

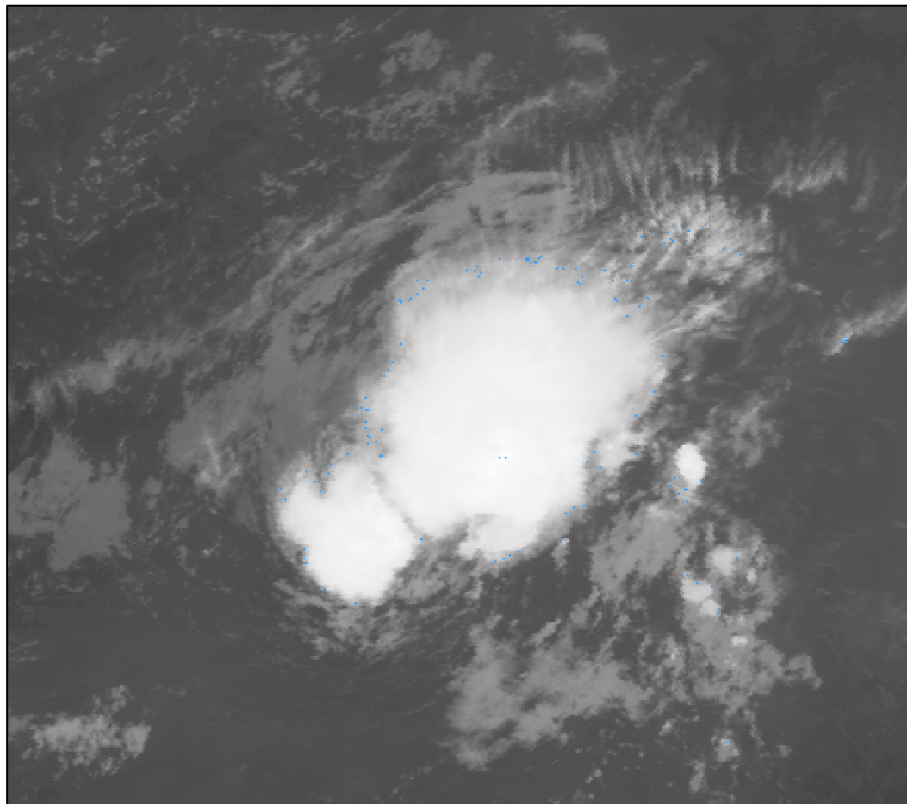


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

TROPICAL DEPRESSION ELEVEN (AL112022)

28–29 September 2022

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National Hurricane Center
14 December 2022



GOES-16 INFRARED SATELLITE IMAGE OF TROPICAL DEPRESSION ELEVEN AT 0320 UTC 28 SEPTEMBER 2022, SHORTLY AFTER THE DEPRESSION'S FORMATION AND PEAK INTENSITY. IMAGE COURTESY OF NOAA/NESDIS/STAR.

Tropical Depression Eleven was a short-lived tropical cyclone that remained over the open waters of the central tropical Atlantic.

Tropical Depression Eleven

28–29 SEPTEMBER 2022

SYNOPTIC HISTORY

Tropical Depression Eleven formed from a tropical wave that departed the west coast of Africa on 17 September. The wave moved westward during the next few days while producing disorganized shower and thunderstorm activity. By late on 20 September, the thunderstorm activity became a little more concentrated which resulted in the formation of a broad area of low pressure the next day about 475 n mi southwest of the Cabo Verde Islands. The system was located within a relatively dry mid-level environment and was only able to produce intermittent bursts of disorganized convection while it moved slowly west-northwestward to northwestward on 22–23 September. During the next couple of days, a break in the mid-level ridge enabled the system to drift generally northward while it continued to struggle to produce sustained convection due to the marginal thermodynamic environment across the central tropical Atlantic. By 26 September, deep convection became more persistent and began showing signs of organization, but satellite wind data that morning indicated that the circulation was elongated and that the low lacked a well-defined center. Despite the marginal environmental conditions, the low became better defined later that day, and deep convection continued to increase, but generally remained disorganized. By 0000 UTC 27 September, the low began to move slowly eastward to the south of a broad trough over the eastern subtropical Atlantic. By late that day, deep convection became better organized, and it is estimated that a tropical depression formed by 0000 UTC 28 September about 525 n mi west of the Cabo Verde Islands. Satellite wind data around the time of formation indicated that the system had maximum sustained winds of 30 kt. 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 1¹.

