NATIONAL HURRICANE CENTER
TROPICAL CYCLONE REPORT

TROPICAL STORM ROSLYN

(EP182016)

25 – 29 September 2016

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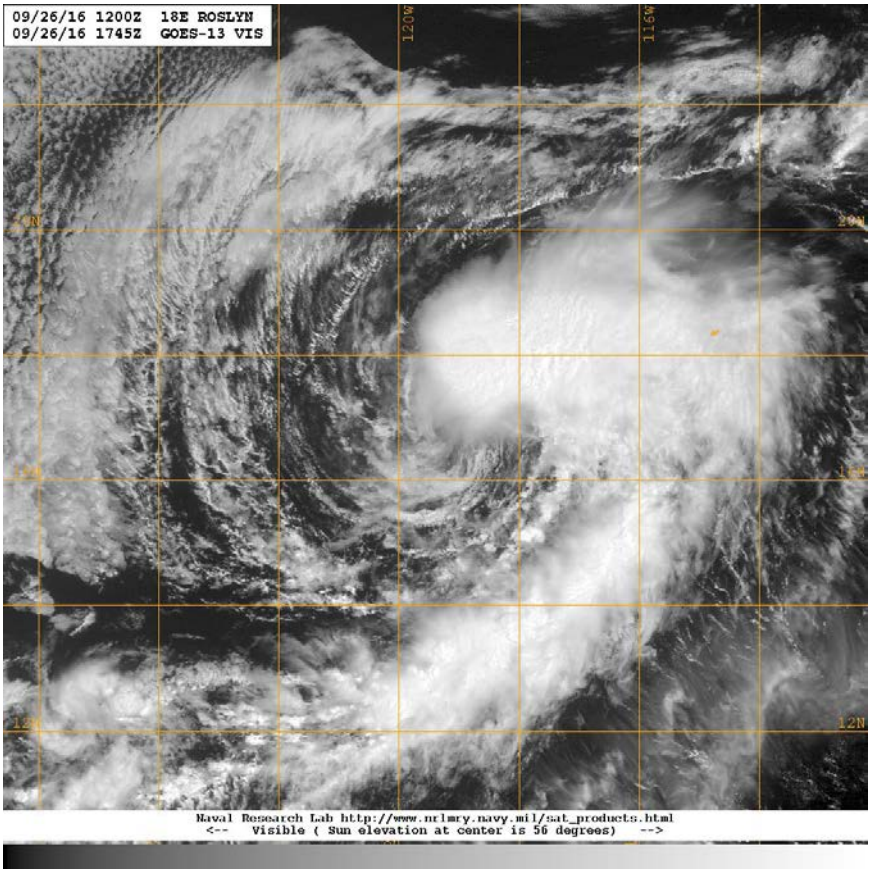

GOES-13 VISIBLE SATELLITE IMAGE OF TROPICAL STORM ROSLYN AT 1745 UTC 26 SEPTEMBER 2016. IMAGE COURTESTY OF NAVAL RESEARCH LAB.

Roslyn was a tropical storm that remained at sea, and did not intensify significantly.

Tropical Storm Roslyn

25 – 29 SEPTEMBER 2016

SYNOPTIC HISTORY

Roslyn appears to have originated from a tropical wave that entered the eastern North Pacific on 17 September. The wave moved slowly westward over the next few days, and by 20 September a broad area of low pressure formed several hundred n mi south-southwest of Manzanillo, Mexico. Over the next several days, the low moved westward with no significant increase in the organization of its associated deep convection; the system was broad and lacked a well-defined center of circulation. On 24 September, showers and thunderstorms became a little better organized with some indications of banding, but the low-level circulation was elongated from southwest to northeast. The next day, visible satellite images indicated that the circulation became sufficiently well-defined to designate the formation of a tropical depression around 1200 UTC 25 September while centered about 700 n mi southwest of the southern tip of the Baja California peninsula. 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[1].

