

Tropical Cyclone Report
Hurricane Adolph
25 May - 1 June 2001

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Adolph was a category 4 hurricane (on the Saffir-Simpson Hurricane Scale) that tracked parallel to the coast of Mexico and did not directly affect any land areas. Its maximum winds of 125 kt make Adolph the strongest and only category 4 hurricane on record for the month of May in the northeast Pacific Ocean.

a. Synoptic History

A tropical wave that emerged from the coast of Africa on 7 May appears to have been the precursor disturbance of Hurricane Adolph. Surface analyses showed a weak low beginning along the wave axis over Panama and Costa Rica late on 18 May. The low eventually moved into the northeastern Pacific Ocean on 22 May and Dvorak satellite classifications began around 1800 UTC 24 May. Convection was broadly distributed and disorganized, however, until about 1800 UTC 25 May, when a concentration of deep convection developed just south of the Gulf of Tehuantepec. QuikSCAT data (Fig. 1) and Dvorak satellite intensity estimates suggests that the season's first tropical depression formed from this system by 1800 UTC about 215 n mi south-southwest of Acapulco, Mexico.

The best track chart of the tropical cyclone's path is given in Fig. 2, with the wind and pressure history shown in Figs. 3 and 4, respectively. The complete best track is given in Table 1. Tropical Depression One-E strengthened as it drifted unclimatologically to the east-northeast, and became Tropical Storm Adolph at 1800 UTC 26 May when the cyclone was centered about 195 n mi south-southwest of Acapulco. As Adolph turned slowly northward toward the Mexican coast on 27 May, a ragged banding eye became visible on satellite imagery and deep convection began to appear around the developing eye. Adolph became a hurricane around 1800 UTC that day when it was located about 220 n mi south of Acapulco. On 28 May, Adolph came under the influence of a mid-tropospheric ridge to its north and turned slightly to the left; its closest approach to the Mexican coast was about 145 n mi southwest of Acapulco near 1200 UTC the same day. Once hurricane strength had been attained, the pace of intensification increased dramatically. Adolph reached its peak intensity of 125 kt just 30 h later at 0000 UTC 29 May.

Shortly after reaching peak intensity, Adolph turned from a general west-northwest heading to a westerly track at an increased speed, about 7-10 kt, around the western edge of the mid-tropospheric ridge over Mexico. By 0600 UTC 30 May, Adolph had weakened to about 100 kt. The slow weakening trend continued, with some oscillations in convective intensity and eye definition. By 0000 UTC 1 June, Adolph had weakened below hurricane strength when it was centered about 380 n mi south-southwest of Cabo San Lucas. Over the next 24 h, Adolph continued on a westward track at around 5-8 kt over cooler water, which resulted in rapid weakening. Convection continued

to diminish and the system became a tropical depression by 1800 UTC the same day. No further deep convection was noted after that, and the tropical cyclone dissipated about 400 n mi south-southwest of Cabo San Lucas by 0000 UTC 2 June. A swirl of low clouds persisted in this area for several days thereafter.

b. Meteorological Statistics

Observations in Hurricane Adolph (Figs.3 and 4) include satellite-based Dvorak technique intensity estimates from the Tropical Prediction Center's (TPC) Tropical Analysis and Forecast Branch (TAFB), the NOAA Satellite Analysis Branch (SAB), and the U. S. Air Force Weather Agency (AFWA). Adolph's peak intensity of 125 kt from 0000 UTC to 1200 UTC 29 May is based on Dvorak satellite classifications of 127 kt (T6.5) from the TAFB and SAB.

Of particular interest is the rapid deepening that occurred on 27 and 28 May. During the early stages of the deepening period from 1534 UTC 27 May to 0048 UTC 28 May, Special Sensor Microwave Imager (SSM/I) satellite data indicated the eye of Hurricane Adolph had decreased by at least one-half its original diameter of about 20 n mi. The significant reduction in the size of the eye was not apparent in conventional visible and infrared satellite data.

