

Tropical Cyclone Report  
Tropical Storm Hermine  
27-31 August 2004

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Tropical Storm Hermine affected southeast Massachusetts as a weakening tropical cyclone.

a. Synoptic History

Hermine developed from a nearly stationary frontal zone over the subtropical Atlantic, the same frontal system that spawned Hurricane Gaston. On 25 August, satellite imagery showed that cloudiness and showers began to increase along the frontal zone south of Bermuda. The activity became detached from the front and began to show signs of cyclonic rotation at the middle levels on 26 August. On the next day, visible satellite images suggested that a weak surface circulation had developed and is estimated that a tropical depression formed at 1800 UTC 27 August about 200 n mi south of Bermuda. The intensity of the convection fluctuated during the following couple of days as the depression moved toward the west-northwest, but the overall organization increased. The system reach tropical storm status at 1200 UTC 29 August and reached its peak intensity of 50 knots and a minimum pressure of 1002 mb at 0600 UTC 30 August. Hermine moved northward and began to gradually weaken under strong northerly shear caused by the outflow of Tropical Storm Gaston located over the eastern United States. The low-level center became detached from the thunderstorm activity, and Hermine reached the southern coast of Massachusetts near New Bedford as a 35-knot tropical storm at 0600 UTC 31 August. Thereafter, it continued northward and weakened rapidly while becoming extratropical. It became absorbed by a frontal zone by 1800 UTC 31 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 Hermine (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 Hermine. Based on post-analysis of satellite images it is estimated that Hermine’s genesis occurred two days earlier than analyzed operationally. The peak intensity, which occurred at 0600 UTC on the 30 August, was based on a later QuikSCAT pass at 0947 UTC showing 45 to 50 knots to the southeast of the center.

Hermine developed within a high pressure environment. Therefore, pressures in the best track are a higher than the usual pressures obtained from applying the Dvorak technique pressure-wind relationship.

Hermine brought a few bands of heavy rains and wind gusts to tropical storm force over eastern Massachusetts, but no tropical storm force sustained winds were measured in the area. Rainfall over Cape Cod and the adjacent islands was mostly less than 0.5 inches. However, rainbands from Tropical Storm Gaston began to spread over the area shortly after Hermine moved off Cape Cod. This made it difficult to separate the rainfall amounts between these two cyclones.

c. Casualty and Damage Statistics

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

d. Forecast and Warning Critique

Hermine was a short-lived tropical cyclone and there were just a few official forecasts to verify. Nevertheless, the average official track errors (with the number of cases in parentheses) for Hermine were 32(5), 110(3), and 158 (1) n mi for the 12, 24, 36 h forecasts, respectively. With the exception of the 12 h forecast, these errors are larger than the average official track errors for the 10-yr period 1994-2003 of 44, 78, and 112 n mi, respectively.

Average official intensity errors were 3, 5 and 10 kt for the 12, 24, and 36 h forecasts, respectively. For comparison, the average official intensity errors over the 10-yr period 1994-2003 are 6, 10, and 12 kt, respectively.

A tropical storm warning was issued for southeastern Massachusetts from Wood Hole to Plymouth, including Martha's Vineyard and Nantucket, at 1700 UTC 30 August. The warning was discontinued at 0900 UTC 31 August.

Table 1. Best track for Hermine, 27-31 August, 2004.

Date/Time (UTC)	Latitude (EN)	Longitude (EW)	Pressure (mb)	Wind Speed (kt)	Stage
27 / 1800	29.0	65.2	1016	25	tropical depression
28 / 0000	29.0	65.7	1016	25	"
28 / 0600	29.1	66.2	1016	25	"
28 / 1200	29.2	66.6	1015	30	"
28 / 1800	29.7	67.2	1015	30	tropical depression
29 / 0000	30.1	68.4	1014	30	"
29 / 0600	30.5	69.2	1014	30	"
29 / 1200	31.1	69.8	1012	35	tropical storm
29 / 1800	31.8	70.5	1005	40	"
30 / 0000	32.6	71.1	1005	40	"
30 / 0600	33.8	71.5	1002	50	"
30 / 1200	35.8	71.5	1007	45	"
30 / 1800	37.6	71.4	1008	45	"
31 / 0000	39.9	71.3	1011	35	"
31 / 0600	41.5	70.9	1012	35	"
31 / 1200	43.1	70.5	1014	25	extratropical
31 / 1800					Absorbed by a cold front
31 / 0600	41.5	70.9	1011	35	Landfall near New Bedford Mass.
30 / 0600	33.8	71.5	1002	50	minimum pressure

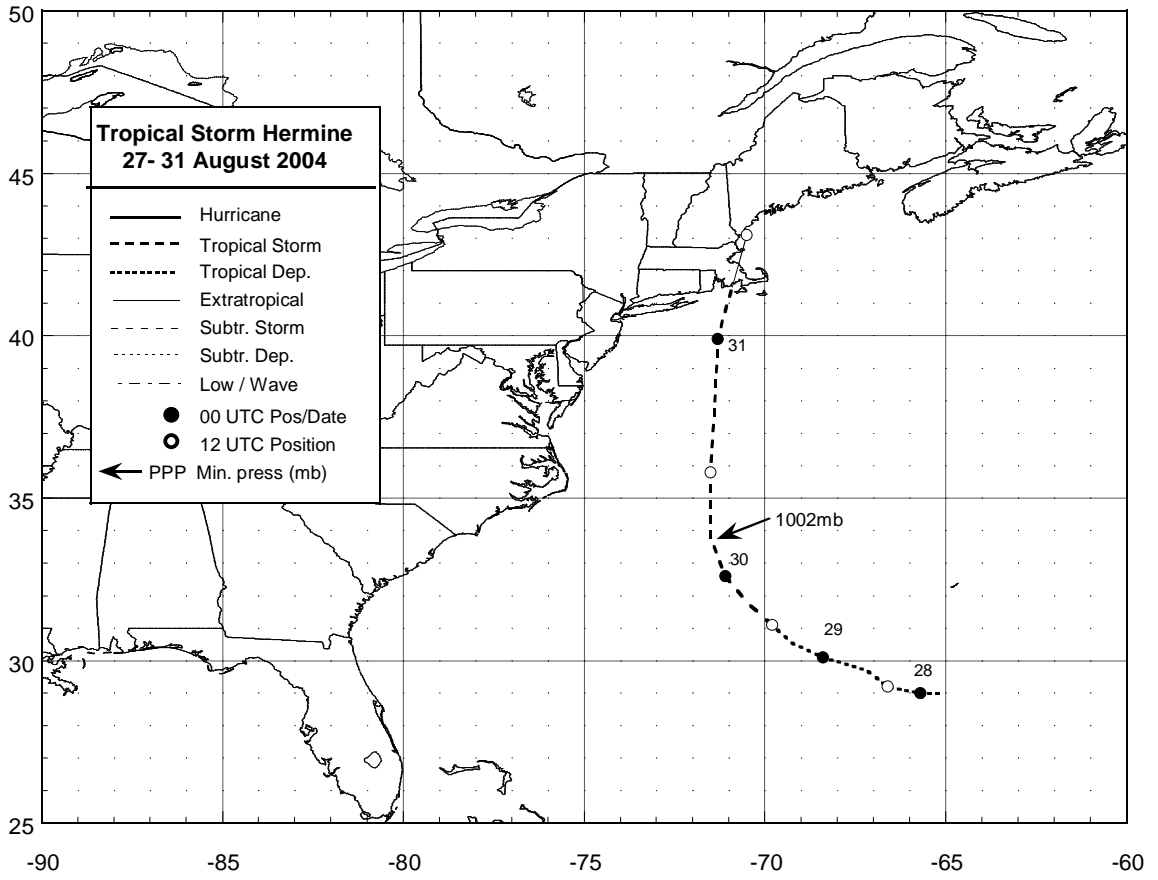


Figure 1. Best track positions for Hermine, 27-31 August, 2004.

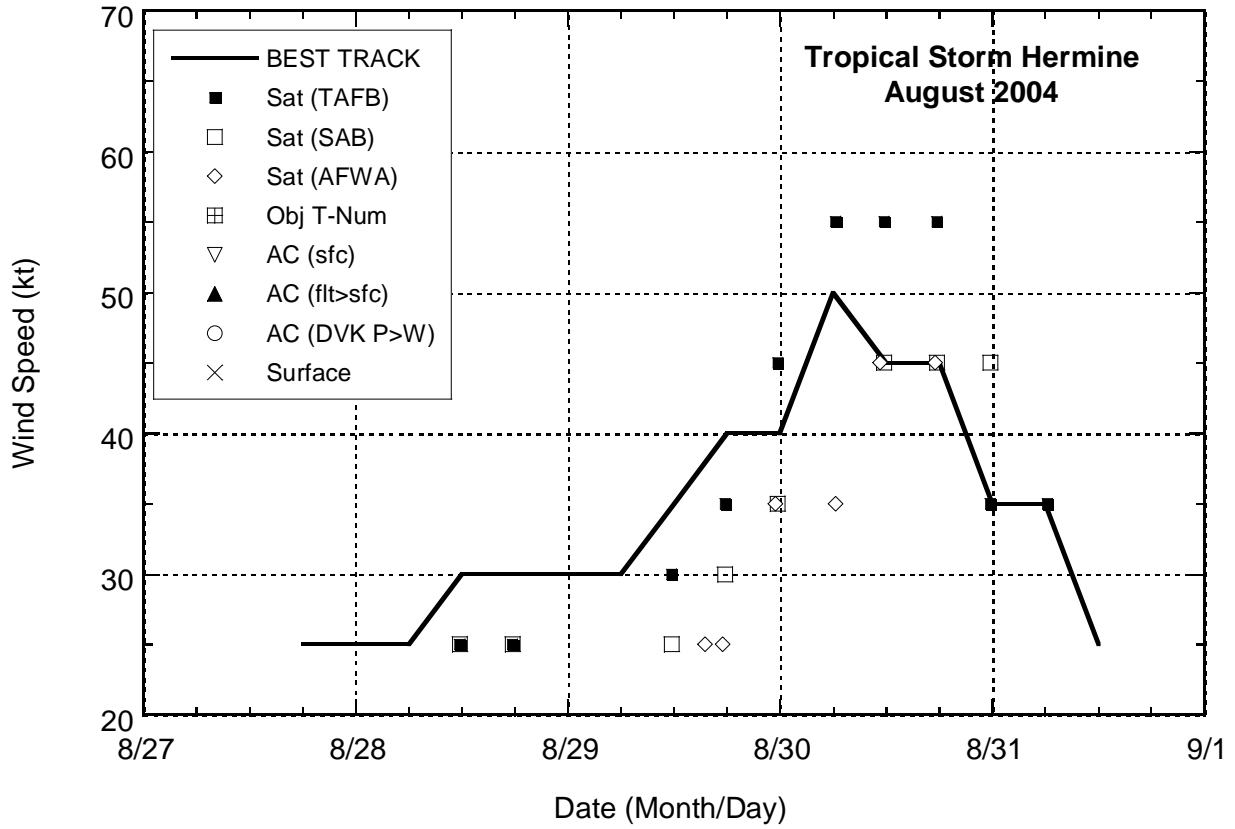


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hermine, 27-31 August, 2004.

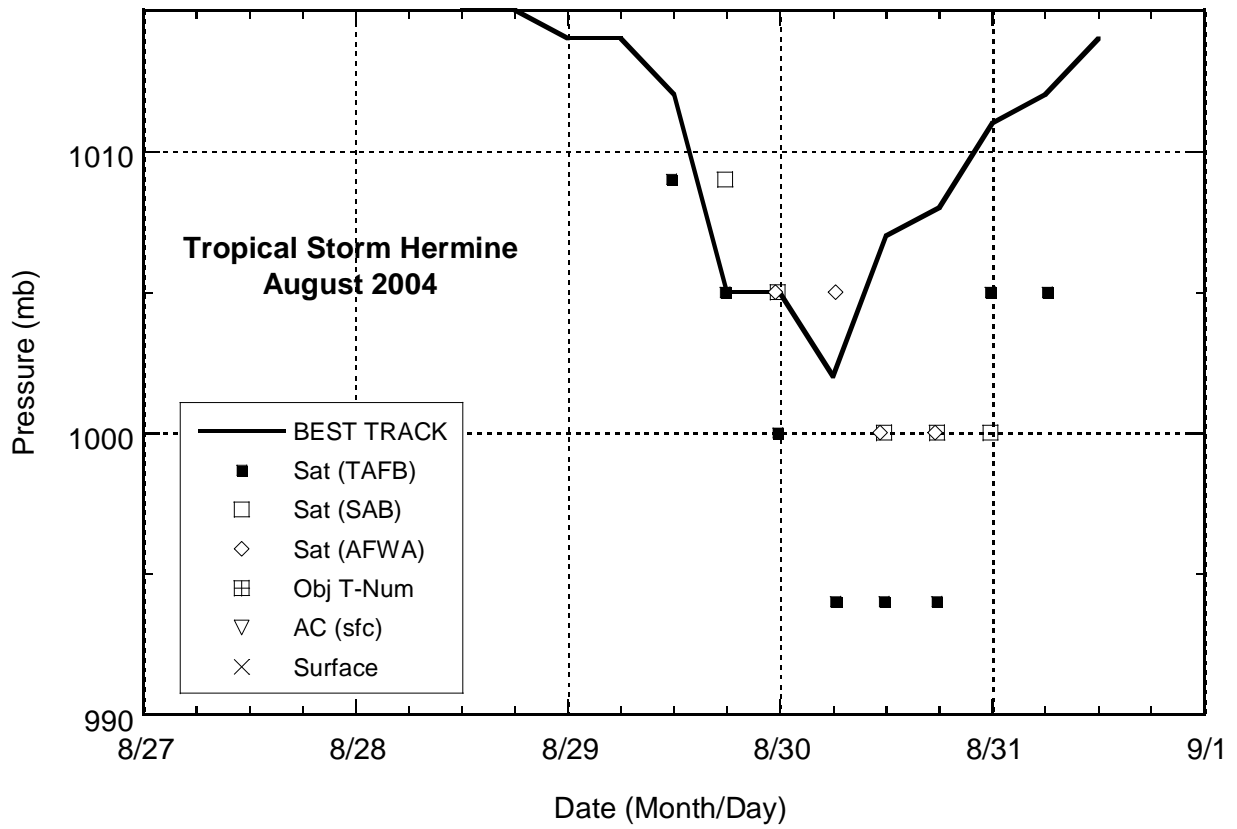


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hermine, 27-31 August, 2004.