

Tropical Cyclone Report
Hurricane Frank
23-26 August 2004

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Hurricane Frank remained over the open waters of the northeastern Pacific Ocean.

a. Synoptic History

Frank developed from the remnants of Atlantic Tropical Storm Earl, which had degenerated into a tropical wave over the eastern Caribbean Sea. This wave crossed Central America on 18 August and, on 22 August, became well-enough organized for Dvorak classifications to be initiated. By 0600 UTC 23 August, the symmetry and quantity of deep convection was sufficient to designate the system as a tropical depression about 360 nm south of Cabo San Lucas, Mexico. The “best track” begins at this time and is listed in Table 1 and a chart of the tropical cyclone’s path is given in Fig. 1. Banding features became more pronounced and inner core convection increased and it is estimated that the tropical cyclone strengthened into Tropical Storm Frank six hours later. Frank intensified rapidly during the day and strengthened into a hurricane around 1800 UTC as an eye feature became apparent in visible and microwave imagery. Frank reached hurricane strength while located about 300 n mi south-southwest of the southern tip of Baja California. It is notable that Frank increased from a tropical depression to a hurricane in only twelve hours.

From 23-25 August, Frank moved northwestward at a forward speed of 9-12 kt, on the southwestern side of a mid-level anticyclone centered over the southwestern United States and northwestern Mexico. The storm reached its estimated peak intensity of 75 kt around 0600 UTC 24 August, at which time it exhibited a ragged eye with a 20 n mi diameter. Thereafter, deep convection decreased and Frank gradually weakened over cooler sea-surface temperatures. The system turned back toward the west-northwest on 25 August and weakened to a tropical depression by 0000 UTC 26 August. Frank degenerated to a remnant low several hours later and drifted toward the southwest for another day before degenerating to an open trough, on 27 August, at a location about 650 n mi west-southwest of the southern tip of Baja California.

b. Meteorological Statistics

The best track positions and intensities for Frank are listed in Table 1, and the wind and pressure histories are shown in Figs. 2 and 3, respectively. Observations in 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). The best track wind speed of 65 kt at 1800 UTC 23 August is based on the appearance of a well-defined circular eye feature observed on microwave satellite imagery.

c. Casualty and Damage Statistics

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

d. Forecast and Warning Critique

Warnings were not issued.

Average official track errors (with the number of cases in parentheses) for Frank were 32 (10), 54 (8), 63 (6), and 65 (4) for the 12, 24, 36, and 48 h forecasts, respectively. These errors are considerably lower than the average official track errors for the 10-yr period 1994-2003 of 38, 70, 100, and 127 n mi, respectively. Frank did not last long enough to verify any forecasts for periods longer than 48 h.

Average official intensity errors were 8, 18, 22, and 21 kt for the 12, 24, 36, and 48 h forecasts, respectively. For comparison, the average official intensity errors over the 10-yr period 1994-2003 are 6, 11, 15, and 17 kt, respectively.

Table 1. Best track for Hurricane Frank, 23-26 August 2004.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
23 / 0600	16.7	110.2	1005	30	tropical depression
23 / 1200	17.3	111.2	1004	45	tropical storm
23 / 1800	18.0	112.2	990	65	hurricane
24 / 0000	18.8	113.0	987	65	"
24 / 0600	19.5	113.7	979	75	"
24 / 1200	20.2	114.3	979	75	"
24 / 1800	20.8	115.0	983	70	"
25 / 0000	21.3	115.6	987	65	"
25 / 0600	21.6	116.2	997	50	tropical storm
25 / 1200	21.8	116.9	1000	45	"
25 / 1800	22.0	117.6	1002	40	"
26 / 0000	22.1	118.3	1006	30	tropical depression
26 / 0600	22.3	119.0	1007	25	remnant low
26 / 1200	22.6	119.6	1007	25	"
26 / 1800	22.5	120.0	1007	25	"
27 / 0000	22.3	120.5	1007	25	"
27 / 0600	22.0	121.0	1007	25	"
27 / 1200	21.5	121.5	1007	25	"
27 / 1800	Dissipated				
24 / 0600	19.5	113.7	979	75	minimum pressure

