Tropical Cyclone Report
Hurricane Gilma
(EP072012)
7-11 August 2012

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Gilma was a short-lived category 1 hurricane (on the Saffir-Simpson Hurricane Wind scale) that did not affect land.

a.   Synoptic History

The origin of Gilma can be traced to a tropical wave that crossed the west coast of Africa on 24 July. The wave encountered strong upper-level winds by 27 July, which limited shower and thunderstorm activity as the system traversed the central tropical Atlantic. The wave entered the eastern North Pacific basin on 2 August. Shower and thunderstorm activity increased markedly near the wave beginning 4 August after it passed west of the Gulf of Tehuantepec, possibly due to an atmospheric Kelvin wave that was moving through the eastern Pacific at that time. There was evidence of curved bands of convection by 5 August, and this prompted the initial Dvorak classifications of the system. A closed low-level circulation was noted in visible satellite imagery on 6 August. By 0600 UTC 7 August, the deep convection became organized enough to mark the formation of a tropical depression centered about 520 n mi west-southwest of Manzanillo, Mexico. The "best track" chart of the tropical cyclone'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.

The depression was steered toward the west-northwest on the south side of a mid-level anticyclone over the southwestern United States and quickly became better organized while embedded within an environment of low vertical wind shear. The system reached tropical storm strength at 1800 UTC 7 August, while located about 565 n mi west-southwest of Manzanillo and attained hurricane strength 24 h later. By 0600 UTC 9 August, Gilma reached an estimated maximum intensity of 70 kt.

Gilma gradually weakened due to increasing vertical wind shear and decreasing sea surface temperatures as it moved north-northwestward through 11 August. The system lost all deep convection just after 0600 UTC 11 August and became a post-tropical cyclone by 1200 UTC that day about 590 n mi west-southwest of the southern tip of Baja California. Now decoupled due to the mid- and upper-level southeasterly flow, the remnant circulation turned westward and then southwestward before dissipating about 750 n mi west of the southern tip of the Baja California peninsula around 0000 UTC 14 August.

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b.	Meteorological Statistics

Observations in Gilma (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 Tropical Rainfall Measuring Mission (TRMM), 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.

Gilma's analyzed peak intensity of 70 kt at 0600 UTC on 9 August is based on a blend of the subjective Dvorak intensity estimates. Peak Dvorak estimates from TAFB and SAB were 77 kt and 65 kt, respectively.

The only surface observations of note were from ship A8WC8, the *CSAV Rio Bueno*, which visually observed winds around 30 kt approximately 180 n mi south of the center of Gilma from 1200 UTC 7 August to 1200 UTC 8 August.

c.	Casualty and Damage Statistics

Gilma remained at sea throughout its lifetime, and there were no reports of damage or casualties.

d.	Forecast and Warning Critique

The genesis of Gilma was generally well predicted. Gilma's incipient disturbance was first mentioned in the Tropical Weather Outlook (TWO) 54 h before genesis at 0000 UTC on 5 August and given a low (less than 30%) chance of development during the next 48 h. The probability of formation was raised to the medium category (30%-50%) in the TWO issued 18 h later and raised to the high category (greater than 50%) at 0000 UTC 7 August, 6 h before genesis occurred.

A verification of NHC official track forecasts (OFCL) for Gilma is given in Table 2a. Official track forecast errors through 48 h were smaller than the mean official track errors for the 5-yr period of 2007-11. A homogeneous comparison of the official track errors with selected guidance models is given in Table 2b. The Hurricane Weather Research and Forecasting model (HWFI) had the lowest average track errors at all time periods. The Geophysical Fluid Dynamics Laboratory (GFDL) model (GHMI) and the variable consensus model TVCE also had lower track errors than the official forecast.

A verification of NHC official intensity forecasts for Gilma is given in Table 3a. Official intensity forecast errors were substantially lower 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 3b. The NHC official forecasts were superior to all of the intensity guidance for the 12 h, 48 h, and 72 h forecast times. Of the forecast guidance, the HWFI had the smallest intensity errors for Gilma.

There were no coastal tropical cyclone watches or warnings issued in association with Gilma.

