

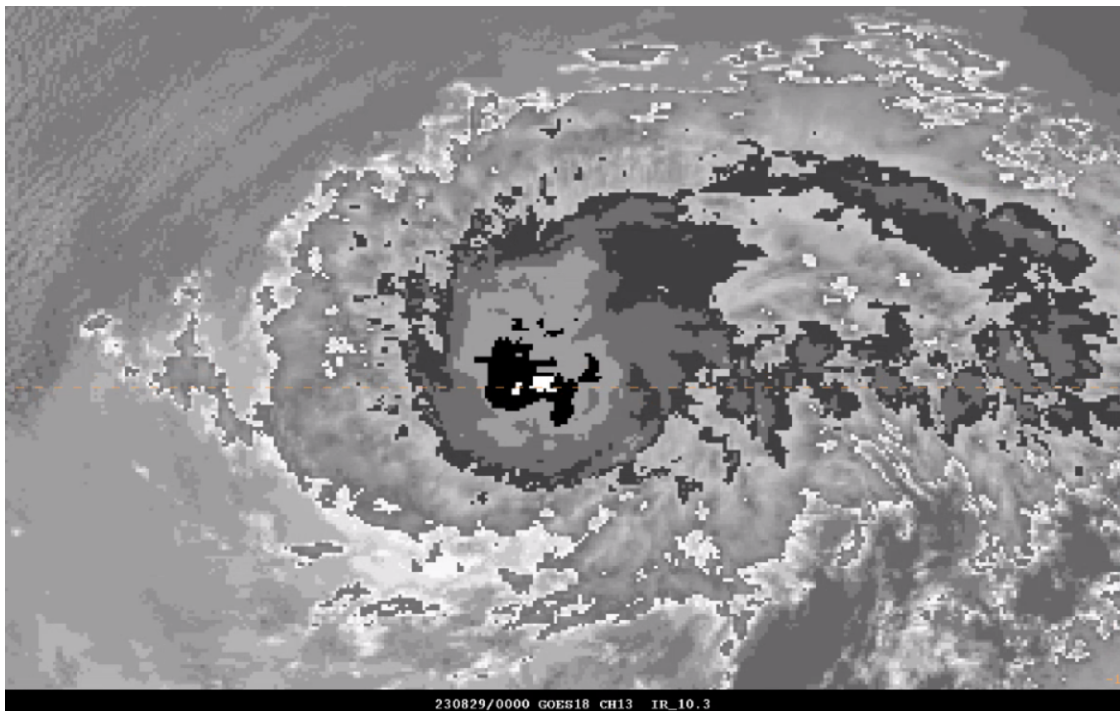


# NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT<sup>1</sup>

## TROPICAL STORM IRWIN (EP102023)

26–29 August 2023

Eric Blake  
National Hurricane Center  
15 February 2024



GOES-18 INFRARED SATELLITE IMAGE OF IRWIN AT 0000 UTC 29 AUGUST 2023 NEAR PEAK INTENSITY.

Irwin was a short-lived tropical storm over the west-central portion of the eastern Pacific Ocean.

---

<sup>1</sup> This is an abbreviated Tropical Cyclone Report since there were no coastal watches or warnings issued and no direct fatalities reported in association with Irwin.

# Tropical Storm Irwin

26–29 AUGUST 2023

## BEST TRACK

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

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

### *Origin*

Irwin’s origin appears to be from a tropical wave noted over Central America on 16 August. The wave spawned a weak trough that moved quite slowly westward within the Intertropical Convergence Zone (ITCZ) for several days. Eventually the trough became embedded in the eastern side of a larger monsoon trough farther west, and the system only reached 100°W by 23 August. Probably as a result of this interaction, the system that eventually spawned Irwin was fairly broad and large, and took some time to consolidate and form a well-defined center.

