

Tropical Cyclone Report
Hurricane Ileana
(EP102006)
21- 27 August 2006

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Ileana was a fairly typical eastern North Pacific Ocean hurricane, becoming a major hurricane far offshore of Mexico while passing close to Socorro Island.

a. Synoptic History

The wave that spawned Ileana moved off of the west coast of Africa on 8 August. Only isolated convection formed near the wave axis as it traversed the Atlantic basin for the next week or so. This system entered the eastern North Pacific Ocean on 16 August and convection increased somewhat around the wave axis. A weak low formed from the system on 19 August and produced enough convection to warrant Dvorak classifications later that day. As the low moved west-northwestward south of the Gulf of Tehuantepec, thunderstorm activity increased on 20 August but remained disorganized. However, deep convection consolidated near the low overnight and it is estimated that a tropical depression formed about 300 n mi south-southwest of Acapulco, Mexico at 1200 UTC 21 August. 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.

Low vertical wind shear and very warm sea surface temperatures contributed to a rapid intensification of the depression. It became a tropical storm 6 h after the cyclone’s formation, reached hurricane status the next day and strengthened into a major hurricane about 48 h after genesis. Middle-tropospheric ridging over Mexico forced the system to move northwestward between the time of tropical cyclone formation until near peak intensity. On 23 August, the center of Ileana passed about 50 n mi south of Socorro Island, causing hurricane-force wind gusts on the island. The hurricane reached its peak intensity of 105 kt at 1200 UTC 23 August and maintained that intensity for the rest of the day. Ileana commenced a slow weakening on 24 August as the tropical cyclone encountered cooler waters. This weakening was rather protracted over the next few days probably due to light vertical wind shear. The tropical cyclone gradually diminished in forward speed as middle-level ridging to the north slowly weakened and Ileana maintained a heading between west-northwest and northwest. Sea-surface temperatures finally decreased enough on 26 August to weaken Ileana into a tropical storm. Deep convection diminished markedly later that day as water temperatures dropped below 24°C and the tropical storm became a tropical depression early on 27 August about 550 n mi west of Cabo San Lucas, Mexico. Ileana degenerated into a large remnant low at 1800 UTC 27 August, and the low moved slowly westward for a couple of days before dissipating on 29 August.

b. Meteorological Statistics

Observations in Ileana (Figs. 2 and 3) include satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB), the U. S. Air Force Weather Agency (AFWA) and the Cooperative Institute for Meteorological Satellite Studies (CIMSS). Microwave satellite imagery from NOAA polar-orbiting satellites, the NASA Tropical Rainfall Measuring Mission (TRMM), the NASA QuikSCAT, and Defense Meteorological Satellite Program (DMSP) satellites were also useful in tracking Ileana. There was considerable spread between the objective and subjective satellite intensity estimates early on 23 August, with objective estimates as high as 122 kt. However, AMSU-based intensity estimates (not shown) supported the lower subjective estimates. Thus a blend of the AMSU and subjective estimates, with less weight given to the objective estimates, was used to derive the peak intensity of 105 kt.

There were two observing platforms that reported tropical-storm force winds in Ileana. A Mexican Navy surface site on Socorro Island (elevation 35 m) measured 15 minute sustained winds of 51 kt, gusting to 67 kt, with a pressure of 999.8 mb noted between 1500 and 1530 UTC on 23 August. On the next day, the Cosco Panama (call sign A8HR7) reported 41 kt winds and a pressure of 1007 mb at 1800 UTC about 140 n mi northeast of Ileana's center. Six hours later, the same ship reported 35 kt winds and a pressure of 1006 mb. However QuikSCAT data nearly coincident with the ship observation suggest that these winds were too high.

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 well prognosticated in the National Hurricane Center's Tropical Weather Outlooks. The Outlook issued at 1700 UTC 20 August was the first to mention the possibility that a depression could form. Genesis occurred a little less than 24 h later.

A verification of official and guidance model track forecasts is given in Table 2. Average official track errors for Ileana were 20, 36, 48, 57, 52, 56, and 121 n mi for the 12, 24, 36, 48, 72, 96 and 120 h forecasts, respectively. These errors are extremely low through 96 h compared to the average long-term official track errors (Table 2) and are among some of the lowest ever in the eastern North Pacific Ocean. The number of forecasts ranged from 23 n mi at 12 h to 5 n mi at 120 h. The official forecast beat most of the guidance models. Among the models, the UKMI performed extremely well while the GFSI struggled to even beat climatology (CLP5) at most time periods.

