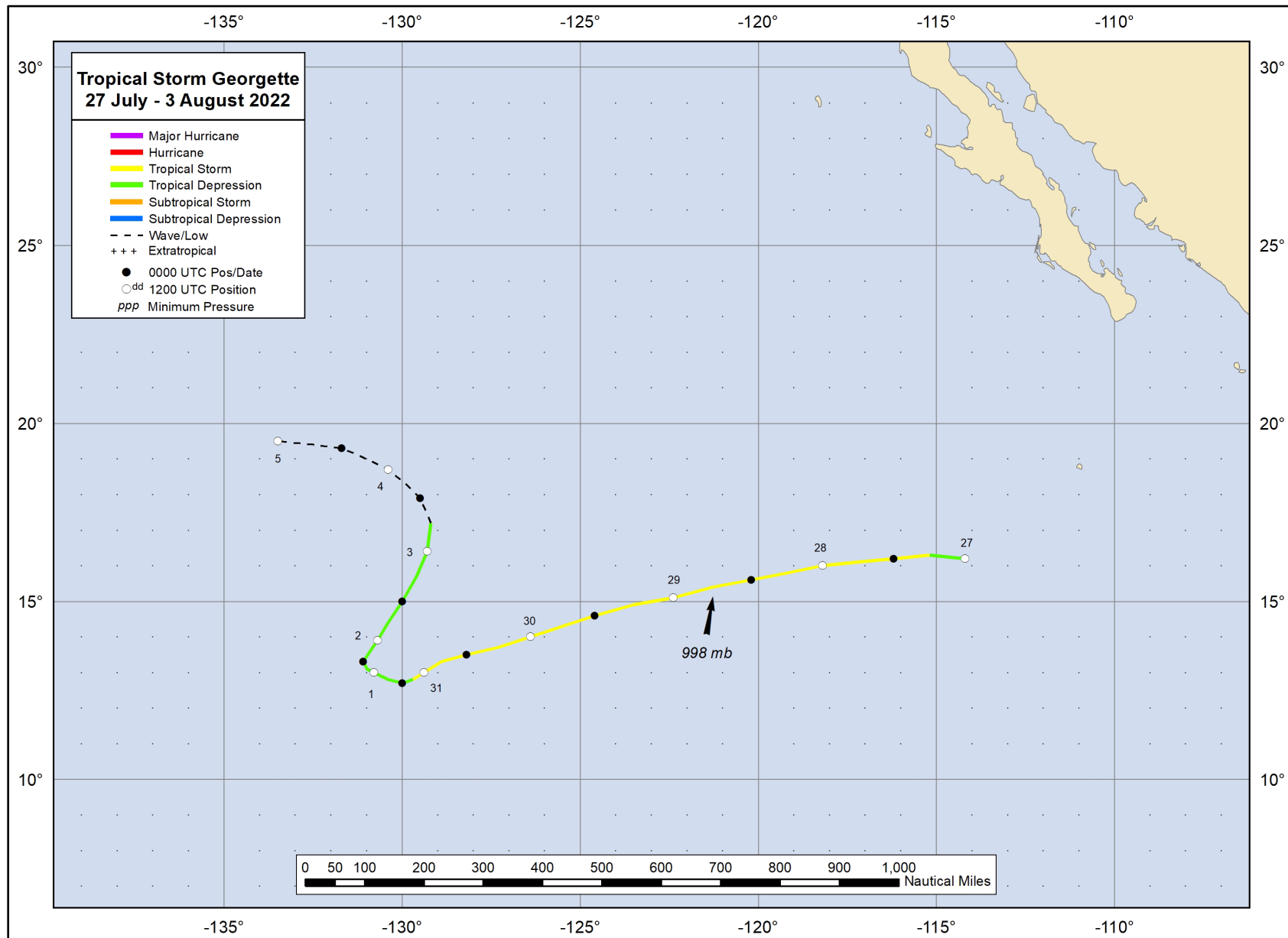
Figure 1.   Best track positions for Tropical Storm Georgette, 27 July–3 August 2022.
