

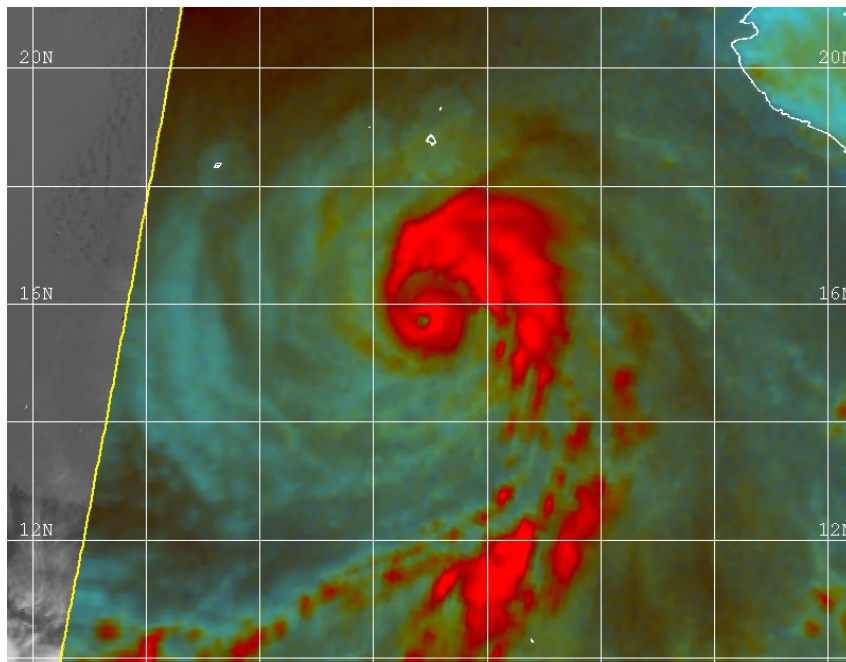


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

HURRICANE ALETTA (EP022018)

6–11 June 2018

Lixion A. Avila
National Hurricane Center
23 July 2019¹



SSMIS MICROWAVE IMAGE AT 1316 UTC 8 JUNE 2018 SHOWING THE DISTINCT EYE OF HURRICANE ALETTA NEAR THE TIME OF THE HURRICANE'S PEAK INTENSITY. IMAGE COURTESY OF THE NAVAL RESEARCH LABORATORY.

Hurricane Aletta intensified rapidly and became the first category four hurricane on the Saffir-Simpson Hurricane Wind Scale of the 2018 eastern North Pacific hurricane season.

¹ Original report dated 31 July 2018. This version corrects best track information in Table 1.

Hurricane Aletta

6–11 JUNE 2018

SYNOPTIC HISTORY

The origin of Hurricane Aletta is associated with a tropical wave that moved off the west coast of Africa on 22 May. The wave was barely detectable on satellite images while it was moving westward across the tropical Atlantic and the Caribbean Sea. It then continued westward across Central America, and it was not until the wave was south of the Gulf of Tehuantepec around the 3rd of June that the convection began to increase. For the next couple of days, the thunderstorm activity gained organization with the development of low-level cyclonic rotation and convective bands. Satellite data indicate that the disturbance developed a well-defined center at 0000 UTC 6 June, marking the formation of a tropical depression about 300 n mi south-southwest 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 1².

Under ideal conditions for intensification (sea surface temperatures close to 30°C and very low wind shear), the depression reached tropical storm status at 0600 UTC 6 June, followed by some gradual strengthening. By the next day, however, rapid intensification began, and Aletta became a category four hurricane, reaching a peak intensity of 120 kt at 1200 UTC 8 June about 500 n mi west-southwest of Manzanillo, Mexico. This was a marked wind increase of 65 kt in 24 hours. During this period, Aletta was moving between the west-northwest and west well away from the coast of Mexico, steered by the flow around a subtropical ridge over the southwestern United States. By early on 9 June, the cyclone began to move toward cooler waters and stable air, and rapid weakening then occurred. Aletta’s downfall was remarkable since the hurricane weakened from category four strength to a tropical storm in about 30 hours. By 1200 UTC 11 June, the cyclone had lost its convection and became a remnant low. The weak low meandered within a light surface flow for several days until dissipation.

