# MEMBER REPORT Philippines

ESCAP/WMO Typhoon Committee
16th Integrated Workshop
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2-3 December 2021

# CONTENTS

## I. Overview of tropical cyclones which have affected/impacted Member's area as of November 2021

As of November 2021, we have 14 tropical cyclones entered and/or developed inside the Philippine Area of Responsibility (PAR), (4) were Tropical Depression, (3) Tropical Storm (TS), (3) Severe Tropical Storm (STS), and (4) typhoon. From the 14 tropical cyclones shown in Figure A, seven (7) made landfall and these were Tropical Storm (TS) Dujuan, Tropical Storm Choi-wan, Typhoon Conson, Typhoon Chantu, Severe Tropical Storm Kompasu, Tropical Storm Crising, and Tropical Depression Lannie.

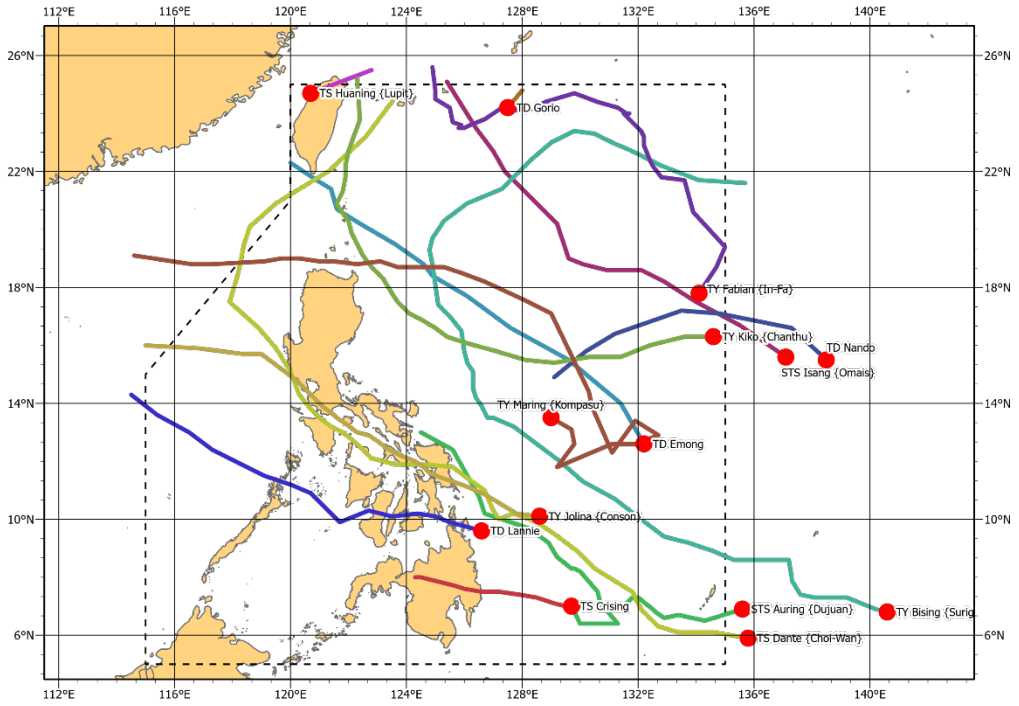


Figure A. Operational tracks of tropical cyclones that entered and developed inside the PAR, as of November 2021.

# Tropical Cyclones that directly affects the Philippines as of November 2021

## 1. Severe Tropical Storm "DUJUAN" (2101) {AURING}

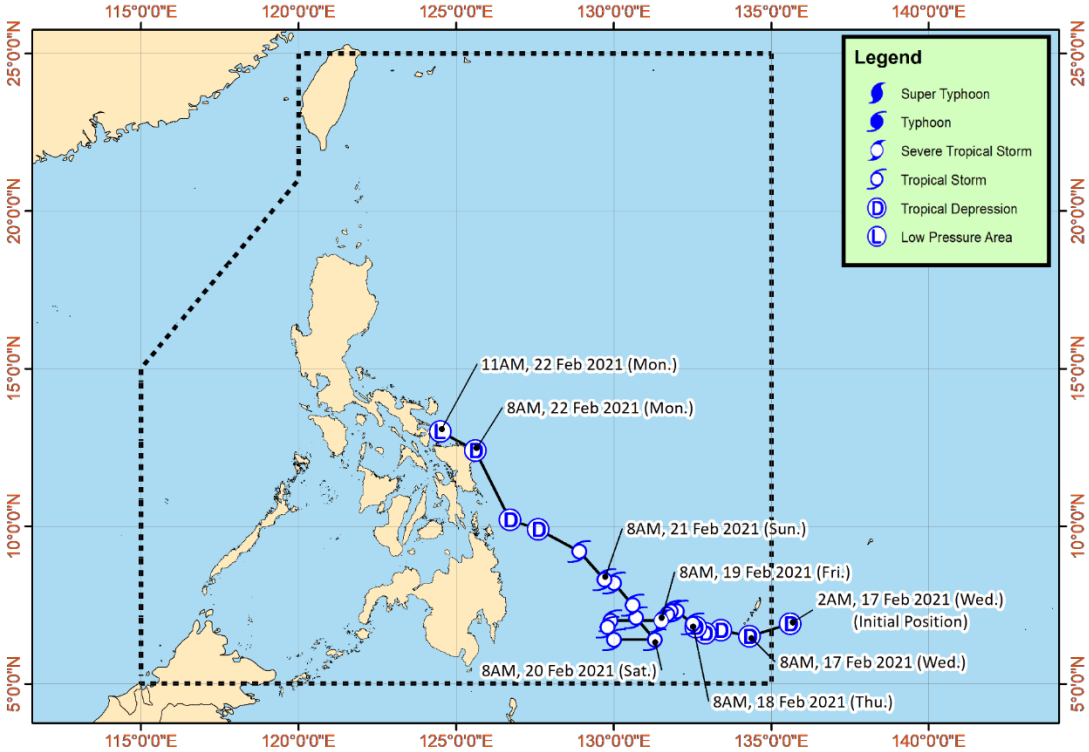


Figure 1. Operational track of STS Dujuan (Auring) from 17-22 February 2021.

**Chronology of STS "DUJUAN" (2101) {AURING}**

- 17 February - Developed into a Tropical Depression near Palau and entered the Philippine Area of Responsibility (PAR).
- 18 February – intensifies into a Tropical Storm while slowly moving over the Philippine Sea.
- 19 February (Morning) – intensifies into a Severe Tropical Storm (STS).
- 19 February (Afternoon) – weakens into a Tropical Storm (TS) while almost stationary over the Philippine Sea, east of Mindanao.
- 21 February – weakens into a Tropical Depression (TD).
- 22 February (Morning) – the TD made landfall over Batag Island, Laoang, Northern Samar.
- 22 February (Afternoon) – the TD weakens into a low-pressure area (LPA).

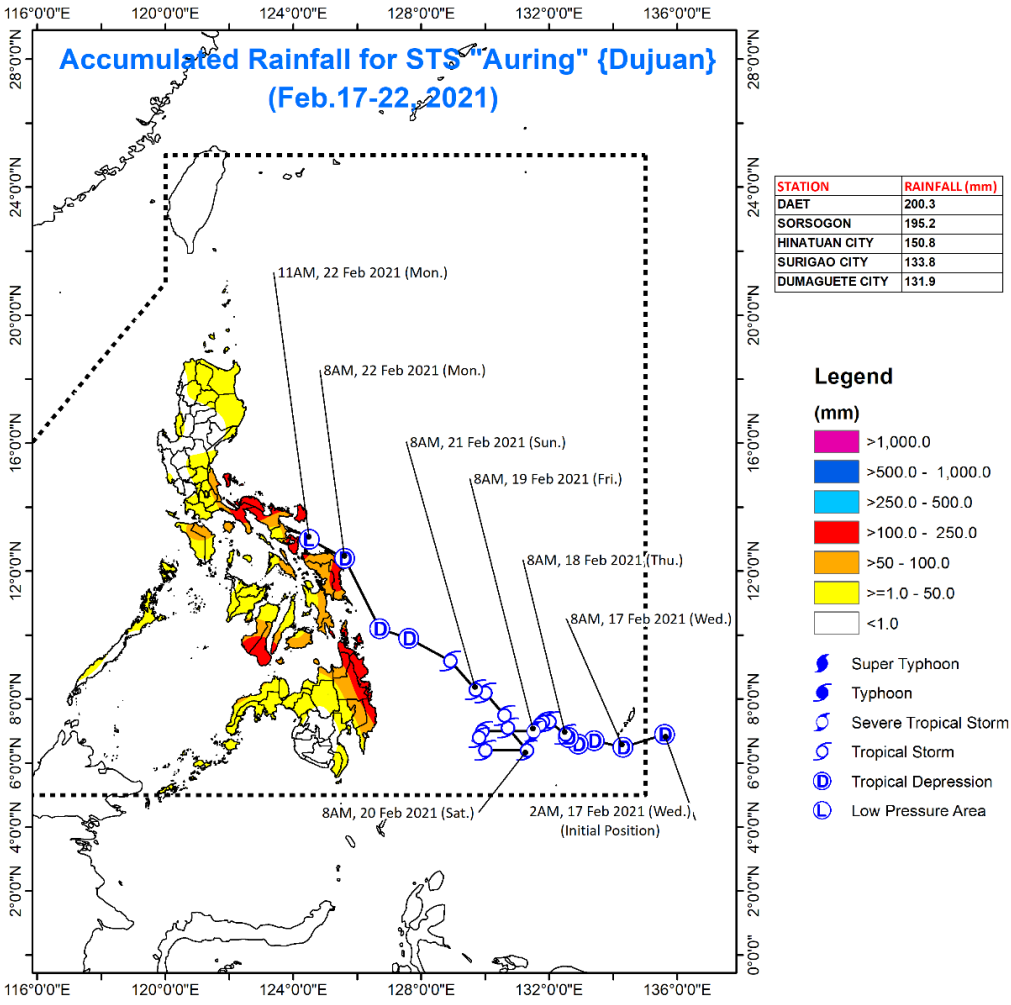


Figure 1A. Accumulated rainfall with operational track of STS Dujuan from 17-22 February 2021.

