NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

TROPICAL STORM BARRY

(AL022025)

28–30 June 2025

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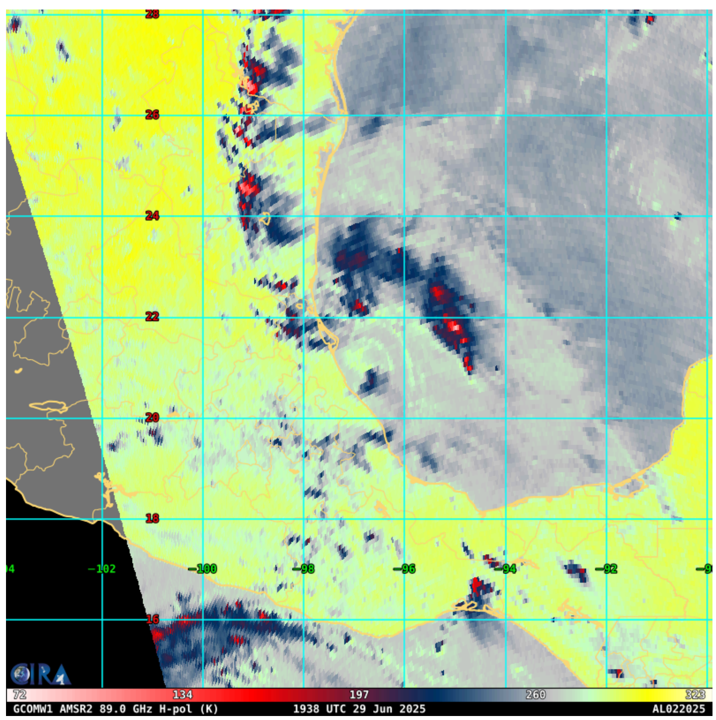

AMSR2 MICROWAVE IMAGE OF TROPICAL STORM BARRY AT 1938 UTC 29 JUNE JUST BEFORE LANDFALL IN MEXICO.

Barry was a short-lived tropical storm that formed over the Bay of Campeche and caused widespread flooding in eastern Mexico resulting in 8 direct fatalities in that country.

Tropical Storm Barry

28–30 JUNE 2025

SYNOPTIC HISTORY

The origins of Barry are somewhat unclear, but one contributing feature was the northern portion of a tropical wave that reached the Yucatan Peninsula on the morning of 26 June. A broad area of low pressure formed over the Peninsula and emerged over the Bay of Campeche the morning of 28 June. While deep convection gradually grew through the day, hurricane reconnaissance aircraft and scatterometer data revealed that a closed circulation had formed by that afternoon, marking the formation of a 25-kt tropical depression about 115 n mi east of Veracruz, Mexico, by 1800 UTC 28 June. Despite moderate-to-strong westerly vertical wind shear, warm sea surface temperatures and a moist environment were sufficient for Barry to strengthen to a tropical storm by the morning of 29 June as indicated by Air Force Reserve Hurricane Hunter aircraft flight-level and dropsonde observations. The "best track" chart of Barry'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[1].

The tropical storm reached a peak intensity of 40 kt by 1800 UTC 29 June before vertical wind shear began to strip away deep convection from the system and expose the low-level circulation. It is estimated that Barry made landfall at 0200 UTC 30 June as a 30-kt tropical depression about 15 n mi south of Tampico in the Mexican state of Veracruz. Barry's shallow circulation continued westward inland and dissipated over the mountainous terrain of eastern Mexico by 1200 UTC 30 June.

METEOROLOGICAL STATISTICS

Observations in Barry (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 and dropwindsonde observations from three flights of the 53rd Weather Reconnaissance Squadron of the U.S. Air Force Reserve Command (Fig. 4). Data and imagery from NOAA polar-orbiting satellites including the Advanced Microwave Sounding Unit (AMSU), the NASA Global

[1] 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.

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 Barry.

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

Winds and Pressure

Barry's peak intensity of 40 kt at 1800 UTC 29 June is based on a combination of aircraft observations and objective satellite intensity estimates. The third Air Force Reserve reconnaissance flight reported an 850-mb peak wind of 51 kt at 1648 UTC (corresponding to a 40-kt surface-reduced wind speed). In addition, objective ADT satellite estimates near the time of peak intensity ranged between T2.9/43 kt to T2.8/41 kt and SATCON had estimates of 40 to 42 kt. The minimum central pressure of 1006 mb is based on a dropwindsonde that measured a pressure of 1008 mb with 18-kt winds at 1430 UTC.

Barry made landfall in a data sparse region of the state of Veracruz south of Tampico. Data from a Mexican Naval automated station (ILOV4) located on Lobos Island indicated a wind shift accompanied by a minimum pressure of 1008.5 mb at 2230 UTC. This is the basis for the estimated landfall pressure of 1009 mb. This increase in the minimum central pressure from the aircraft observation from earlier in the day, as well as the degraded representation on both the satellite and radar imagery (Fig. 5), is the basis for the reduction in intensity to 30 kt at landfall.

Rainfall and Flooding

Barry produced more than five inches (~125 mm) of rain across large portions of the Mexican states of Tamaulipas and Veracruz during the period from 29 June to 1 July (Fig. 6). The states of San Luis Potosí, Puebla and Oaxaca also received isolated rainfall totals of up to five inches (~125 mm). The highest rainfall amounts reported were 17.99 inches (457 mm) at San Gabriel, Tamaulipas; 14.65 inches (372.0 mm) at Angel Rosario Cabada, Veracruz; and 11.63 inches (295.5 mm) at Sabinas, Tamaulipas. These rains caused flooding and mudslides across portions of eastern and southeastern Mexico.

