

Tropical Cyclone Report  
Tropical Storm Hilda  
(EP112009)  
22-28 August 2009

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Hilda was a tropical storm that spent most of its existence in the central North Pacific basin, passing well to the south of Hawaii.

a. Synoptic History

Hilda appears to have been initiated by a tropical wave that crossed Central America on 13 August. This wave moved westward over the eastern North Pacific for several days with little or no indications of development. By 18 August, deep convection associated with the system began to show some signs of organization, and the wave spawned a westward-moving low-level circulation around 1200 UTC 21 August. Thunderstorm activity associated with this circulation was not sufficiently well organized, however, to designate the formation of a tropical depression until 1200 UTC 22 August when it was centered approximately 1100 n mi east-southeast of the Big Island of Hawaii. Although situated in an environment of northeasterly vertical shear, the cyclone was able to strengthen a little, and satellite imagery and scatterometer data indicate that it became a tropical storm some six hours after genesis. The “best track” chart of Hilda’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<sup>1</sup>.

Hilda was located to the south of the eastern edge of a subtropical ridge over the central North Pacific, and the associated steering current moved the storm on a westward heading at 8-9 kt. Strengthening was limited by persistent northeasterly shear, and Hilda crossed into the central North Pacific basin around 1200 UTC 23 August with an estimated intensity of 40 kt. The moderate shear continued over the cyclone, but Hilda was able to intensify slightly, reaching its peak intensity of 55 kt by 0600 UTC 24 August, when it was located about 740 n mi southeast of the Big Island of Hawaii. Lumbering generally westward to the south of a mid-level ridge for the next couple of days, Hilda encountered an environment that was less conducive for strengthening. The weakening trend was gradual at first but accelerated late on 25 August as Hilda’s convective structure deteriorated significantly. The cyclone eventually weakened to a

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

tropical depression by 0000 UTC 27 August while centered about 430 n mi south-southeast of the Big Island of Hawaii. The depression produced persistent but limited convection for a couple of more days as it continued westward, well to the south of Hawaii, and by 1800 UTC 28 August the cyclone degenerated to a remnant low. Steered by the low-level trade wind flow, the remnant circulation headed west-northwestward for the following three days and finally dissipated late on 31 August about 1100 n mi west-southwest of Honolulu.

b. Meteorological Statistics

Observations in Hilda (Figs. 2 and 3) include satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the Central Pacific Hurricane Center (PHFO), the Joint Typhoon Warning Center (JTWC), and the Satellite Analysis Branch (SAB). Data and imagery from NOAA polar-orbiting satellites, the NASA Tropical Rainfall Measuring Mission (TRMM), the NASA QuikSCAT, and Defense Meteorological Satellite Program (DMSP) satellites, among others, were also useful in constructing the best track of Hilda.

The cyclone's peak intensity of 55 kt on 24 August is based on a consensus of subjective Dvorak estimates. The weakening depicted in the best track during 25-26 August was diagnosed, despite higher Dvorak intensity estimates, on the basis of a QuikSCAT overpass at 1558 UTC 25 August that revealed Hilda had weakened to about 45 kt, and based on passive microwave imagery showing convective coverage had decreased. Additional QuikSCAT overpasses were useful in estimating Hilda's strength at other times, both before and after the time of peak intensity.

No ship reports of winds of tropical storm force associated with Hilda have been received.

c. Casualty and Damage Statistics

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

d. Forecast and Warning Critique

Hilda's genesis was fairly well predicted in the National Hurricane Center's (NHC's) Tropical Weather Outlooks (TWOs). The area of disturbed weather that eventually developed into Hilda was first mentioned in the TWO at 1800 UTC 20 August, a little less than two days prior to genesis. This system was initially assigned a low (less than 30 percent) chance of tropical cyclone formation over the ensuing 48 h. In the TWO issued 24 h before genesis, the formation probability was increased to medium (30 to 50 percent chance), and it was set to high (greater than 50 percent chance) in the TWO issued 18 h prior to genesis.

