



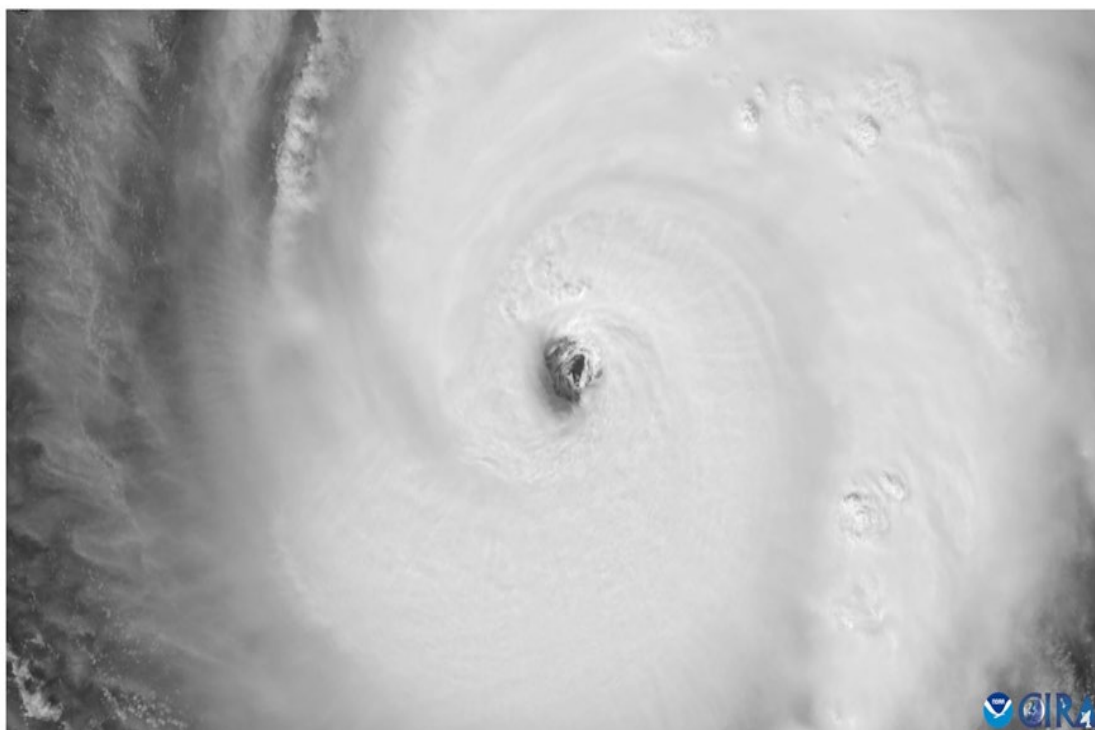
# NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

## HURRICANE GABRIELLE

(AL072025)

17–25 September 2025

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National Hurricane Center  
17 December 2025



NOAA-21 VIIRS VISIBLE IMAGE OF HURRICANE GABRIELLE AT 1706 UTC 22 SEPTEMBER 2025, JUST BEFORE PEAK INTENSITY. IMAGE COURTESY NOAA/CIRA.

Gabrielle was a category 4 hurricane (on the Saffir-Simpson Hurricane Wind Scale) that took a climatological track across the tropical Atlantic, recurving northeast of the Leeward Islands and Bermuda. It later affected the Azores with hurricane-force wind gusts as a post-tropical cyclone.

# Hurricane Gabrielle

17–25 SEPTEMBER 2025

## SYNOPTIC HISTORY

Gabrielle developed from a tropical wave that left the west coast of Africa early on 12 September. The tropical wave produced only disorganized convection at first, then thunderstorms started to concentrate on the southern end of the wave late on 14 September. This convective activity caused the formation of a broad area of low pressure the next day about midway between the coast of west Africa and the Windward Islands. The system moved west-northwestward and convection further increased on 16 September, with gale-force winds noted on scatterometer data late that day. However, the low-level circulation remained very elongated, and an attempt at a better-defined circulation on the southern side of the wave was unsuccessful early on 17 September. Deep convection re-focused on the northern side of the wave by midday due to forcing from a nearby upper-level trough, causing the formation of a large but well-defined surface circulation and center, which marked the genesis of Tropical Storm Gabrielle near 1800 UTC 17 September about 800 n mi east of the northern Leeward Islands. The “best track” chart of Gabrielle’s path is given in Fig. 1, with the wind and pressure histories shown in Figs. 2 and 3, respectively. The best track positions and intensities are listed in Table 1<sup>1</sup>.

The storm moved steadily to the west-northwest or northwest for the next few days after formation due to a subtropical ridge to the northeast. Vertical wind shear from the upper-level trough remained strong until 19 September, leading to little change in intensity initially. Convection increased that night and, within a warmer sea-surface temperature and lower-shear environment, Gabrielle finally started to intensify on 20 September. The rate was gradual at first with substantial dry air still intertwined in the circulation, but this changed notably the next day due to the formation of an inner core and higher environmental mid-level humidity. Rapid intensification began late on 21 September around the time it became a hurricane, and a well-defined eye was present the next day on satellite imagery (cover). Gabrielle turned to the north through a break in the subtropical ridge, and aircraft and satellite data suggest it reached a peak intensity of 120 kt near 0000 UTC 23 September about 170 n mi east of Bermuda.

