

Tropical Cyclone Report  
Tropical Storm Fabio  
(EP072006)  
31 Jul-3 Aug 2006

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Tropical storm Fabio was a short-lived tropical cyclone that remained over the open waters of the eastern North Pacific Ocean.

a. Synoptic History

Fabio formed from a tropical wave that emerged from the coast of Africa on 15 July and then moved westward across the Atlantic Ocean and Caribbean Sea, producing limited showers and thunderstorms. The tropical wave produced a temporary burst of deep convection as it crossed Central America on 25 July, but this activity weakened on 26-27 July as the wave entered the eastern North Pacific. Convection re-developed on 28 July, at which time a weak area of low pressure formed approximately 450 n mi southwest of Manzanillo, Mexico. Showers and thunderstorms associated with the area of low pressure slowly organized over the next three days as it moved northwestward, and by 1800 UTC 31 July, the system acquired sufficient deep convection to be designated as a tropical depression while centered 850 n mi southwest of the southern tip of Baja California. The cyclone became the sixth tropical storm of the season 6 hours later and reached its peak intensity of 45 kt at 1200 UTC 1 August. As Fabio moved due westward under the influence of a mid-tropospheric ridge to the north, the cyclone was affected by increasing easterly vertical shear and a more stable air mass. These environmental factors ultimately resulted in the cyclone weakening back to a depression at 0000 UTC 3 August about 1400 miles east of Hilo Hawaii. Fabio degenerated into a remnant low at 0000 UTC 4 August, continued westward, and became an open trough by 0000 UTC 6 August. The “best track” chart of Fabio 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 Fabio (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 AQUA, the NASA QuikSCAT, and Defense Meteorological Satellite Program (DMSP) satellites were also useful in tracking Fabio. There were no ship reports of winds of tropical storm force during Fabio. The estimated peak intensity of 45 kt and minimum pressure of 1000 mb are based on Dvorak satellite intensity estimates.

c. Casualty and Damage Statistics

While Fabio did not directly affect land, the moisture associated with the remnant trough moved across the Hawaiian Islands on 6-7 August and interacted with an upper-level low, generating heavy showers and thunderstorms over the islands. The most significant rains occurred on Kauai where the Mount Waialeale rain gauge recorded 15.08 inches in the 24 h period ending at 1800 UTC 7 August. Heavy rains contributed to flooding on Hanalei River which forced the closure of Kuhio Highway at the Hanalei Bridge on 7 August. No other serious problems were reported over the Hawaiian Islands and no deaths have been attributed to Fabio.

d. Forecast and Warning Critique

The potential for TC formation was first conveyed in the Tropical Weather Outlook (TWO) beginning at 1700 UTC 28 July, approximately 80 hours prior to formation of a tropical depression. Approximately 32 h before development, the TWO stated that “a tropical depression could form during the next day or so.”

A verification of official and guidance model track forecasts is given in Table 2. Average official track errors for Fabio were 23, 41, 64, and 93 n mi for the 12, 24, 36, and 48 h forecasts, respectively. Since Fabio was short-lived as a TC, the number of forecasts ranged from 11 at 12 h to 5 at 48 h. There were no forecasts verified for 96 and 120 h, and only one verified forecast for 72 h. The official errors were lower than the average long-term official track errors (Table 2).

Average official intensity errors were 6.2, 10.8, 14.3, and 16.5 kt for the 12, 24, 36, and 48 h forecasts, respectively. These errors are comparable to the average long-term official intensity errors of 6, 11, 14, and 17 kt for the 12, 24, 36, and 48 h forecasts respectively.

