NATIONAL HURRICANE CENTER
TROPICAL CYCLONE REPORT

TROPICAL STORM OCTAVE

(EP152013)

12 – 15 October 2013

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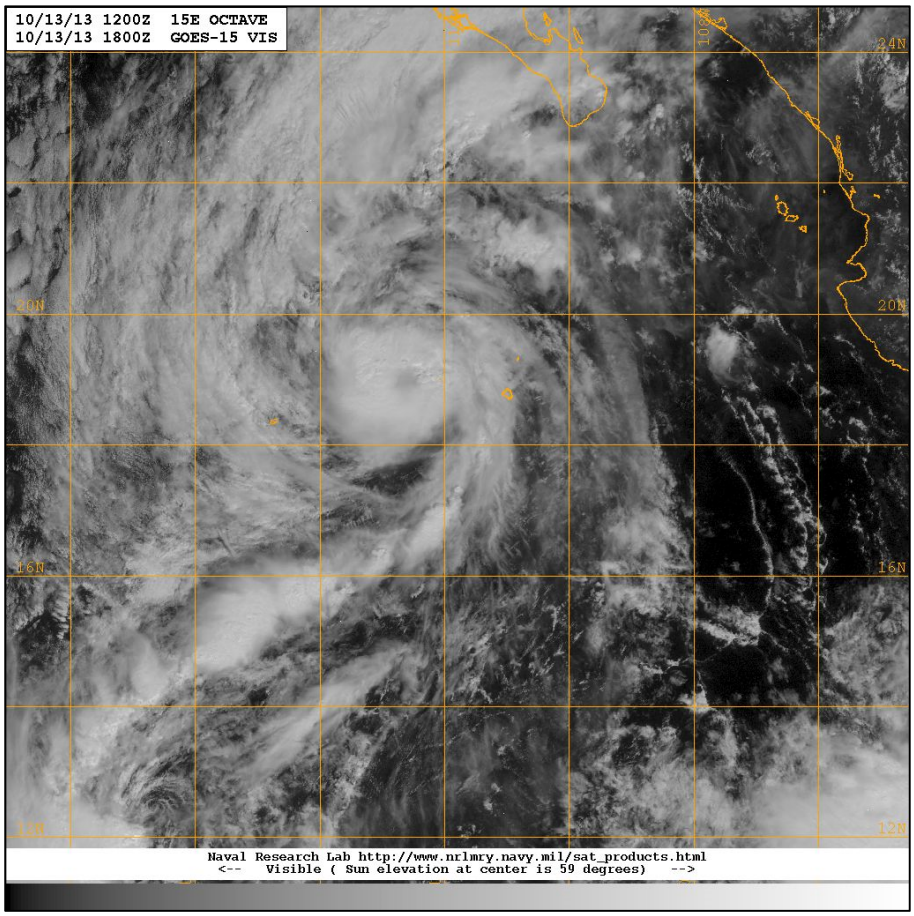
2 December 2013



GOES-15 SATELLITE IMAGE OF TROPICAL STORM OCTAVE AT 1800 UTC 13 OCTOBER 2013. IMAGE COURTESY OF THE U.S. NAVAL RESEARCH LABORATORY.

Octave was a tropical storm that made landfall over the southern portion of the Baja California peninsula, where it produced heavy rains and gusty winds.

Tropical Storm Octave

12 – 15 OCTOBER 2013

SYNOPTIC HISTORY

The genesis of Octave appears to be associated with the combined influences of a tropical wave and a broad area of disturbed weather, the former having spawned Tropical Storm Jerry in the Atlantic basin before it moved over Central America on 5 October. The wave was inactive on 5 October, but it did gain shower and thunderstorm activity a day later when it was located south of Guatemala. Meanwhile, a large area of disturbed weather likely associated with the base of a deep-layer trough was located over the Gulf of Tehuantepec and Bay of Campeche. The wave overtook this area of disturbed weather on 7 October, and the merged system gradually became better organized during the next several days while it moved westward to the south of southwestern Mexico. The shower and thunderstorm activity consolidated on 12 October, and by 1800 UTC that day a tropical depression formed about 475 n mi south of the southern tip of the Baja California peninsula. The depression became a tropical storm 6 h later. The "best track" chart of Octave'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[1].

