

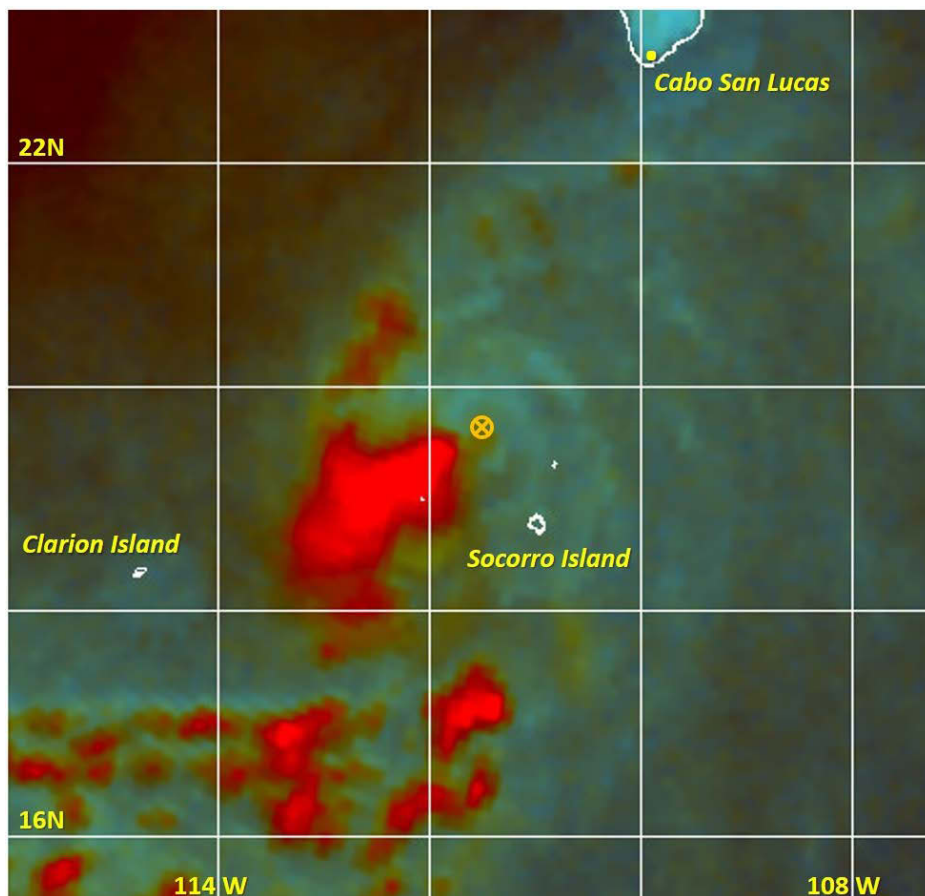


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

TROPICAL STORM HENRIETTE (EP092019)

12–13 August 2019

Stacy R. Stewart
National Hurricane Center
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A 1252 UTC 12 AUGUST 2019 SSMI/S PASSIVE MICROWAVE IMAGE OF HENRIETTE WHEN THE SHEARED TROPICAL STORM WAS NEAR ITS PEAK INTENSITY. IMAGE COURTESY OF THE U.S. NAVY/FNMOC, MONTEREY, CA.

Henriette was a short-lived, compact tropical storm that dissipated over the open eastern North Pacific Ocean after passing north of Socorro Island.

Tropical Storm Henriette

12–13 AUGUST 2019

SYNOPTIC HISTORY

A vigorous tropical wave, accompanied by 24-h pressure falls of 3 to 4 mb, moved off the west coast of Africa on 28 July. The wave moved westward for the next several days, producing only intermittent bursts of deep convection due to intrusions of dry mid-level air and westerly to northwesterly deep-layer vertical wind shear. However, by early on 5 August when the wave moved across the central Lesser Antilles, more organized deep convection developed in association with a well-defined mid-level circulation center and the disturbance nearly became a tropical depression over the eastern Caribbean Sea based on scatterometer wind data depicting a nearly closed surface circulation. However, the associated convection did not persist and the wave was unable to close off a surface circulation later that day. The pronounced wave continued its westward trek across the Caribbean Sea and entered the eastern North Pacific basin on 9 August.

Shortly after moving into the eastern Pacific, the wave began to interact with a weak monsoon trough, resulting in the formation of a small low pressure system over the Gulf of Tehuantepec early on 9 August. Deep convection slowly increased and the low became better organized over the next 24 h while moving west-northwestward closer to the southern coast of Mexico. Interaction of the low's outer circulation with the coastal Sierra Madre del Sur mountain range likely caused the system to open up into a trough of low pressure on 10 August. The trough maintained a west-northwestward motion parallel to and just offshore the south-central and southwestern coasts of mainland Mexico, producing disorganized thunderstorm activity until late on 11 August when the disturbance was located a few hundred n mi south-southeast of Baja California Sur. A 1716 UTC ASCAT-C scatterometer pass that day indicated that the disturbance's surface wind field had become better defined and a small low pressure system had formed immediately following an intense burst of deep convection. Strong thunderstorms continued to develop near the low-level center, and it is estimated that a tropical depression formed around 0000 UTC 12 August about 240 n mi south of the southern tip of Baja California Sur, 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 1.

Thunderstorm activity continued to increase near the center of the cyclone for the next 12 h, and the system strengthened into a tropical storm 6 h later while passing north of Socorro Island. Henriette reached its peak intensity of 40 kt at 1200 UTC 12 August when the compact tropical cyclone was located about 210 n mi south-southwest of the southern tip of Baja California Sur, Mexico (cover image). Henriette began to gradually weaken 6 h later due to the tropical storm moving west-northwestward over cooler waters and into a drier and more stable air mass. The cyclone quickly weakened to a tropical depression by 0600 UTC 13 August — just 18 h after achieving peak intensity — and degenerated into a post-tropical remnant low 6 h later. The

weakening low turned westward early on 14 August and moved into strong vertical wind shear conditions, which caused the small cyclone to dissipate by 0600 UTC 15 August about 450 n mi west-southwest of the southern tip of Baja California Sur.

METEOROLOGICAL STATISTICS

Observations in Henriette (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), 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 Henriette.

Henriette's estimated peak intensity of 40 kt at 1200 UTC 12 August is based on ASCAT scatterometer winds of 37–38 kt that were sampled between 1600–1800 UTC during the time when the cyclone's satellite appearance was eroding. Therefore it is assumed that stronger winds were likely present during the time of best convective organization a few hours earlier. The estimated minimum pressure of 1003 mb is based on a blend of ADT, SATCON, and Knaff-Zehr-Courtney (KZC) pressure estimates.

There were no ship or land reports of winds of tropical-storm-force winds associated with Henriette.

CASUALTY AND DAMAGE STATISTICS

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

FORECAST AND WARNING CRITIQUE

The genesis of Henriette was poorly forecast, which isn't unusual for systems that only become short-lived, weak tropical cyclones. The wave from which Henriette formed was first introduced in the Tropical Weather Outlook 120-h forecast period with a low probability (<40% chance) of genesis 126 h prior to formation (Table 2). The probabilities were increased to the medium (40%–60%) category 108 h prior to genesis, but never reached the high (>60%) category. In the 48-h forecast period, the disturbance was introduced in the low, and medium categories 78 h and 30 h before genesis, respectively, but also never reached the high category. In fact, both the 2-day and 5-day probabilities were lowered to the low category 18 h before genesis occurred (minus signs in Table 2).



Due to Henriette's short lifetime, there were only four 12-h forecasts and two 24-h forecasts that verified. Thus, a comprehensive verification of NHC official (OFCL) and guidance track and intensity forecast errors is not provided. The four 12-h and two 24-h OFCL track forecasts had mean track errors of 16.1 n mi and 26.8 n mi, respectively, which were lower than the 5-yr average forecast track errors. Similarly, official forecast intensity errors were lower than the mean official errors for the previous 5-yr period at 12 h (2.5 kt) and 24 h (2.5 kt).

No tropical cyclone watches or warnings were associated with Henriette.



Table 1. Best track for Tropical Storm Henriette, 12–13 August 2019.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
11 / 1800	18.2	107.7	1006	30	low
12 / 0000	18.8	109.1	1006	30	tropical depression
12 / 0600	19.3	110.4	1005	35	tropical storm
12 / 1200	19.7	111.5	1003	40	"
12 / 1800	20.1	112.6	1004	40	"
13 / 0000	20.5	113.7	1005	35	"
13 / 0600	20.9	114.7	1007	30	tropical depression
13 / 1200	21.2	115.5	1008	25	low
13 / 1800	21.3	116.3	1009	20	"
14 / 0000	21.5	116.9	1009	20	"
14 / 0600	21.8	117.3	1009	15	"
14 / 1200	22.0	117.6	1010	15	"
14 / 1800	22.0	117.9	1010	15	"
15 / 0000	21.7	118.0	1010	15	"
15 / 0600					dissipated
12 / 1200	19.7	111.5	1003	40	maximum intensity & 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. The negative signs in parentheses indicate the number of hours prior to genesis that probabilities were reduced to the low category.

	Hours Before Genesis	
	48-Hour Outlook	120-Hour Outlook
Low (<40%)	78 (-18)	126 (-18)
Medium (40%-60%)	30	108
High (>60%)	—	—

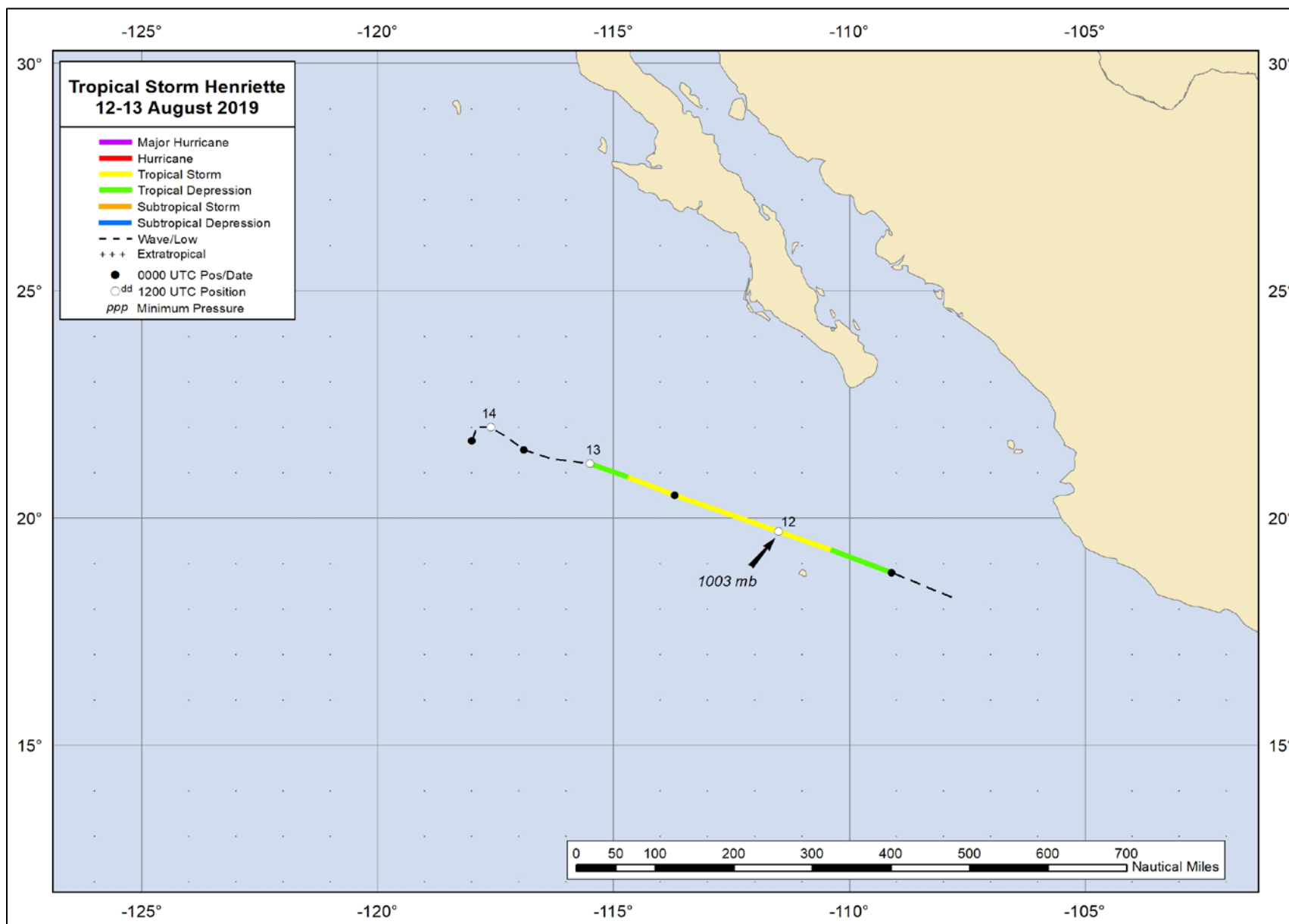


Figure 1. Best track positions for Tropical Storm Henriette, 12–13 August 2019.

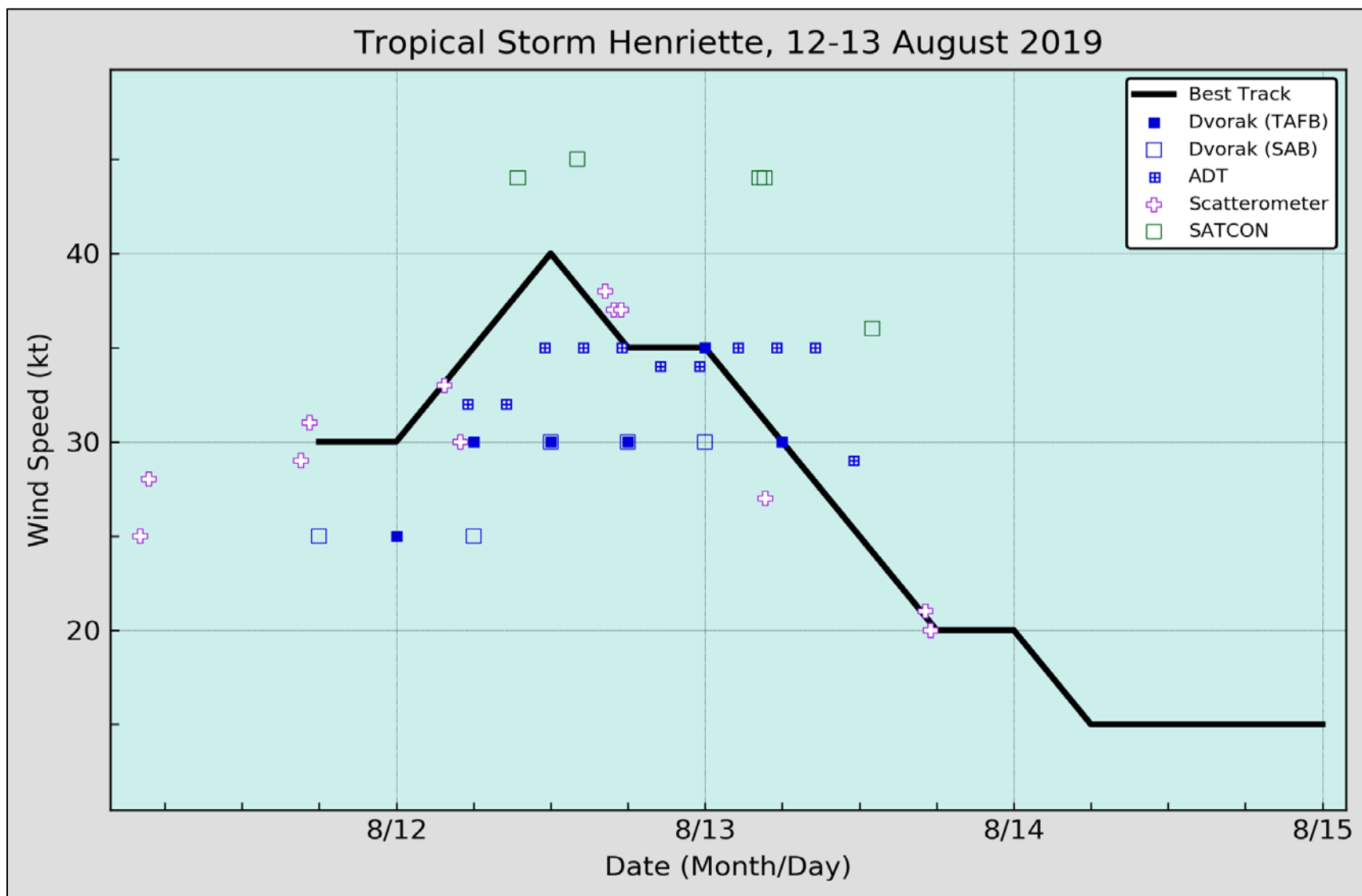


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Henriette, 12–13 August 2019. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

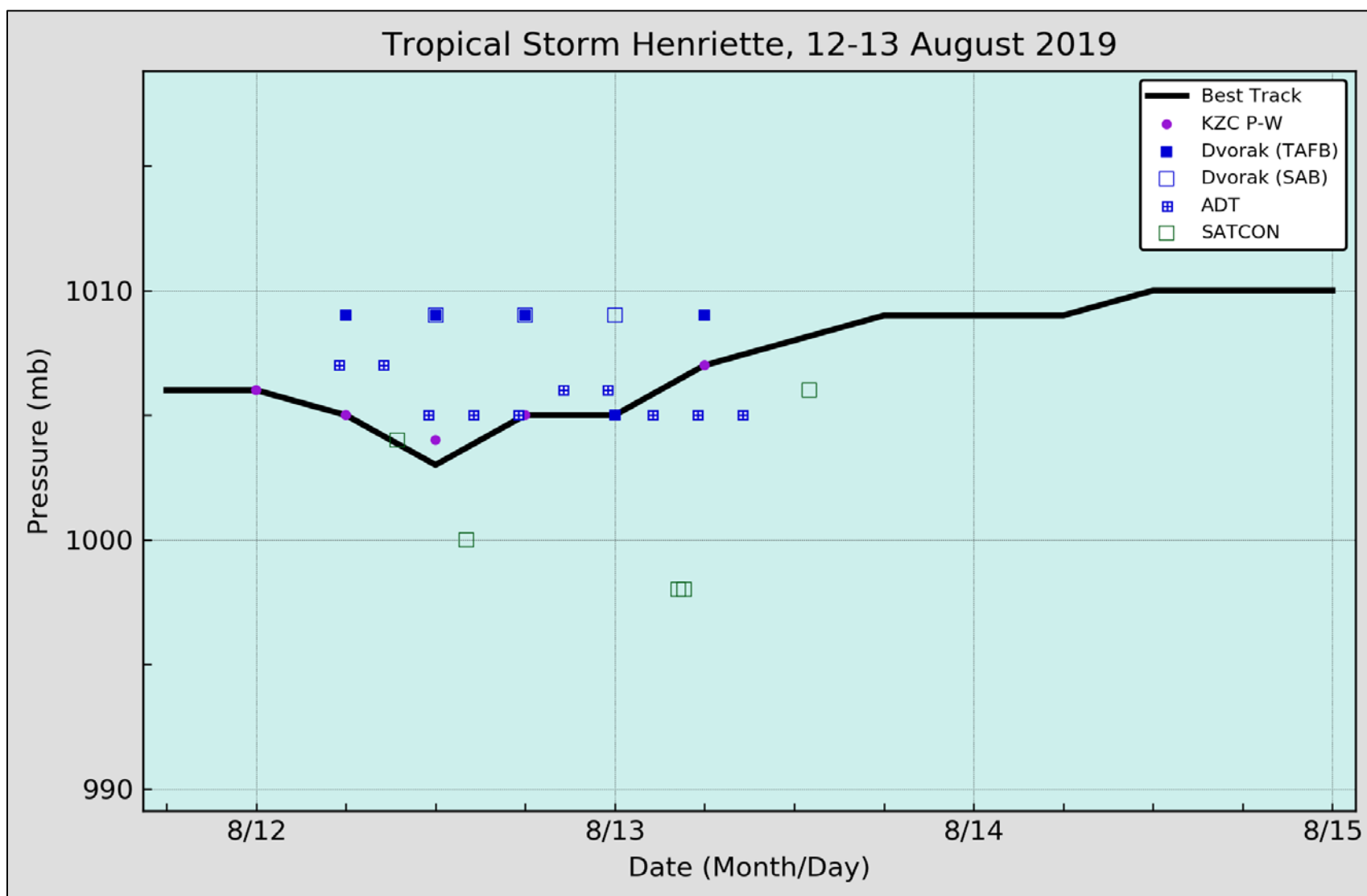


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Henriette, 12–13 August 2019. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for 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.