Table 1.   Best track for Hurricane Gilma, 7-11 August 2012.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
06 / 0000	12.4	105.9	1008	25	low
06 / 0600	12.7	106.9	1008	25	"
06 / 1200	13.0	108.0	1008	25	"
06 / 1800	13.3	109.1	1008	25	"
07 / 0000	13.6	110.2	1008	25	"
07 / 0600	14.1	111.3	1006	30	tropical depression
07 / 1200	14.6	112.4	1006	30	"
07 / 1800	14.9	113.4	1001	40	tropical storm
08 / 0000	15.2	114.4	997	50	"
08 / 0600	15.5	115.4	994	55	"
08 / 1200	15.7	116.3	989	60	"
08 / 1800	15.9	117.2	987	65	hurricane
09 / 0000	16.1	117.8	987	65	"
09 / 0600	16.3	118.3	984	70	"
09 / 1200	16.7	118.7	988	65	"
09 / 1800	17.1	118.9	991	60	tropical storm
10 / 0000	17.6	118.9	991	60	"
10 / 0600	18.1	119.0	992	60	"
10 / 1200	18.5	119.2	994	55	"
10 / 1800	18.9	119.4	997	50	"
11 / 0000	19.3	119.6	999	45	"
11 / 0600	19.6	119.8	1001	40	"
11 / 1200	20.0	120.0	1002	35	low
11 / 1800	20.4	120.3	1004	30	"
12 / 0000	20.7	120.6	1004	30	"
12 / 0600	21.0	120.9	1005	30	"
12 / 1200	21.3	121.1	1006	25	"
12 / 1800	21.5	121.3	1006	25	"
13 / 0000	21.5	121.6	1007	20	"
13 / 0600	21.3	121.7	1007	20	"
13 / 1200	21.0	121.9	1007	20	"
13 / 1800	20.7	122.1	1007	20	"
14 / 0000	20.2	122.3	1007	20	"
14 / 0600					dissipated
09 / 0600	16.3	118.3	984	70	minimum pressure

Table 2a.   NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Hurricane Gilma, 7-11 August 2012. Mean errors for the 5-yr period 2007-11 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	**22.3**	**39.9**	**59.9**	**77.5**	112.0	183.6	
OCD5	35.5	76.9	138.6	201.4	269.3	333.9	
Forecasts	15	13	11	9	5	1	
OFCL (2007-2011)	28.6	46.3	62.7	78.1	108.0	145.3	
OCD5 (2007-2011)	38.5	74.8	116.0	159.8	246.1	324.2	

Table 2b.   Homogeneous comparison of selected track forecast guidance models (in n mi) for Hurricane Gilma, 7-11 August 2012. 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 2a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	25.1	43.7	70.0	97.0	105.5		
OCD5	42.8	94.6	183.6	282.5	410.8		
GFSI	26.1	**43.5**	**68.2**	107.1	153.1		
GHMI	25.1	**40.9**	**57.6**	**89.0**	**84.8**		
HWFI	**22.2**	**36.5**	**53.8**	**70.5**	**83.4**		
EXMI	30.4	56.8	90.4	130.7	**88.0**		
CMCI	43.9	82.8	134.6	179.9	181.9		
AEMI	30.4	55.6	85.0	132.3	204.0		
FSSE	27.9	54.2	89.3	128.1	113.0		
TVCE	**22.3**	**40.3**	**65.0**	**92.8**	**95.4**		
LBAR	44.8	107.6	195.5	282.6	419.0		
BAMD	44.4	88.9	151.1	200.8	245.6		
BAMM	43.5	89.3	150.6	215.2	277.4		
BAMS	47.2	93.0	162.2	225.1	289.1		
NAMI	36.7	77.7	110.7	119.8	178.5		
Forecasts	10	9	7	5	1		

Table 3a.   NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Hurricane Gilma, 7-11 August 2012. Mean errors for the 5-yr period 2007-11 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	**4.0**	**6.2**	**7.3**	**5.6**	**6.0**	**15.0**	
OCD5	5.9	8.8	13.5	15.8	14.2	13.0	
Forecasts	15	13	11	9	5	1	
OFCL (2007-2011)	6.4	10.6	13.7	15.1	17.0	18.5	
OCD5 (2007-2011)	7.5	12.4	16.1	18.4	20.1	20.1	

Table 3b.   Homogeneous comparison of selected intensity forecast guidance models (in kt) for Hurricane Gilma, 7-11 August 2012. 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.