Only one ship report of tropical storm force winds associated with Adolph was noted. At 0600 UTC 28 May, ship **DLBX** (located about 120 n mi northeast of the center) reported a sustained east-southeast wind of 39 kt and a pressure of 1006.0 mb. No land stations reported sustained tropical storm force winds.

c. Casualty and Damage Statistics

No reports of damage or casualties associated with Hurricane Adolph were received by the National Hurricane Center.

d. Forecast and Warning Critique

Average official track errors for Adolph were 30, 60, 93, 121, and 185 n mi for the 12, 24, 36, 48, and 72 h forecasts, respectively. These errors were lower than the previous 10-year averages (Table 2) through 48 h, and higher than average at 72 h. The official track errors (OFCL) for Adolph were better than all available model guidance through 48 h except for the AVNI. Nearly half of the model guidance was better at 72 h than the official forecasts.

The average intensity errors for the 12, 24, 36, 48, and 72 h forecasts were 8, 13, 16, 22, and 28 kt, respectively, and were all underestimates except at 12 h. These errors are near or slightly above the 10-yr average of 7, 12, 16, 19, and 21 kt, respectively. These errors would be considered satisfactory under normal circumstances. However, the rapid intensification (RI) and rapid weakening (RW) periods were not forecast very well. Some intensity forecast errors were as much as 55 kt too low at 72 h during RI, and 30 kt too high at 72 h during RW. The SHIPS and GFDL intensity models also did not forecast the rapid strengthening to category 4. However, the decay stage was reasonably-well forecast by those two models.

Table 3 lists the watches and warnings associated with Adolph issued by the government of Mexico. As noted above, no sustained tropical storm force winds were observed over land.

Table 1. Best track for Hurricane Adolph, 25 May - 1 June 2001.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
25 / 1800	13.6	101.1	1006	25	tropical depression
26 / 0000	13.7	101.2	1006	30	"
26 / 0600	13.8	101.2	1006	30	"
26 / 1200	13.7	100.9	1006	30	"
26 / 1800	13.6	100.5	1004	35	tropical storm
27 / 0000	13.5	100.2	1000	40	"
27 / 0600	13.3	100.0	997	50	"
27 / 1200	13.2	99.7	992	60	"
27 / 1800	13.5	99.5	980	75	hurricane
28 / 0000	13.9	99.8	965	95	"
28 / 0600	14.2	100.2	960	105	"
28 / 1200	14.4	100.5	955	110	"
28 / 1800	14.7	101.2	948	115	"
29 / 0000	15.0	102.1	940	125	"
29 / 0600	15.3	103.2	940	125	"
29 / 1200	15.5	104.2	940	125	"
29 / 1800	15.7	105.2	948	115	"
30 / 0000	15.9	106.1	955	110	"
30 / 0600	16.0	107.0	960	100	"
30 / 1200	16.2	107.8	965	95	"
30 / 1800	16.3	108.6	975	90	"
31 / 0000	16.4	109.4	979	80	"
31 / 0600	16.4	110.2	982	70	"
31 / 1200	16.4	110.8	987	65	"
31 / 1800	16.3	111.3	990	65	"

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
01 / 0000	16.2	111.8	997	55	tropical storm
01 / 0600	16.2	112.0	1003	45	"
01 / 1200	16.3	112.3	1005	35	"
01 / 1800	16.4	112.5	1006	30	tropical depression
02 / 0000					dissipated
29 / 0000	15.0	102.1	940	125	minimum pressure

Table 2. Preliminary track forecast evaluation (heterogeneous sample) for Hurricane Adolph, 25 May - 1 June 2001. Forecast errors for tropical storm and hurricane stages (n mi) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type.

Forecast Technique	Forecast Period (h)				
	12	24	36	48	72
CLIP	30 (22)	63 (20)	101 (18)	152 (16)	232 (12)
P91E	27 (22)	56 (20)	93 (18)	149 (16)	294 (12)
GFDI	45 (15)	94 (13)	136 (11)	180 (9)	262 (5)
LBAR	39 (22)	78 (20)	121 (18)	168 (16)	278 (12)
AVNI	30 (22)	54 (13)	72 (11)	91 (8)	115 (4)
BAMD	45 (22)	82 (20)	114 (18)	133 (16)	124 (12)
BAMM	41 (22)	77 (20)	109 (18)	132 (16)	145 (12)
BAMS	38 (22)	70 (20)	110 (18)	151 (16)	192 (12)
NGPI	36 (22)	69 (20)	103 (18)	134 (16)	194 (12)
UKMI	34 (13)	68 (12)	91 (10)	120 (9)	333 (3)
NHC Official	29 (22)	55 (20)	84 (18)	121 (16)	231 (12)
NHC Official (1991-2000 mean)	37 (2273)	68 (2034)	99 (1802)	128 (1584)	185 (1203)