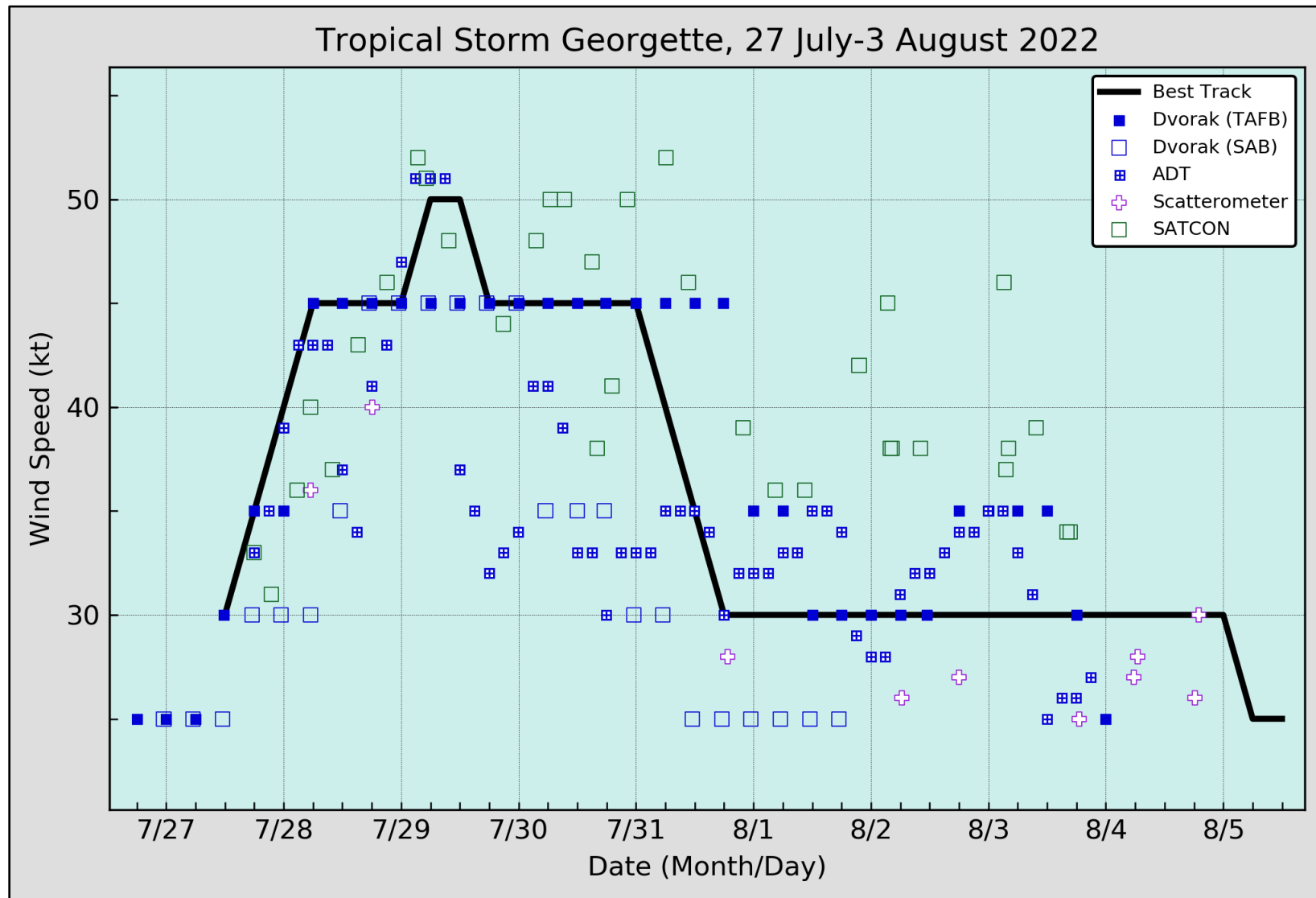
Figure 2.   Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Georgette, 27 July–3 August 2022. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.
