

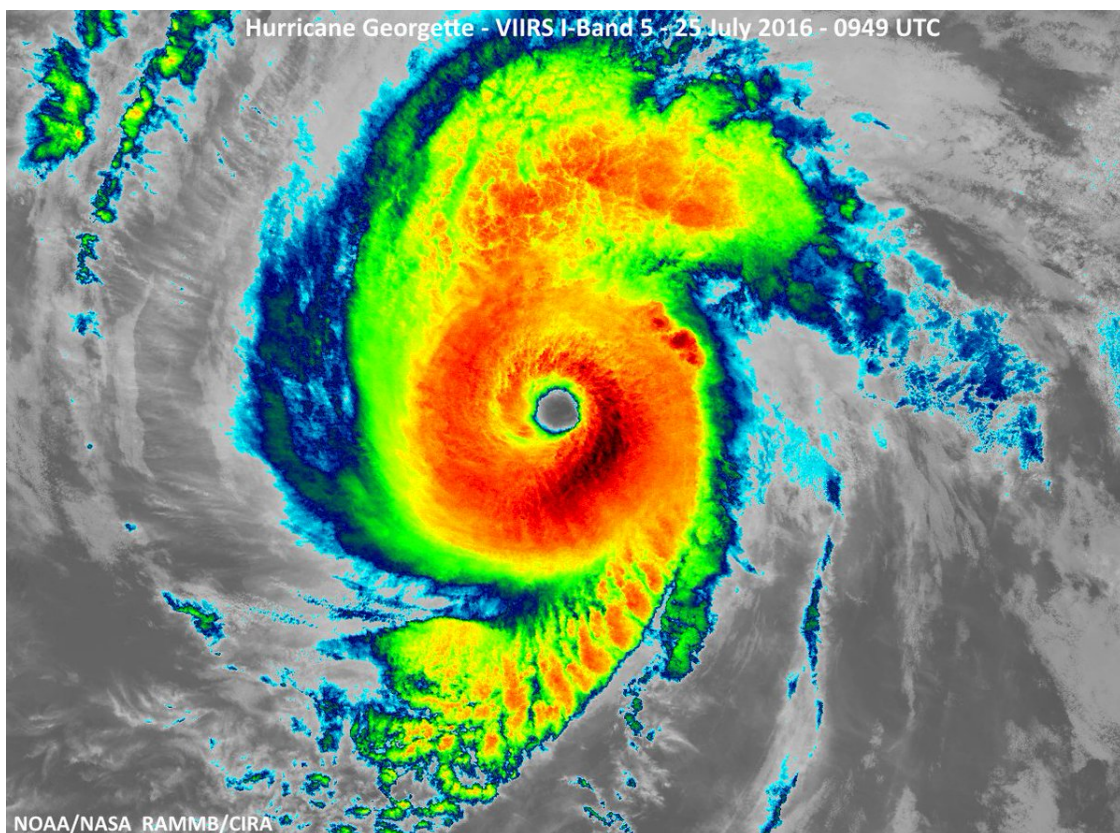


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

HURRICANE GEORGETTE (EP082016)

21 – 27 July 2016

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NOAA-VIIRS VISIBLE IMAGE OF GEORGETTE AT 0949 UTC 25 JULY 2016 NEAR PEAK INTENSITY

Georgette unexpectedly strengthened into a category 4 hurricane well southwest of Mexico but did not affect land.

Hurricane Georgette

21 – 27 JULY 2016

SYNOPTIC HISTORY

The disturbance that produced Georgette was first trackable on 13 July, just west of central America. The cloud system could have been spawned by the same wave that triggered Estelle two days later, but the possible linkage is unclear from satellite imagery and model analyses. Convection was generally limited to the Intertropical Convergence Zone (ITCZ) for the next few days while the low-latitude disturbance moved westward. A broad area of low pressure was first noted on 17 July, accompanied by a few curved band features. Development was slow due to northwesterly shear related to outflow behind Estelle, but this shear somewhat lessened and gradually shifted to the northeast over the next couple of days as Estelle moved away from the disturbance. On 20 July banding features increased, with a larger area of deep convection developing near the center of the low. Early on 21 July, a well-defined circulation formed, and deep convection became organized enough a few hours later to mark the formation of a tropical depression near 0600 UTC 21 July about 700 n mi southwest of Manzanillo, Mexico. 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 1¹.