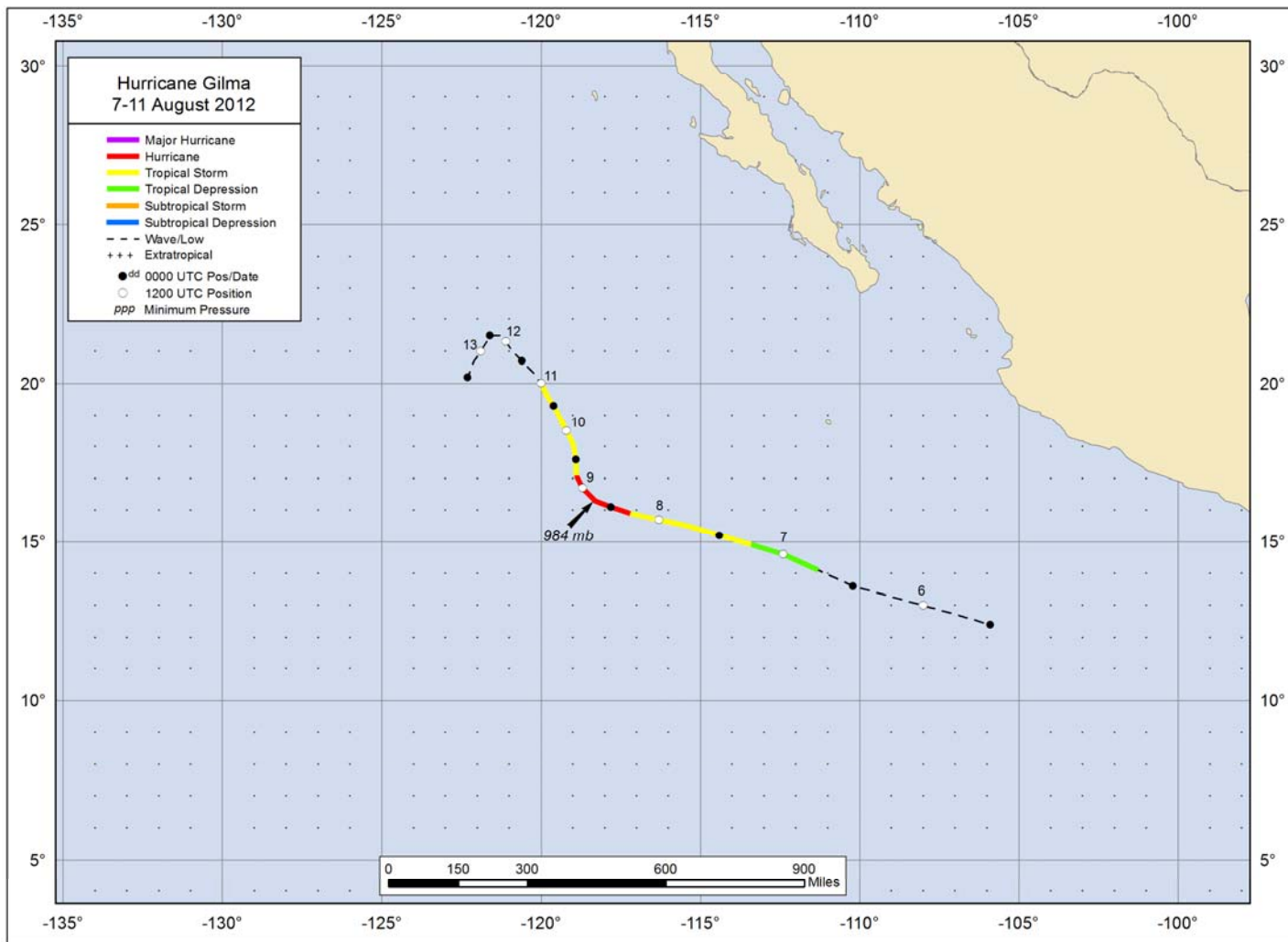| Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	4.0	6.2	7.3	5.6	6.0	15.0	
OCD5	5.9	8.8	13.5	15.8	14.2	**13.0**	
GHMI	4.8	7.6	12.8	14.1	8.0	24.0	
HWFI	4.9	**5.3**	**6.8**	10.1	14.2	**8.0**	
DSHP	5.3	6.4	8.8	9.2	9.8	16.0	
LGEM	5.5	6.4	8.0	6.9	6.6	**12.0**	
ICON	4.5	**5.3**	8.5	8.7	8.8	15.0	
IVCN	4.5	**5.3**	8.5	8.7	8.8	15.0	
Forecasts	15	13	11	9	5	1	