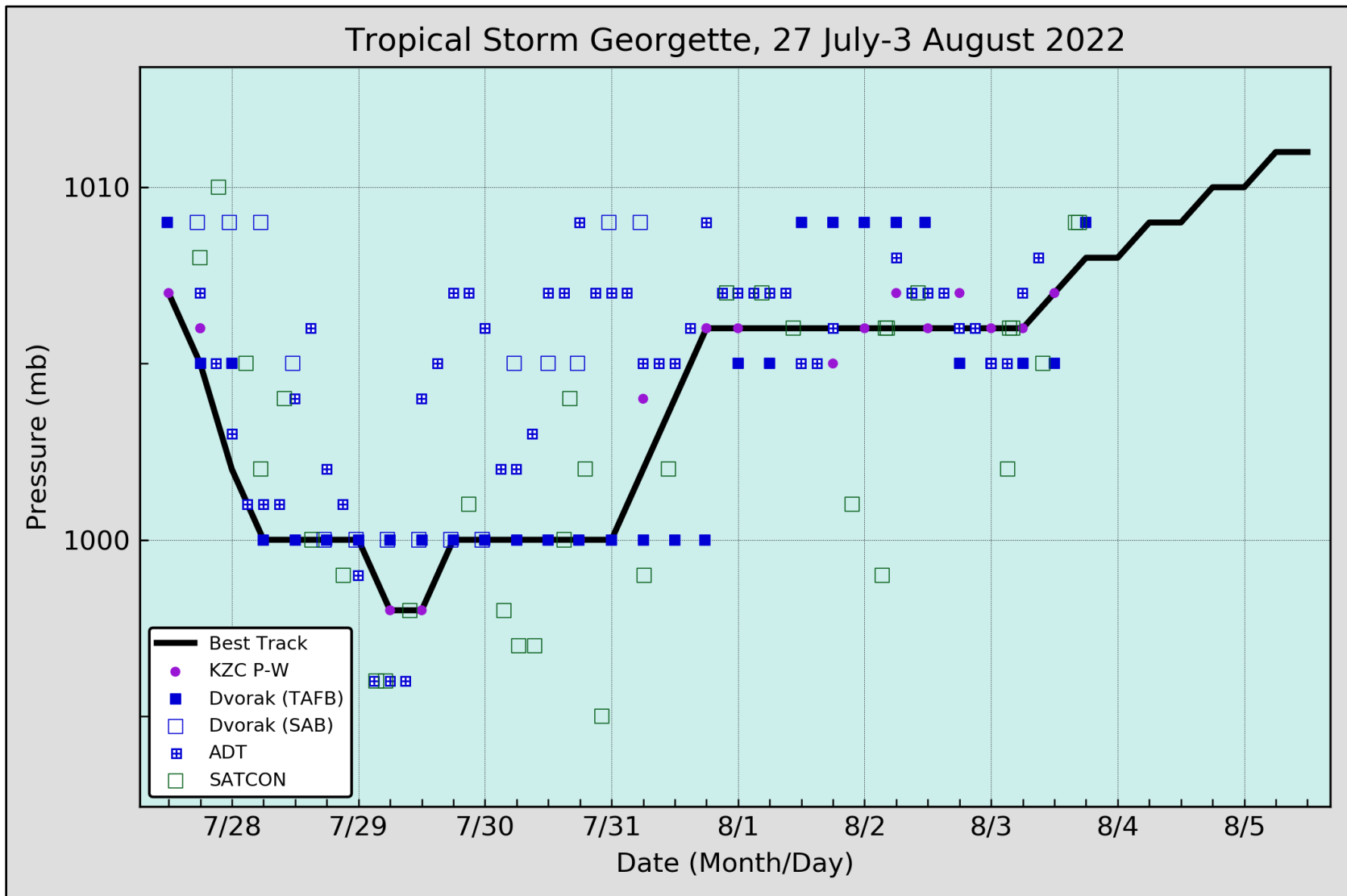
Figure 3.   Selected pressure observations and best track minimum central pressure curve for Tropical Storm Georgette, 27 July–3 August 2022. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute 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.
