



NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

TROPICAL STORM TARA (EP222018)

14–16 October 2018

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National Hurricane Center
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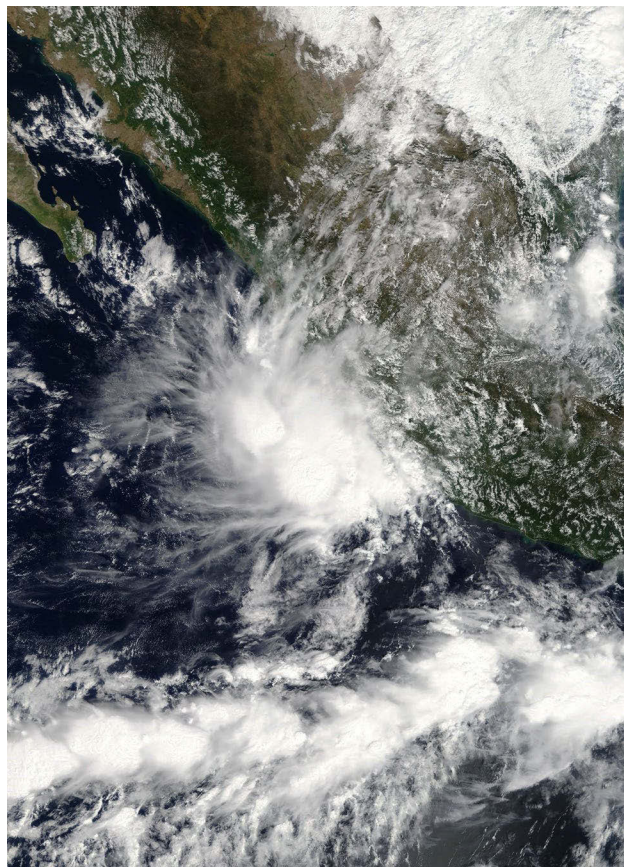


IMAGE OF TROPICAL STORM TARA AT 1730 UTC 15 OCTOBER 2018, COURTESY OF NASA.

Tara was a tiny, short-lived, tropical storm that moved mainly parallel to the coast of southwestern Mexico and dissipated near the coastline.



Tropical Storm Tara

14–16 OCTOBER 2018

SYNOPTIC HISTORY

The disturbance that eventually developed into Tara appeared to come out of the same low-level gyre over Central America that was associated with the genesis of Hurricane Michael over the northwestern Caribbean Sea. From 7 to 10 October, this disturbance moved slowly from Central America to the Gulf of Tehuantepec. Deep convection increased over the Gulf of Tehuantepec on 10 October but was disorganized. Over the next several days, the disturbance moved west-northwestward, parallel to the coast of Mexico, while the associated convection waxed and waned with little change in organization. At 1200 UTC 14 October, the system's deep convection became persistent and better organized and it is estimated that a tropical depression formed while centered about 160 n mi southeast of Manzanillo, 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 1¹.

After genesis, the tropical cyclone moved toward a weakness between a mid-level high over the Gulf of Mexico and a broad trough over the northern Baja California Peninsula, turning from a west-northwestward heading to a north-northwestward track by 15 October. The small cyclone strengthened into a tropical storm early that day, in spite of being under the influence of some easterly shear, while centered about 95 n mi south-southeast of Manzanillo, Mexico. Tara then strengthened some more and reached a peak intensity of 55 kt around 0000 UTC 16 October. Tara's forward speed slowed nearly to a halt that day as the steering currents became very weak. The storm began weakening on 16 October, due to the influence of land and increasing southeasterly shear. By 0000 UTC 17 October, after moving very close to the coast of Mexico west of Manzanillo, the surface circulation of Tara opened up into a trough, and soon thereafter the system completely dissipated.

METEOROLOGICAL STATISTICS

Observations in Tara (Figs. 2 and 3) include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB), and objective Advanced Dvorak Technique (ADT) estimates and Satellite Consensus (SATCON) estimates from the Cooperative Institute for Meteorological Satellite Studies/University of Wisconsin-Madison. Data and imagery from NOAA polar-orbiting satellites

¹ A digital record of the complete best track, including wind radii, can be found on line at <ftp://ftp.nhc.noaa.gov/atcf>. Data for the current year's storms are located in the *bt* directory, while previous years' data are located in the *archive* directory.



including the Advanced Microwave Sounding Unit (AMSU), the NASA/JAXA Global Precipitation Mission (GPM), the European Space Agency's Advanced Scatterometer (ASCAT), and Defense Meteorological Satellite Program (DMSP) satellites, among others, were also useful in constructing the best track of Tara.

