

Preliminary Report
Tropical Storm Calvin
25-27 July 1999

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30 July 1999

Calvin was a minimal tropical storm that remained well away from any land areas.

a. Synoptic History

Calvin developed from a tropical wave that emerged off the coast of Africa on 9 July. The wave crossed Central America and entered the Pacific Ocean 11 days later on the 20th. The wave showed some evidence of a mid-level circulation on the 23rd, and it slowly became better organized over the next two days. ERS scatterometer wind data suggest that an elongated low-level circulation formed within the ITCZ on the 24th, but the system did not yet have the organized convection required of a tropical depression. At 0600 UTC on the 25th, depression status was attained when the circulation, located about 560 nm south-southwest of Cabo San Lucas, became better defined and was accompanied by persistent deep convection in its southeast quadrant.

Satellite microwave imagery indicated that the circulation continued to become better organized over the next several hours, and storm strength was reached at 1200 UTC on the 25th. Almost immediately thereafter, west-northwesterly vertical shear exposed the low-level center and halted the intensification process. Calvin moved to the west-northwest over the next 24 hours in a sheared state with only occasional convection near the center. Satellite classifications indicate that Calvin weakened to a depression at 1200 UTC on the 26th. Late on the 26th, there was an increase in deep convection and a turn to the northwest at a somewhat slower forward speed, with the latter perhaps a response to a mid-tropospheric trough to the northwest of the depression. An alternative possibility is the proximity of Calvin to the developing circulation of Tropical Depression Six-E, which was located about 400 n mi to the southwest. Calvin's convective burst did not persist and the depression dissipated by 1200 UTC 27 July. A low-cloud swirl remained and subsequently continued on a west-northwesterly course for another couple of days.

The "best-track" of Calvin is listed in Table 1 and illustrated in Figure 1.

b. Meteorological Statistics

Figures 2 and 3 show the best track curves of maximum sustained surface wind (defined as a 1 min average at an elevation of 10 m) and minimum central pressure, respectively, as well as the observations on which the best track estimates are based. There were no direct measurements of surface winds; the best track values are based on interpretation of Dvorak satellite classifications

from the Tropical Analysis and Forecast Branch (TAFB) of the Tropical Prediction Center, the NOAA/NESDIS Satellite Analysis Branch (SAB), and the Air Force Weather Agency (indicated by AFGWC in figure legends). In some cases, operational classifications have been reexamined, in view of differences between the operational and best track position estimates.

There are no known ship or land reports of winds in excess of 34 kt associated with Calvin.

c. Casualty and Damage Statistics

Calvin remained at sea during its brief lifetime; there have been no reports of casualties or damage.

d. Forecast and Warning Critique

Calvin was a tropical storm for only 18 hours; therefore only two 12-h forecasts verified. The average error of these two forecasts was 38 n mi, about equal to the 1988-97 period mean.

Acknowledgments:

ERS scatterometer data were obtained from the Fleet Numerical Meteorology and Oceanography web site. Satellite microwave imagery was obtained from the Naval Research Laboratory web site.

Table 1. Best track for Tropical Storm Calvin, 25-27 July 1999.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
25/0600	14.9	115.2	1006	30	tropical depression
25/1200	15.3	116.2	1005	35	tropical storm
25/1800	15.7	117.2	1006	35	“
26/0000	16.1	118.2	1006	35	“
26/0600	16.6	119.2	1006	35	“
26/1200	17.0	120.3	1006	30	tropical depression
26/1800	17.3	121.5	1006	30	“
27/0000	17.8	122.1	1006	30	“
27/0600	18.5	122.6	1007	25	“
25/1200	15.3	116.2	1005	35	minimum pressure