Barry and its remnants were not the primary cause of the devastating floods that occurred in the central Texas Hill Country on 4–5 July. Synoptic-scale flow drew deep tropical moisture spanning from the east Pacific Ocean to the Caribbean (Fig. 7) into the south central United States in early July. A link to additional information on that flooding event from the National Weather Service Weather Forecast Office in Austin/San Antonio, Texas, will be provided when it becomes available.

CASUALTY AND DAMAGE STATISTICS

Barry is responsible for at least 8 direct fatalities[2] in Mexico. Four individuals drowned in vehicles swept away by rainfall-induced inland flooding.[3] Of those victims, three were located in Santa María del Río and one in Ahualulco. Two people were swept away and perished in floodwaters of the Tampaón River[4] in Tamuín. Two others drowned in rough surf operating a vehicle close to a seawall in Veracruz.[5] No indirect deaths were reported.

Barry produced at least $5.64 million USD in damage in Mexico according to various Mexican state government statements[6,7,8]. Flooding from Barry's heavy rain was the primary cause of damage across the states of Tamaulipas, San Luis Potosí, Puebla and Veracruz.[9] Thousands of private residences and multiple schools were inundated, leading to the evacuation of communities and suspension of classes. Roads and highways were damaged or destroyed by overflowing rivers, streams, canals, and by landslides.

FORECAST AND WARNING CRITIQUE

Genesis

The genesis of Barry was not well anticipated (Table 2). The wave from which Barry developed was introduced in the Tropical Weather Outlook only 42 h prior to genesis. The 7-day and 2-day formation probabilities were raised to the medium category 12 h before formation. While the probabilities were raised to high category at 1800 UTC 28 June, the final best track shows that genesis had already occurred at that time. Although only a few outlooks were issued, the location of Barry's formation was well forecast (Fig. 8), with the genesis position located within all of the genesis forecast areas.

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[2] 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.

[3] https://sanluispotosi.quadratin.com.mx/san-luis-potosi/dejan-lluvias-saldo-fatal-e-inundaciones-en-san-luis-potosi/

[4] https://www.astrolabio.com.mx/inundaciones-deslaves-y-danos-deja-tormenta-tropical-barry-en-slp/

[5] https://www.nmas.com.mx/foro-tv/programas/expreso-la-manana/videos/barry-deja-dos-muertos-su-paso-veracruz/

[6] https://quintanaroo.quadratin.com.mx/estiman-en-35-millones-los-danos-por-lluvias-en-el-sur-de-quintana-roo/

[7] https://elefanteblanco.mx/2025/07/08/barry-deja-65-mdp-en-danos-carreteros-y-330-viviendas-afectadas/

[8] https://elcensal.com/tormenta-barry-deja-afectaciones-menores-sin-victimas-ni-danos-graves-proteccion-civil-veracruz-se-estima-un-costo-de-5-millones-de-pesos/

[9] https://lasillarota.com/estados/2025/6/30/remanentes-de-barry-provocan-estragos-en-slp-tamaulipas-puebla-543269.html

Track

A verification of NHC official track forecasts for Barry is given in Table 3a. Official track forecast errors were lower than the mean official errors for the previous 5-yr period for all forecast periods (12 through 36 hours), though the sample size is quite small. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. The European model (EMXI) had the lowest errors at 12 and 24 hours. However, these results should be viewed cautiously due to the small number of verifiable forecasts.

Intensity

A verification of NHC official intensity forecasts for Barry is given in Table 4a. Official intensity forecast errors were lower than the mean official errors for the previous 5-yr period for the 12 and 24 forecast hours. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 4b. It is again difficult to draw conclusions given the small sample size of verifiable forecasts.

Wind Watches and Warnings

Coastal wind watches and warnings associated with Barry are given in Table 5.

ACKNOWLEDGEMENTS

Thank you to Dr. Philippe Papin for the creation of the best track and genesis graphics.

Table 1. Best track for Tropical Storm Barry, 28–30 June 2025.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
28 / 1800	19.2	93.9	1011	25	tropical depression
29 / 0000	19.5	94.7	1011	25	"
29 / 0600	19.7	95.4	1010	30	"
29 / 1200	20.1	96.0	1008	35	tropical storm
29 / 1800	20.9	96.7	1006	40	"
30 / 0000	21.7	97.4	1008	35	"
30 / 0200	21.9	97.7	1009	30	tropical depression
30 / 0600	22.3	98.2	1009	25	"
30 / 1200					dissipated
29 / 1800	20.9	96.7	1006	40	maximum winds & minimum pressure
30 / 0200	21.9	97.7	1009	30	landfall in Veracruz, 20 n mi south-southeast of Tampico

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%)	42	42
Medium (40%-60%)	12	12
High (>60%)	0	0

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Barry, 28–30 June 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	**21.3**	**34.1**	**36.7**					
OCD5	28.7	62.8	88.5					
Forecasts	5	3	1					
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 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Barry, 28–30 June 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 3a due to the homogeneity requirement.

