

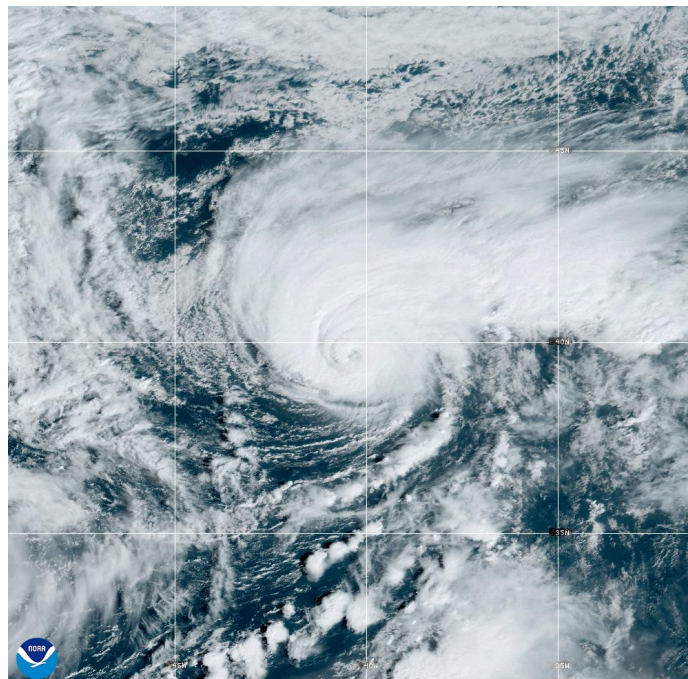


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT¹

HURRICANE ISAAC (AL102024)

25–30 September 2024

Larry A. Kelly
National Hurricane Center
10 December 2024



28 Sep 2024 12:00Z - NOAA/NESDIS/STAR - GOES-East - GEOCOLOR Composite - AL102024

GOES-EAST GEOCOLOR SATELLITE IMAGE OF HURRICANE ISAAC AROUND THE TIME OF ITS PEAK INTENSITY AT 1200 UTC 28 SEPTEMBER 2024. IMAGE COURTESY OF NOAA/NESDIS/STAR.

Isaac was a hurricane that formed over the northern Atlantic Ocean and did not affect land.

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 Isaac

Hurricane Isaac

25–30 SEPTEMBER 2024

BEST TRACK

The “best track²” positions and intensities for Hurricane Isaac are listed in Table 1. The best track chart of Isaac’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 Isaac.

Origin

An extratropical low developed along a stalled frontal boundary over the northern Atlantic Ocean early on 24 September. The extratropical system would begin to occlude and become devoid of frontal features on 25 September. Later that day, convection developed near a well-defined low-level center. Satellite data indicated that convection became sufficiently organized near the low-level center by 1800 UTC 25 September, and the low had completed tropical transition, with formation of the tropical storm about 515 n mi northeast of Bermuda.

Peak Intensity and Minimum Pressure

Isaac’s estimated peak intensity of 90 kt from 0600 to 1200 UTC 28 September is based on a subjective Dvorak intensity estimate of T5.0/ 90 kt from TAFB and a UW-CIMSS SATCON estimate of 89 kt. ADT values from UW-CIMSS were also around 90 kt.

The estimated minimum central pressure of 963 mb is based on the Knaff-Zehr-Courtney pressure-wind relationship.

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 *bt*k 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 Isaac.

CASUALTY AND DAMAGE STATISTICS

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

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 Isaac. The genesis of Isaac was not well predicted with the low from which Isaac developed being introduced in the TWO only 12 hours before the tropical cyclone formed. The poor genesis forecast was due to models depicting that the low-pressure area would struggle to produce organized convection, which made it unclear whether the low would be able to completely transition from an extratropical cyclone.

A verification of NHC official track forecasts for Isaac is given in Table 3a. Official track forecast errors were lower than the mean official errors for the previous 5-yr period, through 60-h, then higher than the mean errors at 72 and 96 h for a small number of forecasts. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. A verification of NHC official intensity forecasts for Isaac is given in Table 4a. Official intensity forecast errors were comparable to the mean official errors for the previous 5-yr period throughout the entire forecast period. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. Of the available guidance, the consensus aids HCCA and FSSE generally performed best for both track and intensity.

