

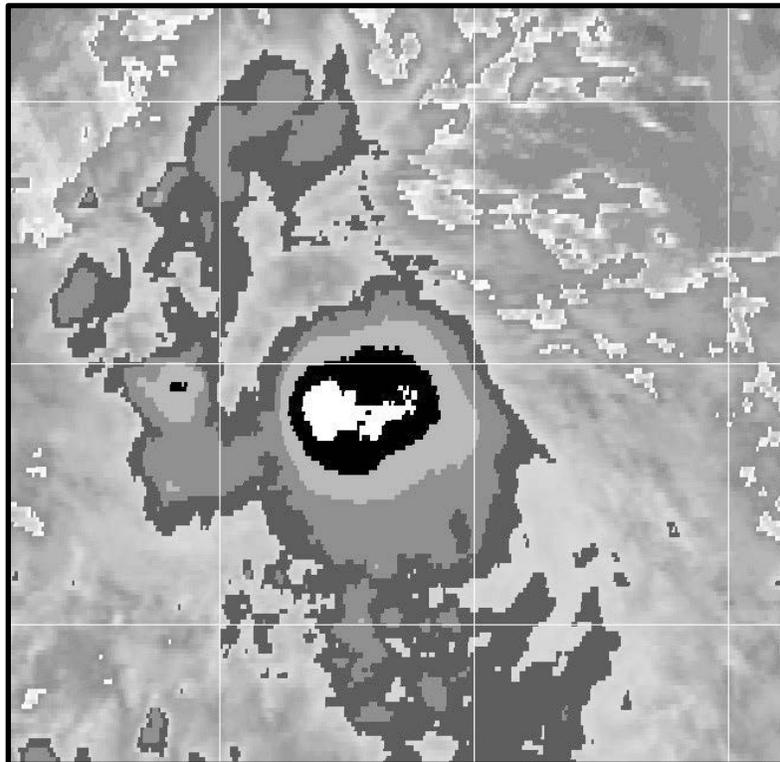


# NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

## TROPICAL STORM GILMA (EP082018)

26–29 July 2018

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National Hurricane Center  
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GOES-15 INFRARED SATELLITE IMAGE OF TROPICAL STORM GILMA AT 0230 UTC 27 JULY 2018.

Tropical Storm Gilma was a short-lived tropical storm over the eastern North Pacific basin that did not affect land.

# Tropical Storm Gilma

26–29 JULY 2018

## SYNOPTIC HISTORY

The genesis of Gilma was primarily associated with a tropical wave that departed the west coast of Africa late on 13 July (Fig. 1). This wave had a large circulation when it was located over the eastern Atlantic, but it became less organized when it neared the Lesser Antilles by 18 July. There was little shower or thunderstorm activity near the wave when it tracked across the Caribbean Sea and Central America, but a large area of deep convection formed along the wave axis on 22 July when the system moved over the far eastern North Pacific. The associated convection waxed and waned during the next few days while the wave moved westward at about 10 kt. Satellite images indicate that the low-level center of circulation became well defined, and the deep convection was sufficiently organized to classify the disturbance a tropical depression by 1200 UTC 26 July, when it was located about 900 n mi southwest of the southern tip of the Baja California peninsula. The “best track” chart of the tropical cyclone’s path is given in Fig. 2, with the wind and pressure histories shown in Figs. 3 and 4, respectively. The best track positions and intensities are listed in Table 1<sup>1</sup>.

After genesis, the cyclone strengthened a little during the next 12 h while it moved west-northwestward on the south-southwest side of a mid-level ridge. Gilma reached its peak intensity of 40 kt (cover image) by 0600 UTC 27 July, when it was centered about 1050 n mi west-southwest of the southern tip of the Baja California peninsula. Shortly after that time, northwesterly shear increased, which caused the convective pattern of the cyclone to become asymmetric, and Gilma began to weaken. Gilma became a tropical depression again by 1800 UTC that day, and at that time it only had a small area of thunderstorms in the southeastern quadrant. The depression lingered for another couple of days while still moving west-northwestward, and then degenerated into a remnant low around 1200 UTC 29 July just east of 140°W, the boundary with the central Pacific basin. The remnant low moved westward and gradually weakened before it dissipated a couple of days later about 350 n mi southeast of Hilo, Hawaii.