After peak intensity, the hurricane turned to the east-northeast and began to move faster due to increasing mid-latitude flow. Gabrielle gradually lost strength late on 23 September through 24 September as it encountered cooler sea-surface temperatures (SSTs) and increasing shear. Satellite images and scatterometer data indicate Gabrielle lost hurricane intensity and tropical characteristics by 1800 UTC 25 September, a few hundred n mi west-southwest of the Azores. The still-powerful low moved through the Azores early the next day with hurricane-force

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<sup>1</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 *btk* directory, while previous years’ data are located in the *archive* directory.

wind gusts and later re-intensified as an extratropical low with sustained hurricane-force winds near 0000 UTC 27 September. The post-tropical cyclone then slowed down and gradually weakened, moving over northern Portugal early on 28 September before opening up into a trough late that day near southern Spain.

## METEOROLOGICAL STATISTICS

Observations in Gabrielle (Figs. 2 and 3) 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. Observations also include flight-level winds and dropwindsonde observations from eight flights of the 53rd Weather Reconnaissance Squadron of the U.S. Air Force Reserve Command and the NOAA Aircraft Operations Center (Fig. 4). 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), the Defense Meteorological Satellite Program (DMSP) satellites, and the Time-Resolved Observations of Precipitation structure and storm Intensity with a Constellation of Smallsats (TROPICS) satellites, among others, were also useful in constructing the best track of Gabrielle.

### *Winds and Pressure*

Gabrielle's estimated peak intensity of 120 kt at 0000 UTC 23 September is primarily based on satellite estimates and extrapolation from earlier aircraft flight-level wind data. The peak 8000-ft flight-level winds were 132 kt at 2042 UTC 22 September, which reduces to 110-115 kt at the surface. The peak 700-mb winds were 129 kt at 1705 UTC that day, which reduces to about 115 kt at the surface using a standard reduction. Given that the pressure was falling rapidly (see below) and that the satellite presentation had not yet peaked, Gabrielle's peak intensity is estimated to be 120 kt. This is also consistent with a blend of UW-CIMSS ADT and subjective Dvorak estimates in conjunction with an improved presentation on satellite imagery after the plane departed.

Table 2 shows surface observations in the Azores as post-tropical Gabrielle passed the island chain. The highest lower-elevation, land-based sustained wind report was at Graciosa (43 kt), with a gust to 83 kt noted at Faial. Note multiple sites had higher gust ratios than typically observed (not unexpected due to the non-tropical nature of Gabrielle near the Azores). An elevated (1010 m) station on top of Terceira Island (Santa Barbara mountain) had a wind gust to 100 kt (time unknown). Terceira also had a minimum pressure of 984.5 mb as the center of Gabrielle passed.

There were no ship or buoy reports of tropical-storm-force winds reported with Gabrielle.

The estimated minimum central pressure of 944 mb at 0000 UTC 23 September is based on both the Knaff-Zehr-Courtney (KZC) pressure-wind relationship and extrapolation of earlier

aircraft data. The minimum central pressure was extrapolated at 947 mb from a NOAA Hurricane Hunter pass near 2046 UTC 22 September, but the pressure had fallen about 5 mb in the preceding 2.5 hours. Since the KZC value had recently been a little low compared to dropsonde data, the minimum central pressure is set just above the KZC relationship for sustained winds of 120 kt.

### **Rainfall and Flooding**

Rainfall from Gabrielle was fairly modest over the Azores, with a peak total of 60.9 mm (2.4 inches) recorded at Graciosa (Table 2). No flooding reports were received while the system was over the Atlantic basin. However, media reports by the BBC indicate the remnants of Gabrielle combined with another mid-latitude cyclone to produce historic flooding in Ibiza<sup>2</sup>.

## **CASUALTY AND DAMAGE STATISTICS**

No direct deaths<sup>3</sup> or injuries were noted from Gabrielle, and the reported damage across the Azores was generally light. The primary effects were large-scale closures of government and school buildings, along with fallen trees, power poles, and damage to some roofs, as noted by the Azores Civil Protection Services.

## **FORECAST AND WARNING CRITIQUE**

### **Genesis**

The genesis forecasts for Gabrielle were some of the best of the season. Table 3 provides the number of hours in advance of formation with the first NHC Tropical Weather Outlook (TWO) forecast in each category. A low (<40%) chance of genesis during the next 7 days was first indicated in the TWO exactly 7 days before formation, and the chances were raised to the medium (40–60%) category 132 h before formation. For the 2-day forecast period, the disturbance was given a low and medium chance of genesis 78 and 54 hours before formation, respectively. The 7-day and 2-day probabilities were raised to the high categories 78 h and 36 h before formation, respectively. The forecasts for the cyclone's genesis location were accurate and had a 100% hit rate, lying within every genesis area depicted in NHC's Graphical TWO (Fig. 5), though the first several outlooks areas were centered a little east of Gabrielle's formation location.

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<sup>2</sup> BBC News, retrieved 11/25/25: <https://www.bbc.com/news/articles/cx27drz0kg1o>

<sup>3</sup> Deaths occurring as a direct result of the forces of the tropical cyclone are referred to as "direct" deaths. These would include those persons who drowned in storm surge, rough seas, rip currents, and freshwater floods. Direct deaths also include casualties resulting from lightning and wind-related events (e.g., collapsing structures). Deaths occurring from such factors as heart attacks, house fires, electrocutions from downed power lines, vehicle accidents on wet roads, etc., are considered "indirect" deaths.

It should be mentioned that the time of genesis was delayed 12 h on the final best track compared to the operational designation. Upon review of all of the post-storm data, the initial center that NHC was tracking was too transient and elongated to be considered a tropical cyclone, and the re-formation to the north was deemed the first tropical cyclone point.