Table 1. Best track for Tropical Storm Fabio 31 July-3 August, 2006

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
31 / 1800	14.1	121.4	1009	30	tropical depression
01 / 0000	14.3	122.6	1005	35	tropical storm
01 / 0600	14.6	123.8	1005	35	"
01 / 1200	14.8	125.2	1000	45	"
01 / 1800	14.7	126.6	1000	45	"
02 / 0000	14.8	127.8	1000	45	"
02 / 0600	14.8	129.2	1000	45	"
02 / 1200	14.8	130.5	1000	40	"
02 / 1800	15.0	132.0	1004	35	"
03 / 0000	15.2	133.5	1006	30	tropical depression
03 / 0600	15.2	135.0	1008	30	"
03 / 1200	15.1	136.5	1009	30	"
03 / 1800	15.0	138.2	1009	30	"
04 / 0000	15.0	139.6	1010	30	remnant low
04 / 0600	14.9	141.2	1011	25	"
04 / 1200	14.9	142.7	1012	25	"
04 / 1800	14.8	144.1	1012	25	"
05 / 0000	14.6	145.7	1013	25	"
05 / 0600	14.4	147.3	1013	25	"
05 / 1200	14.4	149.0	1014	25	"
05 / 1800	14.7	150.7	1015	25	"
06 / 0000					dissipated
01 / 1200	14.8	125.2	1000	45	minimum pressure

Table 2. Preliminary track forecast evaluation (heterogeneous sample) for Tropical Storm Fabio 31 July-3 August, 2006. Forecast errors (n mi) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type. Verification includes the depression stage.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
CLP5	36 ( 8)	70 ( 6)	115 ( 4)	147 ( 2)			
GFNI	42 ( 6)	104 ( 4)	185 ( 2)				
GFDI	<b>22</b> ( 8)	<b>38</b> ( 6)	<b>58</b> ( 4)	102 ( 2)			
GFDL*	31 ( 8)	<b>39</b> ( 6)	<b>51</b> ( 4)	<b>84</b> ( 2)			
GFDN*	40 ( 7)	76 ( 5)	160 ( 3)	284 ( 1)			
GFSI	28 ( 6)	<b>42</b> ( 4)	<b>33</b> ( 4)	<b>13</b> ( 2)			
GFSO*	51 ( 7)	71 ( 3)	71 ( 3)	<b>52</b> ( 2)			
AEMI	24 ( 7)	<b>30</b> ( 4)	<b>33</b> ( 4)	<b>50</b> ( 2)			
NGPI	36 ( 7)	58 ( 5)	101 ( 3)	<b>96</b> ( 1)			
NGPS*	32 ( 7)	65 ( 5)	102 ( 3)	157 ( 1)			
UKMI	39 ( 6)	78 ( 4)	109 ( 2)				
UKM*	27 ( 4)	64 ( 3)	111 ( 2)	117 ( 1)			
BAMD	49 ( 8)	107 ( 6)	162 ( 4)	213 ( 2)			
BAMM	38 ( 8)	83 ( 6)	133 ( 4)	182 ( 2)			
BAMS	38 ( 8)	76 ( 6)	118 ( 4)	159 ( 2)			
CONU	27 ( 8)	45 ( 6)	<b>55</b> ( 4)	<b>65</b> ( 2)			
GUNA	25 ( 4)	46 ( 2)	<b>51</b> ( 2)				
FSSE	<b>20</b> ( 7)	<b>35</b> ( 5)	<b>51</b> ( 3)	97 ( 1)			
OFCL	23 ( 8)	44 ( 6)	67 ( 4)	97 ( 2)			
NHC Official (2001-2005 mean)	35 (1300)	60 (1152)	83 (1009)	103 (877)	145 (652)	192 (465)	231 (313)

\* Output from these models was unavailable at forecast time.

Table 3. Preliminary intensity forecast evaluation (heterogeneous sample) for Tropical Storm Fabio 31 July-3 August 2006. Forecast errors (kt) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type. Verification includes the depression stage.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
SHF5	5.9 (8)	9.8 (6)	12.0 (4)	16.0 (2)			
GFDI	5.1 (8)	9.0 (6)	9.5 (4)	<b>8.0</b> (2)			
GFDL*	<b>3.9</b> (8)	<b>7.3</b> (6)	<b>5.5</b> (4)	<b>3.5</b> (2)			
SHIP	<b>4.9</b> (8)	8.3 (6)	9.8 (4)	14.0 (2)			
DSHP	<b>4.9</b> (8)	8.3 (6)	9.8 (4)	14.0 (2)			
FSSE	5.0 (7)	8.6 (5)	10.7 (3)	17.0 (1)			
ICON	<b>3.5</b> (8)	8.0 (6)	<b>7.8</b> (4)	<b>6.5</b> (2)			
OFCL	5.0 (8)	7.5 (6)	8.8 (4)	10.0 (2)			
NHC Official (2001-2005 mean)	6.2 (1300)	10.8 (1152)	14.3 (1009)	16.5 (876)	18.7 (652)	18.3 (465)	19.3 (313)

\* Output from these models was unavailable at forecast time.

