

Tropical Cyclone Report
Tropical Storm Olivia
(EP162006)
09-12 October 2006

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Tropical Storm Olivia was a short-lived tropical cyclone that remained over the open waters of the eastern North Pacific Ocean.

a. Synoptic History

Olivia originated from a tropical wave that moved off the west coast of Africa on 18 September 2006. Minor flareups of convection occurred on 19 and 20 September when the wave was located south and southwest, respectively, of the Cape Verde Islands. Otherwise, the wave marched uneventfully westward across the tropical Atlantic Ocean and northern South America remaining devoid of any significant convection. However, upon reaching the eastern North Pacific waters on 29 September, convection began to slowly increase. The wave continued westward at a slower forward speed around 10 kt, and by early on 5 October a broad surface low pressure system had developed along the wave axis. Convection gradually increased over the next few days and Dvorak satellite classifications were initiated on early on 7 October. The low pressure system continued to become better defined, while convection continued to increase both in vertical depth and horizontal coverage. However, moderate upper-level westerly wind shear did not allow the convection to persist near the low-level circulation center for more than a few hours at any given time, which prevented the system from obtaining the organization required of a tropical depression. As the low pressure system moved slowly westward, convection steadily increased and gradually organized into a long curved band in the northern semicircle, and it is estimated that a tropical depression formed by 1800 UTC 9 October 2006 about 1180 n mi west-southwest of the southern tip of Baja California, 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 forming, Tropical Depression Sixteen-E turned slowly northward and moved into a region of weaker vertical wind shear, and strengthened into a tropical storm at 0600 UTC 10 October. Shortly after obtaining tropical storm status, Olivia began to gradually accelerate toward the northeast at 8-12 kt and reached its estimated peak intensity of 40 kt just 6 h later. However, almost as quickly as Olivia strengthened, it weakened as it moved into a region of stronger upper-level southerly winds and drier air, which caused deep convection to decrease and become displaced away from the low-level circulation center (Fig. 4). The cyclone became a tropical depression by 1200 UTC 11 October about 900 n mi west-southwest of southern Baja California. The depression turned eastward and strong vertical shear caused the cyclone to degenerate into a non-convective remnant low pressure system early on 13 October. The remnant

low moved east-southeastward and by 0000 UTC 15 October was absorbed into the southern portion of the larger remnant circulation of former Tropical Storm Norman (EP152006) when the latter system was centered about 130 n mi south-southwest of Manzanillo, Mexico. It is possible that the remnants of Olivia played a role in the redevelopment of Norman back into a tropical cyclone just 6 h later.

b. Meteorological Statistics

Observations in Olivia (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 satellite 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 Olivia. The peak intensity of 40 kt is based on a blend of Dvorak satellite intensity estimates from TAFB, SAB, and AFWA and the ragged appearance in passive microwave satellite imagery. However, a minimum central pressure of 1000 mb, which typically corresponds to an intensity of 45 kt, was assigned due to the background environmental pressures being lower than average by at least 3 mb.

No wind reports of tropical storm force were received in association with Olivia.

c. Casualty and Damage Statistics

There were no reports of damage or casualties associated with Olivia.

d. Forecast and Warning Critique

The genesis of Tropical Storm Olivia was well anticipated in the eastern North Pacific Tropical Weather Outlook product (TWO). The incipient disturbance was first mentioned in the 1700 UTC 5 October 2006 TWO, and potential tropical cyclogenesis was explicitly mentioned in the 2300 UTC 6 October outlook. A tropical depression formed 67 h later.

A verification of official and guidance model track forecasts is given in Table 2. Average official track errors for Olivia were 40, 78, 105, 89, and 84 n mi for the 12, 24, 36, 48, and 72 h forecasts, respectively. The sample size was quite small with the number of forecasts ranging from 11 at 12 h to 1 at 72 h. These errors are greater than the average long-term official track errors (Table 4) through 36 h, and then considerably smaller than average at 48 and 72 h. After turning northeastward, Olivia accelerated sooner than expected and this is the main reason for the larger track errors through 36 h.