METEOROLOGICAL STATISTICS

Observations in Hurricane Aletta (Figs. 2 and 3) include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the

² 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*k directory, while previous years’ data are located in the *archive* directory.

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 including the Advanced Microwave Sounding Unit (AMSU), the NASA 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 Aletta.

The hurricane moved about 120 n mi south of the SEMAR Mexican Navy automatic weather station located at Isla Clarion, Colima. That station measured sustained winds of 35 kt with a peak wind of 47 kt around 1715 UTC 10 June. The station was also very valuable to operationally determine the tropical-storm force wind radii.

Aletta's maximum intensity of 120 kt at 1200 UTC 8 June was based on a blend of Dvorak intensity estimates from TAFB and SAB, and objective Dvorak numbers from the University of Wisconsin/CIMSS. Aletta's eye was very distinct, and surrounded by very deep convection at that time.

CASUALTY AND DAMAGE STATISTICS

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

FORECAST AND WARNING CRITIQUE

The genesis of Hurricane Aletta was well anticipated. In fact, the possibility of tropical cyclone formation in 5 days, although low, was introduced in the NHC Tropical Weather Outlook about 120 hours before genesis. A high chance of tropical cyclone formation within 5 days was indicated about 3 days in advance. However, the 48 h high chance of genesis was introduced only 18 hours in advance. Table 2 provides the number of hours in advance of formation associated with the first reference to the system in the TWO forecast in each likelihood category.

A verification of NHC official track forecasts for Aletta is given in Table 3a. Official forecast track errors for the first 3 days were higher than the mean official errors for the previous 5-yr period. However, the errors were much smaller at 96 and 120 h. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. The HFIP corrected consensus (HCCA) and the Florida State Super Ensemble (FSSE) consensus models in general performed better than most of the individual models and better than the official forecast through 48 h for Aletta.

A verification of NHC official intensity forecasts for Aletta is given in Table 4a. Official forecast intensity errors were mostly higher than the mean official errors for the previous 5-yr period, because the official forecast did not capture the peak intensity of Aletta. However, the initial intensification was correctly forecast since NHC called for a wind increase from 30 to 75 kt



in 48 hours. The Rapid Intensification (RI) Index was high at that time, with a 50% chance of a 55-kt wind increase in 48 h. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. Similar to the track forecast guidance, the HCCA and FSSE models performed better than the rest of intensity guidance and the NHC forecasts.

No watches or warnings were issued in association with Aletta.



Table 1. Best track for Hurricane Aletta, 6–11 June 2018.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
06 / 0000	14.0	105.4	1005	30	tropical depression
06 / 0600	14.2	106.1	1004	35	tropical storm
06 / 1200	14.2	106.8	1000	40	"
06 / 1800	14.2	107.5	999	45	"
07 / 0000	14.4	108.1	997	50	"
07 / 0600	14.7	108.7	994	55	"
07 / 1200	14.9	109.1	994	55	"
07 / 1800	15.1	109.6	987	65	hurricane
08 / 0000	15.4	110.1	970	90	"
08 / 0600	15.6	110.6	957	105	"
08 / 1200	15.7	111.0	943	120	"
08 / 1800	15.9	111.5	943	120	"
09 / 0000	16.0	112.0	953	110	"
09 / 0600	16.1	112.5	963	100	"
09 / 1200	16.2	113.0	970	90	"
09 / 1800	16.1	113.5	980	70	"
10 / 0000	15.9	114.0	996	55	tropical storm
10 / 0600	16.0	114.4	1000	45	"
10 / 1200	16.2	114.8	1002	40	"
10 / 1800	16.5	115.4	1002	40	"
11 / 0000	16.8	115.9	1002	40	"
11 / 0600	16.9	116.5	1003	35	"
11 / 1200	16.8	117.4	1004	30	low
11 / 1800	16.6	118.0	1004	30	"
12 / 0000	16.5	118.5	1005	30	"
12 / 0600	16.4	119.0	1006	25	"
12 / 1200	16.3	119.5	1006	25	"
12 / 1800	16.0	119.6	1007	25	"
13 / 0000	15.7	119.6	1007	25	"



Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
13 / 0600	15.5	119.4	1008	25	"
13 / 1200	15.6	119.3	1008	20	"
13 / 1800	15.7	119.3	1008	20	"
14 / 0000	15.9	119.3	1008	20	"
14 / 0600	16.0	119.3	1008	20	"
14 / 1200	16.1	119.2	1008	20	"
14 / 1800	16.3	119.0	1008	20	"
15 / 0000	16.4	118.8	1008	20	"
15 / 0600	16.4	118.3	1008	20	"
15 / 1200	16.3	117.8	1008	20	"
15 / 1800	16.3	117.3	1008	20	"
16 / 0000	16.2	116.8	1008	20	"
16 / 0600					dissipated
08 / 1200	15.8	111.0	943	120	Maximum winds/ 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%)	72	120
Medium (40%-60%)	48	96
High (>60%)	18	72

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Hurricane Aletta. 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	23.4	42.6	52.8	65.9	71.7	49.2	47.9
OCD5	27.6	53.1	80.4	105.7	178.3	251.1	283.7
Forecasts	20	18	16	14	10	6	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 Hurricane Aletta. 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	24.2	43.7	55.2	68.0	74.9	49.8	29.3
OCD5	26.8	51.6	79.1	105.4	180.6	255.5	288.7
GFSI	34.1	58.1	80.5	93.2	154.7	143.8	150.8
HMNI	28.9	54.9	73.9	93.2	154.6	203.8	187.3
HWFI	32.8	62.8	83.4	93.8	113.5	89.9	87.0
EGRI	19.9	34.2	50.5	71.3	86.8	62.0	44.0
EMXI	26.6	46.3	64.1	72.1	56.5	47.5	50.2
CMCI	23.3	46.0	75.1	100.4	145.5	185.9	306.0
NVGI	25.8	42.9	56.3	69.3	103.3	124.2	119.0
AEMI	26.0	45.2	64.4	83.8	130.9	146.1	173.9
HCCA	22.3	36.5	53.5	67.4	79.9	40.2	24.9
FSSE	22.8	38.8	53.7	66.6	78.6	66.7	46.3
TVCX	21.6	39.9	55.0	69.5	82.8	58.0	25.9
GFEX	24.4	41.3	55.8	68.0	76.4	56.4	50.8
TVCA	23.4	41.3	58.1	72.5	92.9	70.2	29.5
TVCE	22.8	40.2	55.9	49.3	91.5	74.5	34.6
TABD	36.1	89.0	151.0	168.9	157.2	174.4	104.5
TABM	34.0	73.6	124.5	129.2	151.6	173.7	178.2
TABS	35.9	66.2	105.4	112.8	163.8	155.7	279.5
Forecasts	19	17	15	13	9	5	1

Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Hurricane Aletta. 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	8.0	16.9	21.3	22.5	16.0	20.8	22.5
OCD5	11.4	23.6	33.9	42.3	29.5	9.2	4.0
Forecasts	20	18	16	14	10	6	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 Hurricane Aletta. 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	8.0	16.9	21.3	22.5	16.0	20.8	22.5
OCD5	11.4	23.6	33.9	42.3	29.5	9.2	4.0
HWFI	9.6	16.4	23.3	24.9	12.9	9.5	20.0
IVCN	9.3	17.3	23.2	25.9	15.1	15.2	19.0
HCCA	8.0	14.2	19.6	22.7	14.6	17.5	23.0
DSHP	9.8	18.0	21.9	22.4	13.7	21.8	27.5
LGEM	9.6	19.3	25.6	28.5	16.3	11.7	21.5
GFSI	10.7	19.7	26.2	29.3	18.3	26.3	26.5
EMXI	15.2	28.4	37.8	43.3	26.2	4.2	1.5
HMNI	10.3	19.5	24.8	25.9	15.9	16.8	21.5
FSSE	8.3	14.4	20.3	20.1	13.2	21.8	31.5
Forecasts	20	18	16	14	10	6	2

