Preliminary Report
Hurricane Lester
15-26 October 1998

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Lester moved close, and parallel to, the coast of Mexico for several days, but hurricane conditions remained offshore.

a. Synoptic History

The tropical wave responsible for the origination of Hurricane Lester left Africa on 29 September. This wave initiated the development of Hurricane Lisa in the tropical Atlantic Ocean on 5 October midway between Africa and the Lesser Antilles. The wave itself continued westward, moving across Central America on 11 and 12 October as a poorly-organized cluster of thunderstorms. A low-level circulation center was first observed on satellite imagery on the 13th, in the eastern Pacific Ocean about 150 n mi south of the border between El Salvador and Guatemala. This feature moved slowly northwestward as convection increased near the center and a banding feature formed. It is estimated that Tropical Depression Fourteen-E formed at 0000 UTC on 15 October while centered about 175 n mi south of the coast of Guatemala. This is the time of the beginning of the best-track of Hurricane Lester as shown in Fig. 1 and listed in Table 1.

Lester's track generally paralleled the coast of Mexico from the 15th through the 20th. The track turned southwestward on the 22nd and northwestward on the 24th and dissipation occurred about 450 n mi southwest of the southern tip of the Baja Peninsula on the 26th. On the large scale, the motion is toward the west-northwest at 10 kt or less. This is consistent with the steering associated with a high pressure ridge which was located to the northeast or north during Lester's existence. On a shorter time scale, a short wave trough passed by to the north on the 17th, which slowed the forward motion to nearly stationary for several hours. Another short wave trough slowed the motion to nearly stationary again on the 22nd. A ridge then built to the north causing a motion toward the southwest for a day, followed by a resumption of a northwestward track.

The shape of the track closely resembles the shape of the coastline from the 15th through the 18th (Fig. 1). The track shape, along with its close proximity to the coast, may be coincidental. Mexico is a mountainous country and the effects of this land mass on the track and intensity of a tropical cyclone are not well known.

Lester's center moved to about 100 n mi south of the Guatemala and Mexico coasts on the 15th, while it was a tropical storm. Lester became a hurricane on the 16th and remained one until the 23rd. The closest point of approach of the center to the coast was about 60 n mi south of Puerto Angel, Mexico on the 17th and 18th. Its maximum 1-min surface wind

speed reached 90 kt on the 17th and remained near that speed through the 22nd, when it briefly reached 100 knots. It is possible that tropical storm force winds and some heavy rainfall reached the coast between the Mexico/Guatemala border and Punta Maldonaldo. It is not believed that Lester was close enough for hurricane conditions to reach the coast.

Meteorological statistics

A U.S. Air Force reconnaissance aircraft flew into the center on the 17th and 18th. This was a test of international aviation clearance procedures. The highest wind speed reported by this aircraft was 98 kt at 700 mb on the 18th and the minimum central surface pressure was 973 mb.

Figs. 2 and 3 show plots of the best-track pressure and wind speed curves, along with the reconnaissance data mentioned above and Dvorak satellite intensity estimates. Subjective Dvorak estimates were provided by the U.S. Air Force Weather Agency (AFGWC), the Tropical Analysis and Forecast Branch (TAFB) of the Tropical Prediction Center, NWS and the Satellite Analysis Branch (SAB) of NESDIS. The maximum wind speed of 100 kt on the 22nd is based on satellite imagery showing a well-defined eye embedded in an area of cloud tops of -60 to -70°C.

There have been no observations received of strong winds on the coast of Mexico.

A series of radar images from the Mexican National Meteorological Service radar at Puerto Angel showed the northern half of an eye wall remaining off shore on the 17th and 18th.

c. Casualty and damage statistics

There have been no reports received of casualties or damage.

d. Forecast and warning critique.

For the official track forecasts issued while Lester was a tropical storm or hurricane, the average track errors were 11, 32, 63, 94, 125, and 183 n mi, respectively for the 0-, 12-, 24-, 36-, 48-, and 72-h forecast periods. There were 41 forecast cases verified at the 0-h forecast, decreasing to 29 cases at 72 hours. These errors are slightly smaller than the corresponding 1988-1997 average official errors at all forecast periods.

There was a significant northward bias to the official track forecasts while Lester was near the coast of Mexico. Much of the model guidance also had this bias as a result of forecasting a short wave trough to erode the ridge to the north of the hurricane.

In the early stages, the official wind speed forecasts failed to capture the strengthening and 72-h wind speed forecast errors were as large as 65 knots.