## **Track**

A verification of NHC official track forecasts for Gabrielle is given in Table 4a. Official track forecast errors were lower than the mean official errors for the previous 5-yr period through 72 h, then higher at 96 and 120 h. A homogeneous comparison of the official track errors with selected guidance models is given in Table 4b. The NHC's track forecasts for Gabrielle bested almost all of the guidance through 96 h, and were fairly consistent, except biased a bit to the north especially after recurvature (Fig. 6). The Google DeepMind model (GDMI) had the lowest errors through 24 h of any of the aids, though overall had about the same performance as the corrected-consensus HCCA or Florida State Superensemble (FSSE) models if one considers later time periods. The HAFS guidance, both A and B, had some of the highest errors of any of the typically skillful track models.

## **Intensity**

A verification of NHC official intensity forecasts for Gabrielle is given in Table 5a. Official intensity forecast errors were higher or much higher than the mean official errors for the previous 5-yr period, with the exception of the 12-hour forecast. This is not a surprising result given that the OCD5 (CLPR) errors were also much higher than average, suggesting this was a harder cyclone to forecast than average, largely owing to the rapid intensification episode. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 5b. Despite the rapid intensification, the NHC official intensity forecast performed well overall, outperforming most available guidance. The Florida State Superensemble (FSSE) forecast was the best overall model, especially at 60 hours and beyond. The HWRF model (HWF1) and the COAMPS-TC model (CTCI) had some very high errors for Gabrielle, even though in the latter forecast periods (96-120 h) these aids outperformed OFCL.

## **Wind Watches and Warnings**

Coastal wind watches and warnings associated with Gabrielle are given in Table 6. Initially, Gabrielle was expected to be a hurricane near the Azores. However, Gabrielle was not tropical when it reached those islands, but the warnings were continued until the damaging wind threat passed.

## **ACKNOWLEDGEMENTS**

Carlos Ramalho of the Portuguese Institute for Sea and Atmosphere (IPMA) provided the Azores data. Dr. Philippe Papin (NHC) created the Graphical TWO verification figure, and Dr. Lisa Bucci created the reconnaissance summary and NHC official track figure.

Table 1. Best track for Hurricane Gabrielle, 17–25 September 2025.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
17 / 1800	19.0	47.7	1005	45	tropical storm
18 / 0000	19.3	48.9	1004	45	"
18 / 0600	19.6	50.0	1004	45	"
18 / 1200	20.0	51.2	1004	45	"
18 / 1800	20.5	52.2	1004	45	"
19 / 0000	21.0	53.1	1004	45	"
19 / 0600	21.4	54.1	1004	45	"
19 / 1200	21.7	55.1	1004	45	"
19 / 1800	22.1	56.1	1004	45	"
20 / 0000	22.9	57.0	1004	45	"
20 / 0600	23.9	57.7	1004	45	"
20 / 1200	24.6	58.3	1001	50	"
20 / 1800	25.2	58.6	996	55	"
21 / 0000	25.9	59.0	996	55	"
21 / 0600	26.6	59.8	995	55	"
21 / 1200	27.3	60.7	995	60	"
21 / 1800	28.1	61.5	993	65	hurricane
22 / 0000	28.9	62.1	985	70	"
22 / 0600	29.6	62.5	977	80	"
22 / 1200	30.4	62.5	958	100	"
22 / 1800	31.3	62.1	951	115	"
23 / 0000	32.1	61.4	944	120	"
23 / 0600	32.8	60.4	945	120	"
23 / 1200	33.5	59.2	946	120	"



Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
23 / 1800	34.3	57.4	947	115	"
24 / 0000	34.9	55.2	953	110	"
24 / 0600	35.4	52.8	958	100	"
24 / 1200	35.8	50.2	965	90	"
24 / 1800	35.9	47.2	970	85	"
25 / 0000	35.9	44.0	974	75	"
25 / 0600	36.1	40.2	976	70	"
25 / 1200	36.4	36.7	979	65	"
25 / 1800	36.8	33.6	982	60	extratropical
26 / 0000	37.6	30.6	983	55	"
26 / 0600	38.6	27.5	984	55	"
26 / 1200	39.6	24.2	986	55	"
26 / 1800	40.4	21.4	985	60	"
27 / 0000	41.0	18.5	984	65	"
27 / 0600	41.4	15.7	988	60	"
27 / 1200	41.8	13.1	992	50	"
27 / 1800	41.4	11.2	993	50	"
28 / 0000	41.0	9.5	994	45	"
28 / 0600	40.4	8.1	1005	40	"
28 / 1200	39.5	7.4	1010	35	"
28 / 1800	38.5	6.5	1012	25	"
29 / 0000					dissipated
23 / 0000	32.1	61.4	944	120	minimum pressure and maximum winds

Table 2. Selected Azores surface observations for Post-Tropical Gabrielle, 26 September 2025.

