Tropical Cyclone Report
Tropical Storm Dora
4 – 6 July 2005

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Dora was a weak tropical storm that briefly skirted the southwestern coast of Mexico before turning westward and dissipating over the open ocean.

a. Synoptic History

The tropical wave that ultimately spawned Dora moved off the west coast of Africa on 18 June. The wave moved westward for the next couple of weeks and remained essentially devoid of any deep convection. On 1 July, the wave reached Central America, at which time vigorous convection began to develop. By 3 July, QuikSCAT surface wind data indicated a broad cyclonic circulation had developed along the wave axis over the Gulf of Tehuantepec. Increasing surface convergence gradually generated more convection near the low-level circulation, which prompted the initiation of satellite classifications. By 0000 UTC 4 July, the system had acquired enough convective organization to be designated a tropical depression about 125 n mi south of Acapulco, Mexico. 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 1.

After having moved westward for more than 2 weeks, the system abruptly turned northward when a shortwave trough over the southwestern United States and northern Mexico amplified sharply southward and weakened the subtropical ridge to the north of the depression. This flow pattern also enhanced the upper-level outflow to the north of the depression and the cyclone intensified into Tropical Storm Dora 6 h later. Dora reached its peak intensity of 40 kt by 1200 UTC that same day. By 0000 UTC 5 July, Dora began moving west-northwestward and the center passed about 40 n mi south-southeast of Zihuatanejo, Mexico around 0300 UTC. By late that day, the ridge to the north of Dora re-strengthened, inducing a more westward track. The westward motion brought Dora over much lower sea-surface temperatures causing the cyclone to weaken to a depression at 1800 UTC that day about 65 n mi west-southwest of Manzanillo, Mexico. Dora degenerated into a non-convective low pressure system early on 6 July before dissipating at 1800 UTC about 220 n mi west of Manzanillo.

b. Meteorological Statistics

Observations in Dora (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 imagery from NOAA polar-orbiting satellites, the NASA Tropical Rainfall Measuring Mission (TRMM), the NASA

QuikSCAT, and Defense Meteorological Satellite Program (DMSP) satellites were also useful in tracking Dora.

A 1200 UTC 4 July 40-kt wind report from ship H9UY (**Nikkei Phoenix**) located 20 n mi east of the center was useful in determining the peak intensity of Dora. A 30-kt wind report at 1500 UTC 4 July from ship 4XFQ located 35 n mi southeast of the center was helpful in estimating the extent of tropical storm-force winds.

After Dora began to interact with the mountainous terrain of coastal Mexico on 5 July, satellite-based automated objective Dvorak T-numbers from the University of Wisconsin's Cooperative Institute for Meteorological Satellite Studies (UW-CIMSS) produced overestimated intensity values of 40-50 kt, which were 10-20 kt larger than nearby surface observations indicated (Fig. 2). These inflated values were likely due to enhanced convective development caused by the southerly upslope flow on the east side of Dora.

c. Casualty and Damage Statistics

There were no reports of damages or casualties associated with Dora.

d. Forecast and Warning Critique

Average official track errors (with the number of cases in parentheses) for Dora were 49 (8), 97 (6), 141 (4), and 132 (2) n mi for the 12, 24, 36, and 48 h forecasts, respectively. Except for the 48 h time period, these errors are much greater than the average official track errors for the 10-yr period 1995-2004[1] [(37, 68, 97, and 123 n mi, respectively), (Table 4)]. Initially, the vast majority of the guidance models and, subsequently, the official forecasts, did not pick up on the northward turn. This is the reason for the higher than average OFCL track forecast errors.

Average official intensity errors were 3, 10, 18, and 25 kt for the 12, 24, 36, and 48 h forecasts, respectively. For comparison, the average official intensity errors over the 10-yr period 1995-2004 are 6, 11, 14, and 17 kt, respectively. Again, most of the guidance models, including SHIPS and GFDL, did not anticipate the northwestward motion and the resultant close proximity to the mountainous southwestern Mexican coast, which ultimately inhibited the strengthening process.

[1] Errors given for the 96 and 120 h periods are averages over the four-year period 2001-4.

Table 1. Best track for Tropical Storm Dora, 4-6 July 2005.

Date/Time (UTC)	Latitude (^{o}N)	Longitude (^{o}W)	Pressure (mb)	Wind Speed (kt)	Stage
04/0000	14.9	99.2	1008	30	tropical depression
04/0600	15.2	99.3	1005	35	tropical storm
04/1200	16.1	99.7	1003	40	"
04/1800	16.7	100.4	1004	40	"
05/0000	17.2	101.4	1005	35	"
05/0600	17.7	102.6	1006	35	"
05/1200	18.1	103.8	1007	35	"
05/1800	18.4	104.8	1008	30	tropical depression
06/0000	18.5	105.8	1009	30	"
06/0600	18.5	106.9	1010	25	"
06/1200	18.6	107.4	1011	20	low
06/1800	18.9	107.6	1011	15	"
07/0000					dissipated
04/1200	16.1	99.7	1003	40	minimum pressure

Table 2. Preliminary forecast evaluation (heterogeneous sample) for Dora, 4-6 July 2005. 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, but does not include the extratropical stage, if any.

Forecast Technique	Forecast Period (h)						
	12	24	36	48			
CLP5	55 (8)	125 (6)	215 (4)	217 (2)			
GFNI	99 (6)	204 (3)	308 (1)				
GFDI	64 (8)	111 (6)	**129** (4)	145 (2)			
GFDL	64 (7)	**83** (5)	**106** (3)	**74** (1)			
GFDN	83 (6)	178 (4)	258 (2)				
GFSI	63 (5)	112 (4)	166 (2)				
GFSO	95 (5)	138 (3)	151 (3)	180 (1)			
NGPI	74 (7)	182 (4)	242 (3)				
NGPS	62 (5)	169 (2)	331 (1)				
UKM	90 (3)	161 (2)					
BAMD	**42** (8)	**62** (6)	**80** (4)	**46** (2)			
BAMM	52 (8)	**87** (6)	123 (4)	**109** (2)			
BAMS	63 (8)	109 (6)	158 (4)	147 (2)			
CONU	66 (8)	126 (6)	168 (4)				
FSSE	53 (4)	117 (3)	179 (1)				
OFCL	49 (8)	97 (6)	141 (4)	132 (2)			
NHC Official (1995-2004 mean)	37 (2654)	68 (2378)	97 (2096)	123 (1829)			

Table 5. Watch and warning summary for Tropical Storm Dora, 4-6 July 2005.

Date/Time (UTC)	Action	Location
4 July / 0400	Tropical Storm Warning	Acapulco westward to Zihuatanejo, Mexico
4 July / 0400	Tropical Storm Watch	west of Zihuatanejo westward to Punta Sel Telmo
4 July / 2100	Tropical Storm Warning	extended westward from Zihuatanejo westward to Punta Sel Telmo
4 July / 2100	Tropical Storm Watch	West of Punta Sel Telmo westward to Manzanillo
5 July / 0600	Tropical Storm Warning	Discontinued from Zihuatanejo eastward
5 July / 0900	Tropical Storm Warning	Lazaro Cardenas westward to La Fortuna
5 July / 0900	Tropical Storm Warning	Discontinued from Lazaro Cardenas eastward
5 July / 2100	Tropical Storm Warning	Discontinued