Octave steadily strengthened while it moved northwestward in conducive atmospheric conditions and over warm water during the next 24 h, and it reached its peak intensity of 55 kt around 1800 UTC 13 October when it was located about 340 n mi south-southwest of the southern tip of the Baja California peninsula. The storm maintained that intensity for the next 12 h while it turned northward along the western periphery of a subtropical ridge. By 1800 UTC 14 October, the cloud pattern became less organized due to an increase in wind shear and slightly cooler waters, and Octave began to weaken. The storm continued to weaken on its approach to the Baja peninsula, and it is estimated that it made landfall at 0500 UTC 15 October just north of Cabo San Lazaro, Mexico, with maximum winds of 40 kt.

Additional weakening occurred after the storm made landfall and the low- and mid-level circulations decoupled. Octave weakened to a tropical depression by 1200 UTC 15 October over the Gulf of California, and the cyclone became a remnant low 6 h later just prior to moving inland over mainland Mexico. The remnant low dissipated shortly after 0000 UTC 16 October over the southern portion of the Mexican state of Sonora.

[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 *btk* directory, while previous years' data are located in the *archive* directory.

METEOROLOGICAL STATISTICS

Observations in Octave (Figs. 2 and 3) include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB), and objective Advanced Dvorak Technique (ADT) estimates from the Cooperative Institute for Meteorological Satellite Studies/University of Wisconsin-Madison (CIMSS). Data and imagery from NOAA polar-orbiting satellites including the Advanced Microwave Sounding Unit (AMSU), the NASA Tropical Rainfall Measuring Mission (TRMM), 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 Octave.

The estimated peak intensity of 55 kt from 1800 UTC 13 October to 0600 UTC 14 October is based on a blend of satellite intensity estimates from TAFB, SAB, and CIMSS, and a pair of ASCAT passes during that time period.

Octave produced up to 6 inches of rain over portions of the states of Baja California Sur and Sonora in northwestern Mexico. These rains produced mainly minor flooding.

There was one observing site on land of tropical-storm-force winds. Sierra Laguna, which is located in Baja California Sur, reported a maximum sustained wind of 44 kt at 0640 UTC 14 October. These winds were orographically enhanced, as this station is located at an elevation of 6,393 ft above sea level. In addition, the ship ***Westerdam*** (call sign PINX) reported a maximum wind of 31 kt at 1300 UTC 14 October, when it was located just offshore of the southern tip of the Baja California peninsula.

CASUALTY AND DAMAGE STATISTICS

No casualties were reported. Damage statistics are unavailable.

FORECAST AND WARNING CRITIQUE

The development of Octave was well anticipated. A low probability of formation was included in the NHC's 5-day Tropical Weather Outlook at 1800 UTC 6 October, which was 6 days before Octave developed. The 5-day development probability was increased to the medium category 5 days before Octave formed, and increased to the high category 4 days before genesis. Regarding the 48-h outlook, Octave formed a little later than expected, given that a high probability was first forecast 3 days before the cyclone formed.

A verification of NHC official track forecasts for Octave is given in Table 2a. Official forecast track errors were much greater than the mean official errors for the previous 5-yr period

at all forecast times. The large errors are predominately related to a substantial slow bias in the official forecasts, which incorrectly expected Octave to slow down on its approach to the Baja California peninsula. A homogeneous comparison of the NHC official track errors with selected guidance models is given in Table 2b. The Florida State Superensemble (FSSE) and the simple dynamical model consensus (TVCE) were the only aids that consistently beat the NHC forecasts. It should be noted that the sample size is very small, and there were no cases beyond 48 h.

A verification of NHC official intensity forecasts for Octave is given in Table 3a. NHC forecast intensity errors were much lower than the mean official errors for the previous 5-yr period. A homogeneous comparison of the NHC official intensity errors with selected guidance models is given in Table 3b. The consensus aids outperformed the dynamical and statistical models at most of the forecast times and were competitive with the NHC forecasts.