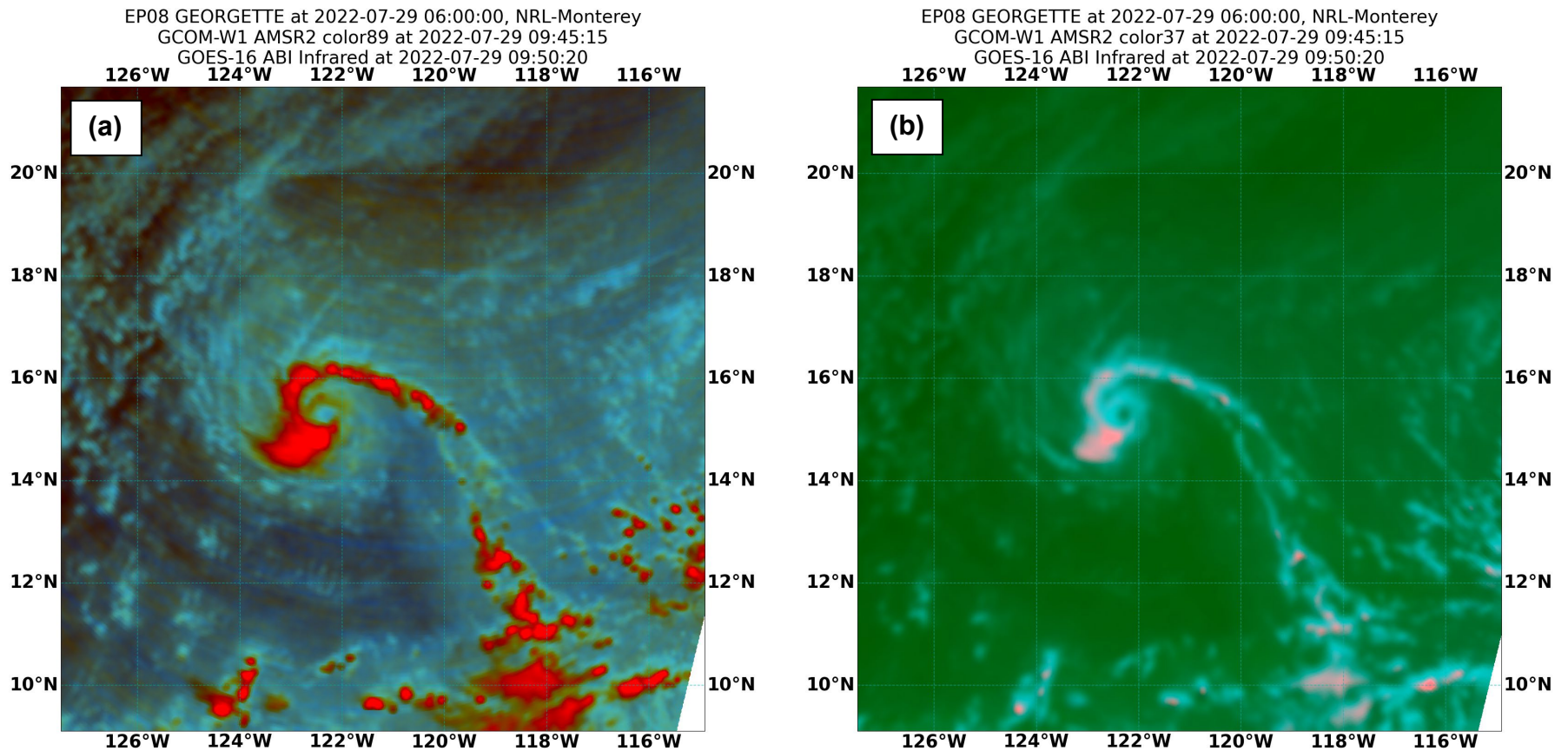
EP08 GEORGETTE at 2022-07-29 06:00:00, NRL-Monterey
GCOM-W1 AMSR2 color89 at 2022-07-29 09:45:15
GOES-16 ABI Infrared at 2022-07-29 09:50:20

EP08 GEORGETTE at 2022-07-29 06:00:00, NRL-Monterey
GCOM-W1 AMSR2 color37 at 2022-07-29 09:45:15
GOES-16 ABI Infrared at 2022-07-29 09:50:20

Figure 4.   (a) 89-GHz GCOM-W1 AMSR2 microwave image of Tropical Storm Georgette at 0945 UTC 29 July, during the time of its peak intensity. The image shows an elongated convective band curling around the center. (b) 37-GHz AMSR2 microwave image at the same time showing Georgette's well-defined low-level structure and center of circulation. Images courtesy of the Naval Research Laboratory.