Initially, the cyclone moved slowly northward, and it strengthened into a tropical storm by 0000 UTC 26 September, while banding features became better defined over the southeastern portion of the circulation. A mid- to upper-level low pressure system located near the Baja California peninsula caused Roslyn to turn northeastward and east-northeastward, and it also produced southwesterly shear over the storm. Despite the shear, Roslyn strengthened to its peak intensity of 45 kt around 1800 UTC 26 September while centered a little over 600 n mi southwest of the southern tip of the Baja California peninsula. Within an environment of increasing southwesterly shear and decreasing sea surface temperatures, the storm began weakening after 0000 UTC 27 September. Showers and thunderstorms became displaced farther to the north and northeast of the tropical cyclone's center as Roslyn slowly weakened on 27 and 28 September. The system turned northward and weakened to a tropical depression around 0000 UTC 29 September, and by 1200 UTC that day the cyclone lacked sufficient deep convection to qualify as a tropical cyclone. Steered by the low-level flow, the remnant low turned westward while continuing to weaken. The low dissipated a few hundred n mi west of Cabo San Lazaro, Mexico shortly after 1800 UTC 30 September.

[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 Roslyn (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 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 Roslyn. The estimated peak intensity of 45 kt is based on ASCAT data, which was 10 kt higher than the contemporaneous subjective Dvorak estimates.

There were no ship reports of winds of tropical storm force associated with Roslyn.

CASUALTY AND DAMAGE STATISTICS

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

FORECAST AND WARNING CRITIQUE

The genesis forecasts for Roslyn were overly aggressive in the longer range (Table 2). It was first mentioned in the Tropical Weather Outlook, 216 h in advance of formation, that an area of low pressure could form several hundred miles southwest of Mexico with a 5-day genesis probability in the "low" category. The 5-day probability was raised to medium 126 h prior to genesis, and at that same time a 2-day probability was introduced in the low category. The 5-day probability was raised to high 102 h before Roslyn formed. The 2-day probability was raised to medium 96 h prior to genesis, and to high 72 h prior to genesis.

A verification of NHC official track forecasts for Roslyn is given in Table 3a. At all forecast ranges (there were no official forecasts to verify beyond 72 h), the mean official forecast track errors were higher than the mean official errors for the previous 5-yr period. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. Quite a few models had mean errors lower than the official forecast at various intervals. The HFIP Corrected Consensus Approach (HCCA) performed quite well in comparison to the other guidance.

A verification of NHC official intensity forecasts for Roslyn is given in Table 4a. Official forecast intensity errors were lower than the mean official errors for the previous 5-yr period. Although the NHC intensity forecasts were a little worse than average, none of the official forecasts called for Roslyn to strengthen significantly, which turned out to be correct. A

homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. Some models, such as the GFDL Hurricane Model (GHMI) had slightly lower intensity errors than the official forecasts for several forecast intervals. Interestingly, the climatology and persistence model (OCD5) had lower errors than the official forecasts at 72 h (but for only 2 cases).

There were no coastal watches or warnings associated with Roslyn.

Table 1. Best track for Tropical Storm Roslyn, 25 – 29 September 2016.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
25 / 1200	15.3	119.7	1006	30	tropical depression
25 / 1800	15.8	119.7	1005	30	"
26 / 0000	16.2	119.7	1005	35	tropical storm
26 / 0600	16.5	119.6	1003	40	"
26 / 1200	16.7	119.4	999	45	"
26 / 1800	16.8	119.0	999	45	"
27 / 0000	17.0	118.6	999	45	"
27 / 0600	17.5	118.1	1003	40	"
27 / 1200	18.0	117.5	1003	40	"
27 / 1800	18.5	116.8	1003	40	"
28 / 0000	19.2	116.1	1004	35	"
28 / 0600	20.0	115.5	1005	35	"
28 / 1200	20.7	115.2	1006	35	"
28 / 1800	21.3	115.1	1007	35	"
29 / 0000	21.8	115.1	1007	30	tropical depression
29 / 0600	22.5	115.2	1008	25	"
29 / 1200	23.2	115.4	1010	25	low
29 / 1800	23.8	115.7	1012	20	"
30 / 0000	24.2	116.0	1012	15	"
30 / 0600	24.4	116.5	1014	15	"
30 / 1200	24.3	116.9	1014	15	"
30 / 1800	24.0	117.2	1014	15	"
31 / 0000					dissipated
26 / 1200	16.7	119.4	999	45	minimum pressure and maximum winds

