

Tropical Cyclone Report
Tropical Storm Odile
(EP0162008)
8-12 October 2008

John L. Beven II
National Hurricane Center
19 November 2008

Odile was a tropical storm that moved parallel to and just offshore of the west coast of Mexico.

a. Synoptic History

Odile had a complex origin. A tropical wave moved westward from the coast of Africa on 23 September. This wave merged with another area of vorticity over the tropical Atlantic on 26 September, with the combined system continuing westward. The wave reached the western Caribbean on 4 October, where it merged with the southern end of an old frontal system. The northern end of this combination moved west-northwestward across the Yucatan Peninsula into the Bay of Campeche, where it contributed to the formation of Atlantic Tropical Storm Marco.

The southern end of the system moved westward into the eastern Pacific and almost immediately showed signs of organization. However, the development was stopped by easterly vertical wind shear as the system stalled south of El Salvador on 5 October. There was little motion or change in organization during the next couple of days. Early on 8 October, another tropical wave moved into the eastern Pacific and approached the disturbance. Development resumed at that time, and it is estimated that a tropical depression formed at 1200 UTC that day about 105 n mi south-southwest of San Salvador, El Salvador. 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 1¹.

A large mid- to upper-level ridge over Mexico steered the depression west-northwestward as it formed, with the center passing south of the Gulf of Tehuantepec as the system became a tropical storm on 9 October. A northwestward turn on 10 October was followed by a resumed west-northwestward motion on 11 October. This resulted in the center moving parallel to the coast of Mexico about 40 n mi offshore. Odile reached an estimated peak intensity of 50 kt on 10-11 October. After that, increasing southeasterly vertical wind shear caused rapid weakening. The cyclone became a tropical depression early on 12 October and subsequently decayed into a remnant low early on 13 October about 45 n mi south of Manzanillo, Mexico. The low moved slowly south-southwestward before dissipating later that day.

¹ A digital record of the complete best track, including wind radii, can be found on line at <ftp://ftp.nhc.noaa.gov/atcf>. Data for the current year’s storms are located in the *brk* directory, while previous years’ data are located in the *archive* directory.

b. Meteorological Statistics

Observations in Odile (Figs. 2 and 3) include satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB), as well as flight-level, stepped frequency microwave radiometer (SFMR), and dropwindsonde observations from one flight of the 53rd Weather Reconnaissance Squadron of the U. S. Air Force Reserve Command. Data and imagery from NOAA polar-orbiting satellites, the NASA Tropical Rainfall Measuring Mission (TRMM), the NASA QuikSCAT, and Defense Meteorological Satellite Program (DMSP) satellites, among others, were also useful in tracking Odile.

The maximum intensity of Odile is somewhat speculative. Dvorak satellite intensity estimates were 55 kt from 0600-1800 UTC 11 October. However, the Air Force Reserve Hurricane Hunter aircraft that investigated Odile near 1800 UTC that day found a much weaker system, with maximum 700 mb flight-level winds of 31 kt and maximum estimated surface winds of 46 kt from the Stepped Frequency Microwave Radiometer. In addition, intensity estimates from the Advanced Microwave Sounding Unit and the QuikScat scatterometer were between 40-50 kt on 10-11 October. The best track intensity blends these estimates and shows 50 kt from 0600 UTC 10 October through 1200 UTC 11 October, followed by rapid weakening.

The aircraft reported a minimum pressure of 1010 mb at 1754 UTC 11 October. However, a dropsonde released at the flight-level center reported 26-kt surface winds, suggesting that the actual central pressure was lower.

Two ships reported winds of tropical storm-force in Odile. A ship with the call sign VRED4 reported 52-kt winds and a pressure of 1002.0 mb at 1500 UTC 10 October. The **Westerdam** (call sign PINX) reported 35-kt winds at 0400 UTC 9 September. There were no reports of tropical storm-force winds from the coastal stations in Mexico.

c. Casualty and Damage Statistics

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

d. Forecast and Warning Critique

The genesis of Odile was generally well-forecasted. The pre-Odile disturbance was first mentioned in the Tropical Weather Outlook on 4 October, and the potential for tropical cyclone formation was first noted on 5 October. During the period of unfavorable wind shear on 5-7 October, the outlooks noted that the upper-level winds were forecast to decrease and allow the system to become a tropical cyclone. However, experimental genesis forecasts were in the “medium” category (20-50% chance of tropical cyclone formation within 48 h) through this time, and did not reach the “high” category (greater than 50% chance of tropical cyclone formation within 48 h) until genesis occurred.

A verification of official and guidance model track forecasts is given in Table 2. Average official track errors for Odile were 35, 56, 69, 89, 151, and 237 n mi for the 12, 24, 36, 48, 72, and 96 h forecasts, respectively. The number of forecasts ranged from 15 at 12 h to 1 at 96 h. These errors are lower than the average long-term official track errors (Table 2) through 48 h and larger at 72-96 h, although the number of forecasts at those latter times is small. None of the dynamical track forecast models had consistently lower errors than the official forecasts. However, the medium and deep versions of the Beta and Advection model (BAMM and BAMD) had significantly lower average errors than the official forecast at most times.

Average official intensity errors were 8, 13, 17, 20, 30, and 35 kt for the 12, 24, 36, 48, 72, and 96 h forecasts, respectively (Table 3). For comparison, the average long-term official intensity errors are 6, 10, 14, 16, 19, and 19 kt, respectively. The intensity forecasts had larger average errors than climatology and persistence (OCD5) at 12, 24, and 96 h, indicating the forecasts had no skill. The forecasts had a notable high bias, with several forecasts calling for Odile to become a hurricane. The GFDL model (GHMI) had lower average errors than the official forecast at all times, as did the consensus models ICON and IVCN.

The government of Mexico issued coastal watches and warnings for Odile (Table 4). It should be noted that a hurricane watch was issued in anticipation of Odile becoming a hurricane. The watch was discontinued on 11 October when the aircraft data showed that Odile was weakening.

Table 1. Best track for Tropical Storm Odile, 8-12 October 2008.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
08 / 1200	11.7	89.4	1006	25	tropical depression
08 / 1800	11.9	90.5	1006	30	"
09 / 0000	12.2	91.5	1006	30	"
09 / 0600	12.5	92.8	1005	35	tropical storm
09 / 1200	12.7	93.9	1000	45	"
09 / 1800	13.1	94.7	1000	45	"
10 / 0000	13.5	95.4	1000	45	"
10 / 0600	13.8	96.2	997	50	"
10 / 1200	14.2	96.9	997	50	"
10 / 1800	15.0	97.9	997	50	"
11 / 0000	15.7	98.9	997	50	"
11 / 0600	16.3	100.1	997	50	"
11 / 1200	16.8	101.2	997	50	"
11 / 1800	17.4	102.3	1004	45	"
12 / 0000	17.8	103.5	1005	35	"
12 / 0600	18.1	104.1	1006	30	tropical depression
12 / 1200	18.3	104.3	1006	25	"
12 / 1800	18.6	104.5	1007	25	"
13 / 0000	18.4	104.6	1007	25	remnant low
13 / 0600	18.0	105.0	1008	20	"
13 / 1200	17.4	105.0	1008	20	"
13 / 1800					dissipated
11 / 0600	16.3	100.1	997	50	minimum pressure

