NATIONAL HURRICANE CENTER
TROPICAL CYCLONE REPORT

TROPICAL STORM SELMA

(EP202017)

27–28 October 2017

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27 November 2017

GOES-16 VISIBLE SATELLITE IMAGE OF TROPICAL STORM SELMA AT 1600 UTC 27 OCTOBER 2017.

Selma was a short-lived tropical storm that made landfall near Playa El Pimental, El Salvador. Heavy rainfall associated with Selma caused flash-flooding and mud slides that resulted in some damage in El Salvador.

Tropical Storm Selma

27–28 OCTOBER 2017

SYNOPTIC HISTORY

The genesis of Selma appears to be associated with a Central American Gyre (Papin et. al 2017) that developed on 24 October, which is the same feature that helped spawn Atlantic Tropical Storm Philippe. The gyre moved slowly north-northwestward over Central America during the next couple of days, and a small area of disturbed weather developed in its wake over the eastern Pacific Ocean just west of the coasts of Costa Rica and Nicaragua early on 26 October. The small system moved west-northwestward, and satellite data indicated that the disturbance developed a well-defined center around 1800 UTC that day. Deep convection became sufficiently organized to classify the system a tropical depression around 0000 UTC 27 October, when it was located about 200 n mi south of San Salvador, El Salvador. This development was likely aided by ongoing gap wind events from the Gulfs of Papagayo and Fonseca. The depression strengthened into a tropical storm 6 h later. The "best track" chart of Selma'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].

After becoming a tropical storm, Selma turned north-northwestward in the flow between a mid-level ridge to its northeast and a deep-layer trough over the Gulf of Mexico. Meanwhile, the cloud pattern of the compact storm changed little in structure, with deep convection persisting near and to the southwest of the low-level center due to northeasterly shear (cover image). Selma moved generally northward late on 27 October and early 28 October and made landfall near Playa El Pimental, El Salvador, around 1100 UTC 28 October with maximum winds of 35 kt. The circulation dissipated a little before 1800 UTC that day over the rugged terrain of El Salvador and western Honduras.

METEOROLOGICAL STATISTICS

Observations in Selma (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). 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

[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.

Satellite Program (DMSP) satellites, among others, were also useful in constructing the best track of Selma.

The 35-kt peak intensity of Selma from 0600 UTC 27 October until it made landfall is based on ASCAT data from 0300–0400 UTC 27 October and TAFB Dvorak classifications of T2.5 (35 kt) at 0000 and 0600 UTC 28 October. There were no observations of sustained tropical-storm-force winds in association with Selma.

Landfalling systems like Selma are rare events for the Pacific coast of Central America, with the most recent tropical storm landfall in that region being Alma in 2008. In fact, Selma is the only tropical storm on record that has made landfall in El Salvador.

CASUALTY AND DAMAGE STATISTICS

There were no reports of casualties associated with Selma. Authorities from El Salvador reported some minor damage, consisting of trees down and mudslides, however, there is no monetary damage estimate at the time of this report.

FORECAST AND WARNING CRITIQUE

The genesis of Selma was not well predicted. The potential for tropical cyclone development was first mentioned in the Tropical Weather Outlook only 42 h before the tropical cyclone formed (Table 2). The 5-day probability of formation was increased to the medium category (40–60%) 30 h before development, and it only reached the high category 6 h before Selma formed. The 48-h probability of formation did not reach the high category before genesis. There were two main reasons for the poor genesis predictions. It was unclear if the disturbance would have enough time to organize before it reached the coast of Central America and there was the expectation of strong shear in the area where Selma formed. In addition, Selma formed in a region that is unclimatological for tropical cyclogenesis.

Given the short duration of Selma as a tropical cyclone there are only four verifying forecasts at 12 h and two at 24 h. The average NHC forecast track errors for these time periods were higher than the mean official errors for the previous 5-yr period (Table 3). The verifying forecasts had a west bias, as most of the guidance poorly predicted the sharpness of Selma's northward turn (not shown). Due to the small number of forecasts, a comparison of the official track errors and the guidance models is not provided.

A verification of NHC official intensity forecasts for Selma is given in Table 4. Official forecast intensity errors were close to the mean official errors for the previous 5-yr period for the small number of verifying forecasts.

Watches and warnings associated with Selma are given in Table 5.

REFERENCES

Papin, P**.**, L. F. Bosart, R. D. Torn, 2017: A Climatology of Central American Gyres. *Mon. Wea. Rev.*, **145**, 1983–2000.

Table 1. Best track for Tropical Storm Selma, 27 – 28 October 2017.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
26 / 1800	10.3	88.6	1005	30	low
27 / 0000	10.3	88.9	1005	30	tropical depression
27 / 0600	10.5	89.2	1004	35	tropical storm
27 / 1200	10.8	89.3	1004	35	"
27 / 1800	11.3	89.3	1004	35	"
28 / 0000	12.0	89.1	1004	35	"
28 / 0600	12.7	89.0	1004	35	"
28 / 1100	13.4	89.0	1004	35	"
28 / 1200	13.5	89.0	1005	30	tropical depression
28 / 1800					dissipated
27 / 0600	10.5	89.2	1004	35	maximum winds and minimum pressure
28 / 1100	13.4	89.0	1004	35	landfall near Playa El Pimental, El Salvador

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%)	36	42
Medium (40%-60%)	12	30
High (>60%)	-	6

Table 3. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Selma, 27 – 28 October 2017. 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	33.7	62.7					
OCD5	45.8	116.6					
Forecasts	4	2					
OFCL (2012-16)	22.2	33.9	43.8	54.8	80.0	108.9	145.1
OCD5 (2012-16)	35.7	72.0	112.2	150.2	217.0	271.0	340.2

Table 4. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Selma, 27 – 28 October 2017. 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	**3.8**	10.0					
OCD5	7.3	27.5					
Forecasts	4	2					
OFCL (2012-16)	5.8	9.4	11.8	13.2	15.0	15.7	14.9
OCD5 (2012-16)	7.6	12.2	15.7	18.1	20.6	21.8	20.0

Table 5. Watch and warning summary for Tropical Storm Selma, 27 – 28 October 2017.

Date/Time (UTC)	Action	Location
27/ 0900	Tropical Storm Warning issued	coast of El Salvador
27 / 1500	Tropical Storm Watch issued	Pacific coast of Guatemala
28 / 1500	Tropical Storm Warning discontinued	coast of El Salvador
28 / 1500	Tropical Storm Watch discontinued	Pacific coast of Guatemala

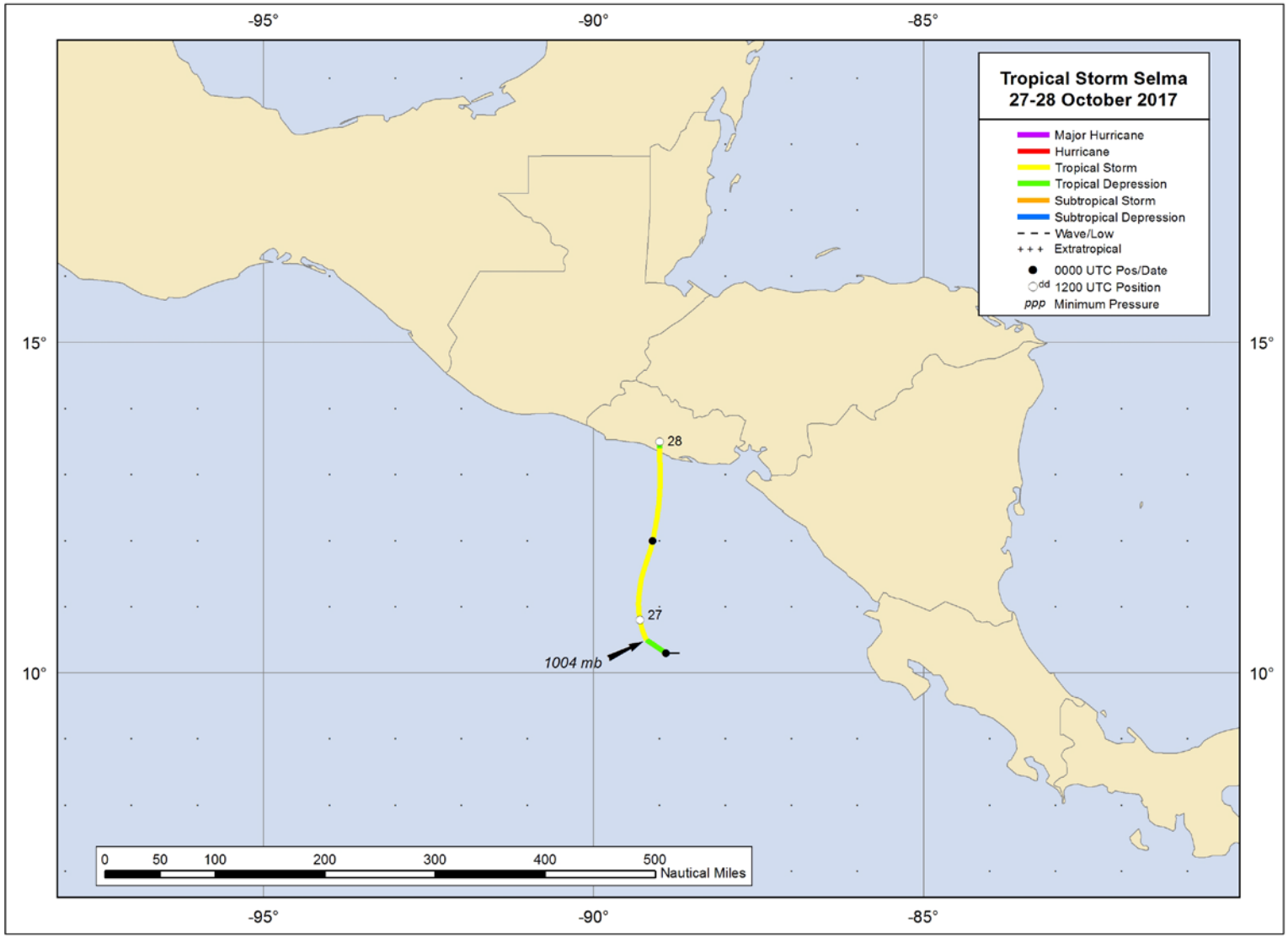

Figure 1. Best track positions for Tropical Storm Selma, 27–28 October 2017.

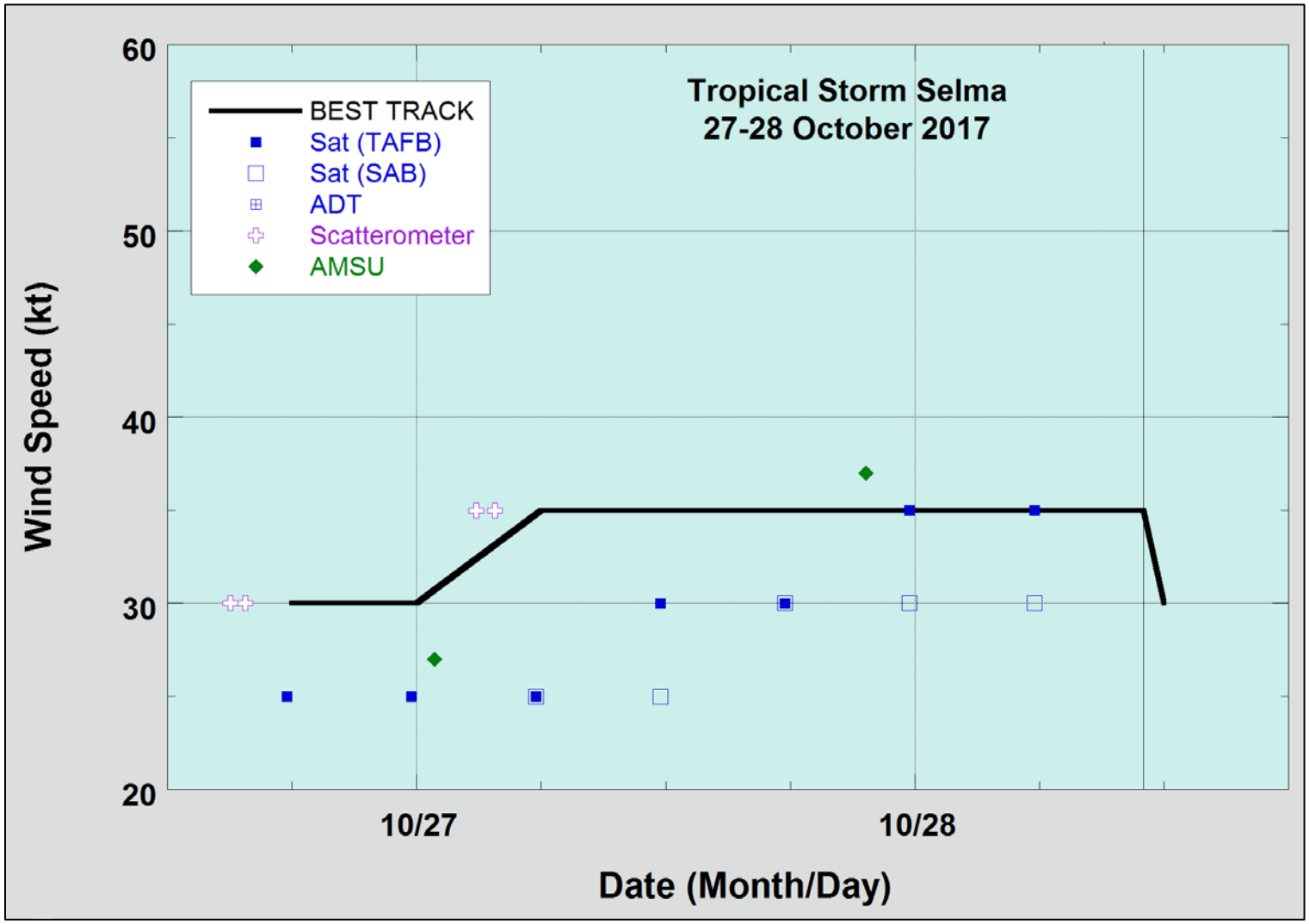

Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Selma, 27–28 October 2017. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. Dashed vertical lines correspond to 0000 UTC, and the solid vertical line corresponds to landfall.

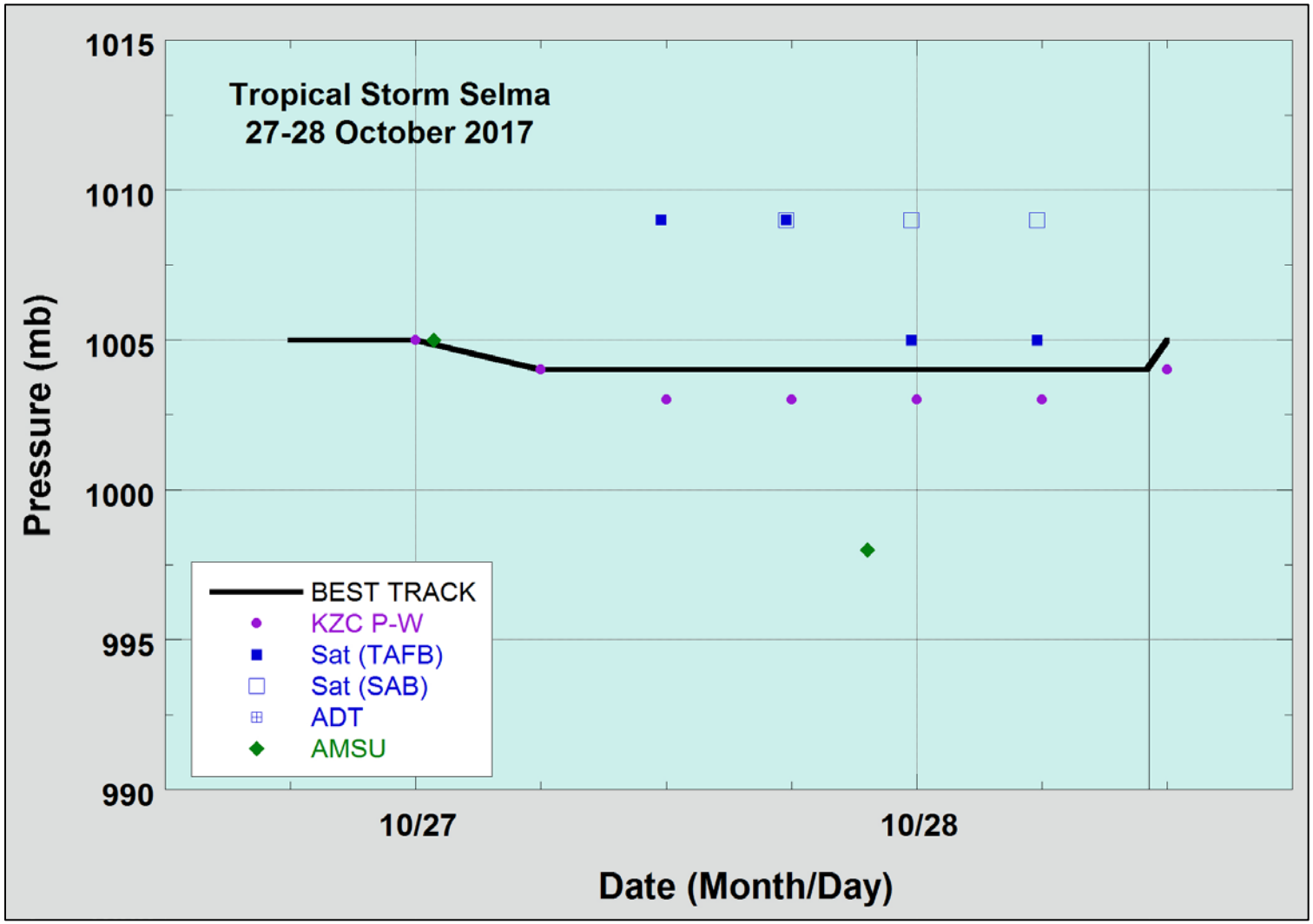

Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Selma, 27–28 October 2017. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC, and the solid vertical line corresponds to landfall.