

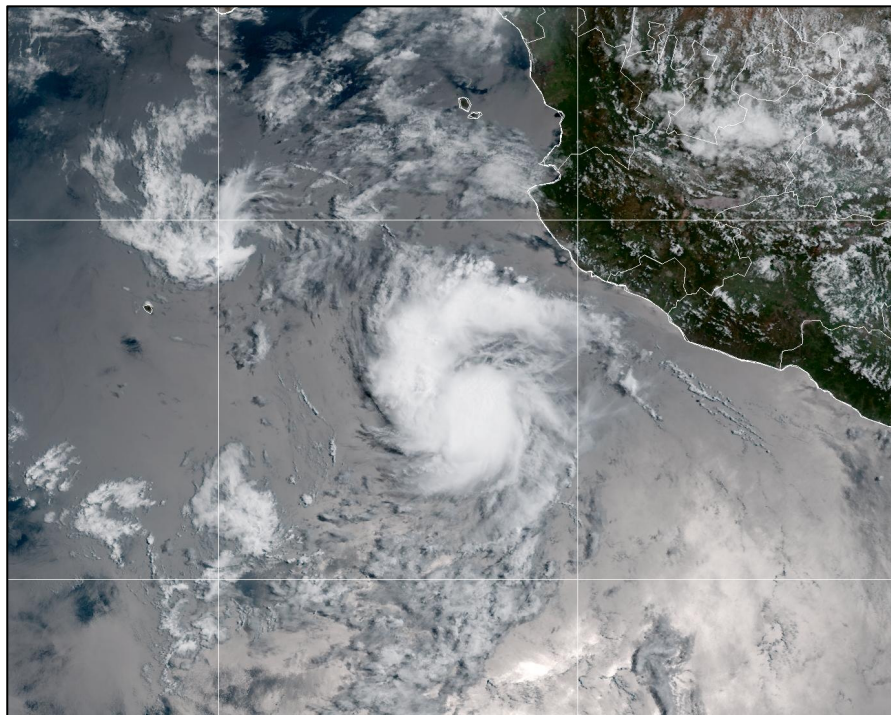


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT¹

TROPICAL STORM ALETTA (EP012024)

4–5 July 2024

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National Hurricane Center
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GOES-WEST GEOCOLOR IMAGE OF TROPICAL STORM ALETTA NEAR PEAK INTENSITY AT 1620 UTC 4 JULY 2024.
IMAGE COURTESY OF NOAA/NESDIS/STAR

Aletta was a small, short-lived tropical storm that formed in the eastern Pacific basin offshore of southwestern Mexico and did not directly impact land. Aletta was the latest first named storm in the eastern Pacific basin since the beginning of the satellite era in 1966.

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 Aletta.

Tropical Storm Aletta

4–5 JULY 2024

BEST TRACK

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

Origin

Aletta’s origins were likely related to the same tropical wave that led to the formation of Tropical Storm Chris in the Gulf of Mexico. As this wave approached Central America on 27–28 June, its southern portion began to interact with a pre-existing monsoon trough in the far eastern Pacific. The combined feature gradually lifted northwestward over the next few days, and after Chris dissipated over Mexico on 1 July, shower and thunderstorm activity became more persistent over the eastern Pacific waters around 105°W. On the afternoon of 3 July, continued deep convection led to the formation of an area of low pressure that began to move northward. That night, the convection associated with the low became sufficiently organized to mark the formation of a tropical depression at 0600 UTC 4 July, about 200 n mi south of Manzanillo, Mexico.

Peak Intensity and Minimum Pressure

Aletta’s peak intensity of 35 kt from 1200 UTC 4 July to 0000 UTC 5 July is supported by a combination of subjective and objective satellite data. On 4 July, SATCON intensity estimates starting at 1500 UTC oscillated between 34–36 kt that day, and SAB provided a Dvorak fix of T2.5/35 kt at 0000 UTC 5 July. While not used directly for Aletta’s peak intensity, an RCM-1 Synthetic Aperture Radar (SAR) pass at 1256 UTC 4 July (Fig. 4) depicted Aletta’s tropical-storm-force wind field with a small radius of maximum winds (~15 n mi). It is worth noting that SAR wind data is still being evaluated for their utility in estimating the peak winds and structure in tropical cyclones. The estimated minimum central pressure of 1005 mb is based on the Knaff-Zehr-Courtney (KZC) 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 Aletta.