Table 2. Track forecast evaluation (heterogeneous sample) for Tropical Storm Odile, 8-12 October 2008. Forecast errors (n mi) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in boldface type.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
CLP5	45 (16)	75 (14)	96 (12)	123 (10)	208 (6)	414 (2)	
GFNI	64 (9)	157 (7)	259 (6)	318 (5)			
GFDI	39 (16)	62 (14)	95 (12)	109 (9)	278 (6)	324 (2)	
HWFI	60 (16)	97 (14)	123 (12)	138 (10)	210 (5)	182 (1)	
NAMI	40 (6)	47 (2)	105 (2)				
GFSI	47 (13)	66 (11)	89 (10)	95 (9)	138 (5)	137 (1)	
AEMI	61 (11)	102 (10)	152 (9)	170 (7)	270 (5)	412 (1)	
NGPI	67 (13)	111 (10)	95 (9)	123 (7)	376 (3)	732 (2)	
UKMI	37 (13)	68 (11)	125 (9)	206 (5)	470 (3)		
EGRI	45 (13)	88 (9)	205 (7)	321 (4)			
EMXI	48 (11)	83 (10)	105 (8)	93 (6)	112 (3)	121 (1)	
BAMD	43 (16)	61 (14)	67 (12)	71 (10)	124 (6)	150 (2)	
BAMM	42 (16)	55 (14)	53 (12)	44 (10)	69 (6)	66 (2)	
BAMS	52 (15)	78 (14)	108 (12)	130 (10)	159 (6)	129 (2)	
LBAR	41 (15)	67 (14)	88 (12)	93 (10)	235 (6)	285 (2)	
TCON	37 (9)	54 (5)	90 (4)	113 (2)			
TVCN	39 (16)	58 (14)	80 (12)	106 (10)	189 (6)	361 (2)	
TVCC	39 (16)	55 (14)	68 (12)	82 (10)	163 (6)	234 (2)	
GUNA	37 (9)	64 (5)	109 (4)	141 (2)			
FSSE	37 (12)	54 (10)	82 (8)	105 (6)	39 (2)		
OFCL	35 (15)	56 (13)	69 (11)	89 (9)	151 (5)	237 (1)	
NHC Official (2003-2007 mean)	31.9 (1282)	55.1 (1129)	77.4 (979)	97.9 (849)	136.2 (620)	180.1 (439)	226.1 (293)

Table 3. Intensity forecast evaluation (heterogeneous sample) for Tropical Storm Odile, 8-12 October 2008. Forecast errors (kt) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in boldface type.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
OCD5	5.9 (16)	12.1 (14)	20.2 (12)	30.0 (10)	32.7 (6)	5.0 (2)	
GHMI	6.3 (16)	10.6 (14)	13.2 (12)	13.3 (9)	8.3 (6)	5.5 (2)	
GFNI	7.2 (9)	9.1 (7)	13.5 (6)	13.8 (5)			
HWFI	7.7 (16)	14.1 (14)	17.0 (12)	16.2 (9)	13.0 (5)	1.0 (1)	
LGEM	7.2 (16)	14.5 (14)	18.0 (12)	20.9 (10)	24.7 (6)	29.0 (2)	
DSHP	7.8 (16)	13.3 (14)	19.4 (12)	22.5 (10)	29.2 (6)	37.0 (2)	
FSSE	5.4 (12)	10.5 (10)	14.8 (8)	19.7 (6)	43.0 (2)		
ICON	5.4 (16)	8.7 (14)	9.3 (12)	9.3 (9)	15.2 (5)	18.0 (1)	
IVCN	5.1 (16)	7.6 (14)	8.4 (12)	9.7 (10)	13.5 (6)	21.0 (2)	
OFCL	7.7 (15)	12.7 (13)	17.3 (11)	20.0 (9)	30.0 (5)	35.0 (1)	
NHC Official (2003-2007 mean)	6.2 (1282)	10.4 (1129)	13.9 (979)	16.3 (848)	18.7 (620)	19.2 (439)	19.1 (293)

Table 4. Watch and warning summary for Tropical Storm Odile, 8-12 October 2008.

Date/Time (UTC)	Action	Location
10 / 0300	Tropical Storm Watch issued	Punta Maldonado to Zihuatanejo
10 / 1500	Tropical Storm Warning issued	Lagunas de Chacahua to Zihuatanejo
10 / 2100	Tropical Storm Watch issued	Zihuatanejo to Punta San Telmo
11 / 0300	Tropical Storm Warning modified to	Lagunas de Chacahua to Punta San Telmo
11 / 0300	Tropical Storm Watch issued	Punta San Telmo to Manzanillo
11 / 0900	Tropical Storm Warning discontinued	East of Punta Maldonado
11 / 0900	Hurricane Watch issued	Tecpan de Galeana to Punta San Telmo
11 / 1500	Tropical Storm Watch discontinued	All
11 / 1500	Tropical Storm Warning modified to	Tecpan de Galeana to Manzanillo
11 / 1500	Hurricane Watch modified to	Zihuatanejo to Manzanillo
11 / 2100	Tropical Storm Warning modified to	Lazaro Cardenas to La Fortuna
11 / 2100	Hurricane Watch discontinued	All
12 / 1500	Tropical Storm Warning discontinued	All

