Tropical Cyclone Report
Hurricane Ileana
(EP092012)
27 August – 2 September 2012

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Ileana was a category 1 hurricane (on the Saffir-Simpson Hurricane Wind Scale) that remained over the eastern North Pacific Ocean and did not directly affect land.

a.   Synoptic History

Ileana formed from a tropical wave that emerged off the west coast of Africa on 12 August. The wave lacked any significant deep convection during its westward trek across the Atlantic. The tropical wave crossed into the eastern North Pacific on 21 August and convection began to develop the next day. A broad low pressure area formed along the wave axis on 22 August, but the convection remained poorly organized for the next few days. A well-defined circulation center finally developed on 25 August, and convection increased and became organized enough by 1200 UTC 27 August for the system to be classified as a tropical depression about 325 n mi south-southwest of Manzanillo, Mexico. The depression achieved tropical storm strength just 6 h later. 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[1].

Over the next few days, the cyclone moved northwestward along the southwestern periphery of a mid-level ridge and into an environment consisting of deep moisture, low vertical wind shear, and warm sea-surface temperatures of 28°-29° C. These favorable conditions allowed Ileana to steadily strengthen, and it is estimated that the tropical cyclone reached hurricane intensity by 0000 UTC 30 August. Around this time, the hurricane continued to show improved organization of the deep convection, which was accompanied by intermittent appearances of an eye in infrared and visible satellite imagery. A banded eye developed as Ileana reached its peak intensity of 75 kt around 1800 UTC that day (Fig. 4), when the hurricane was located about 315 n mi west-southwest of the southern tip of the Baja California peninsula. However, both the peak intensity and hurricane status were short-lived when Ileana made a west-northwestward turn due to increased ridging to the north, which brought the cyclone over much cooler waters. By 1800 UTC 31 August, the system weakened to a tropical storm as it entered a drier and more stable air mass that further helped to diminish the inner-core convection. Ileana turned westward and remained on that track for the next couple of days. The cyclone steadily weakened due to moderate southeasterly shear, becoming a tropical depression by 0600 UTC 2 September. The

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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.

associated convection gradually waned and completely dissipated by 1200 UTC 4 September when Ileana became a post-tropical remnant low pressure system about 1100 n mi west-southwest of the southern tip of Baja California. The vertically shallow cyclone moved west-southwestward and then southwestward under the influence of lower-layer trade wind flow, and finally dissipated by 1200 UTC 6 September when it was located about 1200 n mi east-southeast of the Hawaiian Islands.

b.   Meteorological Statistics

Observations in Ileana (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 Ileana.

There was only one ship report of tropical-storm-force winds associated with Ileana. The ship *New Orleans Express* (call sign VSXC9) reported 35-kt winds at 1200 UTC 31 August when the ship was located about 385 n mi north of Ileana. However, these winds were probably enhanced due to orographic effects created by the Baja Peninsula and are, therefore, not considered to be representative of the outer wind field of the hurricane. There were no surface observations from any land stations since the circulation of Ileana remained out at sea during its entire lifetime.

The 75-kt analyzed peak intensity at 1800 UTC 30 August (Fig. 4) is based on Dvorak T-numbers of 4.5/77 kt from TAFB and SAB. Much lower ADT intensity values around that time were not considered to be representative since the algorithm used an incorrect scene type during the intensity analysis process.

c.   Casualty and Damage Statistics

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

d.   Forecast and Warning Critique

The genesis of Ileana was predicted reasonably well. The tropical wave that developed into Ileana was introduced in the Tropical Weather Outlook with a low chance (< 30%) of development 90 h before genesis occurred. The probability was increased to the medium category (30-50%) 36 h prior to formation and to the high category (>50%) 12 h before Ileana developed.