The storm's estimated peak intensity of 55 kt at 0000 UTC 16 October is based on a Dvorak classification from TAFB. Microwave imagery showed a fairly well-defined inner core around that time (Fig. 4).

Tara produced locally heavy rainfall over southern Mexico. The maximum rainfall totals reported were 9.51 inches at Cuale, Jalisco, 9.11 inches at José Maria Morelos y Pavón, Michoacan, and 7.13 inches at Cihuatlán, Jalisco.

No land or ship reports of tropical-storm-force winds associated with Tara have been received.

CASUALTY AND DAMAGE STATISTICS

Although heavy rains associated with Tara likely caused some flooding, there are no reports of casualties or damage associated with this system.

FORECAST AND WARNING CRITIQUE

The genesis of Tara was not very well predicted. The disturbance from which the tropical cyclone formed was first mentioned in the Tropical Weather Outlook with a low (<40%) probability of formation within both 2 days and 5 days 84 h prior to genesis (Table 2). The 2- and 5-day genesis probabilities were raised to medium (40–60%) 24 h before formation, and the 5-day probability was set to high (>60%) just 12 h prior to genesis. The 2-day genesis probability never reached the high category before Tara's formation.

A verification of NHC official track forecasts for Tara is given in Table 3a. The mean official track forecast errors were mostly much higher than the most recent 5-year mean errors at the 12- through 48-h forecast intervals. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. Interestingly, the simple trajectory models TABS and TABM had lower errors than the official forecasts at 24 through 48 h for a small number of cases. These models are typically among the most poorly performing track guidance.

A verification of NHC official intensity forecasts for Tara is given in Table 4a. The mean official intensity forecast errors were slightly higher than the long-term means at 12 and 24 h, and lower than the long-term means at 36 and 48 h. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. In general, the best intensity guidance was the model consensus, IVCN, which had lower errors than the official forecast at 12, 24, and 48 h, and errors that were comparable to the official forecast at 36 h. A few of the earlier official intensity forecasts incorrectly called for Tara to move well offshore and to become a



hurricane, but subsequent NHC forecasts accurately predicted Tara's peak intensity of 55 kt, correctly anticipating that the cyclone would remain close to the coast.

Coastal watches and warnings associated with Tara are listed in Table 5.

ACKNOWLEDGMENTS

The Meteorological Service of Mexico provided rainfall totals. Andrew B. Penny produced the track and intensity verification statistics.



Table 1. Best track for Tropical Storm Tara, 14–16 October 2018.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
14 / 1200	17.0	102.8	1006	30	tropical depression
14 / 1800	17.2	103.4	1006	30	"
15 / 0000	17.3	103.8	1005	30	"
15 / 0600	17.6	104.1	1003	35	tropical storm
15 / 1200	17.9	104.2	1001	40	"
15 / 1800	18.2	104.2	1000	45	"
16 / 0000	18.4	104.3	995	55	"
16 / 0600	18.5	104.4	998	50	"
16 / 1200	18.7	104.6	1001	40	"
16 / 1800	18.9	104.9	1003	35	"
17 / 0000					dissipated
16 / 0000	18.4	104.3	995	55	maximum wind and minimum pressure



Table 2. Number of hours in advance of formation associated with the first NHC Tropical Weather Outlook forecast in the indicated likelihood category. Note that the timings for the “Low” category do not include forecasts of a 0% chance of genesis.

	Hours Before Genesis	
	48-Hour Outlook	120-Hour Outlook
Low (<40%)	84	84
Medium (40%-60%)	24	24
High (>60%)	-	12

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Tara. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	23.2	45.9	69.6	117.9			
OCD5	36.8	69.5	119.5	154.0			
Forecasts	8	6	4	2			
OFCL (2013-17)	21.8	33.2	43.0	53.9	80.7	111.1	150.5
OCD5 (2013-17)	34.9	70.7	109.1	146.1	213.8	269.0	339.7



Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Tara. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 3a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	26.3	49.3	72.4	117.9			
OCD5	48.3	82.0	139.4	154.0			
GFSI	36.4	61.6	91.3	161.8			
HWFI	33.6	73.0	113.2	156.9			
EMXI	36.3	61.5	56.3	88.3			
GFEX	26.8	59.0	70.1	119.4			
TVCE	26.1	56.1	70.7	123.5			
HCCA	26.3	63.8	82.4	126.4			
TVCX	24.1	62.4	74.3	116.8			
AEMI	30.7	51.7	75.3	136.5			
TABS	29.9	48.4	55.6	61.3			
TABM	32.4	37.2	37.5	51.7			
TABD	38.1	54.3	93.7	124.2			
Forecasts	5	4	3	2	0	0	0



Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Tara. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	6.2	10.8	10.0	7.5			
OCD5	8.9	11.5	9.8	1.5			
Forecasts	8	6	4	2			
OFCL (2013-17)	5.8	9.6	11.8	13.2	15.1	15.1	14.6
OCD5 (2013-17)	7.6	12.4	15.6	17.7	19.8	20.8	19.6

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Tara. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 4a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	5.0	10.0	10.0	7.5			
OCD5	6.8	10.8	10.0	1.5			
HWFI	4.8	8.5	11.3	10.0			
DSHP	5.4	7.0	4.3	14.0			
LGEM	6.4	11.5	12.3	6.0			
IVCN	4.4	8.5	10.7	7.0			
GFSI	8.4	15.5	19.7	7.5			
EMXI	8.4	9.8	11.3	8.5			
HCCA	4.8	5.8	6.0	10.5			
Forecasts	5	4	3	2			



Table 5. Watch and warning summary for Tropical Storm Tara, 14-16 October 2018.

Date/Time (UTC)	Action	Location
15 / 0900	Tropical Storm Watch issued	Punta San Telmo to Cabo Corrientes
16 / 0300	Tropical Storm Watch modified to	Manzanillo to Punta San Telmo
16 / 0300	Tropical Storm Warning issued	Manzanillo to Cabo Corrientes
16 / 2100	Tropical Storm Watch discontinued	All
16 / 2100	Tropical Storm Warning discontinued	All