Warnings associated with Octave are shown in Table 4.

Table 1. Best track for Tropical Storm Octave, 12-15 October 2013.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
12 / 1800	15.0	109.1	1005	30	tropical depression
13 / 0000	15.6	110.0	1003	35	tropical storm
13 / 0600	16.6	111.0	1000	40	"
13 / 1200	17.6	112.0	997	45	"
13 / 1800	18.8	112.8	994	55	"
14 / 0000	20.0	113.4	994	55	"
14 / 0600	21.2	113.9	994	55	"
14 / 1200	22.4	113.8	997	50	"
14 / 1800	23.6	113.4	999	45	"
15 / 0000	24.5	112.8	1002	40	"
15 / 0600	25.1	112.0	1002	40	"
15 / 1200	25.8	111.0	1005	30	tropical depression
15 / 1800	26.5	109.7	1008	20	low
16 / 0000	27.1	108.8	1009	15	"
16 / 0600					dissipated
13 / 1800	18.8	112.8	994	55	minimum pressure and maximum winds
15 / 0500	25.0	112.2	1002	40	Landfall near Cabo San Lazaro, Mexico

Table 2a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Octave. 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	38.6	71.8	105.2	141.3			
OCD5	52.5	123.2	219.5	302.5			
Forecasts	9	7	5	3			
OFCL (2008-12)	27.0	43.1	57.8	71.9	101.7	137.2	165.9
OCD5 (2008-12)	37.4	73.0	114.9	158.3	238.4	313.5	389.1

Table 2b. Homogeneous comparison of NHC official forecasts with selected track forecast guidance models (in n mi) for Tropical Storm Octave. 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 2a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	40.7	51.9	91.7	147.9			
OCD5	51.3	102.2	190.3	285.0			
GFSI	**28.9**	**46.8**	140.8	240.4			
GHMI	50.6	**48.2**	**72.8**	**123.1**			
HWFI	**26.3**	**41.8**	104.2	156.4			
EGRI	51.9	103.0	104.8	**78.3**			
EMXI	41.3	65.8	**85.9**	**113.6**			
CMCI	79.8	98.7	107.9	**119.6**			
AEMI	**30.8**	**31.2**	**86.5**	157.7			
FSSE	**31.5**	**37.7**	**74.5**	**122.4**			
TVCE	**33.1**	**47.4**	**84.8**	**121.7**			
LBAR	52.9	97.4	160.4	299.8			
BAMS	47.6	**31.2**	128.0	238.5			
BAMM	48.1	71.8	92.6	**128.5**			
BAMD	68.6	96.5	162.5	295.1			
NAMI	**40.3**	104.5	263.1	433.2			
Forecasts	4	2	2	2			

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Octave. 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	**3.9**	**6.4**	**6.0**	**5.0**			
OCD5	5.2	9.1	7.4	4.0			
Forecasts	9	7	5	3			
OFCL (2008-12)	6.3	10.5	13.4	14.5	15.3	17.0	17.3
OCD5 (2008-12)	7.6	12.5	16.5	18.8	20.4	20.3	20.6

Table 3b. Homogeneous comparison of NHC official forecasts with selected intensity forecast guidance models (in kt) for Tropical Storm Octave. 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	3.1	5.0	3.8	2.5			
OCD5	4.6	7.8	6.8	5.5			
HWFI	4.0	5.3	5.0	7.5			
GHMI	4.6	8.7	9.3	8.5			
DSHP	4.1	6.2	5.0	4.5			
LGEM	3.8	5.2	7.3	6.0			
FSSE	3.3	**3.3**	**2.3**	3.5			
ICON	3.6	**4.8**	**3.5**	5.0			
IVCN	3.6	**4.8**	**3.5**	5.0			
Forecasts	8	6	4	2			

Table 4. Watch and warning summary for Tropical Storm Octave, 12-15 October 2013.