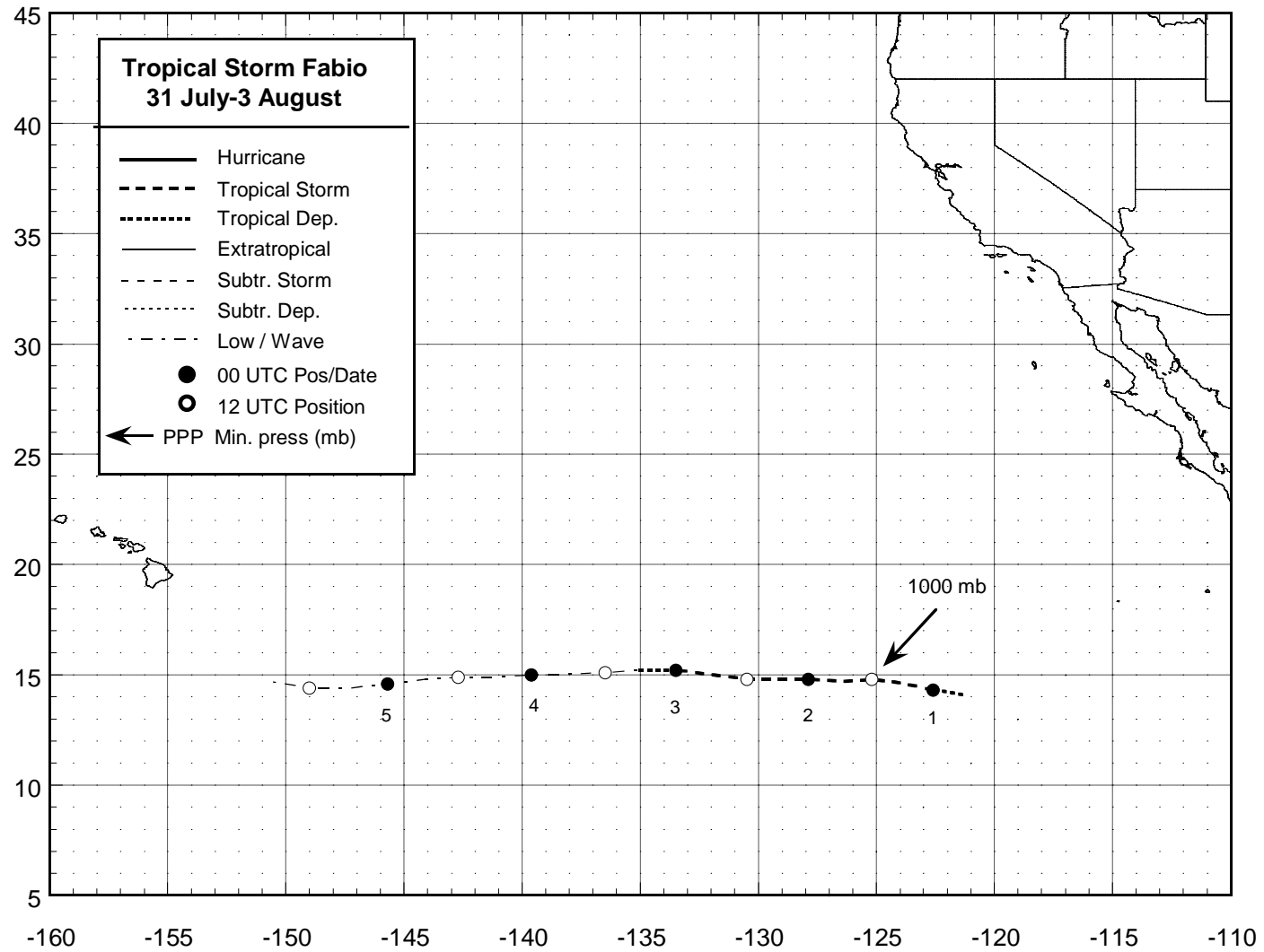


Figure 1. Best track positions for Fabio 31 July-03 August 2006.