There were no coastal watches or warnings issued for Isaac.



Table 1. Best track for Hurricane Isaac, 25–30 September 2024.

| Date/Time (UTC) | Latitude (°N) | Longitude (°W) | Pressure (mb) | Wind Speed (kt) | Stage |
|-----------------|---------------|----------------|---------------|-----------------|----------------|
| 24 / 1200 | 38.7 | 58.4 | 1003 | 40 | extratropical |
| 24 / 1800 | 38.6 | 58.6 | 1002 | 40 | " |
| 25 / 0000 | 38.1 | 58.8 | 998 | 45 | " |
| 25 / 0600 | 37.3 | 58.5 | 998 | 45 | " |
| 25 / 1200 | 37.0 | 57.2 | 998 | 45 | " |
| 25 / 1800 | 36.9 | 55.7 | 998 | 45 | tropical storm |
| 26 / 0000 | 37.0 | 54.5 | 997 | 45 | " |
| 26 / 0600 | 37.1 | 53.4 | 997 | 45 | " |
| 26 / 1200 | 37.2 | 52.3 | 997 | 45 | " |
| 26 / 1800 | 37.3 | 51.2 | 992 | 50 | " |
| 27 / 0000 | 37.2 | 50.1 | 988 | 55 | " |
| 27 / 0600 | 37.1 | 49.1 | 985 | 60 | " |
| 27 / 1200 | 37.1 | 47.7 | 981 | 65 | hurricane |
| 27 / 1800 | 37.5 | 46.2 | 976 | 75 | " |
| 28 / 0000 | 38.0 | 44.4 | 965 | 85 | " |
| 28 / 0600 | 38.8 | 42.3 | 963 | 90 | " |
| 28 / 1200 | 39.7 | 40.4 | 963 | 90 | " |
| 28 / 1800 | 40.6 | 39.1 | 965 | 85 | " |
| 29 / 0000 | 41.5 | 38.0 | 967 | 75 | " |
| 29 / 0600 | 42.3 | 37.0 | 969 | 70 | " |
| 29 / 1200 | 43.0 | 36.1 | 971 | 65 | " |



| Date/Time (UTC) | Latitude (°N) | Longitude (°W) | Pressure (mb) | Wind Speed (kt) | Stage |
|-----------------|---------------|----------------|---------------|-----------------|------------------------------------|
| 29 / 1800 | 43.7 | 35.1 | 973 | 60 | tropical storm |
| 30 / 0000 | 44.1 | 33.8 | 976 | 55 | " |
| 30 / 0600 | 44.4 | 32.0 | 978 | 55 | extratropical |
| 30 / 1200 | 44.7 | 30.1 | 980 | 50 | " |
| 30 / 1800 | 45.2 | 28.0 | 983 | 45 | " |
| 01 / 0000 | 46.1 | 26.3 | 987 | 45 | " |
| 01 / 0600 | 47.0 | 25.1 | 991 | 45 | " |
| 01 / 1200 | 47.8 | 24.4 | 993 | 45 | " |
| 01 / 1800 | 48.4 | 23.7 | 995 | 40 | " |
| 02 / 0000 | 49.1 | 23.0 | 996 | 40 | " |
| 02 / 0600 | 49.7 | 22.5 | 996 | 40 | " |
| 02 / 1200 | 50.4 | 22.1 | 997 | 40 | " |
| 02 / 1800 | 51.2 | 21.6 | 997 | 40 | " |
| 03 / 0000 | 51.9 | 21.0 | 998 | 40 | " |
| 03 / 0600 | | | | | dissipated |
| 28 / 0600 | 38.8 | 42.3 | 963 | 90 | 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%) | 12 | 12 |
| Medium (40%-60%) | -- | -- |
| High (>60%) | -- | -- |

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Isaac. 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 | 14.8 | 26.0 | 37.5 | 46.3 | 51.0 | 99.7 | 209.4 | |
| OCD5 | 46.5 | 115.8 | 160.3 | 176.0 | 238.0 | 241.5 | 289.0 | |
| Forecasts | 15 | 13 | 11 | 9 | 7 | 5 | 1 | |
| OFCL (2019-23) | 23.9 | 36.5 | 49.3 | 63.4 | 79.2 | 93.4 | 132.9 | 190.4 |
| OCD5 (2019-23) | 45.7 | 97.1 | 153.0 | 205.4 | 254.9 | 297.8 | 372.7 | 439.1 |



Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Isaac. 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 | 15.4 | 24.2 | 30.0 | 39.9 | 50.9 | 87.4 | | |
| OCD5 | 50.1 | 129.3 | 185.0 | 207.8 | 273.9 | 270.2 | | |
| GFSI | 14.3 | 28.8 | 38.0 | 61.4 | 86.4 | 83.9 | | |
| HWFI | 18.5 | 37.6 | 54.4 | 89.4 | 94.5 | 126.9 | | |
| HMNI | 20.8 | 37.5 | 54.3 | 83.1 | 95.9 | 138.6 | | |
| HFAI | 14.1 | 25.7 | 37.9 | 52.2 | 81.9 | 131.2 | | |
| HFBI | 17.8 | 28.5 | 32.0 | 46.3 | 63.8 | 82.3 | | |
| EMXI | 10.6 | 23.7 | 35.2 | 47.2 | 51.3 | 97.7 | | |
| CMCI | 16.2 | 34.0 | 52.5 | 72.0 | 132.5 | 234.6 | | |
| TVCA | 12.5 | 23.6 | 33.4 | 43.9 | 49.0 | 60.9 | | |
| TVCX | 12.6 | 22.8 | 32.8 | 45.5 | 49.4 | 66.4 | | |
| GFEX | 11.5 | 22.2 | 35.5 | 51.8 | 61.6 | 73.5 | | |
| TVDG | 12.2 | 22.6 | 32.7 | 43.8 | 51.9 | 64.4 | | |
| HCCA | 12.6 | 17.6 | 22.8 | 33.4 | 39.5 | 62.7 | | |
| FSSE | 11.3 | 15.8 | 24.1 | 35.0 | 43.0 | 69.6 | | |
| AEMI | 14.4 | 27.7 | 34.1 | 42.6 | 47.7 | 40.5 | | |
| TABS | 33.1 | 77.7 | 119.1 | 156.9 | 160.1 | 164.3 | | |
| TABM | 27.6 | 54.6 | 69.7 | 66.3 | 72.5 | 73.6 | | |
| TABD | 42.5 | 102.9 | 168.8 | 215.4 | 288.1 | 464.1 | | |
| Forecasts | 13 | 11 | 9 | 7 | 5 | 3 | | |



Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Isaac. 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 | 5.0 | 8.5 | 11.4 | 13.3 | 10.7 | 7.0 | 0.0 | |
| OCD5 | 7.4 | 14.3 | 18.6 | 20.0 | 17.4 | 9.0 | 12.0 | |
| Forecasts | 15 | 13 | 11 | 9 | 7 | 5 | 1 | |
| OFCL (2019-23) | 5.0 | 7.3 | 8.5 | 9.7 | 10.4 | 10.9 | 12.9 | 15.5 |
| OCD5 (2019-23) | 6.6 | 10.2 | 13.1 | 15.6 | 17.2 | 18.6 | 21.8 | 22.6 |

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Isaac. 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 | 5.4 | 9.1 | 11.1 | 10.0 | 5.0 | 3.3 | | |
| OCD5 | 8.1 | 14.6 | 17.8 | 14.9 | 11.0 | 4.7 | | |
| HWFI | 8.6 | 9.5 | 9.9 | 8.0 | 4.0 | 1.7 | | |
| HMNI | 7.5 | 10.3 | 12.8 | 12.7 | 10.2 | 11.0 | | |
| HFAI | 6.6 | 10.2 | 11.6 | 9.9 | 6.8 | 5.0 | | |
| HFBI | 7.8 | 14.1 | 15.3 | 10.9 | 5.4 | 1.3 | | |
| DSHP | 6.7 | 11.4 | 14.2 | 14.6 | 9.6 | 6.0 | | |
| LGEM | 6.2 | 11.3 | 13.6 | 11.9 | 7.2 | 4.0 | | |
| ICON | 6.1 | 10.0 | 12.0 | 10.9 | 7.0 | 2.7 | | |
| IVCN | 6.2 | 10.4 | 12.2 | 10.1 | 6.2 | 3.0 | | |
| IVDR | 5.9 | 10.5 | 12.4 | 10.1 | 6.0 | 3.0 | | |
| GFSI | 7.1 | 12.8 | 15.8 | 11.9 | 6.6 | 3.7 | | |
| EMXI | 10.2 | 16.4 | 17.9 | 12.1 | 6.2 | 4.0 | | |
| HCCA | 5.4 | 8.6 | 9.8 | 8.6 | 5.4 | 1.0 | | |
| FSSE | 5.8 | 8.6 | 10.6 | 8.1 | 4.0 | 4.3 | | |
| Forecasts | 13 | 11 | 9 | 7 | 5 | 3 | | |