Date/Time (UTC)	Action	Location
14 / 1500	Tropical Storm Warning issued	Santa Fe to Punta Abreojos, Mexico
15 / 0600	Tropical Storm Warning discontinued	Santa Fe to Punta Abreojos, Mexico

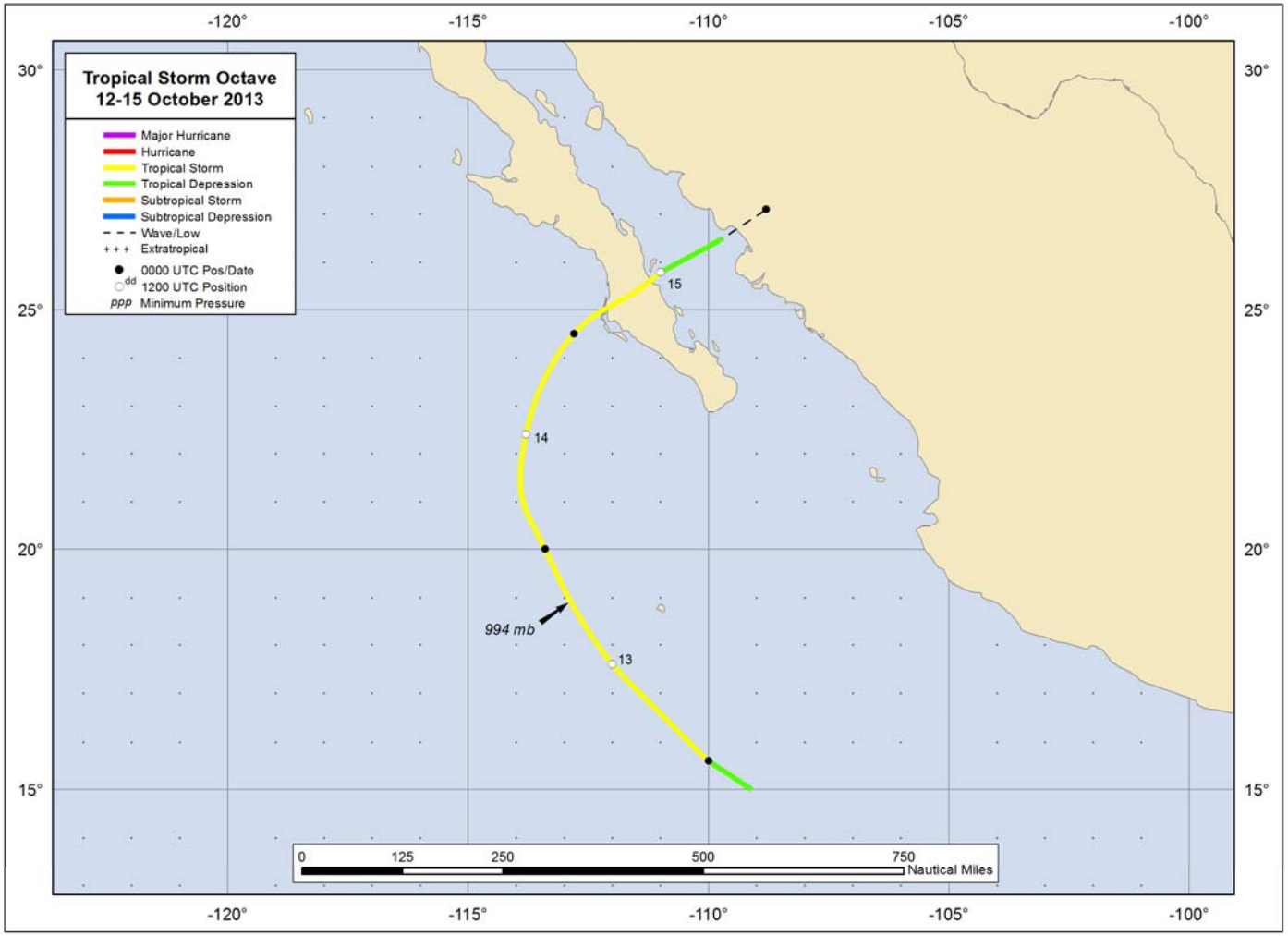


Figure 1. Best track positions for Tropical Storm Octave, 12-15 October 2013.