CASUALTY AND DAMAGE STATISTICS

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

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 5 shows composites of 7-day TWO genesis areas for each category prior to the formation of Aletta. The system that became Aletta was first mentioned in the TWO 108 hours prior to genesis with a low chance (<40%) of development within 7 days. The 7-day formation probabilities were raised to the medium category (40–60%) 96 hours before development. While the 2-day formation probabilities were introduced as a low and medium chance 60 and 36 hours before development, respectively, neither the 2-day nor 7-day probabilities entered the high category before Aletta became a tropical cyclone. A challenging aspect of the formation of Aletta was how small the cyclone was, and the global model guidance struggled to properly depict the system in the days leading up to and even after its formation. Regardless, all the issued 7-day TWO areas correctly captured the tropical cyclone's genesis location (Fig. 5).

Aletta is notable for being the latest (1200 UTC 4 July) first named storm in the eastern Pacific basin since reliable satellite records began (1966–onward), becoming a tropical storm later in the calendar year than Ava (0000 UTC 3 July 1969) and Agatha (1800 UTC 2 July 2016).

A verification of NHC official track forecasts for Aletta is given in Table 3. Official track forecast errors were greater than the mean official errors for the previous 5-yr period for a small number of forecasts at 12 and 24 h. A verification of NHC official intensity forecasts for Aletta is given in Table 4. Official intensity forecast errors were lower than the mean official errors for the previous 5-yr period for a small number of forecasts at 12 and 24 h. A homogeneous comparison of the official track and intensity errors with selected guidance models is not shown due to the small sample size of forecasts.

There were no coastal watches or warnings issued for Aletta.



Table 1. Best track for Tropical Storm Aletta, 4–5 July 2024.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
03 / 1800	14.5	104.3	1008	25	low
04 / 0000	15.4	104.4	1008	25	"
04 / 0600	16.3	104.8	1007	30	tropical depression
04 / 1200	17.1	105.6	1005	35	tropical storm
04 / 1800	17.7	106.6	1005	35	"
05 / 0000	18.3	107.6	1005	35	"
05 / 0600	18.7	108.4	1006	30	tropical depression
05 / 1200	18.8	109.3	1006	30	"
05 / 1800	18.7	110.2	1007	25	"
06 / 0000	18.5	111.1	1007	20	low
06 / 0600	18.4	111.8	1008	20	"
06 / 1200	18.3	112.4	1009	20	"
06 / 1800	18.1	113.0	1009	20	"
07 / 0000					dissipated
04 / 1200	17.1	105.6	1005	35	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%)	60	108
Medium (40%-60%)	36	96
High (>60%)	-	-



Table 3. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Aletta, 4–5 July 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	28.2	58.7						
OCD5	54.1	92.4						
Forecasts	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 4. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Aletta, 4–5 July 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	2.5	5.0						
OCD5	5.2	12.5						
Forecasts	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