The close proximity of the track to the coastline required the issuance of watches and

warnings from Sipacate, Guatemala westward to Punta San Telmo, Mexico. Tropical storm warnings were issued east of Puerto Arista, Mexico and hurricanes warnings were issued to the west of Puerto Arista to Acapulco. A hurricane watch was issued west of Acapulco to Punta San Telmo. These actions occurred over the period from the 15th to the 19th and are listed in Table 2.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed(kt)	Stage
15/0000	11.3	91.7	1005	30	tropical depression
0600	11.8	91.8	1005	30	"
1200	12.3	92.1	1005	30	"
1800	12.7	92.5	1004	35	tropical storm
16/0000	13.1	93.0	1002	40	"
0600	13.6	93.5	1000	45	"
1200	14.0	94.0	997	50	"
1800	14.2	94.4	991	70	hurricane
17/0000	14.3	94.7	985	75	"
0600	14.4	95.1	980	80	"
1200	14.5	95.4	976	85	"
1800	14.5	95.8	973	85	"
18/0000	14.5	96.4	973	85	"
0600	14.5	97.1	973	85	"
1200	14.4	97.8	973	85	"
1800	14.3	98.5	973	90	"
19/0000	14.2	99.4	970	90	"
0600	14.3	100.3	972	85	"
1200	14.4	101.3	974	85	"
1800	14.6	102.2	978	80	"
20/0000	14.9	103.0	977	85	"
0600	15.0	103.9	973	90	"
1200	15.2	104.8	971	90	"
1800	15.5	105.8	970	90	"
21/0000	15.9	106.7	970	90	"
0600	16.2	107.5	970	90	"
1200	16.5	108.1	970	90	"
1800	16.6	108.6	970	90	"
22/0000	16.6	108.7	970	90	"
0600	16.7	108.8	967	95	"
1200	16.8	108.8	965	100	"
1800	16.7	108.9	966	100	"
23/0000	16.5	109.0	970	95	"
0600	16.3	109.1	980	80	"
1200	16.0	109.4	990	65	"
1800	15.5	109.7	995	60	tropical storm
24/0000	15.2	110.1	998	55	"
0600	15.1	110.6	1000	50	"
1200	15.3	111.3	1002	45	"
1800	15.5	112.0	1003	45	"
25/0000	16.0	112.8	1004	40	"
0600	16.5	113.6	1005	40	"
1200	17.0	114.2	1005	40	"
1800	17.3	114.7	1005	35	"
26/0000	17.4	115.1	1005	30	tropical depression
0600	17.5	115.3	1005	30	"
1200	17.7	115.2	1005	25	"
1800					dissipated
22/1200	16.8	108.8	965	100	minimum pressure

Table 2. Watches and warnings issued for Hurricane Lester, October 1998.

Date/time(UTC)	Action	Location
15/1500	tropical storm warning	Sipacate, Guatemala to Puerto Arista, Mexico
15/1500	tropical storm watch	west of Puerto Arista to Puerto Angel, Mexico
16/0300	tropical storm warning	Puerto Arista to Punta Maldonaldo, Mexico
16/0300	hurricane watch	Puerto Arista to Punta Maldonaldo
16/0900	hurricane warning	Puerto Arista to Punta Maldonaldo
16/1500	tropical storm warning discontinued	Guatemala
17/0900	hurricane watch	west of Punta Maldonaldo to Acapulco, Mexico
17/0900	tropical storm warning discontinued	east of Puerto Arista
17/2100	hurricane warning	Salina Cruz to Acapulco, Mexico
17/2100	hurricane watch	west of Acapulco to Zihuatanejo, Mexico
17/2100	hurricane warning discontinued	east of Salina Cruz
19/0900	hurricane warning discontinued	Salina Cruz to Acapulco
19/0900	hurricane watch	Zihuatanejo to Punta San Telmo, Mexico
19/2100	hurricane watch discontinued	west of Acapulco to Punta San Telmo

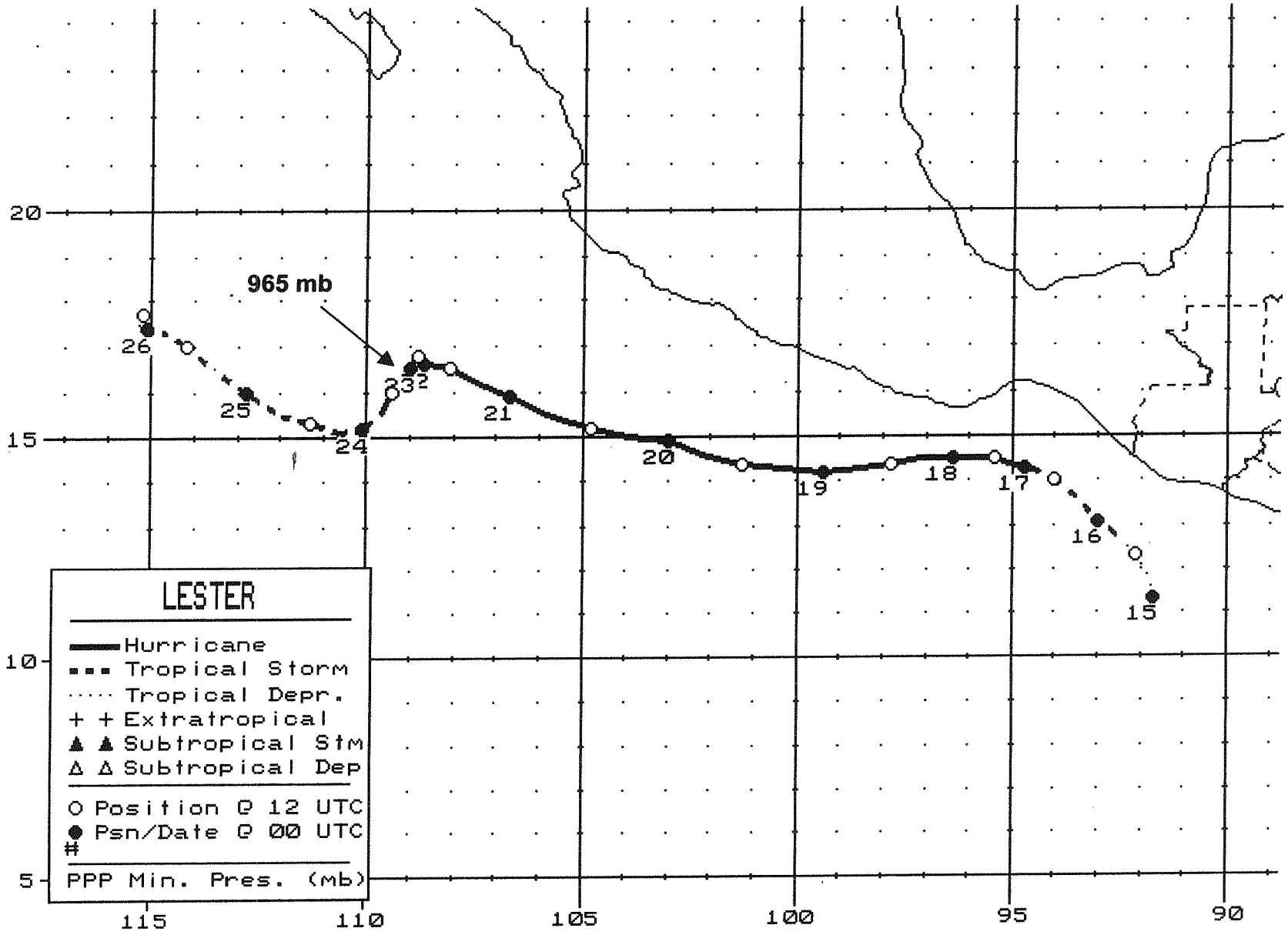

Fig. 1. Best track of Hurricane Lester, 15-26 October 1998.

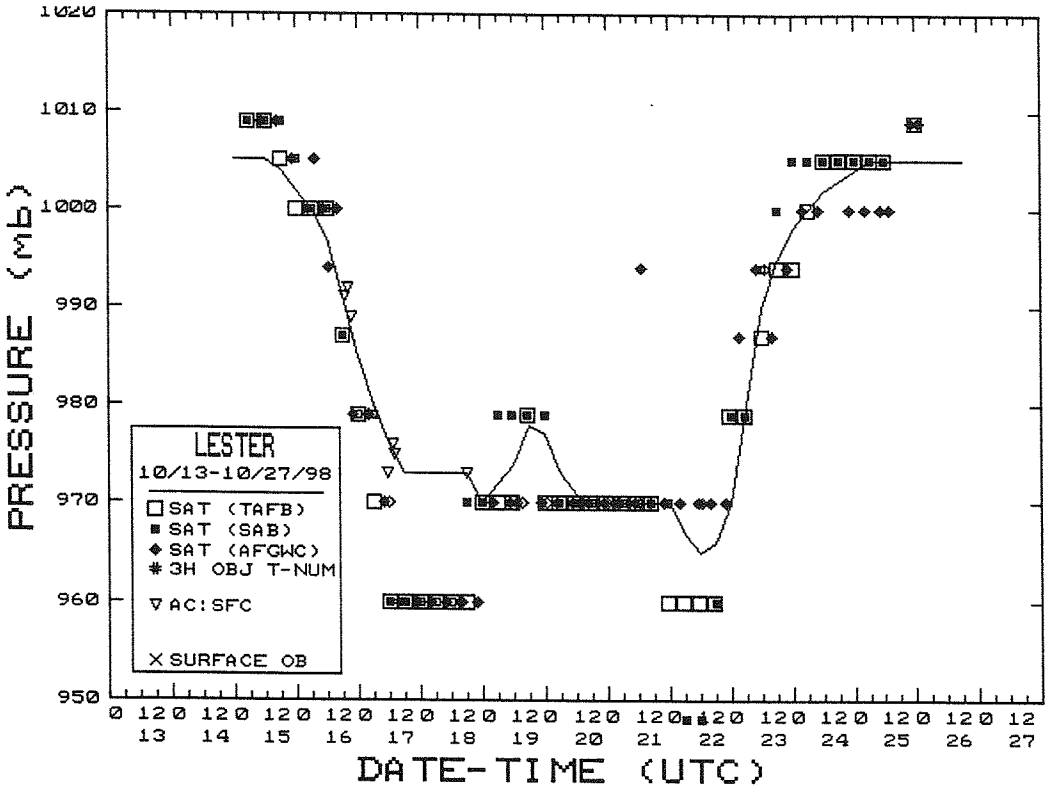

Fig. 2. Best track minimum central pressure curve for Hurricane Lester.

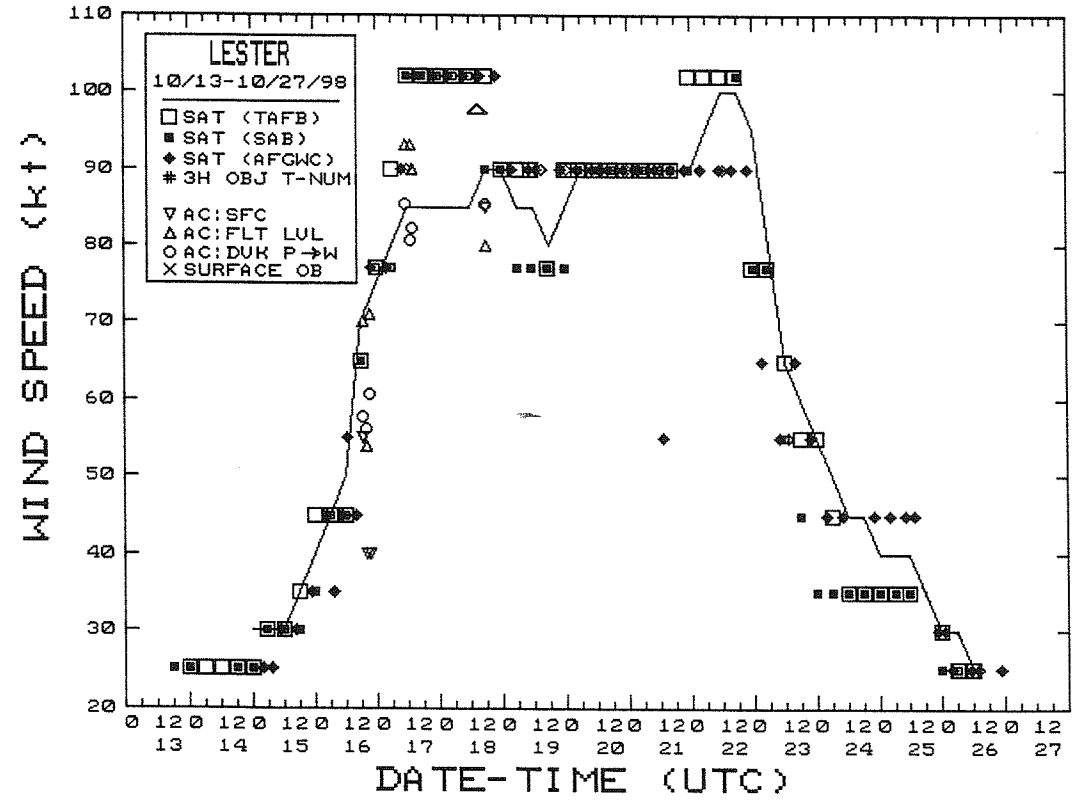

Fig. 3. Best track maximum 1-min wind speed curve for Hurricane Lester.