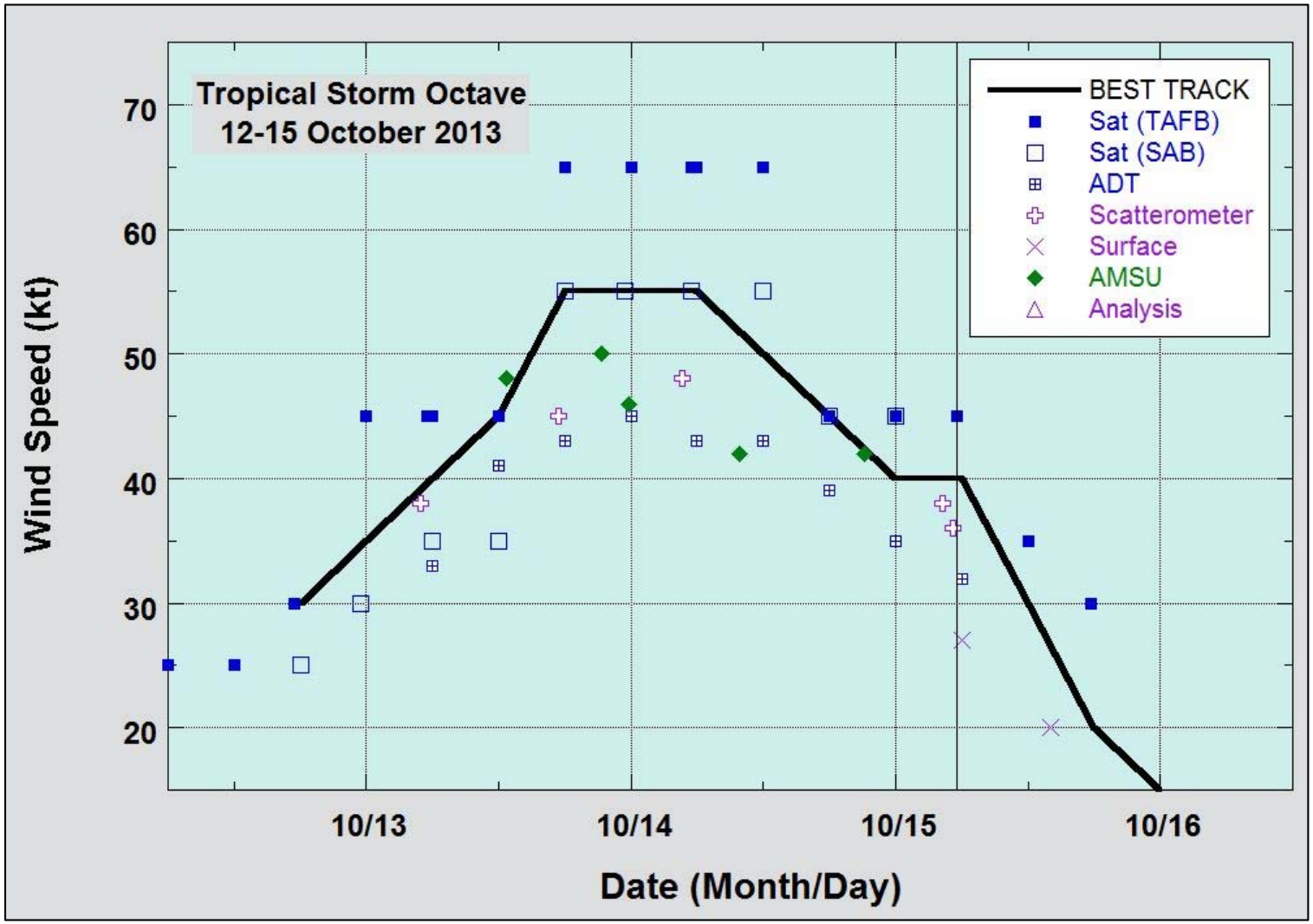


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Octave, 12-15 October 2013. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. Dashed vertical lines correspond to 0000 UTC, and the solid vertical line corresponds to landfall.