### *Peak Intensity and Minimum Pressure*

Irwin’s estimated peak intensity of 40 kt is supported by ASCAT data that showed peak winds of 35–40 kt. The estimated minimum central pressure of 998 mb is based on the Knaff-Zehr-Courtney (KZC) pressure-wind relationship.

## CASUALTY AND DAMAGE STATISTICS

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

---

<sup>2</sup> 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.

<sup>3</sup> Observations include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and Satellite Analysis Branch (SAB), and 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 Irwin.

## FORECAST AND WARNING VERIFICATION

Genesis forecasts for Irwin were poor at long range but skillful at short range. Table 2 provides the number of hours in advance of formation with the first NHC Tropical Weather Outlook (TWO) forecast in each likelihood category. A low (<40%) chance of genesis during the next 7 days was first indicated in the TWO only 3 days before Irwin formed. However, the 2-day genesis probabilities were in the high category (>60%) 42 h before genesis, suggesting that NHC forecasters quickly realized the shorter-term formation chances. Figure 4 shows composites of 7-day TWO genesis areas for each category prior to Irwin's formation. Despite the lack of lead time, Irwin's genesis location fell within all potential genesis areas depicted in NHC's Graphical TWO.

A verification of NHC official track forecasts for Irwin is given in Table 3a. Official track forecast errors were higher than the mean official errors for the previous 5-yr period. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. The sample size is too small to make any meaningful comparisons.

A verification of NHC official intensity forecasts for Irwin is given in Table 4a. Official intensity forecast errors were lower than the mean official errors for the previous 5-yr period. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. The sample size is also too small to make any meaningful comparisons.

There were no coastal watches or warnings issued for Irwin.



Table 1. Best track for Tropical Storm Irwin, 26–29 August 2023.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
26 / 1800	15.5	117.9	1001	30	tropical depression
27 / 0000	15.9	118.6	1001	30	"
27 / 0600	16.3	119.3	1001	30	"
27 / 1200	16.6	120.0	1000	35	tropical storm
27 / 1800	17.0	121.0	999	35	"
28 / 0000	17.2	121.9	999	35	"
28 / 0600	17.5	122.6	999	35	"
28 / 1200	17.9	123.2	999	35	"
28 / 1800	18.5	123.8	999	35	"
29 / 0000	19.1	125.0	998	40	"
29 / 0600	19.5	126.4	999	40	"
29 / 1200	19.7	128.1	1002	35	low
29 / 1800	19.3	129.6	1003	35	"
30 / 0000	18.9	131.0	1004	30	"
30 / 0600	18.8	132.3	1005	30	"
30 / 1200	19.0	133.5	1005	25	"
30 / 1800	19.1	134.5	1005	25	"
31 / 0000	19.1	135.4	1005	25	"
31 / 0600	19.1	136.4	1005	25	"
31 / 1200	19.1	137.2	1005	25	"
31 / 1800	19.1	137.9	1005	25	"
01 / 0000	19.0	138.5	1005	25	"
01 / 0600	18.8	139.0	1005	25	"
01 / 1200	18.5	139.3	1005	25	"
01 / 1800	18.1	139.7	1005	25	"
02 / 0000	17.7	140.1	1005	25	"
02 / 0600	17.3	140.5	1005	25	"
02 / 1200	16.9	140.8	1005	25	"
02 / 1800	16.5	141.1	1006	20	"
03 / 0000	16.2	141.4	1006	20	"



Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
03 / 0600					dissipated
29 / 0000	19.1	125.0	998	40	minimum pressure and max winds

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%)	66	72
Medium (40%-60%)	60	66
High (>60%)	42	54