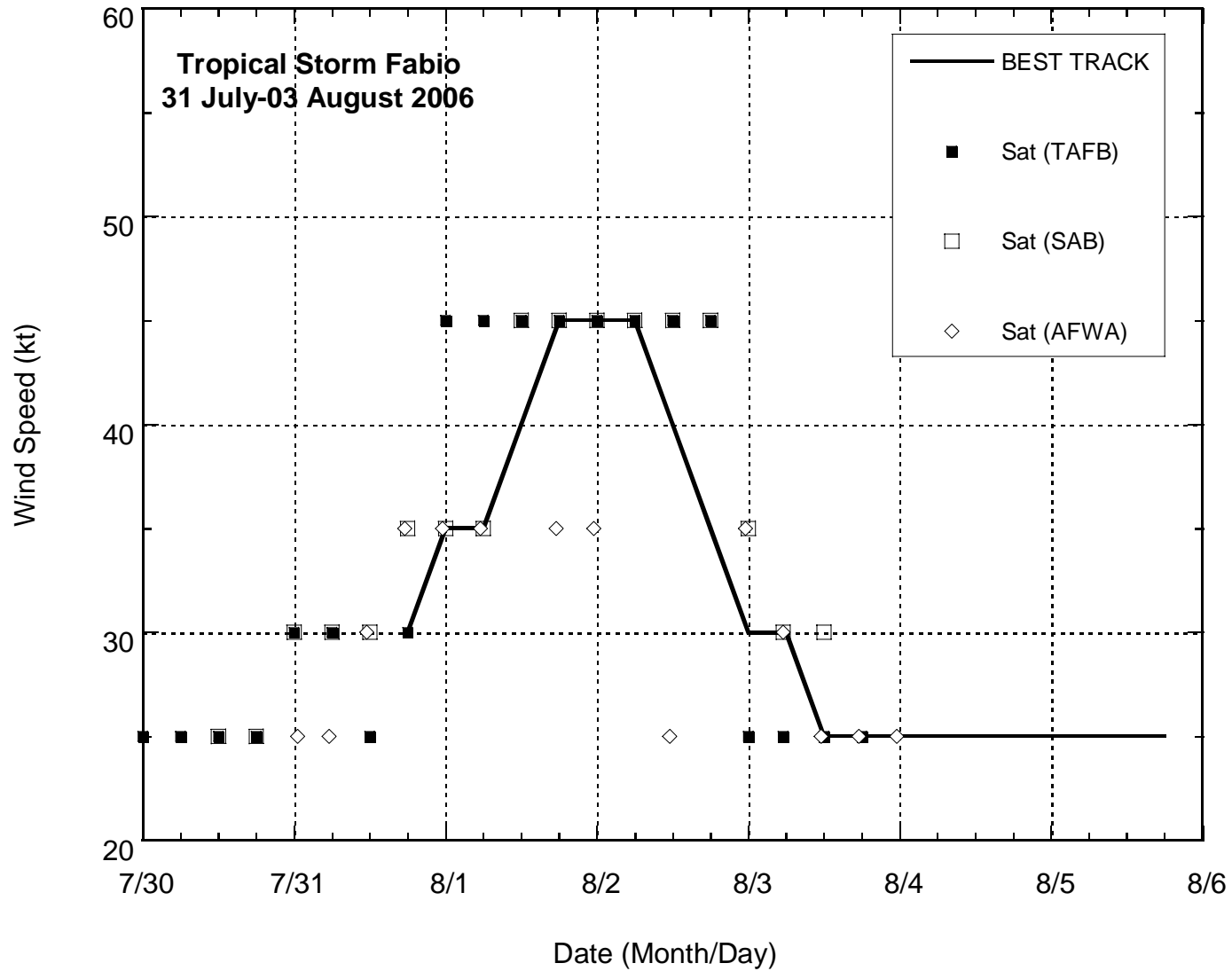


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Fabio 31 July-3 August 2006.