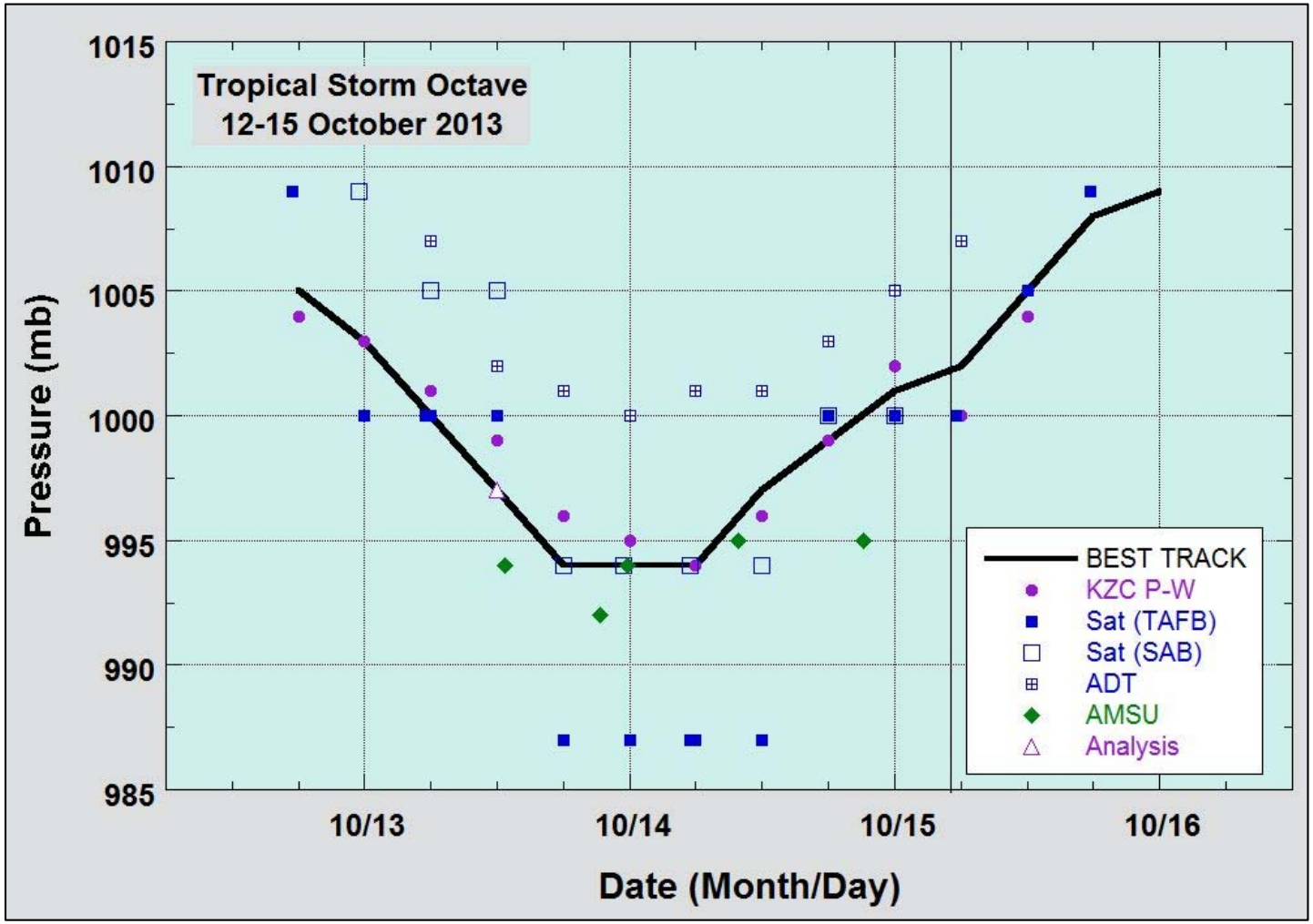


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Octave, 12-15 October 2013. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC, and the solid vertical line correspond to landfall.