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Total rain (mm)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) <sup>a</sup>	Sustained (kt)	Gust (kt)	
<b>Azores</b>						
<b>International Civil Aviation Organization (ICAO) Sites</b>						
San Miguel (WMO 08512) (76m station elevation)	26/0800	996.5	26/0900	19 (10 min)	56	1.3
Terceira (WMO 08511) (90m station elevation)	26/0700	984.5	26/0800	33 (10 min)	65	8.3
Faial (WMO 08506) (55m station elevation)	26/0400	984.4	26/0200	42 (10 min)	83	17.6
Faial (WMO 08505) (41m station elevation)	26/0400	986.4	26/0500	29 (10 min)	60	29.6
Pico (WMO 08504) (39m station elevation)	26/0400	985.7	26/0600	23 (10 min)	47	28.2
Graciosa (WMO 08510) (25m station elevation)	26/0500	988.6	26/0900	43 (10 min)	63	60.9
Flores (WMO 08501) (28m station elevation)	26/1700	1000.4	26/0900	22 (10 min)	33	22.2
<b>Other</b>						
Santa Barbara Mountain, Terceira (1010m station elevation)					100	

<sup>a</sup> Date/time is for sustained wind when both sustained and gust are listed.

Table 3. Number of hours in advance of Gabrielle’s 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%)	78	168
Medium (40%-60%)	54	132
High (>60%)	36	78

Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Hurricane Gabrielle, 17–25 September 2025. 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>19.0</b>	<b>26.8</b>	<b>31.7</b>	<b>39.6</b>	<b>54.2</b>	<b>77.1</b>	152.1	306.9
OCD5	50.0	108.7	174.3	234.1	267.4	295.9	364.7	457.7
Forecasts	30	28	26	24	22	20	16	12
OFCL (2020-24)	23.0	34.3	45.8	58.7	73.5	89.8	128.7	185.4
OCD5 (2020-24)	45.1	95.7	150.9	203.1	252.7	295.4	366.2	426.6

Table 4b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Hurricane Gabrielle, 17–25 September 2025. 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	18.3	26.2	31.2	40.0	53.1	74.5	142.6	298.6
OCD5	48.6	109.1	176.7	238.5	273.5	311.9	376.3	461.6
GFSI	20.7	30.8	37.1	51.1	68.3	89.7	209.3	411.1
HWFI	23.4	35.6	47.5	66.1	94.8	116.5	207.2	358.4
HMNI	23.0	31.6	38.0	57.8	65.8	78.6	148.8	310.4
HFAI	23.2	38.6	52.5	74.9	104.5	137.4	241.5	330.4
HFBI	24.9	42.2	56.9	73.6	100.9	139.3	250.5	380.3
GDMI	<b>16.8</b>	<b>25.6</b>	36.0	46.3	62.9	91.9	177.4	327.0
EMXI	18.6	29.6	35.3	42.5	60.0	77.5	146.8	326.7
NVGI	25.8	42.8	51.0	68.4	79.8	96.3	177.3	<b>237.4</b>
CMCI	30.3	59.5	89.4	118.5	143.1	151.2	154.6	<b>131.1</b>
CTCI	23.7	31.0	41.9	61.6	87.1	117.4	165.4	<b>166.7</b>
TVCE	19.2	29.8	39.3	54.3	76.2	99.9	161.8	<b>274.0</b>
TVCX	19.2	30.0	39.4	53.8	74.7	97.0	160.0	<b>274.4</b>
GFEX	<b>17.5</b>	26.8	33.3	40.2	56.3	<b>69.2</b>	146.1	317.5
TVDG	18.9	29.4	39.0	54.9	77.1	99.5	163.5	<b>283.3</b>
HCCA	18.4	27.7	36.2	50.6	70.5	93.8	177.4	<b>295.7</b>
FSSE	19.5	30.4	36.8	43.2	58.9	76.0	159.1	340.4
AEMI	22.1	31.9	41.0	61.0	79.7	101.4	153.3	<b>247.3</b>
TABS	44.8	80.7	120.2	158.2	196.4	229.0	282.9	374.9
TABM	30.4	43.9	59.2	78.0	95.2	110.0	187.8	401.7
TABD	30.5	51.9	67.2	84.1	112.4	171.2	346.6	641.9
Forecasts	28	27	25	23	21	18	14	10

Table 5a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Hurricane Gabrielle, 17–25 September 2025. 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>4.2</b>	7.9	10.4	12.5	14.1	14.2	17.5	25.0
OCD5	6.2	11.6	17.0	20.4	23.9	26.2	30.3	32.2
Forecasts	30	28	26	24	22	20	16	12
OFCL (2020-24)	5.1	7.3	8.6	10.0	10.5	10.9	12.4	13.6
OCD5 (2020-24)	6.8	10.6	13.8	16.5	17.9	19.2	21.4	19.9

Table 5b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Hurricane Gabrielle, 17–25 September 2025. 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 5a due to the homogeneity requirement.

Model ID	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	4.3	7.9	10.2	12.6	14.5	14.2	17.1	24.0
OCD5	6.3	12.0	18.0	20.9	24.0	25.8	29.9	32.3
HWFI	8.2	14.5	19.5	19.5	20.9	17.8	<b>16.0</b>	28.9
HMNI	6.0	9.9	14.1	15.3	17.0	18.3	17.9	<b>20.8</b>
HFAI	6.1	10.7	14.9	17.7	15.7	15.3	27.4	40.3
HFBI	5.3	9.5	13.6	15.8	15.8	18.5	25.9	39.6
GDMI	6.7	9.5	13.0	15.3	18.3	19.6	23.6	28.3
DSHP	5.3	9.7	13.6	15.5	17.3	19.4	22.6	27.4
LGEM	5.7	10.0	13.5	15.2	16.3	17.3	19.9	28.7
ICON	5.8	10.2	13.5	15.8	17.0	16.2	17.5	24.8
IVCN	4.8	9.5	13.4	15.0	15.8	16.2	19.4	26.8
IVDR	5.0	9.7	13.9	15.6	16.1	16.6	19.9	27.7
CTCI	6.4	10.1	14.5	19.8	23.4	24.3	<b>15.9</b>	<b>19.1</b>
GFSI	7.8	13.1	17.3	20.4	21.6	22.7	27.3	39.0
EMXI	9.2	15.6	21.5	25.7	29.2	32.9	40.4	42.0
HCCA	4.7	8.8	12.6	14.9	15.7	16.7	19.1	26.0
FSSE	4.4	9.0	12.5	13.1	<b>12.7</b>	<b>13.4</b>	<b>11.2</b>	<b>21.7</b>
Forecasts	29	26	24	23	21	18	14	10



Table 6. Coastal watch and warning summary for Hurricane Gabrielle, 17–25 September 2025.

