

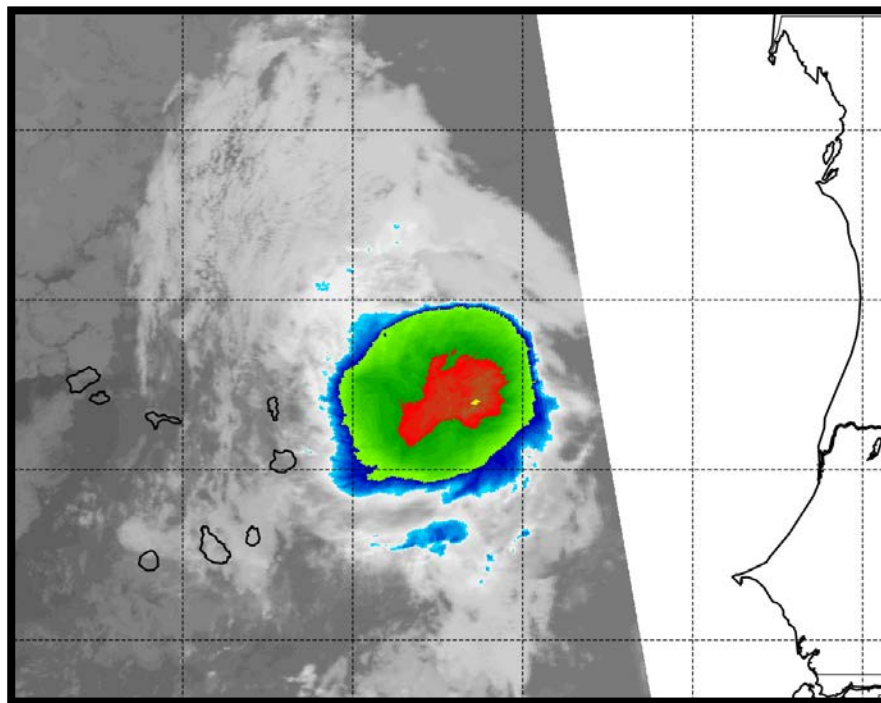


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

TROPICAL DEPRESSION TEN (AL102020)

31 July–1 August 2020

John P. Cangialosi
National Hurricane Center
14 December 2020



NASA TERRA MODIS INFRARED SATELLITE IMAGE OF TROPICAL DEPRESSION TEN AT 0015 UTC 1 AUGUST.
IMAGE COURTESY OF THE NAVAL RESEARCH LAB.

Tropical Depression Ten was a short-lived depression over the far eastern Atlantic Ocean that did not affect land.

Tropical Depression Ten

31 JULY–1 AUGUST 2020

SYNOPTIC HISTORY

The genesis of Tropical Depression Ten was associated with a tropical wave that moved off the west coast of Africa on 28 July. The westward-moving wave was producing a notable amount of deep convection over Africa, however, the showers and thunderstorms gradually lessened as the wave moved offshore. An area of low pressure formed along the wave axis by 1800 UTC 29 July about midway between the west coast of Africa and the Cabo Verde Islands. The low pressure system slowed down and then turned northward and north-northeastward on 30 and 31 July as it moved around the east side of a large mid- to upper-level low. Showers and thunderstorms waxed and waned near the center during the next couple of days and the low was close to becoming a tropical depression early on 30 July. The convection became sufficiently organized by 1800 UTC 31 July to mark the formation of a tropical depression when the cyclone was located about 200 n mi east of the eastern-most Cabo Verde Islands. The “best track” chart of the depression’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 the depression formed, deep convection increased over the center and the cyclone had its best satellite appearance around 0000 UTC 1 August (cover image). However, shortly after that time, deep convection steadily weakened due to cool sea surface temperatures and dry air. Meanwhile, the cyclone turned northwestward and then west-northwestward on the northeast and north sides of the cutoff low. Deep convection completely dissipated by 0000 UTC 2 August, resulting in the system degenerating to a remnant low at that time when it was located about 200 n mi north of the Cabo Verde Islands. The remnant low opened into a trough within the next 6 h.

METEOROLOGICAL STATISTICS

Observations in Tropical Depression Ten (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

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 *bt*k directory, while previous years’ data are located in the *archive* directory.

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

The peak intensity of 30 kt is based on a combination of ASCAT data, and subjective and objective Dvorak estimates. The minimum pressure of 1008 mb is based on the Knaff-Zehr-Courtney pressure-wind relationship. Although an ASCAT-B pass around 2300 UTC 31 July showed maximum winds around 35 kt, these winds appear to be rain inflated and were located in the southwest quadrant of the circulation, an area where you would not expect to find the maximum winds in a northwestward moving tropical cyclone. In addition, an ASCAT-C pass around the same time showed maximum winds of 30 kt or less. Since the convective structure degraded shortly after these scatterometer passes, the operational intensity assessment of 30 kt was maintained based on the majority of the data.