"Dujuan" brought moderate to heavy rains over the eastern portion of southern Luzon, Eastern Visayas, and Eastern Mindanao (Figure 1A) and causes ₱53.05M (US$1.05M) damages to infrastructure and ₱106.78M (US$2.11M) damages to agriculture (Source: NDRRMC Sitrep#13 (05 March 2021).

## 2. Tropical Storm “Crising”

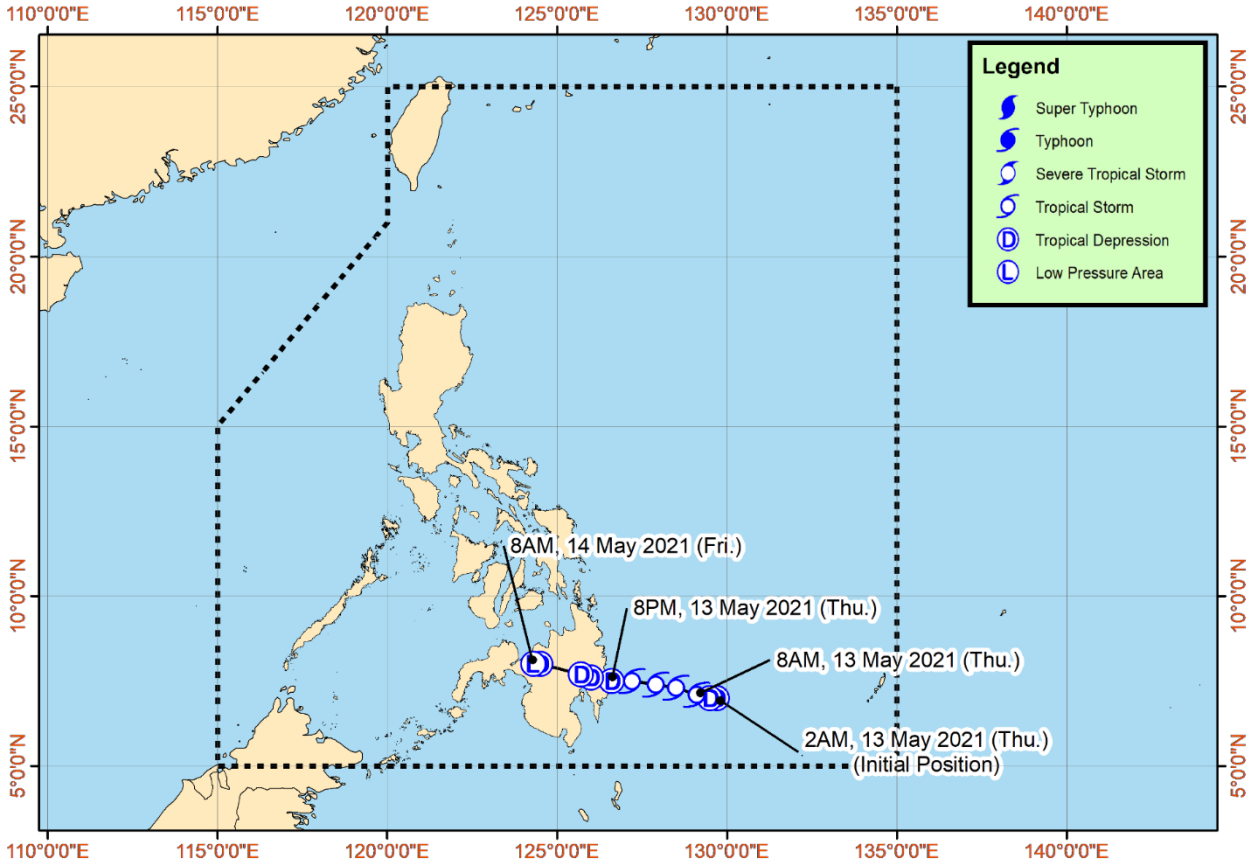


Figure 2. Operational track of TS Crising from 13-14 May 2021.

**Chronology of TS Crising**

- 13 May (Morning)- Developed into a Tropical Depression east of Mindanao inside the Philippine Area of Responsibility (PAR) and was given the domestic name “Crising”.
- 13 May (Morning)- Intensified into a Tropical Storm (TS).
- 13 May (Afternoon) - Weakens into a TD after making landfall over eastern Mindanao (Baganga, Davao Oriental).
- 14 May (Morning) - Weakens into a low-pressure area (LPA).

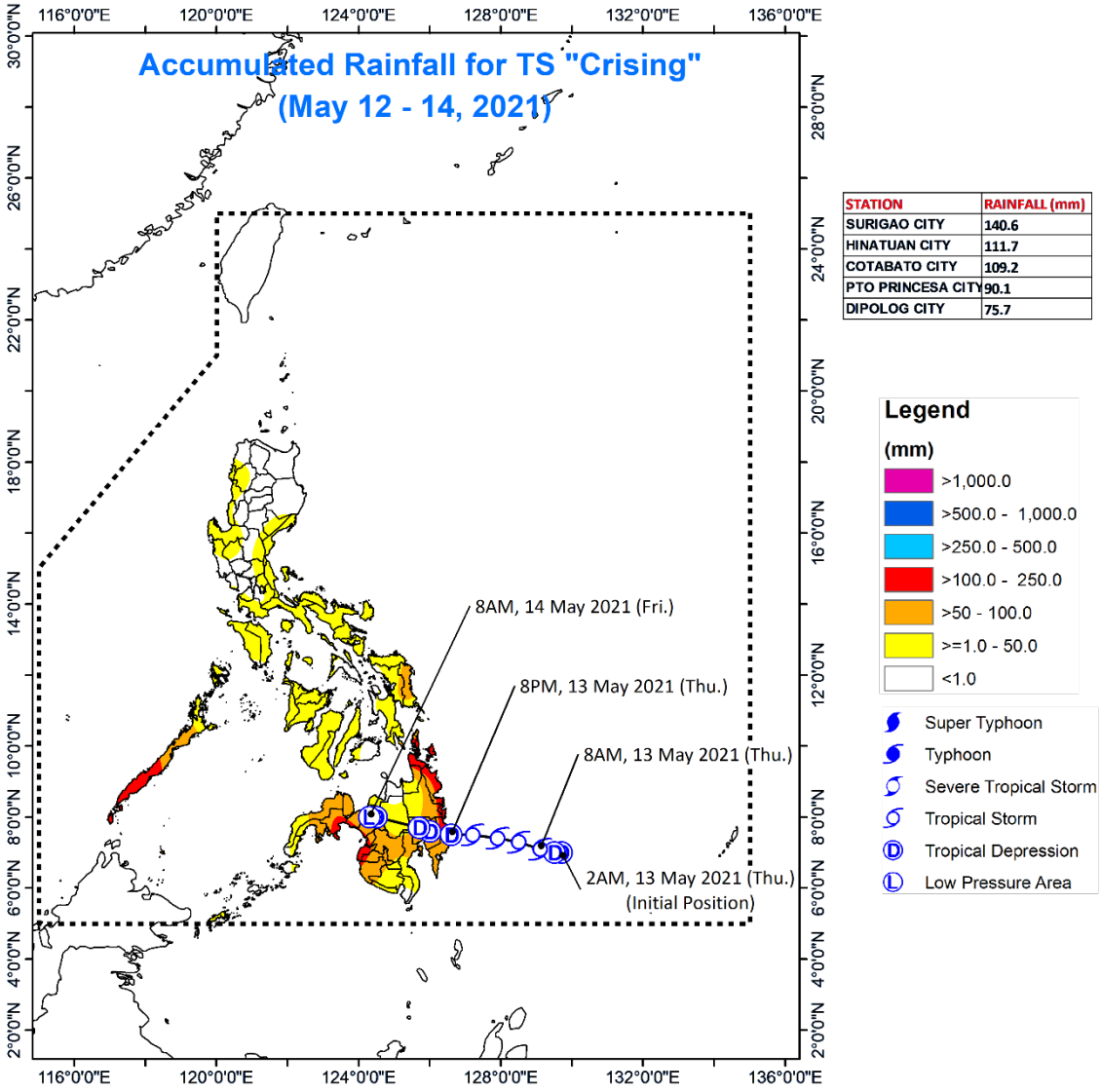


Figure 2A. Accumulated rainfall with operational track of TS Crising from 13-14 May 2021

"**Crising**" brought moderate to heavy rains over Mindanao and the southern portion of Palawan.