A verification of NHC official track forecasts for Ileana is given in Table 2a. Official forecast track errors were lower than the mean official errors for the previous 5-yr period, especially at 120 h where the track errors were more than 60% smaller than average. However, Climatology and Persistence (OCD5) model track errors were also lower than average. A

homogeneous comparison of the official track errors with selected guidance models is given in Table 2b. The Florida State Super Ensemble model (FSSE) and TVCE consensus model were the best performers, and also were the only models that consistently beat the official forecast. However, the ECMWF (EMXI) track forecasts were comparable to the official track forecast (OFCL) for the initial 12-24 h and bested OFCL for the remainder of the forecast periods.

A verification of NHC official intensity forecasts for Ileana is given in Table 3a. Official forecast intensity errors were much lower than the mean official errors for the previous 5-yr period, and averaged 70% better than the 5-yr average through 96 h. Although OCD5 intensity errors were also better than average, which suggests that Ileana was easier to forecast, the improvement in those errors only averaged about 40% at 96 h. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 3b. The performance of the official forecasts was comparable to that of the statistical models and consensus aids, with exception of the OCD5 and GHMI, both of which had the largest intensity errors.

There were no watches or warnings associated with Ileana.

Table 1.   Best track for Hurricane Ileana, 27 August – 2 September 2012.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
25 / 1800	11.3	99.1	1008	20	low
26 / 0000	11.6	99.9	1007	25	"
26 / 0600	11.9	100.7	1007	25	"
26 / 1200	12.4	101.4	1006	25	"
26 / 1800	13.0	102.1	1006	25	"
27 / 0000	13.6	102.9	1005	25	"
27 / 0600	14.2	104.0	1005	25	"
27 / 1200	14.6	105.2	1004	30	tropical depression
27 / 1800	14.9	106.4	1003	35	tropical storm
28 / 0000	15.2	107.4	1001	40	"
28 / 0600	15.4	108.4	999	40	"
28 / 1200	15.7	109.3	998	45	"
28 / 1800	16.2	110.1	997	50	"
29 / 0000	16.7	110.8	995	55	"
29 / 0600	17.3	111.5	993	55	"
29 / 1200	17.8	112.0	991	60	"
29 / 1800	18.3	112.5	989	60	"
30 / 0000	18.8	113.0	987	65	hurricane
30 / 0600	19.4	113.3	984	65	"
30 / 1200	20.0	113.5	981	70	"
30 / 1800	20.5	113.8	978	75	"
31 / 0000	21.0	114.1	978	75	"
31 / 0600	21.5	114.6	981	70	"
31 / 1200	21.9	115.2	985	65	"
31 / 1800	22.2	115.9	987	60	tropical storm
01 / 0000	22.5	116.7	991	55	"
01 / 0600	22.8	117.5	996	50	"
01 / 1200	23.0	118.3	999	45	"
01 / 1800	23.1	119.2	1002	40	"
02 / 0000	23.0	120.1	1004	35	"
02 / 0600	22.9	121.0	1007	30	tropical depression
02 / 1200	22.7	122.0	1008	30	low
02 / 1800	22.5	123.0	1008	30	"
03 / 0000	22.2	124.0	1008	30	"
03 / 0600	21.9	125.0	1008	30	"
03 / 1200	21.6	126.0	1009	30	"
03 / 1800	21.2	126.9	1010	25	"
04 / 0000	20.8	127.7	1010	25	"
04 / 0600	20.2	128.4	1010	25	"
04 / 1200	19.7	129.1	1010	25	"
04 / 1800	19.2	129.8	1011	20	"
05 / 0000	18.7	130.4	1011	20	"
05 / 0600	18.2	131.0	1011	20	"
05 / 1200	17.8	131.7	1011	20	"
05 / 1800	17.3	132.3	1012	15	"
06 / 0000	16.9	133.0	1012	15	"
06 / 0600	16.4	133.6	1012	15	"
06 / 1200					dissipated
30 / 1800	20.4	113.8	978	75	minimum pressure and maximum intensity