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Irwin, 26–29 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	25.4	46.2	75.4	108.9				
OCD5	37.8	46.3	58.6	101.8				
Forecasts	8	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 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Irwin, 26–29 August 2023. 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	23.3	40.6	75.4	108.9				
OCD5	37.3	42.1	<b>58.6</b>	<b>101.8</b>				
GFSI	31.5	<b>26.3</b>	<b>51.7</b>	<b>87.9</b>				
EMXI	<b>22.8</b>	40.9	80.9	<b>108.5</b>				
CMCI	31.6	61.2	105.9	125.6				
HWFI	27.4	41.8	75.7	132.1				
HMNI	30.0	<b>36.7</b>	<b>47.7</b>	<b>44.9</b>				
HFAI	28.1	<b>21.2</b>	<b>41.3</b>	<b>88.2</b>				
HFBI	29.9	<b>23.0</b>	<b>33.3</b>	<b>73.4</b>				
TVCE	23.5	<b>27.0</b>	<b>53.3</b>	<b>81.8</b>				
TVCX	<b>23.1</b>	<b>28.2</b>	<b>52.8</b>	<b>79.4</b>				
GFEX	24.9	<b>32.3</b>	<b>62.6</b>	<b>87.6</b>				
HCCA	<b>22.9</b>	<b>37.8</b>	<b>73.4</b>	111.5				
AEMI	29.4	<b>33.9</b>	<b>55.8</b>	<b>90.8</b>				
TVDG	<b>22.5</b>	<b>27.7</b>	<b>55.3</b>	<b>83.4</b>				
TABS	28.7	46.1	86.1	128.8				
TABM	32.8	<b>39.9</b>	<b>51.5</b>	<b>72.4</b>				
TABD	31.6	<b>38.1</b>	<b>45.1</b>	<b>47.7</b>				
Forecasts	7	5	4	2				



Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Irwin, 26–29 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	<b>3.1</b>	<b>5.0</b>	<b>5.0</b>	<b>2.5</b>				
OCD5	3.0	3.7	4.0	1.5				
Forecasts	8	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

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Irwin, 26–29 August 2023. 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	5.0	5.0	2.5				
OCD5	<b>3.1</b>	<b>4.0</b>	<b>4.0</b>	<b>1.5</b>				
HWFI	<b>2.6</b>	<b>3.8</b>	<b>4.0</b>	<b>1.5</b>				
HMNI	<b>2.9</b>	<b>4.0</b>	<b>2.0</b>	4.0				
HFAI	5.7	6.4	5.5	4.5				
HFBI	5.1	6.0	6.5	5.0				
DSHP	3.7	<b>3.6</b>	<b>3.8</b>	4.0				
LGEM	4.1	<b>4.4</b>	<b>3.8</b>	9.5				
IVCN	<b>3.1</b>	<b>3.8</b>	<b>2.8</b>	2.5				
ICON	<b>2.9</b>	<b>3.2</b>	<b>2.5</b>	2.5				
IVDR	3.6	<b>4.2</b>	<b>2.5</b>	<b>2.0</b>				
HCCA	<b>3.3</b>	<b>4.0</b>	<b>3.2</b>	3.0				
GFSI	4.0	<b>4.0</b>	<b>2.2</b>	8.0				
EMXI	3.6	<b>3.8</b>	5.5	8.5				
Forecasts	7	5	4	2				