- Damage to Agriculture - ₱23.16M (US$0.46M)
- Casualties: Injured – 4, Missing – 2

Source: NDRRMC Sitrep #06 (28 May 2021)

## 3. TROPICAL STORM "CHOI-WAN" (2103) {DANTE}

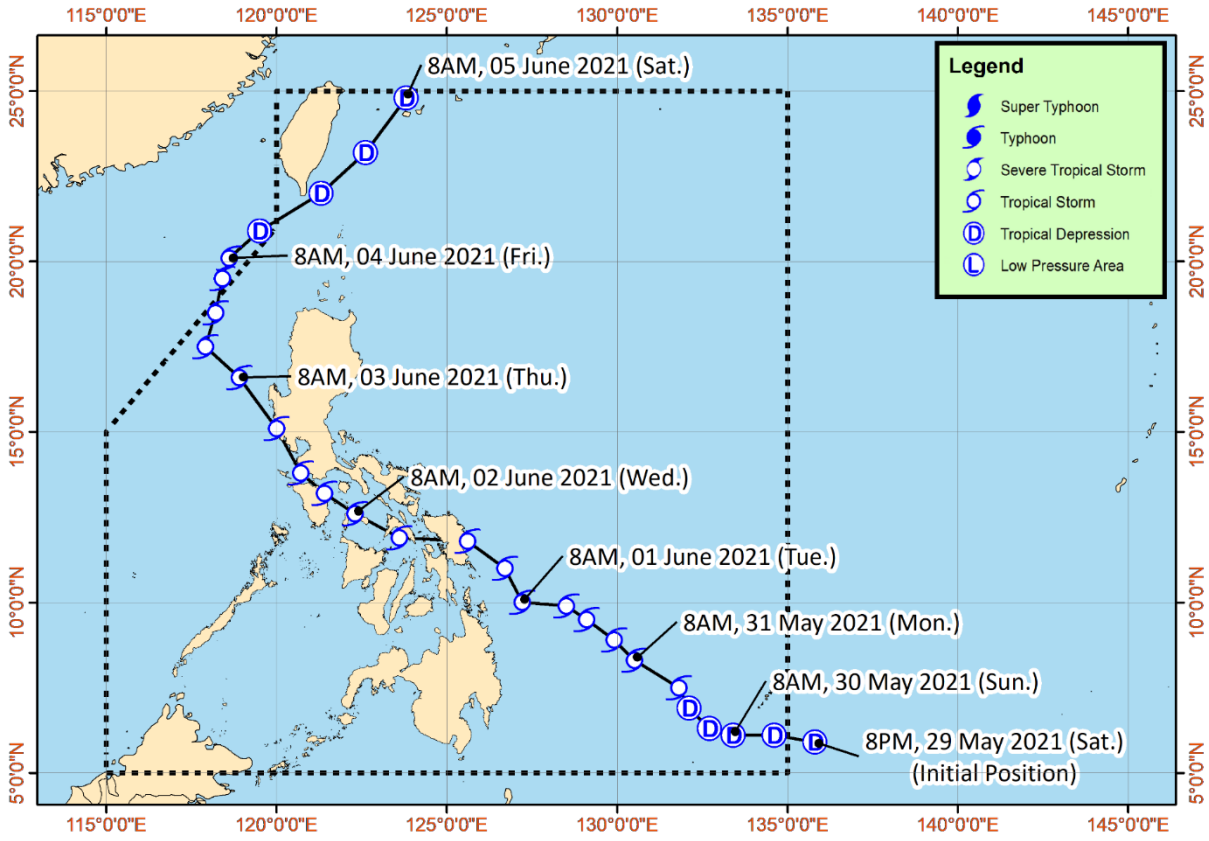


Figure 3. Operational track of TS Choi-wan (Dante) from 29 May – 05 June 2021.

**Chronology of TS "CHOI-WAN" (2103) {DANTE}**

- 29 May, developed into a TD near Palau.
- 30 May, entered the PAR and given domestic name "Dante"
- 31 May, intensified into a TS and was given regional name "Choi-Wan"
- 01 June, made its 1st landfall over Sulat, Eastern
- 02 June 2nd landfall – Cataingan, Masbate.

  3rd landfall – Balud, Masbate

  4th landfall – Romblon, Romblon

  5th landfall – San Agustin, Romblon.

  6th landfall – Pola, Oriental Mindoro.

  7th landfall – Tingloy, Batangas

  8th landfall – Calatagan, Batangas
- 04 June, weakens into a TD.
- 05 June, exited the PAR.

**Highest Peak Gust over land During the Passage of Choi-wan**

| Station | Gustiness (mps) | Date and Time observed (UTC) |
|---|---|---|
| (98536) Romblon, Romblon | 22 | 02 June (0300) |
| (98558) Guiuan, Eastern Samar | 20 | 01 June (1100) |
| (98546) Catarman, Northern Samar | 17 | 01 June (1400) |

**Lowest Mean Sea Level Pressure over land During the Passage of Choi-wan**

| Station | Mean Sea Level Pressure (hpa) | Date and Time observed (UTC) |
|---|---|---|
| (98553) Borongan, Eastern Samar | 997.4 | 01 June (1200) |
| (98536) Romblon, Romblon | 999.6 | 02 June (0000) |

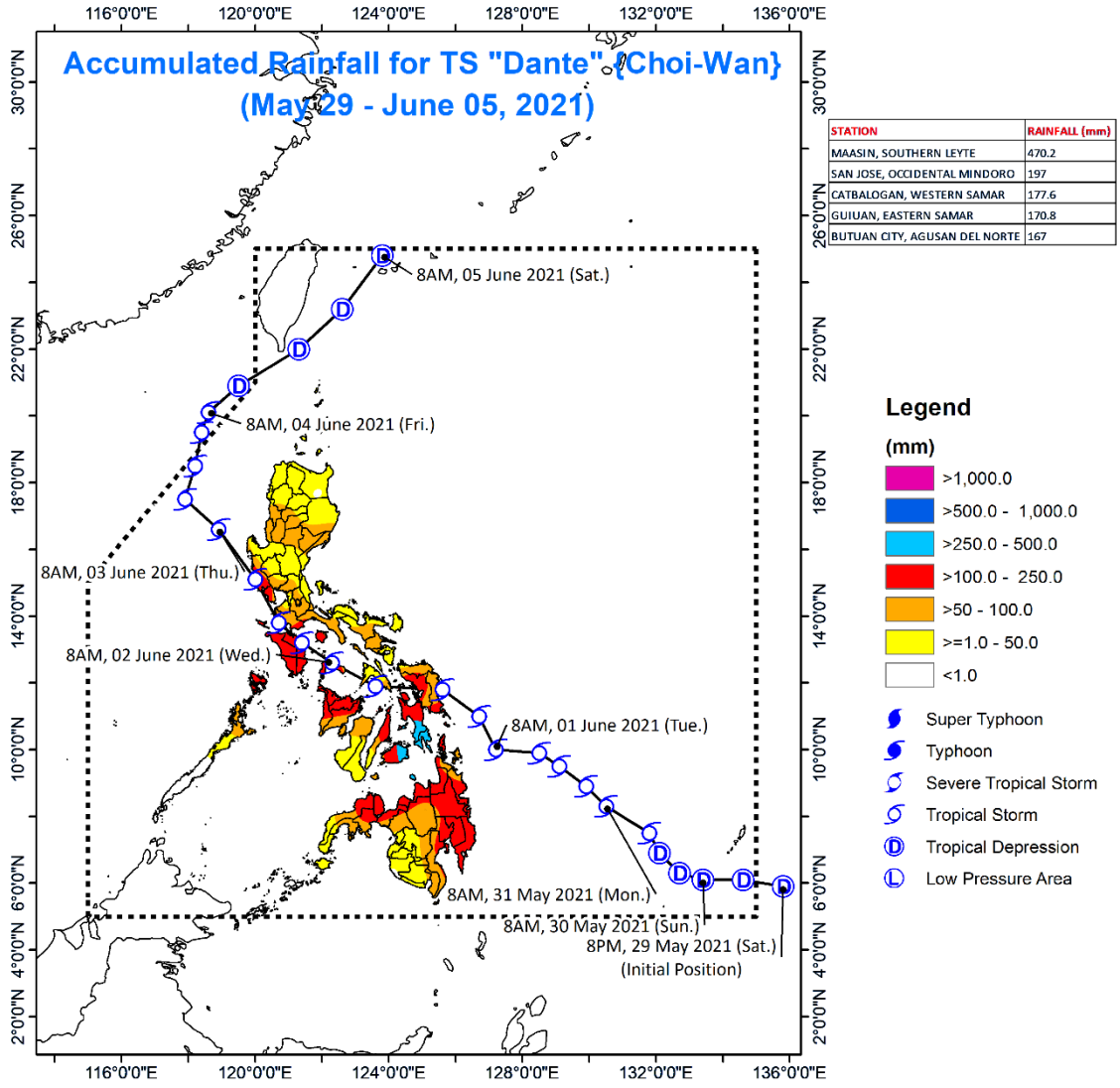


Figure 3A. Accumulated rainfall with operational track of TS Choi-wan from 29 May – 05 June 2021.

"**Choi-Wan**" brought moderate to heavy rains over southern Luzon, Visayas, and Mindanao.