Model ID	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	20.5	34.1	36.7					
OCD5	29.6	62.8	88.5					
GFSI	24.1	48.4	63.2					
HWFI	26.1	36.0	39.3					
HMNI	21.3	43.7	58.4					
HFBI	39.3	54.4	**16.4**					
EMXI	**17.0**	**20.6**	**30.0**					
NVGI	**18.9**	39.3	47.9					
CMCI	23.3	**26.2**	55.8					
HCCA	21.8	**29.5**	**6.0**					
TVCA	25.4	**31.7**	**20.5**					
TVCX	24.2	**30.8**	**24.5**					
GFEX	**20.3**	**31.6**	40.9					
TVDG	25.8	**31.6**	**28.6**					
TABD	27.1	35.4	50.5					
TABM	38.4	58.7	93.4					
TABS	45.6	81.0	117.8					
Forecasts	4	3	1					

Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Barry, 28–30 June 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	**4.0**	**3.3**	10.0					
OCD5	8.8	3.3	4.0					
Forecasts	5	3	1					
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 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Barry, 28–30 June 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	4.0	5.0	10.0					
OCD5	8.8	7.0	**3.0**					
HWFI	7.8	7.0	**9.0**					
HMNI	9.2	11.0	10.0					
HFAI	8.4	**4.0**	**8.0**					
HFBI	6.0	7.0	**9.0**					
DSHP	7.6	14.0	**2.0**					
LGEM	9.6	16.0	**1.0**					
ICON	8.0	12.0	**6.0**					
IVCN	7.0	9.0	**7.0**					
IVDR	6.8	8.0	**8.0**					
GFSI	7.8	8.0	**9.0**					
EMXI	7.4	12.0	**1.0**					
HCCA	7.2	7.0	10.0					
Forecasts	5	1	1					

Table 5. Watch and warning summary for Tropical Storm Barry, 28–30 June 2025.

Date/Time (UTC)	Action	Location
28/ 2100	Tropical Storm Warning Issued	Eastern coast of Mexico from Boca de Catan southward to Tecolutla
02/ 0900	Tropical Storm Warning discontinued	All of Mexico

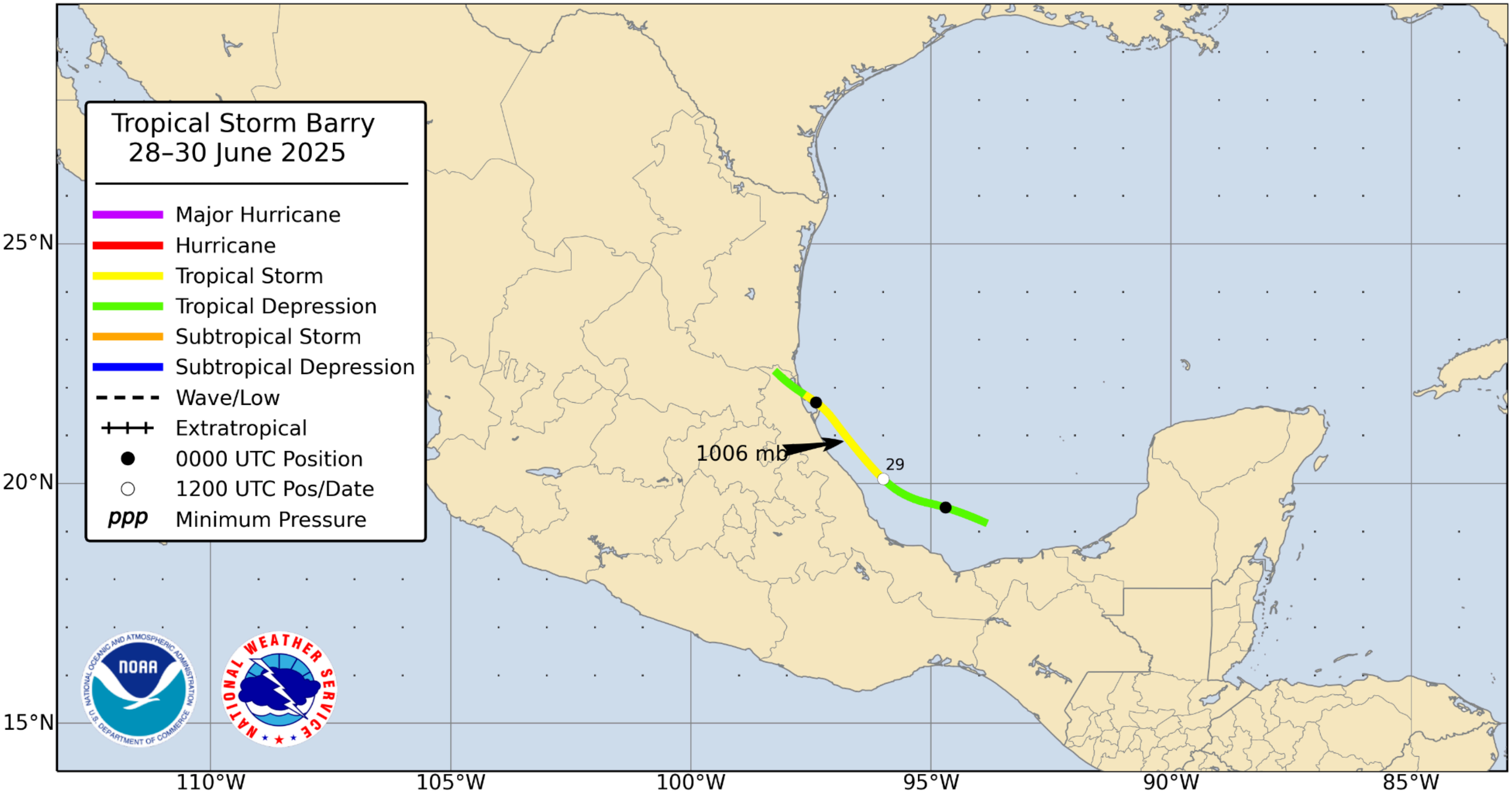

Figure 1. Best track positions for Tropical Storm Barry, 28–30 June 2025.