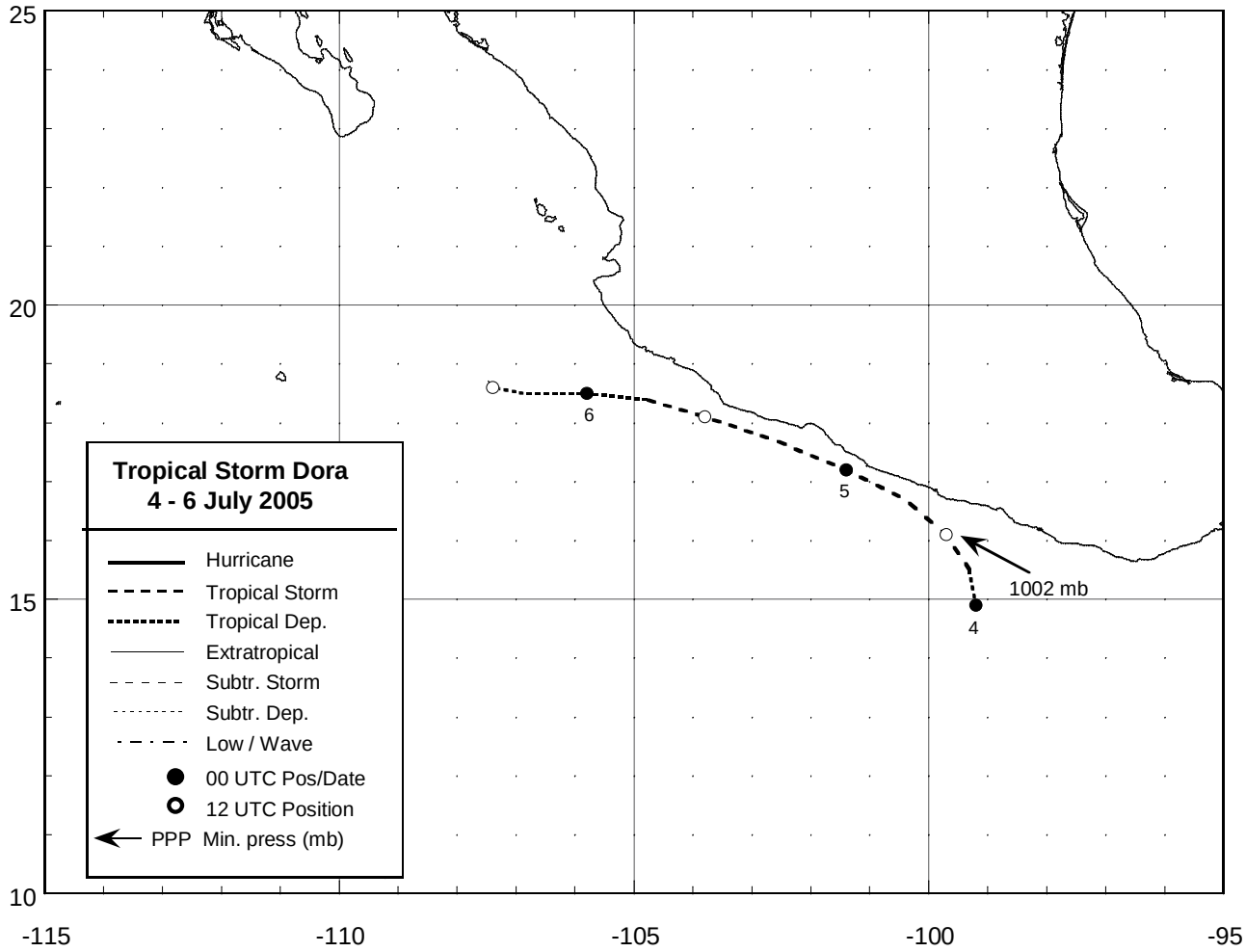

Figure 1. Best track positions for Tropical Storm Dora, 4-6 July 2005.