- Damages to Infrastructure - ₱157.64 (US$3.11M)
- Damages to Agriculture - ₱152.11M (US$3.0M)
- Casualties**:** Dead - 10, Injured - 3, Missing - 1

Source: NDRRMC Sitrep #13 (25June2021)

## 4. TYPHOON "CONSON" (2113) {JOLINA}

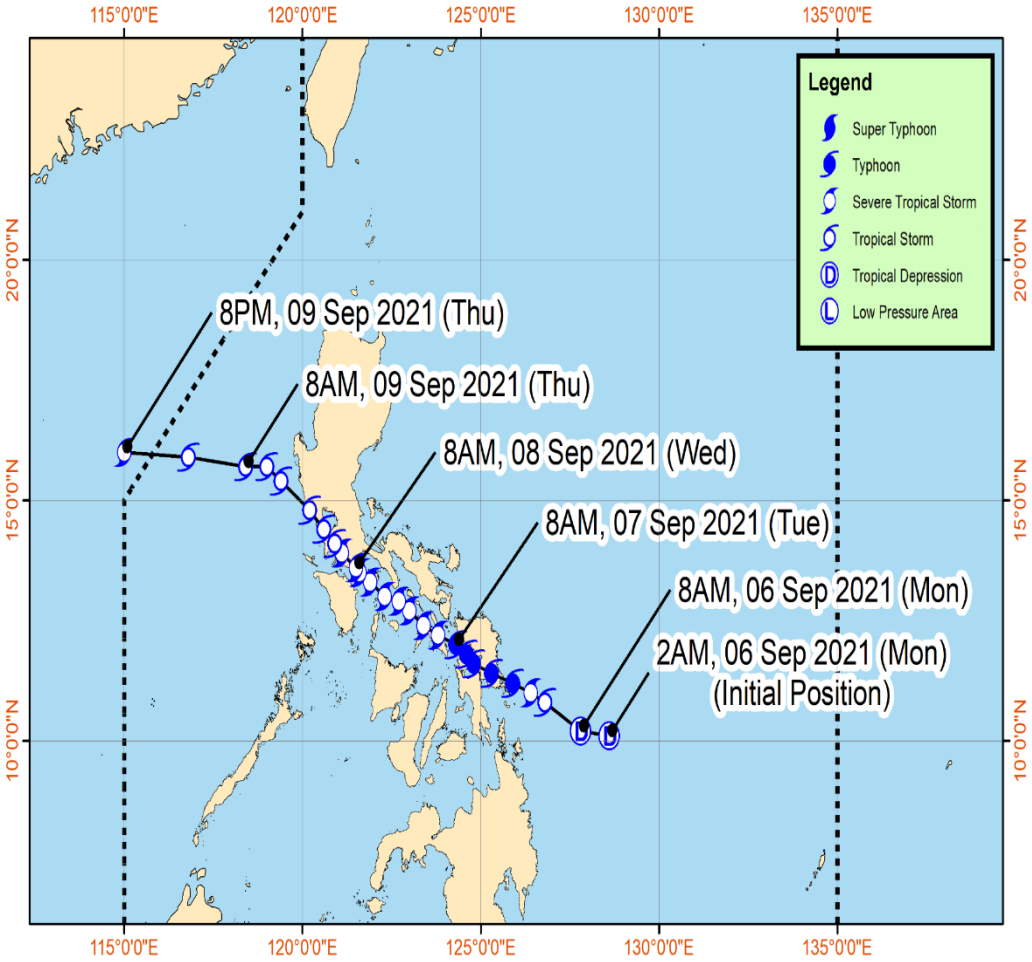


Figure 4. Operational track of Ty Conson (Jolina) from 06- 09 September 2021.

**Chronology of Ty "CONSON" (2113) {JOLINA}**

- 06 September (morning) – developed into a Tropical Depression (TD) located east of Mindanao.
- 06 September (early afternoon) – intensifies into a Tropical Storm (TS) and given regional name "Conson".
- 06 September (late afternoon) – further intensifies into a Severe Tropical Storm (STS) as it moves towards Eastern Visayas.
- 06 September (evening) – rapidly intensifies into a Typhoon as it continues to move towards Eastern Visayas (Samar provinces).
- 07 September (AM) – made landfall over
  1st - Daram, Samar
  2nd - Sto. Nino, Samar.
  3rd - Almagro, Samar.
  4th – Tagapul-an, Samar.
  5th – Dimasalang, Masbate
- 07 September – weakens into a Severe Tropical Storm (STS) after several landfalls.
- 08 September – weakens into a Tropical Storm after making its 6th and 7th landfall over Torrijos, Marinduque, and San Juan, Batangas respectively.
- 09 September – re-intensifies into a Severe Tropical Storm after exiting the Philippine Area of Responsibility (PAR).

## Highest Peak Gust over land During the Passage of Conson

| Station | Gustiness (mps) | Date and Time observed (UTC) |
|---|---|---|
| (98558) Guiuan, Eastern Samar | 38.0 | 06 September (1230) |
| (98432) Ambulong, Batangas | 24.0 | 08 September (0336) |
| (98550) Tacloban City, Leyte | 23.0 | 06 September (1840) |
| (98548) Catbalogan City, Samar | 22.0 | 06 September (1800) |

## Lowest Mean Sea Level Pressure over land During the Passage of Conson

| Station | Mean Sea Level Pressure (hpa) | Date and Time observed (UTC) |
|---|---|---|
| (98558) Guiuan, Eastern Samar | 991.6 | 06 September (1300) |
| (98548) Catbalogan City, Samar | 993.4 | 06 September (1800) |
| (98543) Masbate City, Masbate | 997.2 | 07 September (1200) |

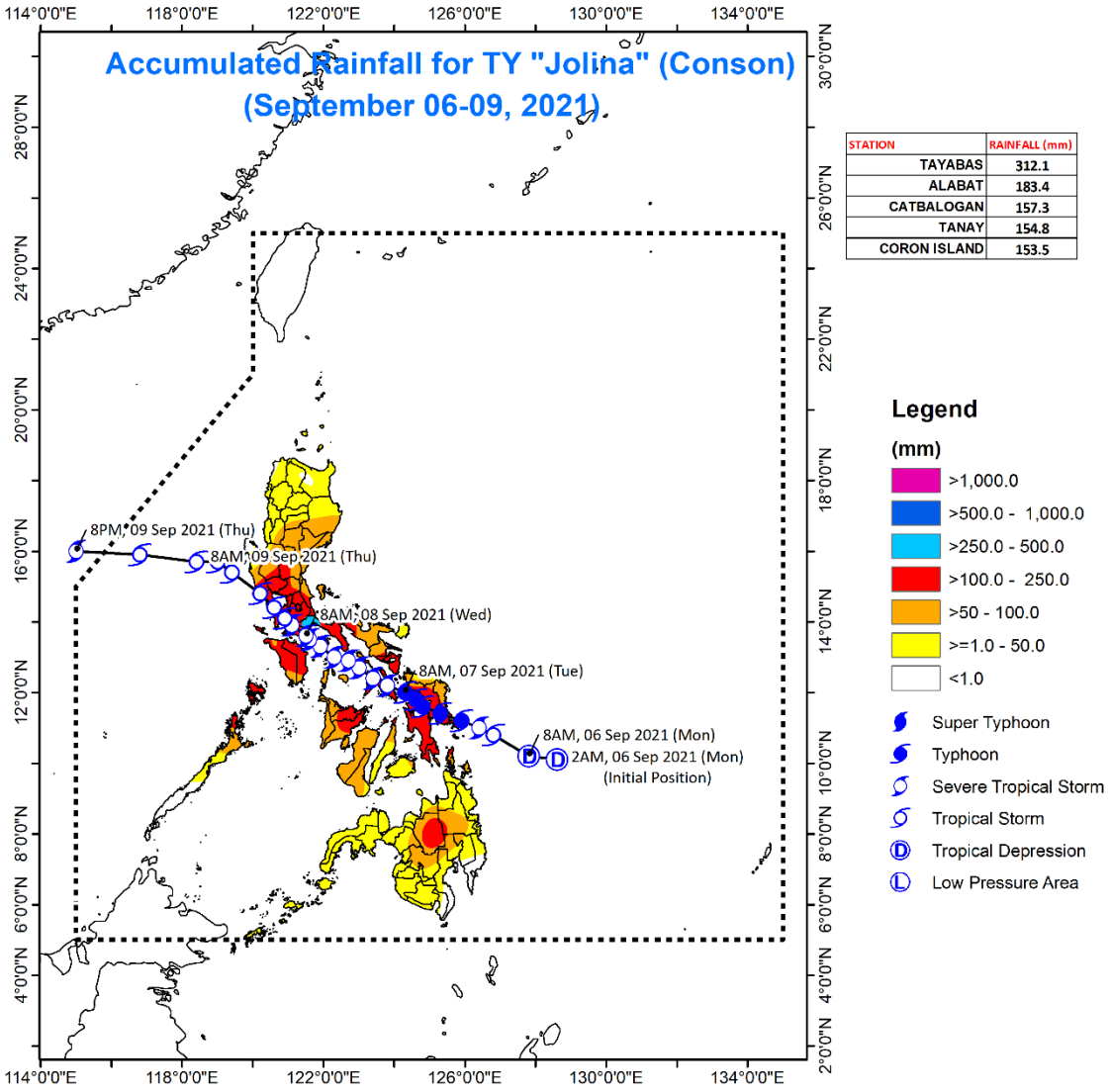


Figure 4A. Accumulated rainfall with operational track of Ty Conson from 06- 09 September 2021.

"**Conson**" brought moderate to heavy rains over southern Luzon, Visayas, and Mindanao.

- Damages to Infrastructure - ₱63.67M (US$1.26M)
- Damages to Agriculture – ₱1.35B (US$26.7M)
- Casualties: Dead – 20, Injured – 33, Missing – 4

Source: NDRRMC Sitrep #15 (23 September 2021)

## 5. TYPHOON "CHANTHU" (2114) {KIKO}

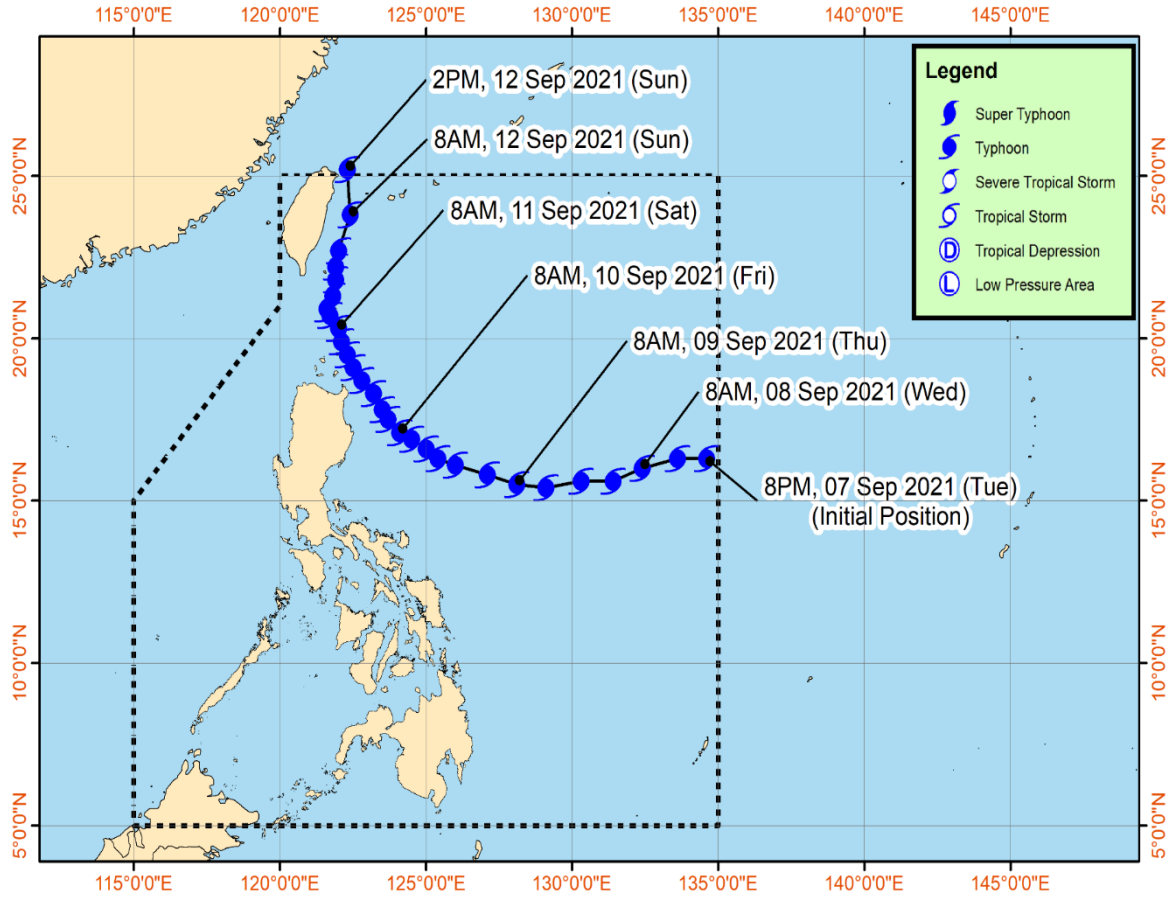


Figure 5. Operational track of Ty Chantu (Kiko) from 07 - 12 September 2021.

**Chronology of Ty "CHANTHU" (2114) {KIKO}**

- 6 September – developed into a Tropical Depression (TD) West of Guam (outside PAR).
- 7 September (morning) – intensified into a Tropical Storm (TS) west of northern Marianas and was named "CHANTU".
- 7 September (afternoon) – intensified into a Severe Tropical Storm (STS).
- 7 September (evening) – rapidly intensifies into a Typhoon as it enters the Philippine Area of Responsibility.
- 8 September – continues to intensify as it moves westward over the Philippine Sea.
- 9 September – intensifies further as it began to move west-northwest over the Philippine Sea.
- 10 September – began to move northwest towards extreme northern Luzon.
- 11 September – made landfall over Ivana, Batanes, and began to move north-northeastward over the Bashi Channel.
- 12 September – slightly weakens as it exited the Philippine Area of Responsibility (PAR).

**Highest Peak Gust over land During the Passage of Chanthu**

| Station | Gustiness (mps) | Date and Time observed (UTC) |
|---|---|---|
| (98134) Basco, Batanes | 86 | 10 September (2350) |
| (98132) Itbayat, Batanes | 40 | 11 September (0100) |
| (98133) Calayan, Cagayan | 30 | 10 September (2000) |

**Lowest Mean Sea Level Pressure over land During the Passage of Chanthu**

| Station | Mean Sea Level Pressure (hpa) | Date and Time observed (UTC) |
|---|---|---|
| (98134) Basco, Batanes | 927.8 | 11 September (0000) |
| (98133) Calayan, Cagayan | 996.2 | 10 September (1900) |

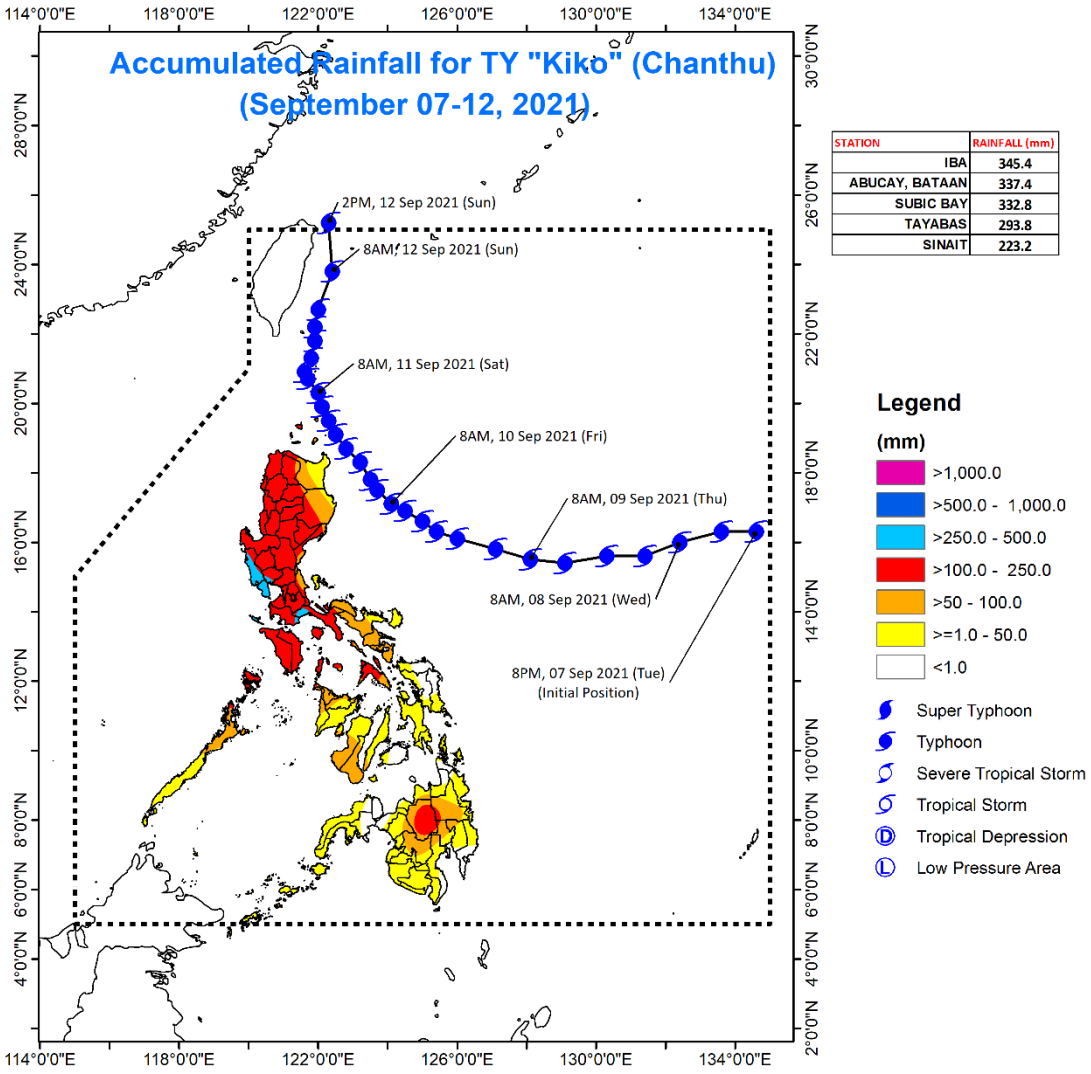


Figure 5A. Accumulated rainfall with operational track of Ty Chanthu from 07- 12 September 2021.

"**Chantu**" brought moderate to heavy rains over Luzon.