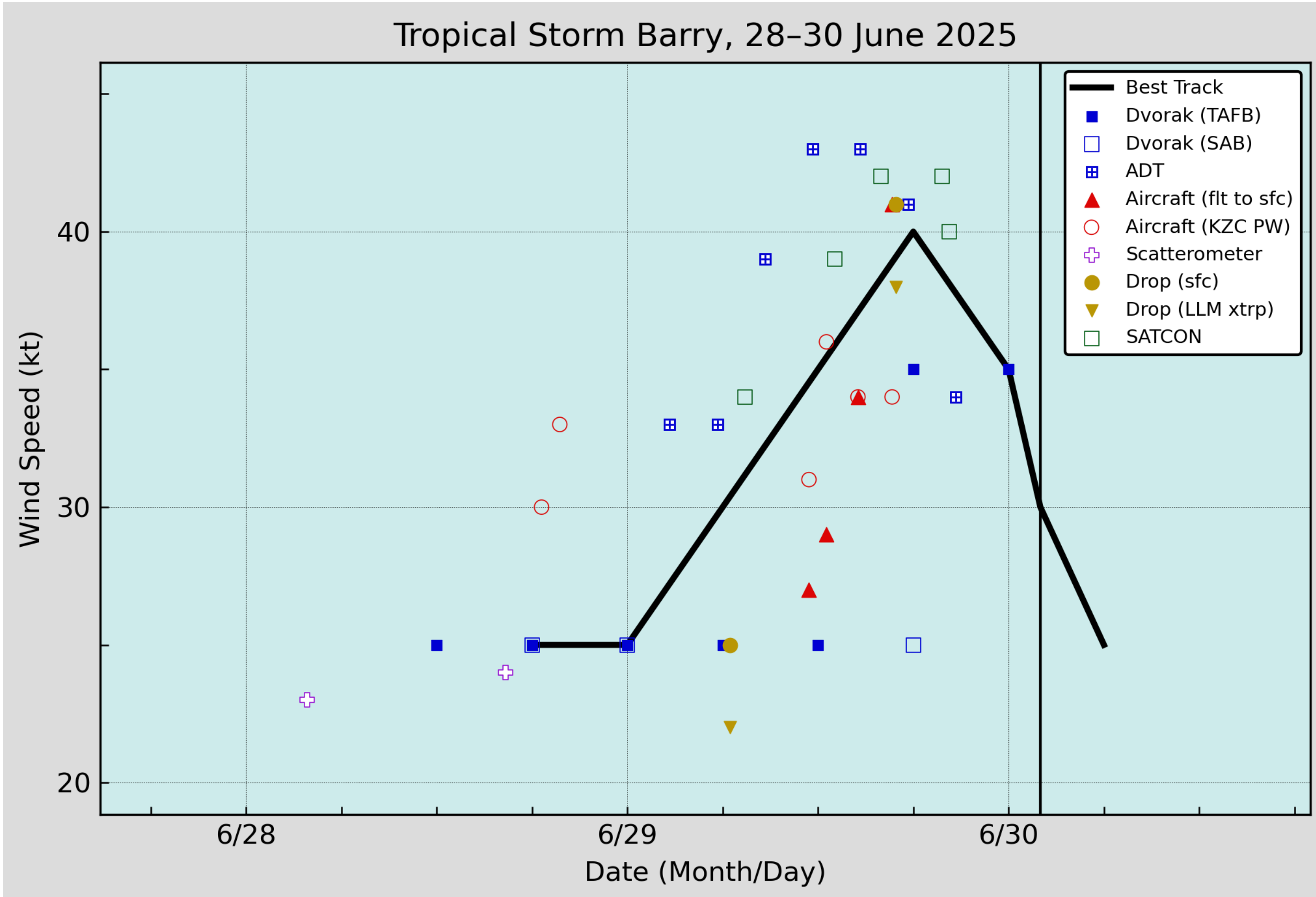

Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Barry, 28–30 June 2025. Aircraft observations have been adjusted for elevation using 90%, 80%, and 75% adjustment factors for observations from 700 mb, 850 mb, and 925 mb, respectively. Dropwindsonde 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, and the solid vertical line corresponds to landfall.