After formation, low- to mid-level ridging to the east of the depression caused it to turn northward. Although a large burst of deep convection developed overnight to the northeast of the cyclone’s center, the depression did not strengthen further. Deep convection then became less organized by 1200 UTC 28 September, and satellite wind data indicated that the maximum winds decreased to 25 kt. Around that time, the low- to mid-level ridge strengthened which caused the depression to turn northwestward, and the cyclone continued on that heading for the remainder of its existence. Although the system continued to produce bursts of deep convection, increasing southwesterly vertical wind shear caused the thunderstorm activity to gradually become less organized over the next 24 h. The depression degenerated into a post-tropical remnant low by 1200 UTC 29 September when it was located about 700 n mi west of the Cabo Verde Islands.

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

Shortly thereafter, the low degenerated into a trough of low pressure over the central tropical Atlantic.

METEOROLOGICAL STATISTICS

Observations in Tropical Depression Eleven (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 the depression.

Winds and Pressure

The 30-kt estimated peak intensity of the depression is based on a pair of ASCAT passes around 0000 UTC 28 September that revealed peak winds of around 30 kt. The peak intensity is also supported by Dvorak classifications of T2.0 (30 kt) from TAFB. The depression's minimum pressure of 1008 mb is based on the Knaff-Zehr-Courtney pressure-wind relationship (Fig. 3).

CASUALTY AND DAMAGE STATISTICS

There were no reports of damage or casualties associated with Tropical Depression Eleven.

FORECAST AND WARNING CRITIQUE

The genesis forecasts for Tropical Depression Eleven were adequate, especially considering the marginal environment in which it formed and the short-lived nature of the system. The potential for tropical cyclone formation was first introduced into the Tropical Weather Outlook at 0600 UTC 21 September, nearly a week before the depression formed (Table 2). At the time it was first mentioned in the TWO, the system was given a low chance (<40%) of development over the next 5 days. In the subsequent TWO at 1200 UTC that day, a low chance of development over the next 48 h was introduced. The TWOs during the first few days of the disturbance's existence correctly stipulated that only slow development was possible due to the marginal environmental conditions. Although the probabilities of development remained in the low category, beginning with the TWO issued at 0000 UTC 25 September, it was indicated that conditions could become slightly more conducive for development during the middle portion of the following week. As that time approached, the 2- and 5-day probabilities were raised to the



medium category at 0600 UTC 26 September, and to the high category 6 h later. This resulted in 42 h of lead time for the medium (40–60%) category and 36 h for the high (>60%) category, which are noticeably better than for most short-lived depressions. The location of formation was captured within about 70% of the areas depicted on the NHC Graphical Tropical Weather Outlook (Fig. 4). While the medium and high areas depicted on the TWO had a 100% hit rate for the location of genesis, the TWOs that indicated a low chance of formation had a slight westward bias regarding the depression's development location.

Due to the depression's short existence, there were only three verifying 12-h forecasts and one verifying 24-h forecast. Therefore, a comprehensive verification of official and guidance track and intensity forecast errors is not provided. The average error of the official 12-h forecasts was 29.2 n mi, and the single verifying 24-h forecast had a zero n mi error. The NHC intensity forecasts had average errors of 8.3 kt and 10.0 kt at 12 h and 24 h, respectively. The first couple of NHC forecasts called for some slight strengthening, which did not occur. The official forecasts indicated that the system would be short-lived, but the depression degenerated into a remnant low and dissipated even sooner than expected.

There were no coastal watches or warnings issued in association with the depression.