Average official intensity errors were 8, 12, 11, 11, 10, 13, and 6 kt for the 12, 24, 36, 48, 72, 96, and 120 h forecasts, respectively. For comparison, the average long-term official intensity errors are 6, 11, 14, 17, 19, 18 and 19 kt, respectively, given in Table 3. The initial rapid intensification of Ileana was not well-forecast by NHC and contributed to the somewhat larger than average errors up to 24 h. Models such as SHIPS and Florida State Superensemble (FSSE) better anticipated this intensification and led to lower errors than the official forecast. The FSSE in particular had very low errors for Ileana. The official forecast errors for 72 h and beyond were much lower than the long-term average.

Table 1. Best track for Hurricane Ileana, 21-27 August 2006.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
21 / 1200	12.0	101.8	1006	30	tropical depression
21 / 1800	12.5	102.8	1004	35	tropical storm
22 / 0000	13.1	103.9	1002	40	"
22 / 0600	13.8	105.0	997	50	"
22 / 1200	14.4	106.1	990	60	"
22 / 1800	15.1	107.3	984	70	hurricane
23 / 0000	16.2	108.6	976	80	"
23 / 0600	17.1	109.8	965	95	"
23 / 1200	17.8	111.0	955	105	"
23 / 1800	18.5	112.1	955	105	"
24 / 0000	19.2	113.1	955	105	"
24 / 0600	19.7	113.8	960	95	"
24 / 1200	20.2	114.6	968	90	"
24 / 1800	20.6	115.2	973	85	"
25 / 0000	20.9	115.7	975	80	"
25 / 0600	21.2	116.2	977	75	"
25 / 1200	21.5	116.7	980	70	"
25 / 1800	21.8	117.1	983	65	"
26 / 0000	22.1	117.6	987	55	tropical storm
26 / 0600	22.4	118.2	990	50	"
26 / 1200	22.6	118.7	992	50	"
26 / 1800	22.8	119.1	995	45	"
27 / 0000	23.1	119.5	998	40	"
27 / 0600	23.3	119.9	1002	35	"
27 / 1200	23.5	120.5	1003	30	tropical depression
27 / 1800	23.7	121.1	1004	30	remnant low
28 / 0000	23.8	121.6	1005	25	"
28 / 0600	23.9	122.0	1006	25	"
28 / 1200	24.0	122.3	1007	25	"
28 / 1800	23.9	122.6	1008	25	"
29 / 0000	23.8	122.8	1009	20	"
29 / 0600	23.7	123.0	1009	20	"
29 / 1200	-	-	-	-	dissipated
23 / 1200	17.8	111.0	955	105	minimum pressure

Table 2. Preliminary track forecast evaluation (heterogeneous sample) for Hurricane Ileana, 21-27 August 2006. Forecast errors (n mi) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type. Verification includes the depression stage.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
CLP5	28 (23)	59 (21)	92 (19)	124 (17)	181 (13)	204 (9)	222 (5)
GFNI	27 (17)	43 (15)	56 (13)	64 (11)	90 (7)	172 (3)	
GFDI	23 (23)	42 (21)	57 (19)	64 (17)	60 (13)	82 (9)	197 (5)
GFSI	36 (23)	72 (21)	114 (19)	155 (17)	217 (13)	248 (9)	137 (5)
AEMI	32 (22)	62 (20)	98 (18)	137 (17)	173 (13)	190 (9)	120 (5)
NGPI	34 (18)	51 (16)	61 (14)	77 (12)	105 (8)	151 (4)	
UKMI	22 (20)	32 (18)	35 (16)	43 (14)	37 (10)	120 (6)	108 (2)
BAMD	32 (23)	55 (21)	73 (19)	94 (17)	150 (13)	198 (9)	246 (5)
BAMM	31 (23)	53 (21)	75 (19)	100 (17)	158 (13)	203 (9)	239 (5)
BAMS	33 (23)	57 (21)	88 (19)	131 (17)	222 (13)	267 (9)	252 (5)
CONU	23 (23)	36 (21)	49 (19)	57 (17)	60 (13)	63 (9)	50 (5)
GUNA	23 (18)	33 (16)	40 (14)	49 (12)	68 (8)	118 (4)	
FSSE	21 (22)	36 (20)	45 (18)	50 (16)	54 (12)	90 (8)	158 (4)
OFCL	20 (23)	36 (21)	48 (19)	57 (17)	52 (13)	56 (9)	121 (5)
NHC Official (2001-2005 mean)	35 (1300)	60 (1152)	83 (1009)	103 (877)	145 (652)	192 (465)	231 (313)