Initially, the depression moved west-northwestward around the southwestern periphery of a subtropical ridge. Northeasterly shear prevented much development at first, but the depression became a tropical storm about 30 h after genesis. Microwave data indicated that the small cyclone was forming an inner core on 22 July, but easterly shear caused the vortex to be tilted, with the mid-level center displaced west of the surface circulation. This shear began to relax the next day, and Georgette gradually intensified while it turned northwestward, becoming a hurricane at 0000 UTC 24 July. The shear was quite low later that day, and the low- and mid-level centers became vertically aligned, helping Georgette to rapidly intensify by late on 24 July. The tropical cyclone reached an estimated peak intensity of 115 kt near 0600 UTC 25 July when it was located about 520 n mi southwest of Cabo San Lucas, Mexico. Scatterometer data showed that Georgette remained a very small system, with tropical-storm-force winds only extending out about 40 n mi from the center near the time of peak intensity.

Later on 25 July, Georgette rapidly weakened as it moved over cooler waters, dropping below hurricane strength on 26 July. The cyclone continued to weaken while it moved into an increasingly unfavorable environment of even cooler waters and dry mid-level air. Georgette’s forward speed became quite slow on that day due to a mid- to upper-level trough weakening the subtropical ridge. Early on 27 July, deep convection associated with Georgette dissipated, and the cyclone degenerated into a post-tropical cyclone by 0600 UTC about 1075 n mi west-

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 *bt* directory, while previous years’ data are located in the *archive* directory.

southwest of the southern tip of Baja California Sur. The now-vertically-shallow cyclone turned to the west-northwest and west over the next couple of days and accelerated within the low-level trade winds. The low pressure area dissipated early on 30 July just before it entered the central Pacific basin.

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 the Satellite Analysis Branch (SAB), and objective Advanced Dvorak Technique (ADT) 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.

The estimated 115-kt peak intensity of Georgette is based on Dvorak satellite intensity estimates from TAFB and SAB.

There were no tropical-storm-force wind reports from ships associated with Georgette.

CASUALTY AND DAMAGE STATISTICS

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

FORECAST AND WARNING CRITIQUE

The genesis forecasts for Georgette were poor. Although NHC recognized there was a low chance of genesis roughly four days prior to when the cyclone formed (Table 2), the environment was not thought to be favorable enough for a tropical cyclone to form because of shear. Consequently, the 48-h genesis probabilities never entered the medium or high categories before the post-analysis time of genesis. The ECMWF model did not show genesis consistently with this system, even on the day before it formed, while the GFS/UKMET had a more consistent signal of a tropical cyclone forming about two days prior to formation despite the predicted environment.

A verification of NHC official track forecasts for Georgette is given in Table 3a. Official forecast track errors were well below the mean official errors for the previous 5-yr period. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. Overall the NHC track errors were some of the lowest on record, with a mean 48-h



error of only 24 n mi, and the NHC forecasts were superior to almost all of the guidance. The HWRF had a particularly good performance for Georgette, while the ECMWF struggled with this hurricane.

A verification of NHC official intensity forecasts for Georgette is given in Table 4a. Official forecast intensity errors were generally higher than the mean official errors for the previous 5-yr period. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. Most of the guidance had a low bias, and none of the models anticipated Georgette's forming into a major hurricane (Figure 4), which increased the average error in the short term. Overall, the NHC intensity forecasts did well in comparison to the guidance. The HWRF had relatively low errors for Georgette, while the LGEM had a notably poor performance for this hurricane.

There were no coastal watches or warnings issued for Georgette.



