

Tropical Cyclone Report  
Tropical Storm Olivia  
2 - 10 October 2000

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Olivia was a tropical storm that formed off the southwest coast of mainland Mexico, and generally tracked west-northwestward and remained over open water. After dissipating as a tropical cyclone, the remnant low-level circulation tracked across central Baja California, northwest Mexico and the desert southwest United States.

a. Synoptic history

Tropical Storm Olivia originated from a tropical wave that emerged from the coast of Africa on 16 September. The wave tracked westward across the tropical North Atlantic with disorganized convection, until 25 September when the wave reached the central Caribbean Sea. While the structure of the wave improved upon tracking across the western Caribbean Sea and Central America, the convection remained weak and disorganized. Even after emerging over the eastern North Pacific on 28 September, little thunderstorm activity was associated with the wave until a burst of deep convection developed late on 30 September near the region of maximum vorticity.

The lack of deep convection over the eastern Pacific may have been the result of (1) much of the low-level inflow being drawn into major Hurricane Keith located in the western Caribbean Sea east of Belize and (2) the upper-level outflow from Keith creating northeasterly shear on the pre-Olivia wave. By 2345 UTC 30 September, separation between the wave and Hurricane Keith increased enough to allow sufficient convective banding to develop. The Tropical Analysis and Forecast Branch (TAFB) then began satellite classifications on the system. At 0000 UTC 2 October, the TAFB designated the system as a tropical disturbance with low-level cyclonic winds of 20 to 25 kt. It was upgraded to Tropical Depression Seventeen-E at 1200 UTC. By 0600 UTC 3 October, satellite classifications from both TAFB and the NOAA/NESDIS Satellite Analysis Branch (SAB) indicated the depression had strengthened into Tropical Storm Olivia, about 220 n mi south of Manzanillo, Mexico.

Olivia tracked west-northwestward and eventually northwestward away from the west coast of Mexico and reached a peak intensity of 55 kt late on 3 October. Tropical Storm Olivia maintained that intensity for another 36 hours before gradual weakening ensued, apparently due to an increase in the northeasterly shear again created by Hurricane Keith located to the northeast. Once Keith moved inland over northeast Mexico and weakened, the northeasterly shear previously caused by Keith's outflow decreased enough to allow Olivia to strengthen back to 55 kt early on 8 October. By that time, however, Olivia had tracked far enough westward over cooler sea-surface temperatures to begin the final weakening phase. Olivia decreased back to tropical depression strength at 0600 UTC 9 October, and dissipated over water at 0600 UTC 10 October about 520 n mi west-southwest of the southern tip of the Baja California Peninsula of Mexico.

The remnant low-level circulation of Olivia tracked steadily northward and then northeastward. It persisted as a swirl of low clouds until early 11 October when a brief burst of moderate convection developed northeast of the low-level center. The new convection was unable to persist near the low-

level center due to increasing southwesterly shear ahead of a mid-to upper-level trough approaching from the west. The remnant circulation did eventually make landfall along the west coast of Baja California about midway between Punta Eugenia and Cabo San Lazaro. It then tracked across the Gulf of California and into northwest mainland Mexico and the southwest United States. While not classified as a tropical cyclone at landfall, the remnant of Olivia did bring considerable rainfall to the normally arid regions of Baja California, northwest Mexico, and the desert southwest U.S. Although not spectacular by most standards, rainfall totals exceeded 3 inches across those areas and produced localized flash flooding.

b. Meteorological statistics

The “best track” of Olivia is given in Table 1 and Figure 1. Figures 2 and 3 show the best track maximum sustained (1 min average) surface (10 m elevation) wind speed and minimum central pressure, as well as the associated observations. These include Dvorak satellite technique position and intensity estimates from the TAFB, the SAB, and the Air Force Weather Agency (AFWA).

c. Casualty and Damage Statistics

Olivia developed offshore the west coast of mainland Mexico and remained to the south of Baja California. It had no direct effect on land while a tropical cyclone and no reports of damage or casualties were received by the National Hurricane Center. There were no reports of tropical storm force winds from any ships.

d. Forecast and Warning Critique

NHC official average track forecast errors for Olivia were 32, 51, 70, 93, and 133 n mi at 12 (23 cases), 24 (21 cases), 36 (19 cases), 48 (17 cases) and 72 h (13 cases), respectively. These errors are considerably smaller than the 1990-1999 averages of 37, 69, 101, 132, and 189 n mi. A few of the objective aids had slightly lower forecast errors than the official forecast at 12, 24, and 36 h. The official forecast errors were considerably better than most of the objective aids at 48 and 72 h, especially at 72 h where the GFDL, NOGAPS, and UKMET models had errors of 180, 170, and 175 n mi, respectively.