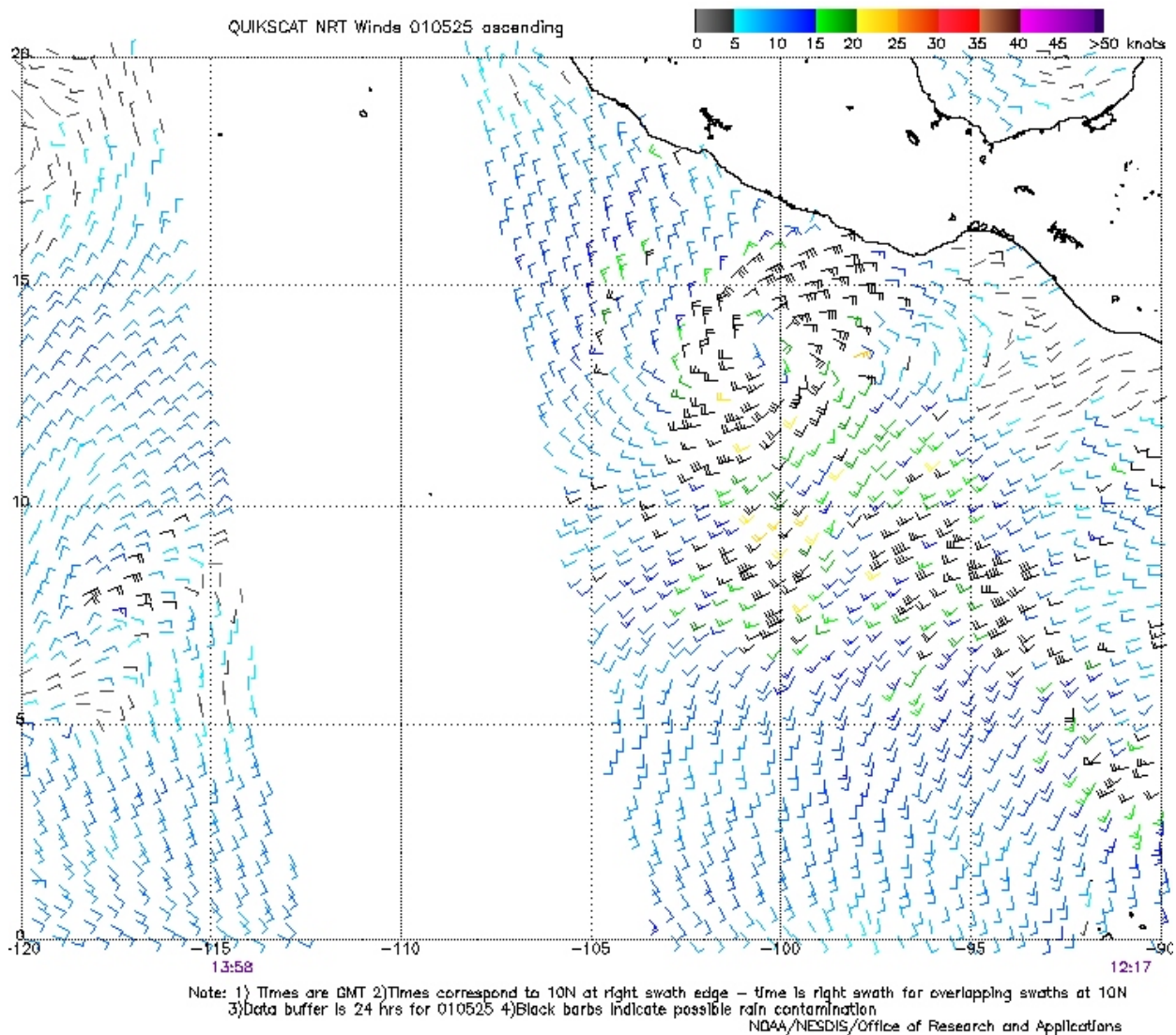


Figure 1. 1217 UTC 25 July 2001 QuikSCAT scatterometer winds showing a well-defined, low-level circulation about 215 n mi south-southwest of Acapulco, Mexico. The center was located near 13.5N 101.0W at this time and was later designated as a tropical depression at 1800 UTC. Black barbs indicate unreliable wind speeds due to heavy rain contamination (Image courtesy of NOAA/NESDIS Marine Observing Systems team).