CASUALTY AND DAMAGE STATISTICS

There were no reports of casualties associated with Tropical Depression Ten.

FORECAST AND WARNING CRITIQUE

The genesis of Tropical Depression Ten was not well anticipated (Table 2). The disturbance that became Tropical Depression Ten was first included in the Tropical Weather Outlook 36 h before genesis occurred, giving the system a low (<40%) chance of tropical cyclone formation during the next two and five days. The probability of genesis reached the medium category (40–60%) 24 h before genesis occurred, but failed to reach the high category (>60%). The genesis of this tropical cyclone was challenging to forecast due to its short window of time to form before it moved into an area with unfavorable environmental conditions.

Due to the tropical depression's short existence, there were only three verifying 12-h forecasts and one verifying 24-h forecast. Thus, a comprehensive verification of official and guidance track and intensity forecast errors is not provided. The official 12-h forecasts had an average track error of 20.9 n mi and an intensity error of 3.3 kt. These compare to the mean 12-h official track and intensity errors for the previous 5-yr period (2015–2019) of 24.1 n mi and 5.2 kt, respectively. The one verifying 24-h forecast had a track error of 32.1 n mi and an intensity error of 5.0 kt; both of these values are below the 5-yr means for track and intensity.

There were no coastal watches or warnings associated with Tropical Depression Ten.



Table 1. Best track for Tropical Depression Ten, 31 July–1 August 2020.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
29 / 1800	12.7	19.7	1009	25	low
30 / 0000	12.7	20.1	1009	25	"
30 / 0600	12.8	20.4	1009	25	"
30 / 1200	13.0	20.4	1008	30	"
30 / 1800	13.1	20.2	1008	30	"
31 / 0000	13.2	20.0	1008	30	"
31 / 0600	13.7	19.7	1008	30	"
31 / 1200	14.5	19.4	1008	30	"
31 / 1800	15.5	19.7	1008	30	tropical depression
01 / 0000	16.5	20.3	1008	30	"
01 / 0600	17.4	21.0	1008	30	"
01 / 1200	18.3	21.8	1009	25	"
01 / 1800	19.0	23.0	1009	25	"
02 / 0000	19.4	24.4	1010	20	low
02 / 0600					dissipated
30 / 1200	13.0	20.4	1008	30	maximum wind and 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%)	36	36
Medium (40%-60%)	24	24
High (>60%)	-	-

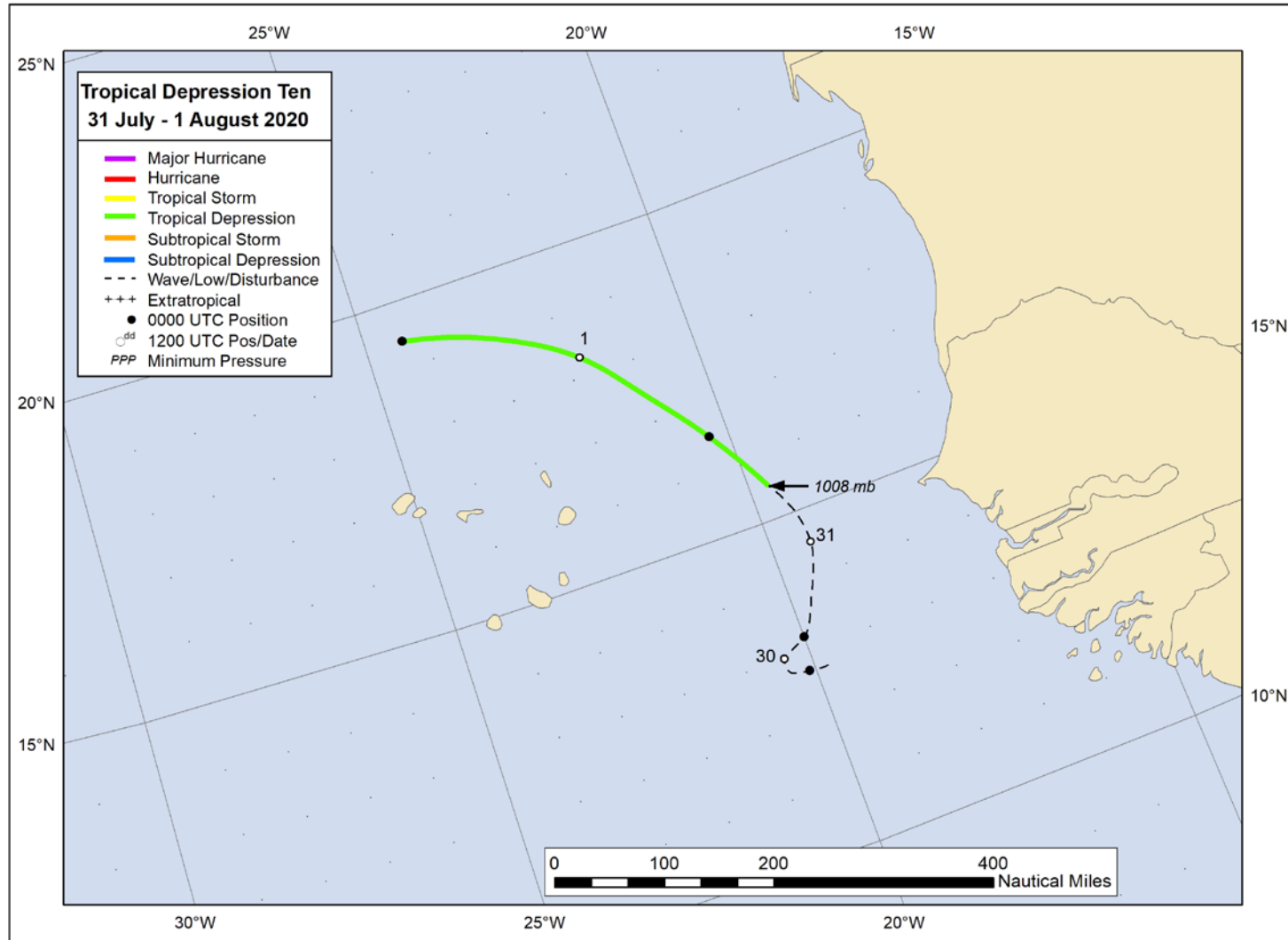


Figure 1. Best track positions for Tropical Depression Ten, 31 July–1 August 2020.

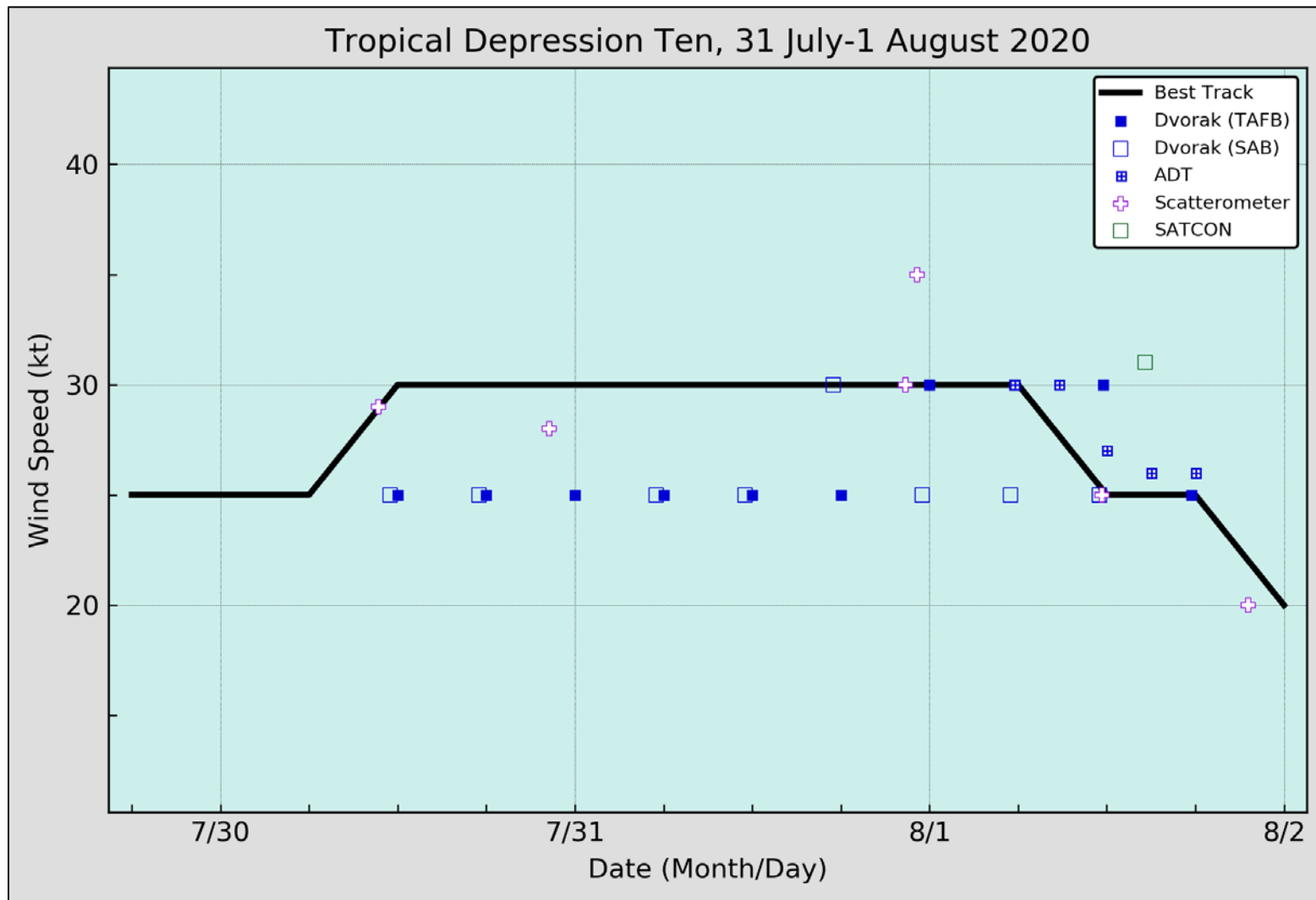


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Depression Ten, 31 July–1 August 2020. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

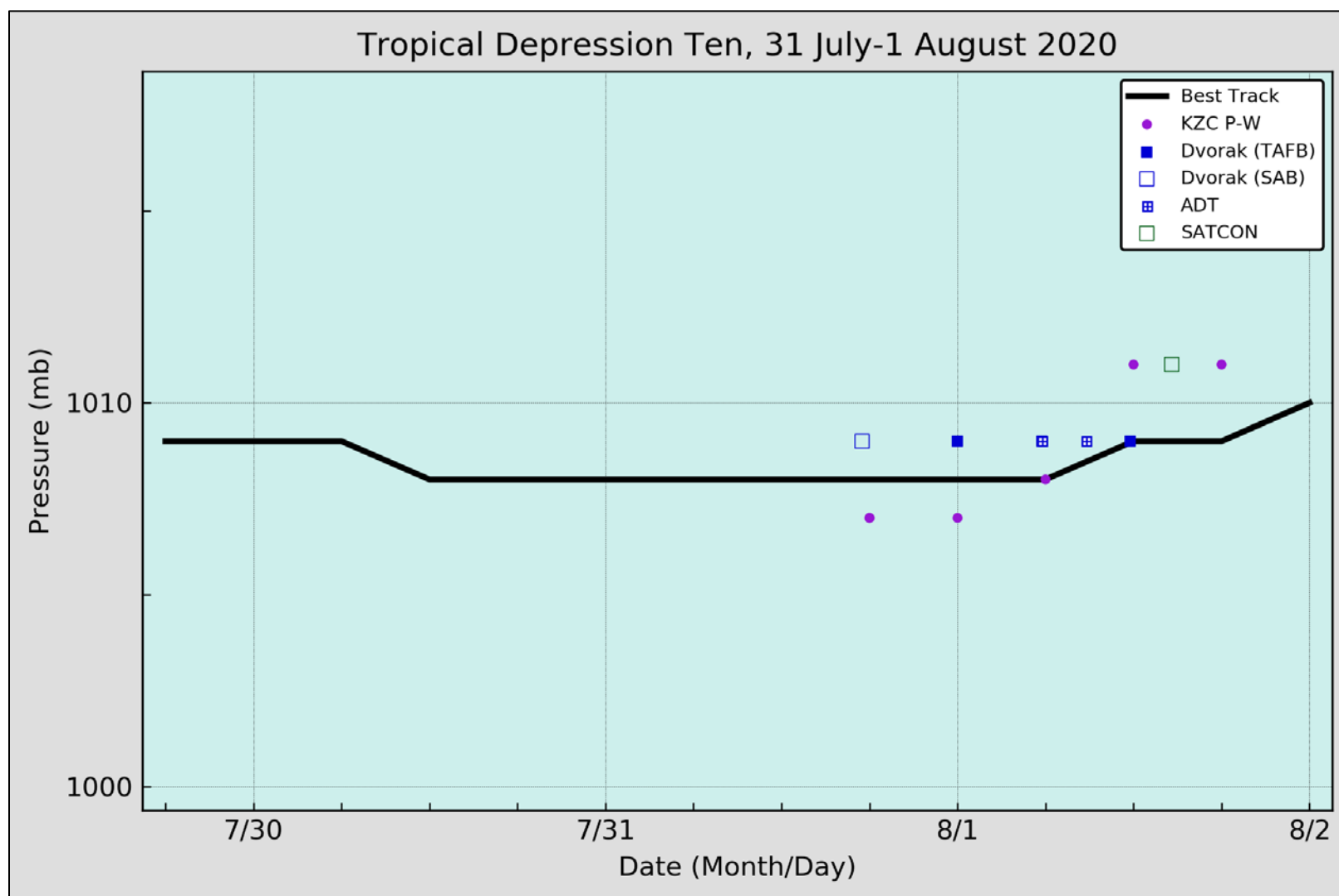


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Depression Ten, 31 July –1 August 2020. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. The one SATCON intensity estimate is from the Cooperative Institute 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.