NHC intensity forecast errors were near the 1990-1999 averages at 12 and 24 h, and worse than the average at 36, 48, and 72 h. There was a negative bias (underforecast) during the first 36 h when Olivia was strengthening and a positive bias (winds overforecast) in all of the forecasts afterwards, especially at 36, 48, and 72 h. The overforecasts of intensity were apparently due to the underestimation of the effects of vertical shear caused by Hurricane Keith’s outflow, even though Keith remained located well to the northeast of Olivia over the western Caribbean Sea and southwest Gulf of Mexico.

There were no tropical cyclone watches or warnings associated with Olivia.

Table 1. Best track, Tropical Storm Olivia, 2-10 October 2000.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
02 / 1200	15.3	103.1	1006	25	tropical depression
02 / 1800	15.3	103.5	1005	30	"
03 / 0000	15.3	103.8	1005	35	tropical storm
03 / 0600	15.3	104.0	1003	35	"
03 / 1200	15.3	104.2	1002	40	"
03 / 1800	15.4	104.5	994	55	"
04 / 0000	15.5	104.8	994	55	"
04 / 0600	15.7	105.2	994	55	"
04 / 1200	15.8	105.5	994	55	"
04 / 1800	15.9	105.9	994	55	"
05 / 0000	16.0	106.5	994	55	"
05 / 0600	16.0	107.0	994	55	"
05 / 1200	15.9	107.6	994	50	"
05 / 1800	15.8	108.0	1000	50	"
06 / 0000	15.7	108.4	1000	45	"
06 / 0600	15.6	108.7	1002	35	"
06 / 1200	15.5	109.1	1001	45	"
06 / 1800	15.6	109.5	1003	45	"
07 / 0000	15.9	110.0	1002	45	"
07 / 0600	16.1	110.6	1000	45	"
07 / 1200	16.5	111.3	997	45	"
07 / 1800	16.9	111.9	994	45	"
08 / 0000	17.4	112.5	997	50	"
08 / 0600	17.8	113.3	1000	55	"
08 / 1200	18.1	114.0	1000	50	"
08 / 1800	18.5	114.9	1000	40	"
09 / 0000	18.9	115.7	1004	35	"

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
09 / 0600	19.4	116.6	1006	30	tropical depression
09 / 1200	19.9	117.4	1006	30	"
09 / 1800	20.3	117.8	1006	30	"
10 / 0000	20.7	118.3	1007	25	"
10 / 0600	21.0	118.7	1008	20	"
10 / 1200					dissipated over water
03 / 1800	15.4	104.5	994	55	minimum pressure
04 / 0000	15.5	104.8	994	55	"
04 / 0600	15.7	105.2	994	55	"
04 / 1200	15.8	105.5	994	55	"
04 / 1800	15.9	105.9	994	55	"
05 / 0000	16.0	106.5	994	55	"
05 / 0600	16.0	107.0	994	55	"
05 / 1200	15.9	107.6	994	50	"
07 / 1800	16.9	111.9	994	45	"