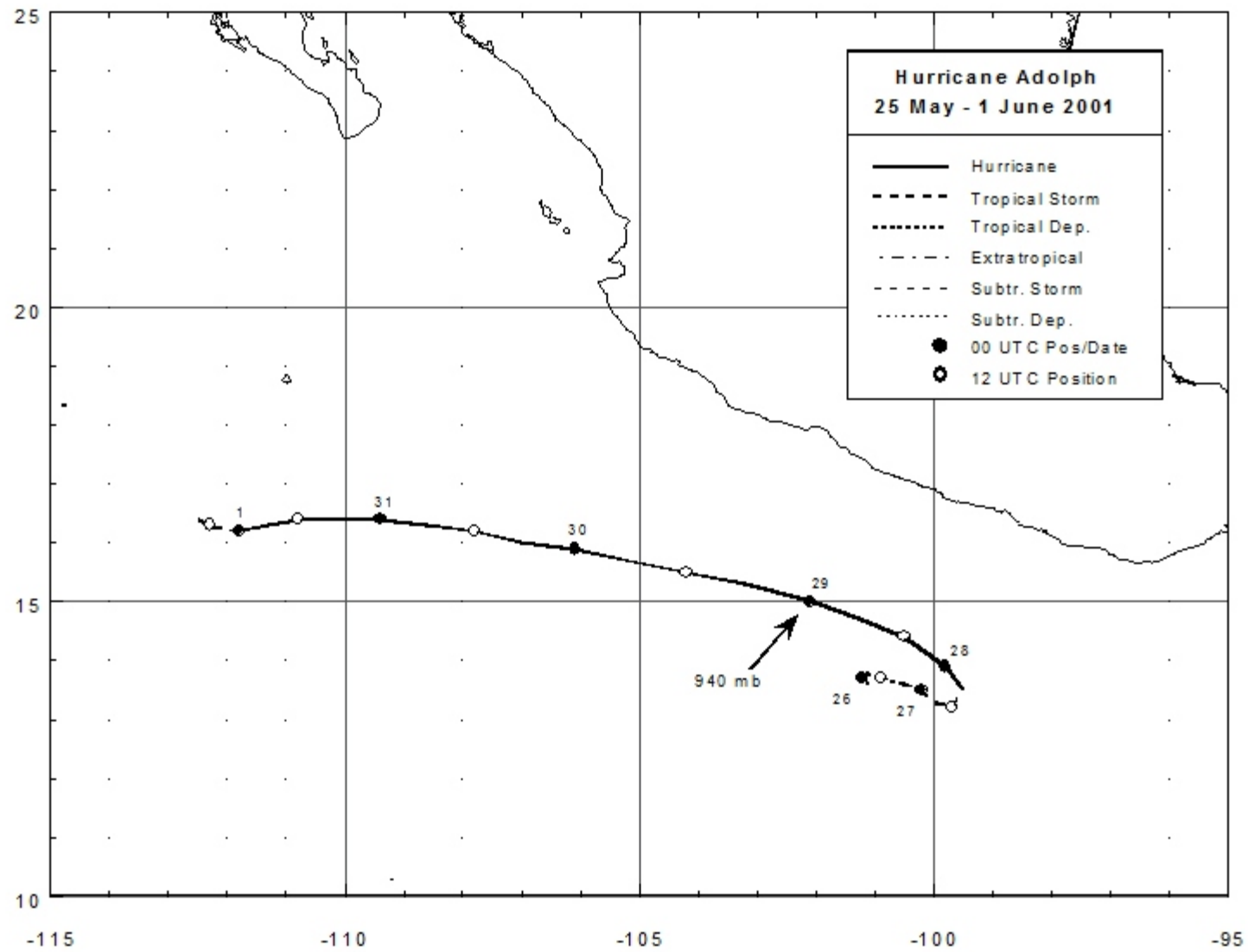


Figure 2. Best track positions for Hurricane Adolph, 25 May - 1 June 2001.