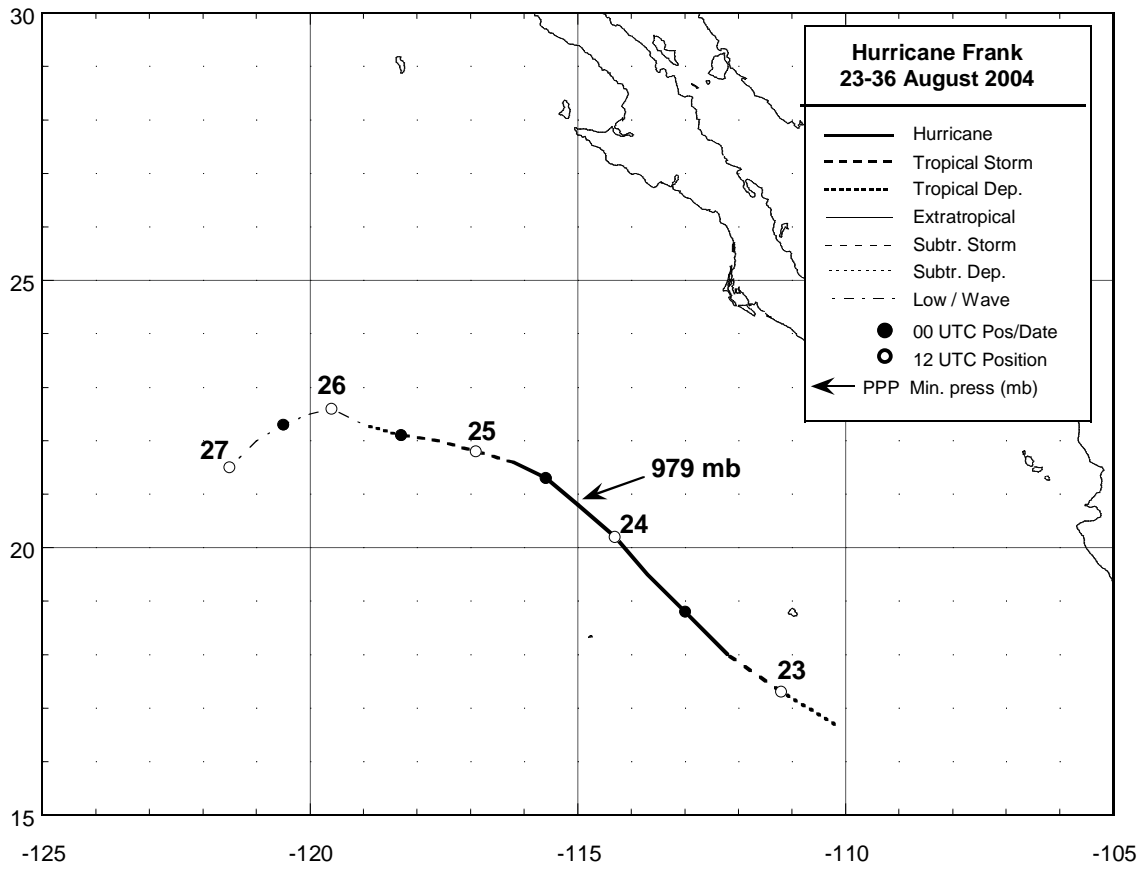


Figure 1. Best track positions for Hurricane Frank, 23-26 August 2004.

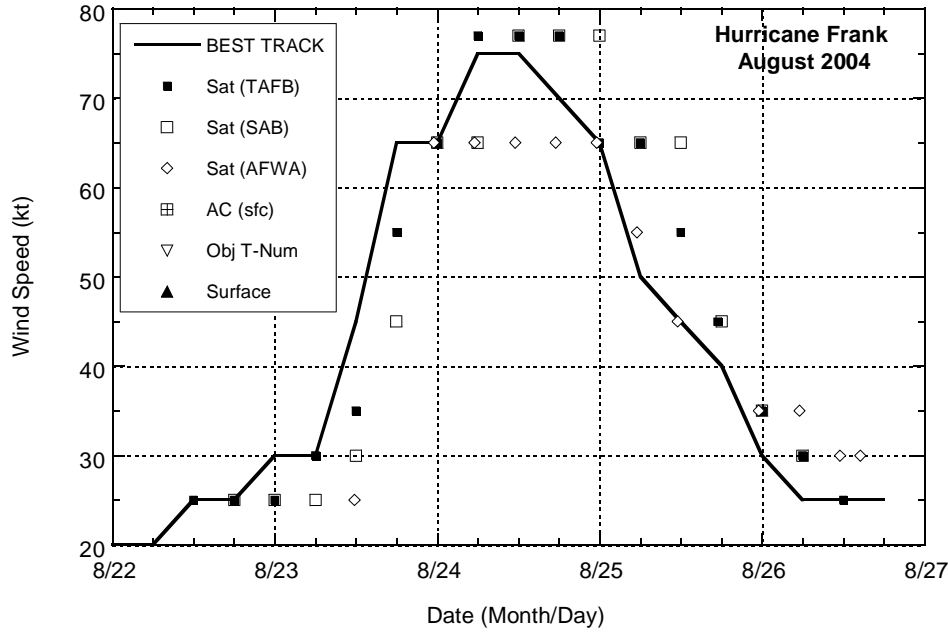


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Frank, 23-26 August 2004.

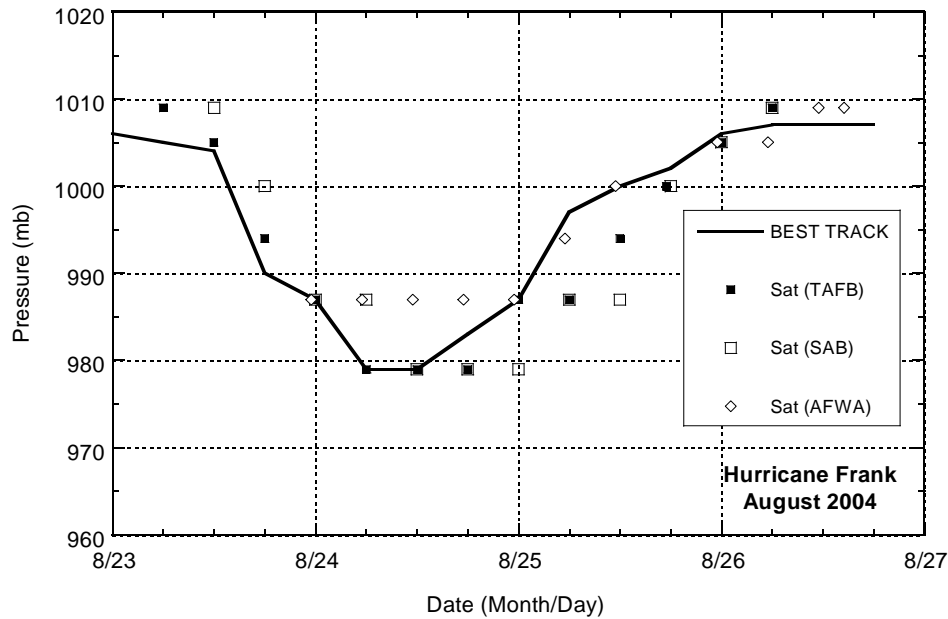


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Frank, 23-26 August 2004.