Republic of the Philippines
DEPARTMENT OF SCIENCE AND TECHNOLOGY
Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)
Weather Division

TROPICAL CYCLONE PRELIMINARY REPORT

Typhoon KRISTINE
TRAMI (2420)

20 to 28 October 2024

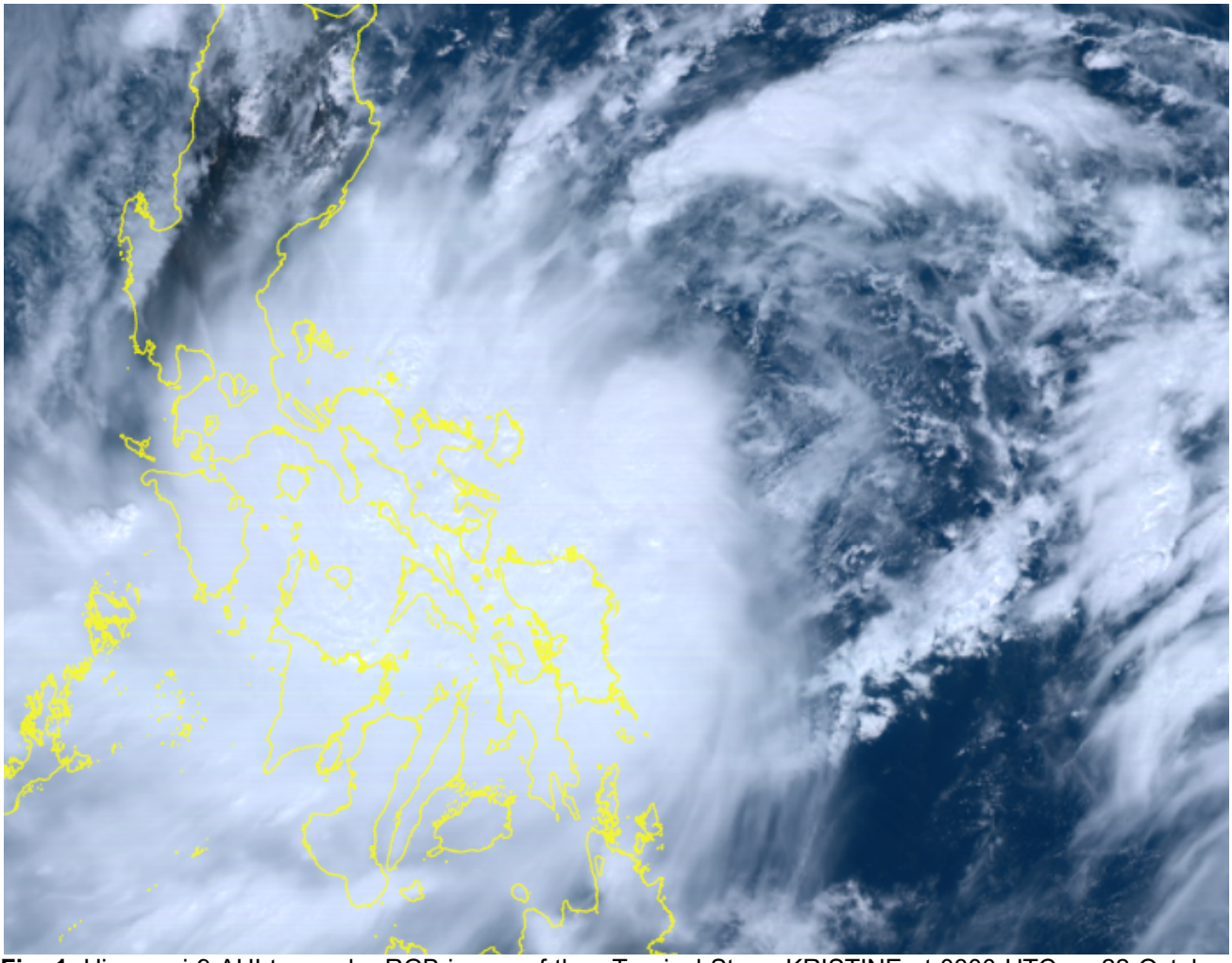

Fig. 1. Himawari-9 AHI true color RGB image of then-Tropical Storm KRISTINE at 0300 UTC on 22 October 2024 when much of Bicol Region and Eastern Visayas was under the displaced deep convection of the tropical storm. Image courtesy of National Institute of Information and Communications Technology (NICT), Japan.