Georgette 5-day Tropical Weather Outlook Areas
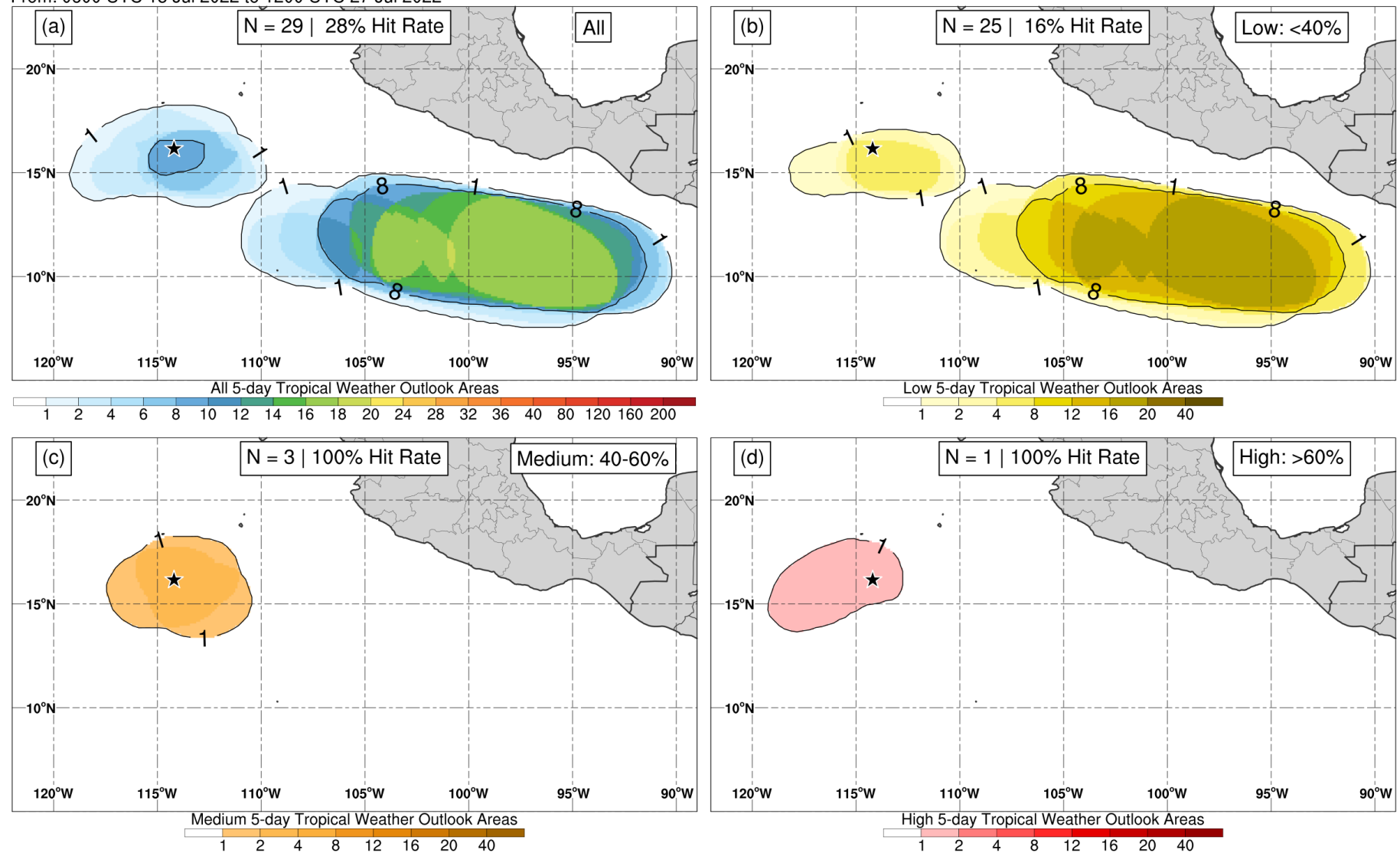From: 0600 UTC 18 Jul 2022 to 1200 UTC 27 Jul 2022

Figure 5.   Composites of 5-day tropical cyclone genesis areas depicted in NHC's Tropical Weather Outlooks prior to the formation of Tropical Storm Georgette for (a) all probabilistic genesis categories, (b) the low (<40%) category, (c) medium (40–60%) category, and (d) high (>60%) category. Georgette's location of genesis is indicated by the black star.