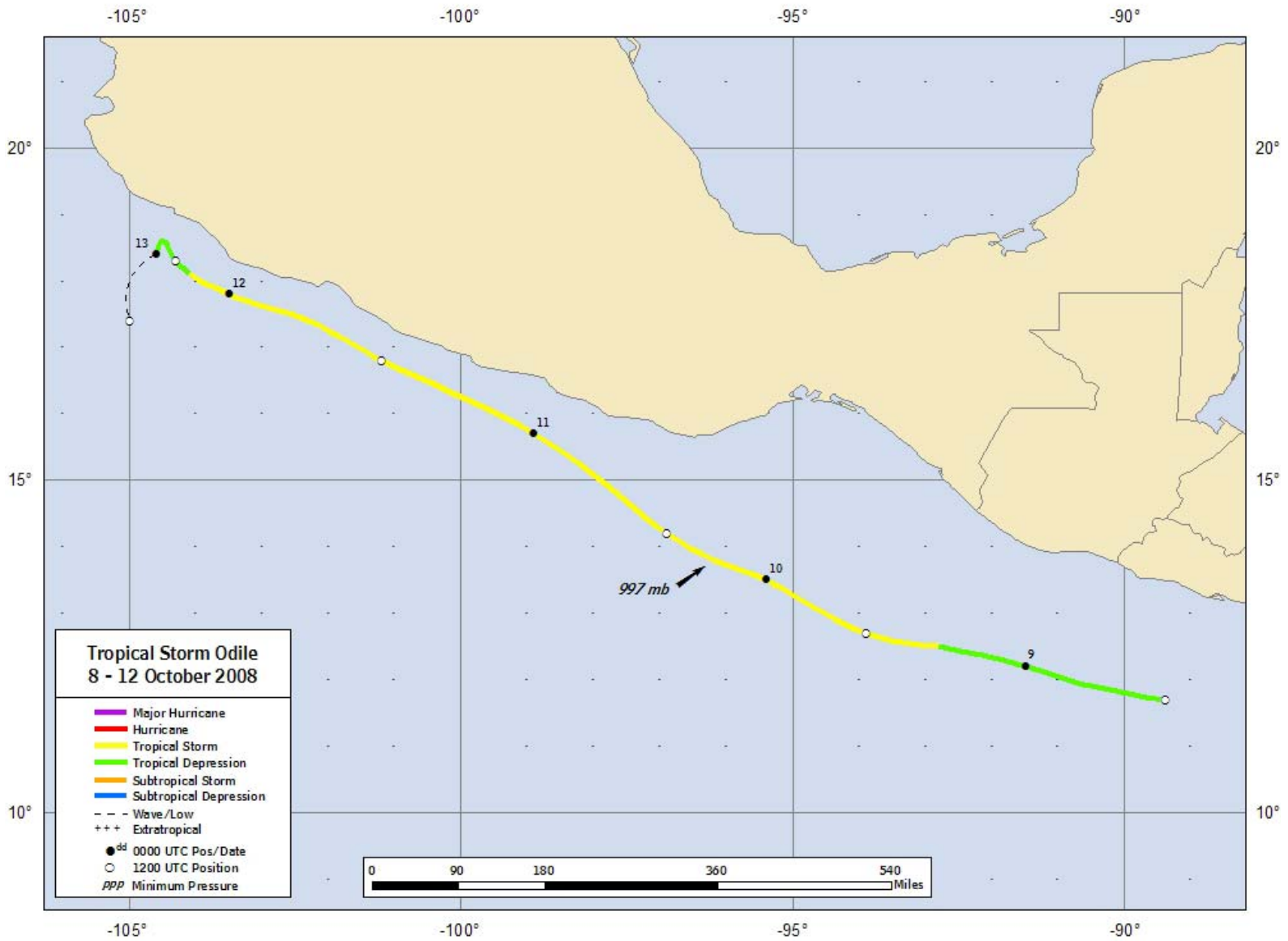


Figure 1. Best track positions for Tropical Storm Odile, 8-12 October 2008.