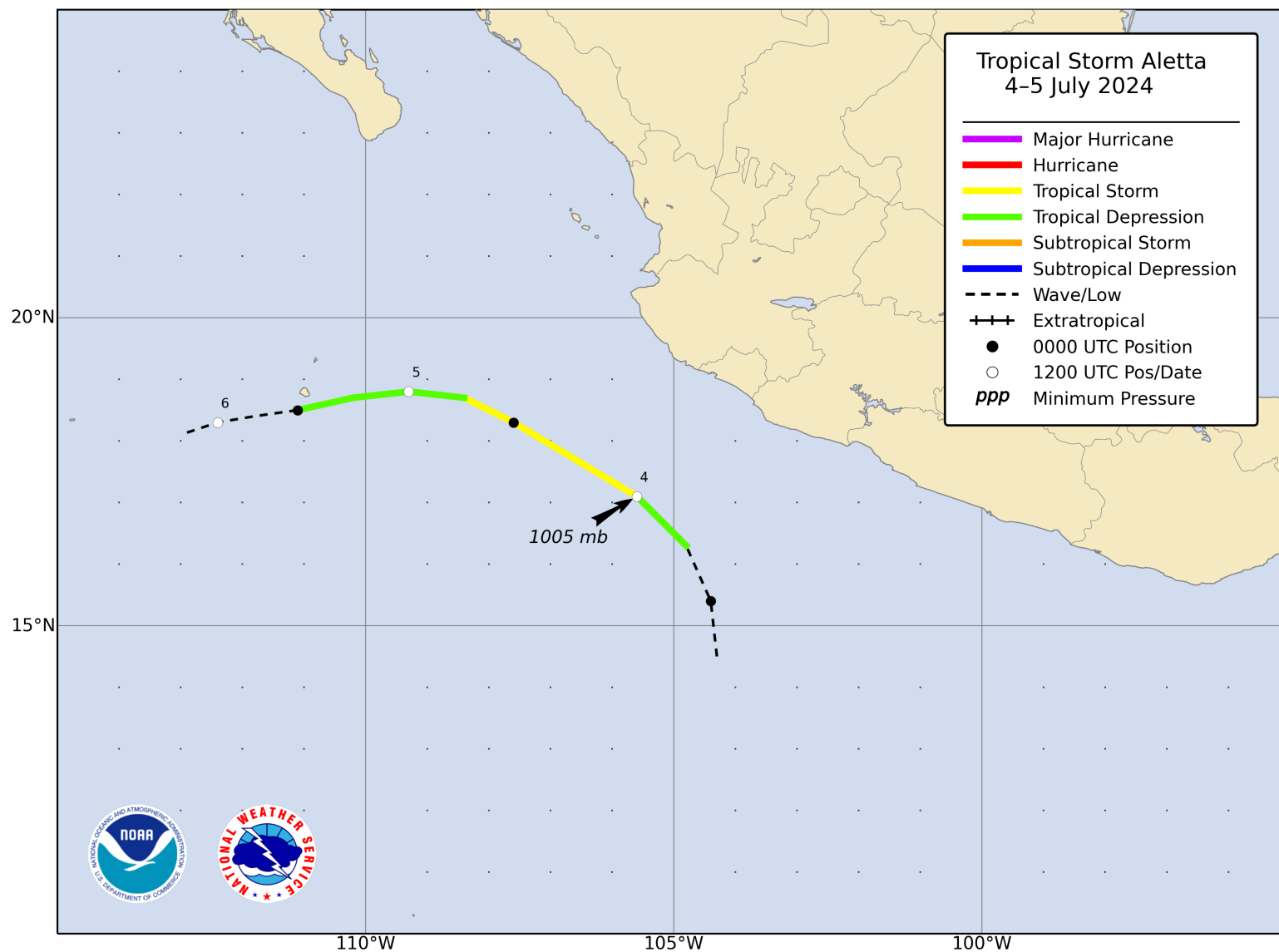


Figure 1. Best track positions for Tropical Storm Aletta, 4-5 July 2024.