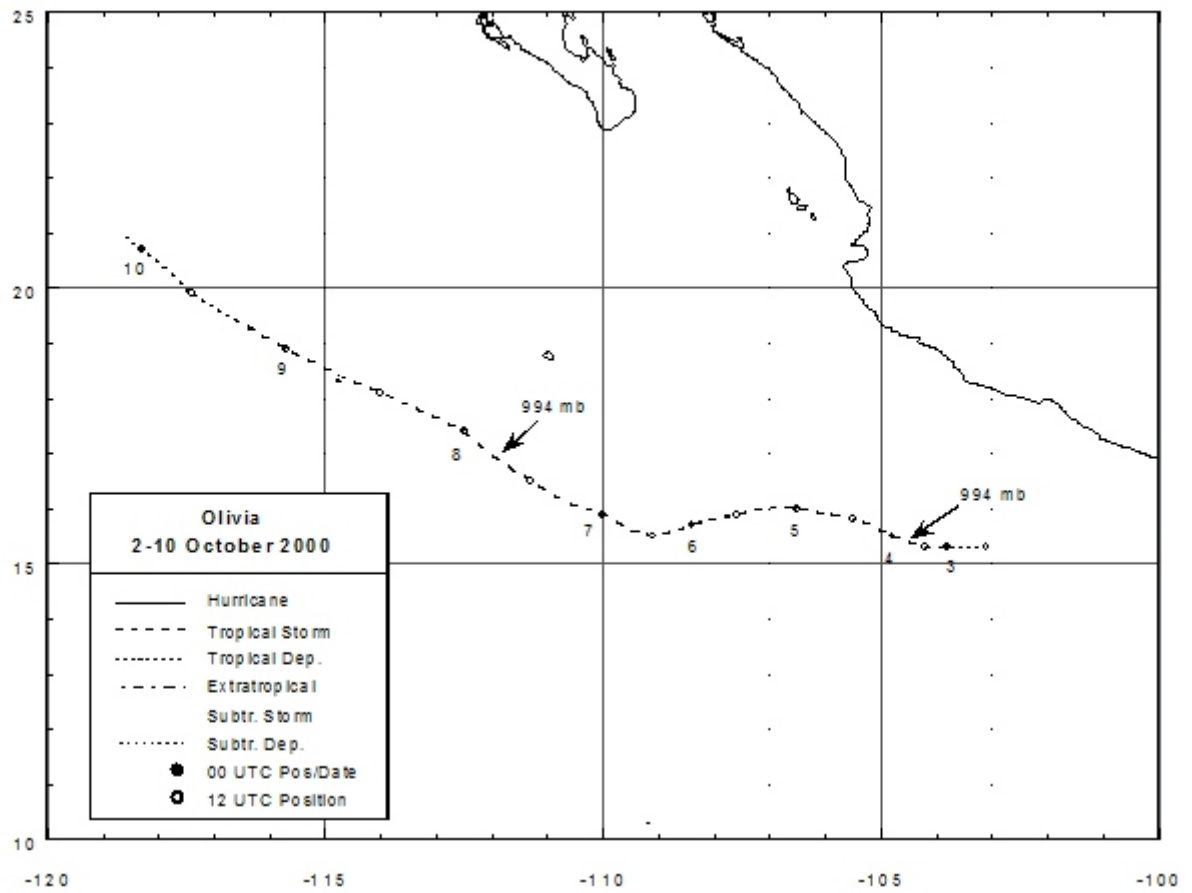


Figure 1. Best track for Tropical Storm Olivia, 2-10 October 2000.