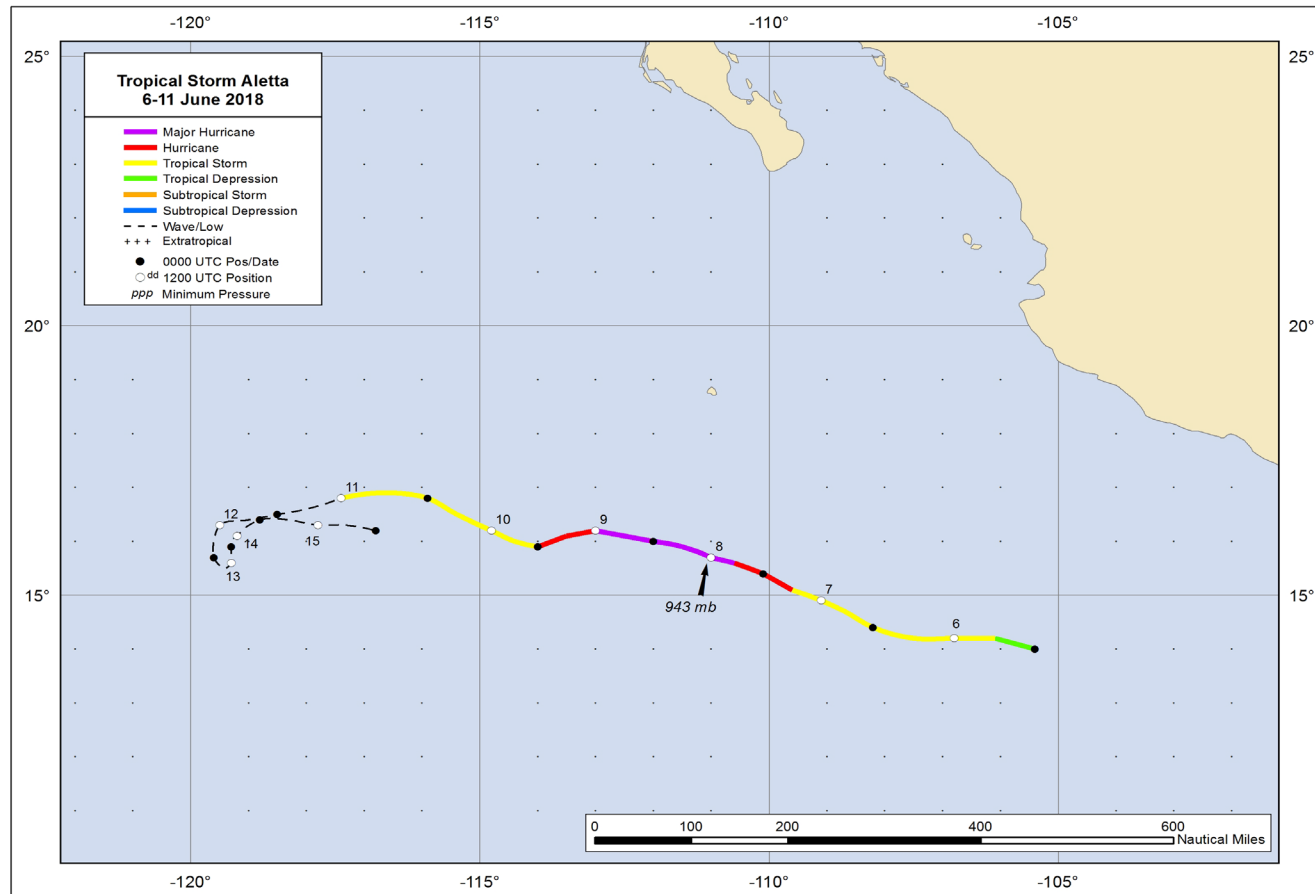


Figure 1. Best track positions for Hurricane Aletta, 6–11 June 2018.