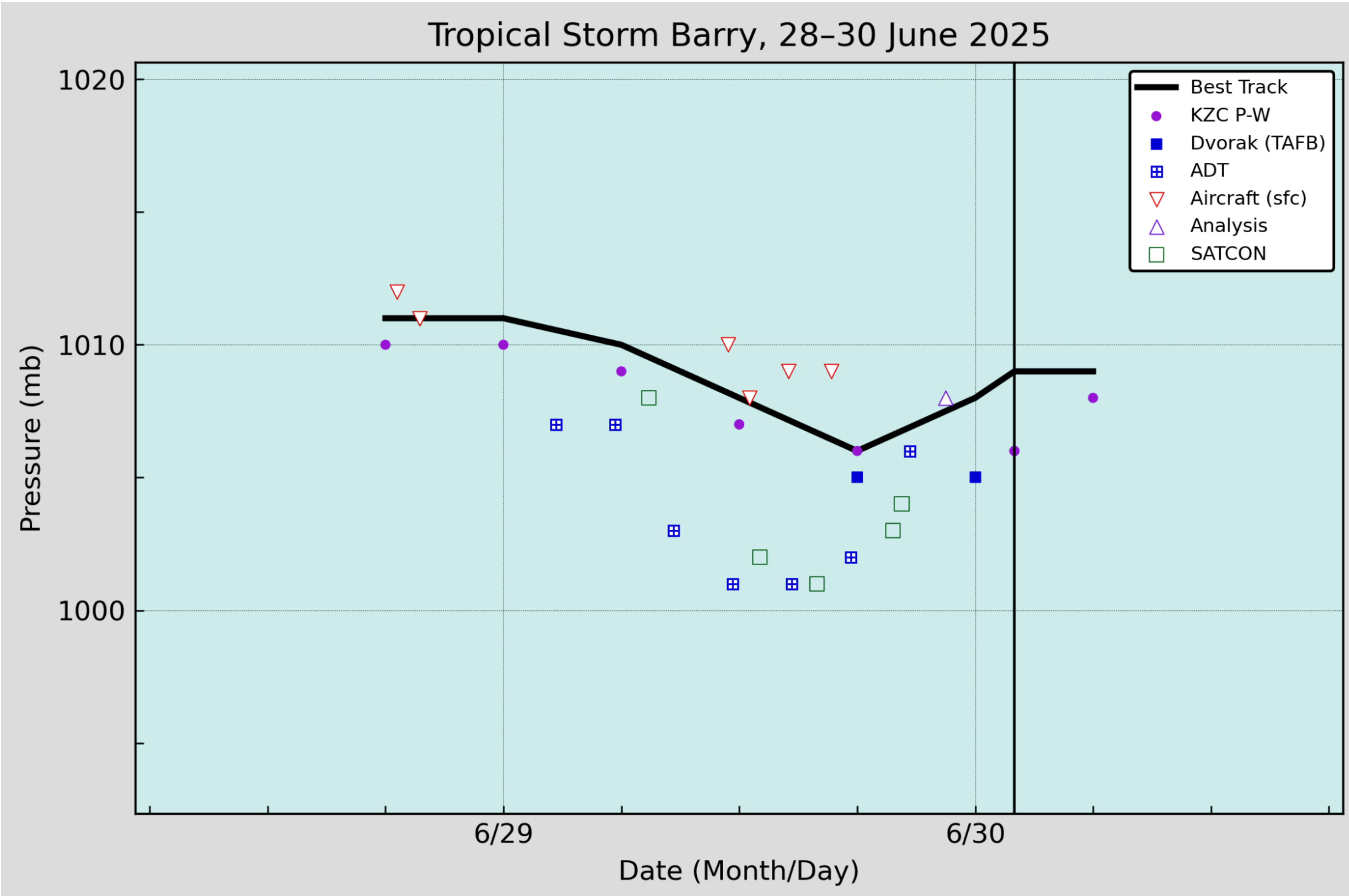

Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Barry, 28–30 June 2025. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological 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, and the solid vertical line corresponds to landfall.