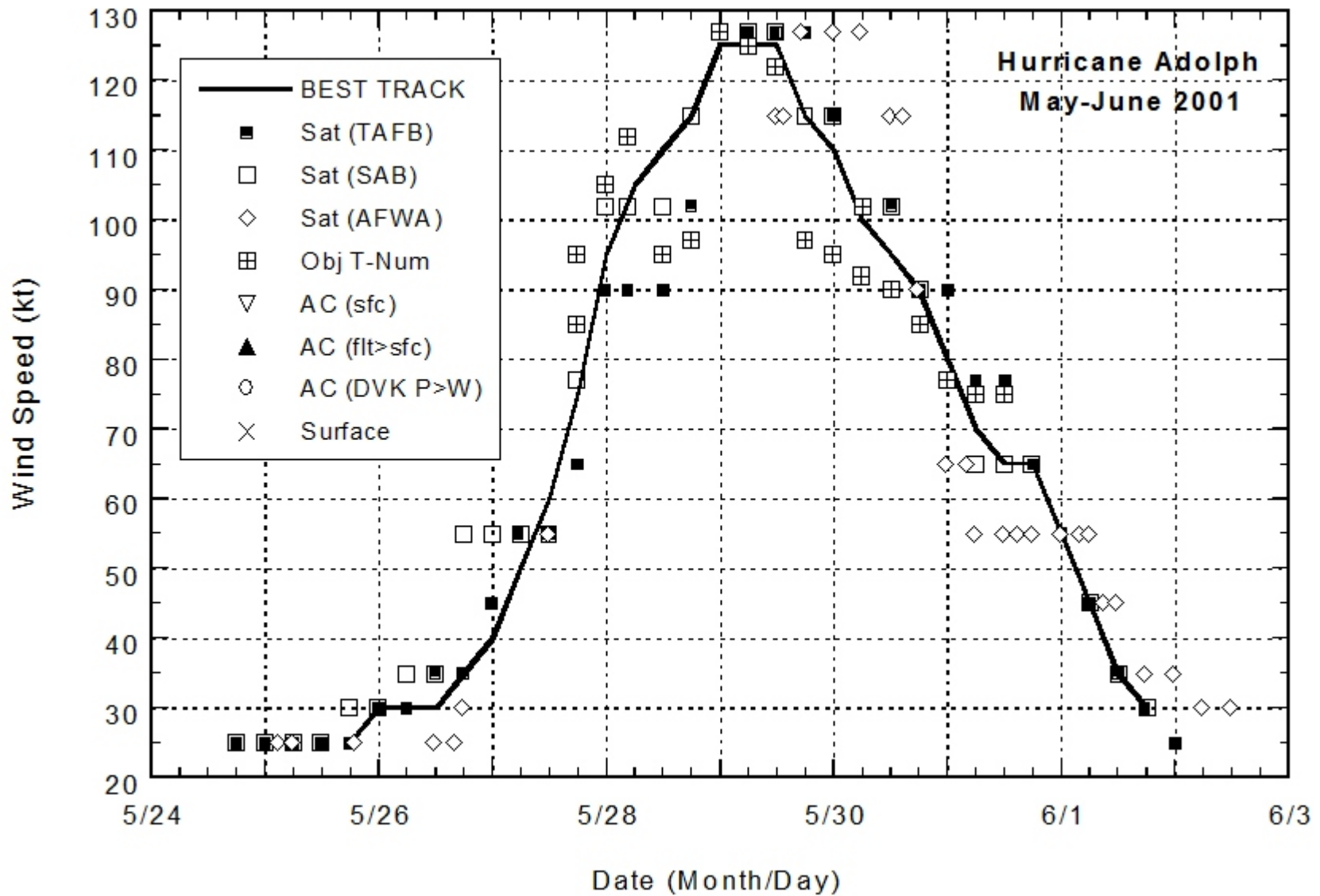


Figure 3. Best track maximum sustained surface wind speed curve for Hurricane Adolph, 25 May - 1 June 2001, and the observations on which the best track curve is based.