## METEOROLOGICAL STATISTICS

Observations in Tropical Storm Gilma (Figs. 3 and 4) 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

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<sup>1</sup> 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*k directory, while previous years’ data are located in the *archive* directory.

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 Gilma.

The estimated maximum intensity of Gilma of 40 kt at 0600 UTC 27 July is based on an ASCAT-A overpass that showed maximum winds of 35–40 kt at 0520 UTC 27 July. This intensity value is also in agreement with a SATCON estimate of 39 kt at 0255 UTC that day.

There were no land-based or ship reports of winds of tropical storm force in association with Gilma.

## CASUALTY AND DAMAGE STATISTICS

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

## FORECAST AND WARNING CRITIQUE

The genesis of Gilma was not particularly well forecast. Although the possibility of tropical cyclone formation was introduced in the NHC Tropical Weather Outlook (TWO) 180 h before genesis, the chance of genesis was never raised to the high category. The pre-Gilma disturbance was never assessed to have a high chance of genesis due to expected unfavorable environmental conditions. While these conditions did not prevent genesis, they did limit how much Gilma strengthened. Table 2 provides the number of hours in advance of formation associated with the first reference to the system in the TWO forecast in each likelihood category.

A verification of NHC official track forecasts for Gilma is given in Table 3a. For the small number of forecasts through 48 h, the official forecast track errors were much higher than 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. The climatology and persistence model (OCD5) was one of the best performers for this storm, with no model having skill over this benchmark at 36 or 48 h. Nearly all of the models and the official forecast had a slow bias for Gilma, which was the biggest contribution to their errors (not shown).

A verification of NHC official intensity forecasts for Gilma is given in Table 4a. Official forecast intensity errors were lower than the mean official errors for the previous 5-yr period at all verifying forecast times, as the NHC forecasts correctly anticipated that Gilma would not strengthen very much. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. The best-performing aids were the statistical-dynamical model LGEM and the GFSI and EMXI global models. These models had generally lower errors than the official forecasts.



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

Table 1. Best track for Tropical Storm Gilma, 26–29 July 2018.

<b>Date/Time (UTC)</b>	<b>Latitude (°N)</b>	<b>Longitude (°W)</b>	<b>Pressure (mb)</b>	<b>Wind Speed (kt)</b>	<b>Stage</b>
26 / 1200	13.0	121.6	1008	30	tropical depression
26 / 1800	13.4	123.2	1007	35	tropical storm
27 / 0000	13.8	124.8	1006	35	"
27 / 0600	14.2	126.3	1005	40	"
27 / 1200	14.5	127.7	1006	35	"
27 / 1800	14.7	129.2	1007	30	tropical depression
28 / 0000	14.8	130.6	1007	30	"
28 / 0600	15.0	131.9	1007	30	"
28 / 1200	15.3	133.0	1007	30	"
28 / 1800	15.7	134.1	1008	30	"
29 / 0000	16.0	135.2	1008	30	"
29 / 0600	16.1	136.5	1008	30	"
29 / 1200	16.1	137.9	1008	30	low
29 / 1800	16.1	139.3	1008	30	"
30 / 0000	16.1	140.8	1008	30	"
30 / 0600	16.1	142.3	1008	30	"
30 / 1200	16.0	143.8	1008	30	"
30 / 1800	15.8	145.2	1008	30	"
31 / 0000	15.7	146.5	1008	25	"
31 / 0600	15.7	147.6	1009	25	"
31 / 1200	15.7	148.8	1009	20	"
31 / 1800	15.7	150.0	1010	20	"
1 / 0000					dissipated
27 / 0600	14.2	126.3	1005	40	maximum wind 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	120-Hour Outlook
Low (<40%)	72	180
Medium (40%-60%)	12	150
High (>60%)	-	-

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Gilma, 26–29 July 2018. 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	35.3	52.8	83.0	120.2			
OCD5	36.5	48.1	56.5	56.6			
Forecasts	9	7	5	3			
OFCL (2013-17)	21.8	33.2	43.0	53.9	80.7	111.1	150.5
OCD5 (2013-17)	34.9	70.7	109.1	146.1	213.8	269.0	339.7



Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Gilma, 26–29 July 2018. 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	36.4	53.0	81.6	120.2			
OCD5	<b>36.3</b>	<b>46.0</b>	<b>52.8</b>	<b>56.6</b>			
GFSI	44.6	74.0	100.7	133.6			
HMNI	47.4	89.1	127.7	162.0			
HWFI	55.2	94.7	131.7	173.3			
EMXI	<b>26.7</b>	<b>34.4</b>	<b>58.5</b>	<b>90.5</b>			
CMCI	46.1	92.7	149.0	189.0			
AEMI	37.4	<b>49.8</b>	<b>59.9</b>	<b>73.1</b>			
HCCA	39.1	62.6	89.1	121.1			
GFEX	<b>32.5</b>	<b>51.1</b>	<b>77.4</b>	<b>106.8</b>			
TVCE	41.4	70.5	102.5	139.0			
TABS	<b>26.2</b>	<b>47.1</b>	86.2	120.5			
TABM	<b>30.2</b>	<b>41.2</b>	<b>77.0</b>	122.6			
TABD	54.4	99.8	141.5	217.5			
Forecasts	8	6	4	3			

Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Gilma, 26–29 July 2018. 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	<b>2.8</b>	<b>7.1</b>	<b>10.0</b>	<b>11.7</b>			
OCD5	2.8	5.9	9.2	11.7			
Forecasts	9	7	5	3			
OFCL (2013-17)	5.8	9.6	11.8	13.2	15.1	15.1	14.6
OCD5 (2013-17)	7.6	12.4	15.6	17.7	19.8	20.8	19.6

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Gilma, 26–29 July 2018. 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	3.1	7.5	11.2	11.7			
OCD5	<b>2.9</b>	<b>6.3</b>	<b>10.5</b>	11.7			
HWFI	<b>2.9</b>	9.2	16.0	16.7			
HMNI	4.4	10.5	13.2	<b>11.0</b>			
DSHP	3.6	8.5	<b>8.8</b>	<b>9.7</b>			
LGEM	3.1	<b>5.5</b>	<b>4.2</b>	<b>4.7</b>			
IVCN	<b>2.8</b>	8.3	12.2	13.0			
HCCA	3.4	9.8	16.2	16.3			
GFSI	3.1	<b>6.3</b>	<b>5.8</b>	<b>4.3</b>			
EMXI	3.1	<b>3.0</b>	<b>4.8</b>	<b>5.0</b>			
Forecasts	8	6	4	3			