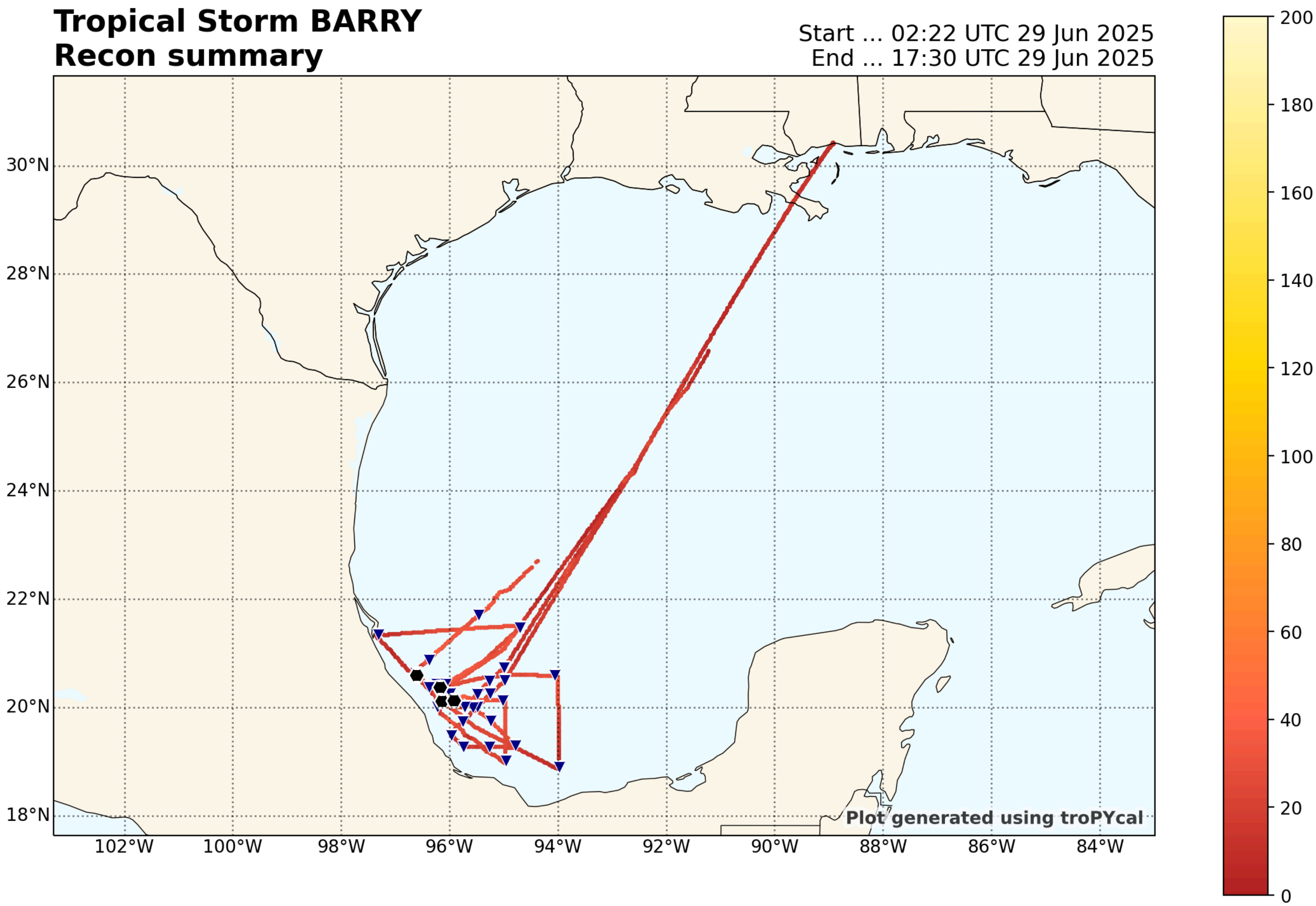

Figure 4. Air Force Reserve aircraft flight tracks (colored lines) from reconnaissance missions into Barry from 29 June 2025 (invest mission from 28 June not plotted). The blue triangles indicate dropsonde locations. The color of the flight track represents the observed flight-level wind speed in knots at that location (see legend).

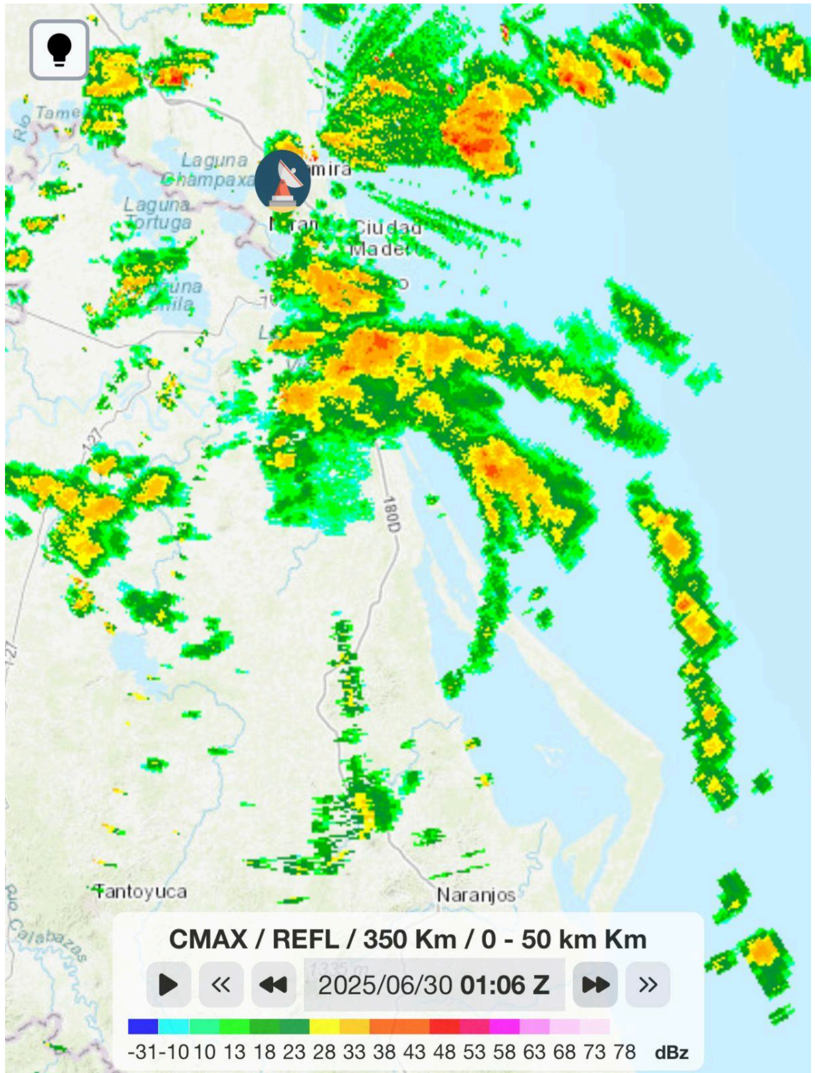

Figure 5. Image of the composite reflectivity from the radar located in Altamira, Mexico, at 0106 UTC on 30 June 2025.