Figure 1.   Best track positions for Hurricane Gilma, 7-11 August 2012.
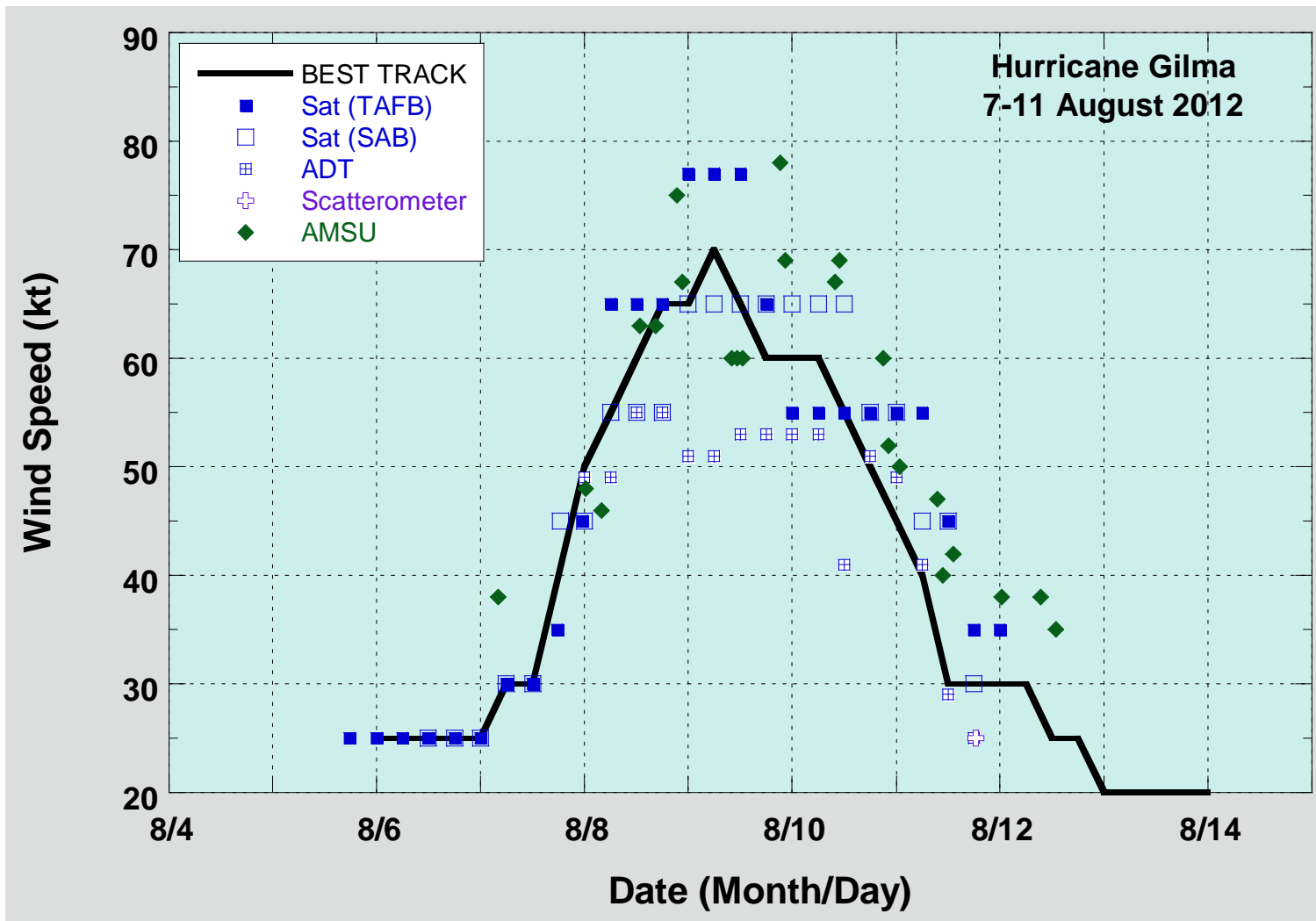
Figure 2.   Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Gilma, 7-11 August 2012. Advanced Dvorak Technique (ADT) estimates represent current intensity (CI) values. AMSU intensity estimates are from the UW-CIMSS technique. Dashed vertical lines correspond to 0000 UTC.
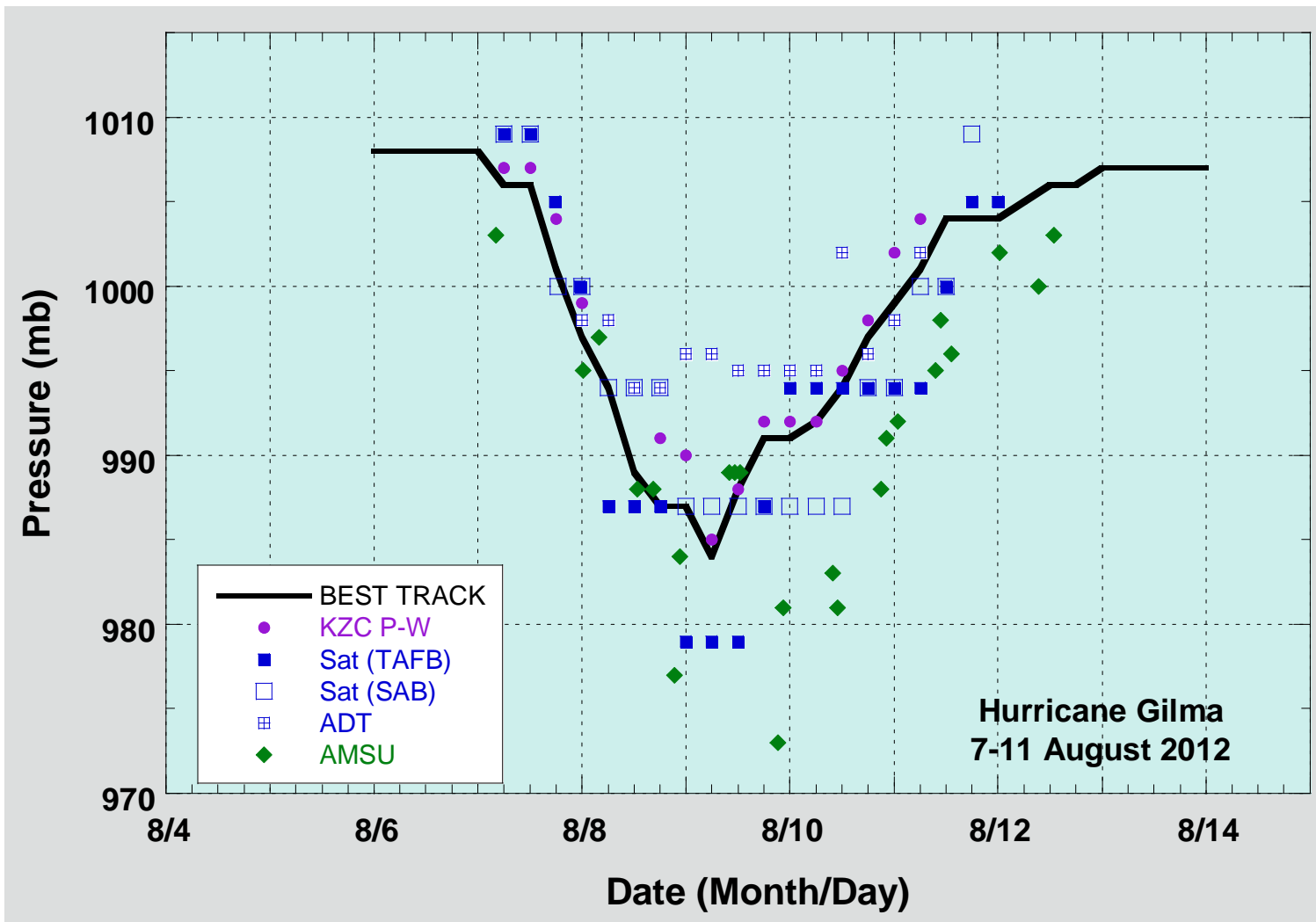
Figure 3.   Selected pressure observations and best track minimum central pressure curve for Hurricane Gilma, 7-11 August 2012. Advanced Dvorak Technique (ADT) estimates represent current intensity (CI) values. AMSU intensity estimates are from the UW-CIMSS technique. The KZC P-W values are obtained by applying the Knaff-Zehr-Courtney pressure-wind relationship to the best track wind data. Dashed vertical lines correspond to 0000 UTC.