A verification of NHC official track forecasts for Hilda is given in Table 2. There were only five NHC forecasts made for this tropical cyclone. The average NHC official forecast track errors were comparable to the previous five-year means at the 12 through 48 h forecast periods and lower than the five-year mean errors at 72 through 120 h. It should be added that the mean climatology-persistence errors for Hilda were significantly lower than the corresponding five-year means for the 24 through 120 h forecast intervals, suggesting that Hilda's track was easier to predict than average.

A verification of NHC official intensity forecasts for Hilda is given in Table 3. At most forecast intervals, the mean NHC intensity forecast errors were lower than the mean official errors for the previous five-year period. The mean climatology-persistence intensity forecasts for this tropical cyclone were below the previous five-year means at most forecast intervals, which suggests that Hilda's intensity was somewhat easier to predict than average.

No watches or warnings were issued for Hilda.

Table 1. Best track for Tropical Storm Hilda, 22-28 August 2009.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
21 / 1200	13.5	133.0	1009	25	low
21 / 1800	13.5	133.8	1008	25	"
22 / 0000	13.6	134.6	1008	25	"
22 / 0600	13.6	135.5	1008	25	"
22 / 1200	13.5	136.4	1006	30	tropical depression
22 / 1800	13.5	137.3	1005	35	tropical storm
23 / 0000	13.5	138.1	1005	35	"
23 / 0600	13.6	138.9	1003	40	"
23 / 1200	13.8	140.0	1003	40	"
23 / 1800	13.9	141.2	1000	45	"
24 / 0000	14.0	142.5	998	50	"
24 / 0600	14.2	143.6	995	55	"
24 / 1200	14.5	144.6	995	55	"
24 / 1800	14.8	145.5	995	55	"
25 / 0000	14.9	146.4	997	50	"
25 / 0600	14.7	147.2	997	50	"
25 / 1200	14.4	147.9	997	50	"
25 / 1800	14.1	148.6	999	45	"
26 / 0000	13.8	149.1	1001	40	"
26 / 0600	13.5	149.6	1002	40	"
26 / 1200	13.3	150.2	1003	40	"
26 / 1800	13.2	150.8	1004	35	"
27 / 0000	13.3	151.4	1005	30	tropical depression
27 / 0600	13.6	152.2	1005	30	"
27 / 1200	13.7	153.1	1006	30	"
27 / 1800	13.7	154.2	1006	30	"
28 / 0000	13.7	155.3	1006	30	"
28 / 0600	13.8	156.5	1006	30	"
28 / 1200	13.9	157.8	1006	30	"
28 / 1800	14.0	159.2	1007	25	remnant low
29 / 0000	14.2	160.8	1007	25	"
29 / 0600	14.6	162.4	1007	25	"
29 / 1200	15.1	163.9	1007	25	"
29 / 1800	15.3	165.5	1007	25	"
30 / 0000	15.5	167.0	1007	25	"
30 / 0600	15.7	168.7	1007	25	"
30 / 1200	15.8	170.4	1007	25	"
30 / 1800	16.0	172.1	1007	25	"
31 / 0000	16.2	173.8	1007	25	"

31 / 0600	16.4	175.2	1008	20	"
31 / 1200	16.6	176.4	1008	20	"
31 / 1800	16.8	177.4	1008	20	"
1 / 0000					dissipated
24 / 0600	14.2	143.6	995	55	minimum pressure and maximum wind speed

Table 2. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Hilda, 22-28 August 2009. Mean errors for the five-year period 2004-8 are shown for comparison. Official errors that are smaller than the five-year means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	<b>27.5</b>	58.0	86.5	91.1	<b>99.9</b>	<b>106.2</b>	<b>123.6</b>
OCD5	30.6	53.2	76.8	76.6	120.2	201.0	238.9
Forecasts	5	5	5	5	5	5	5
OFCL (2004-8)	31.0	51.7	71.7	90.2	123.6	161.3	201.8
OCD5 (2004-8)	38.4	73.6	111.9	149.1	214.2	261.1	311.5

Table 3. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Hilda, 22-28 August 2009. Mean errors for the five-year period 2004-8 are shown for comparison. Official errors that are smaller than the five-year means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	<b>6.0</b>	<b>10.0</b>	14.0	<b>8.0</b>	<b>6.0</b>	<b>17.0</b>	26.0
OCD5	2.6	6.0	7.4	6.6	11.8	21.2	25.0
Forecasts	5	5	5	5	5	5	5
OFCL (2004-8)	6.2	10.2	13.3	15.1	17.7	19.0	18.8
OCD5 (2004-8)	7.1	11.5	14.7	16.8	18.9	20.3	20.2

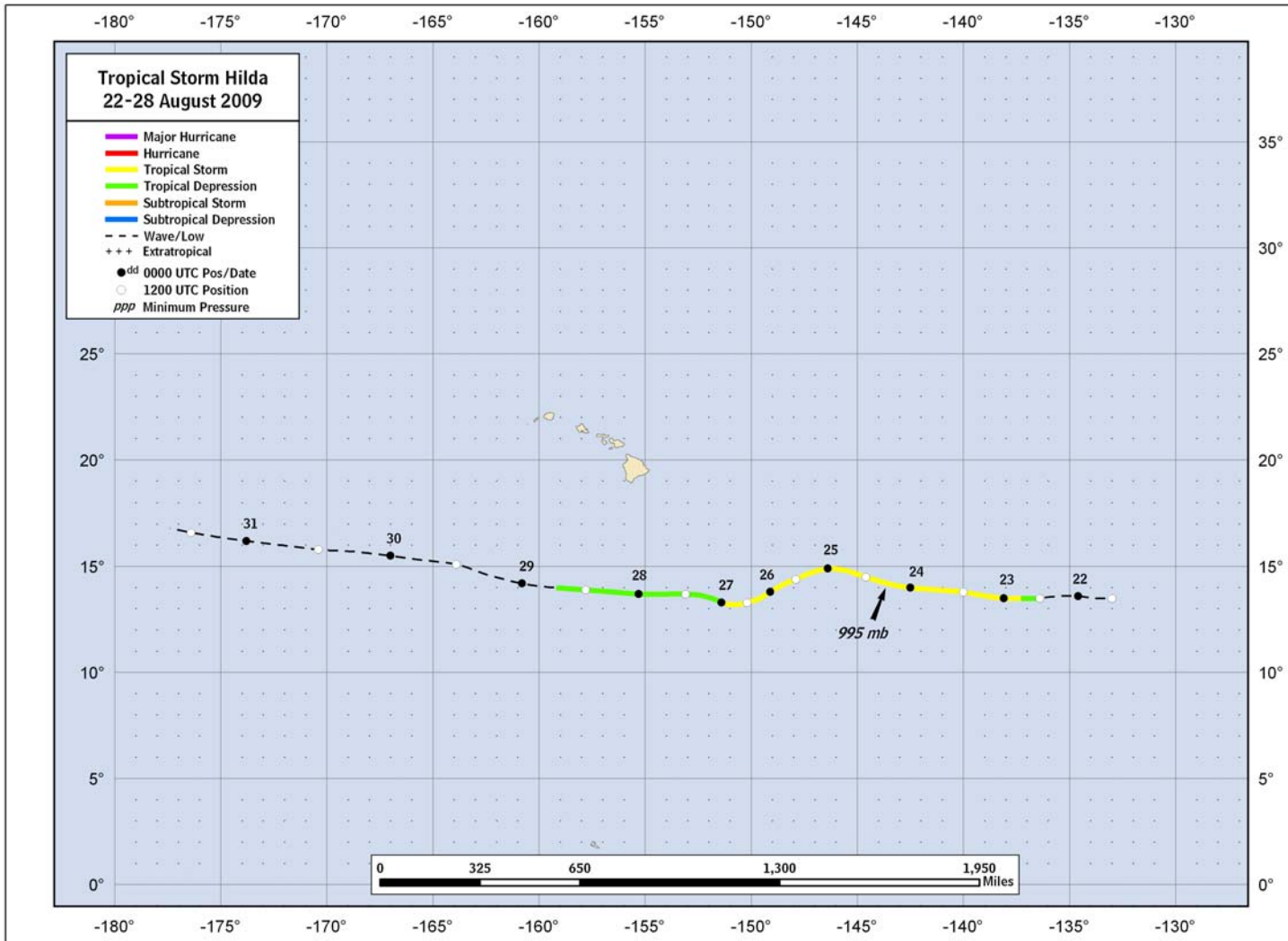


Figure 1. Best track positions for Tropical Storm Hilda, 22-28 August 2009.

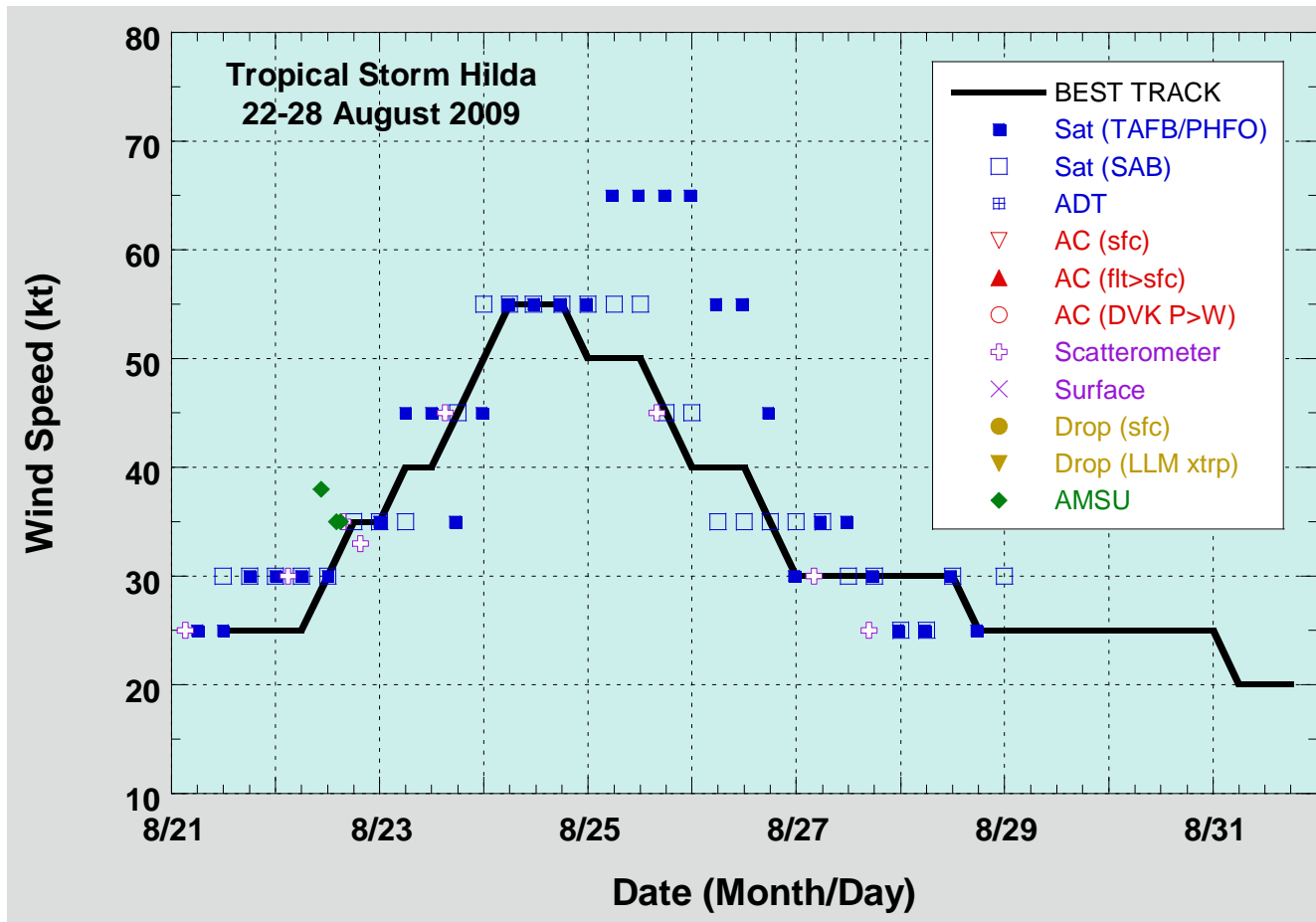


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Hilda, 22-28 August 2009. Dashed vertical lines correspond to 0000 UTC.

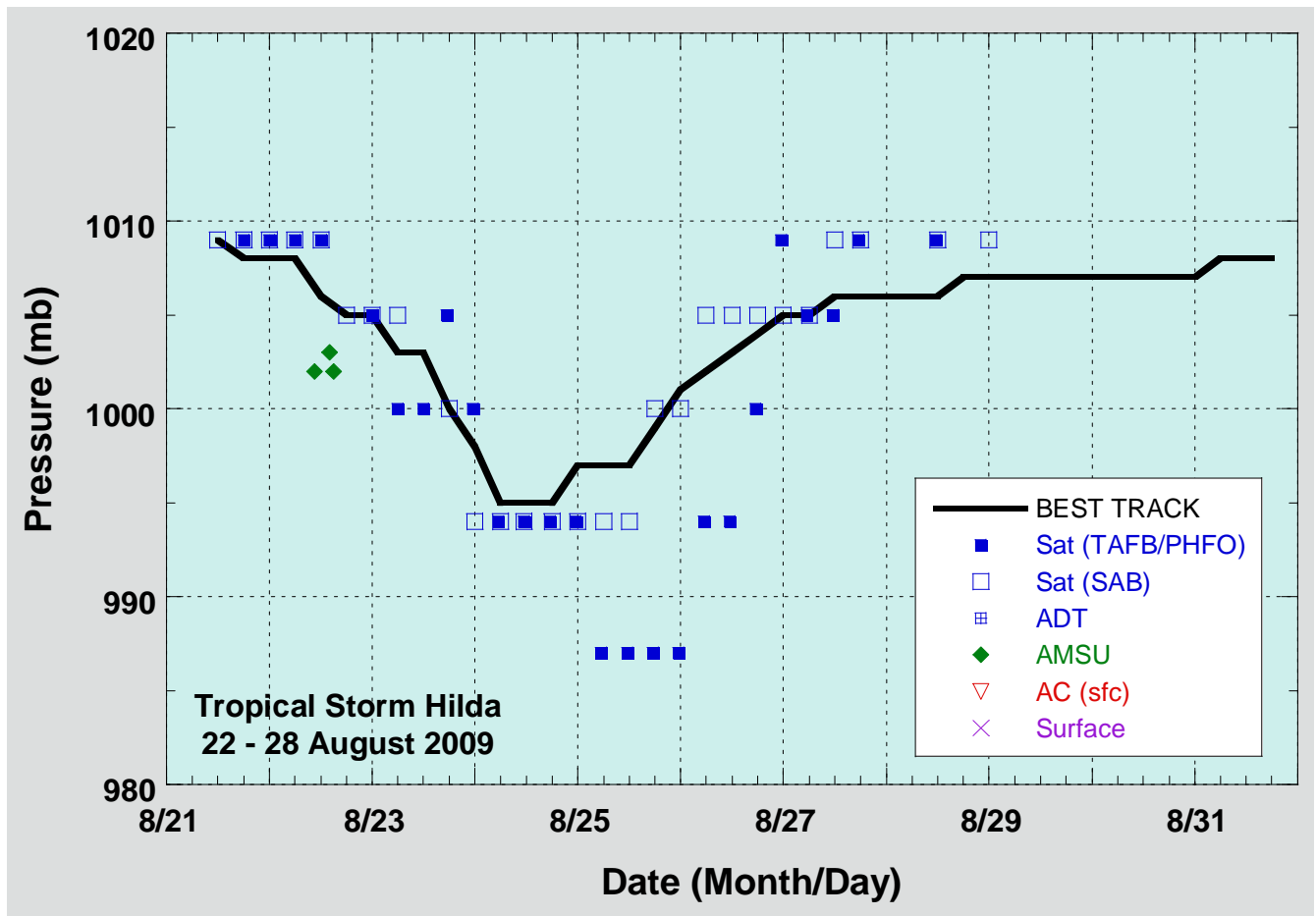


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Hilda, 22-28 August 2009. Dashed vertical lines correspond to 0000 UTC.