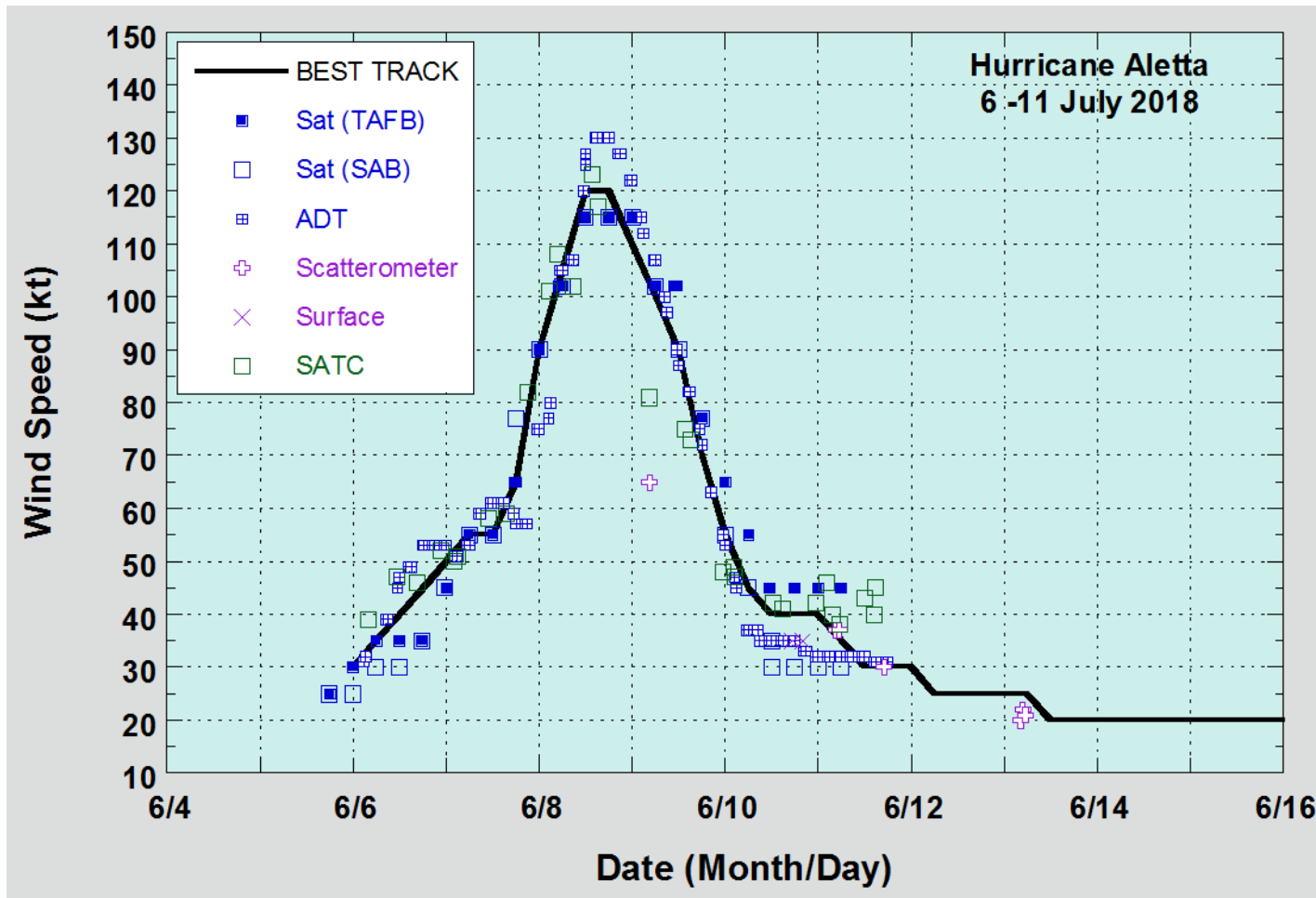


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Aletta, 6–11 June 2018. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