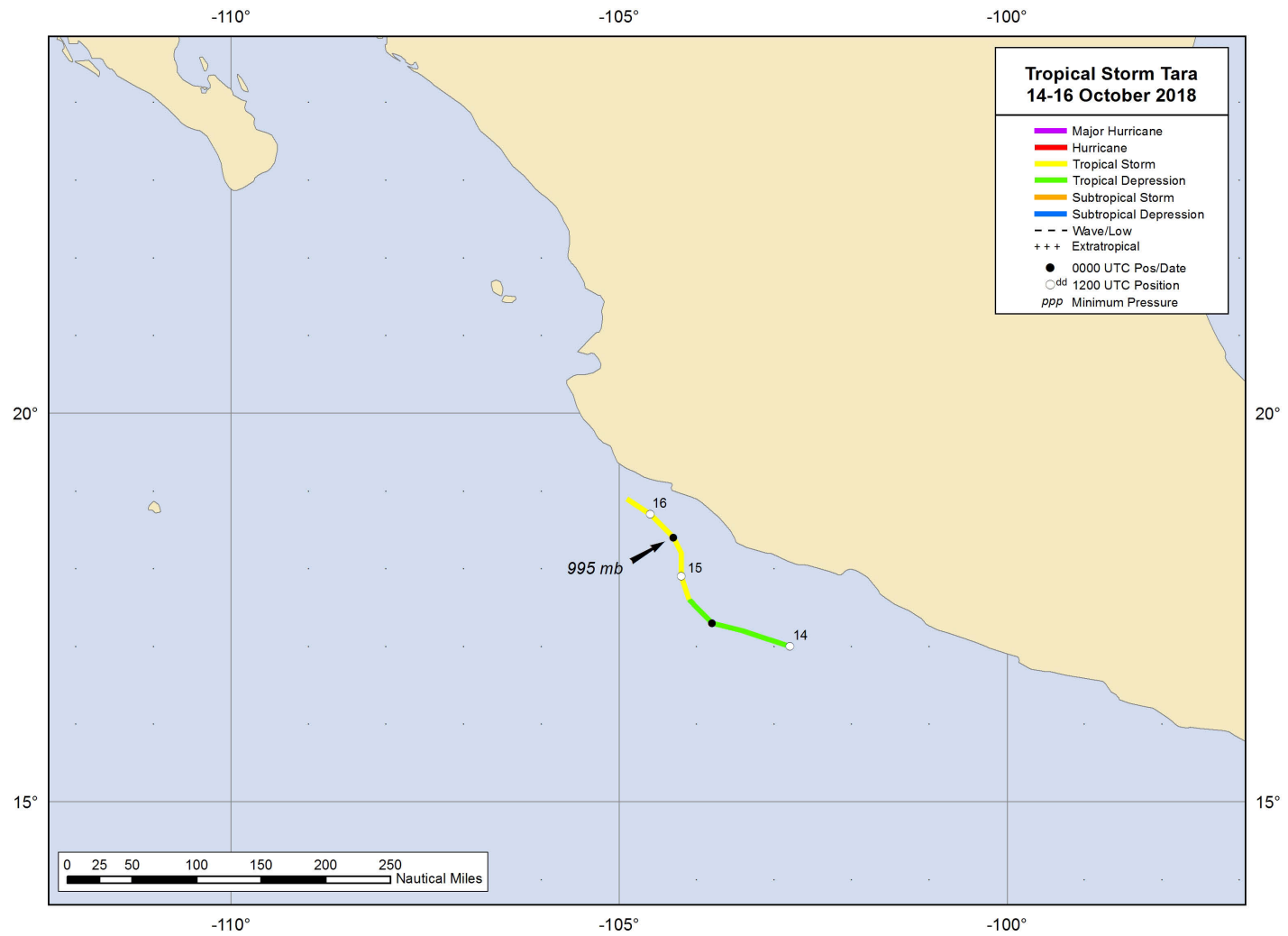


Figure 1. Best track positions for Tropical Storm Tara, 14–16 October 2018.

