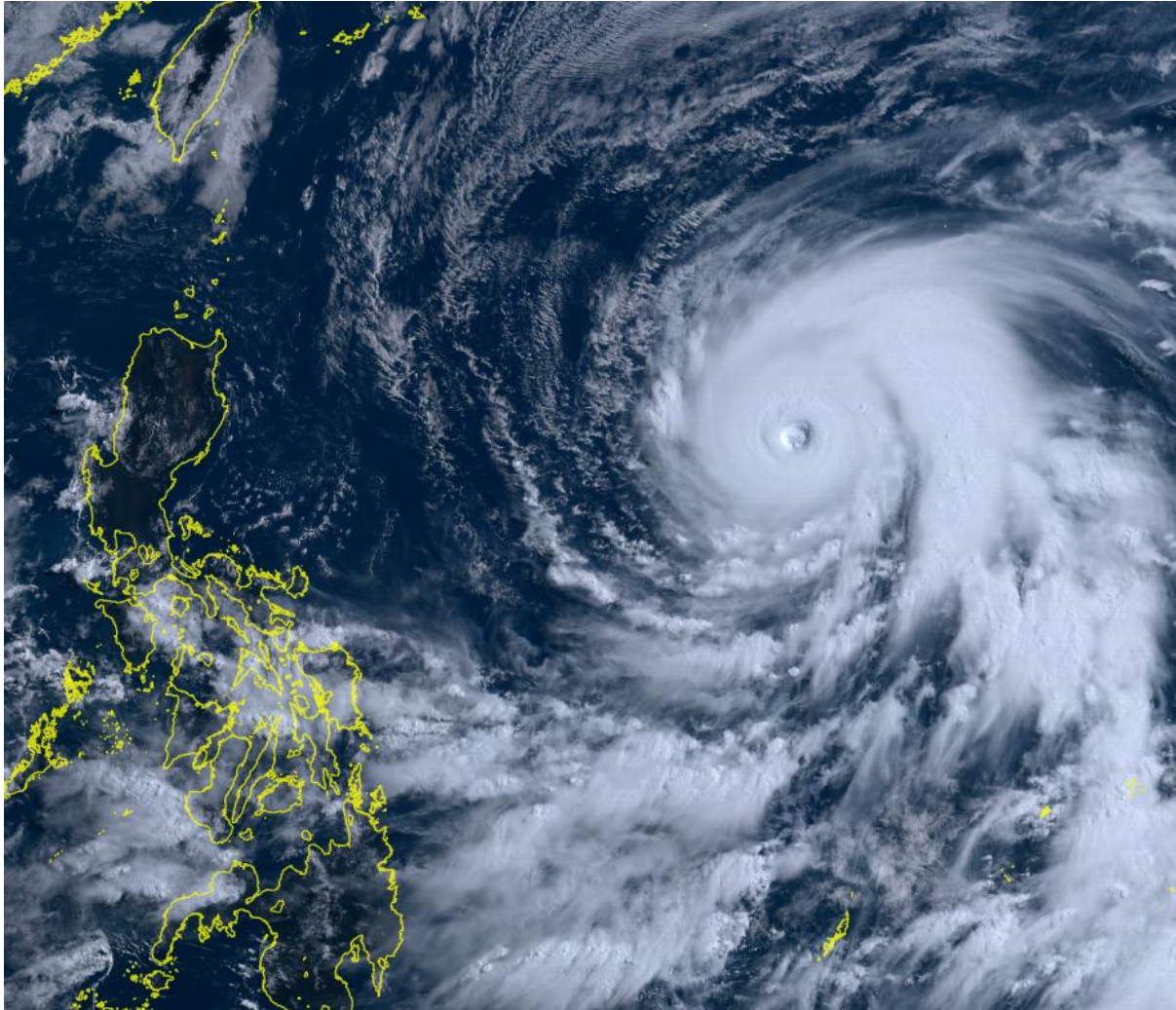




## TROPICAL CYCLONE PRELIMINARY REPORT Super Typhoon Betty (Mawar)



**Fig. 1.** Himawari-9 AHI visible image of Super Typhoon Betty at 00 UTC on 27 May 2023. Imagery courtesy of National Institute of Information and Communications Technology (NICT), Japan.