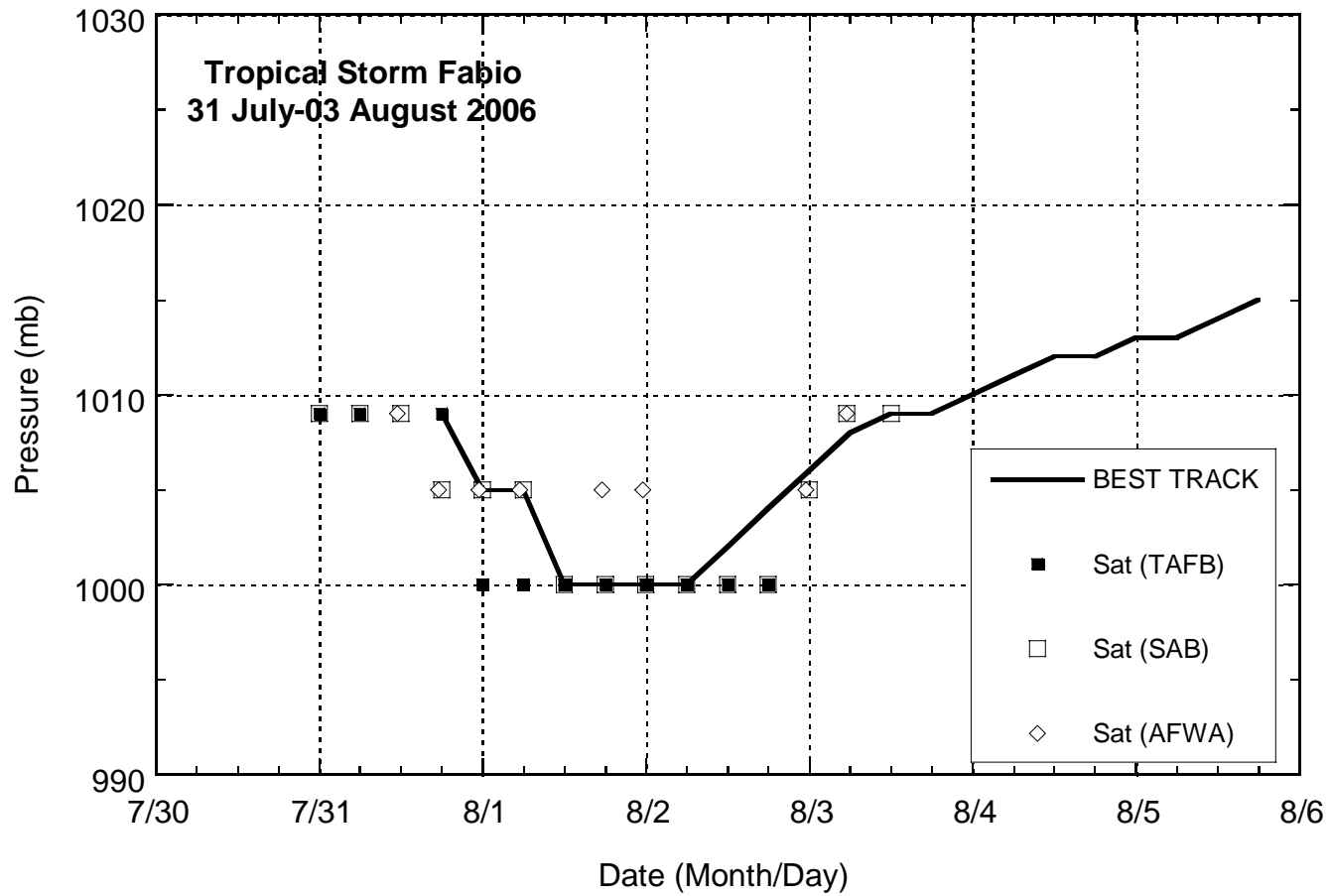


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Fabio 31 July-3 August 2006.