Table 2a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Hurricane Ileana, 27 August – 2 September 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 (Ileana)	**21.5**	**27.3**	**43.0**	**58.7**	**78.0**	**90.2**	**69.2**
OCD5 (Ileana)	28.5	56.2	93.4	130.4	153.2	200.0	200.2
Forecasts	21	19	17	15	11	7	3
OFCL (2007-11)	28.6	46.3	62.7	78.1	108.0	145.3	181.1
OCD5 (2007-11)	38.5	74.8	116.0	159.8	246.1	324.2	392.8

Table 2b.   Homogeneous comparison of selected track forecast guidance models (in n mi) for Hurricane Ileana, 27 August – 2 September 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	21.0	29.4	45.2	57.6	63.9	76.0	
OCD5	30.6	65.3	107.3	135.4	142.8	204.3	
GFSI	21.6	37.7	59.8	74.3	105.7	136.6	
GHMI	24.5	44.2	64.3	85.2	96.2	99.7	
HWFI	**20.6**	32.6	51.2	81.4	103.4	156.6	
EGRI	22.1	35.5	51.0	64.7	70.4	93.4	
EMXI	21.7	30.3	**35.2**	**33.8**	**29.5**	**22.3**	
CMCI	25.5	44.2	63.2	76.3	88.0	121.6	
AEMI	**20.7**	37.2	58.6	71.2	101.2	121.1	
FSSE	**18.0**	**26.0**	**36.4**	**37.5**	**41.9**	**55.8**	
TVCE	**17.1**	**25.4**	**40.2**	**51.5**	**59.4**	**69.8**	
LBAR	34.8	79.9	127.3	137.1	162.7	134.0	
BAMD	29.9	56.6	94.5	121.4	152.2	207.0	
BAMM	28.6	47.3	70.5	91.9	112.8	142.2	
BAMS	26.5	46.3	65.7	76.6	98.4	106.3	
Forecasts	17	15	13	10	6	3	

Table 3a.　　NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Hurricane Ileana, 27 August – 2 September 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 (Ileana)	**2.1**	**3.9**	**4.1**	**5.7**	**2.7**	**5.0**	**16.7**
OCD5 (Ileana)	4.6	6.9	8.9	9.5	11.1	13.4	20.7
Forecasts	21	19	17	15	11	7	3
OFCL (2007-11)	6.4	10.6	13.7	15.1	17.0	18.5	17.8
OCD5 (2007-11)	7.5	12.4	16.1	18.4	20.1	20.1	20.8

Table 3b.　　Homogeneous comparison of selected intensity forecast guidance models (in kt) for Hurricane Ileana, 27 August – 2 September 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.

