

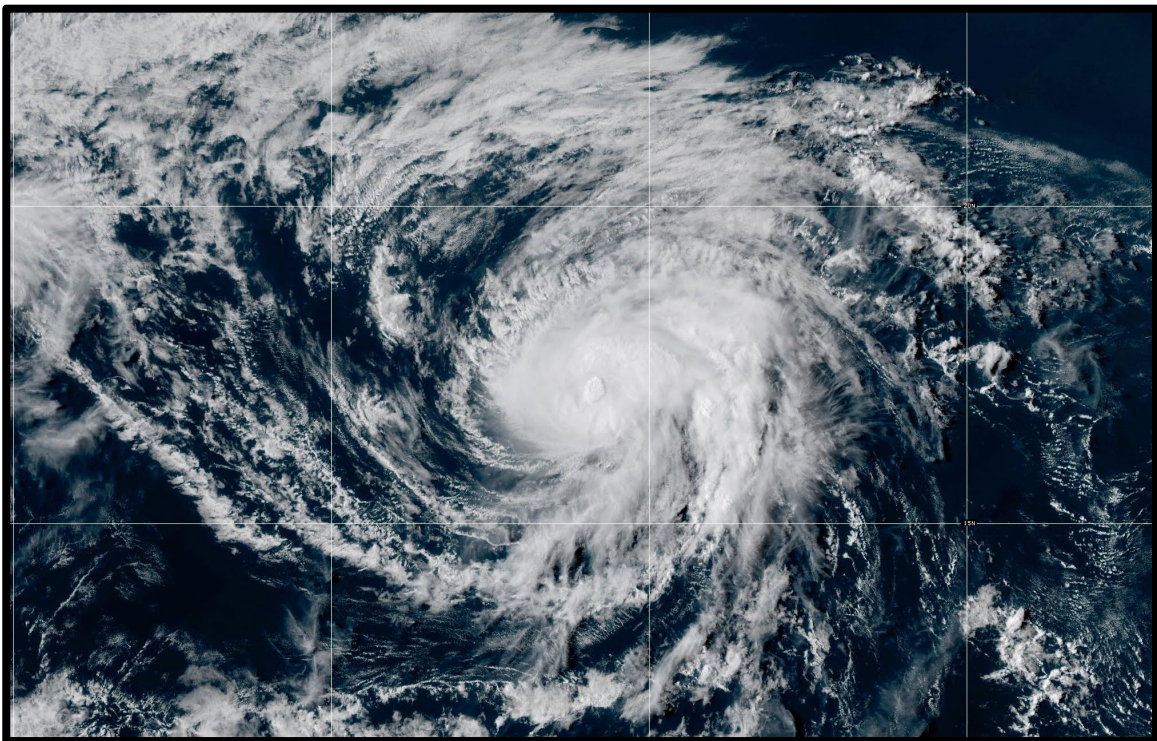


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT¹

TROPICAL STORM HECTOR (EP082024)

25–28 August 2024

Robbie Berg
National Hurricane Center
5 December 2024



GOES-18 GEOCOLOR SATELLITE IMAGE OF TROPICAL STORM HECTOR AT 0000 UTC 27 AUGUST 2024 WHEN IT REACHED ITS PEAK INTENSITY. IMAGE COURTESY OF NOAA/NESDIS/STAR.

Hector was a relatively short-lived tropical storm over the west-central portion of the eastern Pacific basin.

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 Hector.

Tropical Storm Hector

25–28 AUGUST 2024

BEST TRACK

The “best track²” positions and intensities for Tropical Storm Hector are listed in Table 1. The best track chart of Hector’s path is given in Fig. 1, with the wind and pressure histories along with available observations³ shown in Figs. 2 and 3, respectively.

There were no ship or land-based reports of winds of tropical storm force associated with Hector.

Origin

Hector may have originated from the same tropical wave that spawned Hurricane Ernesto in the Atlantic basin. The wave moved off the west coast of Africa on 6 August and developed into Ernesto on 12 August while approaching the Leeward Islands. After Ernesto turned north of Puerto Rico on 14 August, leftover vorticity associated with the wave in the deep tropics became diffuse and difficult to track for a few days. However, the wave became more apparent again around 18 August over the far eastern Pacific Ocean due to an increase in cloudiness and showers, with a well-defined low pressure system forming on 22 August. The low continued westward for almost three days before acquiring enough organized deep convection to be classified as a tropical depression by 0600 UTC 25 August while centered about 695 n mi southwest of the southern tip of the Baja California peninsula.

Peak Intensity and Minimum Pressure

Hector’s peak intensity of 50 kt from 0000 to 0600 UTC 27 August is based on a blend of subjective Dvorak intensity estimates of T3.5/55 kt from TAFB and T3.0/45 kt from SAB, as well as UW-CIMSS SATCON estimates of 50 to 55 kt. Uncertainty in Hector’s peak intensity is a little

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) 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 Hector.

bit higher than normal since there was a two-day gap of scatterometer data and a 20-kt range of subjective and objective intensity estimates on 26 and 27 August. The estimated minimum central pressure of 998 mb is mainly based on the Knaff-Zehr-Courtney (KZC) pressure-wind relationship.

CASUALTY AND DAMAGE STATISTICS

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

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. Genesis was well anticipated although it occurred a little later than expected. A low (<40%) chance of genesis during the next 7 days was first indicated in the TWO almost 7 days before Hector formed. The 7-day formation chances were increased to the medium (40-60%) and high (>60%) categories 120 h and 90 h before genesis, respectively. NHC assessed a low chance of Hector's formation during the next 2 days 102 h before genesis, with those probabilities increasing to the medium and high categories 90 h and 48 h beforehand, respectively. Figure 4 shows composites of 7-day TWO genesis areas for each category prior to the formation of Hector. Coincident with NHC forecasting genesis to occur too soon, the genesis areas during the low and medium phases were too far to the east. The source for this forecast error is that while a well-defined low pressure system formed on 22 August, deep convection did not become sufficiently organized for Hector to be classified as a tropical cyclone until 25 August.

A verification of NHC official track forecasts for Hector is given in Table 3a. Official track forecast errors were comparable to the mean official errors for the previous 5-yr period at 12 h and lower at 24–60 h. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. Most of the consensus aids performed well and generally had errors lower than the official forecasts. The Canadian model (CMCI) was the best-performing deterministic guidance for track.

A verification of NHC official intensity forecasts for Hector is given in Table 4a. Official intensity forecast errors were lower than the mean official errors for the previous 5-yr period at all available time periods (12–60 h). A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. Intensity errors from the official forecasts and the guidance were comparable and were generally less than 10 kt at all available forecast times.

There were no coastal watches or warnings issued for Hector.



Table 1. Best track for Tropical Storm Hector, 25–28 August 2024.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
22 / 1800	14.0	111.9	1009	30	low
23 / 0000	13.9	112.3	1008	30	"
23 / 0600	13.9	112.8	1007	30	"
23 / 1200	14.1	113.5	1007	30	"
23 / 1800	14.5	114.2	1007	30	"
24 / 0000	15.0	114.8	1007	30	"
24 / 0600	15.5	115.4	1007	30	"
24 / 1200	15.8	116.3	1006	30	"
24 / 1800	16.0	117.4	1006	30	"
25 / 0000	16.1	118.6	1006	30	"
25 / 0600	16.1	119.9	1005	30	tropical depression
25 / 1200	16.0	121.0	1004	35	tropical storm
25 / 1800	15.9	121.9	1003	40	"
26 / 0000	15.9	122.7	1002	40	"
26 / 0600	16.0	123.6	1001	40	"
26 / 1200	16.2	124.5	1000	45	"
26 / 1800	16.5	125.4	1000	45	"
27 / 0000	16.9	126.2	998	50	"
27 / 0600	17.2	127.2	998	50	"
27 / 1200	17.4	128.2	1000	45	"
27 / 1800	17.5	129.3	1000	45	"
28 / 0000	17.6	130.3	1000	45	"
28 / 0600	17.6	131.2	1000	45	"
28 / 1200	17.6	132.1	1001	45	"
28 / 1800	17.5	133.0	1004	40	low
29 / 0000	17.2	133.8	1006	35	"
29 / 0600					dissipated
27 / 0000	16.9	126.2	998	50	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%)	102	162
Medium (40%-60%)	90	120
High (>60%)	48	90

