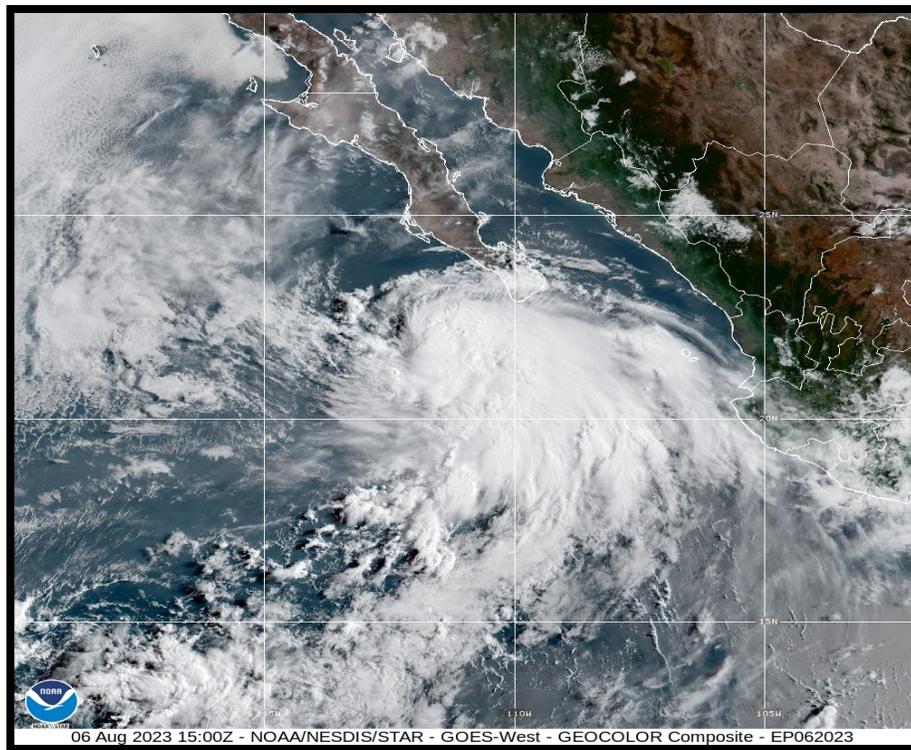# NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT[1]

# TROPICAL STORM EUGENE
## (EP062023)
## 5–7 August 2023

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National Hurricane Center
14 November 2023

**GOES-18 GEOCOLOR IMAGE OF TROPICAL STORM EUGENE AT 1500 UTC 6 AUGUST 2023. IMAGE COURTESY OF NOAA/NESDIS/STAR.**

Eugene was a short-lived tropical storm that moved just offshore the southern tip of the Baja California peninsula and did not directly affect any land areas.

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[1] This is an abbreviated Tropical Cyclone Report since there were no coastal watches or warnings issued and no direct fatalities reported in association with Tropical Storm Eugene.

# Tropical Storm Eugene

## 5–7 AUGUST 2023

## BEST TRACK

The "best track[2]" positions and intensities for Tropical Storm Eugene are listed in Table 1. The best track chart of Tropical Storm Eugene's path is given in Fig. 1, with the wind and pressure histories along with available observations[3] shown in Figs. 2 and 3, respectively.

There were no ship reports of winds of tropical storm force associated with Tropical Storm Eugene.

### *Origin*

Tropical Storm Eugene originated from a tropical wave that moved off the west coast of Africa on 22 July. It crossed Central America and emerged over the far eastern portion of the East Pacific basin south of Guatemala on 1 August.

### *Peak Intensity and Minimum Pressure*

Tropical Storm Eugene rapidly intensified after genesis and reached a peak intensity of 60 kt from 0600 to 1800 UTC 6 August. The estimated peak intensity, is based on a blend of subjective and objective satellite intensity estimates.

The estimated minimum central pressure of 992 mb is based on a blend of subjective and objective satellite intensity estimates and the Knaff-Zehr-Courtney (KZC) pressure-wind relationship.

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[2] 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.

[3] Observations include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), 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 Eugene.

## CASUALTY AND DAMAGE STATISTICS

There were no reports of damage or casualties associated with Tropical Storm Eugene.