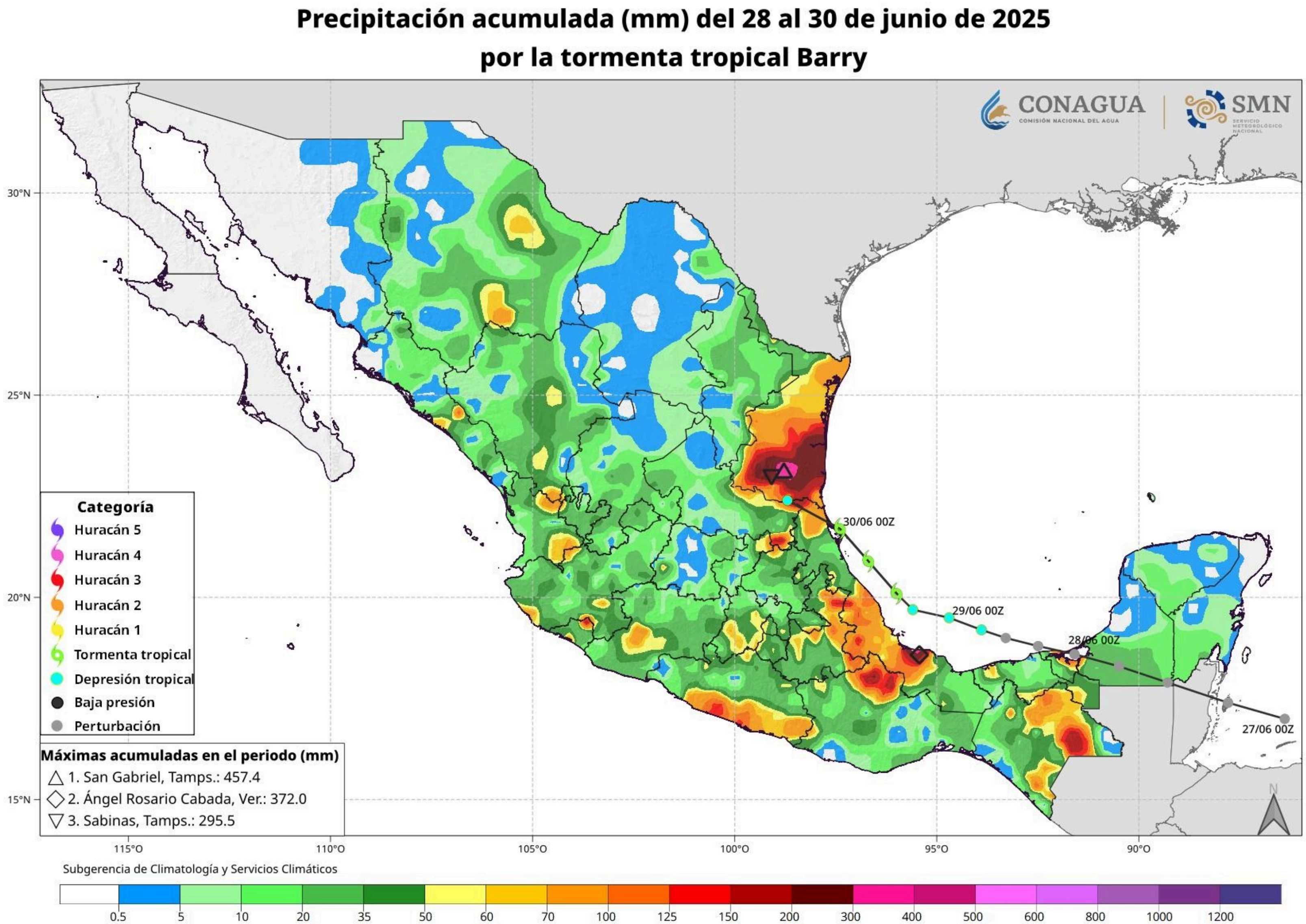

Figure 6. Rainfall totals for Tropical Storm Barry in Mexico. Figure courtesy of CONAGUA. Note that not all of the rainfall shown was associated with Barry. The track is based on the NHC operational assessments.