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Hector, 25–28 August 2024. 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	23.0	22.1	21.1	26.6	57.1			
OCD5	34.5	47.6	53.0	58.2	22.1			
Forecasts	10	8	6	4	2			
OFCL (2019-23)	22.6	34.4	46.0	57.6	69.6	83.5	112.4	137.2
OCD5 (2019-23)	38.2	75.5	117.0	160.0	203.5	247.6	329.5	404.4



Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Hector, 25–28 August 2024. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 3a due to the homogeneity requirement.

Model ID	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	22.2	21.5	19.3	21.5	56.7			
OCD5	36.6	52.9	57.3	63.3	22.9			
GFSI	23.4	24.4	25.5	32.5	33.1			
EMXI	22.2	19.1	28.4	47.2	101.6			
EGR1	28.1	36.8	48.4	72.6	121.6			
CMCI	21.8	18.1	17.7	25.2	22.9			
NVGI	31.0	46.9	69.4	66.6	46.7			
HWFI	23.2	25.8	20.2	21.5	0.0			
HMNI	29.8	35.3	33.1	37.0	67.0			
HFAI	21.4	22.7	32.2	38.3	41.4			
HFBI	21.0	20.9	24.4	21.5	11.4			
CTCI	25.2	27.7	30.1	18.7	20.9			
HCCA	21.8	17.7	18.5	35.9	59.9			
FSSE	22.1	19.8	18.1	14.9	41.8			
AEMI	24.2	24.3	21.4	15.5	18.2			
GFEX	21.2	18.2	19.7	20.2	41.8			
TVCE	21.6	18.9	16.5	10.0	25.8			
TVCX	21.6	18.8	16.4	11.9	31.0			
TVDG	22.1	18.7	17.5	12.8	38.7			
TABD	41.8	82.0	115.2	163.5	162.4			
TABM	35.1	53.6	59.6	80.8	59.0			
TABS	32.4	45.2	48.2	72.1	125.2			
Forecasts	7	6	4	3	1			



Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Hector, 25–28 August 2024. 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	4.0	3.8	3.3	5.0	10.0			
OCD5	3.1	3.9	4.5	7.0	15.0			
Forecasts	10	8	6	4	2			
OFCL (2019-23)	5.5	8.7	10.8	12.7	14.5	15.6	17.1	18.0
OCD5 (2019-23)	7.2	12.2	15.9	18.6	19.9	20.0	19.6	18.7



Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Hector, 25–28 August 2024. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 4a due to the homogeneity requirement.

Model ID	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	3.6	3.3	3.8	5.0	10.0			
OCD5	3.3	3.0	3.5	5.3	14.0			
HWFI	5.1	4.8	3.0	6.3	9.0			
HMNI	5.1	5.5	2.8	2.7	9.0			
HFAI	5.0	4.7	2.8	4.3	8.0			
HFBI	5.7	7.5	5.2	5.0	3.0			
CTCI	3.4	3.7	6.2	6.3	1.0			
DSHP	3.6	5.0	4.2	4.7	4.0			
LGEM	3.7	6.2	5.8	7.0	4.0			
ICON	3.7	4.3	2.2	4.3	0.0			
IVCN	4.0	4.0	2.0	3.7	2.0			
IVDR	4.3	3.8	2.2	3.3	2.0			
HCCA	3.9	3.7	4.0	4.7	2.0			
FSSE	3.7	4.0	3.5	5.0	8.0			
GFSI	4.4	8.2	4.0	3.3	4.0			
EMXI	6.1	8.2	7.0	9.0	11.0			
Forecasts	7	6	4	3	1			

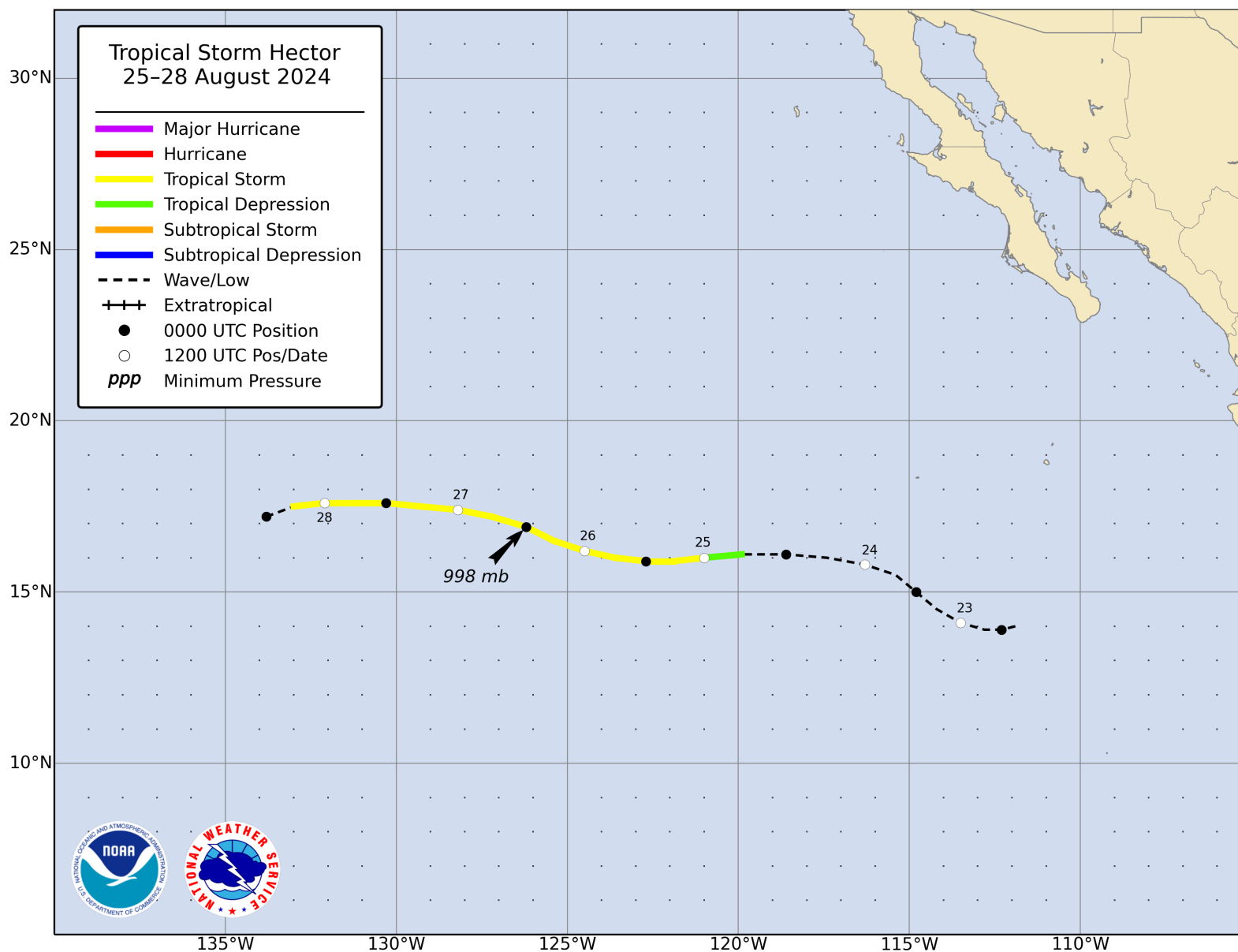


Figure 1. Best track positions for Tropical Storm Hector, 25–28 August 2024.

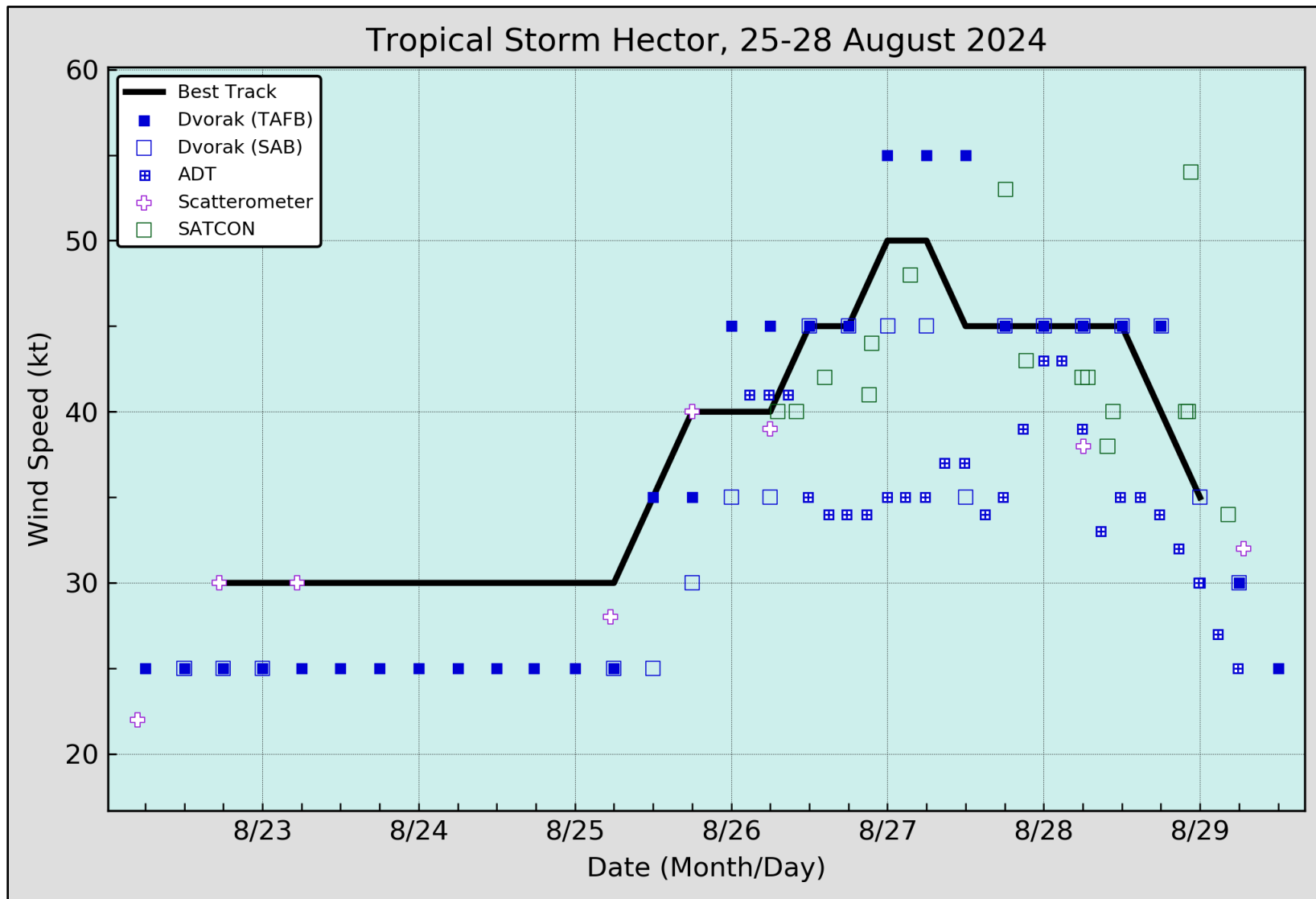


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Hector, 25–28 August 2024. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