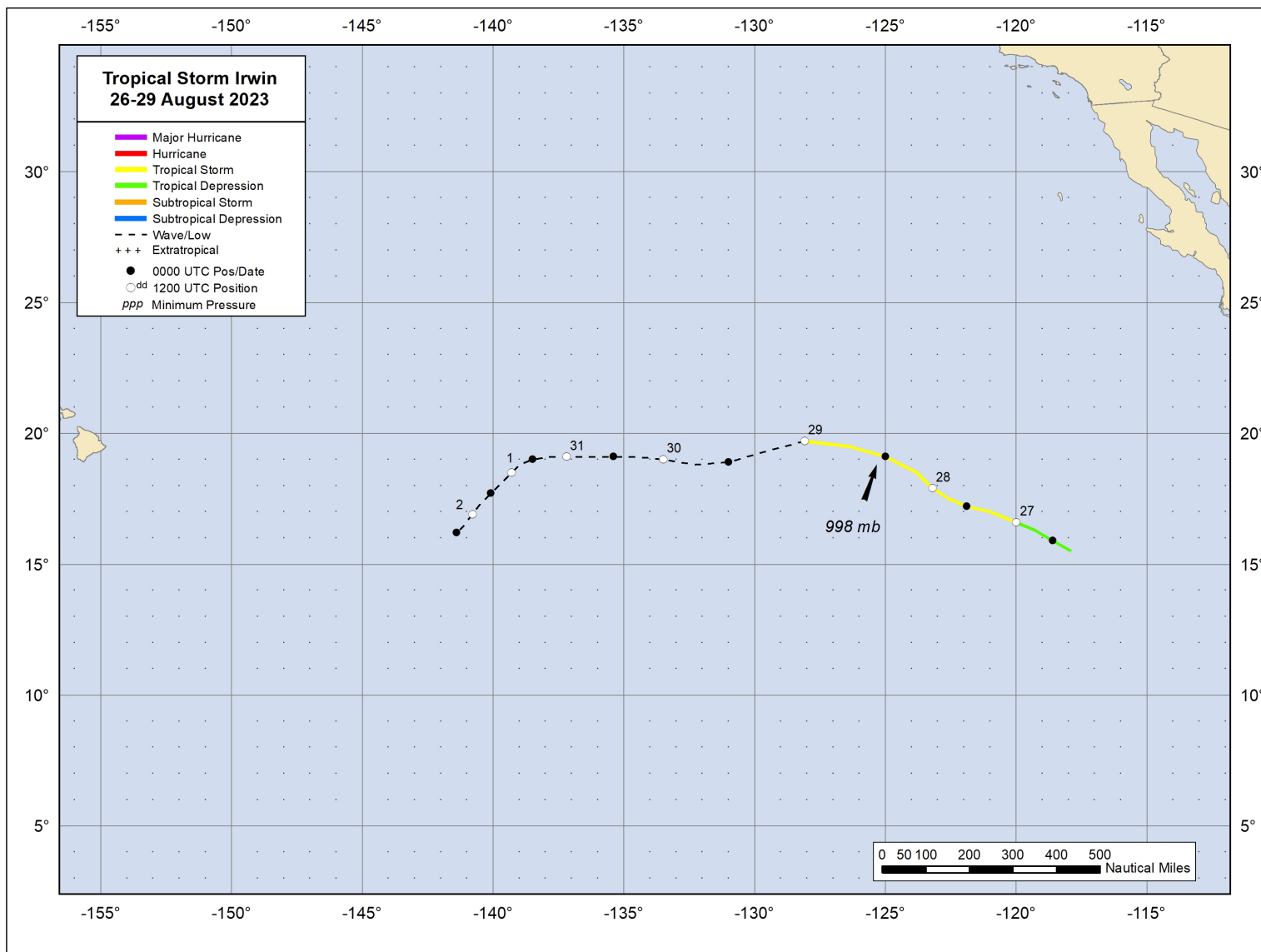


Figure 1. Best track positions for Tropical Storm Irwin, 26–29 August 2023.