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%)	126	216
Medium (40%-60%)	96	126
High (>60%)	72	102

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Roslyn, 25 – 29 September 2016. 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	27.5	52.5	80.4	102.8	136.0		
OCD5	41.2	96.3	164.4	256.5	420.0		
Forecasts	14	12	10	8	4		
OFCL (2011-15)	23.4	36.4	47.2	59.4	89.0		
OCD5 (2011-15)	36.6	74.2	116.5	159.7	245.6		

Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Roslyn, 25 – 29 September 2016. 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	27.5	52.5	80.4	102.8	136.0		
OCD5	41.2	96.3	164.4	256.5	420.0		
GFSI	38.3	72.8	103.2	122.2	**132.3**		
GHMI	**24.4**	**39.0**	**55.4**	**66.6**	**116.5**		
HWFI	**26.5**	**39.7**	**60.1**	**78.2**	154.5		
EMXI	**26.8**	**50.7**	83.1	113.0	161.0		
NVGI	38.3	72.1	97.6	110.7	**107.7**		
GFNI	30.6	**41.2**	**61.0**	**86.2**	150.4		
CMCI	29.5	**46.3**	**61.4**	**84.9**	**100.5**		
CTCI	**24.0**	**46.7**	**74.6**	**93.2**	148.6		
TVCE	**23.5**	**44.6**	**68.5**	**86.5**	**124.9**		
HCCA	**22.7**	**37.5**	**57.7**	**73.0**	**100.0**		
AEMI	39.5	73.9	107.2	129.8	158.9		
BAMS	46.9	96.9	145.5	190.1	260.8		
BAMM	46.3	83.4	114.4	141.9	**112.1**		
BAMD	73.2	147.5	229.5	313.5	408.3		
Forecasts	14	12	10	8	4		

Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Roslyn, 25 – 29 September 2016. 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	**4.3**	**5.0**	**5.5**	**6.3**	**5.0**		
OCD5	4.8	5.3	6.1	7.4	8.8		
Forecasts	14	12	10	8	4		
OFCL (2011-15)	5.9	9.8	12.5	14.0	15.5		
OCD5 (2011-15)	7.7	12.8	16.4	18.8	21.1		

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Roslyn, 25 – 29 September 2016. 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	4.3	5.0	5.5	6.3	7.5		
OCD5	4.8	5.3	6.1	7.4	**5.5**		
HWFI	4.6	5.7	5.7	**4.6**	11.5		
GHMI	4.9	**4.1**	**4.6**	**4.9**	8.5		
IVCN	4.9	5.3	**4.5**	**4.5**	8.0		
GFNI	4.9	5.8	**5.2**	**5.3**	**3.5**		
CTCI	4.5	**4.6**	**4.5**	7.8	8.0		
GFSI	5.1	5.4	**4.1**	**4.9**	**4.0**		
EMXI	5.0	7.3	7.2	6.5	**5.5**		
HCCA	5.1	5.1	**5.2**	**5.9**	14.0		
Forecasts	14	12	10	8	2		

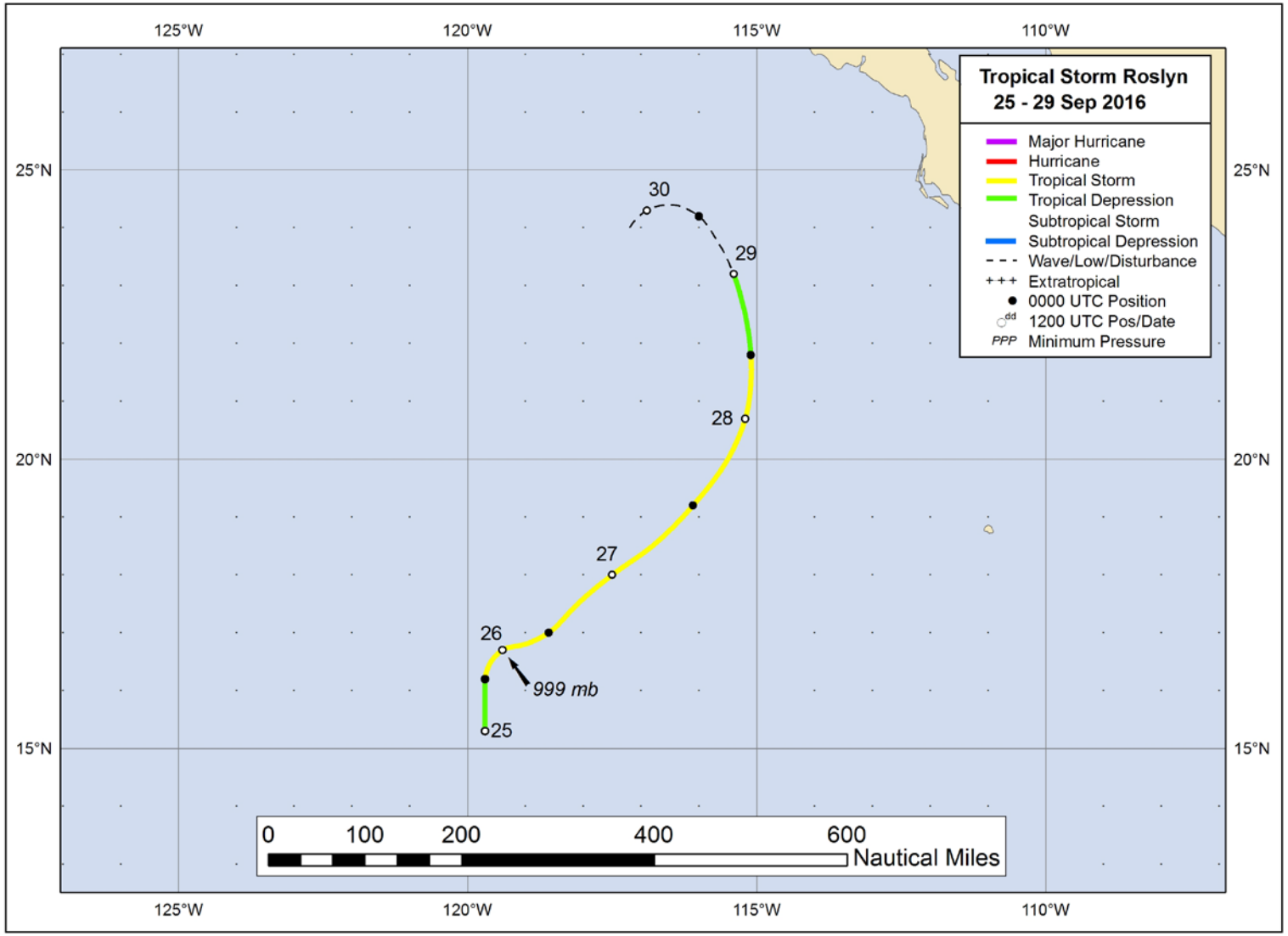

Figure 1. Best track positions for Tropical Storm Roslyn, 25-29 September 2016.

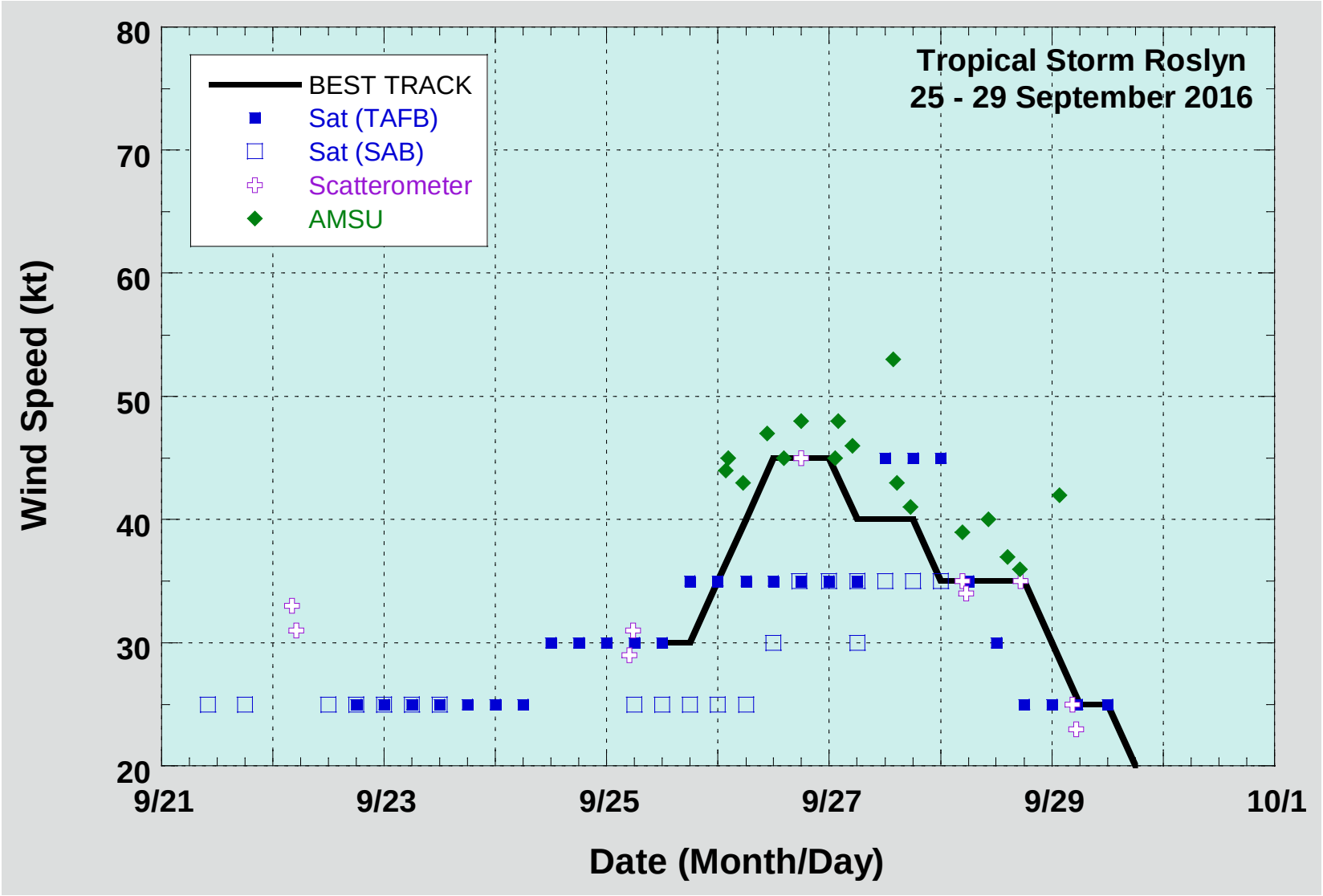

Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Roslyn, 25 – 29 September 2016. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. Dashed vertical lines correspond to 0000 UTC.