- Damages to Agriculture - ₱37.35M (US$0.74M)
- Casualties: Injured - 27

Source: NDRRMC Sitrep #7 (17 September 2021)

## 6. TD LANNIE {LIONROCK} 2117

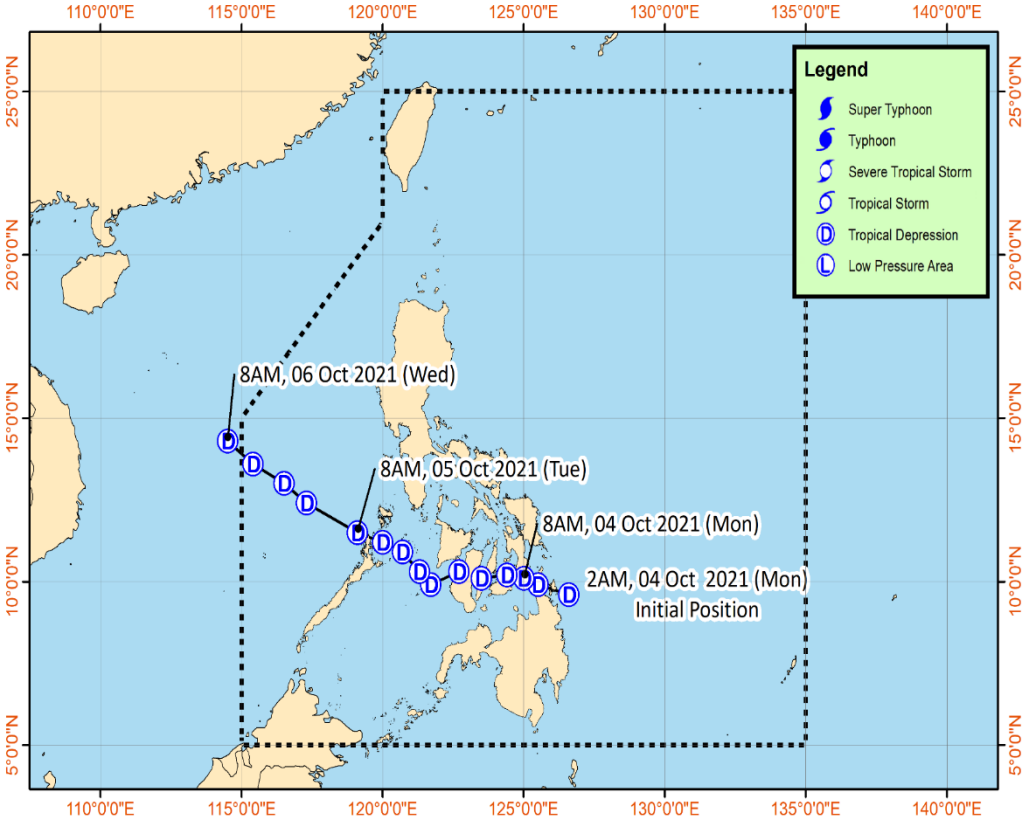


Figure 6. Operational track of TD Lannie (Lionrock) from 04 - 06 October 2021.

**Chronology of TD Lannie (Lionrock) (2117)**

- 04 October – developed into a Tropical Depression (TD) from a low-pressure area (LPA) east of Mindanao and given the domestic name "Lannie". Made landfall on the following areas:
  1st Bucas Grande Island, Socorro, Surigao del Norte
  2nd Cagdianao, Dinagat Islands
  3rd Liloan, Southern Leyte
  4th Padre Burgos, Southern Leyte
  5th Mahanay Island, Talibon, Bohol
  6th Banacon Island, Jetafe, Bohol
  7th Guihulngan, Negros Oriental
  8th San Fernando, Cebu
- 05 October – continues to move northwest over the Sulu towards northern Palawan and made landfall again over:
  9th Iloc Is., Linapacan, Palawan
  10th El Nido, Palawan
- 06 October – exited the Philippine Area of Responsibility (PAR).

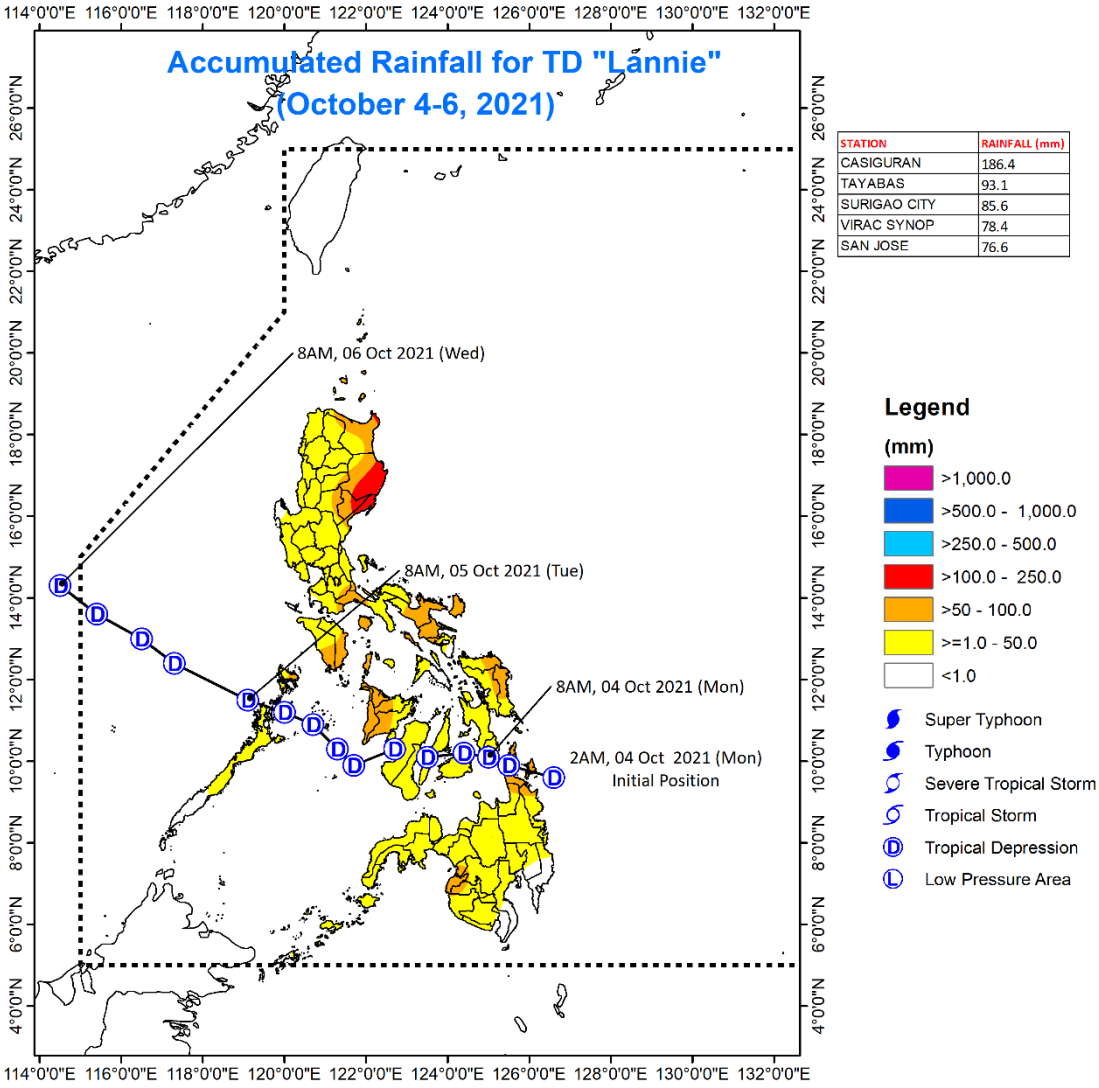


Figure 6A. Accumulated rainfall with operational track of TD Lionrock from 04- 06 October 2021.

"**Lionrock**" brought light to moderate with at times heavy rains over the eastern Luzon.

- Damages to Agriculture - ₱12.23M (US$0.24M)
- Casualties: Dead – 3

Source: NDRRMC Sitrep #4 (11 October 2021)

## 7. SEVERE TROPICAL STORM "KOMPASU" {2118} MARING

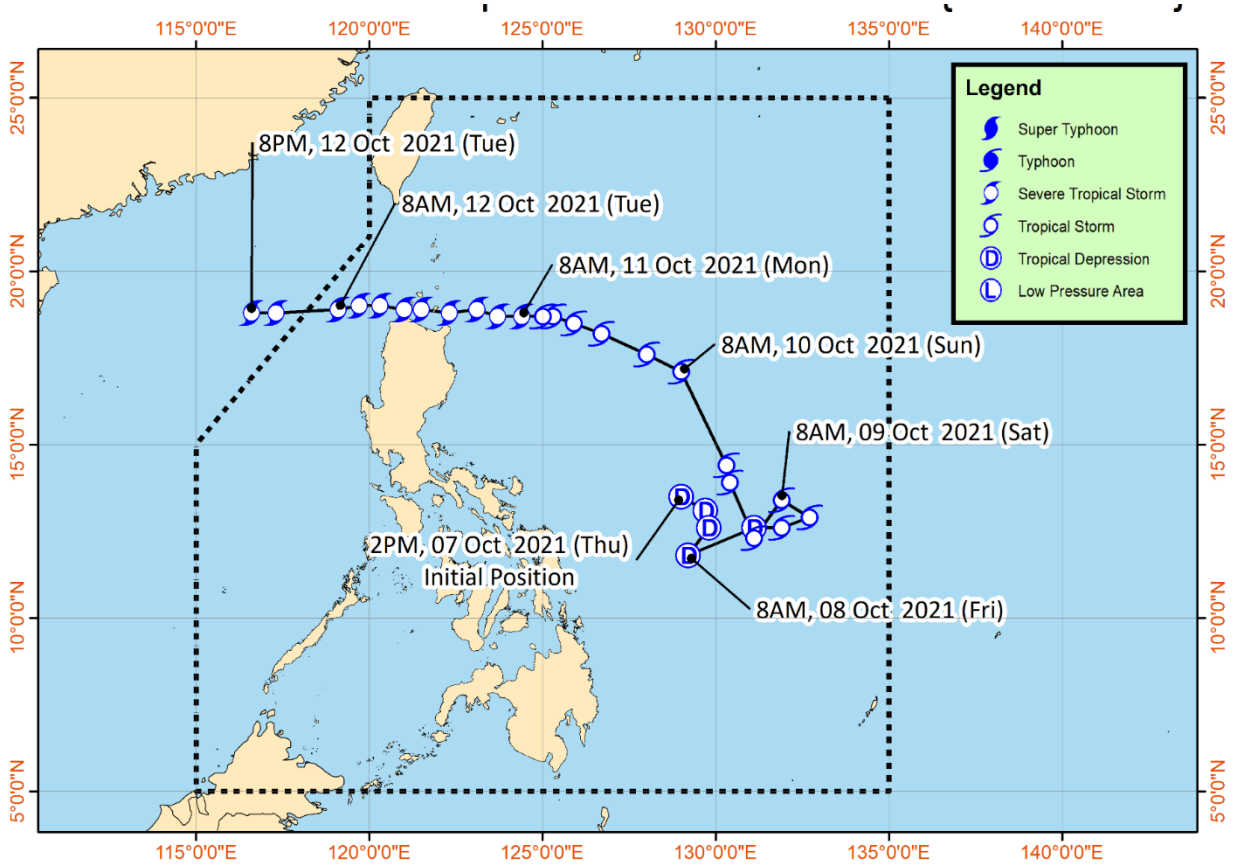


Figure 7. Operational track of STS Kompasu (Maring) from 08 - 12 October 2021.