Average official intensity errors (Table 3) were 4, 4, 7, 9, and 10 kt for the 12, 24, 36, 48, and 72 h forecasts, respectively. These errors are smaller than the average long-term official intensity errors of 6, 11, 14, 17, 19, and 18 kt, respectively. The negative effects of vertical wind

shear were well anticipated, and the OFCL forecasts outperformed all of the statistical intensity forecast models.

Table 1. Best track for Tropical Storm Olivia, 9-12 October 2006.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
09 / 1800	12.8	127.7	1005	30	tropical depression
10 / 0000	13.3	127.7	1005	30	"
10 / 0600	13.9	127.7	1003	35	tropical storm
10 / 1200	14.5	127.3	1001	40	"
10 / 1800	15.4	126.5	1000	40	"
11 / 0000	16.2	125.7	1001	40	"
11 / 0600	16.6	125.3	1003	35	"
11 / 1200	16.8	124.7	1004	30	tropical depression
11 / 1800	17.1	123.9	1005	30	"
12 / 0000	17.3	123.1	1006	30	"
12 / 0600	17.5	122.3	1007	25	"
12 / 1200	17.6	121.5	1007	25	"
12 / 1800	17.6	120.6	1008	25	"
13 / 0000	17.3	119.9	1008	25	low
13 / 0600	17.1	119.3	1008	25	"
13 / 1200	16.8	118.6	1008	25	"
13 / 1800	16.5	117.8	1008	25	"
14 / 0000	16.2	116.8	1008	25	"
14 / 0600	15.8	115.6	1009	20	"
14 / 1200	15.3	114.4	1009	20	"
14 / 1800	14.8	113.0	1009	20	"
15 / 0000					Absorbed into remnant circulation of TS Norman
10 / 1800	15.4	126.5	1000	40	minimum pressure

Table 2. Preliminary track forecast evaluation (heterogeneous sample) for Tropical Storm Olivia, 9-12 October 2006. 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.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
CLP5	58 (11)	143 (9)	240 (7)	370 (5)	669 (1)		
GFNI	31 (4)	61 (2)	132 (2)				
GFDI	47 (11)	85 (9)	103 (7)	115 (5)	93 (1)		
GFDL*	51 (11)	86 (9)	98 (7)	108 (5)	39 (1)		
GFDN*	39 (7)	50 (2)	109 (2)				
GFSI	54 (11)	98 (9)	112 (7)	124 (4)			
GFSO*	58 (11)	102 (9)	127 (6)	118 (4)	111 (1)		
AEMI	43 (11)	77 (9)	88 (7)	87 (5)	80 (1)		
NGPI	38 (8)	96 (6)	157 (4)	215 (2)	252 (1)		
NGPS*	26 (7)	35 (5)	94 (3)	112 (1)			
UKMI	41 (9)	68 (7)	101 (5)	152 (3)			
UKM*	64 (5)	88 (4)	120 (3)	174 (2)			
BAMD	92 (11)	199 (9)	351 (7)	480 (5)	774 (1)		
BAMM	58 (11)	110 (9)	171 (7)	203 (5)	397 (1)		
BAMS	35 (11)	72 (9)	108 (7)	138 (5)	239 (1)		
CONU	43 (11)	74 (9)	88 (7)	83 (5)	80 (1)		
GUNA	15 (6)	29 (4)	56 (2)				
FSSE	32 (5)	29 (5)	38 (4)	46 (2)			
OFCL	40 (11)	78 (9)	105 (7)	89 (5)	84 (1)		
NHC Official (2001-2005 mean)	35 (1300)	60 (1152)	83 (1009)	103 (877)	145 (652)	192 (465)	231 (313)

* Output from these models was unavailable at forecast time.