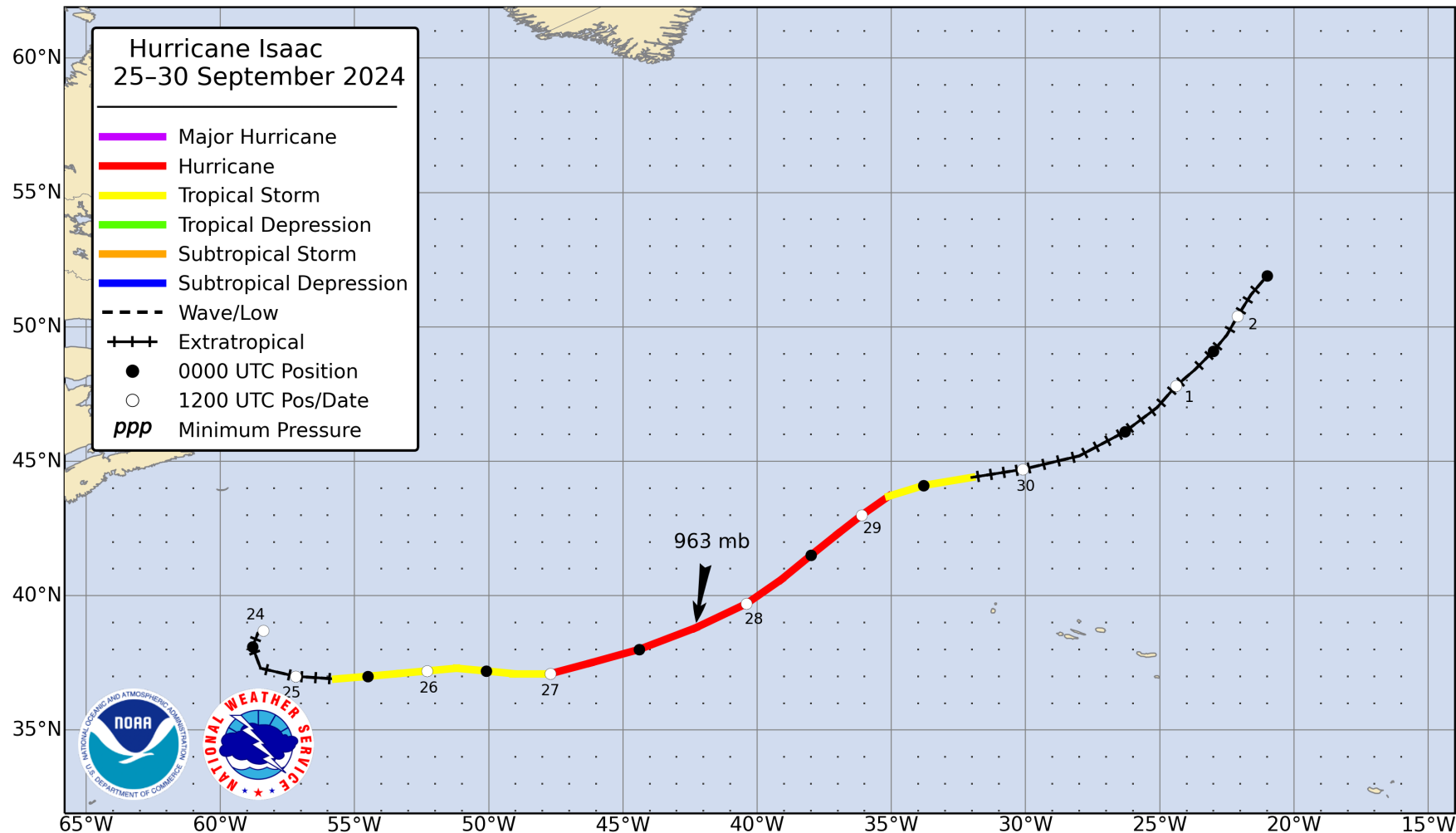


Figure 1. Best track positions for Hurricane Isaac, 25–30 September 2024.