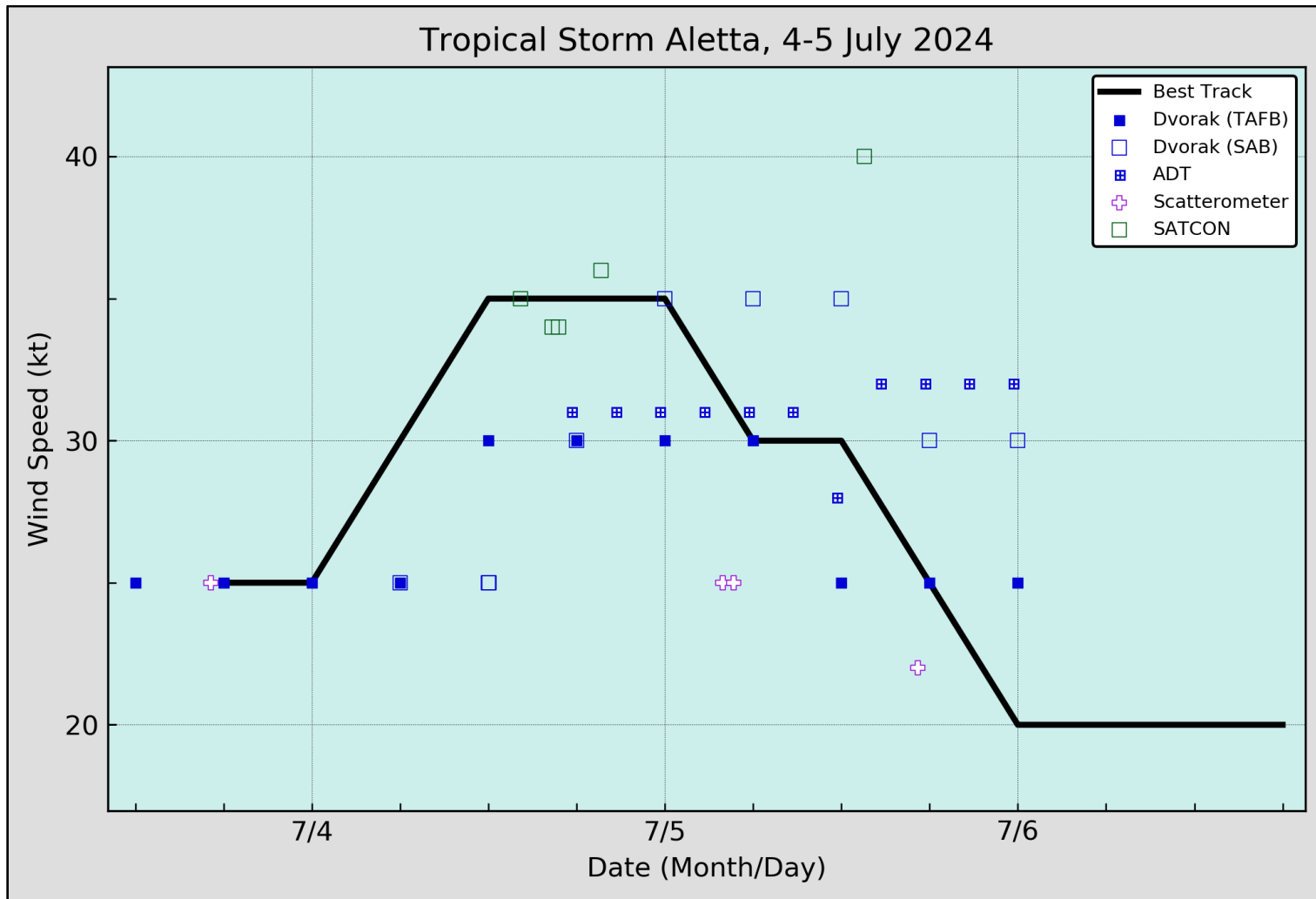


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Aletta, 4–5 July 2024. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