Table 3. Preliminary intensity forecast evaluation (heterogeneous sample) for Tropical Storm Olivia, 9-12 October 2006. Forecast errors (kt) 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.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
SHF5	4.9 (11)	7.9 (9)	7.7 (7)	11.8 (5)	23.0 (1)		
GFDI	5.0 (11)	5.1 (9)	5.3 (7)	4.8 (5)	2.0 (1)		
GFDL*	3.9 (11)	5.9 (9)	5.7 (7)	7.8 (5)	11.0 (1)		
SHIP	4.7 (11)	5.1 (9)	9.1 (7)	11.6 (5)			
DSHP	4.7 (11)	5.1 (9)	9.1 (7)	11.6 (5)			
FSSE	4.8 (5)	6.0 (5)	7.5 (4)	7.5 (2)			
ICON	4.8 (11)	4.3 (9)	6.1 (7)	9.0 (5)			
OFCL	3.6 (11)	4.4 (9)	7.1 (7)	9.0 (5)	10.0 (1)		
NHC Official (2001-2005 mean)	6.2 (1300)	10.8 (1152)	14.3 (1009)	16.5 (876)	18.7 (652)	18.3 (465)	19.3 (313)

* Output from this model was unavailable at forecast time.

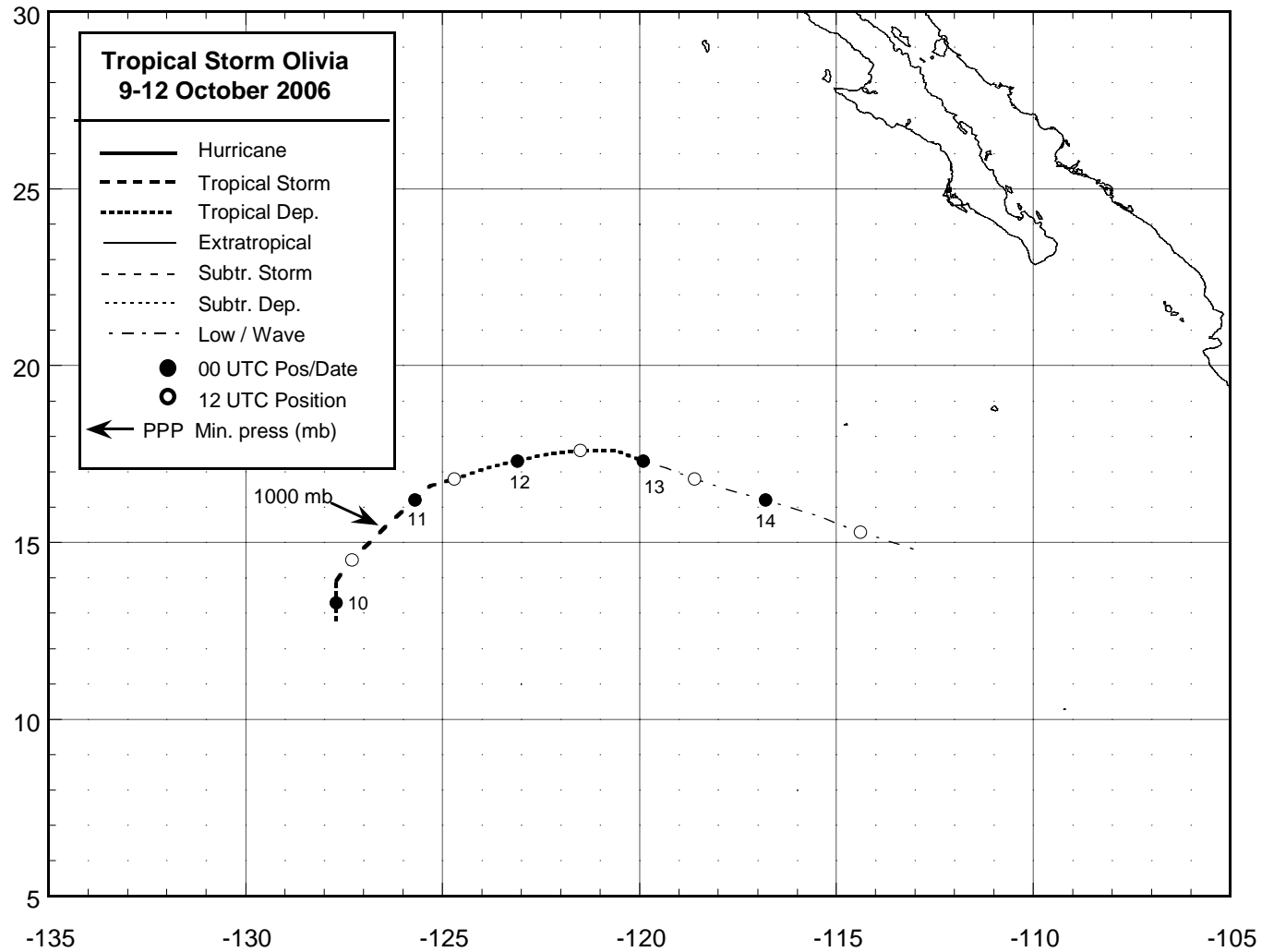


Figure 1. Best track positions for Tropical Storm Olivia, 9-12 October 2006.