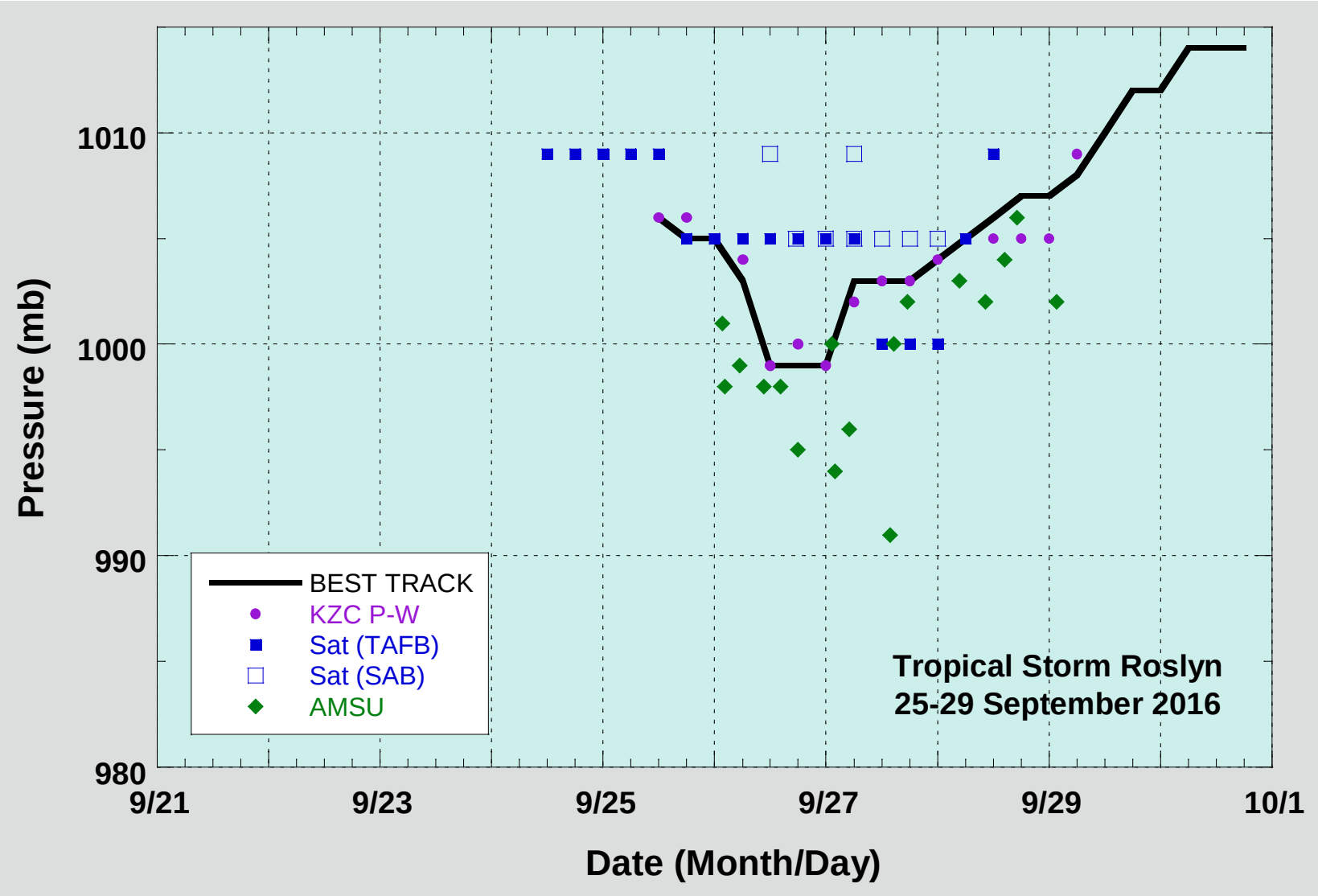

Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Roslyn, 25 – 29 September 2016. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC.