

Preliminary Report  
Tropical Storm Grace  
16-17 October 1997

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a. Synoptic History

Tropical Storm Grace developed from one of several lows that developed along a frontal trough extending east-northeastward from the western Caribbean Sea to the central North Atlantic Ocean. Surface observations indicate that the extratropical low that became Grace was initially centered just north of Hispaniola, and that it reached gale strength near 0000 UTC on 15 October. One day later, a large area of deep convection developed over or just northeast of the low-level circulation center. This is the basis for indicating in the post-storm "best track" (Table 1, Fig. 1) that the system transformed into a tropical cyclone at 0000 UTC on the 16th. The system did not shed all of its extratropical characteristics, however. Most notably, the circulation remained elongated along the frontal trough and a band of deep convection appeared to link Grace to another low-pressure center with gale-force winds that was located about 500 nautical miles to the east-northeast.

Grace developed in an environment of southwesterly vertical wind shear generally to the south of a large extratropical cyclone south of Newfoundland. The associated steering currents accelerated Grace to about 25 knots on an east-northeast to northeast heading. The limited available ship reports and intensity estimates based on satellite pictures suggest that Grace was at its strongest, with 40 knot winds, at the time that it became a tropical cyclone. The storm appeared to slowly weaken thereafter and, on the morning of the 17th, deep convection dissipated. This revealed a weak and diffuse low-level circulation that, over the course of about a day, became indistinguishable from the frontal trough in which it was embedded.

b. Meteorological Statistics

The best track was obtained from the data presented in Figs. 2 and 3. Those figures show Grace's estimated central pressure and maximum one-minute wind speed, respectively, versus time. Position and intensity estimates were obtained from analyses of satellite pictures by NOAA's Synoptic Analysis Branch (SAB) and Tropical Analysis and Forecast Branch (TAFB), and by the Air Force Global Weather Center (AFGWC). The analyses also included surface observations.

There were no observations of tropical storm force winds associated with the tropical cyclone phase of Grace.

c. Casualty and Damage Statistics

Grace did not directly affect land and no reports of casualties or damages were received.

d. Forecast and Warning Critique

Grace was a tropical storm for about 30 hours. This is too short a period to provide a meaningful quantitative evaluation of forecast accuracy.

Hurricane and tropical storm watches and warnings were neither issued nor necessary.

Table 1. Preliminary best track, Tropical Storm Grace,  
16-17 October 1997.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
14/1200	20.0	68.7	1002	30	Extratropical Low
1800	20.3	69.8	1001	30	" "
15/0000	20.3	69.6	999	35	Extratropical Gale
0600	20.3	68.9	999	35	" "
1200	20.6	68.0	999	40	" "
1800	20.8	66.5	999	40	" "
16/0000	21.2	64.4	999	40	Tropical Storm
0600	21.6	61.6	1000	35	" "
1200	22.4	58.8	1000	35	" "
1800	23.6	56.2	1001	35	" "
17/0000	24.0	53.6	1002	35	" "
0600	24.3	50.5	1003	35	" "
1200	24.5	47.3	1004	30	Extratropical Low
16/0000	21.2	64.4	999	40	Minimum Pressure

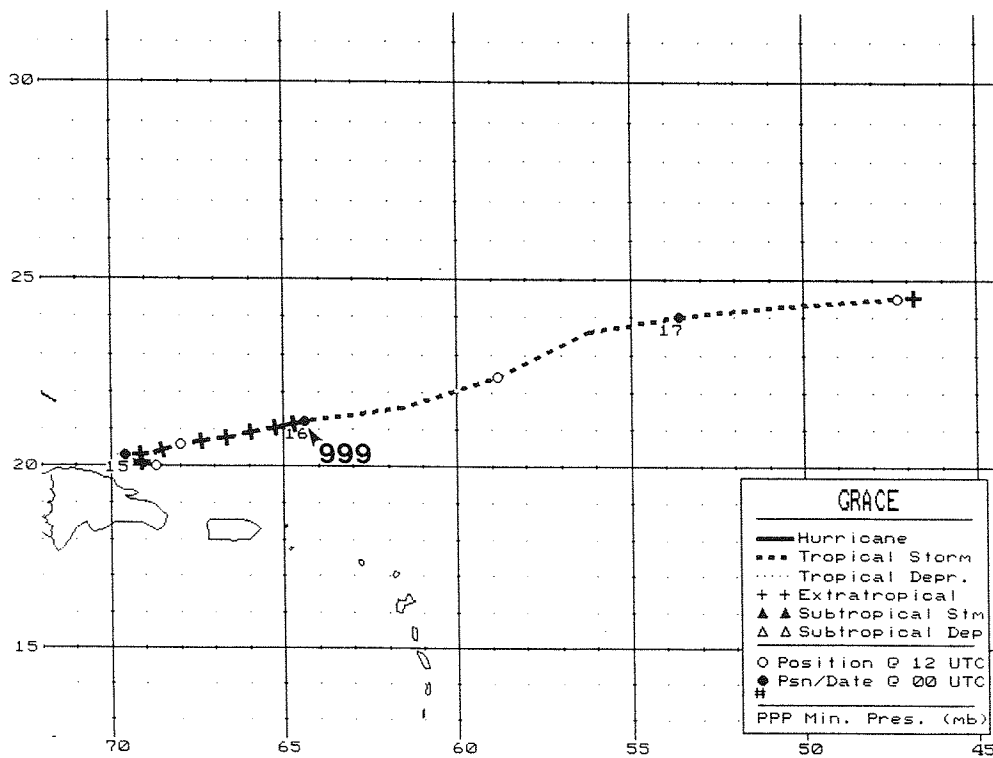


Figure 1. Best track positions for Tropical Storm Grace.