Table 1. Best track for Hurricane Georgette, 21-27 July 2016.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
21 / 0000	9.5	111.0	1008	25	low
21 / 0600	9.7	111.7	1008	25	tropical depression
21 / 1200	10.0	112.4	1008	25	"
21 / 1800	10.5	113.4	1006	30	"
22 / 0000	11.1	114.4	1006	30	"
22 / 0600	11.6	115.4	1006	30	"
22 / 1200	12.1	116.6	1004	40	tropical storm
22 / 1800	12.6	117.9	1002	50	"
23 / 0000	13.0	118.9	1001	55	"
23 / 0600	13.4	120.0	1001	55	"
23 / 1200	13.6	121.0	1001	55	"
23 / 1800	13.8	121.8	997	60	"
24 / 0000	14.1	122.7	993	65	hurricane
24 / 0600	14.5	123.5	988	70	"
24 / 1200	14.9	124.3	983	75	"
24 / 1800	15.4	125.1	972	90	"
25 / 0000	16.0	125.8	961	105	"
25 / 0600	16.6	126.4	952	115	"
25 / 1200	17.2	127.0	956	110	"
25 / 1800	17.7	127.6	964	100	"
26 / 0000	18.0	128.0	974	85	"
26 / 0600	18.1	128.2	982	75	"
26 / 1200	18.2	128.3	988	65	"
26 / 1800	18.3	128.4	994	55	tropical storm
27 / 0000	18.6	128.5	1001	45	"
27 / 0600	19.0	128.7	1006	35	low
27 / 1200	19.5	129.3	1007	30	"
27 / 1800	20.0	130.1	1007	30	"



28 / 0000	20.4	131.1	1007	30	"
28 / 0600	20.6	132.1	1009	25	"
28 / 1200	20.7	133.1	1009	25	"
28 / 1800	20.8	134.0	1009	25	"
29 / 0000	20.7	134.9	1011	20	"
29 / 0600	20.5	135.9	1011	20	"
29 / 1200	20.3	137.1	1012	20	"
29 / 1800	20.1	138.4	1012	20	"
30 / 0000	20.0	139.6	1012	20	"
30 / 0600					dissipated
25 / 0600	16.6	126.4	952	115	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	102
Medium (40%-60%)	0	36
High (>60%)	0	0



Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Georgette. 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	17.5	28.4	27.8	24.4	41.0	54.2	65.8
OCD5	29.4	64.8	92.8	115.3	169.0	209.2	221.1
Forecasts	20	18	16	14	10	6	2
OFCL (2011-15)	23.4	36.4	47.2	59.4	89.0	123.6	159.5
OCD5 (2011-15)	36.6	74.2	116.5	159.7	245.6	331.1	427.4



Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Georgette. 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	72	96	120
OFCL	16.5	28.4	27.8	24.4	41.0	54.2	65.8
OCD5	28.8	64.8	92.8	115.3	169.0	209.2	221.1
GFSI	16.2	25.5	30.9	32.2	53.8	99.3	185.0
GFEX	17.4	27.6	30.1	24.2	52.3	82.7	81.7
EMXI	18.9	35.0	41.6	41.7	87.1	128.7	227.7
GHMI	23.9	37.5	50.4	57.5	94.2	134.6	220.3
HWFI	20.9	36.2	48.7	57.0	80.7	76.1	31.4
CMCI	35.6	67.4	95.8	131.9	242.8	285.2	394.1
GFNI	29.3	40.7	53.8	59.0	115.3	183.0	324.7
AEMI	16.9	27.3	30.5	35.2	53.9	83.4	134.2
TVCN	16.1	27.1	30.6	28.2	44.2	70.1	59.7
TVCX	16.8	26.5	29.2	25.2	44.7	72.6	44.4
LBAR	29.1	74.1	125.8	179.5	303.4	377.0	385.7
BAMD	22.5	35.5	42.0	45.6	65.5	80.2	132.0
BAMM	22.0	39.9	51.1	60.6	77.4	100.9	100.0
BAMS	22.0	42.1	57.3	69.8	78.3	78.6	76.3
Forecasts	19	18	16	14	10	6	2

Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Georgette. 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	6.3	13.1	15.0	13.2	17.5	18.3	7.5
OCD5	10.4	18.7	22.5	23.0	25.6	17.5	8.0
Forecasts	20	18	16	14	10	6	2
(EP) OFCL (2011-15)	5.9	9.8	12.5	14.0	15.5	16.3	14.9
(EP) OCD5 (2011-15)	7.7	12.8	16.4	18.8	21.1	20.9	19.7