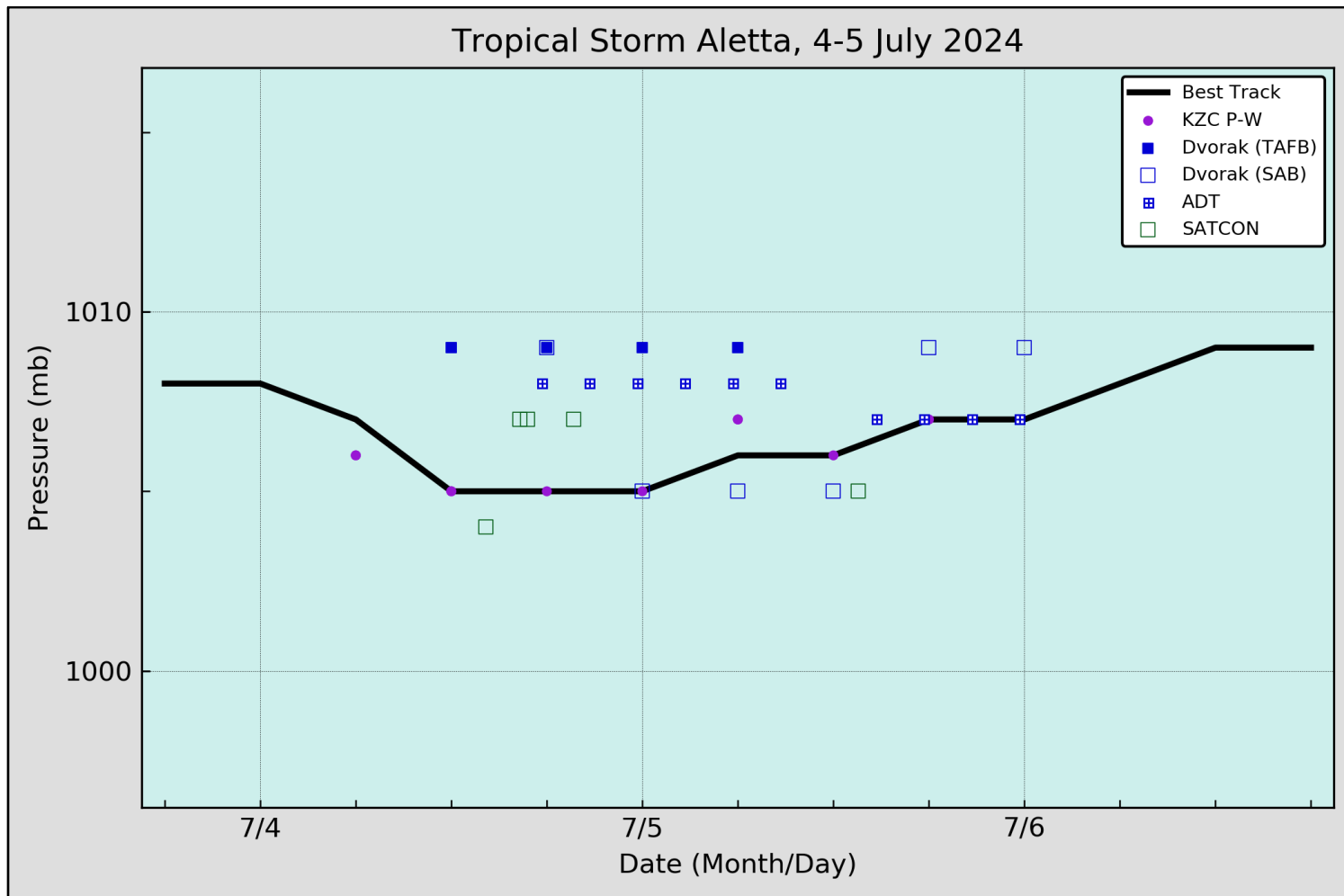


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Aletta, 4–5 July 2024. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological 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.