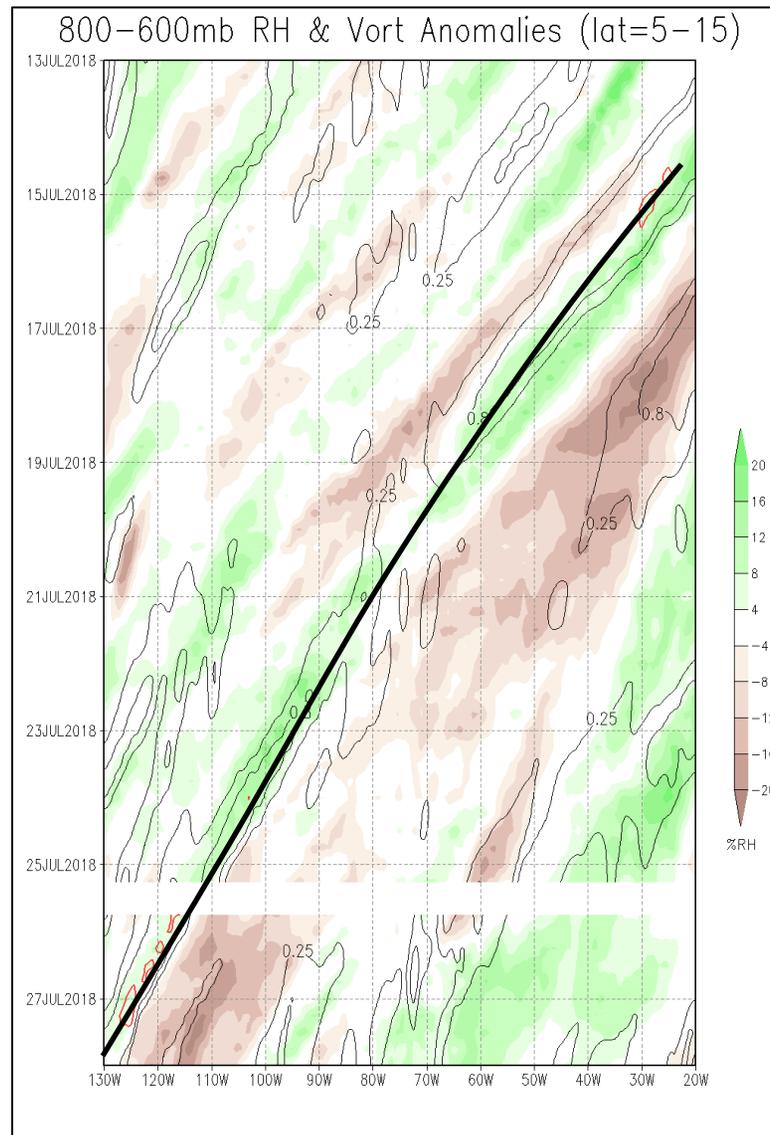


Figure 1. Hovmöller diagram of 800–600-mb relative humidity anomalies (percent, shaded) and relative vorticity anomalies ( $10^{-5} \text{ s}^{-1}$ , contours) based on GFS analyses, averaged between  $5^{\circ}\text{N}$  and  $15^{\circ}\text{N}$  from 13 July through 27 July 2018. The solid black line denotes the tropical wave that contributed to the formation of Gilma.