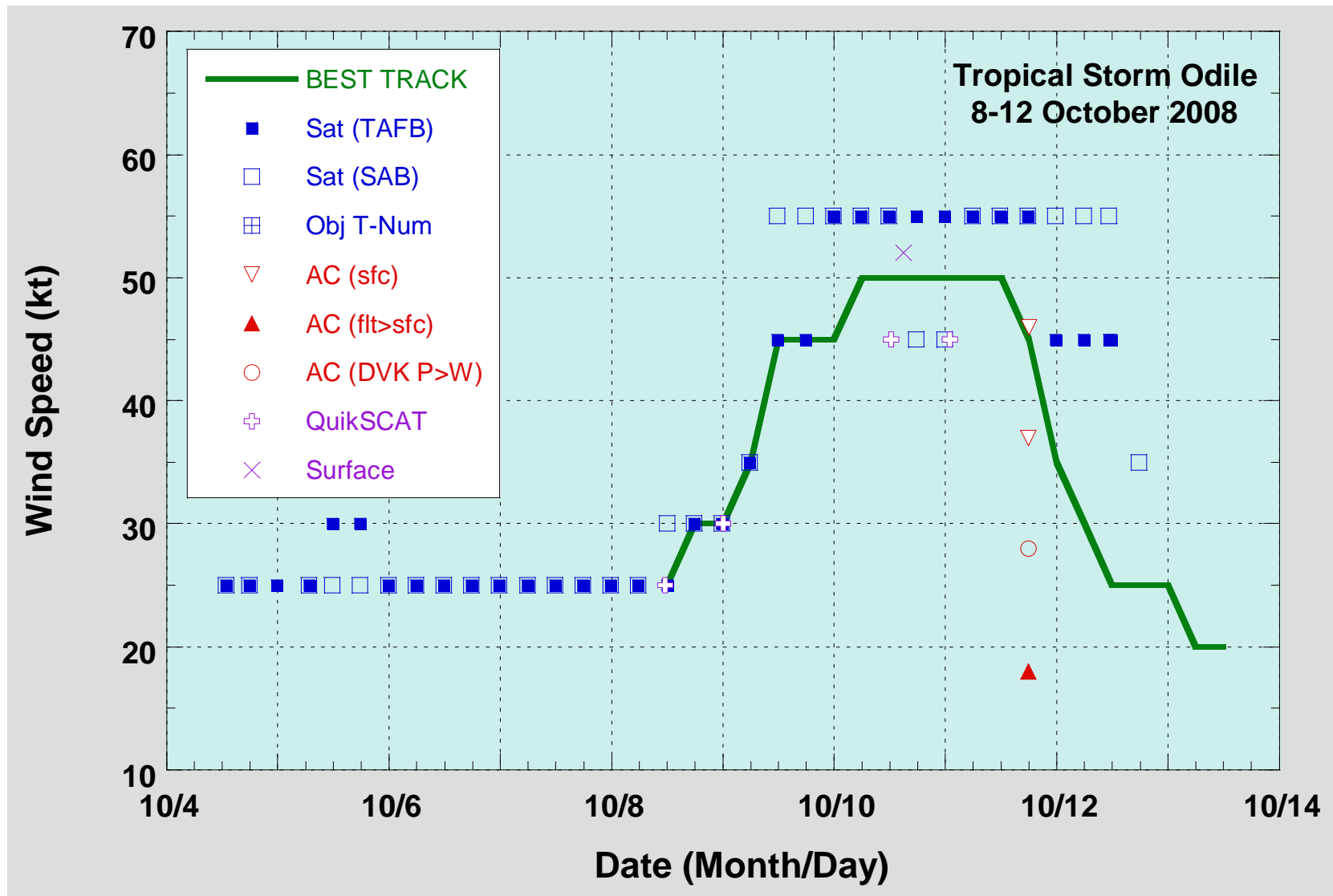


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Odile, 8 – 12 October 2008. Aircraft observations have been adjusted for elevation using 90%, 80%, and 80% reduction factors for observations from 700 mb, 850 mb, and 1500 ft, respectively. Dashed vertical lines correspond to 0000 UTC.

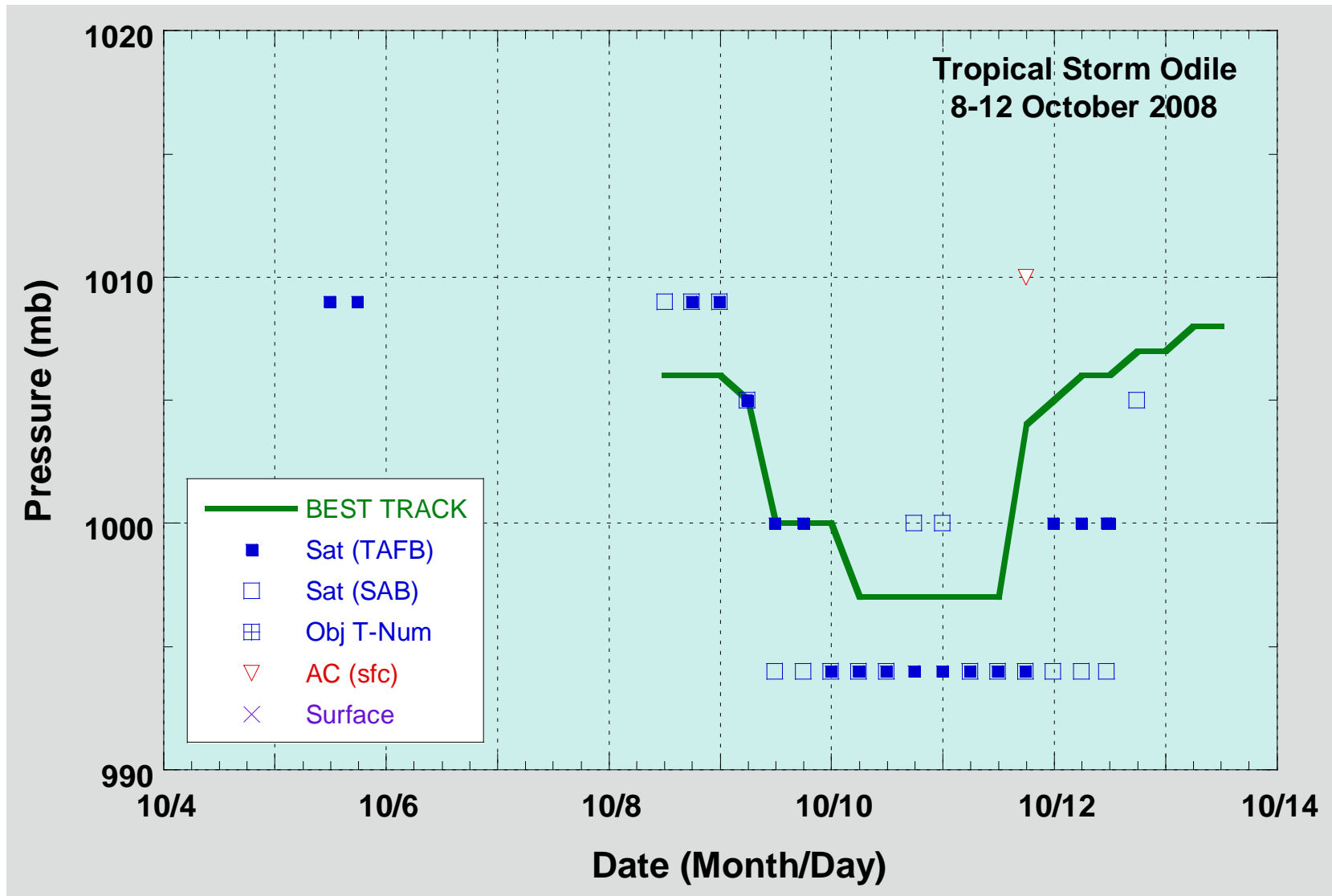


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Odile, 8-12 October 2008. Dashed vertical lines correspond to 0000 UTC.