RCM-1 SAR 3 km Imagery Valid at 1256 UTC 4 Jul 2024

Peak Wind: 46 kt at 17.51°N, 105.94°W

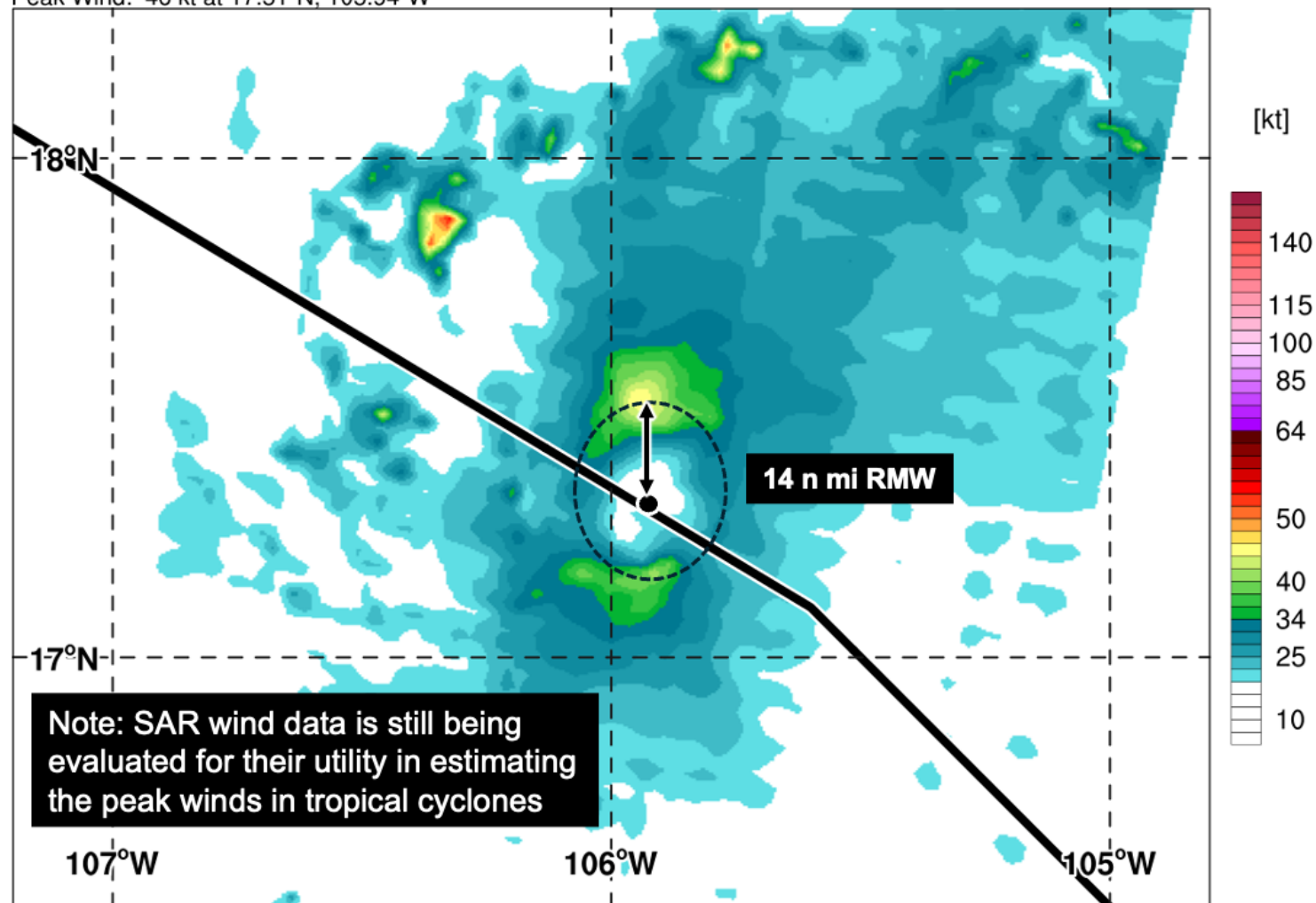


Figure 4. Synthetic Aperture Radar wind speed data at 3-km resolution (shaded, kt) of Aletta from RCM-1 at 1256 UTC 4 July 2024. Annotated on the plot is the best track of Aletta (thick black line), and the estimated radius of maximum winds (RMW, thin dotted line and arrows) based on the peak wind observed from the instrument, though note the disclaimer on the image. Data used to create this image is courtesy of NOAA/NESDIS/STAR.