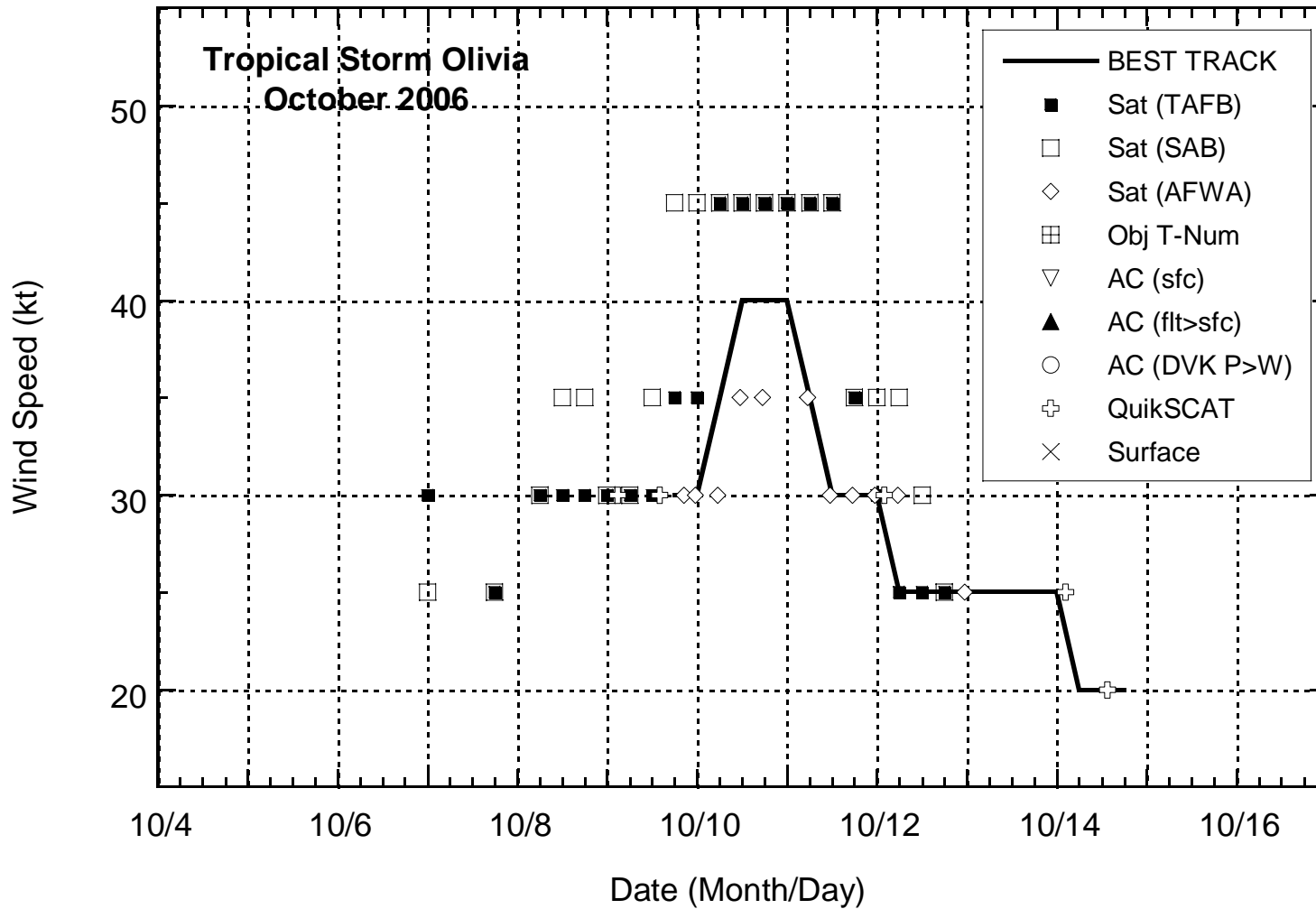


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Olivia, 9-12 October 2006. Estimates during the remnant low stage are based on analyses from the National Hurricane Center and the Tropical Analysis and Forecast Branch.

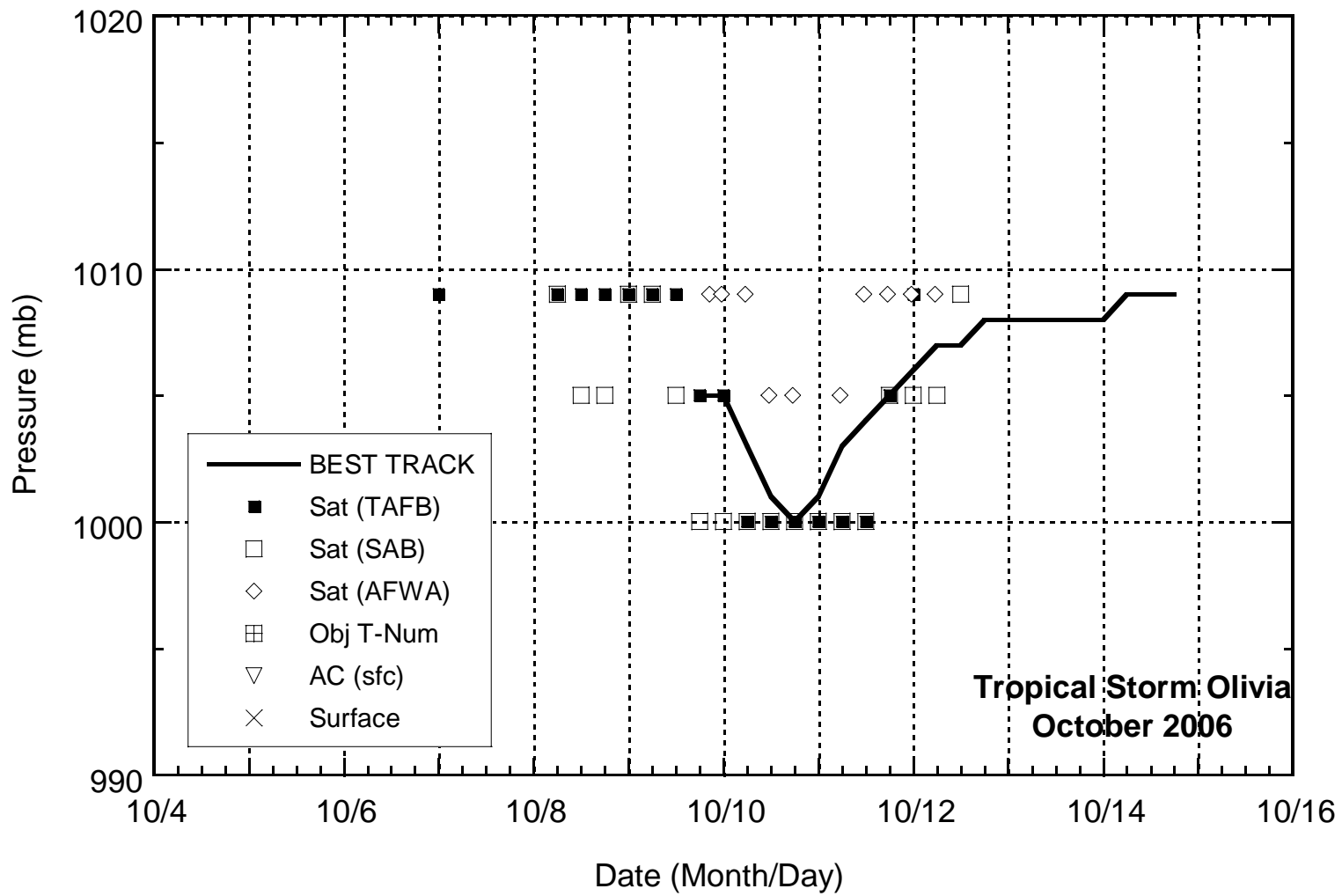


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Olivia, 9-12 October 2006. Estimates during the remnant low stage are based on analyses from the National Hurricane Center and the Tropical Analysis and Forecast Branch.