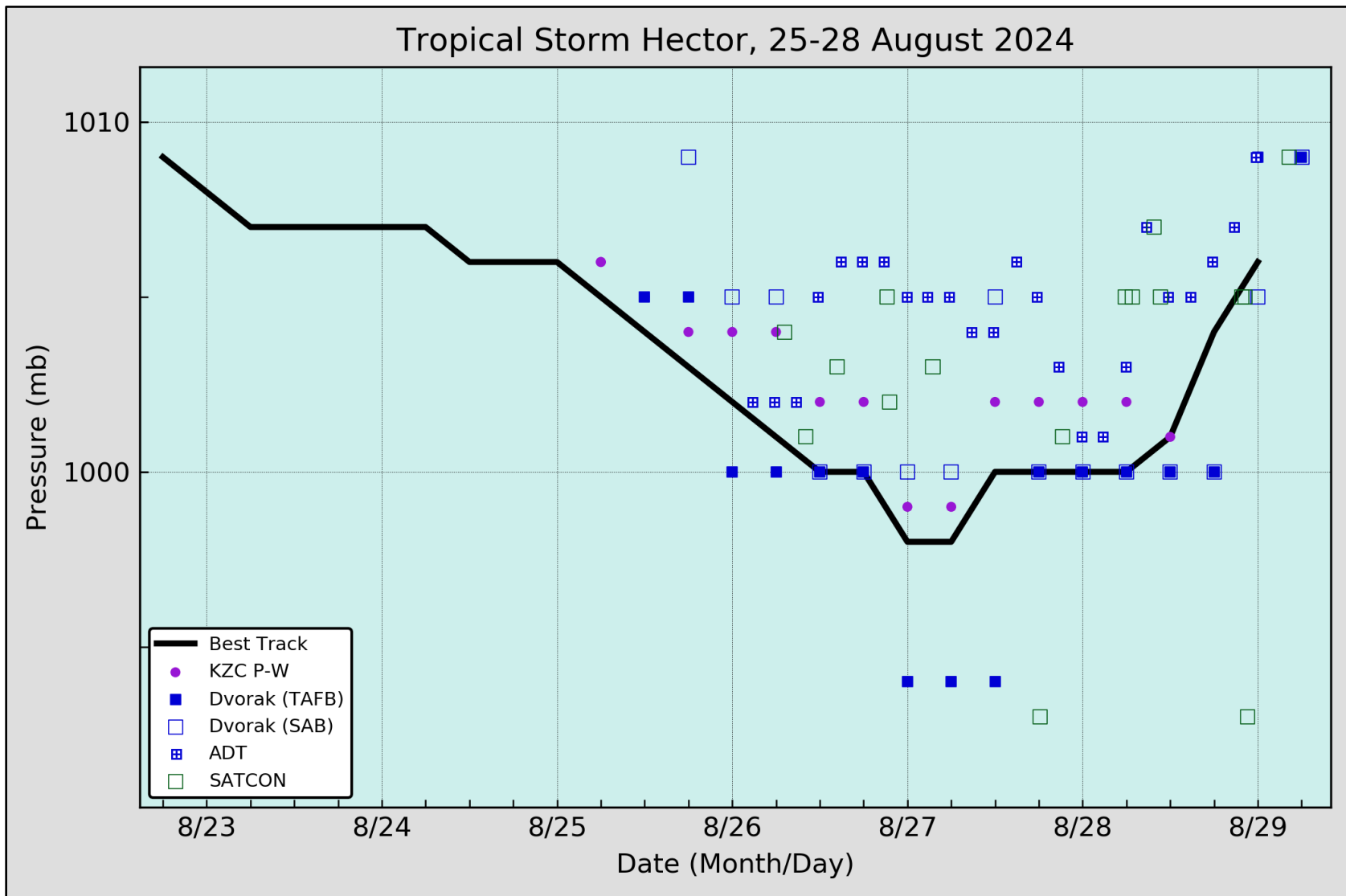


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Hector, 25–28 August 2024. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological 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.