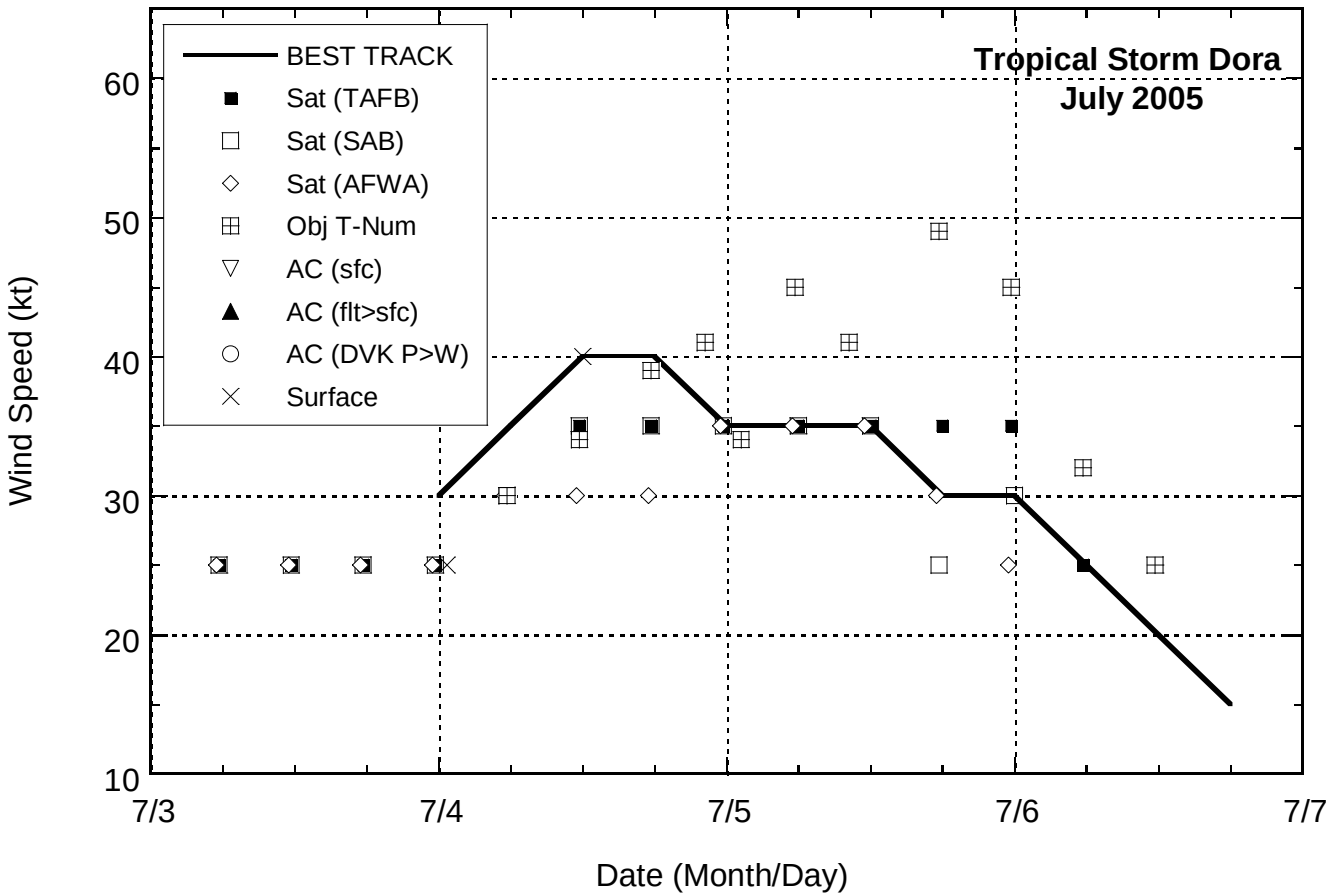

Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Dora, 4-6 July 2005. Objective Dvorak estimates from UW-CIMSS represent linear averages over a three-hour period centered on the nominal observation time.