Table 3. Preliminary intensity forecast evaluation (heterogeneous sample) for Hurricane Ileana, 21-27 August 2006. Forecast errors (kt) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type. Verification includes the depression stage.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
SHF5	9.2 (23)	15.2 (21)	17.9 (19)	17.4 (17)	15.2 (13)	15.6 (9)	19.0 (5)
GFDI	6.9 (23)	12.0 (21)	14.7 (19)	16.6 (17)	16.2 (13)	17.4 (9)	23.4 (5)
SHIP	7.0 (23)	10.2 (21)	11.8 (19)	12.7 (17)	12.0 (13)	16.1 (9)	17.8 (5)
DSHP	7.0 (23)	10.2 (21)	11.8 (19)	12.7 (17)	12.0 (13)	16.1 (9)	17.8 (5)
FSSE	6.2 (22)	9.0 (20)	8.8 (18)	8.2 (16)	4.9 (12)	4.3 (8)	7.8 (4)
ICON	6.5 (23)	10.0 (21)	11.3 (19)	12.4 (17)	8.5 (13)	8.3 (9)	7.8 (5)
OFCL	8.0 (23)	12.1 (21)	11.1 (19)	11.2 (17)	10.0 (13)	12.8 (9)	6.0 (5)
NHC Official (2001-2005 mean)	6.2 (1300)	10.8 (1152)	14.3 (1009)	16.5 (876)	18.7 (652)	18.3 (465)	19.3 (313)