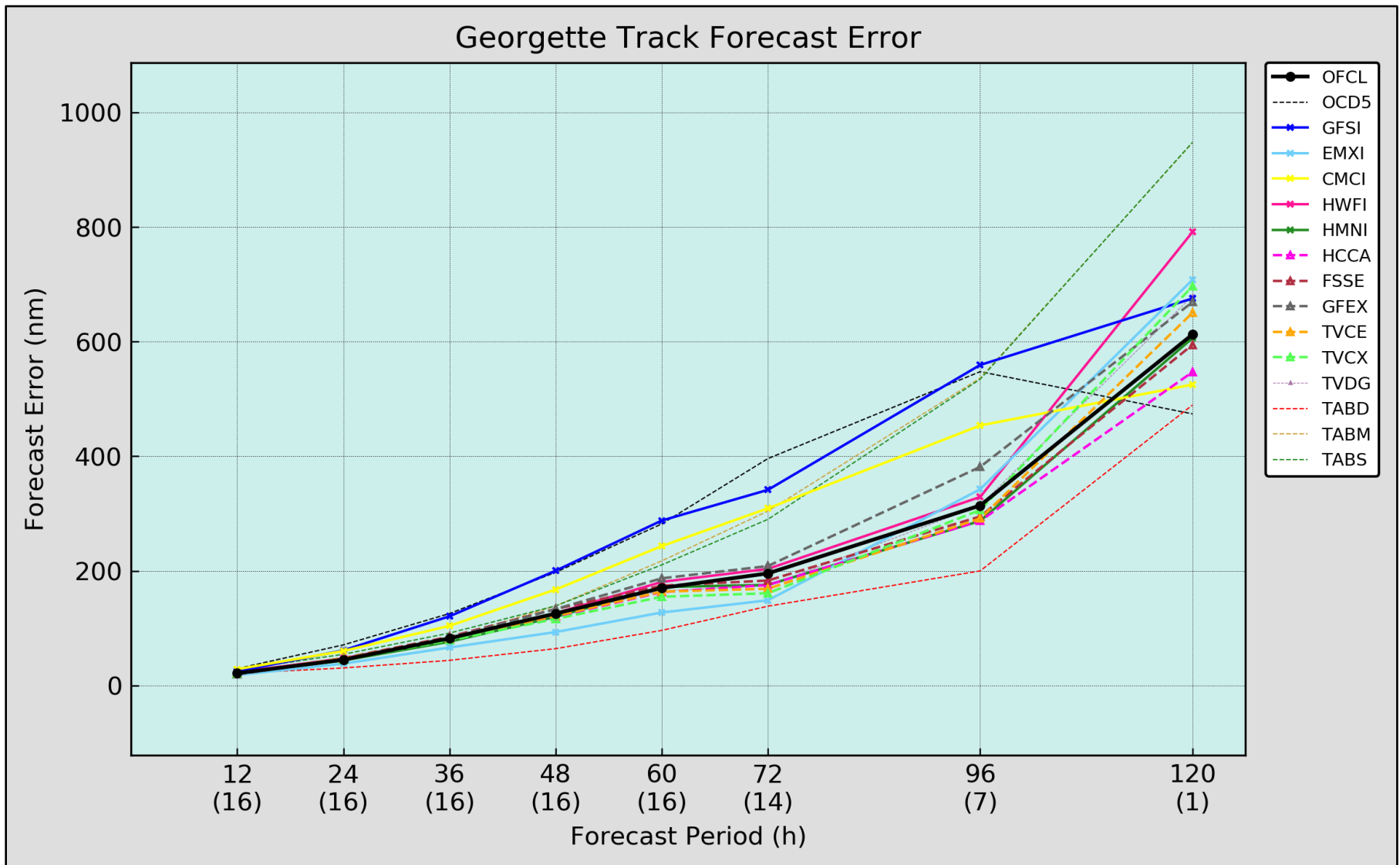
Figure 6.   Homogeneous comparison of selected track forecast guidance model errors (in n mi) for Tropical Storm Georgette, 27 July–3 August 2022. Official NHC track errors are denoted by the thick black line.
