

Tropical Cyclone Report
Tropical Storm Lorena
2-4 October 2001

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30 November 2001

Lorena was a short-lived tropical storm that briefly threatened southwestern Mexico.

a. Synoptic History

The tropical wave that eventually developed into Lorena moved off the west coast of Africa on 13 September. The poorly-defined wave tracked rapidly westward across the Atlantic for more than a week. There was little or no thunderstorm activity associated with the wave until it moved across Central America on 27 September. Significant deep convection finally developed on 29 September and satellite classifications began on 30 September when the system was located about 300 miles south of Acapulco, Mexico. The wave possessed a well-defined closed low-level circulation at that time.

Convection steadily increased and banding features developed during the day on 1 October. Satellite intensity estimates indicate the system became Tropical Depression Thirteen-E at 0000 UTC 2 October. By 1200 UTC, QuikSCAT satellite-derived winds (data not shown) revealed that the low-level circulation had tightened up considerably and satellite intensity estimates indicated the depression had strengthened into Tropical Storm Lorena about 350 n mi south-southwest of Acapulco. Lorena tracked steadily west-northwestward at 8 to 12 knots the remainder of the day and gradually turned toward the northwest early on 3 October. The peak intensity of 50 kt occurred around 1200 UTC later that day as Lorena took a more northerly track when it was located about 180 n mi southwest of Manzanillo, Mexico.

By 0000 UTC 4 October, Lorena's forward speed had decreased to around 6 to 8 knots and strong upper-level southwesterly shear began to adversely affect the cyclone. Lorena weakened to a tropical depression at 1200 UTC and dissipated into a non-convective low later that day about 120 n mi southwest of Puerto Vallarta, Mexico. The remnant low-level cloud circulation remained offshore and persisted for another day or so before completely dissipating just west of Cabo Corrientes, Mexico.

The "best track" chart of Tropical Storm Lorena's path is given in Fig. 1, while the best track positions and intensities are listed in Table 1. Wind and pressure plots are shown in Figs. 2 and 3, respectively.

b. Meteorological Statistics

Observations in Lorena (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), as well as flight-level observations from flights of the 53rd Weather Reconnaissance Squadron of the U. S. Air Force Reserve Command.

Lorena's peak intensity of 50 kt at 1200 UTC 3 September is based on compromise of Dvorak satellite classifications from TAFB, SAB, and AFWA. Since Lorena was forecast to make landfall along the southwestern coast of Mexico near hurricane strength, an Air Force Reserve reconnaissance aircraft was dispatched to investigate the system on 3 October. Flights into the cyclone occurred between 1700 and 2300 UTC 3 October, after Lorena's had attained its peak intensity. The aircrew found that Lorena had already begun to rapidly weaken, based on 700 mb flight-level winds of only 29 kt. However, two dropwindsondes released about 100 n mi northeast of the center (outside of any convection) indicated wind speeds of 25 to 30 kt in a deep layer from the surface to 750 mb. This wind data would suggest that minimal tropical storm force winds possibly existed closer in near the cyclone center.

Ship reports of winds of tropical storm force associated with Lorena are given in Table 2. There were no reports of tropical storm force winds over land since Lorena rapidly dissipated before the outer wind field could reach the coastal areas of southwestern Mexico.

c. Casualty and Damage Statistics

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

d. Forecast and Warning Critique

Owing to the short-lived nature of Tropical Storm Lorena, no meaningful forecast verification statistics are available since only two forecast cycles were available at 48 hours and none at 72 hours. However, the errors associated with the limited number of forecasts were near the statistical average for the past 10 years.

Table 3 lists the watches and warnings issued for Tropical Storm Lorena. However, since Lorena weakened faster than expected, none of the tropical storm warnings or hurricane watches verified.

Table 1. Best track for Tropical Storm Lorena, 2-4 October 2001.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
02 / 0000	11.9	102.0	1006	30	tropical depression
02 / 0600	12.0	103.1	1005	30	"
02 / 1200	12.6	104.3	1004	35	tropical storm
02 / 1800	13.2	105.4	1002	40	"
03 / 0000	14.3	106.0	1002	40	"
03 / 0600	15.0	106.3	1000	45	"
03 / 1200	15.7	106.5	997	50	"
03 / 1800	16.2	106.7	1000	45	"
04 / 0000	16.8	106.7	1004	40	"
04 / 0600	17.6	107.0	1004	35	"
04 / 1200	18.5	107.0	1006	30	tropical depression
04 / 1800	19.6	106.7	1009	25	"
05 / 0000					dissipated
03 / 1200	15.7	106.5	997	50	minimum pressure