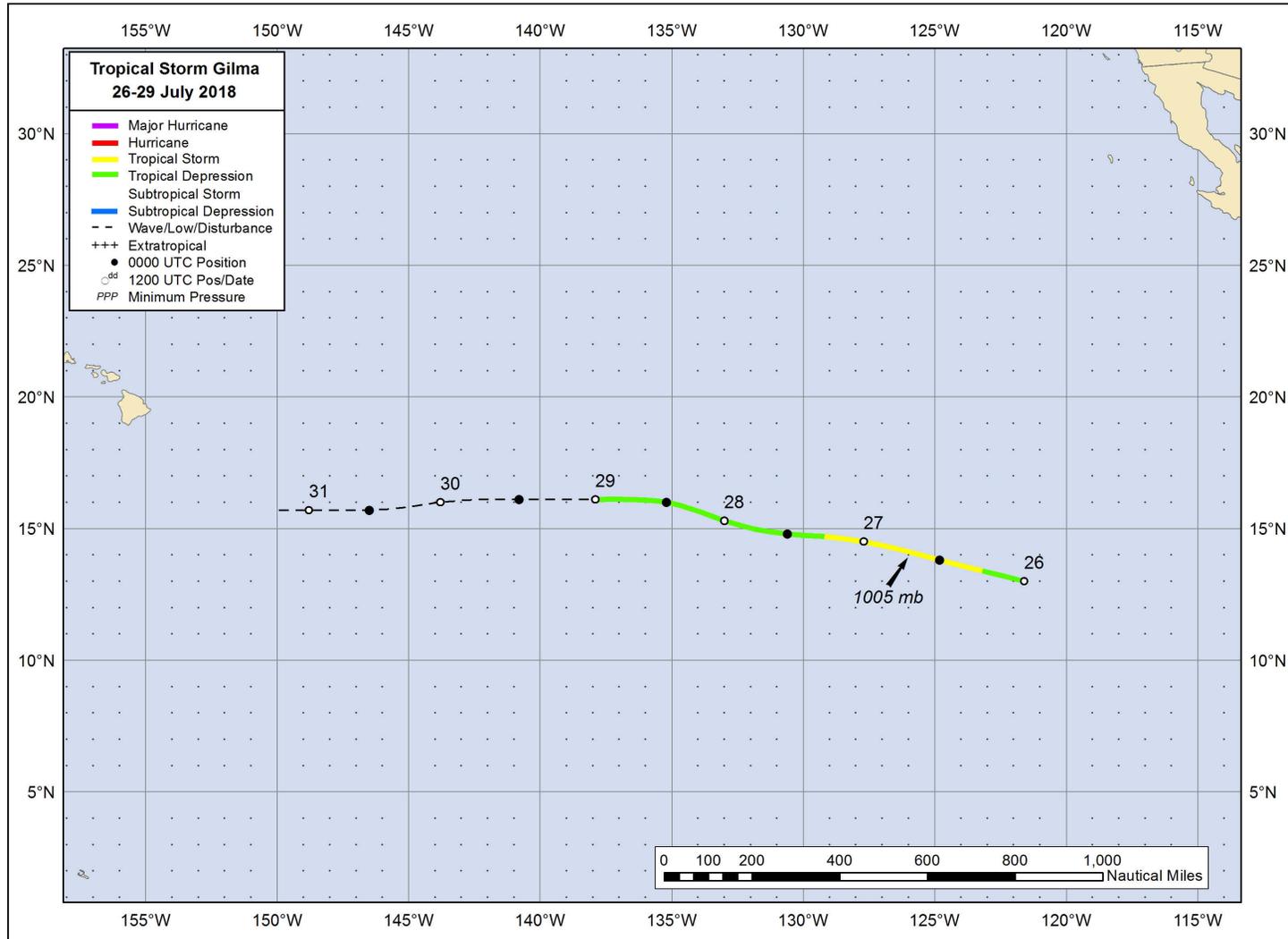


Figure 2. Best track positions for Tropical Storm Gilma, 26–29 July 2018.

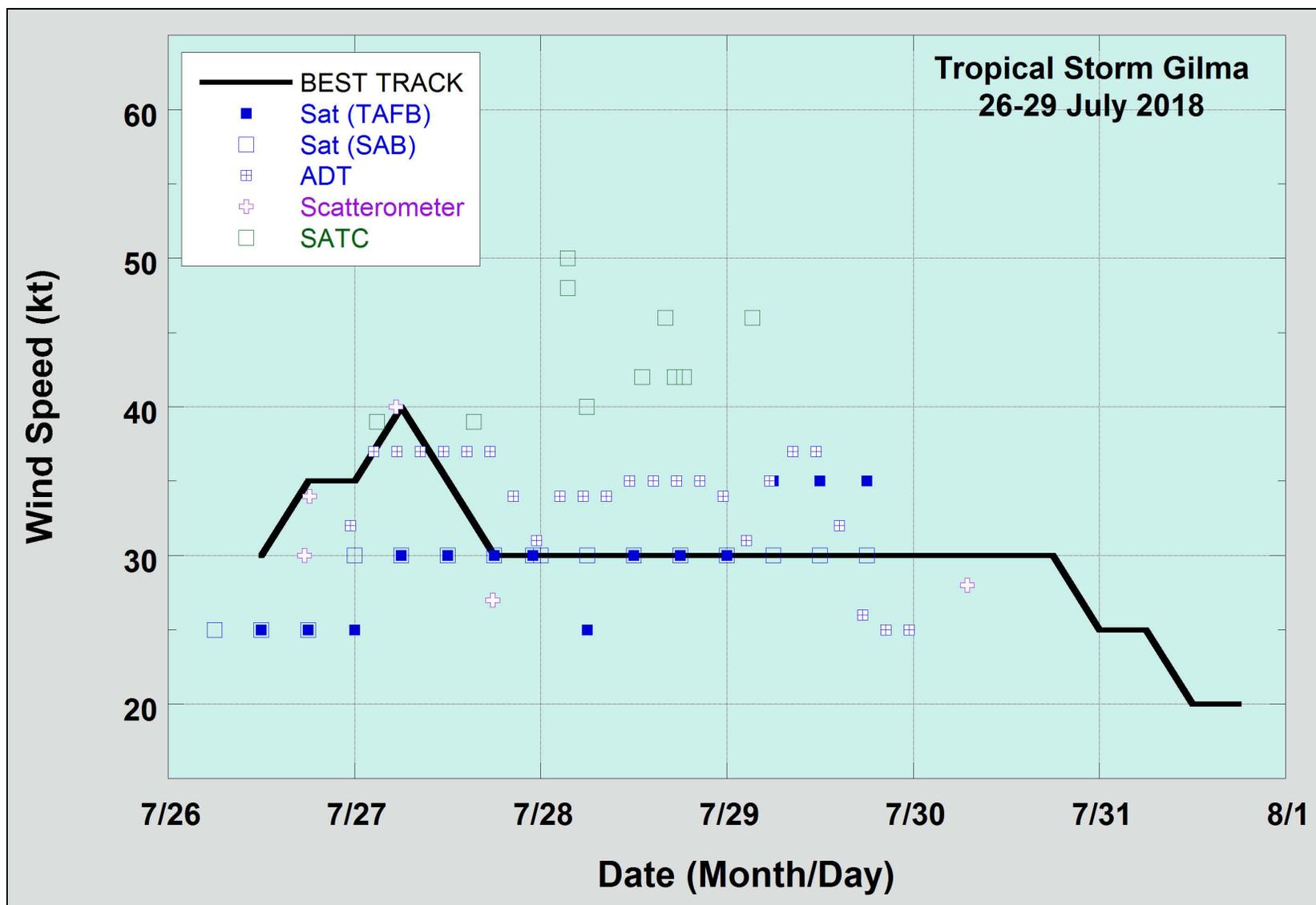


Figure 3. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Gilma, 26–29 July 2018. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