<b>Date/Time (UTC)</b>	<b>Action</b>	<b>Location</b>
<b>23/ 1500</b>	Hurricane Watch Issued	All of the Azores
<b>24/ 0800</b>	Hurricane Watch replaced by Hurricane Warning	All of the Azores
<b>26/ 1200</b>	Hurricane Warning discontinued	All of the Azores

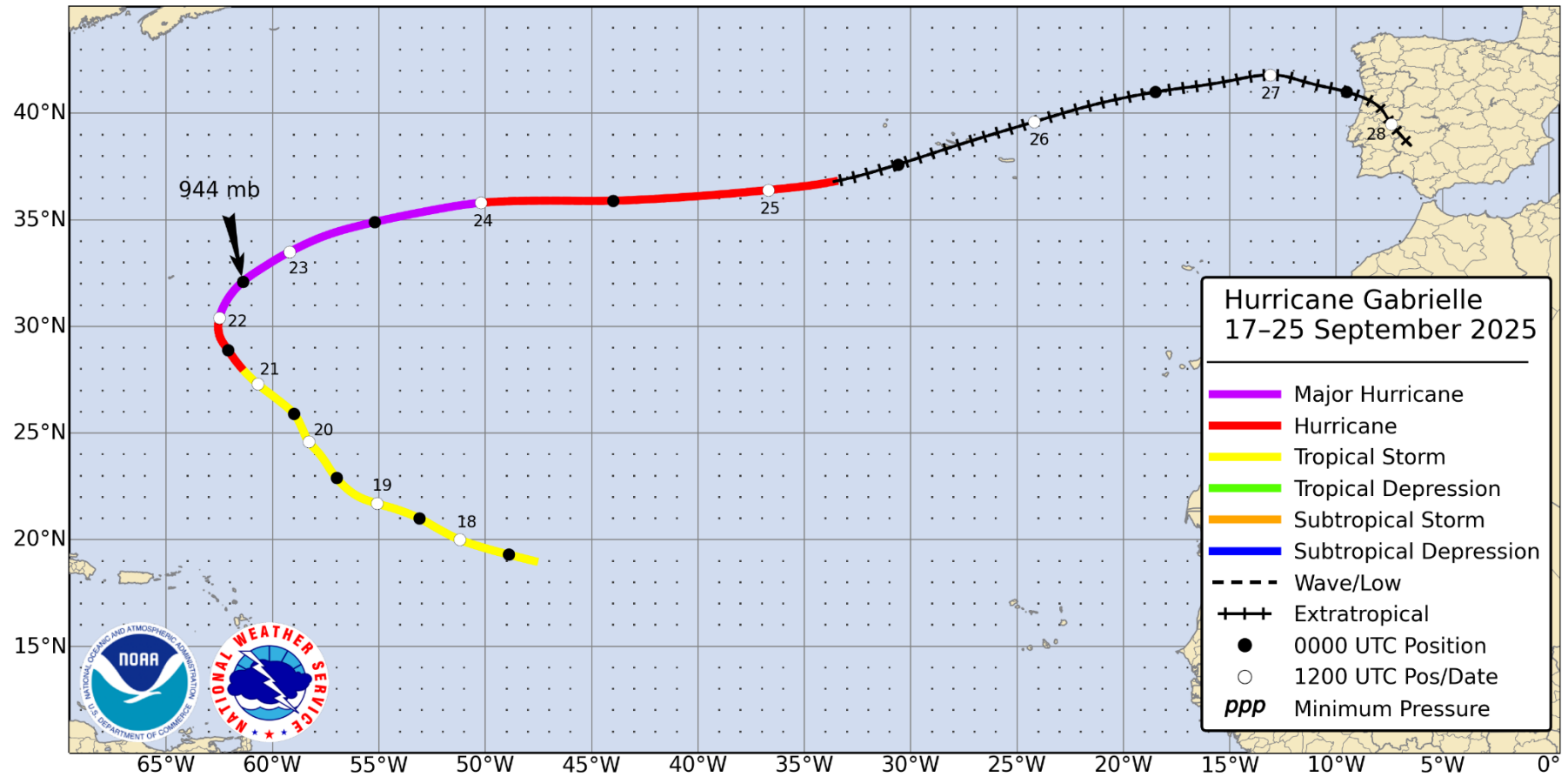


Figure 1. Best track positions for Hurricane Gabrielle, 17–25 September 2025. Track during the extratropical stage partially based on analyses from the NOAA Ocean Prediction Center.