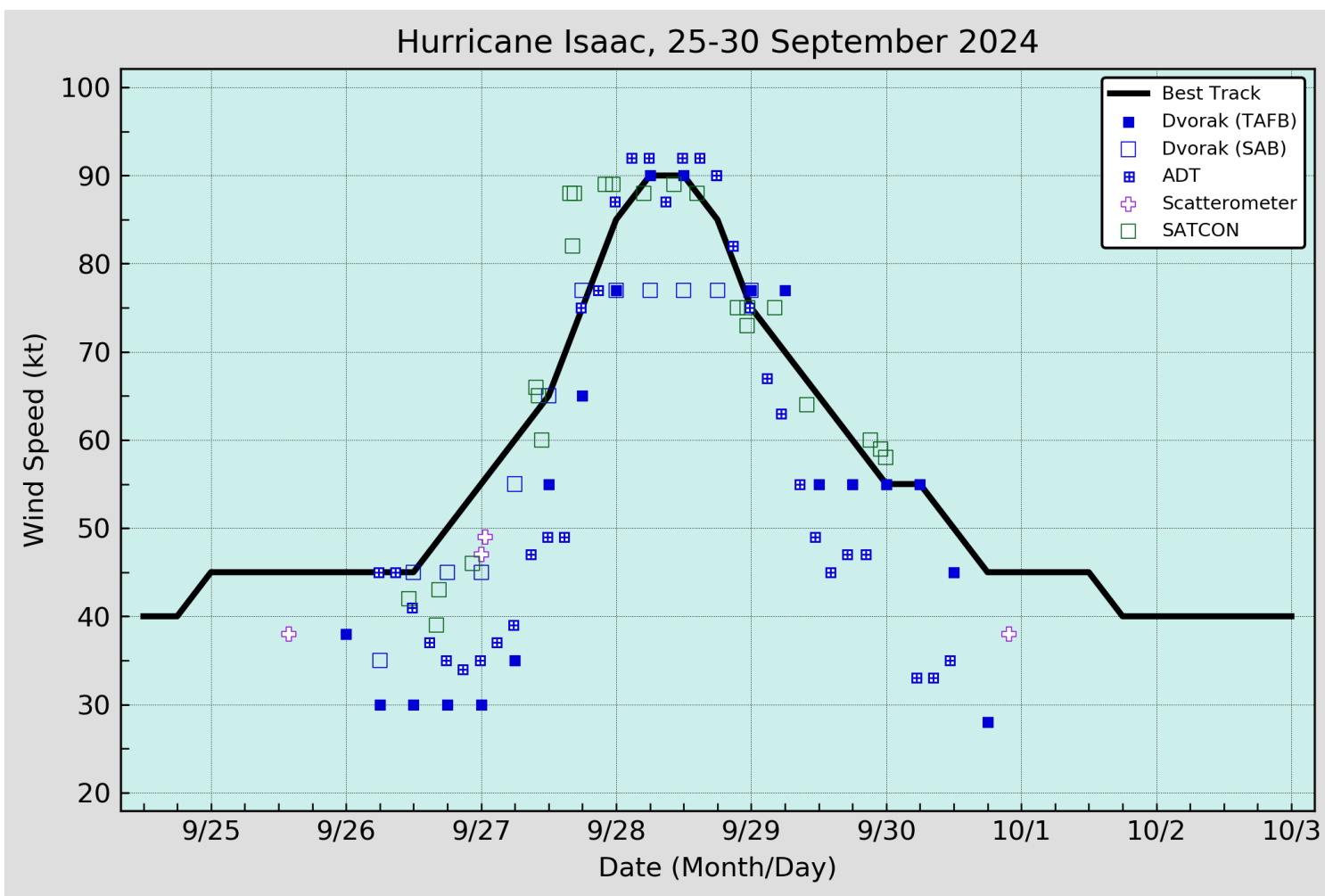


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Isaac, 25–30 September 2024. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