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Summary of Meteorological History

Based on PAGASA preliminary best track[1] position and intensities

First tracked as a low pressure area	0600 UTC, 16 October 2024 Over the Western North Pacific waters E of Guam
Developed into a tropical cyclone	0600 UTC, 20 October 2024 Over the Philippine Sea 1,440 km E of Southeastern Luzon (14.6ºN, 137.5ºE)
Weakened into a remnant low or transitioned into a post-tropical low	1200 UTC, 28 October 2024 Over the East Vietnam Sea off the coast of Quảng Nam, Vietnam 1,265 km W of Northern Luzon (16.1ºN, 108.5ºE)
Peak intensity (lifetime[2])	65 kt (120 km/h), 970 hPa, Typhoon 0600 UTC, 26 October 2024
Period of occurrence (lifetime)	8 days and 6 hours
Entered the PAR region (as tropical cyclone)	1500 UTC, 20 October 2024
Exited the PAR region (as tropical cyclone)	0700 UTC, 25 October 2024
Peak intensity (within the PAR)	55 kt (100 km/h), 980 hPa, Severe Tropical Storm 0600 UTC, 25 October 2024
Period of occurrence (within the PAR)	4 days and 16 hours
Observed landfalls in the Philippines	Divilacan, Isabela: 1630 UTC, 23 October 2024

[1] With preliminary best track as reference, the information provided in this report may be different from those reported during the warning period of the subject tropical cyclone.
[2] 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.

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Extremes of Surface Weather Observations during Tropical Cyclone Days[3]

Based on reports from PAGASA manned surface weather stations

Table 1. Highest storm duration (20 to 25 October 2024) rainfall over land.

Location of weather station	Rainfall (mm)
Daet, Camarines Norte	731.6
Juban, Sorsogon	690.4
Legazpi City, Albay	631.8
Tanay, Rizal	614.5
Ambulong, Tanauan City, Batangas	576.5

Table 2. Highest 24-hour rainfall over land.

Location of weather station	Rainfall (mm)	Date
Daet, Camarines Norte	528.5	22 October 2024
Legazpi City, Albay	431.0	22 October 2024
Juban, Sorsogon	406.0	22 October 2024
Ambulong, Tanauan City, Batangas	391.3	24 October 2024
Mulanay, Quezon	384.6	22 October 2024

Table 3. Lowest mean sea level pressure over land.

Location of weather station	Minimum MSLP (hPa)	Date (MM/DD) and Time (UTC)
Bayombong, Nueva Vizcaya	985.1	10/23 2000
Baguio City	986.0	10/24 0700
Echague, Isabela	987.1	10/23 2000
Tuguegarao City, Cagayan	987.4	10/23 1900
Casiguran, Aurora	988.2	10/23 0700

Table 4. Highest peak gust over land.

Location of weather station	Peak gust speed (m/s)	Peak gust direction	Date (MM/DD) and Time (UTC)
Calayan, Cagayan	28	NE (50º)	10/23 1100 *rep.*
Itbayat, Batanes	26	N (10º)	10/23 0252
Cubi Pt., Subic Bay	26	SW (230º)	10/24 1428
Aparri, Cagayan	25	NNE (20º)	10/23 0925
Ambulong, Tanauan City, Batangas	25	WSW (240º)	10/23 2146
Abucay, Bataan	24	NW (310º)	10/24 1421
Baguio City	22	N (10º)	10/24 1640
		-	10/24 1800 *rep.*

Note:

- For peak gust data retrieved using standard, intermediate, or hourly synoptic observation reports (i.e., QNT), "*rep.*" indicates the time when the observation was reported in the message, but not necessarily its time of occurrence.
- The wind instrument of the manned weather station at Basco, Batanes was non-operational at the time of passage of KRISTINE. As such, peak gust similar to those reported in Calayan, Cagayan and Itbayat, Batanes may have occurred in Basco, Batanes.
- Over land extremes for MSLP and peak gust only covered areas with hoisted Wind Signals to ensure that the extremes are more likely associated with the tropical cyclone itself. There may be lower MSLP and higher peak gust outside these coverage areas.

[3] Also called "storm duration", it refers to the meteorological days of occurrence of the tropical cyclone within the PAR region.

Summary of Tropical Cyclone Product Issuances

Issued by the Weather Division, DOST-PAGASA

Tropical Cyclone Products:

- Tropical Cyclone Advisories:
  - First issuance: 11:00 PM, 20 October 2024
  - Last issuance: 5:00 AM, 21 October 2024
  - Total issued: 2
- Tropical Cyclone Bulletins:
  - First issuance: 5:00 AM, 21 October 2024
  - Last issuance: 11:00 PM, 25 October 2024
  - Total issued: 28
- Tropical Cyclone Warnings for Shipping:
  - First issuance: 5:00 AM, 21 October 2024
  - Last issuance: 11:00 PM, 25 October 2024
  - Total issued: 20
- WC SIGMET
  - First issuance: 4:45 AM, 22 October 2024
  - Last issuance: 4:18 AM, 26 October 2024
  - Total issued: 17

Tropical Cyclone Wind Signals:

- Highest level of wind signal hoisted: Wind Signal No. 3
- Number of provinces where wind signals had been hoisted: 56
- Timeline of hoisting/lifting of wind signals:
  - 5:00 AM, 21 October 2024: Initial hoisting of Wind Signal No. 1
  - 11:00 AM, 22 October 2024: Initial hoisting of Wind Signal No. 2
  - 5:00 PM, 23 October 2024: Initial hoisting of Wind Signal No. 3
  - 8:00 PM, 24 October 2024: Lifting of all hoisted Wind Signal No. 3
  - 5:00 PM, 25 October 2024: Lifting of all hoisted Wind Signal No. 2
  - 11:00 PM, 25 October 2024: Lifting of all hoisted Wind Signals

Other Pertinent Information

- Rainfall distribution maps show that much of the torrential rainfall during the passage of KRISTINE was concentrated over the provinces south of (and not near) the observed path of the tropical cyclone. Analysis of the synoptic environment revealed that the deep convective clouds of KRISTINE were displaced to the southwest of the low-level circulation center. This, alongside the oncoming enhanced Southwest Monsoon flow, resulted in torrential rains over much of Luzon, especially in Metro Manila, CALABARZON, and Bicol Region.
- The National Disaster Risk Reduction and Management Council (NDRRMC) reported that a total of 9,652,607 individuals were affected by the successive occurrences of KRISTINE and LEON (which resulted in compounding and prolonged impacts), with inclement weather conditions initially caused by KRISTINE accounting for most of the impacts. Furthermore, a total of 159 dead, 132 injured, and 22 missing individuals were also reported. Cost of damage to agriculture, infrastructure, housing, and other assets amounted to PHP 18.400 billion.
- The international name “TRAMI” (meaning: A kind of tree belonging to the rose family) was contributed by Vietnam.