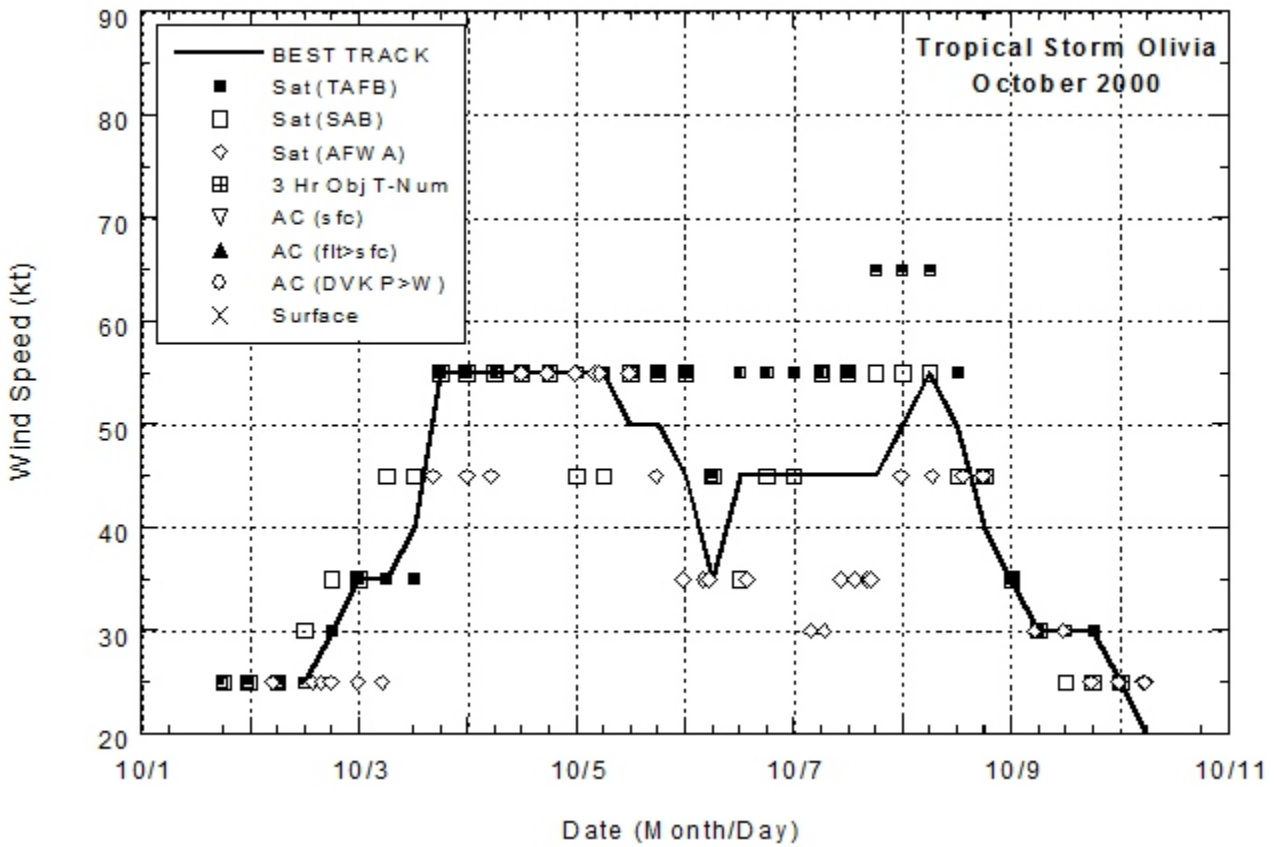


Figure 2. Best track maximum sustained 1-minute 10 meter wind speed curve for Tropical Storm Olivia, 2-10 October 2000.

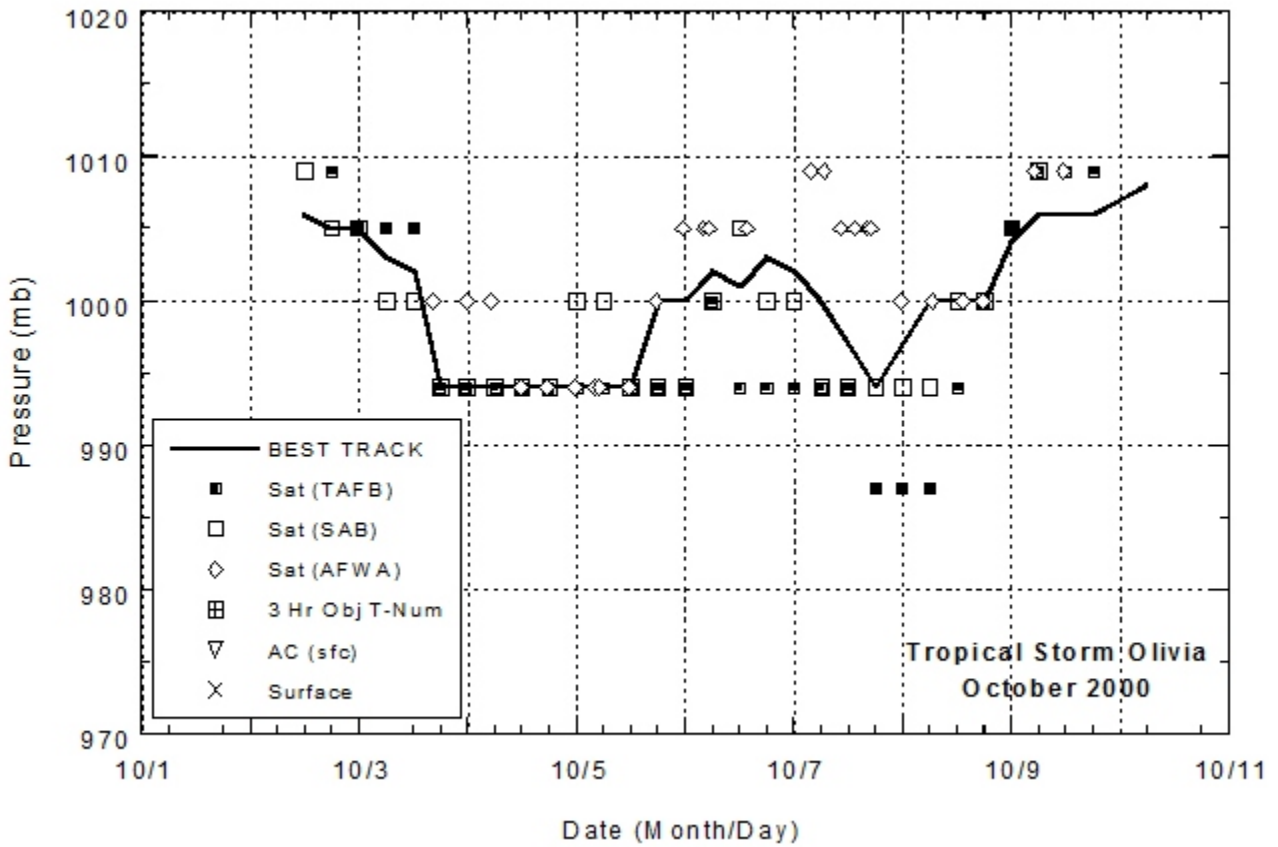


Figure 3. Best track minimum central pressure curve for Tropical Storm Olivia, 2-10 October 2000.