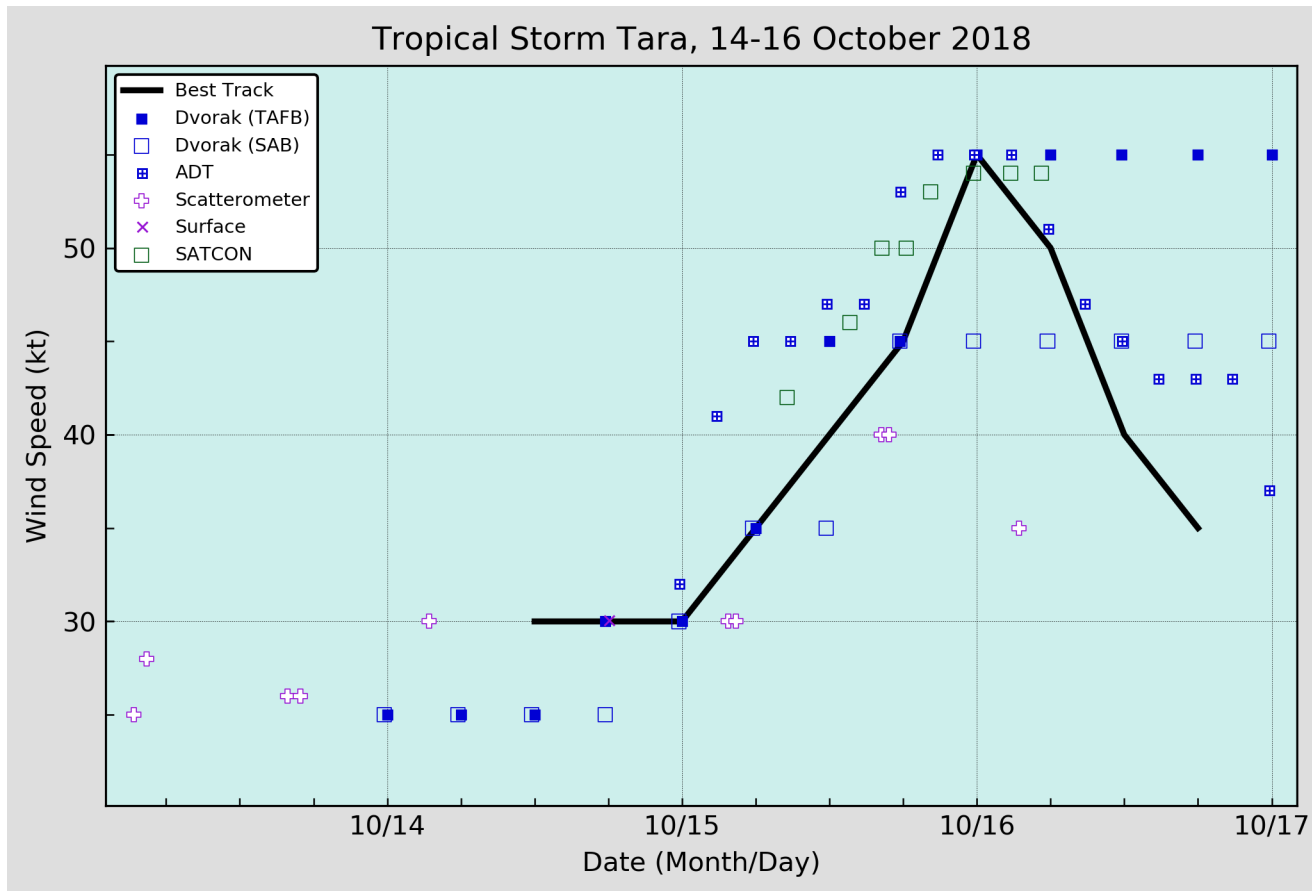


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Tara, 14–16 October 2018. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

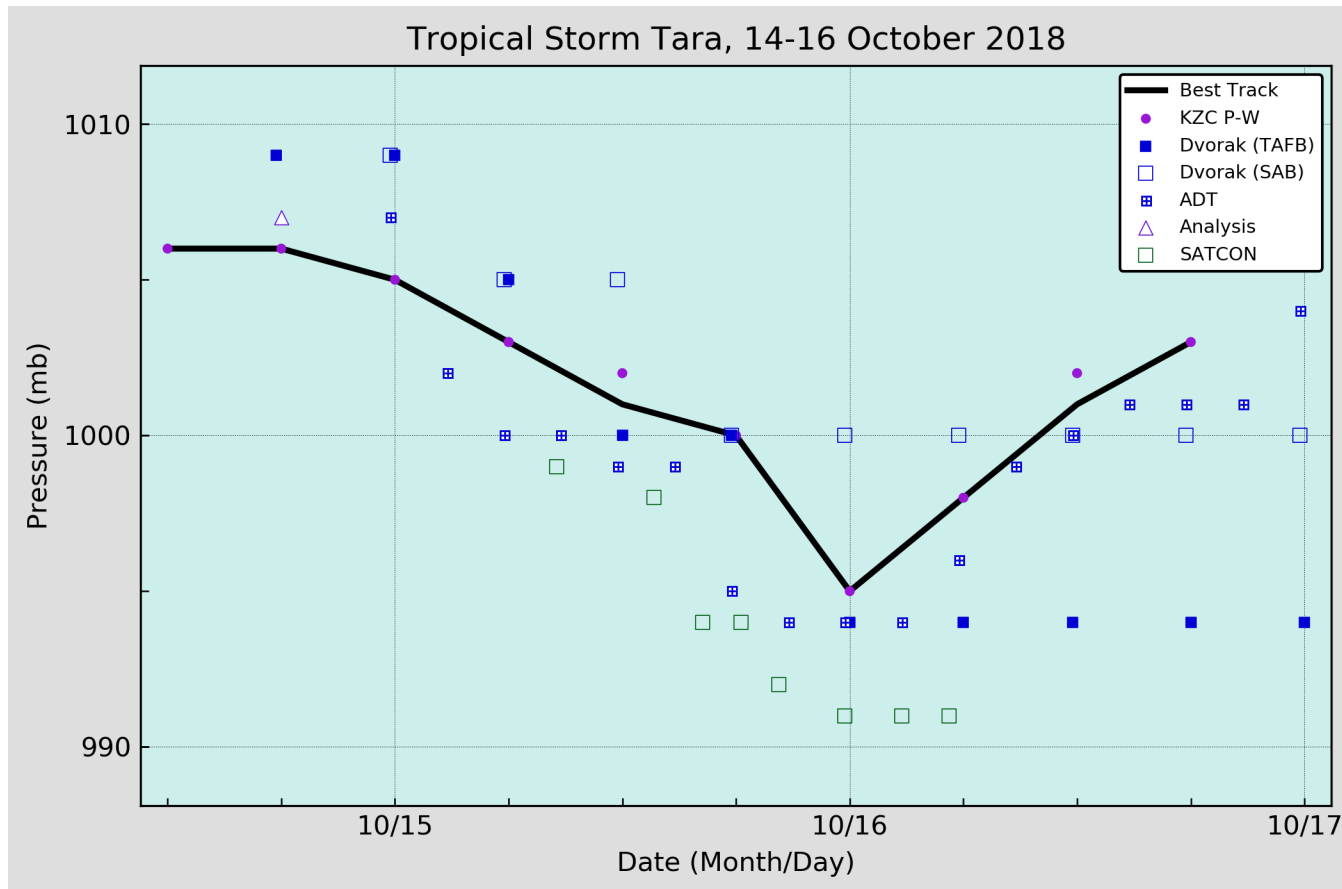


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Tara, 14–16 October 2018. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC.