Table 1. Best track for Tropical Depression Eleven, 28–29 September 2022.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
26 / 1800	13.8	35.8	1009	25	low
27 / 0000	13.6	35.4	1009	25	"
27 / 0600	13.6	35.0	1009	25	"
27 / 1200	13.8	34.7	1009	25	"
27 / 1800	14.1	34.5	1009	25	"
28 / 0000	14.5	34.3	1008	30	tropical depression
28 / 0600	15.1	34.2	1008	30	"
28 / 1200	15.7	34.3	1009	25	"
28 / 1800	16.2	34.7	1009	25	"
29 / 0000	16.7	35.2	1009	25	"
29 / 0600	17.5	36.0	1009	25	"
29 / 1200	18.3	36.9	1009	25	low
29 / 1800					dissipated
28 / 0000	14.5	34.3	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%)	156	162
Medium (40%-60%)	42	42
High (>60%)	36	36

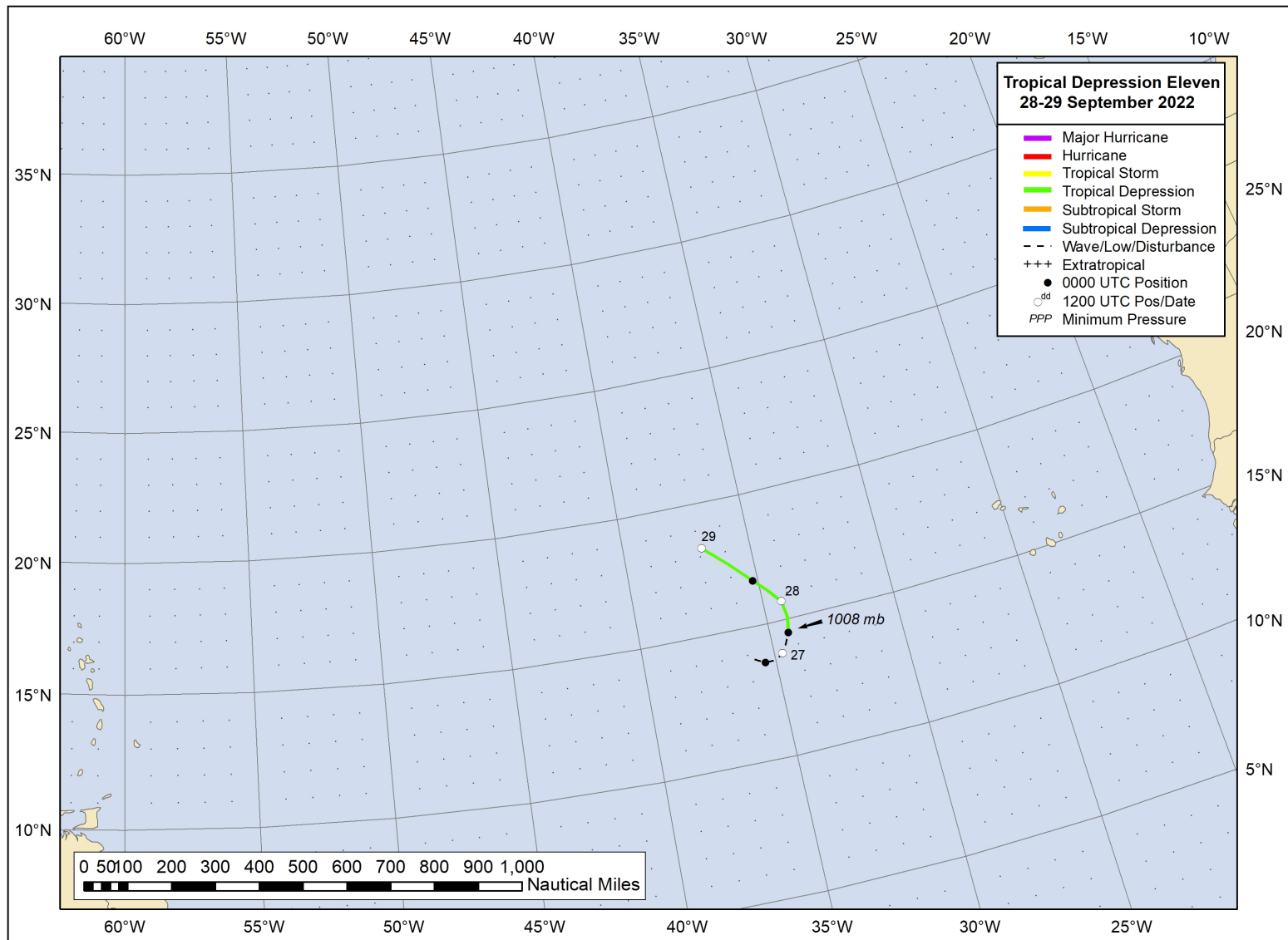


Figure 1. Best track positions for Tropical Depression Eleven, 28–29 September 2022.

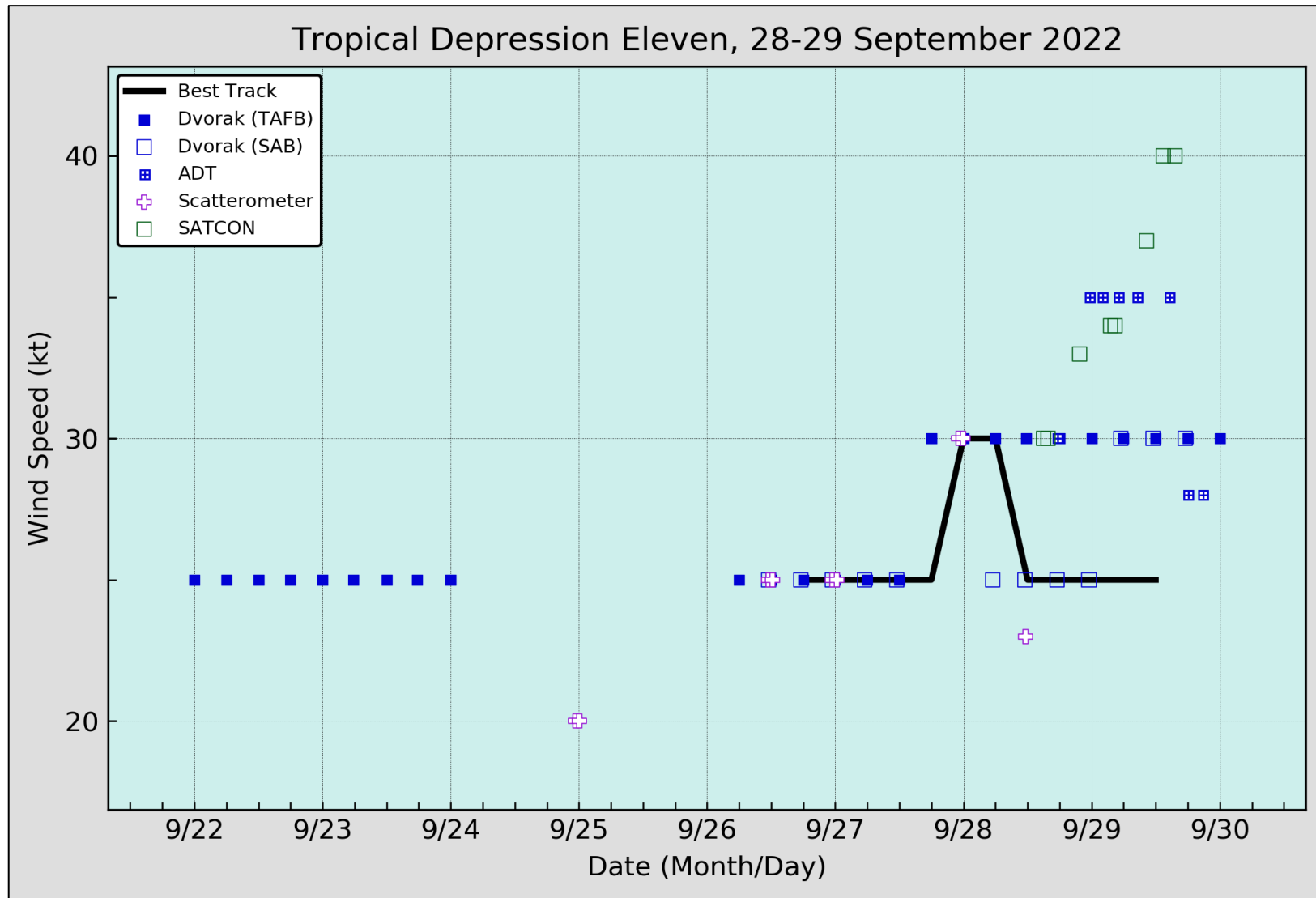


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Depression Eleven, 28–29 September 2022. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

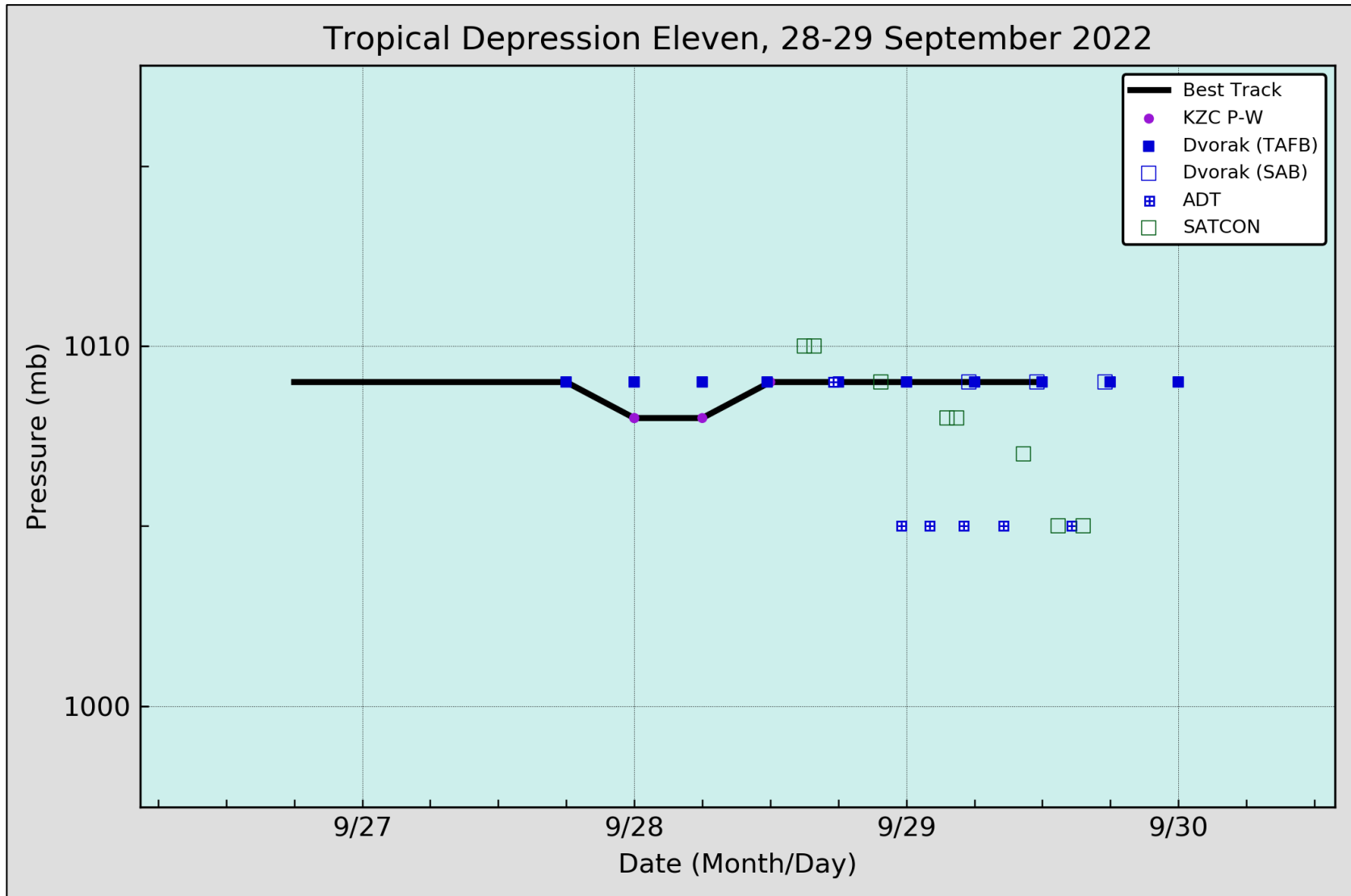


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Depression Eleven, 28–29 September 2022. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute 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.

