NATIONAL HURRICANE CENTER
TROPICAL CYCLONE REPORT

TROPICAL STORM VICKY

(AL212020)

14–17 SEPTEMBER 2020

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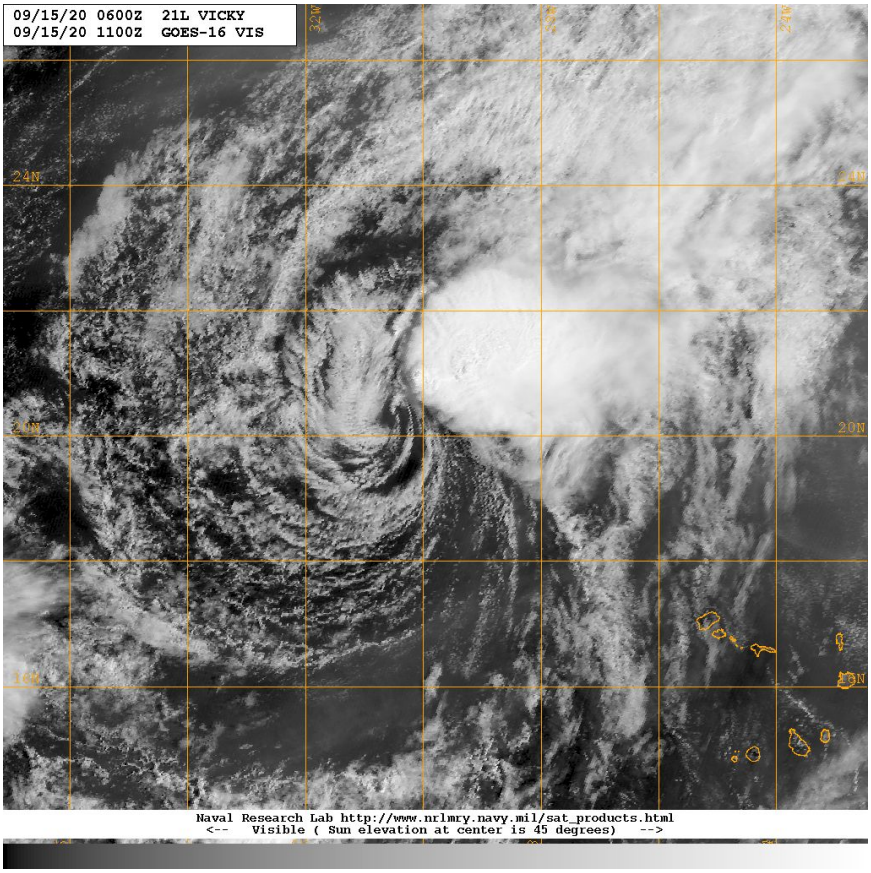

GOES-16 VISIBLE SATELLITE IMAGE OF TROPICAL STORM VICKY AT 1100 UTC 15 SEPTEMBER 2020, NEAR ITS PEAK INTENSITY OF 45 KT. IMAGE COURTESY OF NAVAL RESEARCH LABORATORY.

Vicky was a tropical storm that formed and remained over the eastern Atlantic and was not able to strengthen much due to an environment of strong vertical wind shear.

Tropical Storm Vicky

14–17 SEPTEMBER 2020

SYNOPTIC HISTORY

Vicky formed from a tropical wave that moved off the west coast of Africa on 11 September. A broad area of low pressure associated with the wave moved northwestward and crossed the Cabo Verde Islands with numerous showers and locally heavy rain on 12 September. On 13 September, the low-level circulation and associated deep convection became better organized, and by 0000 UTC 14 September the system is estimated to have become a tropical depression while centered about 170 n mi west of the northwesternmost of the Cabo Verde Islands. 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 depression moved northward along the eastern side of a broad low-level cyclonic gyre associated with the west African monsoon, which also contained the developing Tropical Storm Teddy. The depression soon strengthened into a tropical storm by 0600 UTC 14 September. Vicky turned toward the northwest and reached its peak intensity of 45 kt by 1800 UTC that day. The storm strengthened in spite of significant westerly vertical wind shear associated with the outflow of Teddy located some 900 n mi to its west-southwest. This shear caused the low-level cloud circulation to become exposed to the west and west-southwest of the main area of deep convection. Vicky remained more or less in this sheared state throughout its relatively short lifetime. Even with the strong shear affecting it, the cyclone was able to maintain an intensity of 45 kt through 15 September. On 16 September, the shear became even stronger as the outflow from intensifying Hurricane Teddy became more pronounced. As a result, Vicky began to succumb to the hostile atmospheric environment and slowly weakened, while a low-level ridge to the north caused it to turn toward the west. By 1200 UTC 17 September, the cyclone weakened to a tropical depression. Around 1800 UTC that day, the system had practically no associated deep convection, and consequently Vicky became a remnant low while located about 800 n mi west-northwest of the northwesternmost Cabo Verde Islands. The weakening low moved west-southwestward in the trade winds for a few days, and the system dissipated over the central tropical Atlantic by 0000 UTC 20 September.

METEOROLOGICAL STATISTICS

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

[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.

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 Vicky.

The estimated peak intensity of Vicky, 45 kt, is based on ASCAT scatterometer observations. This intensity is a bit surprising, considering the storm's very ragged appearance on satellite pictures. Maximum Dvorak-based satellite intensity estimates from SAB and TAFB were lower, ranging from 30 to 35 kt respectively. Vicky's estimated minimum pressure of 1001 mb is based on the KZC wind-pressure relationship.

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

CASUALTY AND DAMAGE STATISTICS

On 12 September, the tropical wave and low-pressure area that later developed into Vicky caused flooding in the Cabo Verde Islands that resulted in a drowning death in Praia, the country's capital. There were no reports of damage or casualties directly caused by Vicky, however.

FORECAST AND WARNING CRITIQUE

The genesis of Vicky was fairly well predicted. While still over Africa, the wave from which the storm developed was given a low (<30%) 5-day chance of development 96 h before genesis (Table 2). It was first assigned a low 2-day chance of development 54 h before genesis, at which time the wave had moved off the African coast. The 2- and 5-day formation probabilities were raised to the medium (40–60%) category 30 h and 84 h prior to genesis, respectively. However, the 2- and 5-day genesis probabilities were not raised to the high (>60%) category until 12 h and 18 h before genesis, respectively.

A verification of NHC official track forecasts for Vicky is given in Table 3a. Official track forecast errors were lower than the mean official errors for the previous 5-yr period at 24 through 48 h, and were comparable to the long-term averages at 12, 60 and 72 h. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. The official forecasts beat much of the model guidance except for EGRI, TVCA, and HCCA, which were comparable to or better than the NHC forecasts

A verification of NHC official intensity forecasts for Vicky is given in Table 4a. Official intensity forecast errors were lower than the mean official errors for the previous 5-yr period at all forecast intervals. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. Most of the models had lower errors than the NHC

forecasts, in particular EMXI which was better than the official forecasts at all intervals. It should be noted that the official intensity forecasts, which recognized the unfavorable upper-level winds that would be affecting Vicky, correctly showed no significant strengthening.

No watches or warnings for land areas were issued due to Vicky.

Table 1. Best track for Tropical Storm Vicky, 14–17 September 2020.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
14 / 0000	17.5	28.2	1008	30	tropical depression
14 / 0600	18.0	28.3	1006	35	tropical storm
14 / 1200	18.5	28.6	1003	40	"
14 / 1800	19.0	29.1	1002	45	"
15 / 0000	19.5	29.6	1002	45	"
15 / 0600	20.0	30.1	1002	45	"
15 / 1200	20.5	30.8	1001	45	"
15 / 1800	21.0	31.6	1001	45	"
16 / 0000	21.4	32.6	1004	45	"
16 / 0600	21.5	33.5	1005	40	"
16 / 1200	21.4	34.3	1007	35	"
16 / 1800	21.5	35.0	1007	35	"
17 / 0000	21.6	35.6	1007	35	"
17 / 0600	21.7	36.4	1008	35	"
17 / 1200	21.6	37.6	1008	30	tropical depression
17 / 1800	21.3	38.7	1008	25	"
18 / 0000	20.8	39.4	1009	25	low
18 / 0600	20.5	40.2	1009	25	"
18 / 1200	20.4	41.0	1009	25	"
18 / 1800	20.3	41.9	1009	25	"
19 / 0000	20.1	42.9	1010	20	"
19 / 0600	19.9	44.0	1011	20	"
19 / 1200	19.6	45.1	1011	20	"
19 / 1800	19.3	46.3	1012	20	"
20 / 0000					dissipated
15 / 1200	20.5	30.8	1001	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%)	54	96
Medium (40%-60%)	30	84
High (>60%)	12	18

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Vicky, 14–17 September 2020. 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	60	72	96	120
OFCL	26.2	**26.6**	**42.0**	**61.4**	86.2	102.6		
OCD5	41.9	73.0	145.3	207.3	264.5	334.2		
Forecasts	13	11	9	7	5	3		
OFCL (2015-19)	24.1	36.9	49.6	65.1	80.7	96.3		
OCD5 (2015-19)	44.7	96.1	156.3	217.4	273.9	330.3		

Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Vicky, 14–17 September 2020. 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	60	72	96	120
OFCL	25.3	23.5	40.6	61.4	86.2	102.6		
OCD5	39.9	68.3	138.5	207.3	264.5	334.2		
GFSI	28.5	40.5	62.9	85.7	106.9	119.0		
HWFI	30.9	37.7	63.3	97.5	114.2	149.4		
EGRI	30.9	30.3	**28.8**	**34.3**	**63.7**	**88.2**		
EMXI	27.3	29.8	47.1	64.4	90.8	125.9		
NVGI	31.9	51.5	99.1	147.5	169.1	168.0		
CMCI	32.3	34.3	43.8	64.3	87.7	123.7		
CTCI	33.6	48.3	68.6	88.5	100.5	115.8		
TVCA	26.6	26.7	42.3	**58.9**	**66.0**	**66.7**		
HCCA	25.4	26.0	**37.9**	63.0	**83.0**	111.2		
AEMI	26.1	27.6	45.6	69.5	112.5	146.3		
TABS	34.9	53.9	100.6	144.9	175.4	200.8		
TABM	61.2	147.5	258.5	366.8	488.3	666.1		
TABD	109.6	269.1	463.0	693.3	993.0	1406.7		
Forecasts	12	10	8	7	5	3		

Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Vicky, 14–17 September 2020. 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	60	72	96	120
OFCL	**5.0**	**5.5**	**7.8**	**5.7**	**8.0**	**6.7**		
OCD5	5.3	8.4	13.8	17.9	20.6	24.0		
Forecasts	13	11	9	7	5	3		
OFCL (2015-19)	5.2	7.7	9.4	10.7	11.9	13.0		
OCD5 (2015-19)	6.8	10.8	14.1	17.0	18.8	20.6		

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Vicky, 14–17 September 2020. 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	60	72	96	120
OFCL	4.5	5.0	7.1	4.2	6.2	5.0		
OCD5	**3.6**	8.2	14.4	20.0	23.2	26.0		
HWFI	4.5	**4.1**	**6.1**	4.8	**5.5**	**4.0**		
LGEM	**4.3**	6.8	10.1	11.8	13.5	15.0		
IVCN	**4.1**	**4.9**	**5.9**	4.3	7.8	10.0		
CTCI	**3.8**	6.6	9.0	7.5	10.5	11.0		
GFSI	**3.5**	5.4	**7.0**	5.7	7.8	8.0		
EMXI	**3.7**	**3.6**	**3.6**	**3.3**	**4.2**	**2.0**		
HCCA	**3.8**	**4.2**	**5.9**	**3.8**	6.2	7.0		
FSSE	**3.9**	**4.6**	**4.7**	**2.8**	6.2	5.0		
Forecasts	10	9	7	6	4	1		

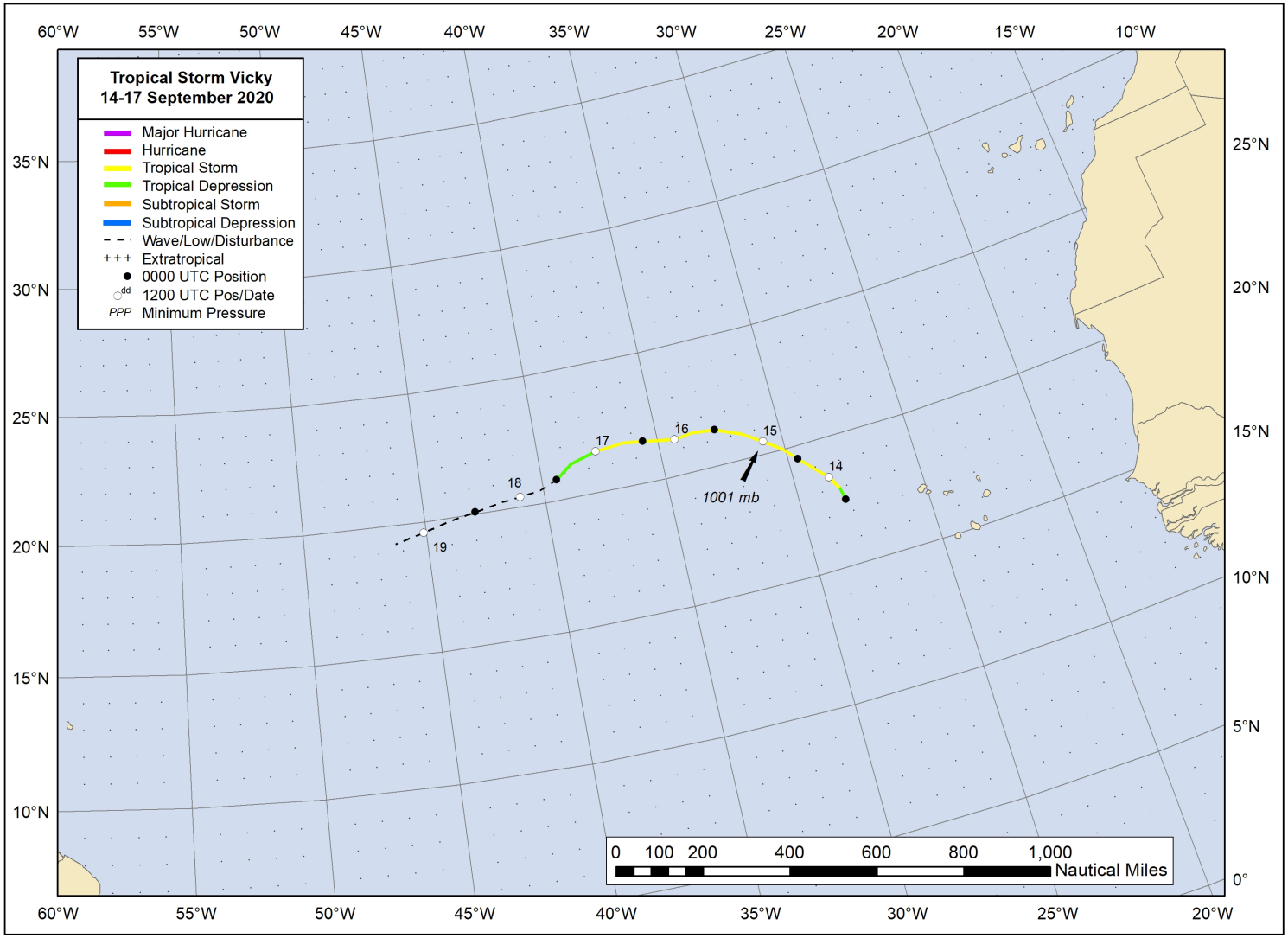

Figure 1. Best track positions for Tropical Storm Vicky, 14–17 September 2020.

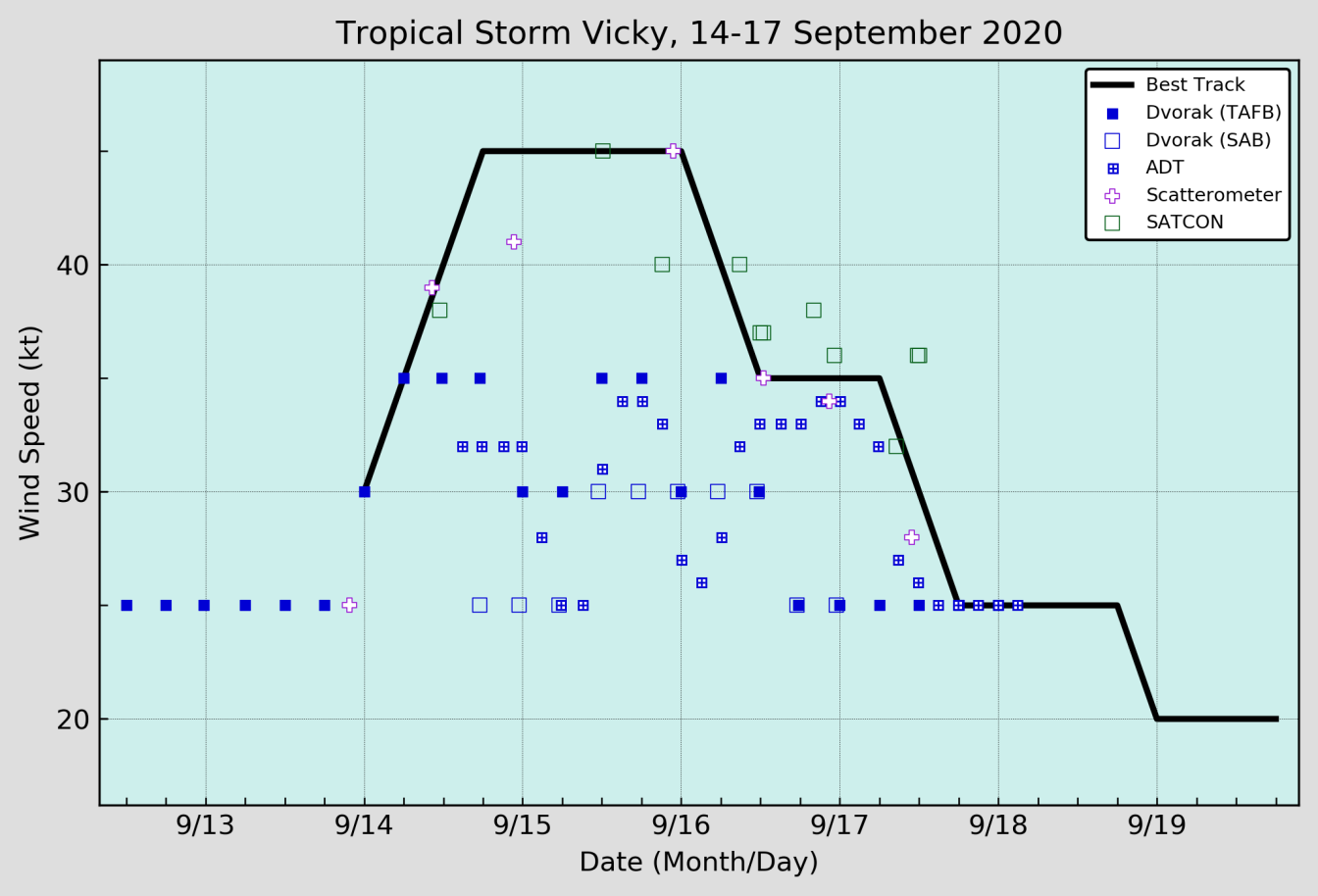

Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Vicky, 14–17 September 2020. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

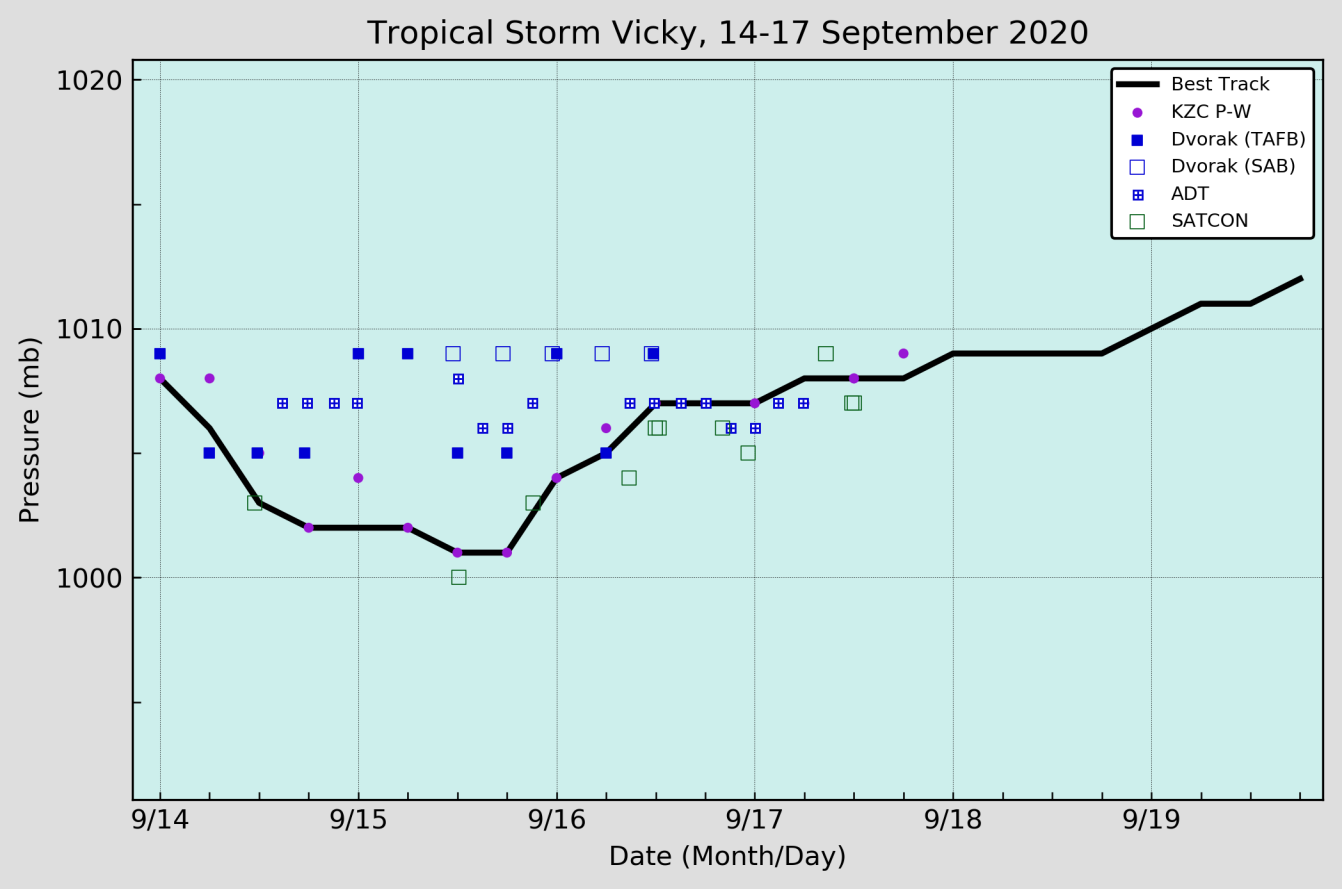

Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Vicky, 14–17 September 2020. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for 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.