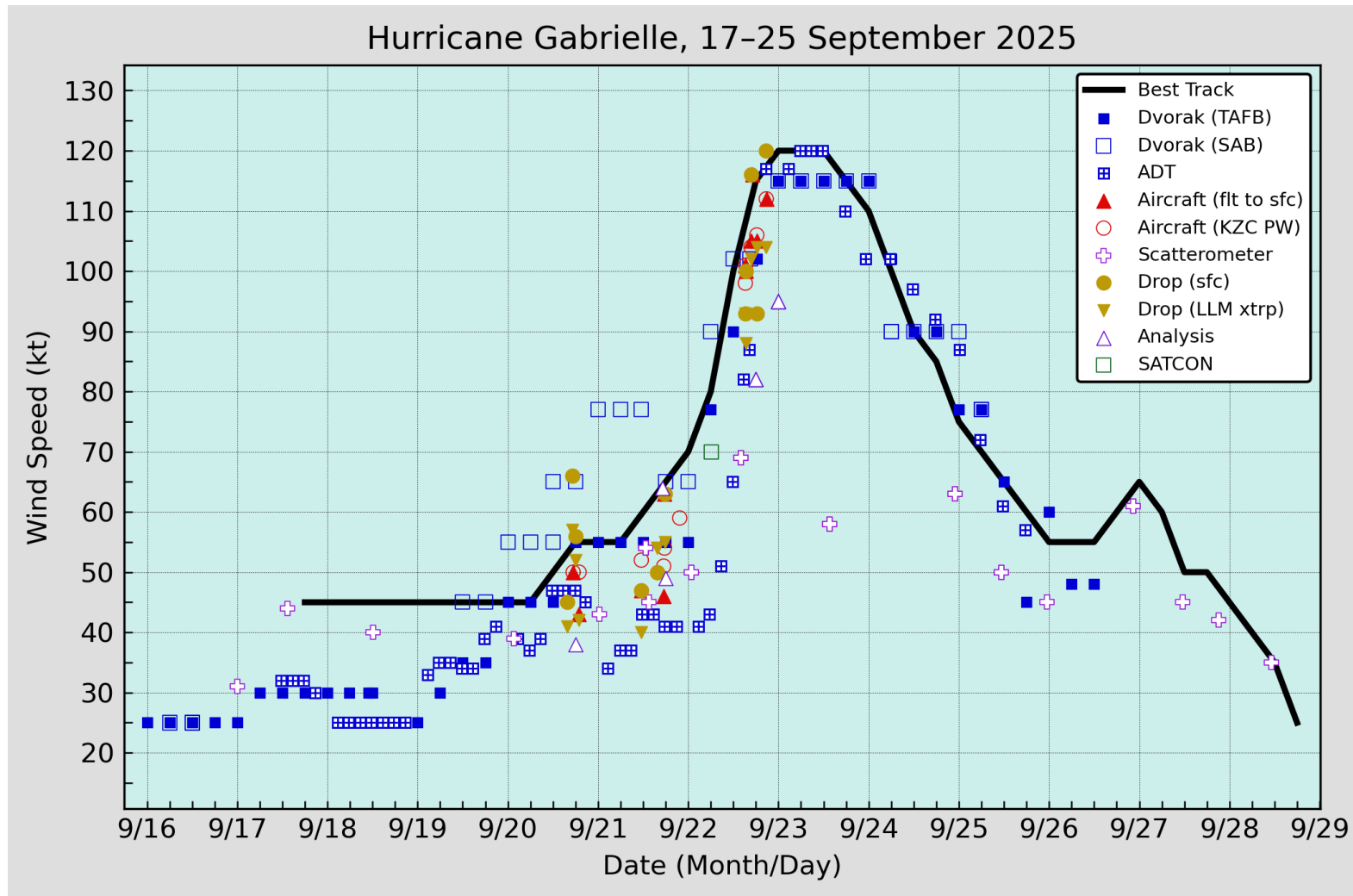


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Gabrielle, 17–25 September 2025. Aircraft observations have been adjusted for elevation using 90% adjustment factors for observations from 700 mb. Dropwindsonde observations include actual 10 m winds (sfc), as well as surface estimates derived from the mean wind over the lowest 150 m of the wind sounding (LLM). 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.