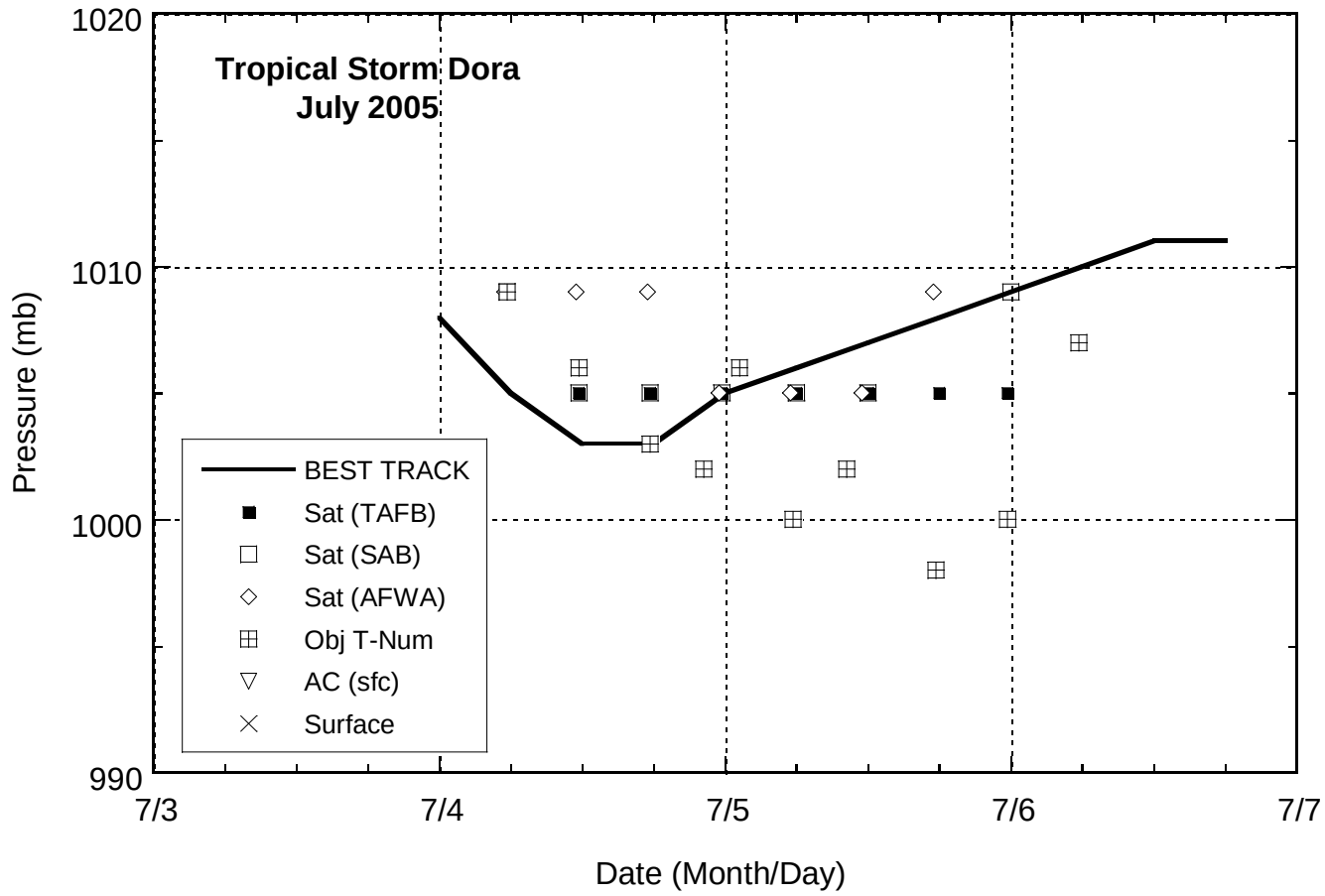

Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Dora, 4-6 July 2005. Objective Dvorak estimates from UW-CIMSS represent linear averages over a three-hour period centered on the nominal observation time.