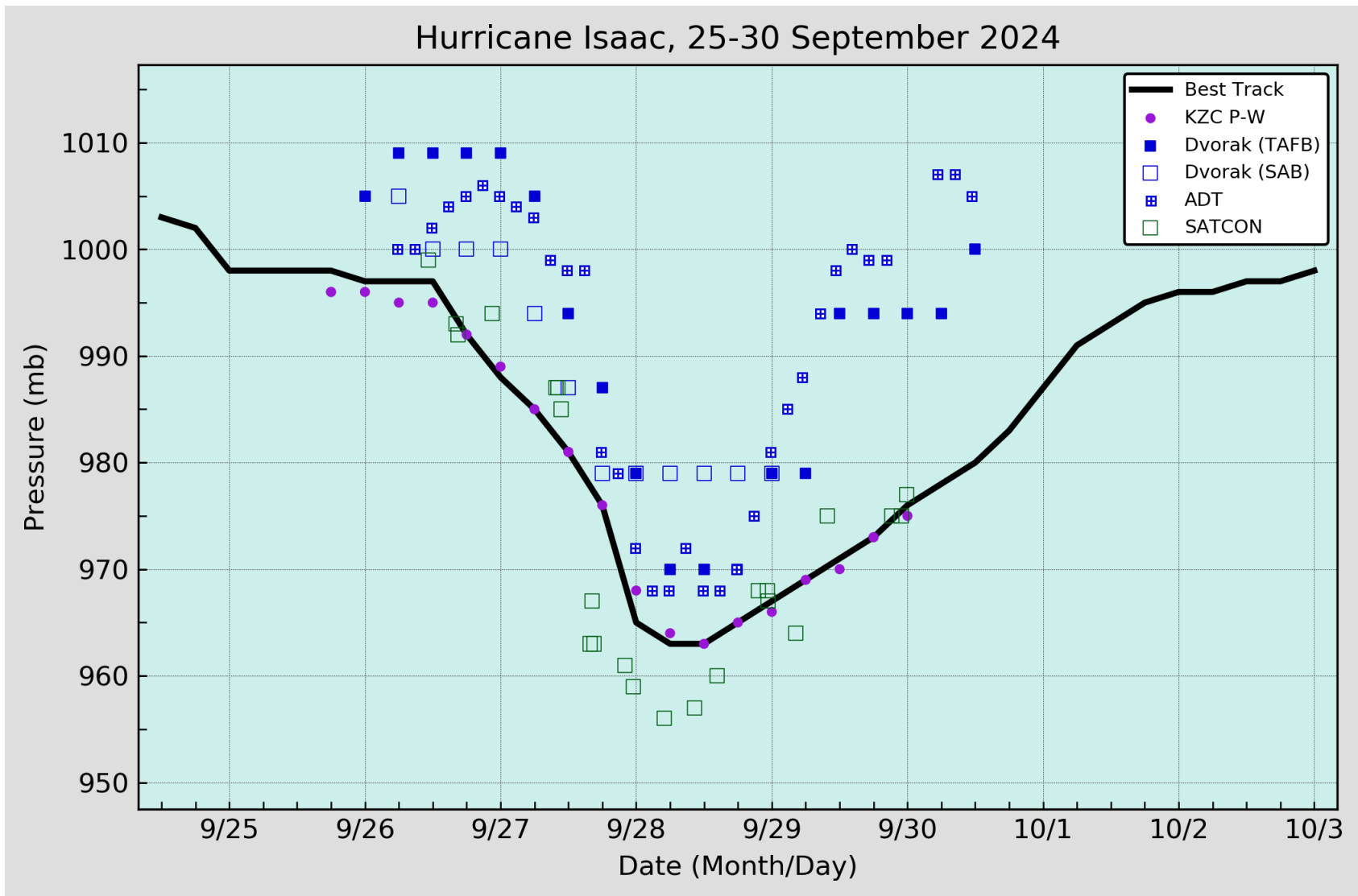


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Isaac, 25–30 September 2024. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological 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.