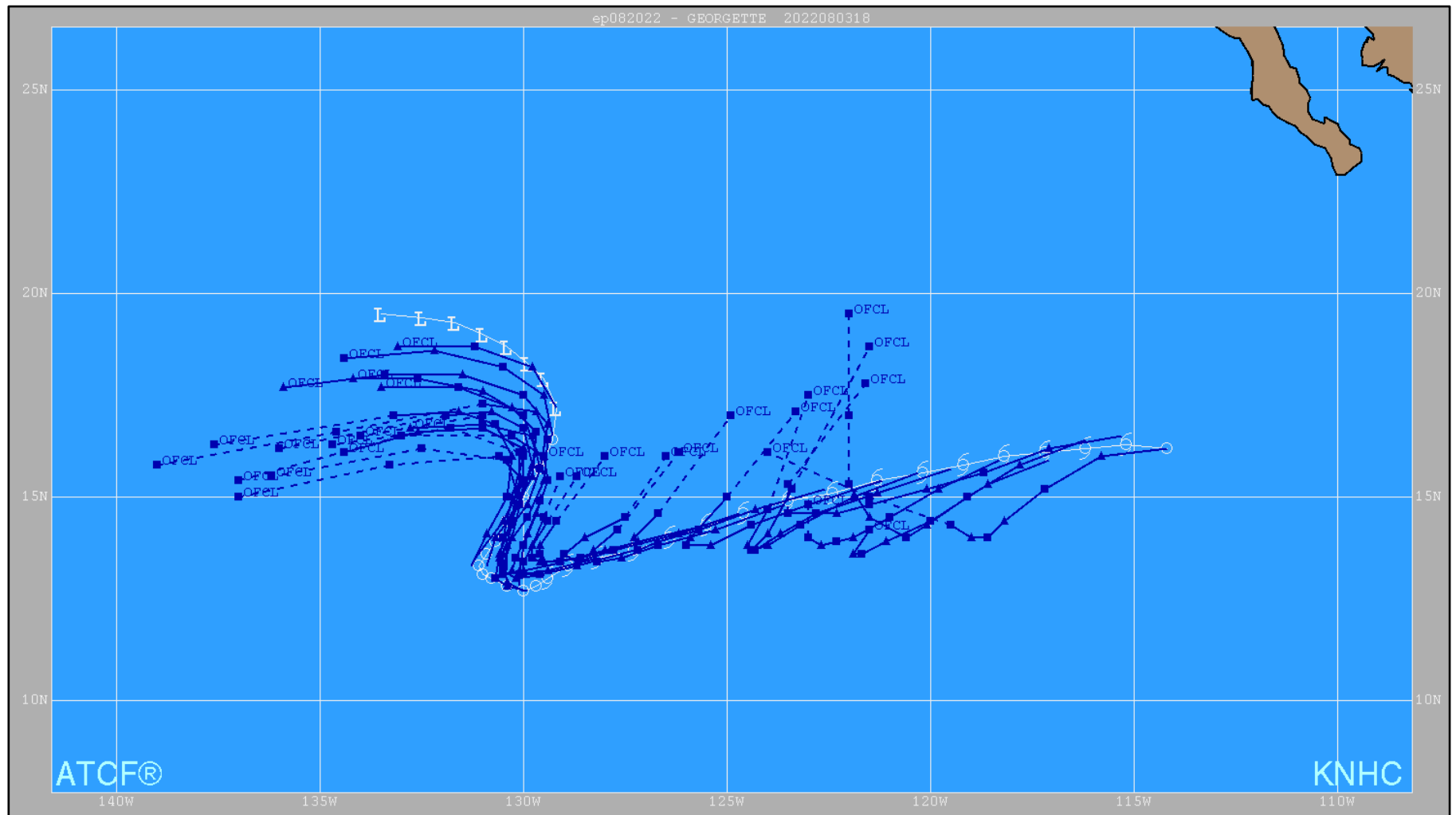
Figure 7.   NHC official track forecasts [dark blue] for Tropical Storm Georgette, 27 July–3 August 2022. The NHC best track is denoted by the white line and symbols.