**R. P. Gile, J. E. M. Bulquerin, and S. F. Duran**

*Tropical Cyclone Group, Marine Meteorological Services Section, Weather Division, DOST-PAGASA*

*Date Published: 3 July 2023*

*Updated: 14 October 2023*

**Disclaimer:** The information herein is based on publicly-issued bulletins, advisories, and warnings and the result of the near-real time (initial) best track analysis. As such, the information provided herein are considered preliminary only and will be replaced by the information that will become available once the Annual Report on Philippine Tropical Cyclones (2023 Edition) is published.

*"The Weather and Climate Authority"*



## Summary of Meteorological History

Based on PAGASA preliminary best track position and intensities

First tracked as a disturbance	0600 UTC, 17 May 2023 Over the sea west of Yap, Federated States of Micronesia
Developed into a tropical cyclone	1200 UTC, 19 May 2023 Over the sea south of Chuuk, Federated States of Micronesia
Transitioned into a post-tropical low	0600 UTC, 03 June 2023 Over the sea south of Honshu, Japan.
Peak intensity (lifetime <sup>1</sup> )	115 kt (215 km/h), 905 hPa, Super Typhoon 1800 UTC, 25 May 2023
Period of occurrence (lifetime)	14 days and 18 hours
Entered the PAR region	1800 UTC, 26 May 2023
Exited the PAR region	0700 UTC, 01 June 2023
Peak intensity (within the PAR)	105 kt (195 km/h), 915 hPa, Super Typhoon 1800 UTC, 26 May 2023
Period of occurrence (within the PAR)	5 days and 13 hours
Observed landfalls in the Philippines	None
Significant hydrometeorological hazards observed over the country	<ul style="list-style-type: none"> <li>• <b>Strong to gale-force wind gusts</b> over Extreme Northern Luzon.</li> <li>• <b>Total rainfall &gt; 100 mm</b> over Babuyan Islands, Benguet, La Union, and most of Ilocos Sur, Pangasinan, Abra, Ifugao, Mountain Province, and Nueva Vizcaya</li> <li>• <b>Monsoon total rainfall &gt; 100 mm</b> over northern Palawan including Calamian and Cuyo Islands, most of Mindoro Provinces, and the far northwestern portion of Antique.</li> </ul>

## Extremes of Surface Weather Observations during Tropical Cyclone Days<sup>2</sup>

Based on reports from PAGASA manned surface weather stations

### Highest storm duration (26 May to 01 June 2023) rainfall over land:

- La Trinidad, Benguet: 484.4 mm
- Baguio City: 442.6 mm
- La Carlota City, Negros Occidental: 193.1 mm

### Highest 24-hour rainfall over land:

- La Trinidad, Benguet: 220.5 mm, 31 May 2023
- Baguio City, Benguet: 184.2 mm, 31 May 2023
- Maasin City, Southern Leyte: 107.6 mm, 26 May 2023

<sup>1</sup> Lifetime is the period from the development into a tropical depression to its weakening into a remnant low or its transitioning into a post-tropical low.

<sup>2</sup> Also called "storm duration", it refers to the meteorological days of occurrence of the tropical cyclone within the PAR region.

**Disclaimer:** The information herein is based on publicly-issued bulletins, advisories, and warnings and the result of the near-real time (initial) best track analysis. As such, the information provided herein are considered preliminary only and will be replaced by the information that will become available once the Annual Report on Philippine Tropical Cyclones (2023 Edition) is published.



#### Lowest sea level pressure over land:

- Basco, Batanes: 990.5 hPa, 0900 UTC, 30 May 2023
- Calayan, Cagayan: 996.5 hPa, 1900 UTC, 30 May 2023
- Tuguegarao City, Cagayan: 997.1 hPa, 0800 UTC, 30 May 2023

#### Highest peak gust over land:

- Basco, Batanes: N (360°) at 66.1 kt (34 m/s), 0023 UTC, 30 May 2023
- Itbayat, Batanes: N (360°) at 46.7 kt (24 m/s), 1936 UTC, 29 May 2023
- Calayan, Cagayan: NW (320°) at 42.8 kt (22 m/s), 0937 UTC, 29 May 2023