Table 2. Selected ship reports with winds of at least 34 kt for Tropical Storm Lorena, 2-4 October

2001. Asterisk (*) indicates pressure was not corrected to sea-level.

Date/Time (UTC)	Ship call sign	Latitude (°N)	Longitude (°W)	Wind dir/speed (kt)	Pressure (mb)
03 / 1730	ELXX7	18.7	104.3	090/35	1011.0*
03 / 1800	SHIP	18.2	104.6	100/35	1012.7
03 / 2115	ELXX7	17.9	103.2		1007.0*

Table 3. Watch and warning summary for Tropical Storm Lorena, 2-4 October 2001.

Date/Time (UTC)	Action	Location
03 / 0300	Tropical Storm Warning Issued	Punta San Telmo northward to Mazatlan, Mexico
03 / 0300	Hurricane Watch Issued	Punta San Telmo northward to Mazatlan, Mexico
04 / 0300	Hurricane Watch Discontinued	Punta San Telmo northward to Mazatlan, Mexico
04 / 1500	Tropical Storm Warning Discontinued	Punta San Telmo northward to Mazatlan, Mexico

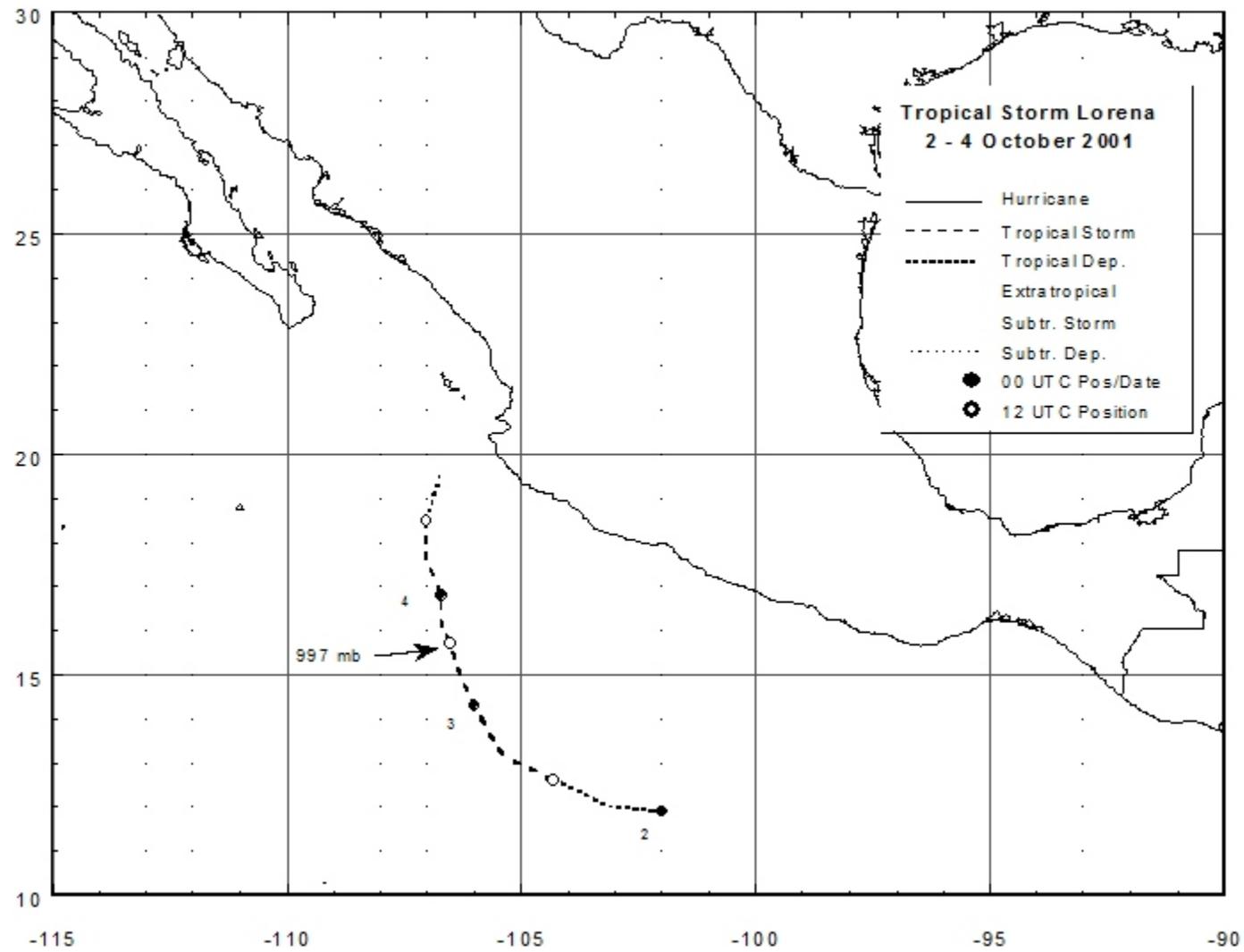


Figure 1. Best track positions for Tropical Storm Lorena, 2-4 October 2001.

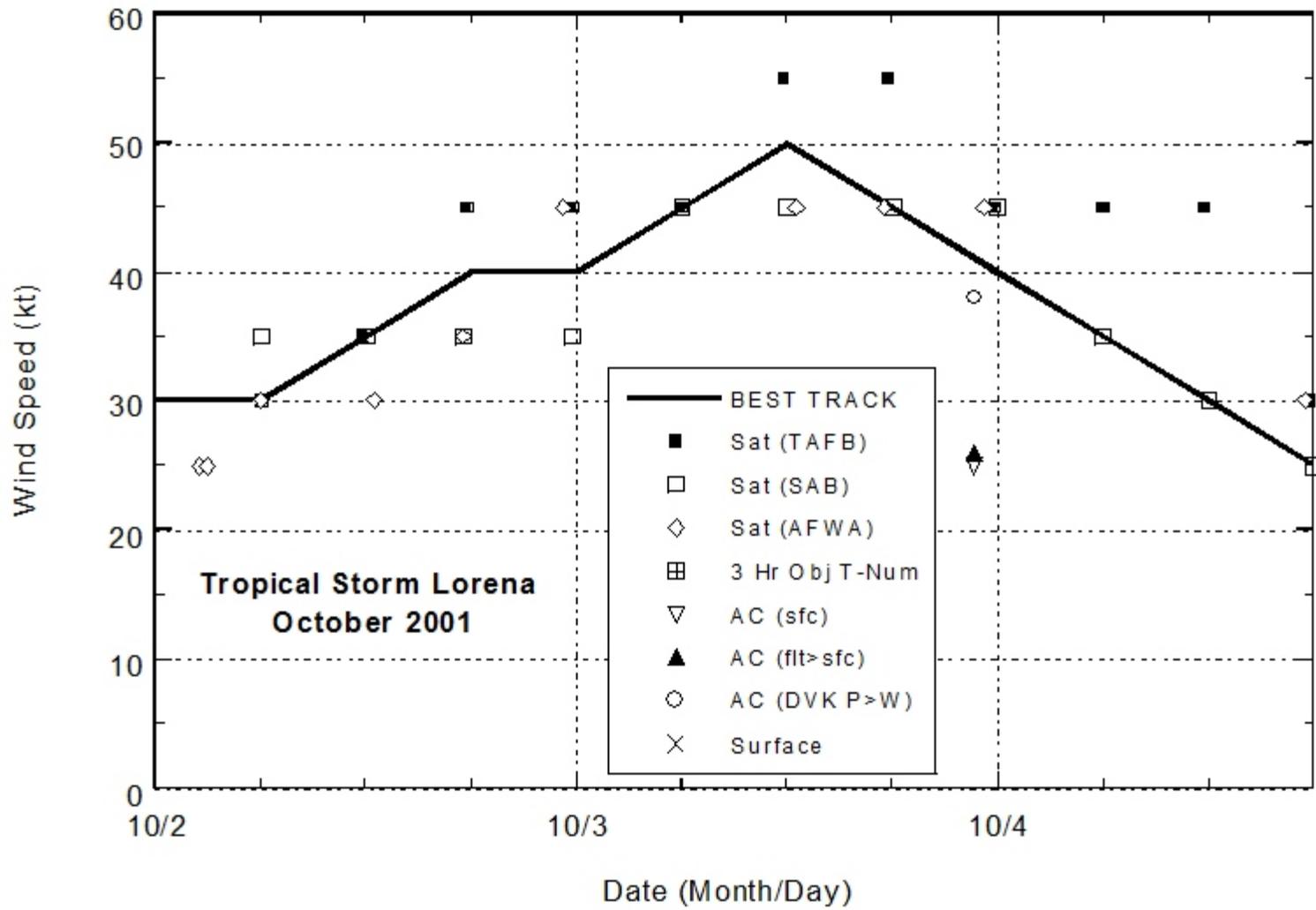


Figure 2. Best track maximum sustained surface wind speed curve for Tropical Storm Lorena, 2-4 October 2001, and the observations on which the best track curve is based. Aircraft observations have been adjusted for elevation using 90%, 80%, and 80% reduction factors for observations from 700 mb, 850 mb, and 1500 ft, respectively.

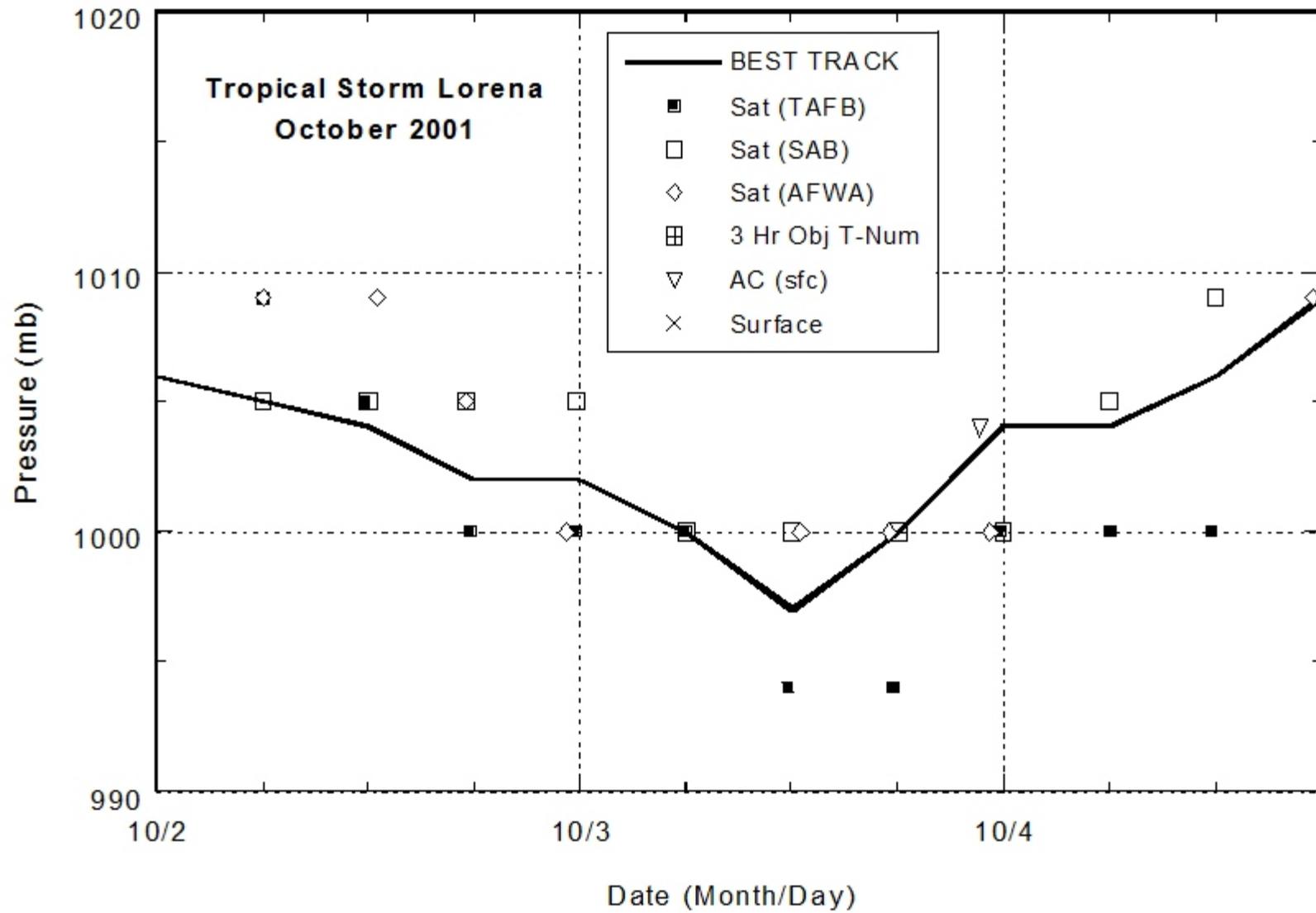


Figure 3. Best track minimum central pressure curve for Tropical Storm Lorena, 2-4 October 2001, and the observations on which the best track curve is based.