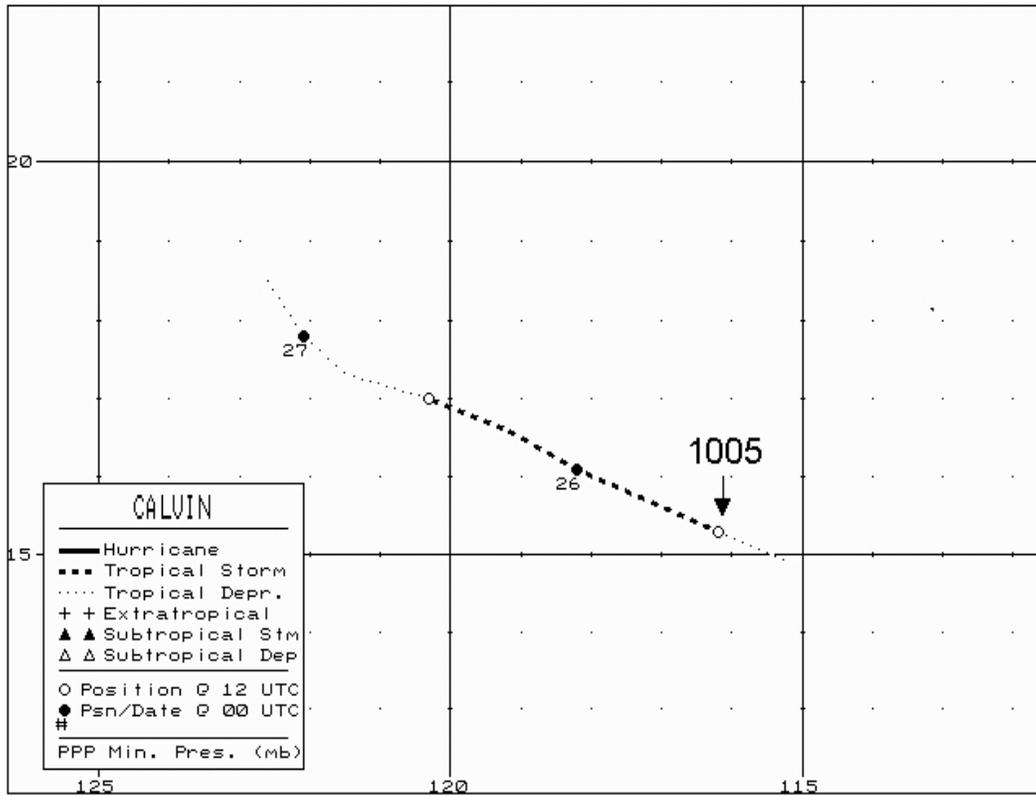


Figure 1. Best track positions for Tropical Storm Calvin, 25-27 July 1999.