**Chronology of TS "KOMPASU" {2118} MARING**

- 07 October – developed into Tropical Depression (TD) east of southern Luzon inside the PAR.
- 08 October – slightly intensifies while moving erratically over the Philippine Sea
- 08 October (evening) – intensifies into a (larger) Tropical Storm
- 09 October – intensifies further over the Philippine Sea and interacts with another circulation.
- 10 October – merged with the remnants of the other circulation and began to move west-northwest towards Luzon Strait.
- 11 October – intensifies into a Severe Tropical Storm (STS) and made landfall in the vicinity of Fuga Island, Cagayan.
- 12 October – slightly intensifies and continues to move away from the extreme northern Luzon and exited the Philippine Area of Responsibility (PAR).

**Highest Peak Gust over land During the Passage of Kompasu**

| Station | Gustiness (mps) | Date and Time observed (UTC) |
|---|---|---|
| (98134) Basco, Batanes | 34.0 | 11 October (0606) |
| (98133) Calayan, Cagayan | 28.0 | 11 October (1400) |
| (98132) Itbayat, Batanes | 25.0 | 11 October (0403) |

**Lowest Mean Sea Level Pressure over land During the Passage of Kompasu**

| Station | Mean Sea Level Pressure (hpa) | Date and Time observed (UTC) |
|---|---|---|
| (98223) Laoag City, Ilocos Norte | 979.6 | 11 October (1800) |
| (98133) Calayan, Cagayan | 980.7 | 11 October (1200) |
| (98232) Aparri, Cagayan | 980.8 | 11 October (1100) |
| (98233) Tuguegarao, Cagayan | 985.8 | 11 October (1230) |
| 98134) Basco, Batanes | 986.0 | 11 October (1800) |

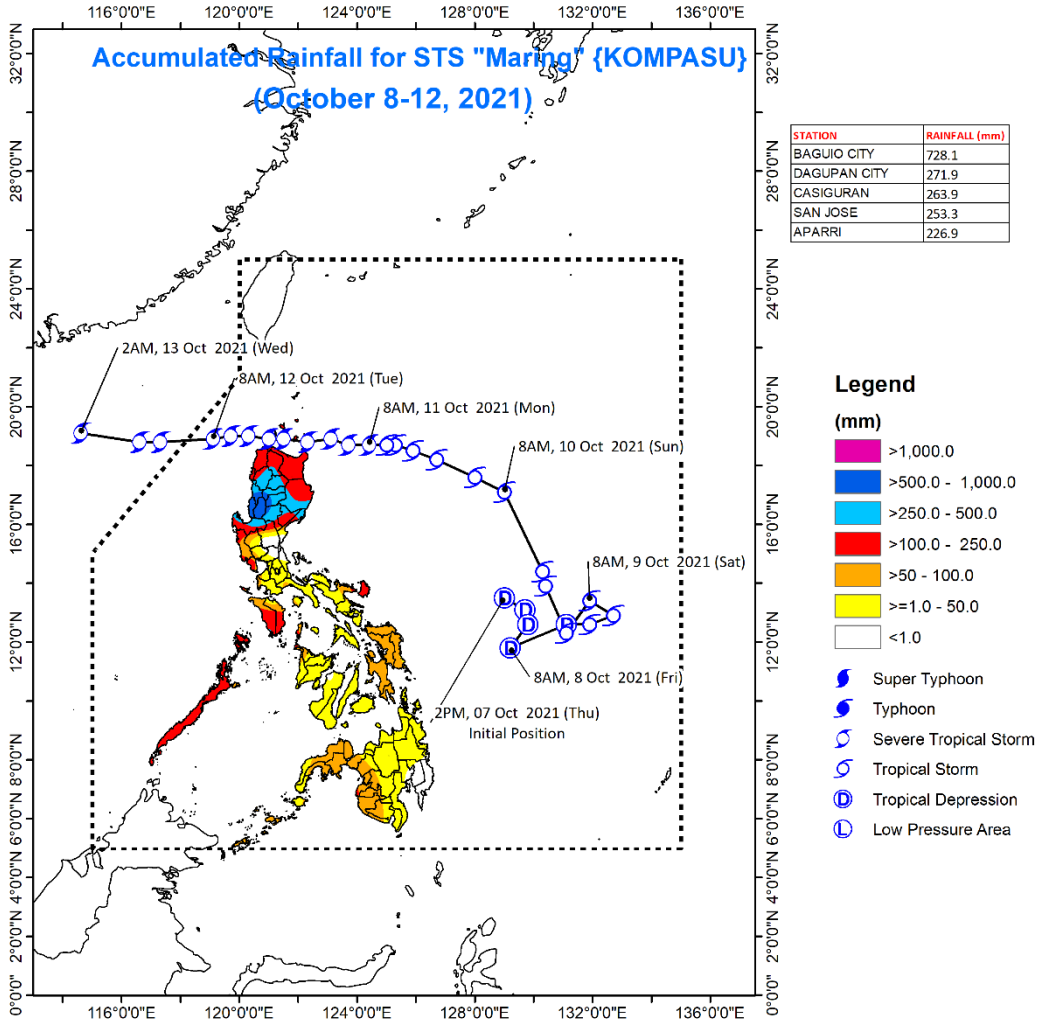


Figure 7A. Accumulated rainfall with operational track of STS Kompasu from 08- 12 October 2021.

"**Kompasu**" brought heavy to intense rains over the northern Luzon.

- Damages to Agriculture - ₱3.27B (US$64.60M)
- Damages to Infrastructure - ₱3.12B (US$61.64M)
- Casualties: Dead – 43, Injured – 5, Missing – 16

Source: NDRRMC Sitrep #15 (31 October 2021)

# Tropical Cyclones that indirectly affects the Philippines in 2021

## I. Typhoon "SURIGAE" {2102} "Bising"

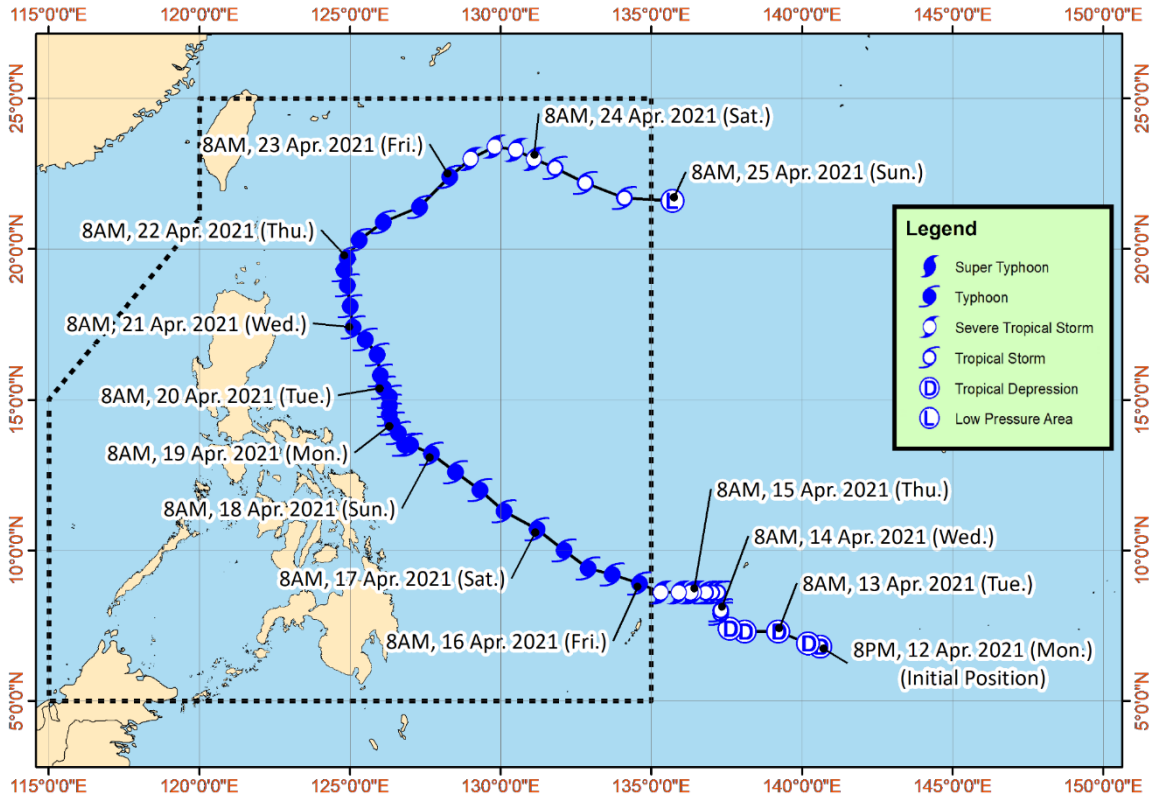


Figure I. Operational track of Ty Surigae (Bising) from 12 - 25 April 2021.