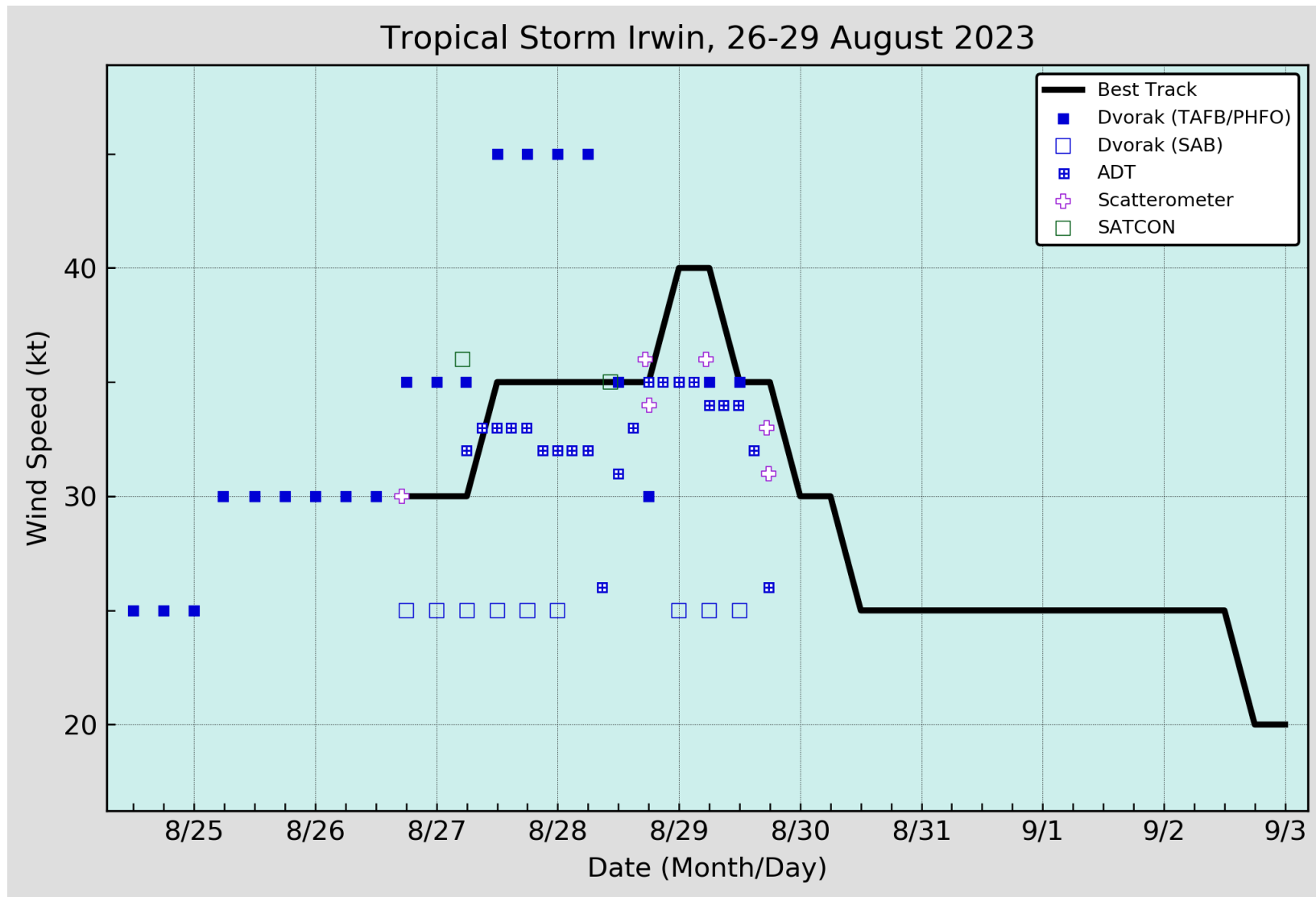


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Irwin, 26–29 August 2023. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