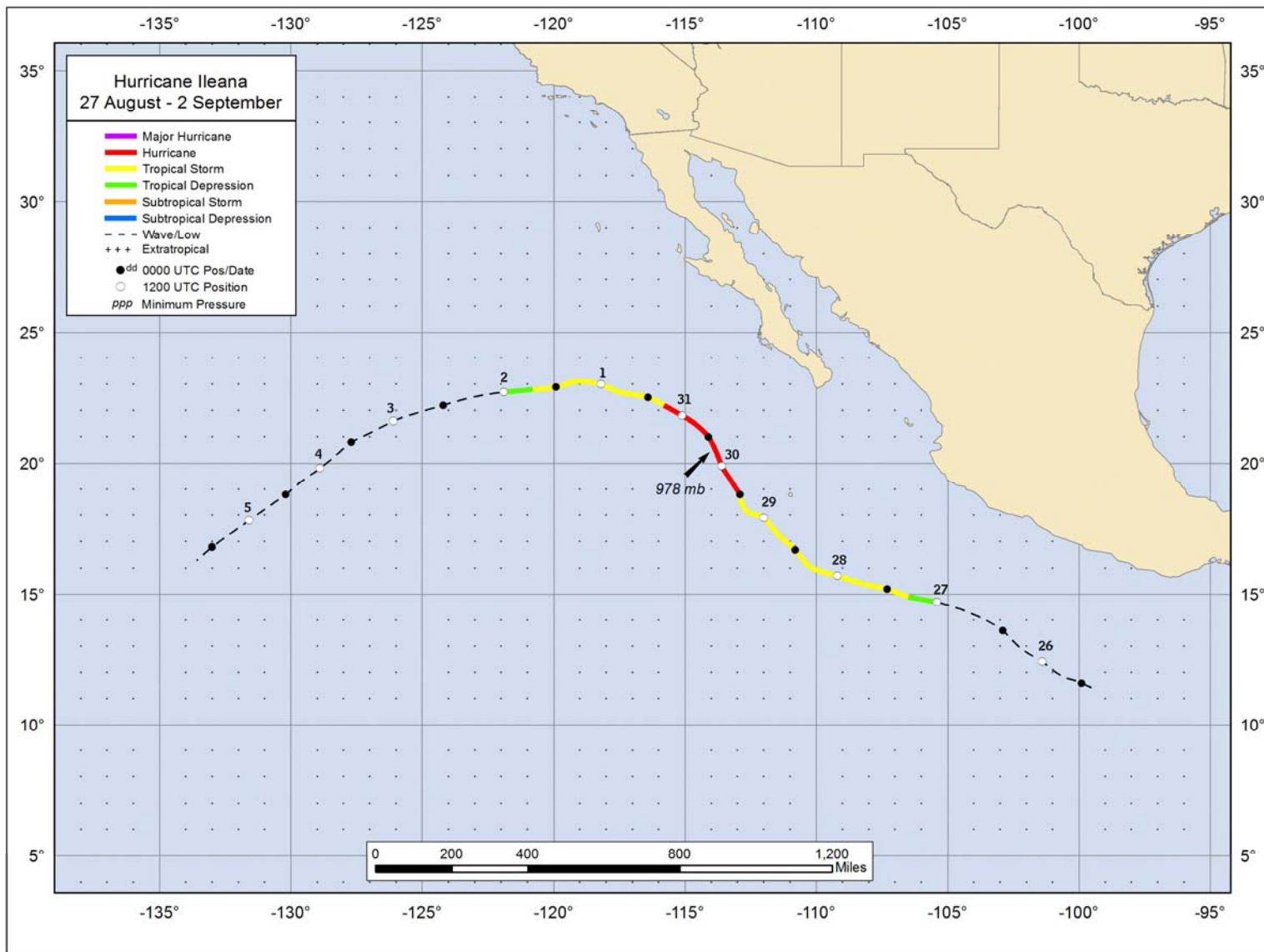| Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	2.3	3.9	4.1	6.2	1.5	5.8	17.5
OCD5	4.7	7.1	9.3	9.6	10.9	15.5	23.0
GHMI	4.3	6.7	8.9	11.6	8.3	14.7	40.5
HWFI	4.3	5.5	5.9	6.3	5.2	11.2	23.0
FSSE	3.8	5.5	4.9	**3.7**	5.0	10.2	**16.0**
DSHP	3.9	5.8	6.0	6.5	8.1	12.5	24.5
LGEM	4.2	5.2	5.7	6.5	3.5	**4.0**	**13.0**
ICON	3.7	**3.8**	4.7	**4.8**	2.1	10.0	25.5
Forecasts	20	18	16	13	10	6	2