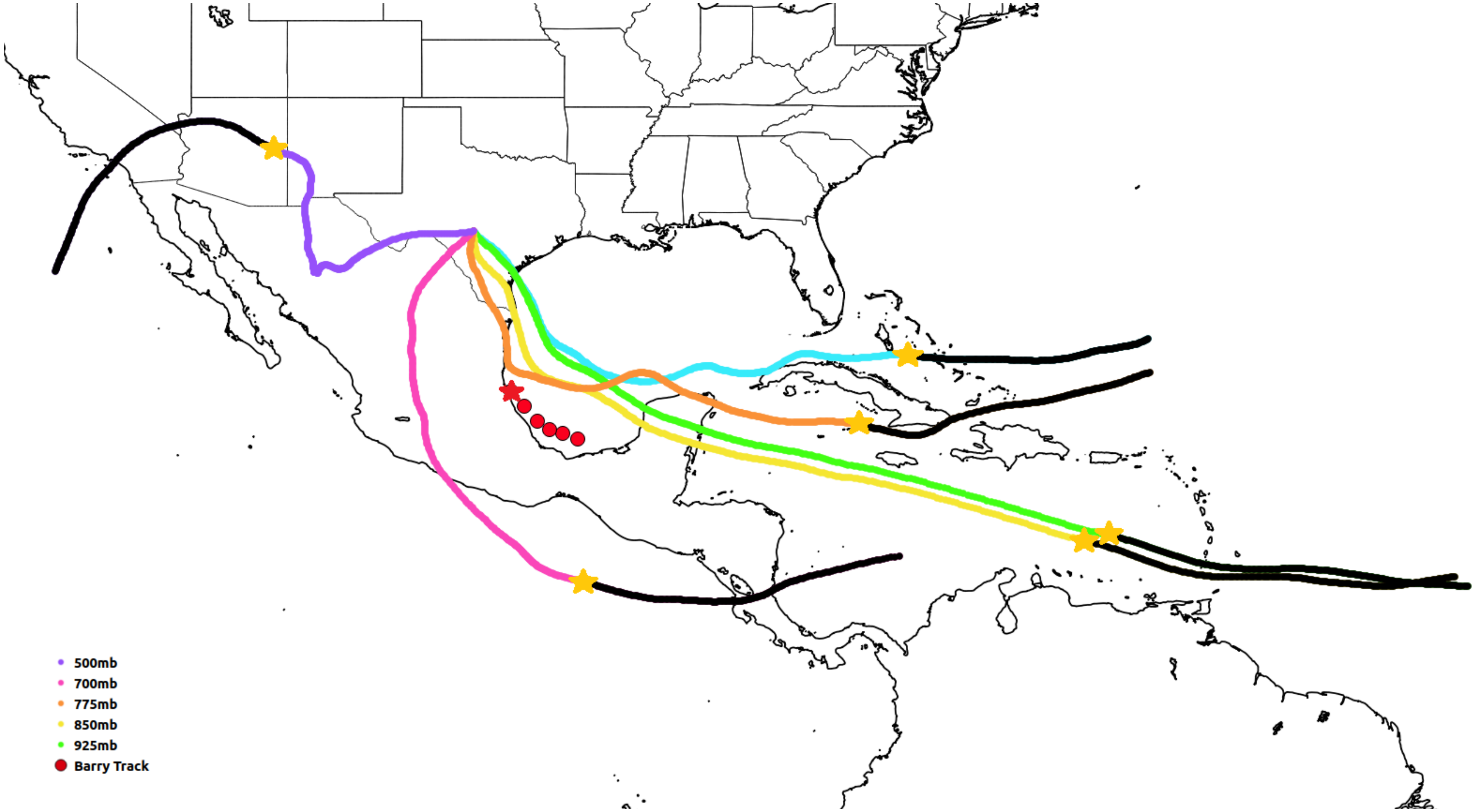

Figure 7. 6.5-day backward trajectories based on 1-hourly output from the GFS model (analyses and forecast hours 1–5) initiated over the Texas torrential rainfall event on 4 July 2025. Parcels were seeded through the low- to mid-levels of the atmosphere (1000–500 mb). Best track positions for Barry are included (red dots). Gold stars indicate locations of parcels at 00 UTC 30 June 2025, around the time of Barry's landfall in Mexico (red star).

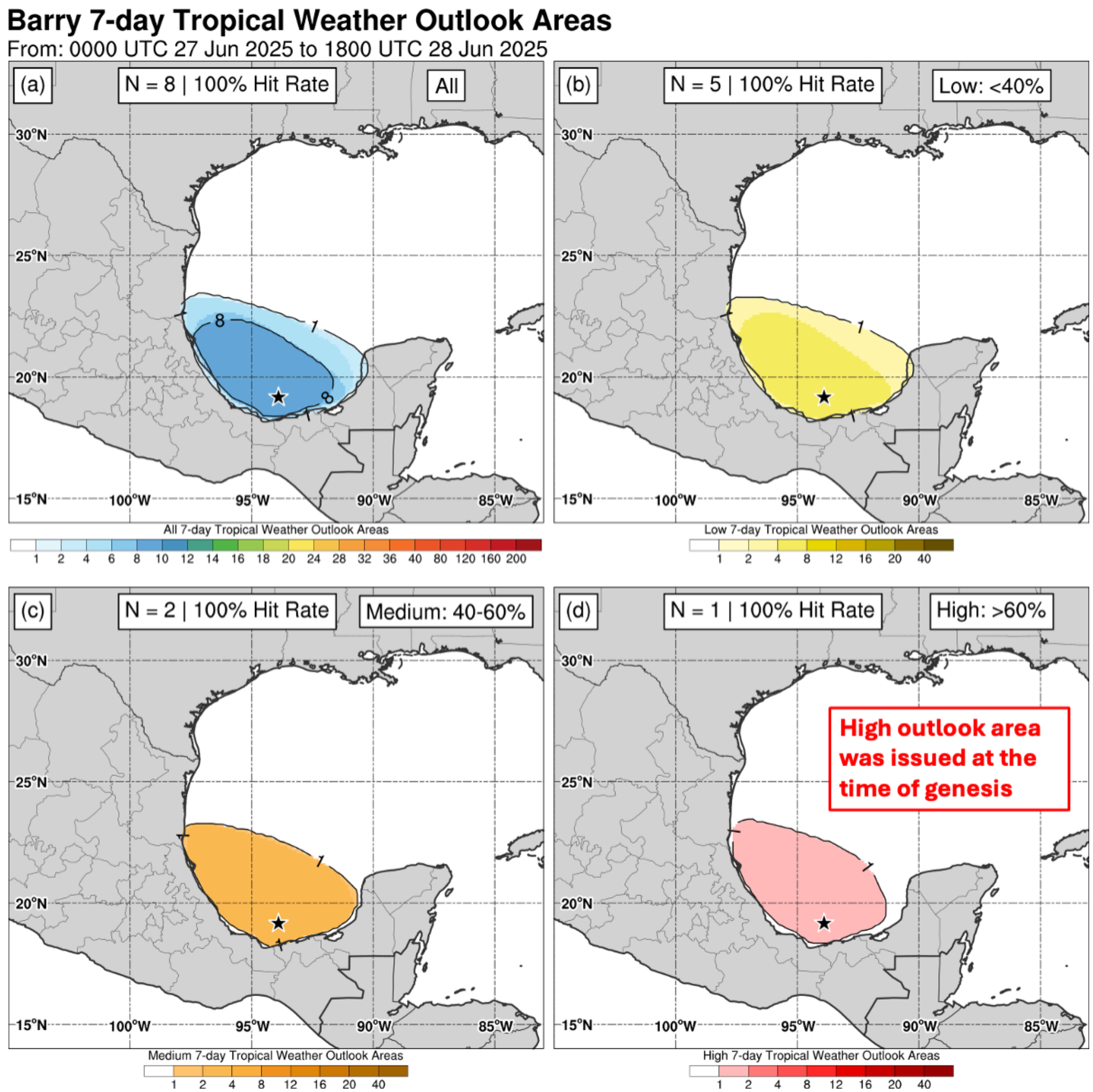

Figure 8. Composites of 7-day tropical cyclone genesis areas depicted in NHC's Tropical Weather Outlooks prior to the formation of Tropical Storm Barry for (a) all probabilistic genesis categories, (b) the low (<40%) category, (c) medium (40–60%) category, and (d) high (>60%) category. The location of genesis is indicated by the black star.