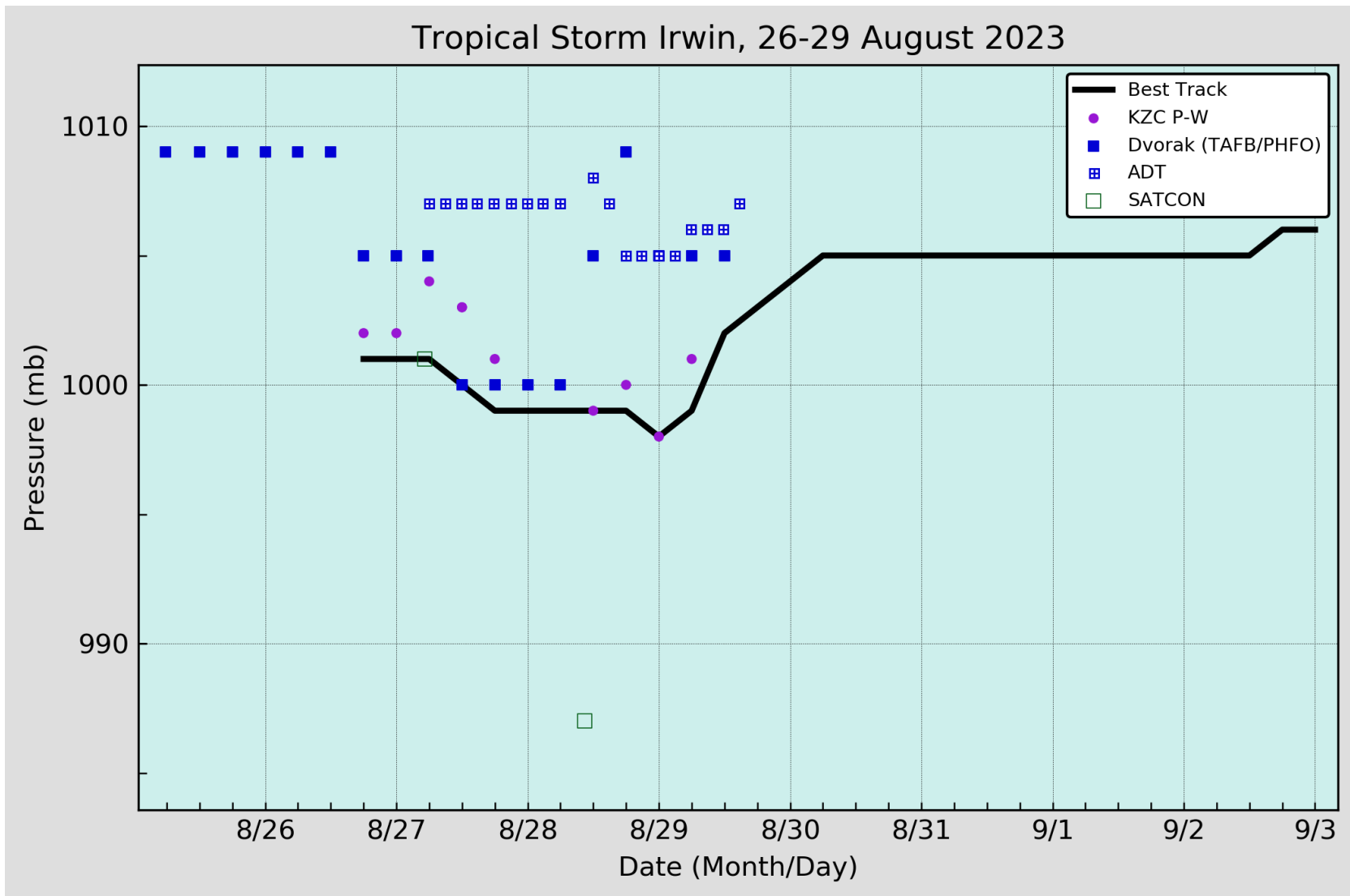


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Irwin, 26–29 August 2023. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological 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.