Isaac 7-day Tropical Weather Outlook Areas

From: 0600 UTC 25 Sep 2024 to 1800 UTC 25 Sep 2024

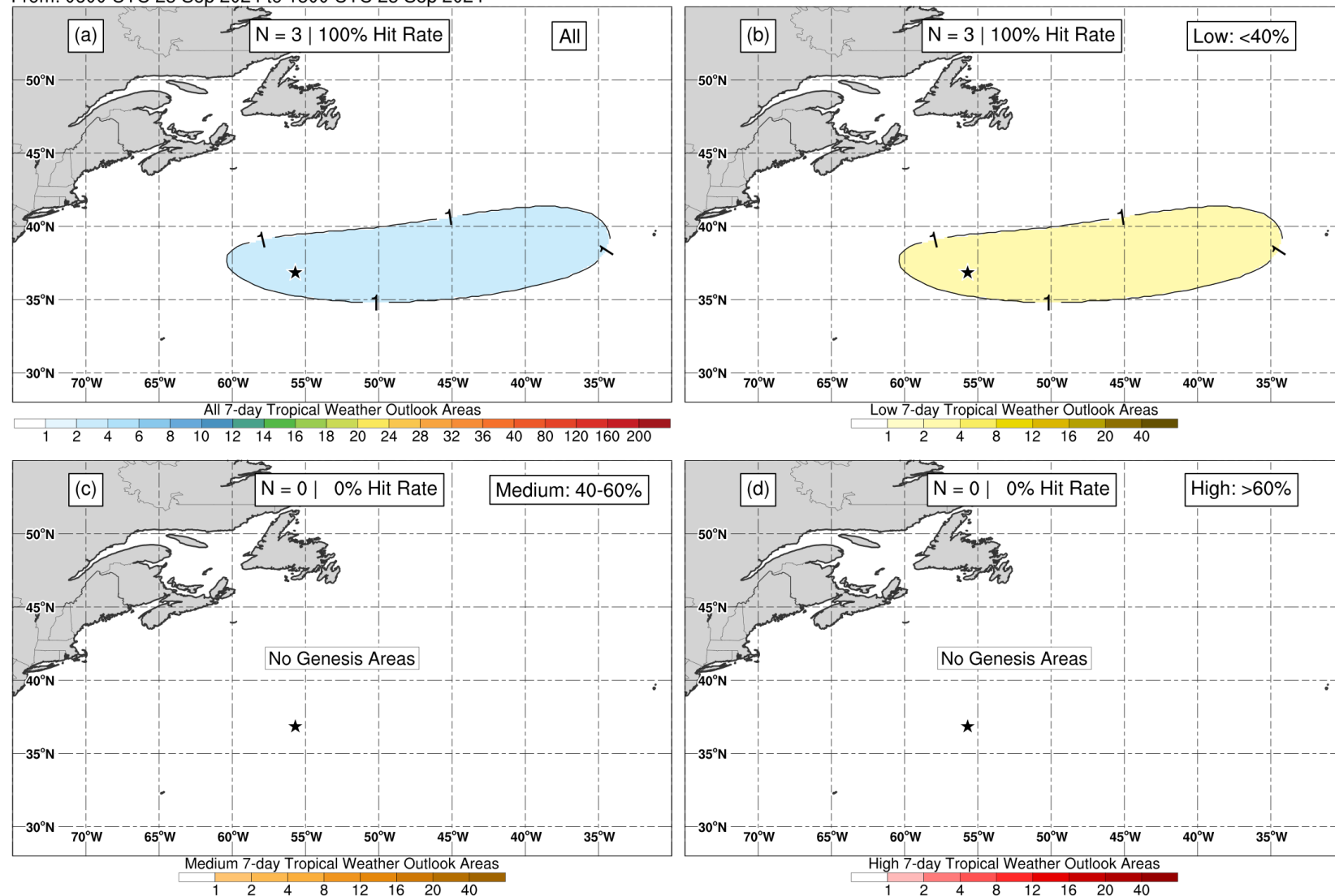


Figure 4. Composites of 7-day tropical cyclone genesis areas depicted in NHC’s Tropical Weather Outlooks prior to the formation of Isaac for (a) all probabilistic genesis categories, (b) the low (<40%) category, (c) medium (40–60%) category, and (d) high (>60%) category. The location of genesis is indicated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