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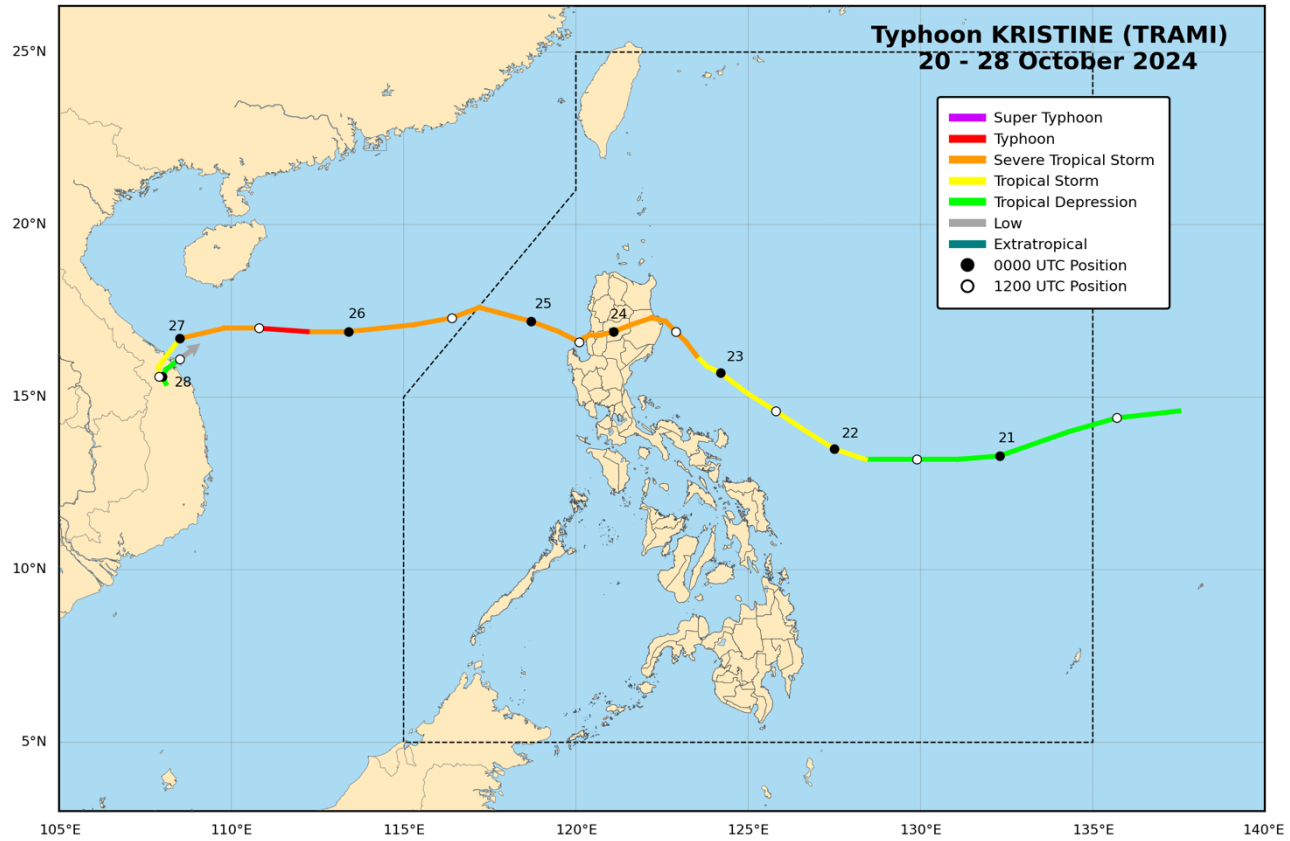

Fig. 2. Preliminary best track positions and intensities (as categories) of Typhoon KRISTINE. Line color indicates the category of tropical cyclone. Shaded circles with date labels indicated 00 UTC positions while open circles indicate 12 UTC positions.

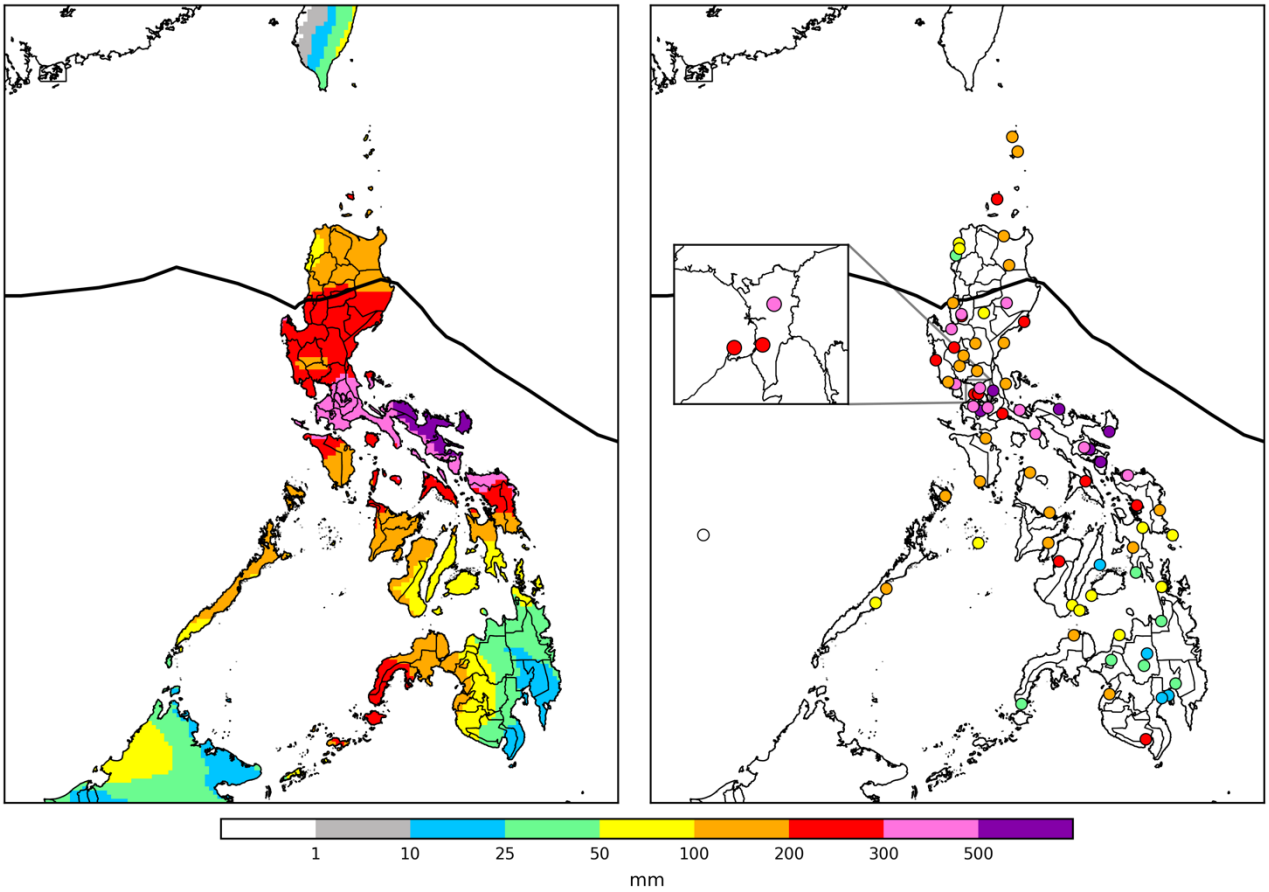

Fig. 3. Nationwide satellite-derived estimates and corresponding gauge observations from PAGASA manned surface weather stations of accumulated rainfall for the period of 20 to 25 October 2024. The preliminary best track of AGHON is shown as thick black line.