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Georgette. 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	72	96	120
OFCL	6.3	13.1	15.0	13.2	17.5	18.3	7.5
OCD5	10.4	18.7	22.5	23.0	25.6	17.5	8.0
HWFI	9.4	10.4	14.5	17.6	13.2	15.8	5.5
GHMI	11.9	19.4	23.6	26.4	33.1	27.0	6.5
IVCN	9.0	13.7	15.8	18.0	24.8	22.5	4.0
DSHP	8.0	13.7	16.2	17.0	21.6	16.5	7.5
LGEM	8.6	15.3	18.3	18.5	24.0	18.5	5.0
EMXI	12.2	21.8	26.8	30.3	33.4	29.7	17.0
GFSI	9.3	17.8	23.8	26.0	30.7	23.5	9.5
Forecasts	20	18	16	14	10	6	2

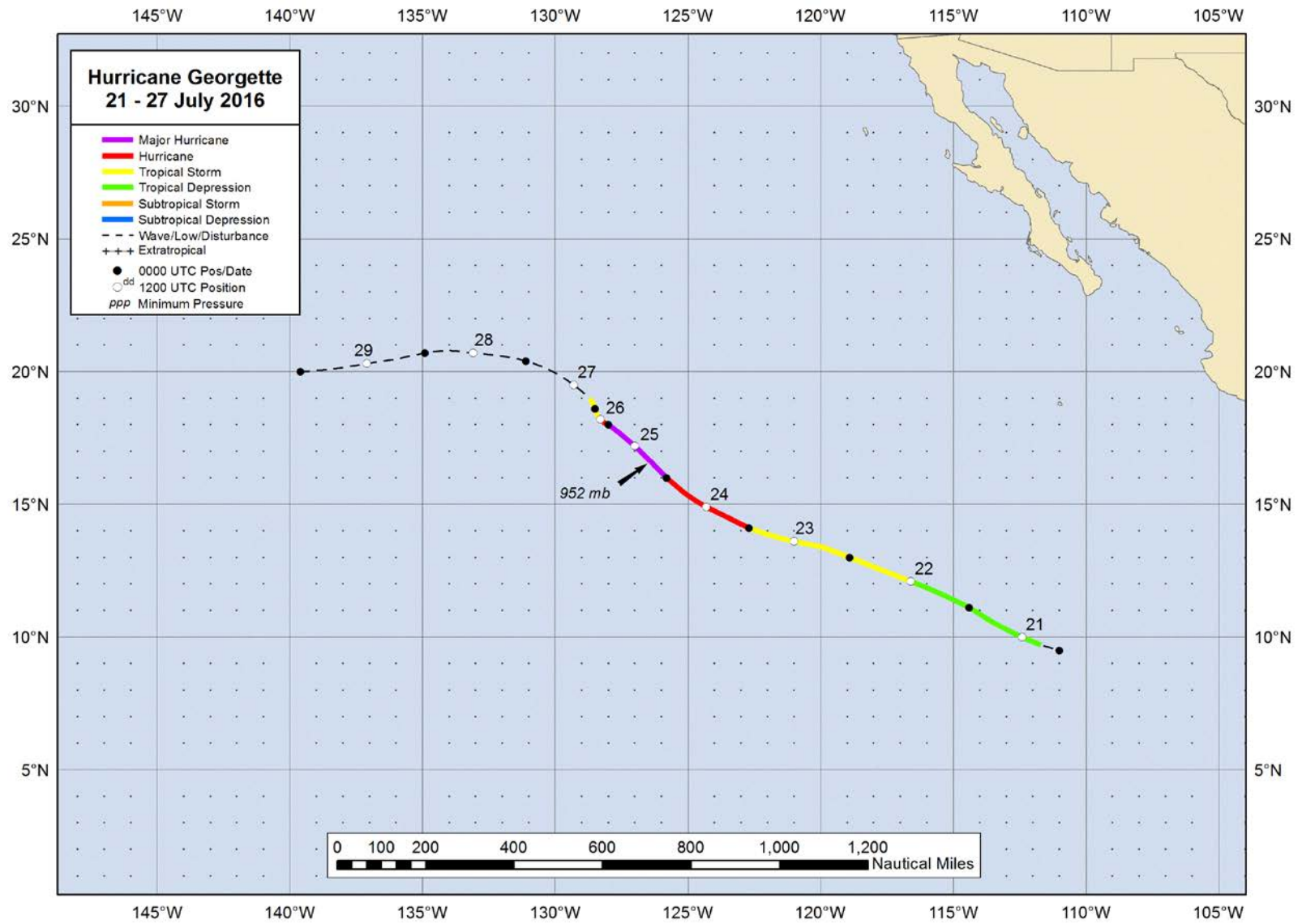


Figure 1. Best track positions for Hurricane Georgette, 21-27 July 2016.