Aletta 7-day Tropical Weather Outlook Areas

From: 1800 UTC 29 Jun 2024 to 0600 UTC 4 Jul 2024

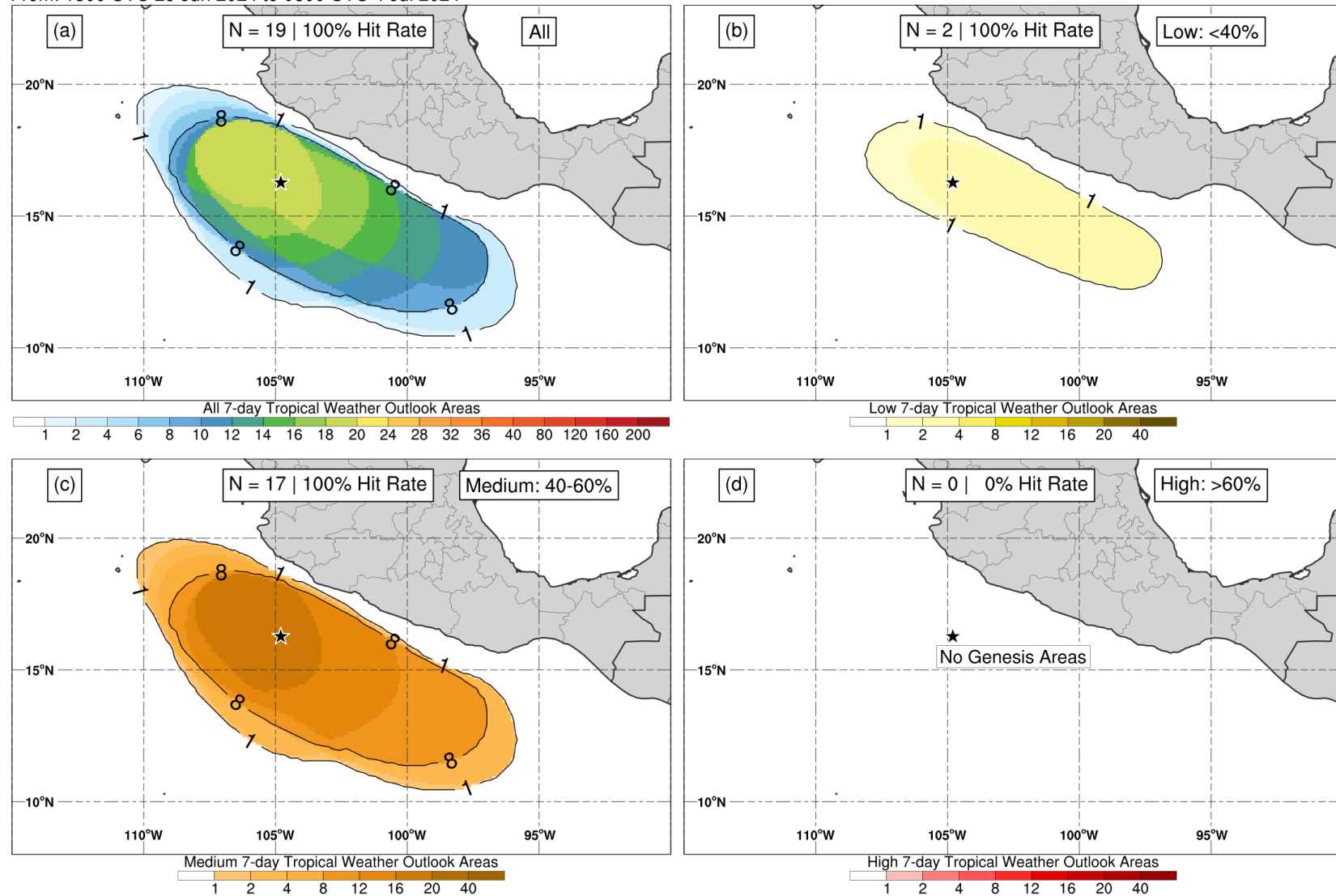


Figure 5. Composites of 7-day tropical cyclone genesis areas depicted in NHC’s Tropical Weather Outlooks prior to the formation of Aletta for (a) all probabilistic genesis categories, (b) the low (<40%) category, (c) medium (40–60%) category, and (d) high (>60%) category. The location of genesis is indicated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