### Summary of Tropical Cyclone Product Issuances

#### Public and Marine Tropical Cyclone Products:

- Tropical Cyclone Updates:
  - First issuance: 4:00 AM, 20 May 2023
  - Last issuance: 4:00 AM, 02 June 2023
  - Total issued: 27
- Tropical Cyclone Advisories:
  - First issuance: 11:00 PM, 24 May 2023
  - Last issuance: 5:00 AM, 27 May 2023
  - Total issued: 7
- Tropical Cyclone Bulletins:
  - First issuance: 5:00 AM, 27 May 2023
  - Last issuance: 5:00 PM, 01 June 2023
  - Total issued: 23
- Tropical Cyclone Warnings for Shipping:
  - First issuance: 5:00 AM, 27 May 2023
  - Last issuance: 5:00 PM, 01 June 2023
  - Total issued: 23

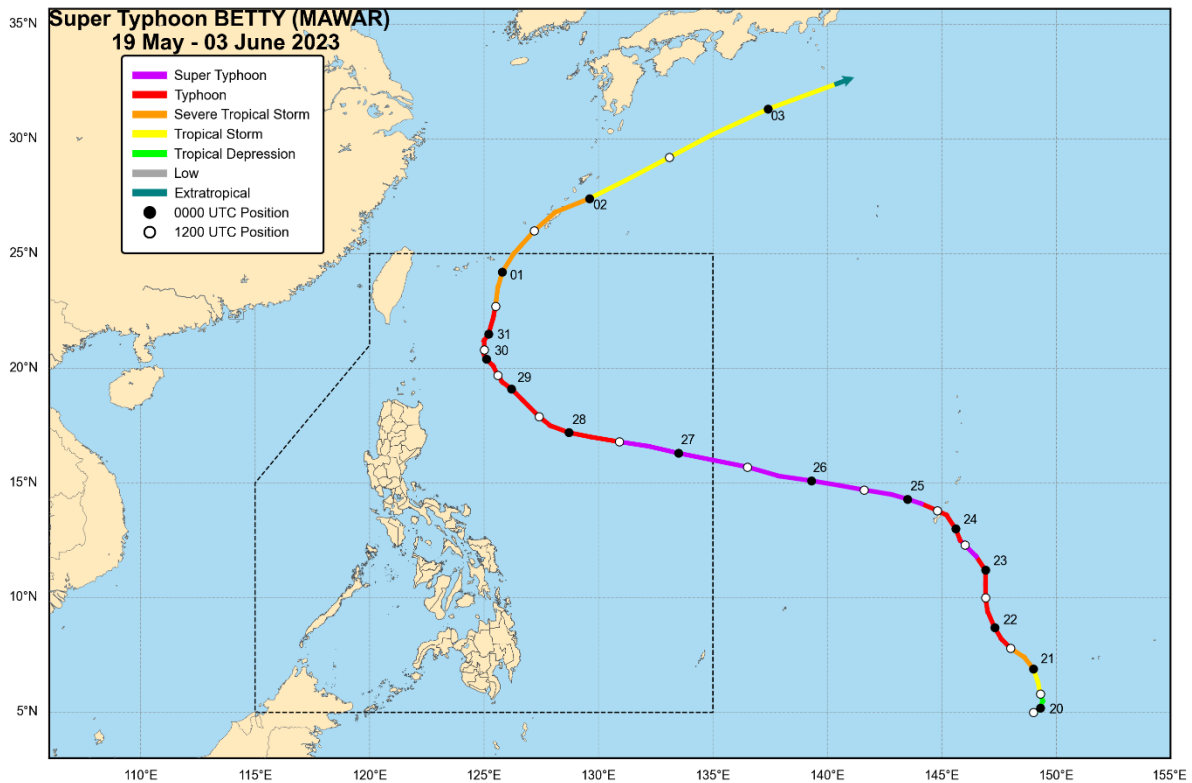
#### Tropical Cyclone Wind Signals:

- Highest level of wind signal hoisted: TCWS #2
- Number of localities where wind signals had been hoisted: 17
- Timeline of hoisting/lifting of wind signals:
  - 11:00 AM, 27 May 2023: Initial hoisting of TCWS #1
  - 5:00 AM, 29 May 2023: Initial upgrading to TCWS #2
  - 5:00 PM, 31 May 2023: Final downgrading from TCWS #2
  - 11:00 AM, 01 June 2023: Final lifting of TCWS #1

### Other Pertinent Information

- Per NDRRMC Situational Report No. 12 dated 5 June 2023, the passage of Super Typhoon Betty resulted in 2 casualties: 1 dead and 1 injured. Furthermore, reports from Ilocos Region and Cordillera Administrative Region show that the production loss and cost of damage to agriculture amounted to PHP 133,000.00, while damage to infrastructure reached PHP 68,695.58. A total of 11 houses were totally damaged, while 91 were partially damaged.
- The passage of Betty over the Philippine Sea enhanced the Southwest Monsoon and triggered the onset of the rainy season for areas under Climate Type I. The monsoon brought heavy rains over the western portion of Southern Luzon.
- The international name "Mawar" (meaning: rose) was contributed by Malaysia.

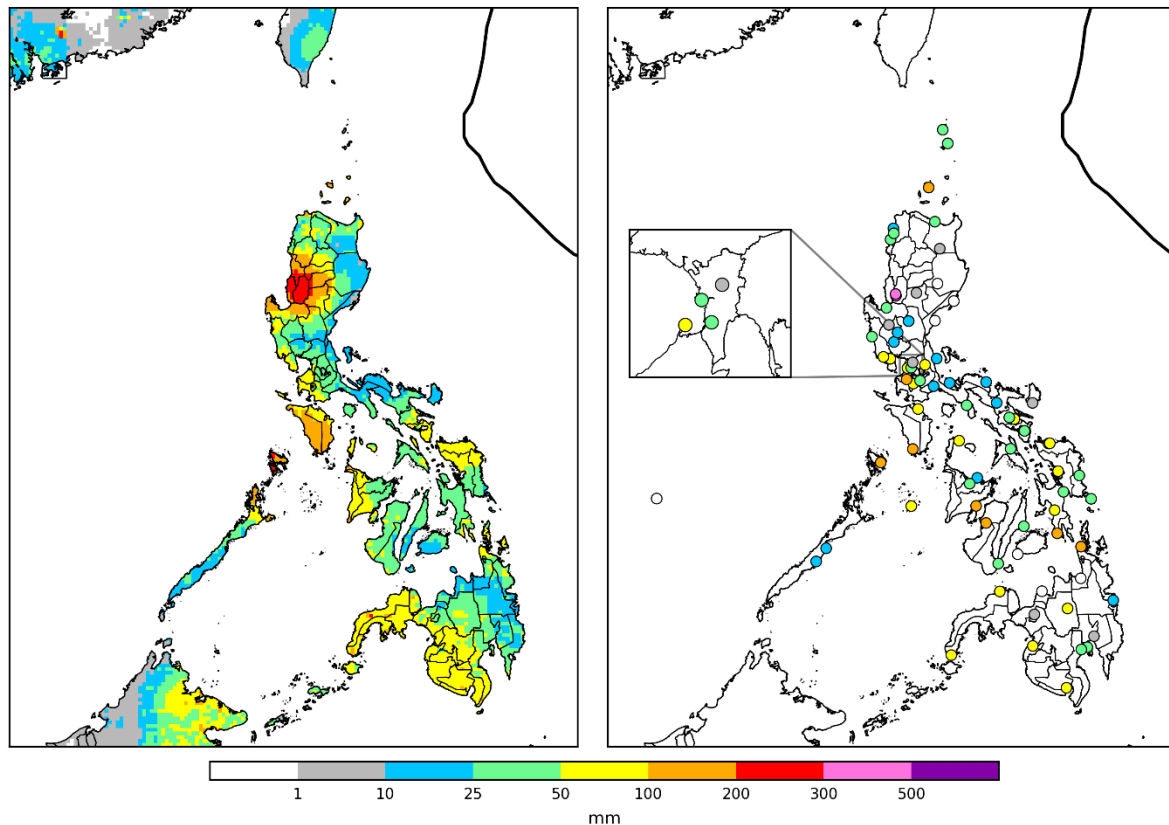
**Disclaimer:** The information herein is based on publicly-issued bulletins, advisories, and warnings and the result of the near-real time (initial) best track analysis. As such, the information provided herein are considered preliminary only and will be replaced by the information that will become available once the Annual Report on Philippine Tropical Cyclones (2023 Edition) is published.



**Fig. 2.** Preliminary best track positions and intensities (as categories) of Super Typhoon BETTY. Line color indicates the category of tropical cyclone. Shaded circles with date labels indicated 00 UTC positions while open circles indicate 12 UTC positions.

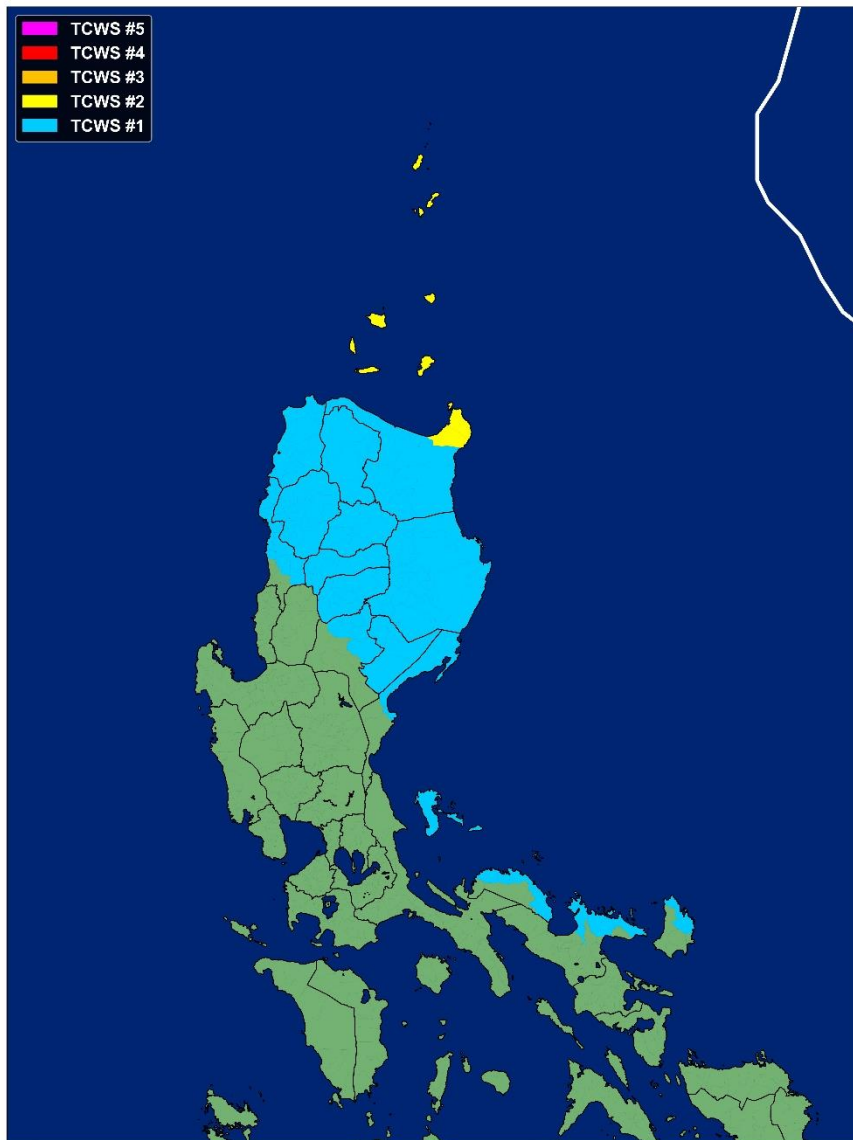
**Disclaimer:** The information herein is based on publicly-issued bulletins, advisories, and warnings and the result of the near-real time (initial) best track analysis. As such, the information provided herein are considered preliminary only and will be replaced by the information that will become available once the Annual Report on Philippine Tropical Cyclones (2023 Edition) is published.

*"The Weather and Climate Authority"*



**Fig. 3.** Nationwide satellite-derived estimates and corresponding gauge observations from PAGASA manned surface weather stations of accumulated rainfall for the period of 26 May to 01 June 2023. The preliminary best track of the tropical cyclone is shown as thick black line.

**Disclaimer:** The information herein is based on publicly-issued bulletins, advisories, and warnings and the result of the near-real time (initial) best track analysis. As such, the information provided herein are considered preliminary only and will be replaced by the information that will become available once the Annual Report on Philippine Tropical Cyclones (2023 Edition) is published.



**Fig. 4.** Highest level and maximum extent of hoisted wind signals during the occurrence of Super Typhoon Betty. The preliminary best track of the tropical cyclone is shown as thick white line.

**Disclaimer:** The information herein is based on publicly-issued bulletins, advisories, and warnings and the result of the near-real time (initial) best track analysis. As such, the information provided herein are considered preliminary only and will be replaced by the information that will become available once the Annual Report on Philippine Tropical Cyclones (2023 Edition) is published.