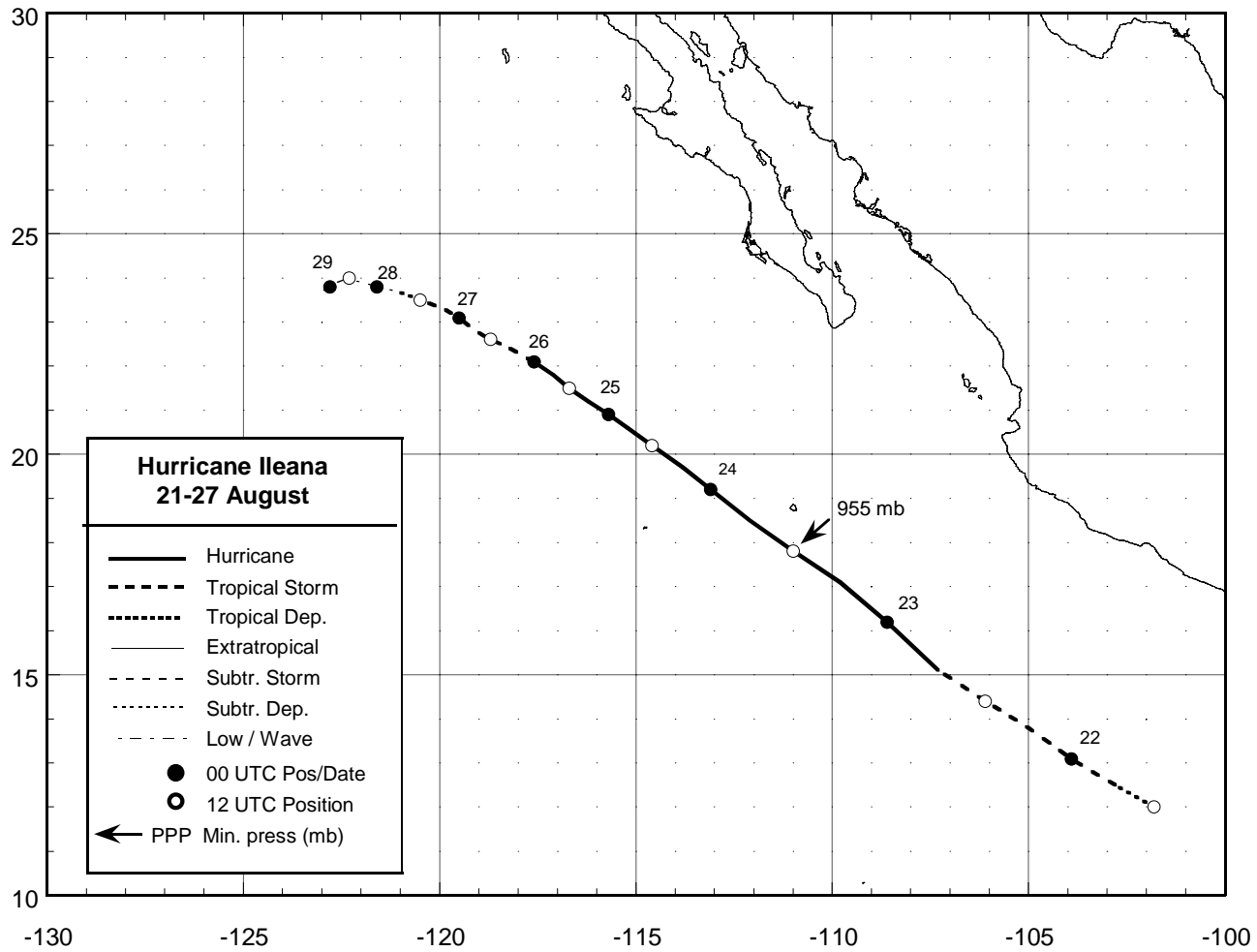


Figure 1. Best track positions for Hurricane Ileana, 21-27 August 2006.

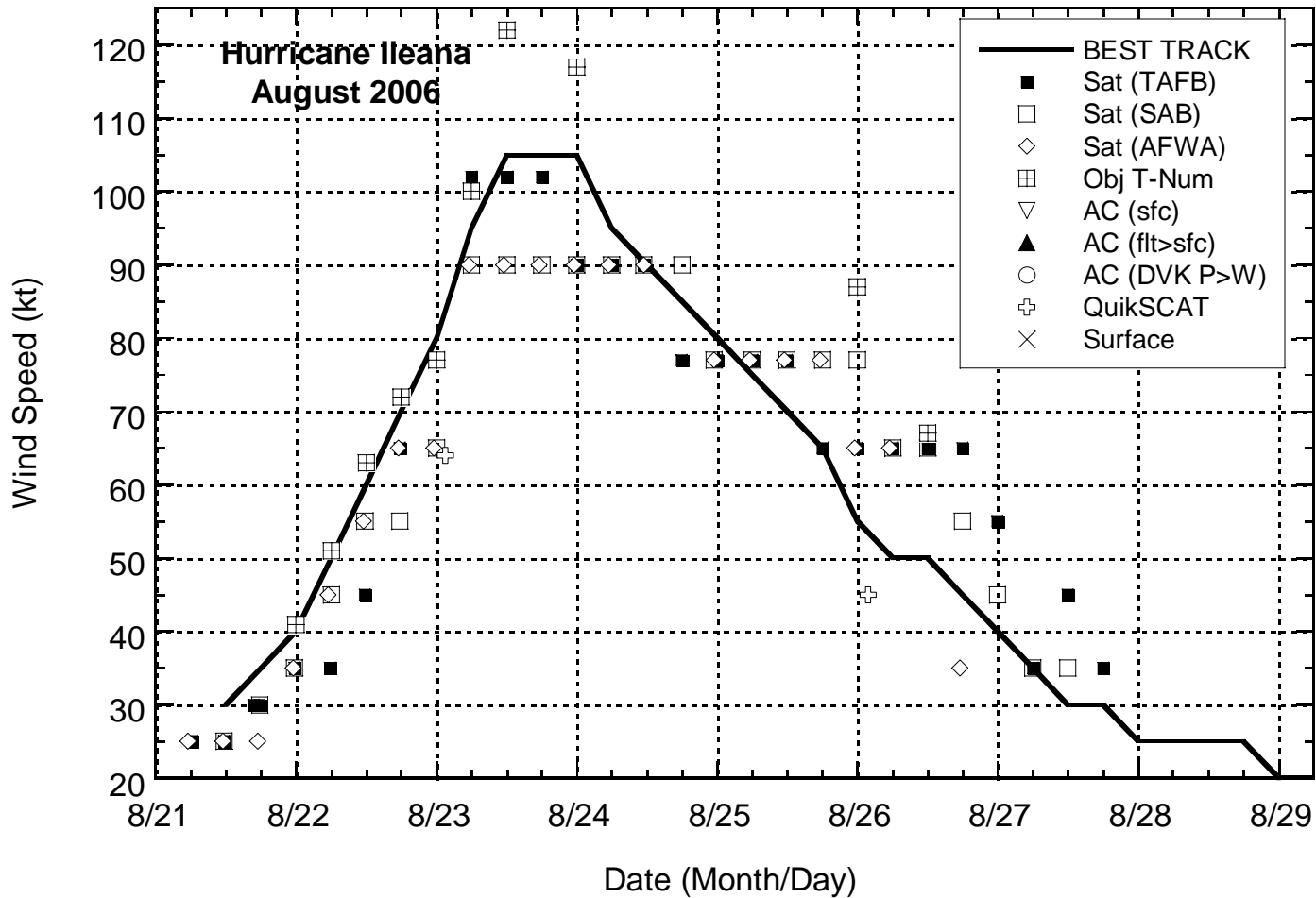


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Ileana, 21-27 August 2006. Objective T-numbers are the Current Intensity estimates from the CIMSS Advanced Dvorak Technique version 7.1.