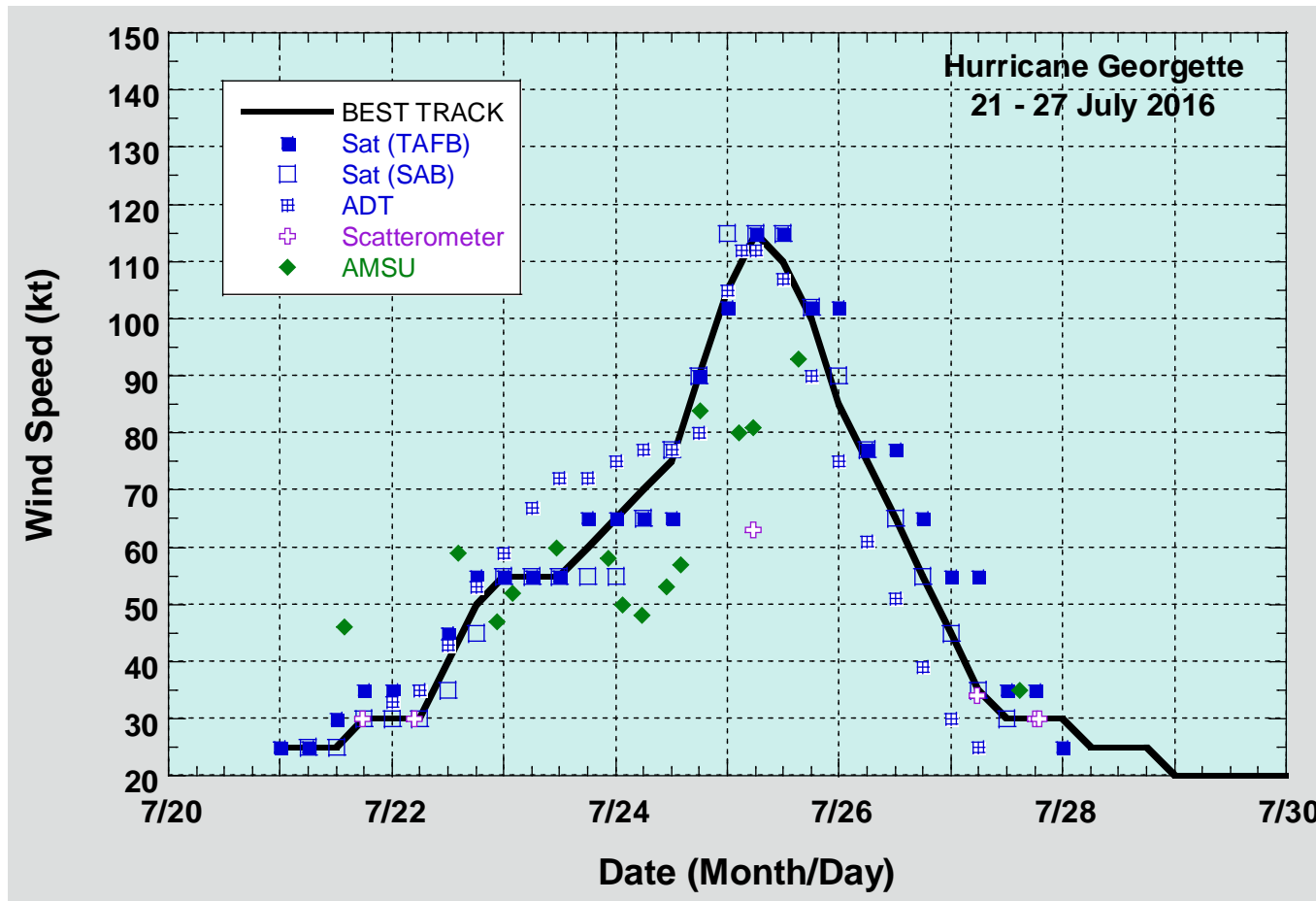


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Georgette. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. Dashed lines refer to 0000 UTC.