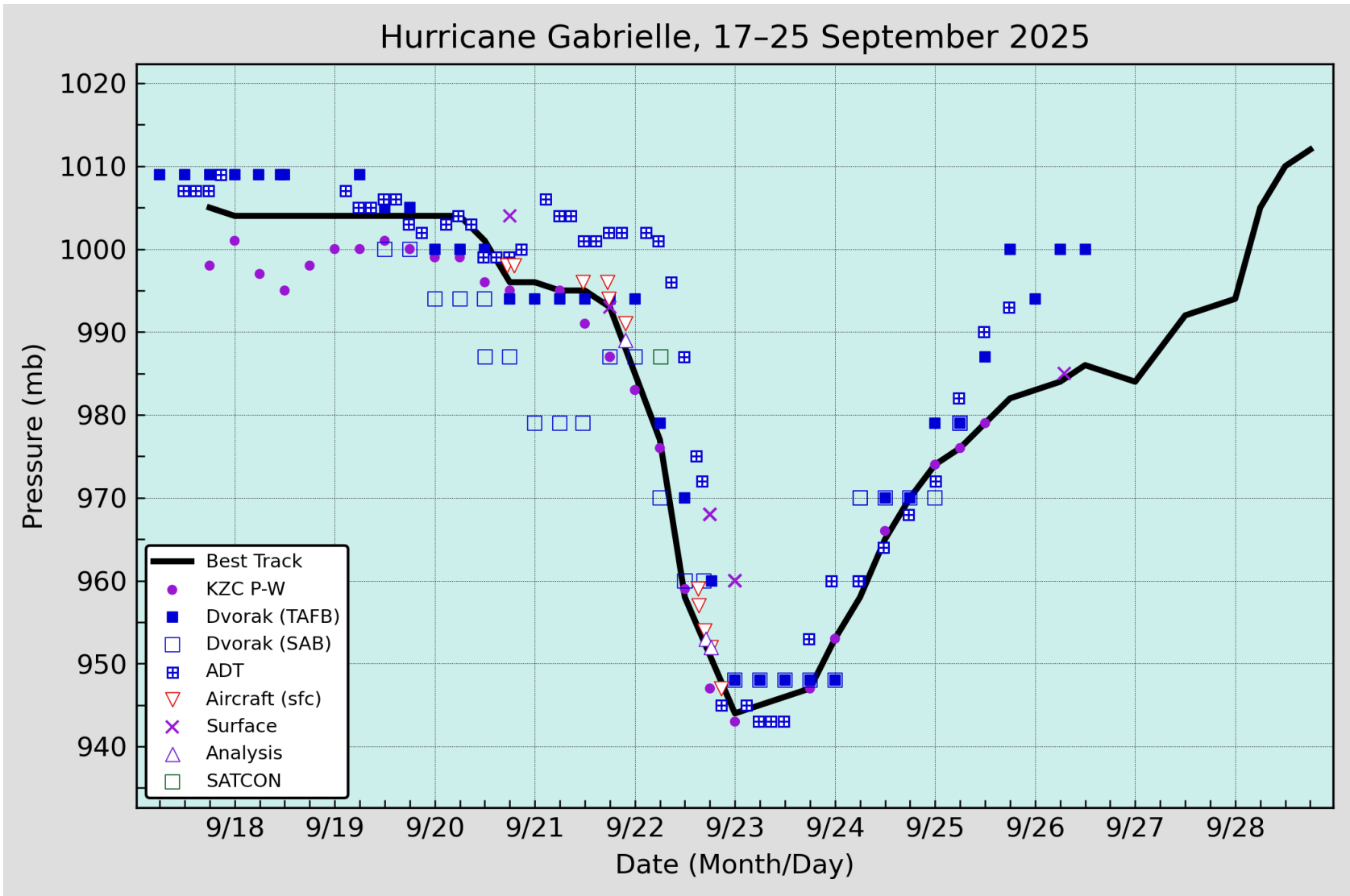


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Gabrielle, 17–25 September 2025. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for 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.