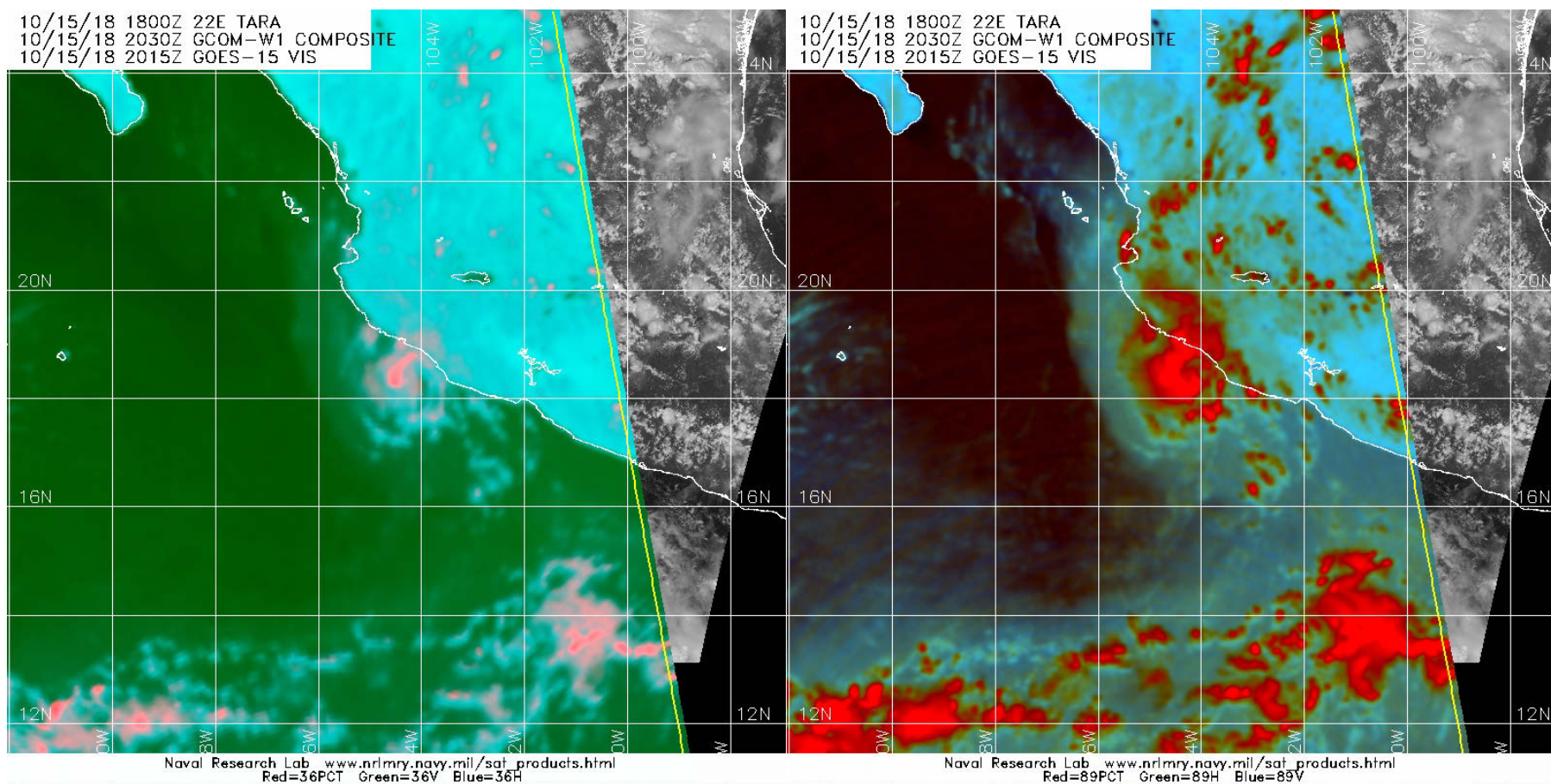


Figure 4. Global Change Observation Mission (GCOM) 36-GHz (left) and 89-GHz (right) microwave imagery of Tropical Storm Tara at 2030 UTC 15 October 2018. Images courtesy of Naval Research Laboratory.