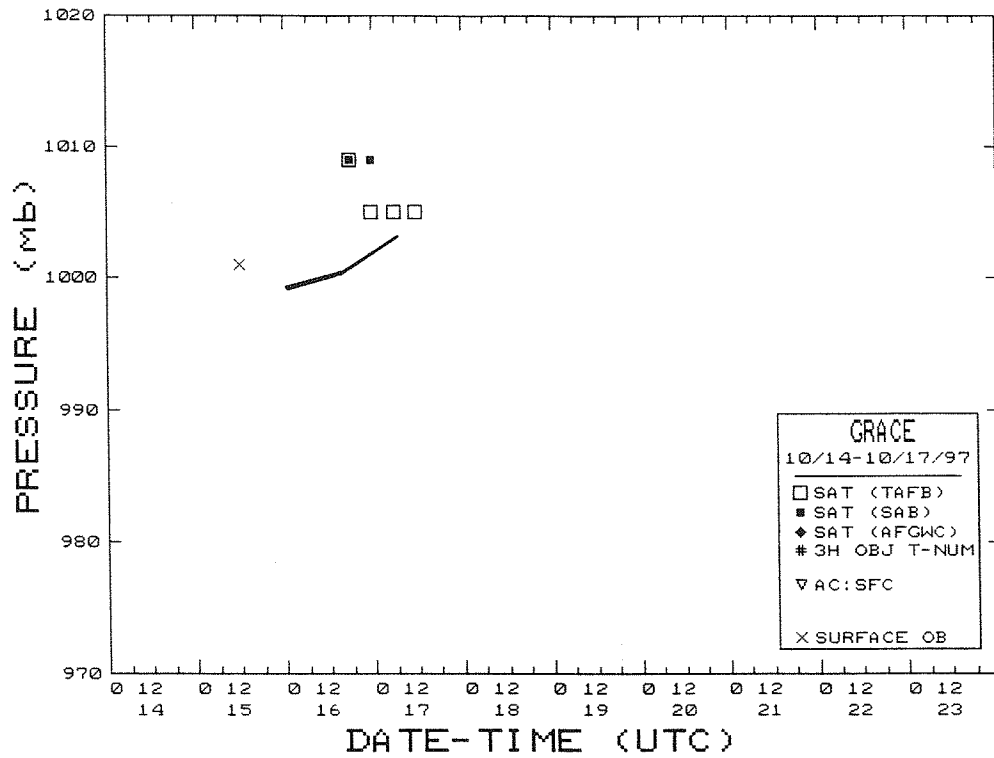


Figure 2. Best track central pressure curve for Tropical Storm Grace, October 1997.

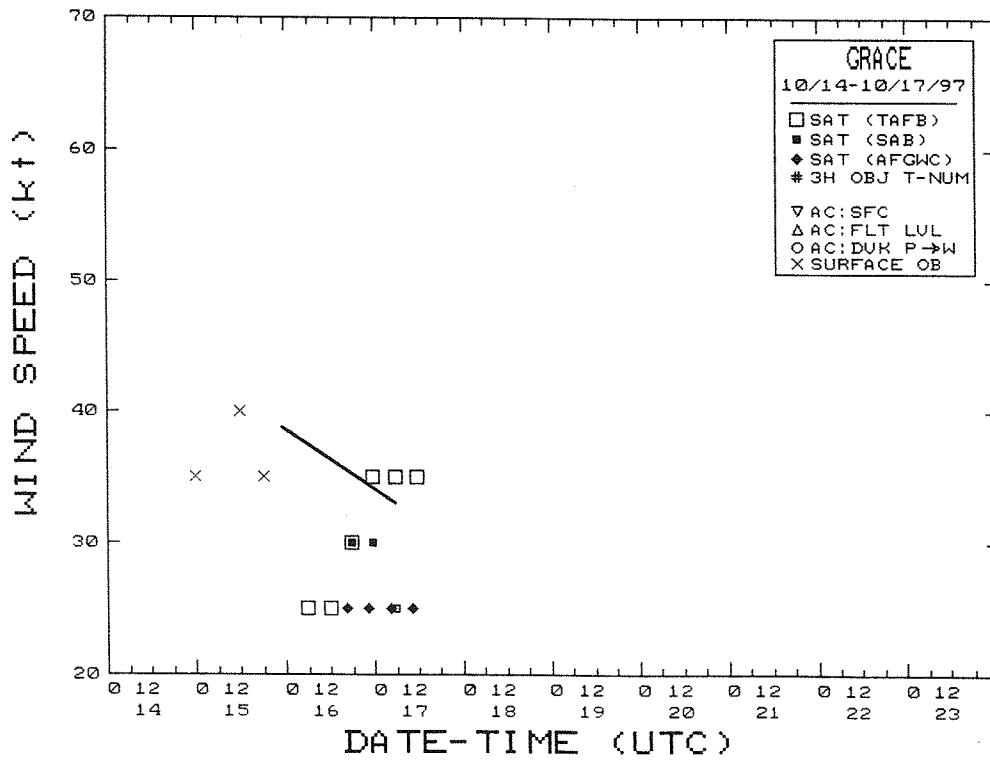


Figure 3. Best track maximum one-minute wind speed curve for Tropical Storm Grace, October 1997.