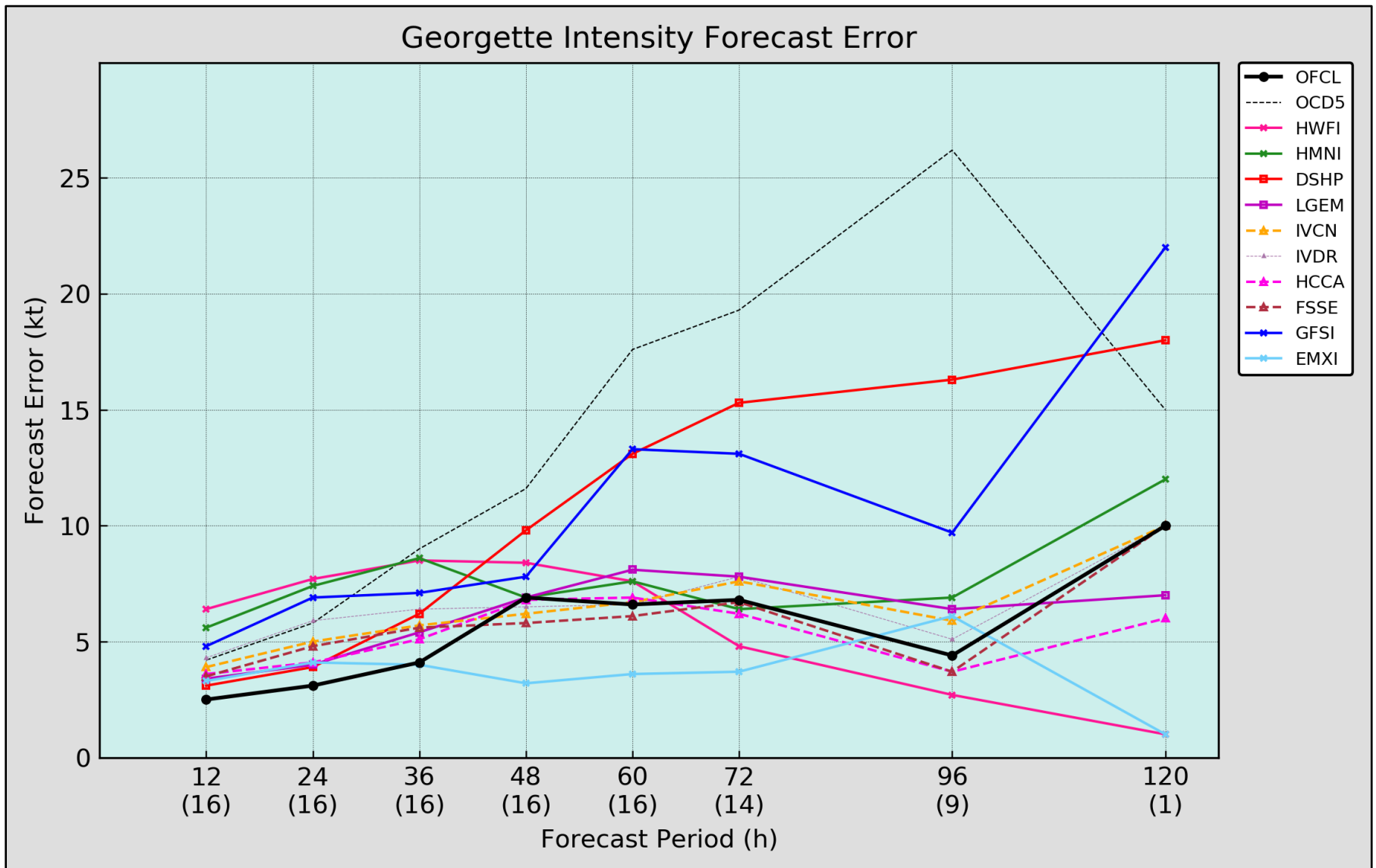
Figure 8.   Homogeneous comparison of selected intensity forecast guidance model errors (in kt) for Tropical Storm Georgette, 27 July–3 August 2022. Official NHC intensity errors are denoted by the thick black line.