## FORECAST AND WARNING VERIFICATION

Table 2 provides the number of hours in advance of formation with the first NHC Tropical Weather Outlook (TWO) forecast in each likelihood category.  Figure 4 shows composites of 7-day TWO genesis areas for each category prior to the formation of Tropical Storm Eugene.

A verification of NHC official track forecasts for Tropical Storm Eugene is given in Table 3. Official track forecast errors were lower than the mean official errors for the previous 5-yr period at all forecast times.  A verification of NHC official intensity forecasts for Tropical Storm Eugene is given in Table 4.  Official intensity forecast errors were higher than the mean official errors for the previous 5-yr period at 12-24 h and lower at 36h.  No meaningful comparisons can be made with the model track or intensity guidance due to the small number of forecasts issued on the system.

There were no coastal watches or warnings issued for Tropical Storm Eugene.

Table 1.        Best track for Tropical Storm Eugene, 5-7 August 2023.

| Date/Time (UTC) | Latitude (°N) | Longitude (°W) | Pressure (mb) | Wind Speed (kt) | Stage |
|---|---|---|---|---|---|
| 04 / 1800 | 15.2 | 103.6 | 1010 | 30 | low |
| 05 / 0000 | 16.3 | 104.3 | 1006 | 30 | " |
| 05 / 0600 | 17.2 | 105.3 | 1006 | 30 | " |
| 05 / 1200 | 17.9 | 106.3 | 1006 | 30 | tropical depression |
| 05 / 1800 | 18.7 | 107.3 | 1004 | 35 | tropical storm |
| 06 / 0000 | 19.5 | 108.3 | 1000 | 45 | " |
| 06 / 0600 | 20.3 | 109.4 | 993 | 60 | " |
| 06 / 1200 | 21.3 | 110.6 | 992 | 60 | " |
| 06 / 1800 | 22.1 | 112.2 | 993 | 60 | " |
| 07 / 0000 | 23.0 | 113.8 | 997 | 50 | " |
| 07 / 0600 | 23.7 | 115.6 | 1000 | 45 | " |
| 07 / 1200 | 24.3 | 117.5 | 1005 | 35 | low |
| 07 / 1800 | 24.9 | 119.2 | 1008 | 30 | " |
| 08 / 0000 | 25.5 | 120.9 | 1008 | 30 | " |
| 08 / 0600 | 25.7 | 121.6 | 1010 | 25 | " |
| 08 / 1200 | 25.9 | 122.3 | 1011 | 20 | " |
| 08 / 1800 | 26.1 | 122.8 | 1012 | 20 | " |
| 09 / 0000 | 26.4 | 122.9 | 1012 | 20 | " |
| 09 / 0600 | 26.6 | 122.8 | 1013 | 15 | " |
| 09 / 1200 | 27.0 | 122.5 | 1013 | 15 | " |
| 09 / 1800 | 27.4 | 121.7 | 1013 | 15 | " |
| 10 / 0000 | 27.7 | 121.1 | 1013 | 15 | " |

| 10 / 0600 | 27.8 | 120.4 | 1013 | 15 | " |
|-----------|------|-------|------|-----|------------------------------|
| 10 / 1200 |      |       |      |     | dissipated |
| 06 / 1200 | 21.3 | 110.6 | 992  | 60  | Maximum winds and minimum pressure |

Table 2.     Number of hours in advance of formation of Eugene 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** | **168-Hour Outlook** |
| Low (<40%) | 78 | 132 |
| Medium (40%-60%) | 36 | 96 |
| High (>60%) | 24 | 72 |

Table 3.    NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Eugene, 5-7 August 2023.  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 | **9.1** | **20.9** | **43.0** | | | | | |
| OCD5 | 43.4 | 126.3 | 222.9 | | | | | |
| Forecasts | 6 | 4 | 2 | | | | | |
| OFCL (2018-22) | 22.1 | 34.0 | 45.4 | 56.0 | 70.9 | 78.7 | 100.5 | 117.8 |
| OCD5 (2018-22) | 36.7 | 73.4 | 114.0 | 156.9 | 193.2 | 244.5 | 317.0 | 376.0 |

Table 4.    NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Eugene, 5-7 August 2023.  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.

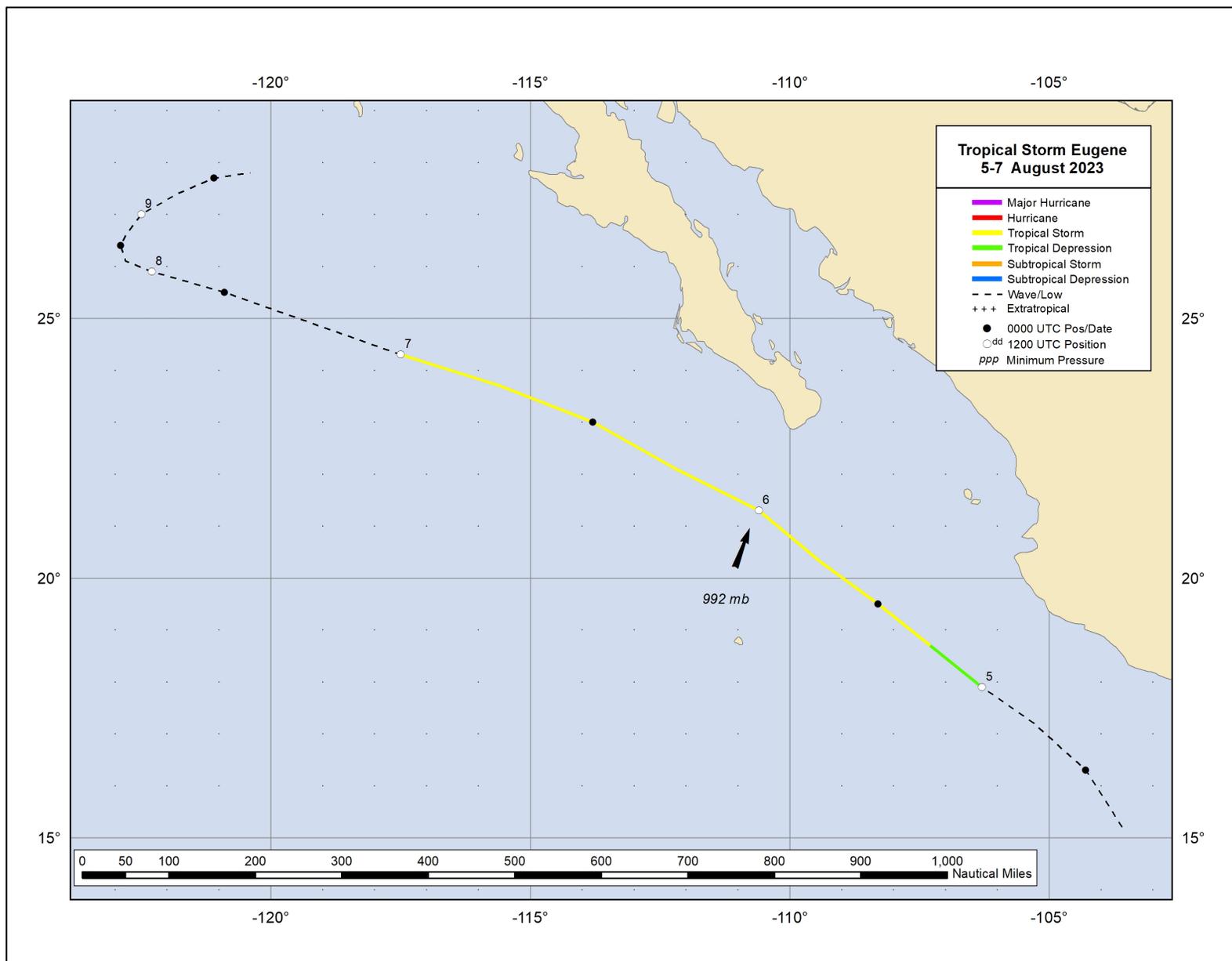|  | Forecast Period (h) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
|  | 12 | 24 | 36 | 48 | 60 | 72 | 96 | 120 |
| OFCL | 10.0 | 11.2 | **2.5** | | | | | |
| OCD5 | 11.8 | 16.2 | 9.5 | | | | | |
| Forecasts | 6 | 4 | 2 | | | | | |
| OFCL (2018-22) | 5.4 | 8.9 | 11.0 | 12.8 | 14.3 | 15.8 | 17.0 | 17.6 |
| OCD5 (2018-22) | 6.9 | 12.1 | 15.9 | 18.6 | 18.7 | 21.0 | 22.3 | 22.1 |

Figure 1.    Best track positions for Tropical Storm Eugene, 5-7 August 2023.
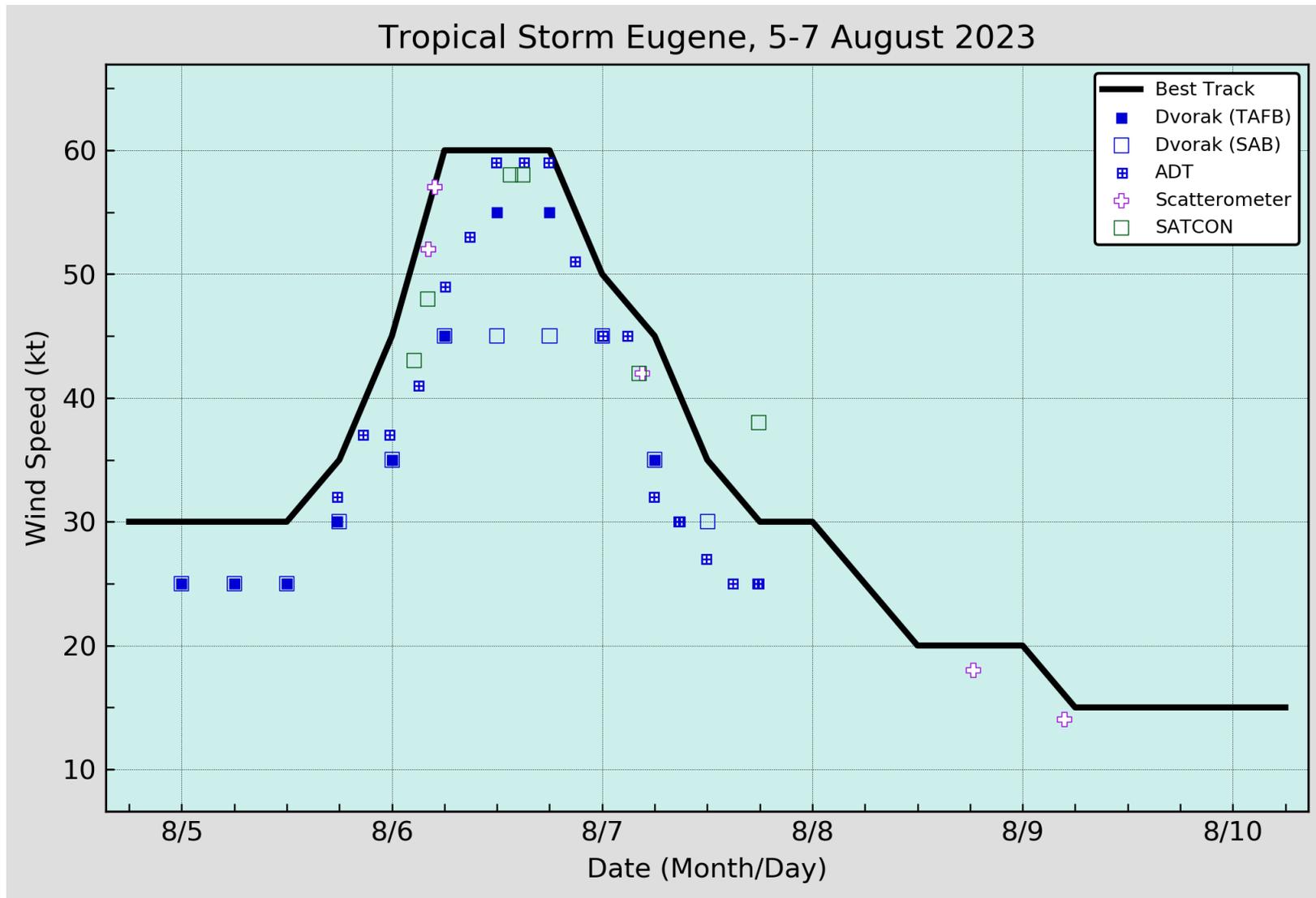
Figure 2.    Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Eugene, 5-7 August 2023. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.
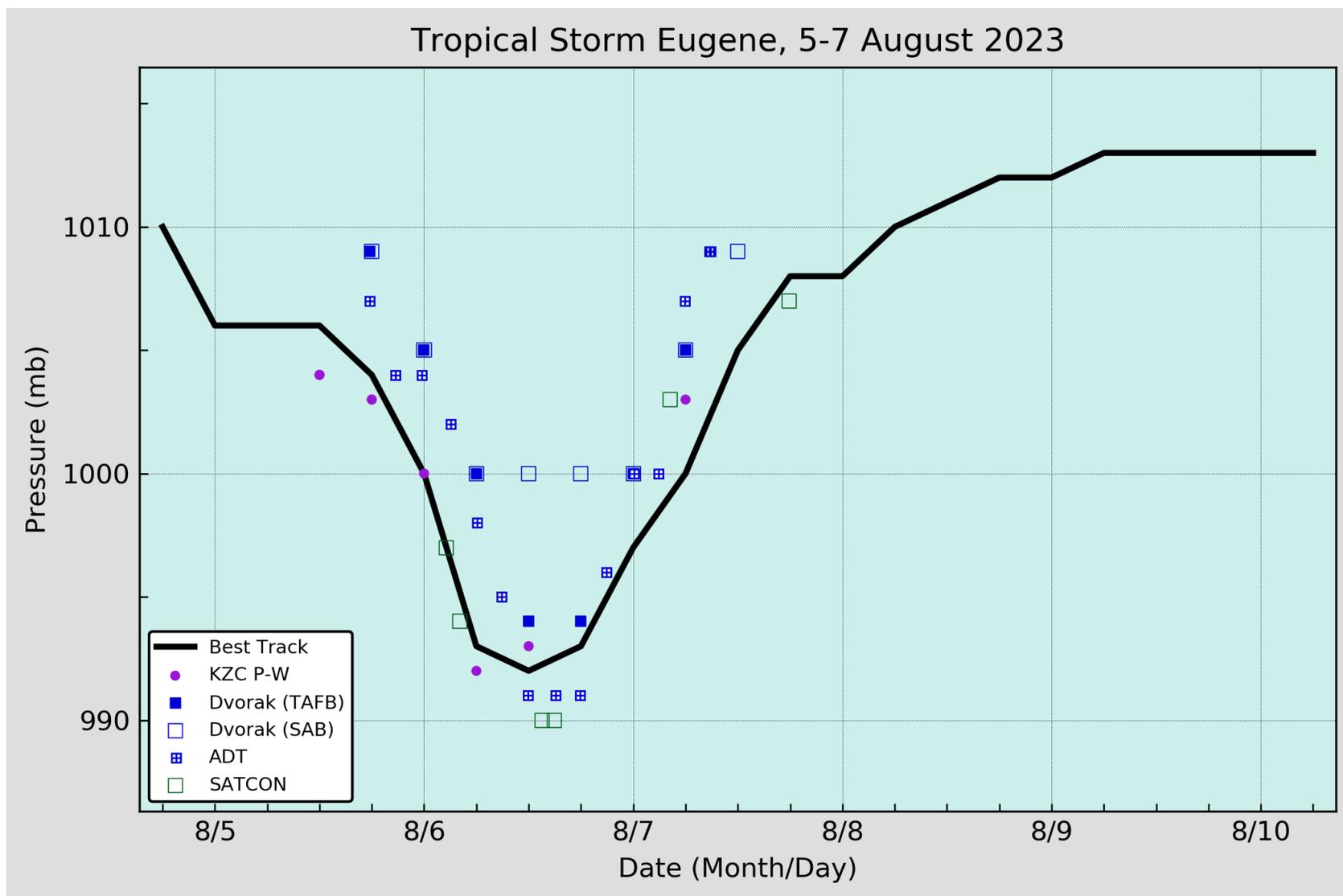
Figure 3.    Selected pressure observations and best track minimum central pressure curve for Tropical Storm Eugene, 5-7 August. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological 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.

**Eugene 7-day Tropical Weather Outlook Areas**
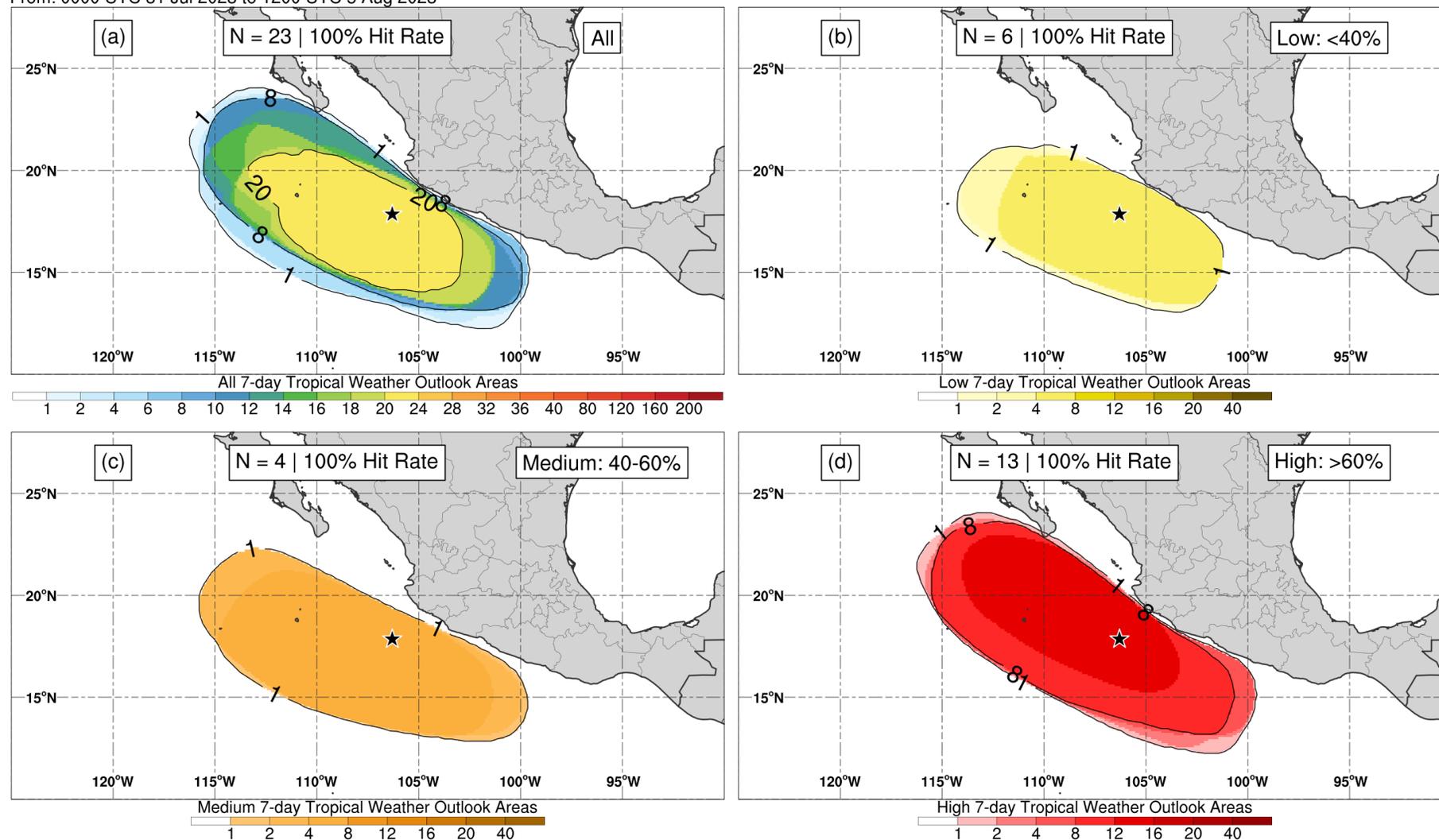From: 0000 UTC 31 Jul 2023 to 1200 UTC 5 Aug 2023



Figure 4.    Composites of 7-day tropical cyclone genesis areas depicted in NHC's Tropical Weather Outlooks prior to the formation of Tropical Storm Eugene for (a) all probabilistic genesis categories, (b) the low (<40%) category, (c) medium (40–60%) category, and (d) high (>60%) category.  The location of genesis is indicated by the black star.