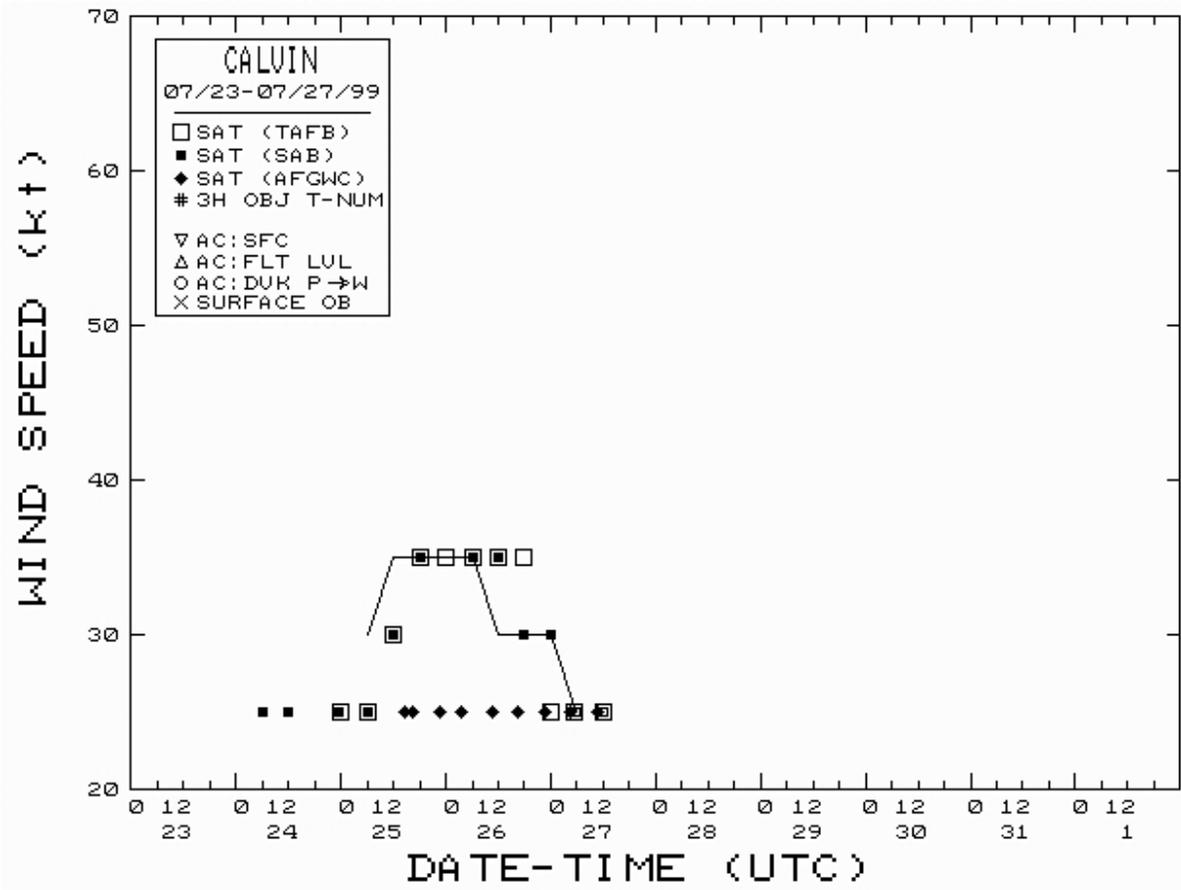


Figure 2. Best track maximum sustained wind speed curve for Tropical Storm Calvin.

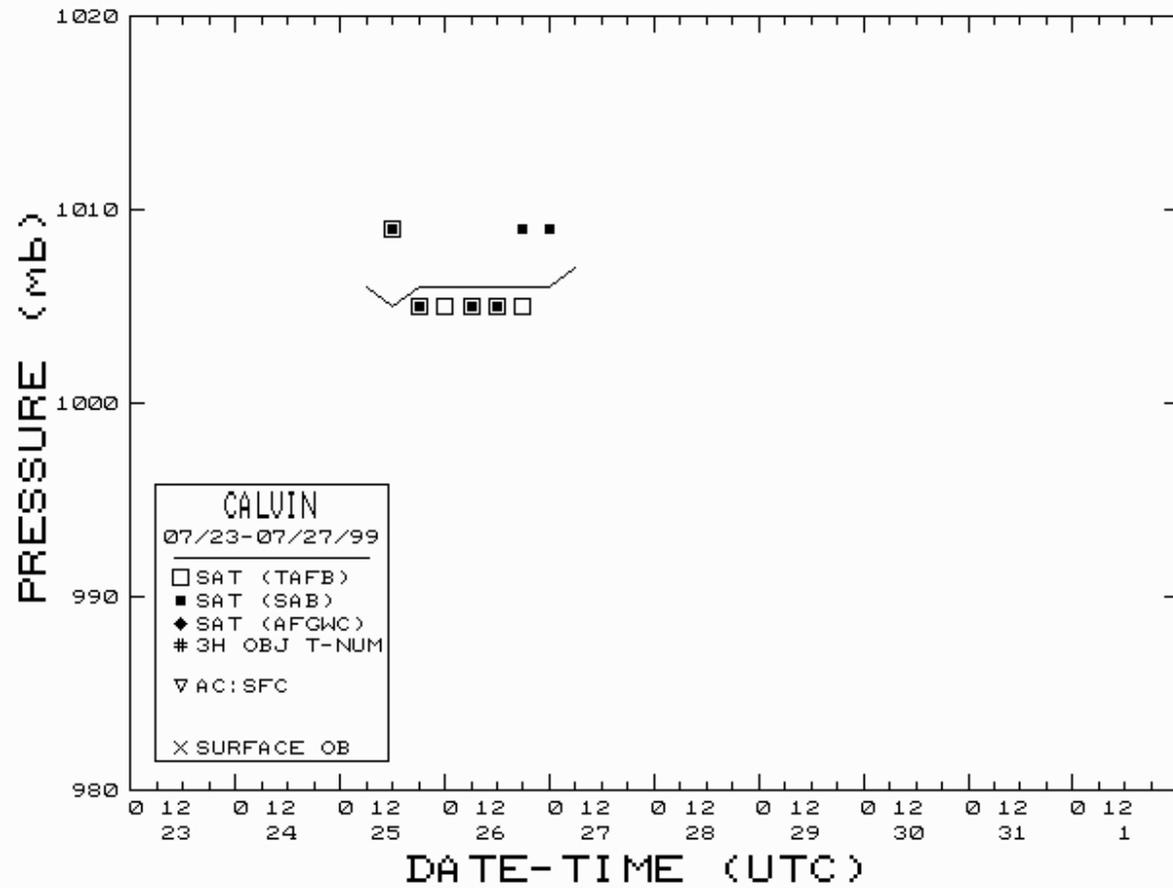


Figure 3. Best track minimum central pressure curve for Tropical Storm Calvin.