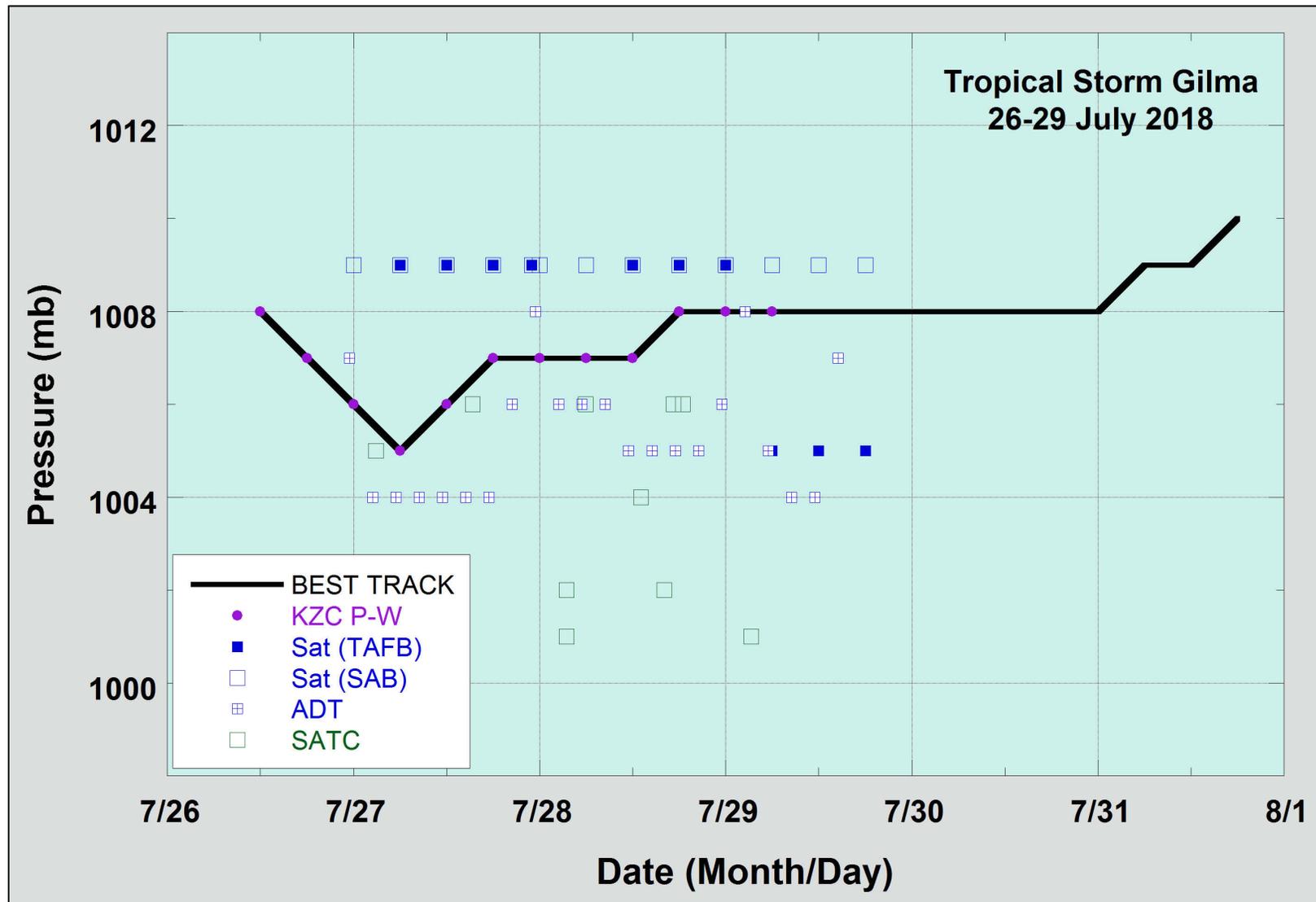


Figure 4. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Gilma, 26–29 July 2018. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC.