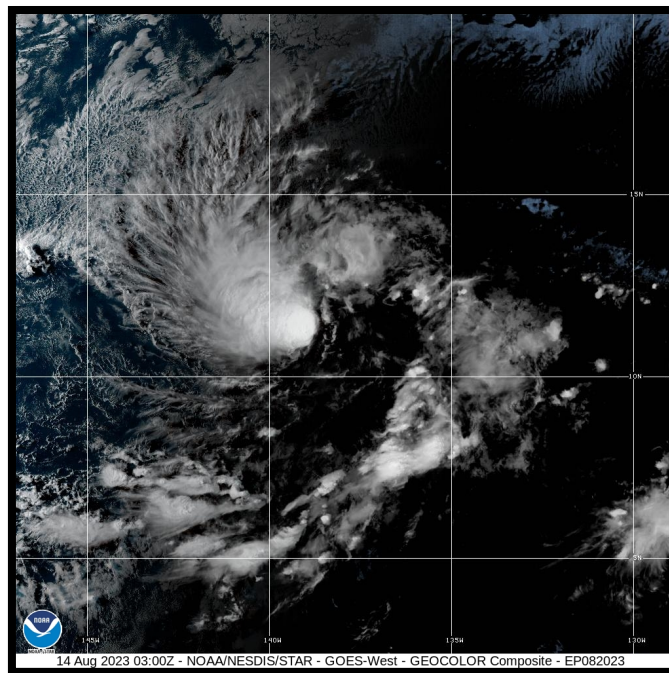# NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT[1]

TROPICAL STORM GREG
(EP082023)
14–17 August 2023

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National Hurricane Center
8 November 2023

**GOES-18 GEOCOLOR IMAGE OF TROPICAL STORM GREG AT 0300 UTC14 AUGUST 2023.
IMAGE COURTESY OF NOAA/NESDIS/STAR.**

Greg was a tropical storm that formed in the far western portion of the eastern Pacific basin and moved into the central Pacific basin.

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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 Greg. This report is based on Greg's history in the National Hurricane Center's area of responsibility in the eastern Pacific basin (east of 140°W longitude). The report will be updated once the Central Pacific Hurricane Center completes its analysis of Greg in the central North Pacific basin (west of 140°W longitude).

Tropical Storm Greg

14–17 AUGUST 2023

BEST TRACK

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

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

Origin

Tropical Storm Greg originated from a tropical wave that moved off the west coast of Africa on 25 July and crossed Central America on 3 August.

Peak Intensity and Minimum Pressure

Greg's peak intensity of 45 kt from 0600 UTC 15 August to 1200 UTC 16 August is based on a blend of subjective and objective satellite intensity estimates. Since the peak occurred west of 140W, this reflects the operational assessment of the Central Pacific Hurricane Center (CPHC).

The estimated minimum central pressure of 1000 mb is based on a blend of satellite intensity estimates and the Knaff-Zehr-Courtney (KZC) pressure-wind relationship.

CASUALTY AND DAMAGE STATISTICS

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

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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), the Central Pacific Hurricane Center (CPHC), and the Joint Typhoon Warning Center (JTWC), as well as objective Advanced Dvorak Technique (ADT) 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 Greg.

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 Greg. A verification of NHC official track forecasts for Tropical Storm Greg is given in Table 3. The National Hurricane Center only issued two forecasts on the system before it entered the Central Pacific basin. Official track forecast errors for those two forecasts 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 Greg is given in Table 4. Official intensity forecast errors were lower than the mean official errors for the previous 5-yr period at all forecast times. No meaningful comparisons can be made with the model track or intensity guidance due to the small number of forecasts issued on the system in the eastern Pacific basin.

There were no coastal watches or warnings issued for Greg.

Table 1.   Best track for Tropical Storm Greg, 14-17 August 2023. The portion of the track west of 140°W is based on operational data from the Central Pacific Hurricane Center.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
14 / 0000	11.3	138.2	1007	30	tropical depression
14 / 0600	11.3	139.2	1005	35	tropical storm
14 / 1200	11.3	140.4	1005	35	"
14 / 1800	11.2	141.5	1005	40	"
15 / 0000	11.1	142.7	1002	40	"
15 / 0600	11.1	144.0	1000	45	"
15 / 1200	11.1	145.2	1000	45	"
15 / 1800	11.1	146.5	1000	45	"
16 / 0000	11.3	147.7	1000	45	"
16 / 0600	11.6	149.1	1000	45	"
16 / 1200	11.7	150.5	1000	45	"
16 / 1800	11.8	151.8	1004	40	"
17 / 0000	12.0	152.9	1004	40	"
17 / 0600	12.1	153.9	1004	40	"
17 / 1200	12.0	155.1	1006	35	"
17 / 1800	12.2	156.3	1007	30	tropical depression
18 / 0000	12.1	157.8	1007	30	low
18 / 0600	12.1	157.8	1008	30	"
18 / 1200	-	-	-	-	dissipated
15 / 0600	11.1	144.0	1000	45	maximum winds 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	**168-Hour Outlook**
Low (<40%)	60	102
Medium (40%-60%)	48	54
High (>60%)	18	42

Table 3.   NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Greg, 14-17 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. Verification of the track forecasts west of 140°W is based on CPHC's operational assessments.

	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	**12.7**	**27.6**	**44.0**	**54.1**	71.0	**71.6**		
OCD5	33.4	72.8	107.3	123.2	153.1	170.9		
Forecasts	2	2	2	2	2	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 Greg, 14-17 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. Verification of the track forecasts west of 140°W is based on CPHC's operational assessments.

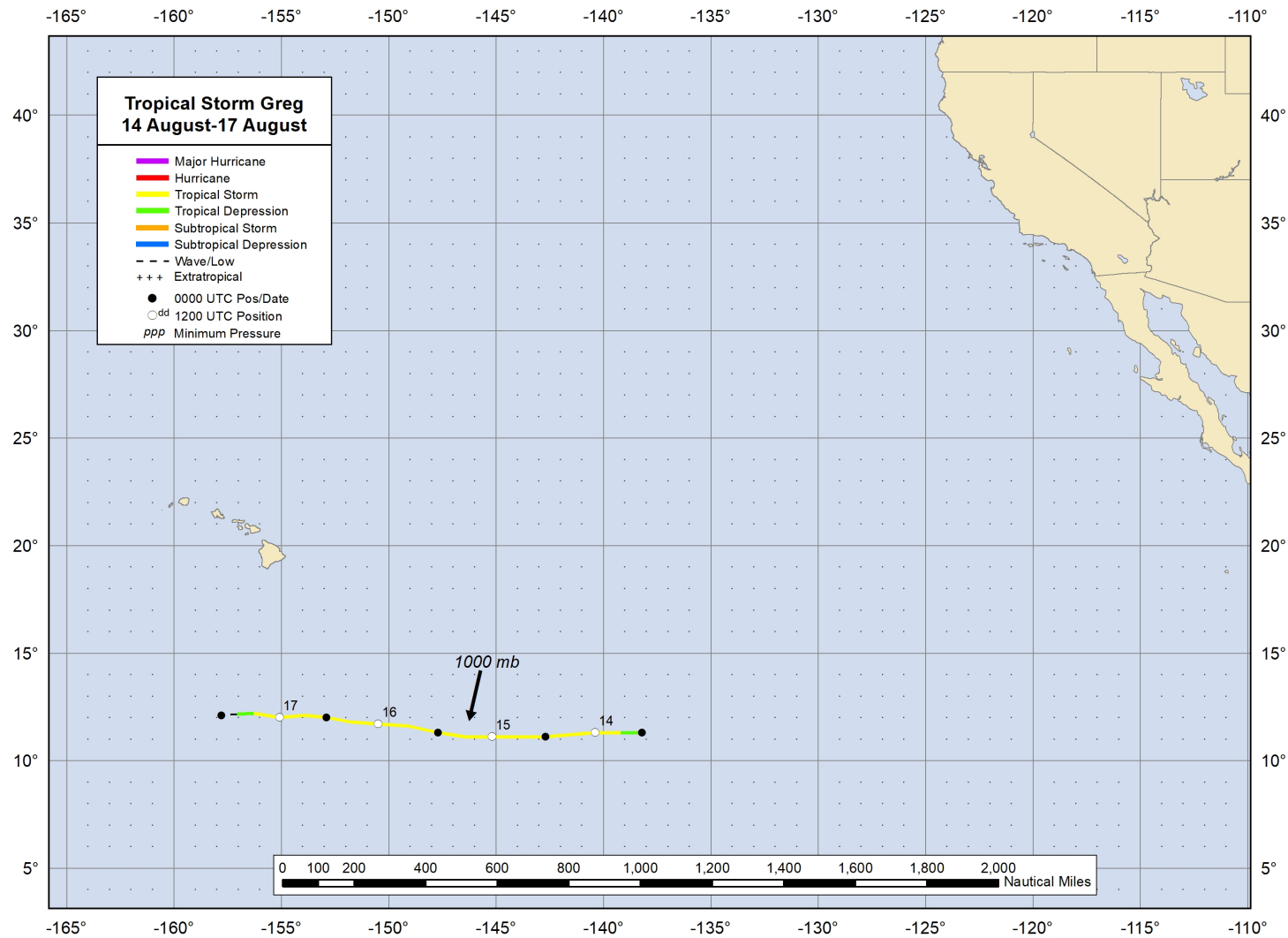|	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	**0.0**	**0.0**	**0.0**	**2.5**	**5.0**	**2.5**		
OCD5	2.0	2.5	4.5	6.5	18.5	21.5		
Forecasts	2	2	2	2	2	2		
OFCL (2018-22)	5.4	8.9	11.0	12.8	14.3	15.8	17.0	17.6
OCD5 (2018-22)	6.9	12.1	15.9	18.6	18.7	21.0	22.3	22.1

Figure 1.   Best track positions for Tropical Storm Greg, 14-17 August 2023. Note that the best track after 0600 UTC 14 August is based on operational assessments from the Central Pacific Hurricane Center.
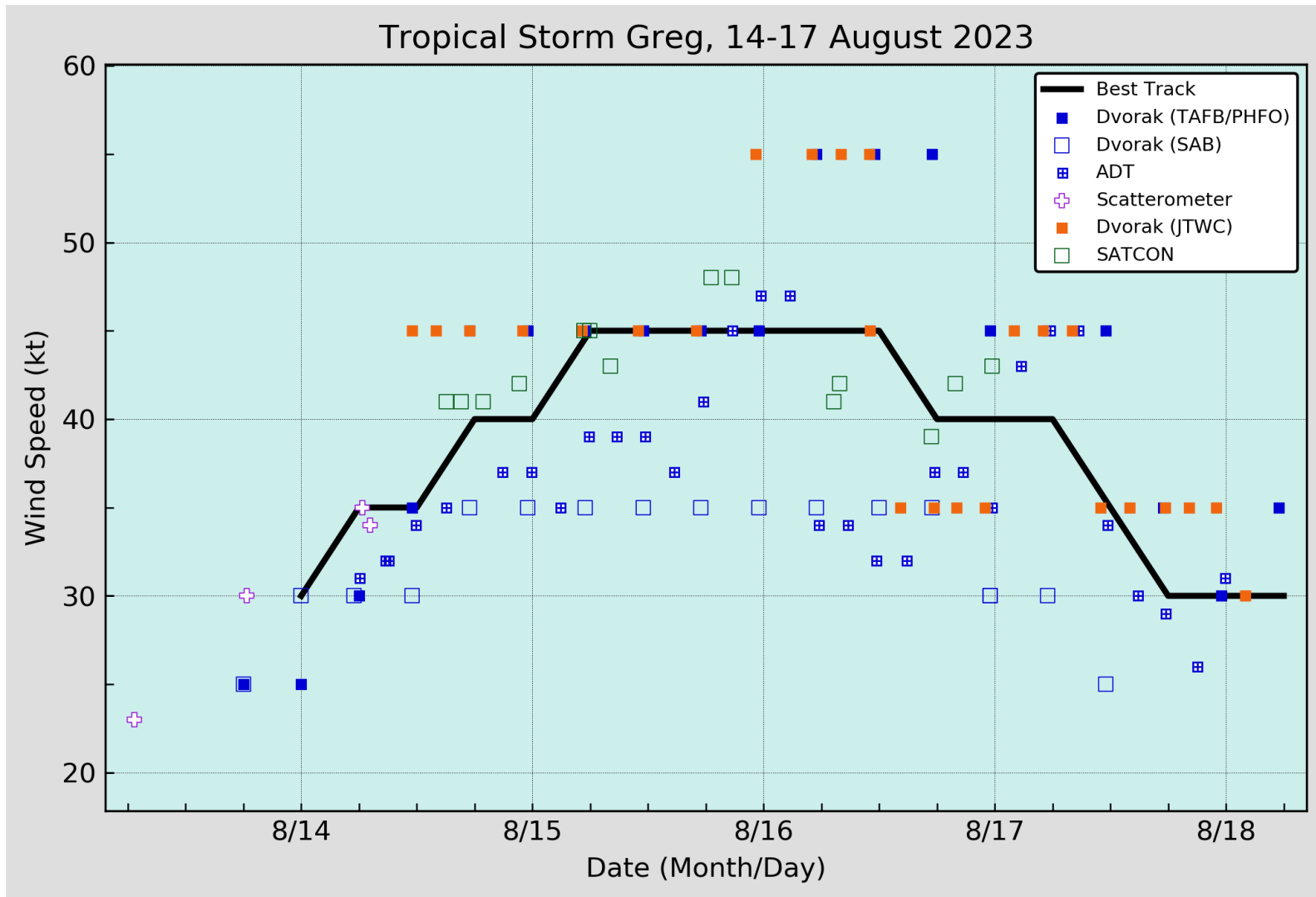
Figure 2.   Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Greg, 14-17 August 2023. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC. Note that the best track after 0600 UTC 14 August is based on operational assessments from the Central Pacific Hurricane Center.
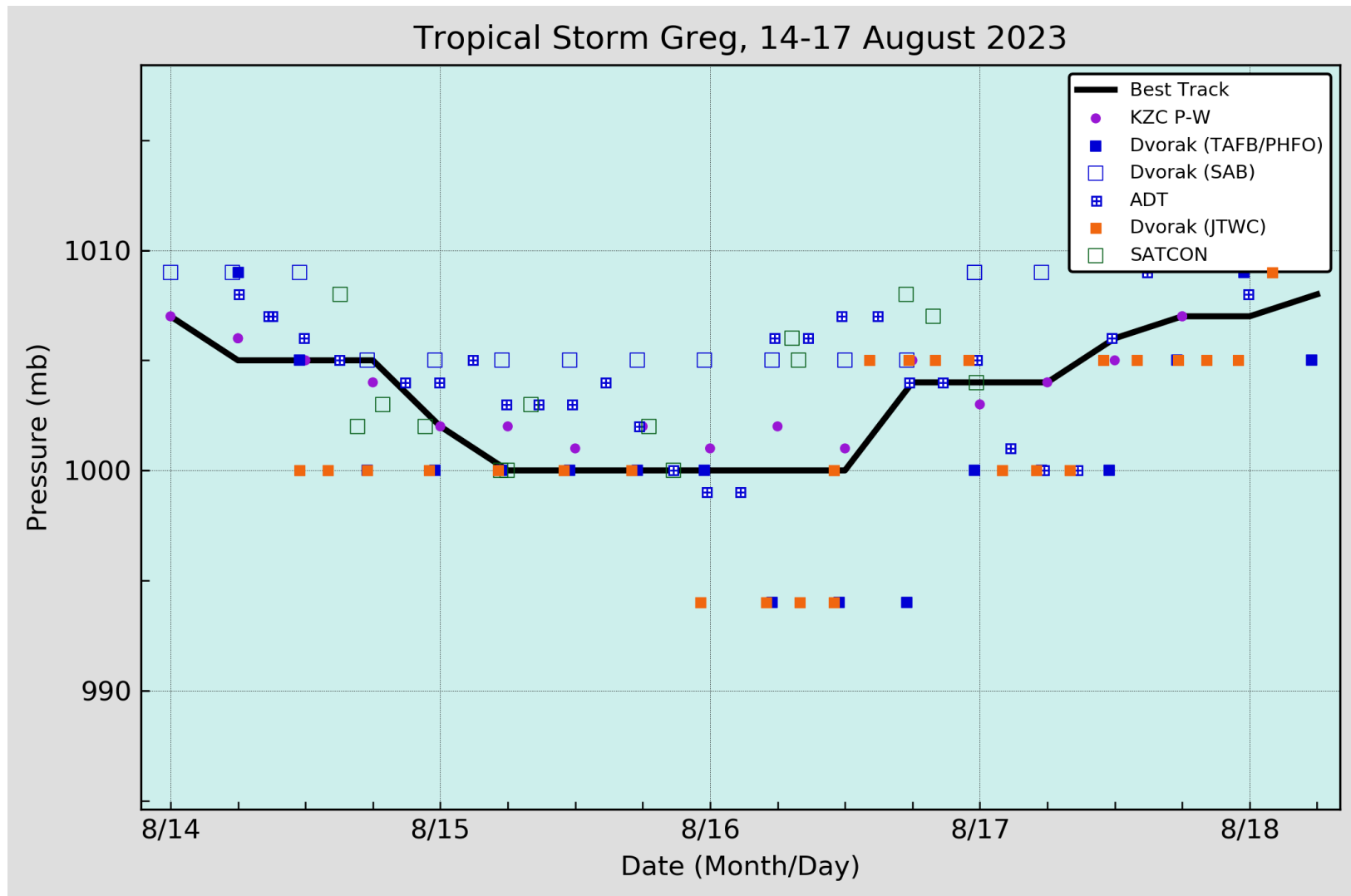
Figure 3.   Selected pressure observations and best track minimum central pressure curve for Tropical Storm Greg, 14-17 August 2023. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC. Note that the best track after 0600 UTC 14 August is based on operational assessments from the Central Pacific Hurricane Center.

Greg 7-day Tropical Weather Outlook Areas
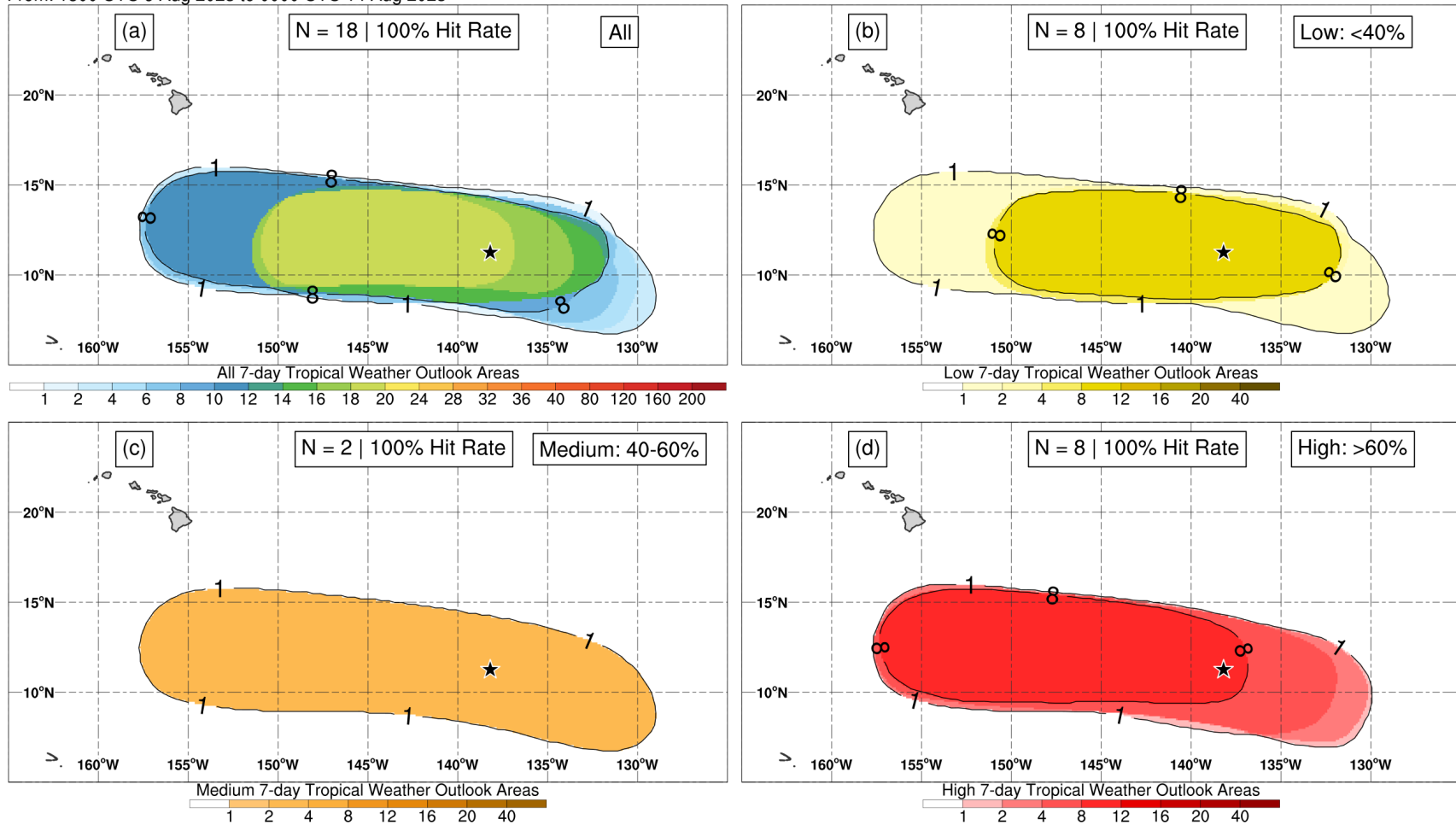From: 1800 UTC 9 Aug 2023 to 0000 UTC 14 Aug 2023

Figure 4.   Composites of 7-day tropical cyclone genesis areas depicted in NHC's Tropical Weather Outlooks prior to the formation of Tropical Storm Greg 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.