Eleven 5-day Tropical Weather Outlook Areas

From: 0600 UTC 21 Sep 2022 to 0000 UTC 28 Sep 2022

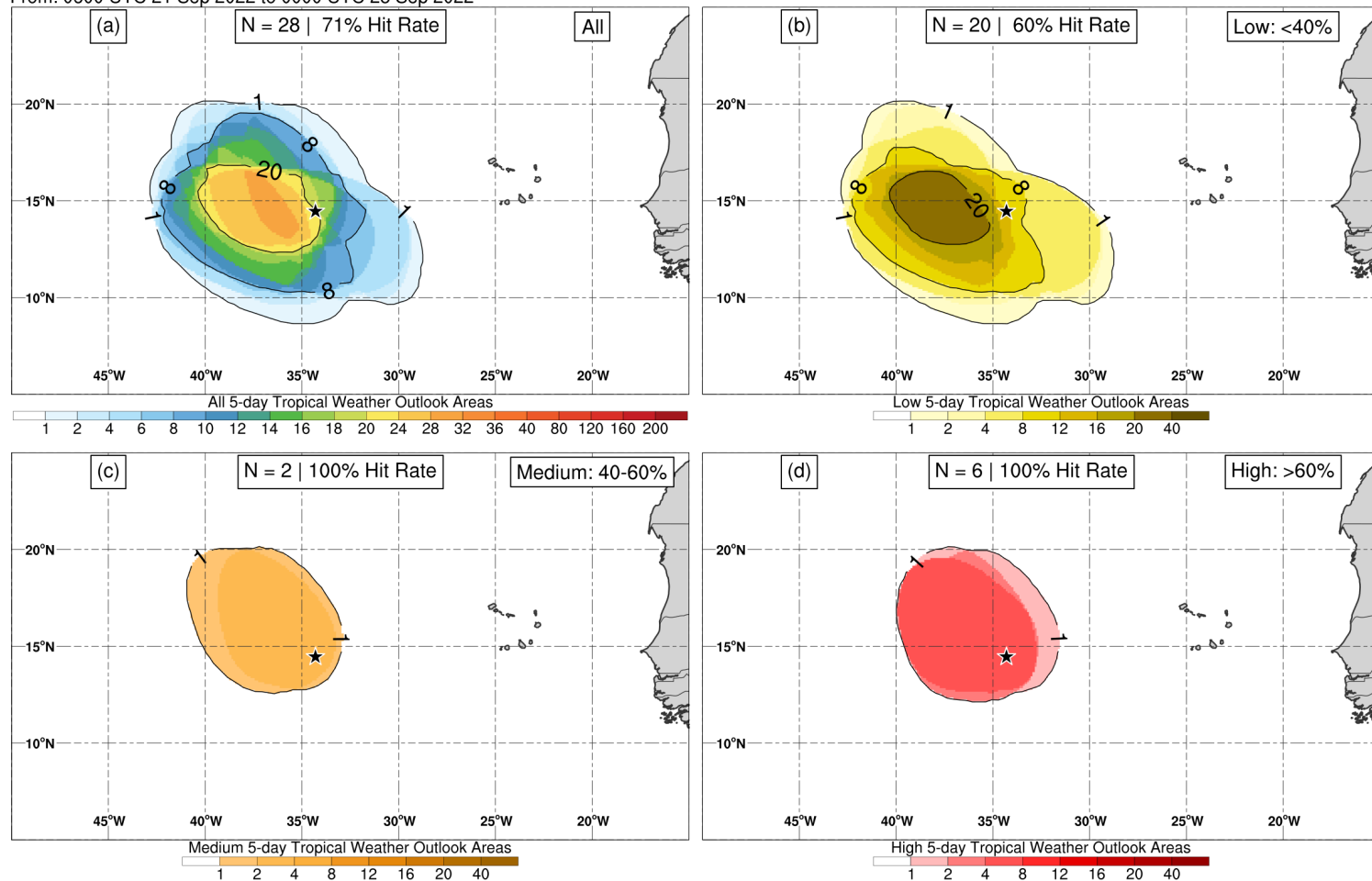


Figure 4. 5-day Tropical Weather Outlook genesis areas associated with the disturbance that developed into Tropical Depression Eleven for (a) all probability areas (10–100%, multi-color shading), (b) low probability areas (< 40%, yellow shading), (c) medium probability areas (40–60%, orange shading), and (d) high probability areas (> 60%, red shading). The black star in each panel indicates the genesis location of the depression. Hit rate indicates the percentage of outlook areas that the genesis location was captured within.