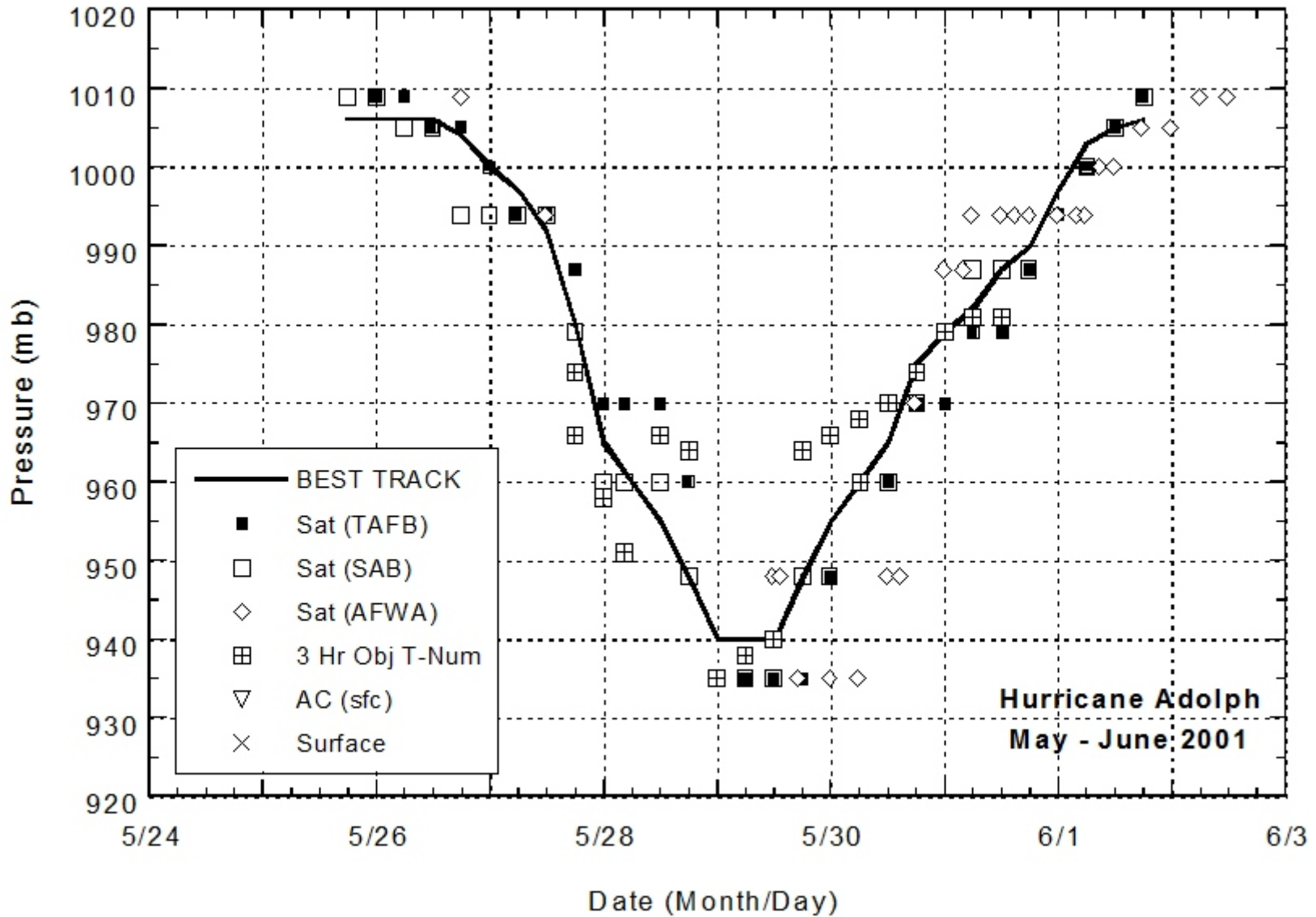


Figure 4. Best track minimum central pressure curve for Hurricane Adolph, 25 May - 1 June 2001, and the observations on which the best track curve is based.