Figure 1.   Best track positions for Hurricane Ileana, 27 August – 2 September 2012.
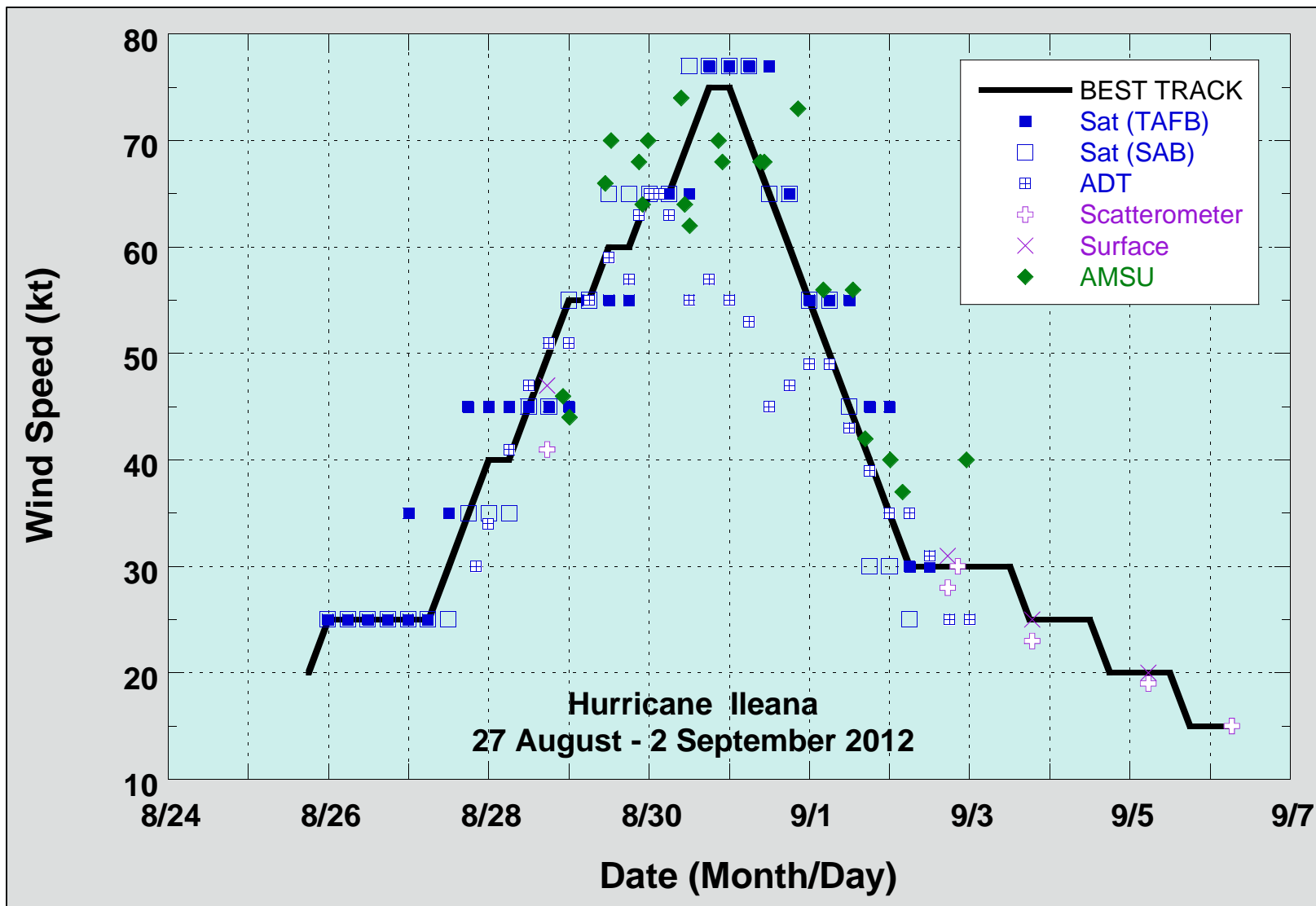
Figure 2.   Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Ileana, 27 August – 2 September 2012. Advanced Dvorak Technique (ADT) estimates represent CI numbers. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. Dashed vertical lines correspond to 0000 UTC.
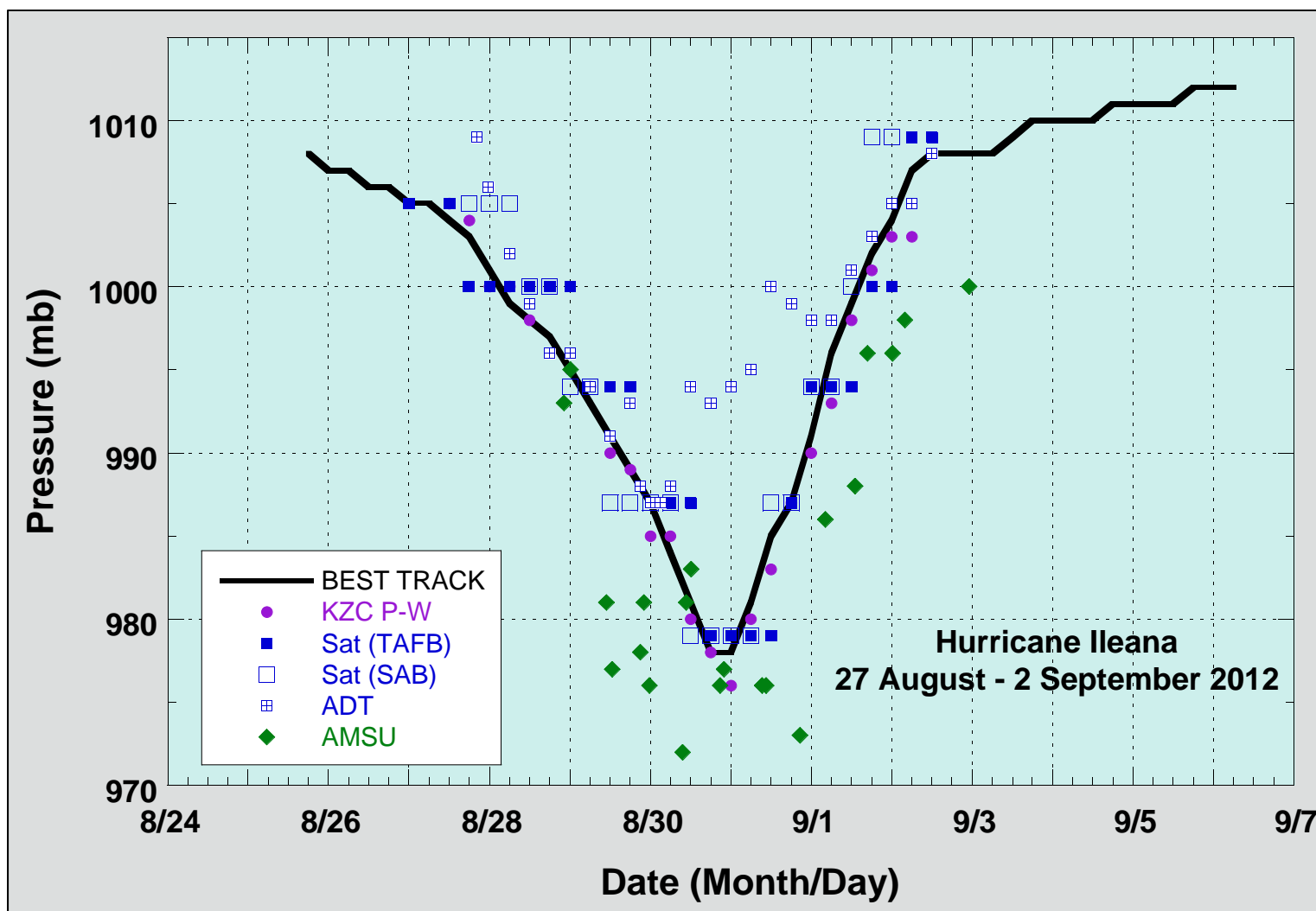
Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Ileana, 27 August – 2 September 2012. Advanced Dvorak Technique (ADT) estimates represent CI numbers. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. 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.