### Irwin 7-day Tropical Weather Outlook Areas

From: 1800 UTC 23 Aug 2023 to 1800 UTC 26 Aug 2023

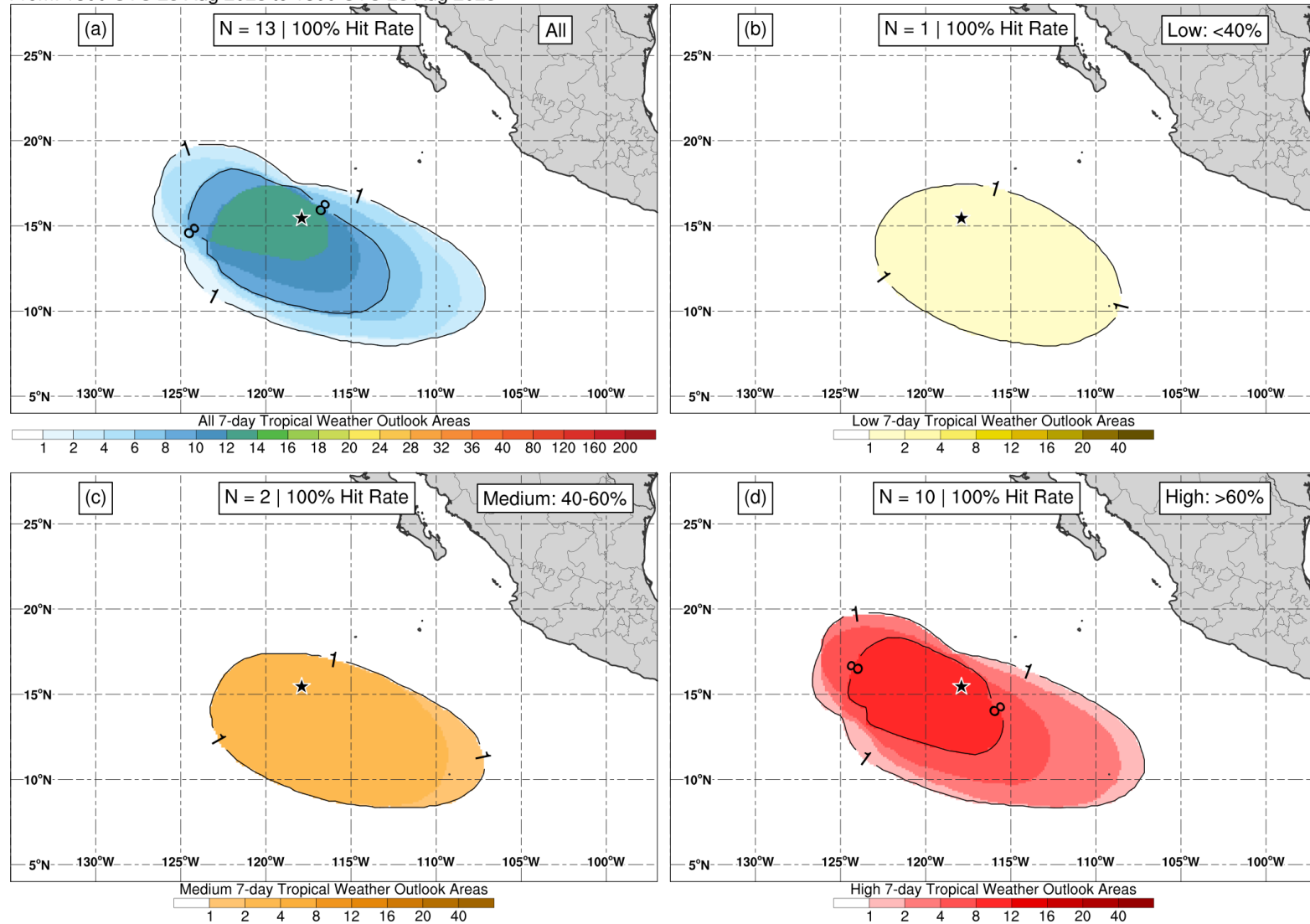


Figure 4. Composites of 7-day tropical cyclone genesis areas depicted in NHC’s Tropical Weather Outlooks prior to the formation of Irwin for (a) all probabilistic genesis categories, (b) the low (<40%) category, (c) medium (40–60%) category, and (d) high (>60%) category. The location of genesis is indicated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