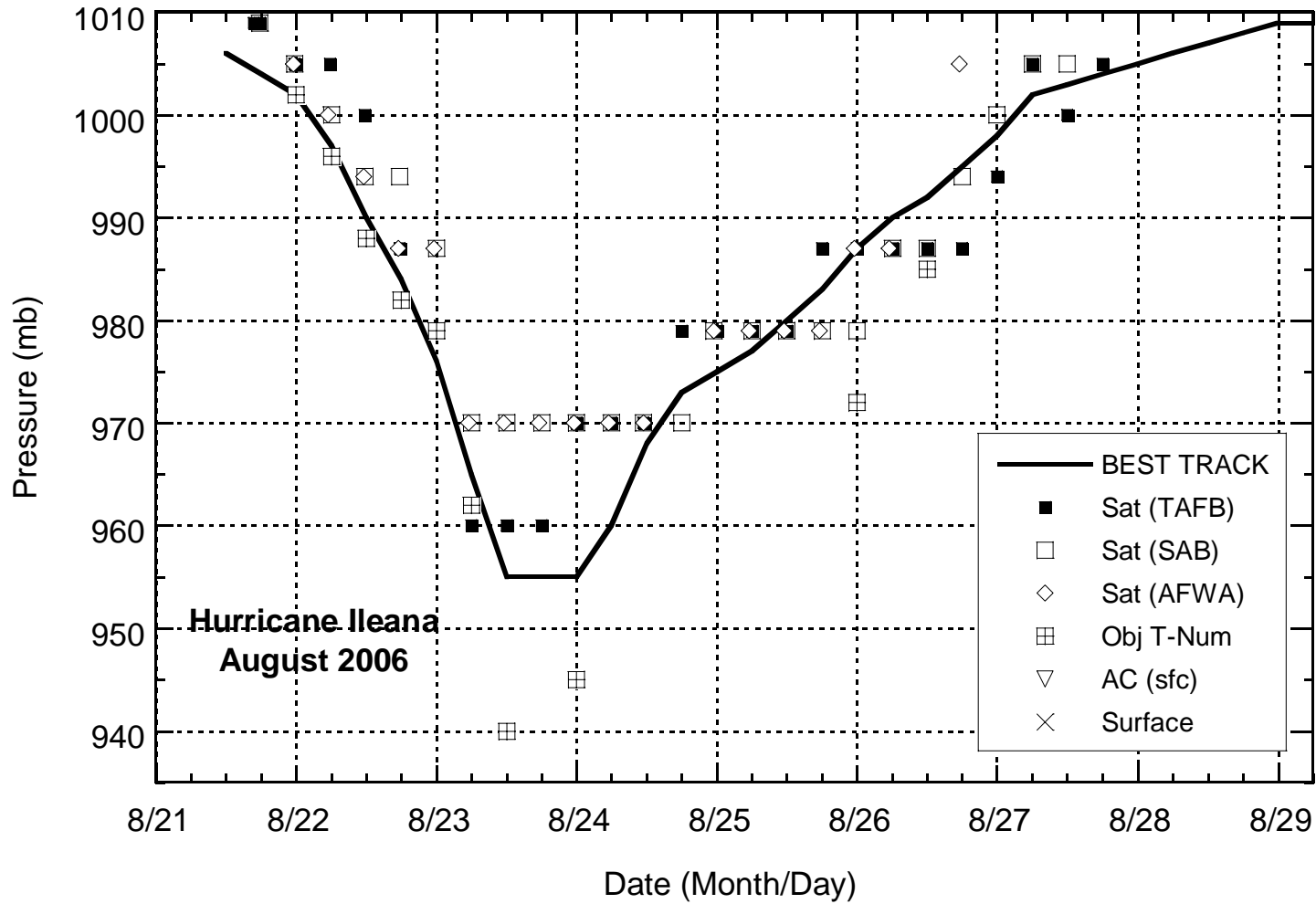


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Ileana, 21-27 August 2006. Objective T-numbers are the Current Intensity estimates from the CIMSS Advanced Dvorak Technique version 7.1.