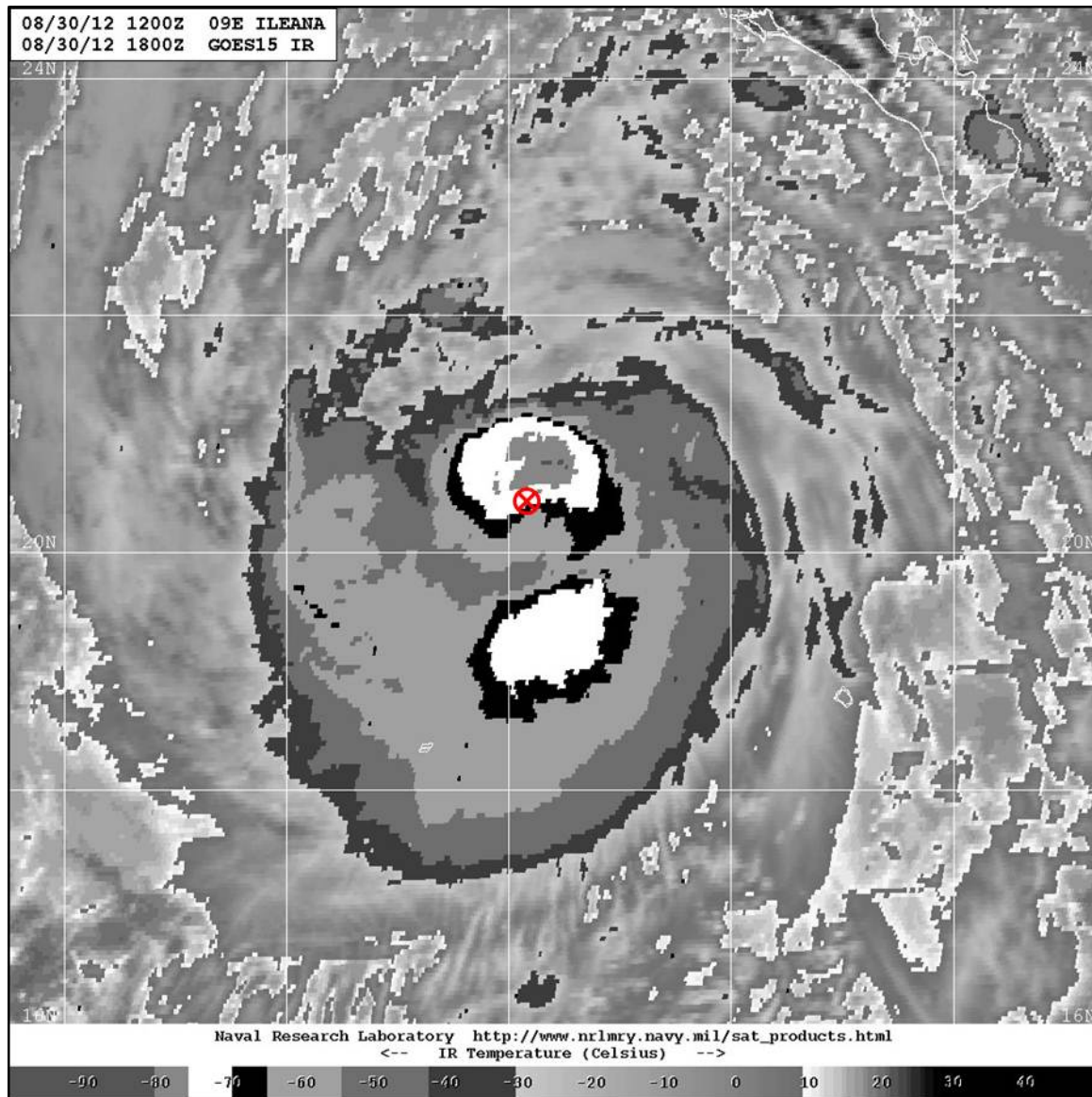
Figure 4.   GOES-15 infrared satellite image of Ileana near peak intensity at 1800 UTC 30 August 2012 (red circled-X represents estimated center position of the hurricane; image courtesy of the Naval Research Laboratory, Monterey, CA).