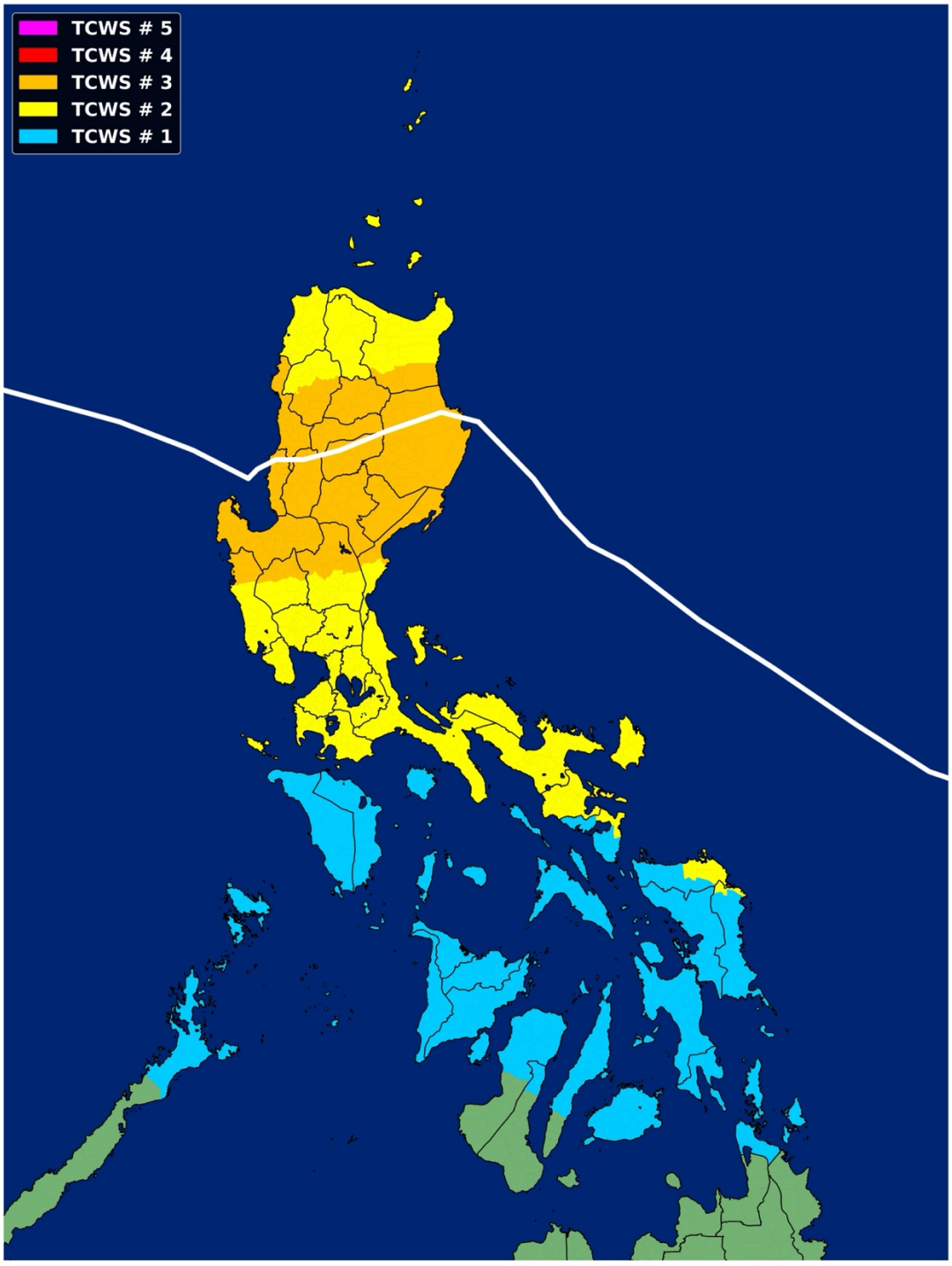

Fig. 4. Highest level and maximum extent of hoisted wind signals during the occurrence of Typhoon KRISTINE. The preliminary best track of the tropical cyclone is shown as thick white line.

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This technical report is published on behalf of the DOST-PAGASA by the:

Marine Meteorological Services Section
Weather Division, DOST-PAGASA

While we ensure the factual correctness and accuracy of the entries in this preliminary tropical cyclone report, readers are advised to report any text or figure in this report which may require correction to the Marine Meteorological Services Section by email at **typhoon.ops@pagasa.dost.gov.ph** with the subject *"Prelim Report [Name of TC], [Year]: For Correction"*.

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