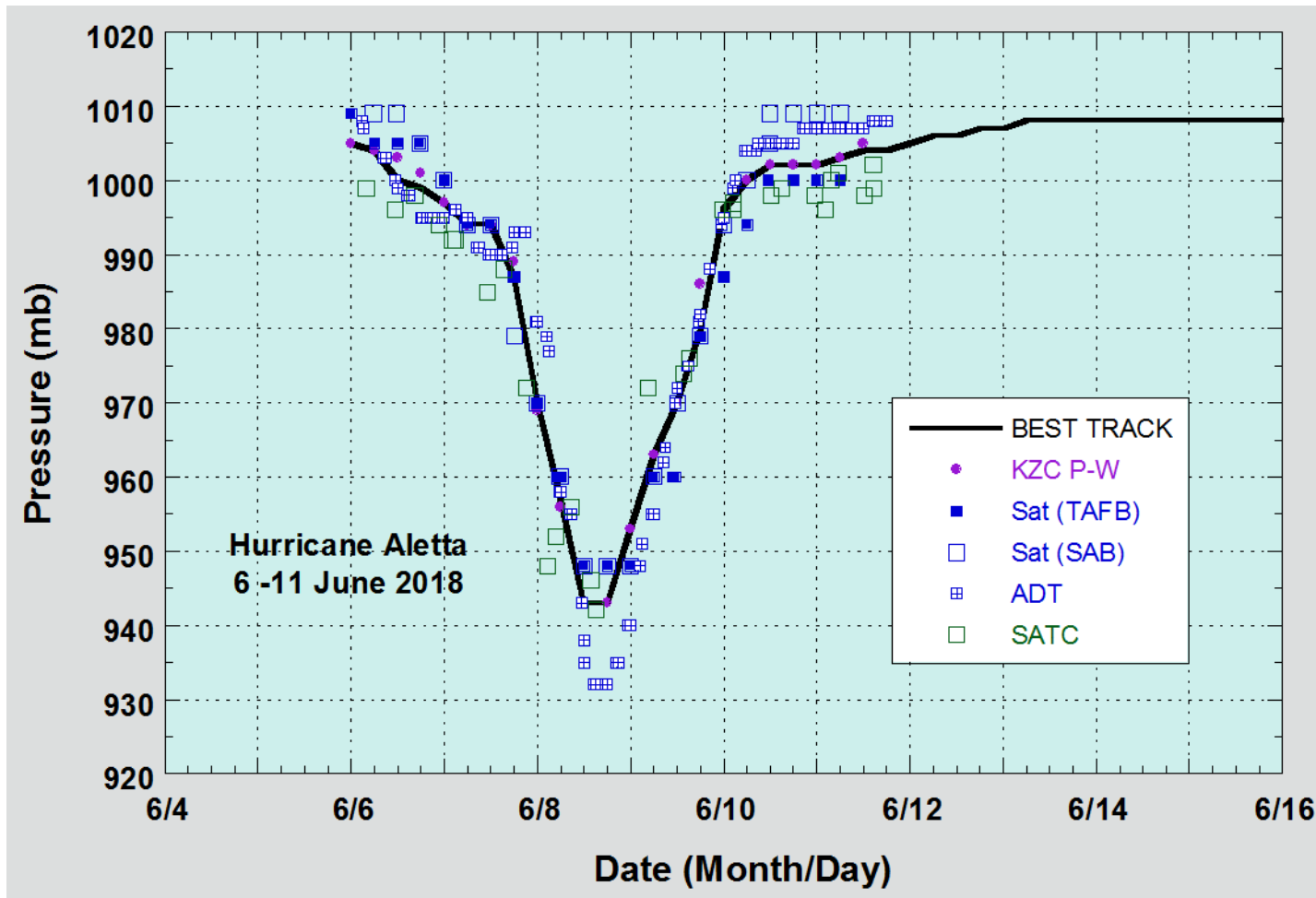


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Aletta, 6–11 June 2018. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC.