

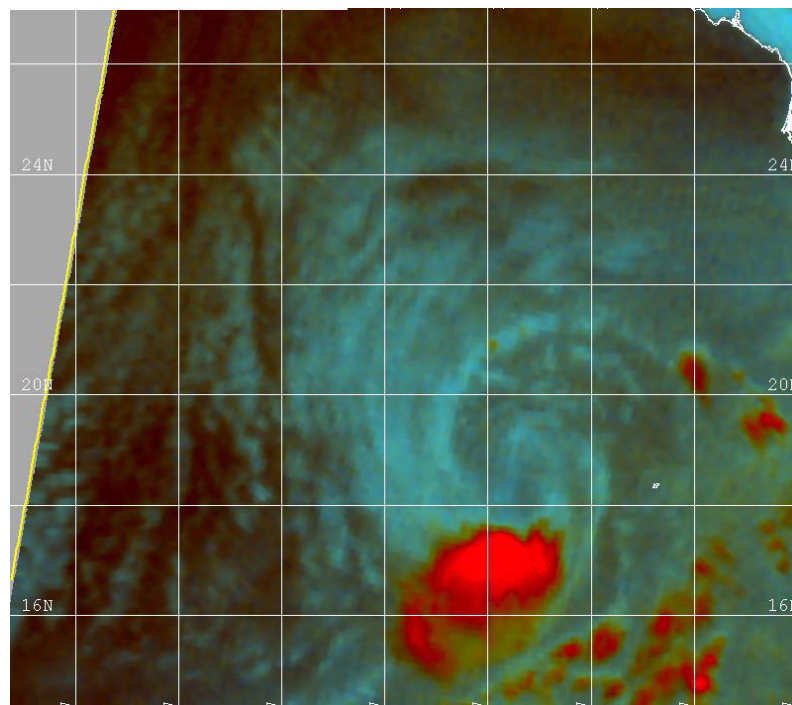


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

TROPICAL STORM DALILA (EP052019)

22–25 July 2019

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National Hurricane Center
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SSMIS MICROWAVE IMAGE AT 1200 UTC 23 JULY 2019 OF DALILA NEAR THE TIME OF THE STORM'S PEAK INTENSITY. IMAGE COURTESY OF THE NAVAL RESEARCH LABORATORY.

Dalila was a highly sheared tropical cyclone that lasted for 3 days over the eastern North Pacific.

Tropical Storm Dalila

22–25 JULY 2019

SYNOPTIC HISTORY

A tropical wave accompanied by a distinct area of disturbed weather moved off the west coast of Africa on 8 July. The disturbance showed some signs of cyclonic rotation while moving westward across the deep tropical Atlantic and the Windward Islands. The system continued westward and moved very close to the island of Curaçao in the central Caribbean Sea on 15 July. Weather service radar data from that island depicted a cyclonic twist at the mid-levels. However, the wave lost most of its convection as it moved westward over the western Caribbean Sea and Central America during 17 and 18 July. The system continued westward over the eastern North Pacific away from the southwest coast of Mexico where convection gradually increased. A broad circulation developed, but the disturbance lacked a well-defined center until 0600 UTC 22 July when a tropical depression formed about 600 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.

Due to northerly shear and the effects of cool waters, the cyclone’s center was devoid of deep convection during its entire life. However, some cyclonically curved bands of thunderstorms were located well to the south of the center where the ocean was warmer. While the cyclone was moving northwestward, there was a brief period of strengthening, and the depression became Tropical Storm Dalila at 0600 UTC 23 July, reaching a peak intensity of 40 kt 6 h later about 500 n mi southwest of the southern tip of the Baja California peninsula. The tropical-storm-force winds were confined to a small area to the east of the center. Weakening began as the cyclone’s circulation moved over cooler waters, and 24 h later the system became a depression. The cyclone degenerated into a remnant low by 1200 UTC 25 July over the cold waters of the Pacific about 600 n mi west of the Baja California peninsula. The remnant low meandered westward for about a day and then dissipated by 1800 UTC 26 July.

METEOROLOGICAL STATISTICS

Observations in Dalila (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 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 Dalila.

The estimated maximum intensity of 40 kt at 1200 UTC 23 July was based on a consensus of satellite intensity estimates when convection was the deepest and closest to the center. In addition, ASCAT data at 1628 UTC 23 July showed a peak wind vector of 38 kt. By then the cloud pattern of the cyclone was on a weakening trend.

CASUALTY AND DAMAGE STATISTICS

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

FORECAST AND WARNING CRITIQUE

The genesis of Dalila was well anticipated. The disturbance from which Dalila developed was introduced with a low probability of formation in the 5-day portion of the Tropical Weather Outlook (TWO) about 174 h prior to genesis. The probability was increased to the high category 54 h in advance of formation. The system was included in the 2-day portion of the TWO with a high probability of formation about 30 h before genesis (Table 2).

Since Dalila was a short-lived cyclone, there were only a few verifying forecasts. The verification of NHC official track forecasts is summarized in Table 3a. Official forecast track errors were lower than the mean official errors for the previous 5-yr period at all forecast times. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. The multi-model ensemble TVCX was the best performer during Dalila, followed by the HFIP Corrected Consensus (HCCA) and the HMON model (HMNI).

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

No coastal watches or warnings were issued in association with Dalila.

Table 1. Best track for Tropical Storm Dalila, 22–25 July 2019.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
22 / 0600	14.7	116.2	1006	30	tropical depression
22 / 1200	15.6	116.3	1006	30	"
22 / 1800	16.5	116.5	1006	30	"
23 / 0000	17.2	116.8	1006	30	"
23 / 0600	17.8	117.1	1005	35	tropical storm
23 / 1200	18.3	117.4	1004	40	"
23 / 1800	18.8	117.8	1005	40	"
24 / 0000	19.2	118.2	1006	35	"
24 / 0600	19.7	118.6	1007	30	tropical depression
24 / 1200	20.2	119.0	1008	30	"
24 / 1800	20.7	119.5	1008	25	"
25 / 0000	21.1	119.8	1008	25	"
25 / 0600	21.4	120.1	1009	25	"
25 / 1200	21.8	120.6	1009	20	low
25 / 1800	22.0	121.2	1009	20	"
26 / 0000	22.2	121.7	1009	20	"
26 / 0600	22.4	122.3	1010	20	"
26 / 1200	22.5	123.0	1010	20	"
26 / 1800					dissipated
23 / 1200	18.3	117.4	1004	40	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%)	66	174
Medium (40%-60%)	42	150
High (>60%)	30	54



Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Dalila. 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	15.3	26.3	39.0	40.1	45.5		
OCD5	23.3	31.0	36.8	41.3	119.3		
Forecasts	11	9	7	5	1		
OFCL (2014-18)	21.1	32.2	41.8	51.8	75.7	101.1	133.7
OCD5 (2014-18)	34.0	69.7	109.0	148.4	223.5	285.5	356.7



Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Dalila. Errors smaller than the NHC official forecast are shown in boldface type.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	15.3	26.3	39.0	40.1	45.5		
GFSI	20.2	35.3	56.5	64.9	214.1		
HMNI	20.3	20.0	27.4	33.9	56.5		
HWFI	20.8	32.2	54.0	70.2	50.4		
NVGI	30.3	48.9	63.1	84.9	94.5		
AEMI	17.2	30.0	41.9	51.7	63.5		
HCCA	14.9	23.0	35.3	43.9	79.0		
TVCX	14.8	21.8	35.5	36.9	45.5		
GFEX	16.7	29.6	46.2	50.7	86.3		
TVCE	15.5	22.2	37.6	40.8	66.6		
TABD	29.8	58.7	86.9	121.6	180.2		
TABM	24.6	43.5	67.9	89.2	133.9		
TABS	27.3	47.6	74.7	93.3	126.4		
OCD5	23.3	31.0	36.8	41.3	119.3		
Forecasts	11	9	7	5	1		



Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Dalila. 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	1.4	2.2	1.4	2.0	0.0		
OCD5	3.5	4.4	4.6	3.8	16.0		
Forecasts	11	9	7	5	1		
OFCL (2014-18)	6.1	10.0	12.2	13.7	15.5	15.4	15.7
OCD5 (2014-18)	7.9	13.1	16.7	19.2	21.8	22.9	22.1

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Dalila. Errors smaller than the NHC official forecast are shown in boldface type.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	1.4	2.2	1.4	2.0	0.0		
OCD5	3.4	5.0	5.3	3.8	16.0		
GFSI	3.6	5.1	5.1	4.2	3.0		
HMNI	4.2	5.9	4.1	2.8	5.0		
HWFI	2.7	3.7	3.9	4.6	3.0		
NVGI	3.9	6.9	7.4	4.0	6.0		
AEMI	3.4	4.8	5.1	1.8	1.0		
DSHP	2.7	4.4	3.9	1.6	3.0		
LGEM	2.8	5.8	6.3	5.0	8.0		
IVCN	2.8	4.3	4.0	1.2	1.0		
HCCA	3.1	4.2	3.9	1.2	1.0		
Forecasts	11	9	7	5	1		

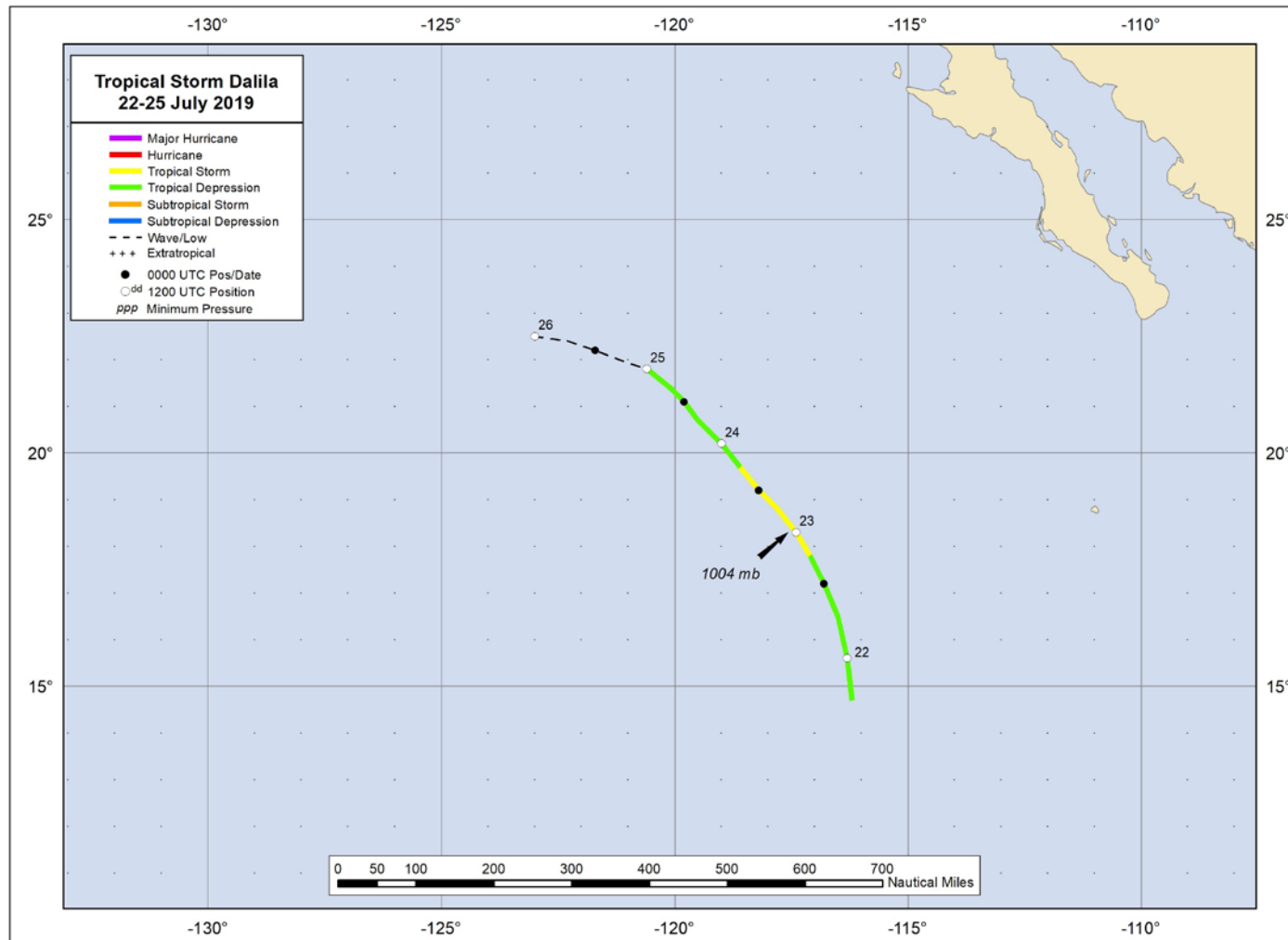


Figure 1. Best track positions for Tropical Storm Dalila, 22–25 July 2019.

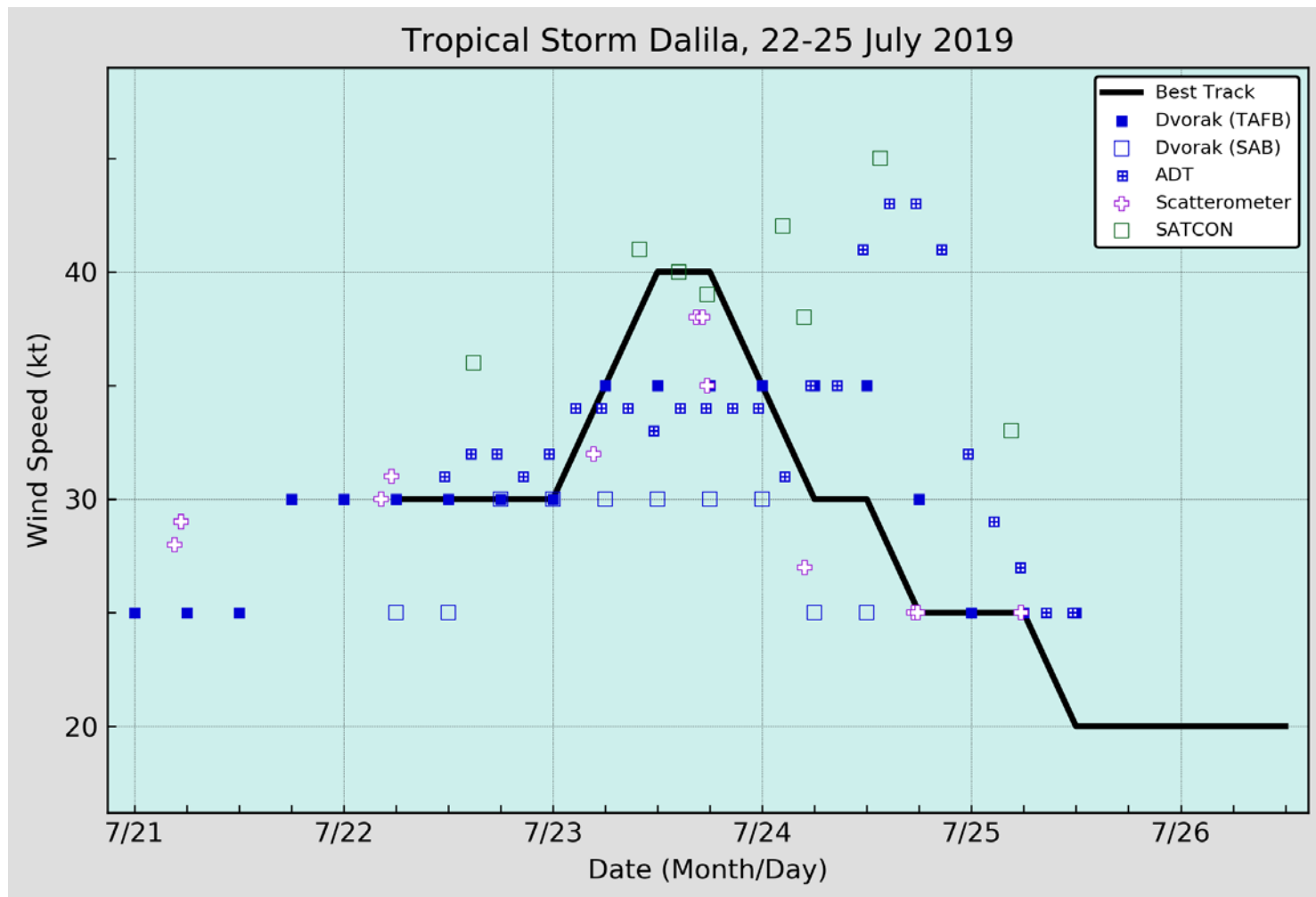


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Dalila, 22–25 July 2019. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies.

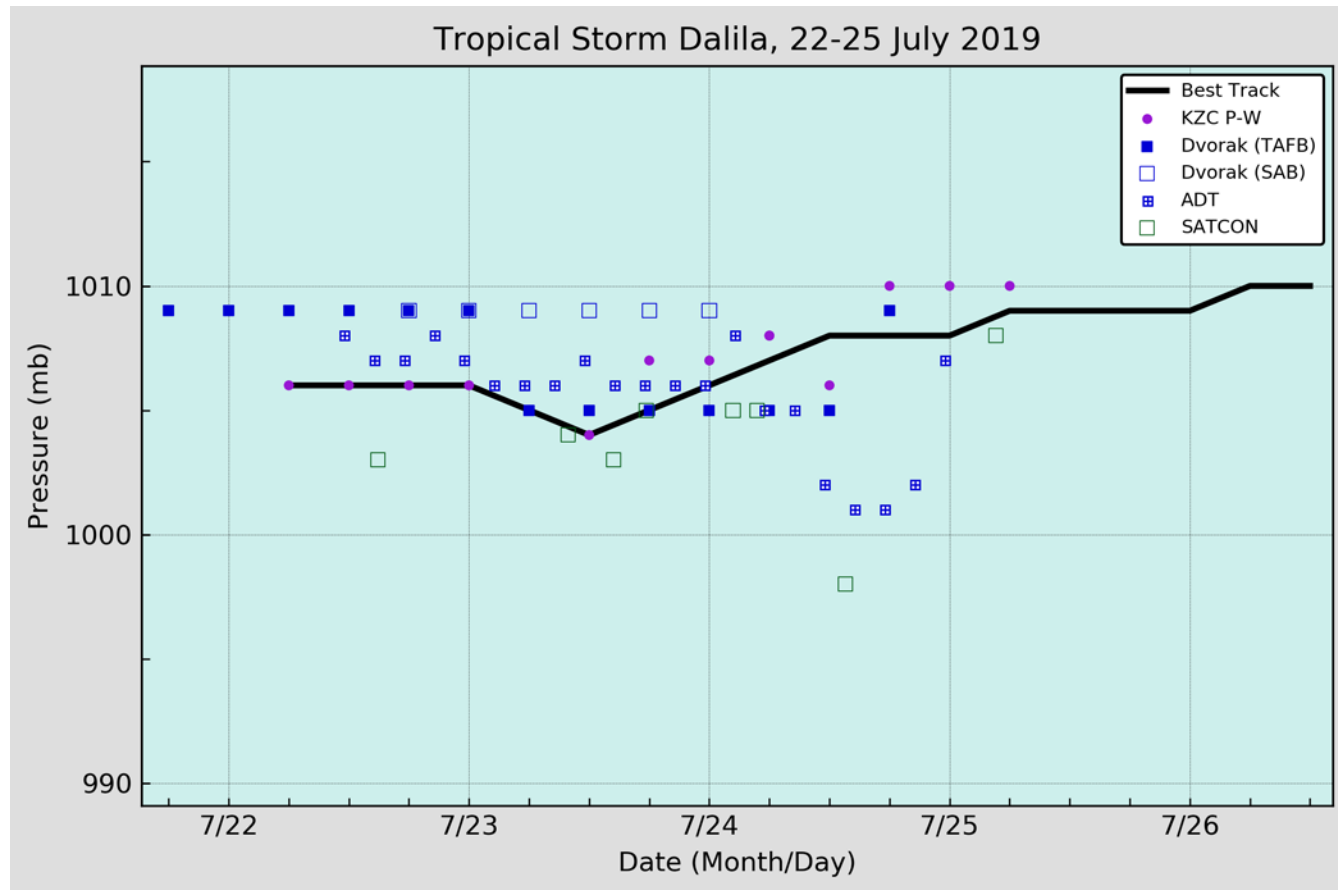


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Dalila, 22–25 July 2019. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological 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.