

Tropical Cyclone Report
Tropical Storm Estelle
19-24 August 2004

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a. Synoptic History

A tropical wave moved westward for a couple of weeks from Africa across the Atlantic, the Caribbean Sea and entered the eastern North Pacific with little convective activity. It was not until 18 August that the shower activity associated with the wave began to increase between 120°W and 130°W, as the wave interacted with a slow moving disturbance probably associated with the Intertropical Convergence zone (ITCZ). The cloud pattern became organized and a few convective curved bands developed rather quickly. It is estimated that a tropical depression formed at 0600 UTC 19 August about 1250 n mi east-southeast of Hilo Hawaii. However, after the formation, there was no significant change in organization for the next 12 to 18 hours and in fact, some Dvorak estimates suggested weakening. Thereafter, convection redeveloped and T-numbers as well as data from a QuikSCAT pass indicated that the system had reached tropical storm status at 0600 UTC 20 August. Estelle moved toward the west-northwest around the periphery of the subtropical ridge and gradually strengthened. It then crossed 140°W into the area of responsibility of the Central Pacific Hurricane basin where Estelle reached its estimated maximum intensity of 60 knots and a minimum pressure of 989 mb at 1200 UTC 21 August. Thereafter, the cyclone began to move toward the west and west-southwest, and weakened due to strong shear. It became a remnant low devoid of thunderstorm activity at 1800 UTC 24 August and dissipated by 0000 UTC 26 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.

b. Meteorological Statistics

Observations in Estelle (Figs. 2 and 3) include satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB) and the U. S. Air Force Weather Agency (AFWA). 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 Estelle.

c. Casualty and Damage Statistics

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

d. Forecast and Warning Critique

The average official track errors (with the number of cases in parentheses) for Estelle were 36 (8), 60 (8), 83 (8), 131(8), 220(8), 229(6) and 329(2), n mi for the 12, 24, 36, 48, 72, 96, 120 h forecasts, respectively. These numbers are similar to the average official track errors for the 12, 24 and 36 h periods. However, they are larger than the average official track errors for the other forecast times. For comparison, the average official track errors for the 10-yr period 1994-2003 are 38, 70, 100, 127, 180, 210 and 247 n mi for the 12, 24, 36, 48, 72, 96, and 120 h periods, respectively.

Average official intensity errors were 4, 11, 13, 14, 21 24 and 30 kt for the 12, 24, 36, 48, 72, 96, and 120 h forecasts, respectively. The average official intensity errors over the 10-yr 1994-2003 period are 6, 11, 15, 17, 20, 18 and 19 kt, respectively.

Table 1. Best track for Tropical Storm Estelle, 19-24 August 2004.

Latitude (°N)	Longitude (°W)	Date/Time (UTC)	Pressure (mb)	Wind Speed (kt)	Stage
19 / 0600	11.6	131.8	1008	30	tropical depression
19 / 1200	11.6	132.7	1008	30	"
19 / 1800	12.0	134.0	1008	30	"
20 / 0000	12.9	135.0	1007	30	"
20 / 0600	13.6	136.3	1006	35	tropical storm
20 / 1200	13.9	137.3	1005	35	"
20 / 1800	14.0	138.3	1000	45	"
21 / 0000	14.3	139.3	994	55	"
21 / 0600	14.6	140.1	992	55	"
21 / 1200	15.0	140.8	989	60	"
21 / 1800	15.4	141.2	990	60	"
22 / 0000	15.8	141.6	995	55	"
22 / 0600	16.0	142.1	996	50	"
22 / 1200	16.1	142.4	998	35	"
22 / 1800	16.2	142.8	998	35	"
23 / 0000	16.4	143.4	998	30	tropical depression
23 / 0600	16.4	144.2	1002	30	"
23 / 1200	16.3	145.1	1006	30	"
23 / 1800	16.2	145.9	1008	30	"
24 / 0000	16.0	147.0	1010	25	"
24 / 0600	15.7	148.2	1012	25	"
24 / 1200	15.3	149.2	1012	25	"
24 / 1800	15.0	150.5	1012	20	remnant low
25 / 0000	14.5	151.5	1012	20	"
25 / 0600	14.3	152.5	1012	20	"
25 / 1200	14.2	153.2	1012	20	"
25 / 1800	14.0	154.0	1012	20	"
26 / 0000					dissipated
21 / 1200	15.0	140.8	989	60	minimum pressure

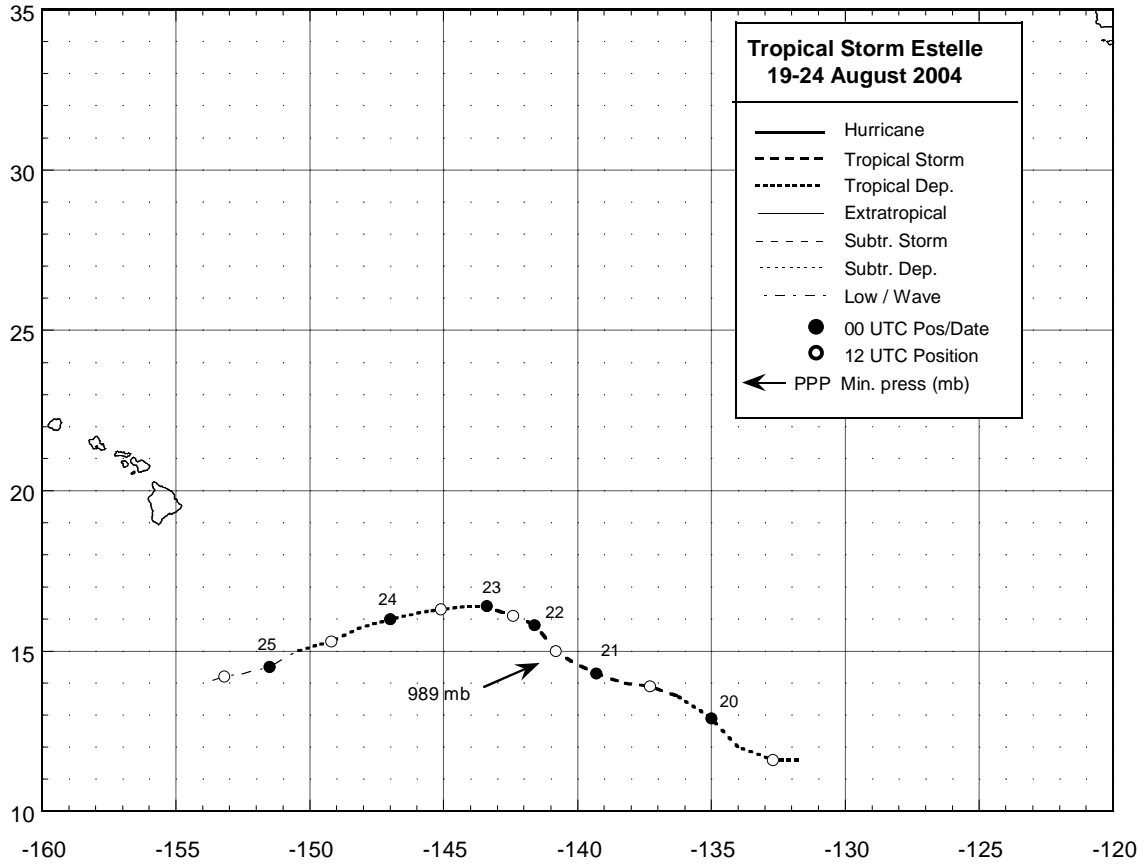


Figure 1. Best track positions for Tropical Storm Estelle, 19-24 August 2004. Best track information west of 140°W was provided by the Central Pacific Hurricane Center.

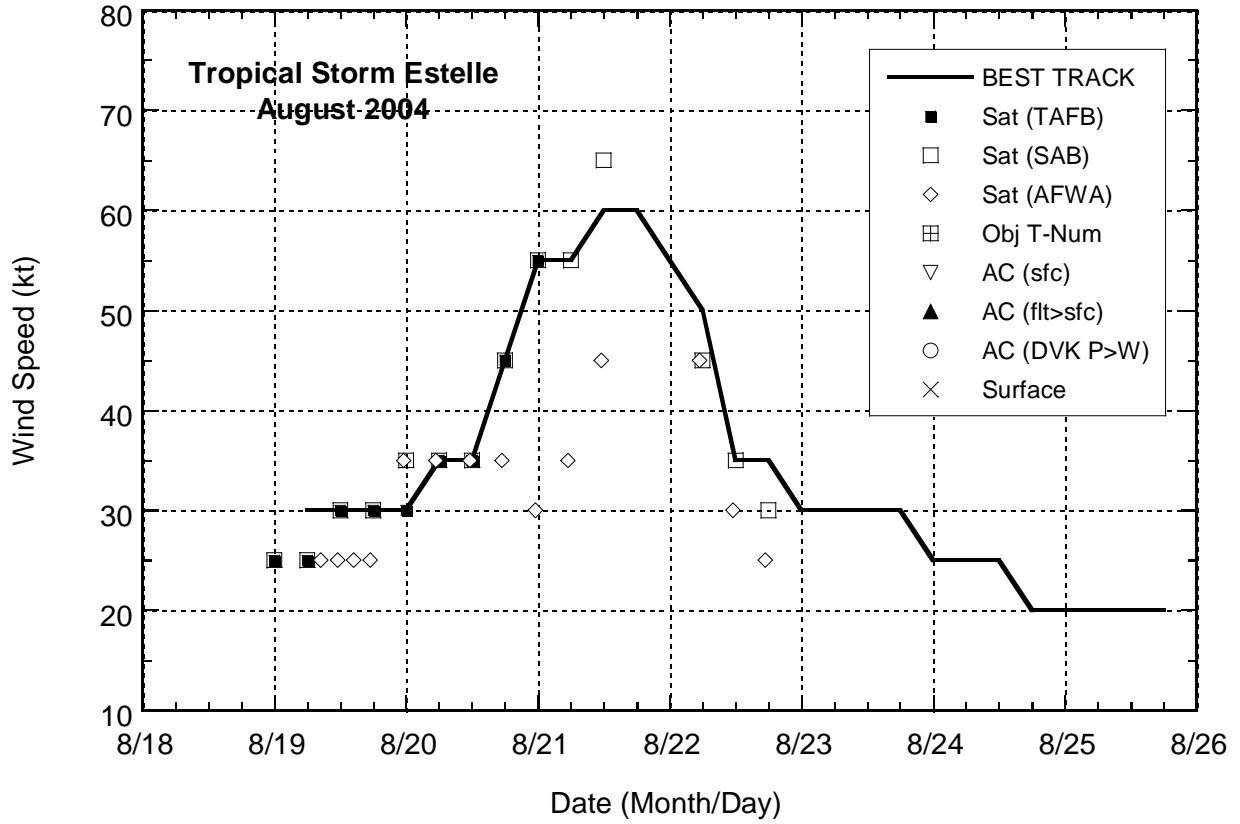


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Estelle, 19-24 August 2004. Best track information after 0000 UTC 21 August was provided by the Central Pacific Hurricane Center.

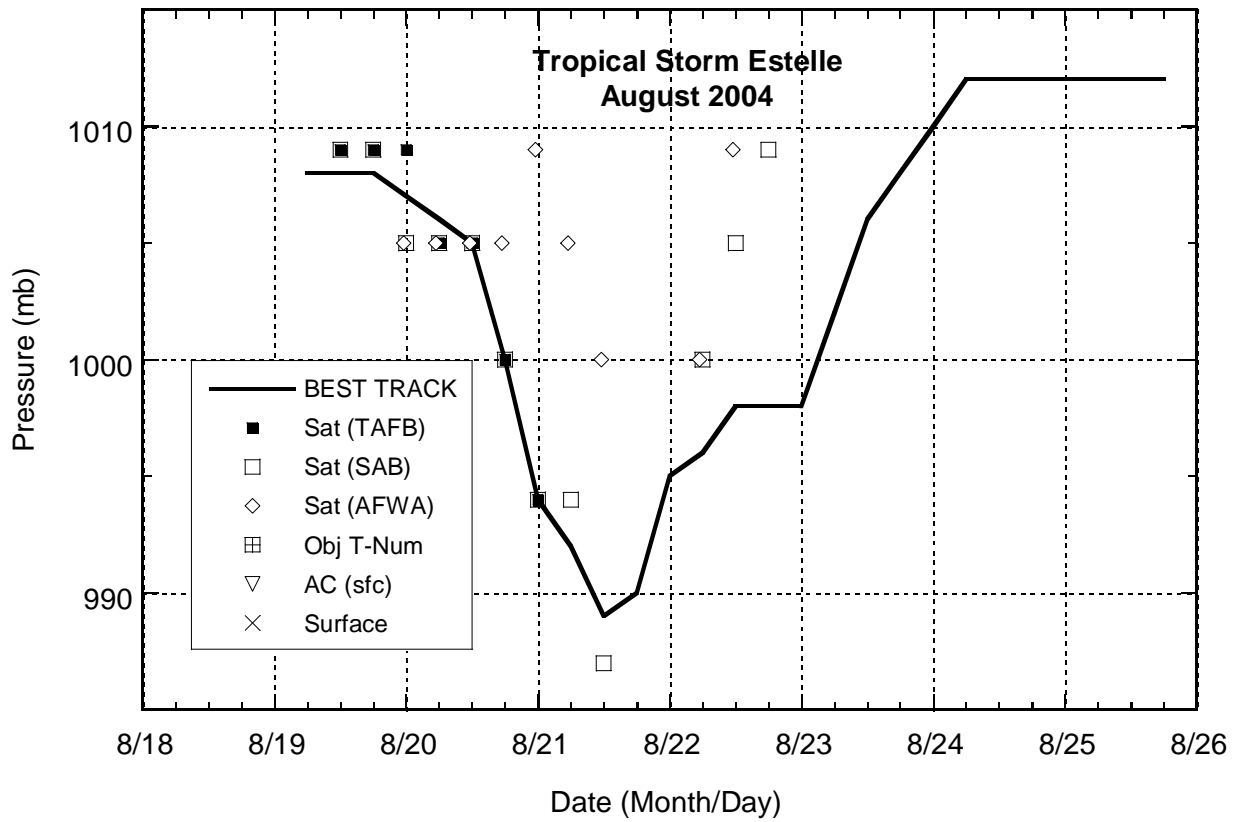


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Estelle, 19-24 August 2004. Best track information 0000 UTC 21 August was provided by the Central Pacific Hurricane Center.