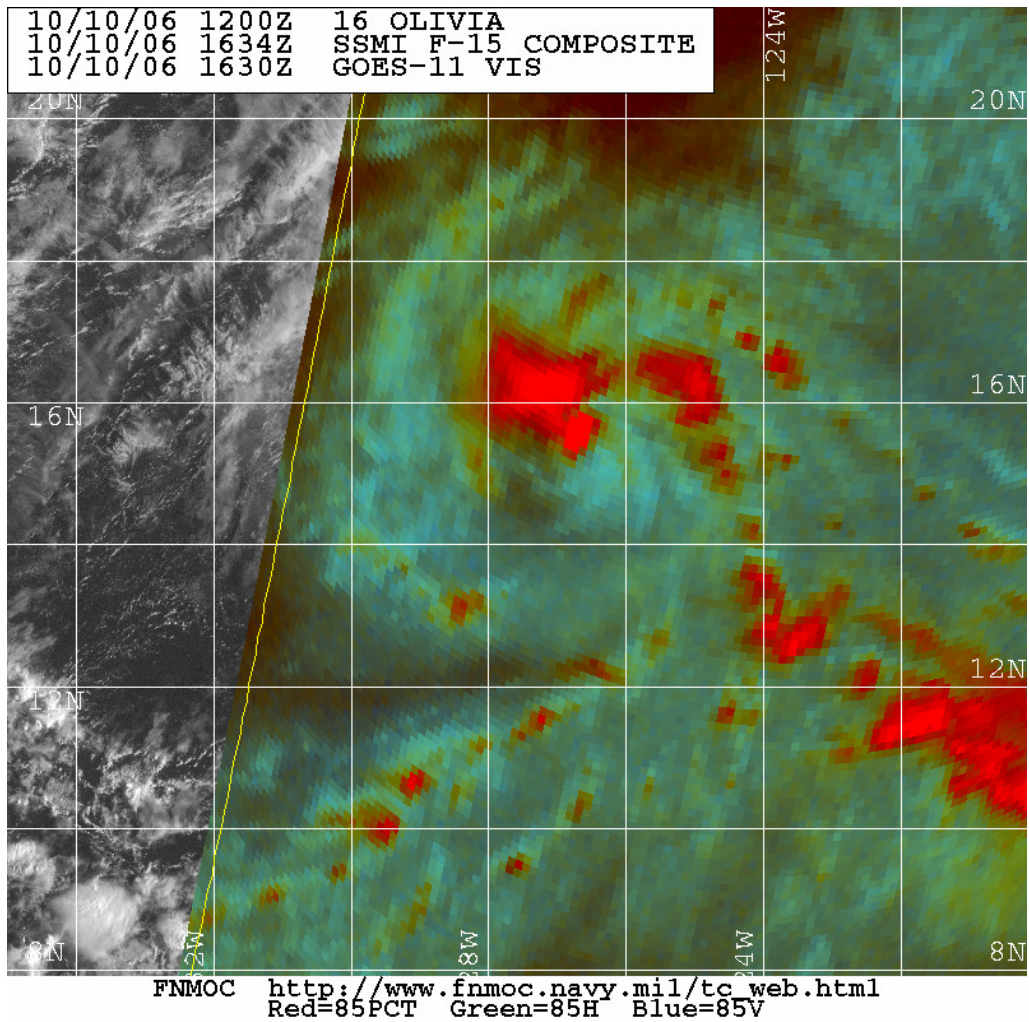


Figure 4. An SSMI 85GHz microwave overpass at 1634 UTC 10 October 2006, which was near the time of Tropical Olivia's peak intensity. The center of circulation was near 15.3° N 126.6° W at that time (image courtesy of the U.S. Navy Fleet Numerical Meteorology and Oceanography Command, Monterey, CA).