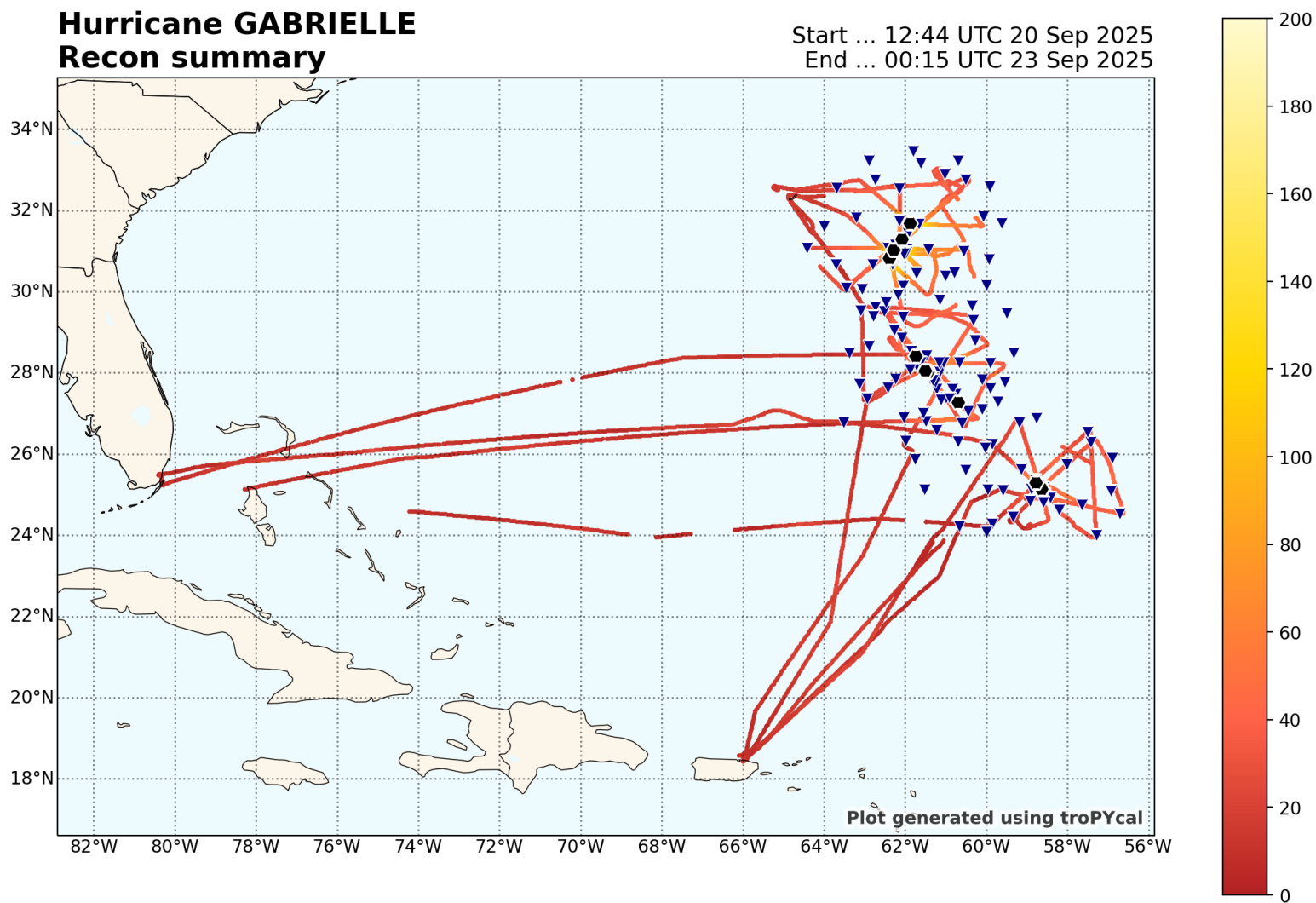


Figure 4. Air Force Reserve and NOAA aircraft flight tracks (colored lines) from reconnaissance missions into Gabrielle from 20—23 September 2025. The blue triangles indicate dropsonde locations. The color of the flight track represents the observed flight-level wind speed in knots at that location (see legend).

### Gabrielle 7-day Tropical Weather Outlook Areas

From: 1800 UTC 10 Sep 2025 to 1800 UTC 17 Sep 2025

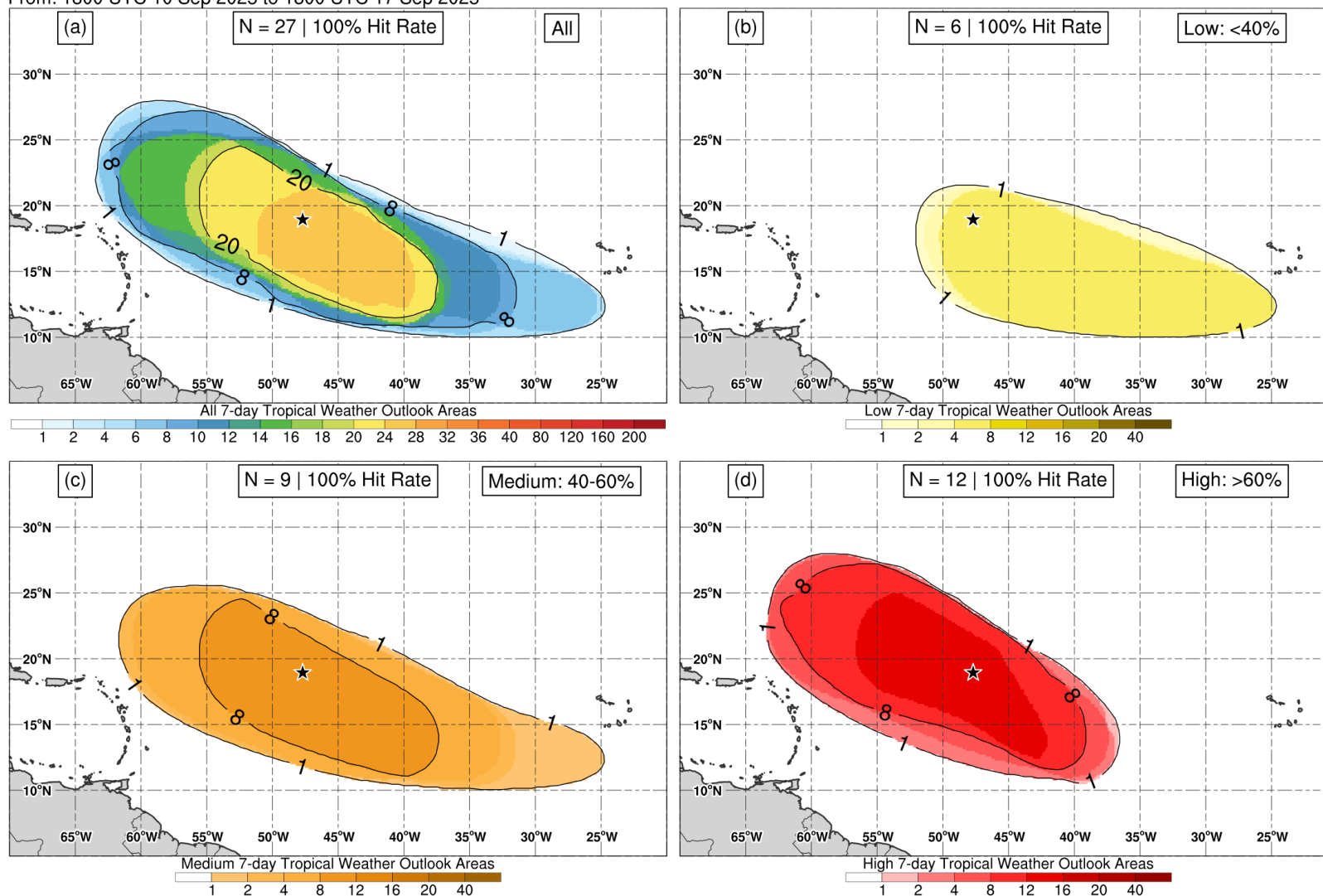


Figure 5. Composites of 7-day tropical cyclone genesis areas depicted in NHC’s Tropical Weather Outlooks prior to the formation of Gabrielle for (a) all probabilistic genesis categories, (b) the low (<40%) category, (c) medium (40–60%) category, and (d) high (>60%) category. The location of genesis is indicated by the black star.