Hector 7-day Tropical Weather Outlook Areas

From: 1200 UTC 18 Aug 2024 to 0600 UTC 25 Aug 2024

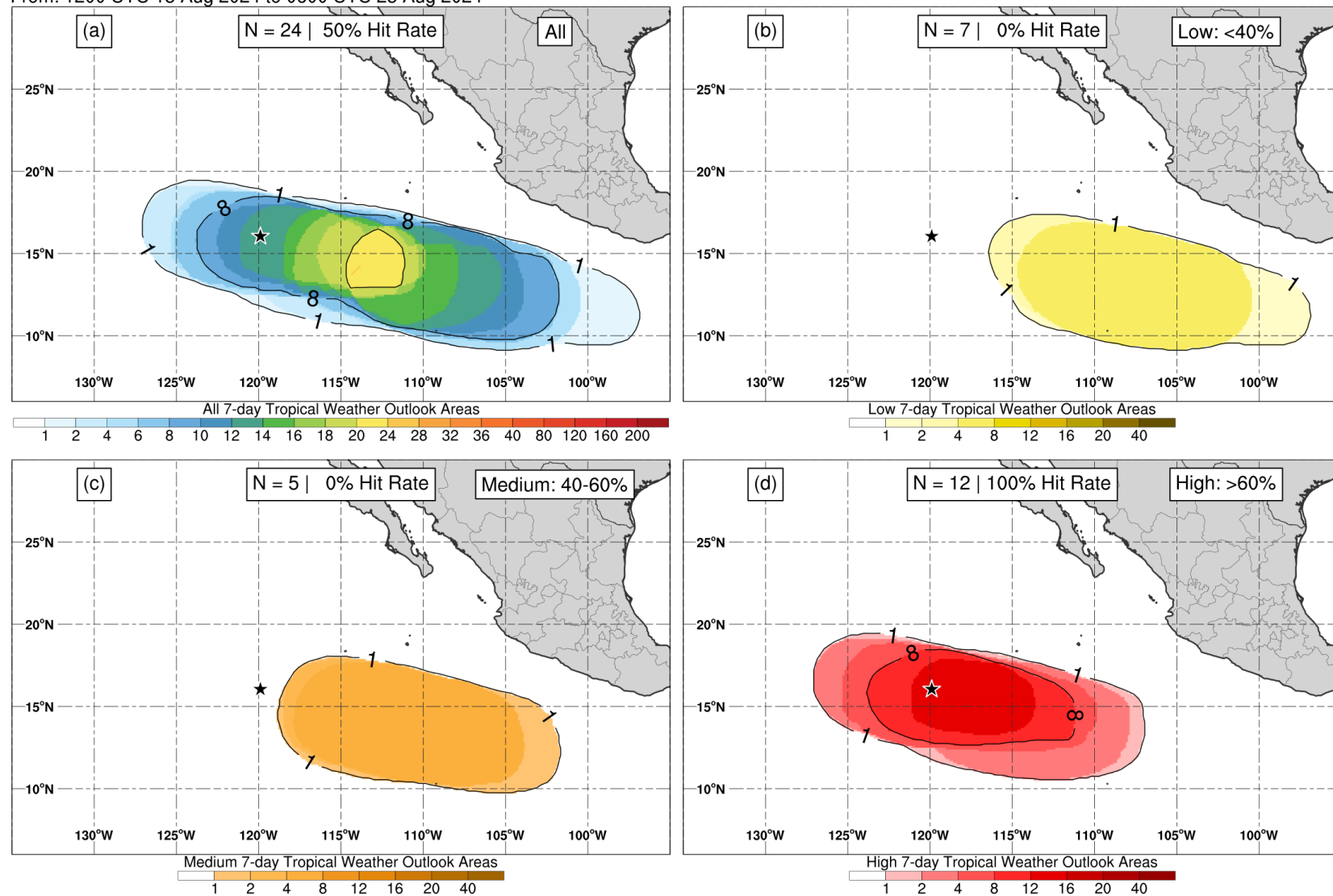


Figure 4. Composites of 7-day tropical cyclone genesis areas depicted in NHC’s Tropical Weather Outlooks prior to the formation of Hector for (a) all probabilistic genesis categories, (b) the low (<40%) category, (c) medium (40–60%) category, and (d) high (>60%) category. The location of genesis is indicated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