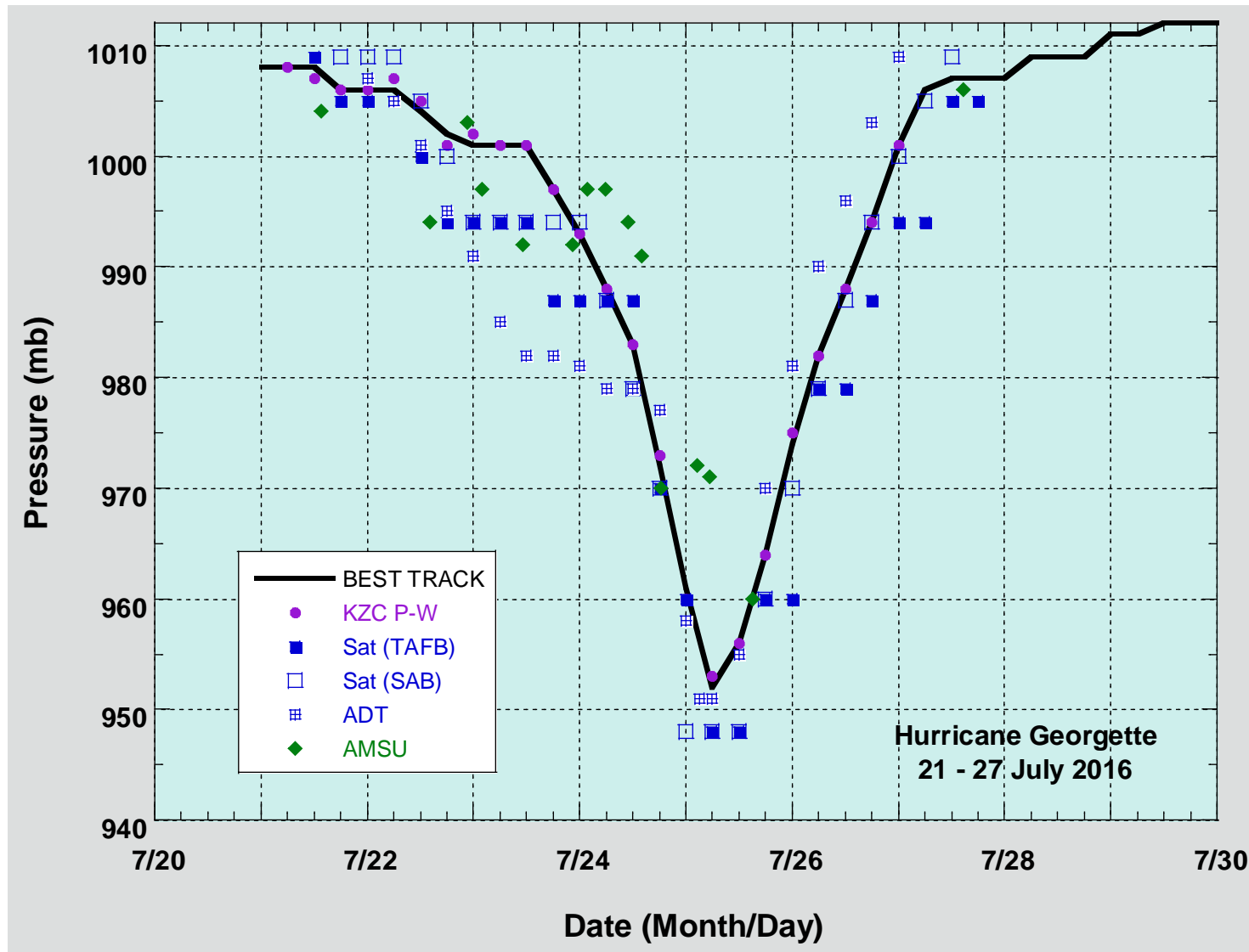


Figure 3. Selected pressure observations and best track minimum central pressure curve for Georgette. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed lines refer to 0000 UTC.

Obj. Aid Time Intensity for 08E for 072406

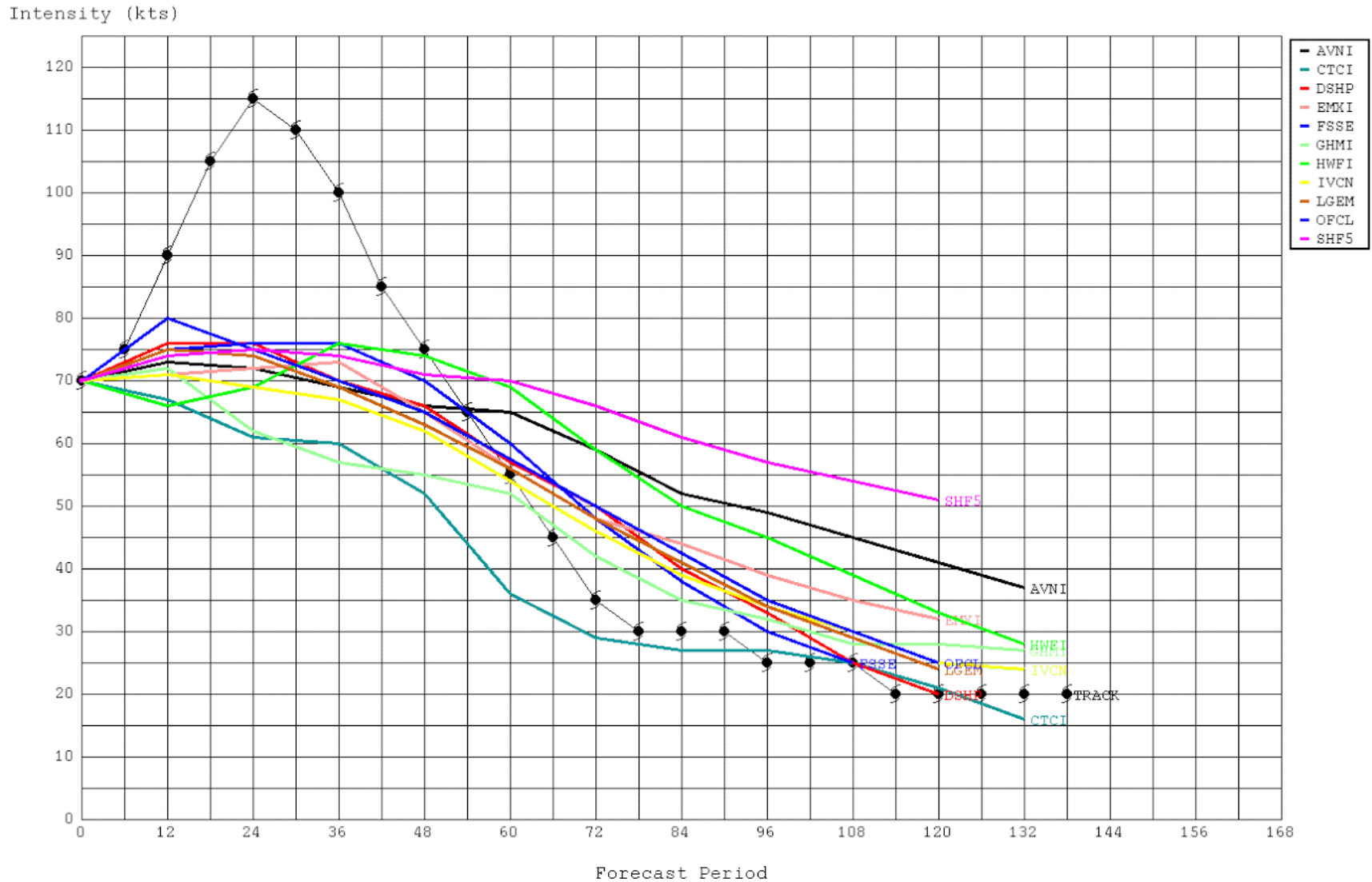


Figure 4. Selected model guidance and NHC intensity forecasts (colored lines) with the verifying intensities (tropical cyclone symbols) just before rapid intensification on 0600 UTC 24 July.