**Chronology of Ty "SURIGAE" {2102} "Bising"**

- 12 April – developed into a Tropical Depression (TD) east of Mindanao outside PAR.
- 14 April – intensifies into a Tropical Storm and was named "SURIGAE".
- 15 April – intensifies into a Severe Tropical Storm (STS).
- 16 April – enters the PAR and intensifies into a Typhoon.
- 17 April – rapidly intensifies while moving northwestward over the Philippine Sea.
- 18 April – slightly weakens while moving slowly over the Philippine Sea
- 19 April – begins to move northward and weakens slightly.
- 20 April – further weakens and continues to move northward slowly.
- 22 April – continues to weaken and moves north-northeastward.
- 23 April – weakens into a Severe Tropical Storm (STS).
- 24 April – weakens into a Tropical Storm (TS).
- 25 April – transitions into an extratropical cyclone and is now outside the Philippine Area of Responsibility (PAR).

**Highest Peak Gust over land During the Passage of Surigae**

| Station | Gustiness (mps) | Date and Time observed (UTC) |
|---|---|---|
| (98446) Virac, Catanduanes | 30.0 | 18 April (2300) |

**Lowest Mean Sea Level Pressure over land During the Passage of Surigae**

| Station | Mean Sea Level Pressure (hpa) | Date and Time observed (UTC) |
|---|---|---|
| (98553) Borongan, Eastern Samar | 996.3 | 18 April (0600) |

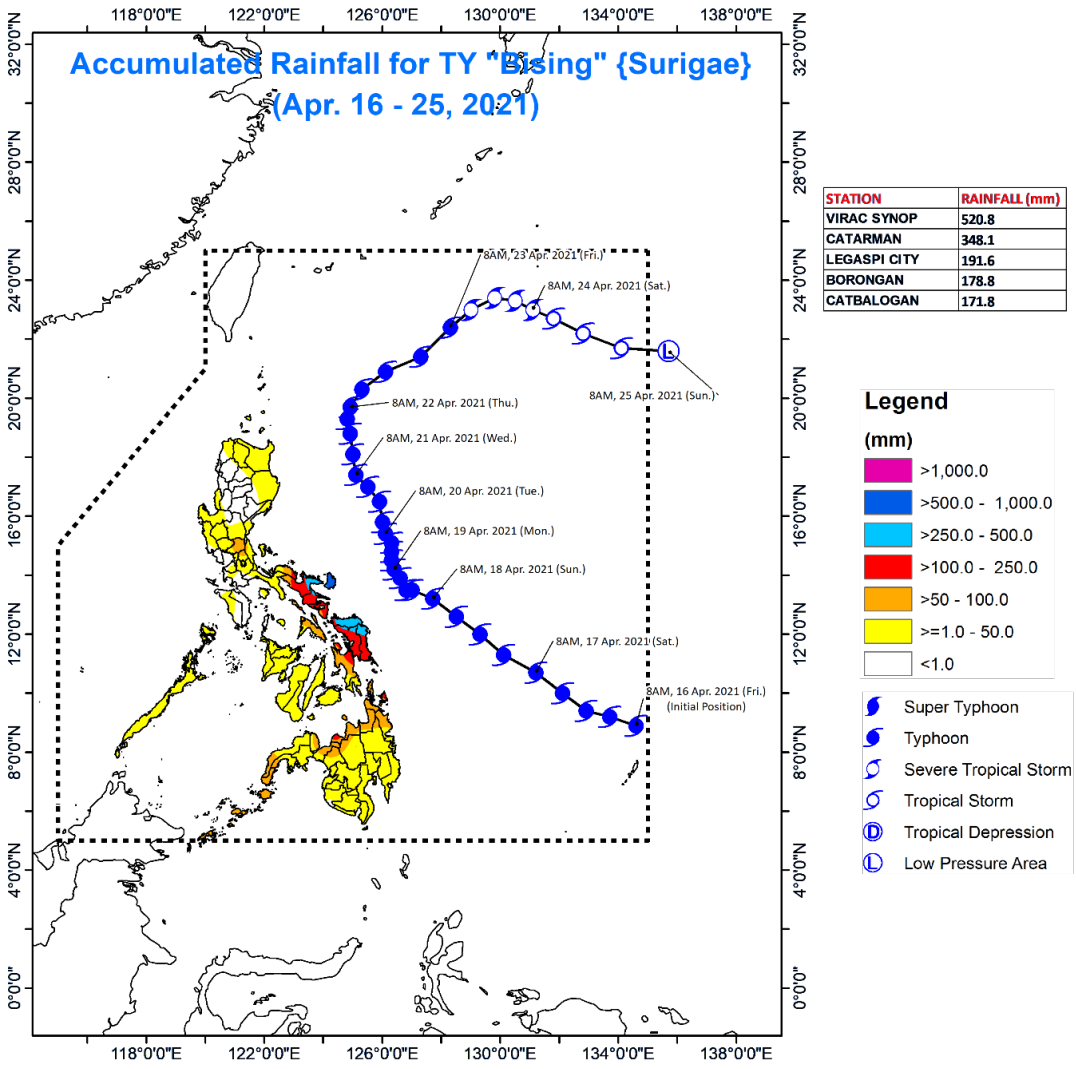


Figure IA. Accumulated rainfall with operational track of Ty Surigae from 16- 25 April 2021.

"**Surigae**" brought moderate to heavy rains over the eastern Visayas.

- Damages to Infrastructure - ₱10.87M(US$0.22M)
- Damages to Agriculture - ₱ 261.91M (US$5.2M)
- Casualties: Dead – 9, Injured – 20

Source: NDRRMC Sitrep #16 (12 May 2021)

## II. Typhoon INFA {2106} “Fabian”

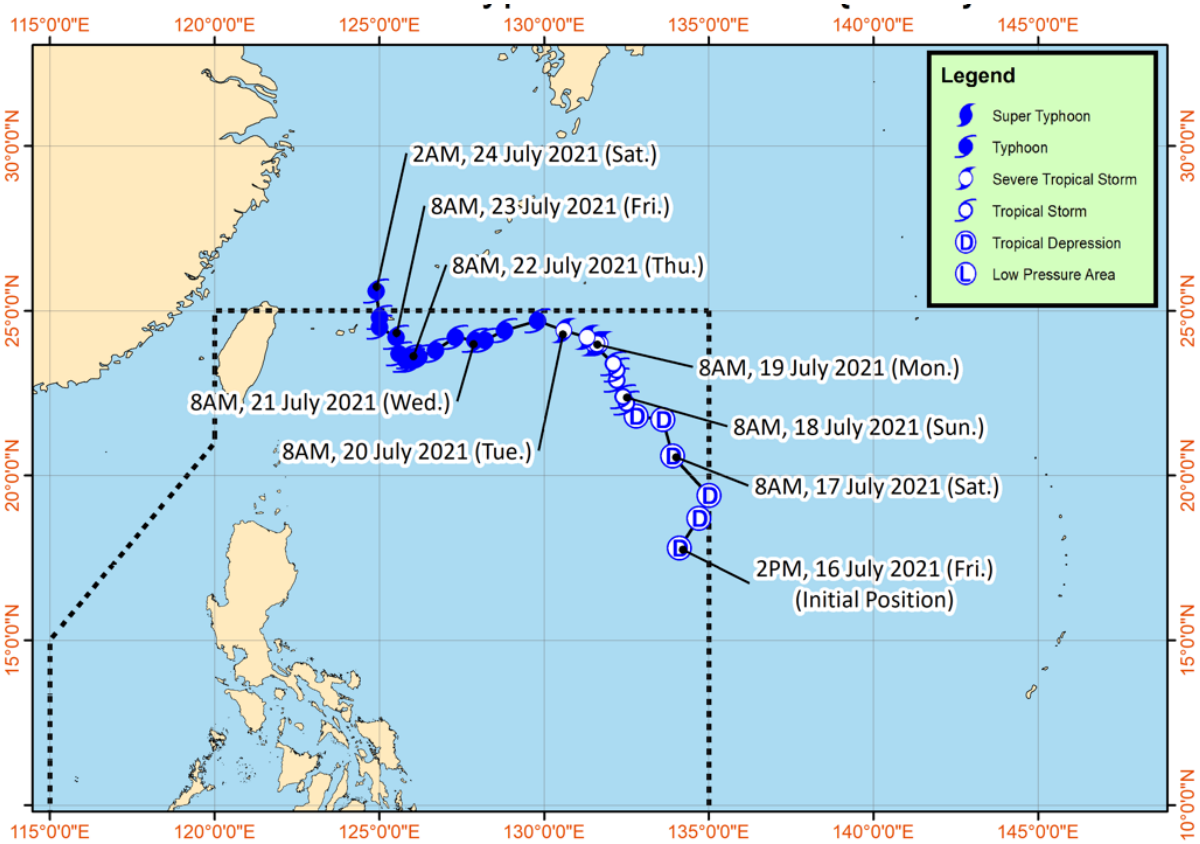


Figure II. Operational track of Ty In-Fa (Fabian) from 16 - 24 July 2021.

**Chronology of Ty INFA {2106} “Fabian”**

- 16 July – developed into a Tropical Depression East of Northern Luzon
- 18 July – intensifies into a Tropical Storm
- 19 July – intensifies into a Severe Tropical Storm while it remains almost stationary
- 20 July – intensifies into a Typhoon
- 21 July – further intensifies while slowly moving westward
- 24 July – slightly weakens and exited the Philippine Area of Responsibility (PAR)

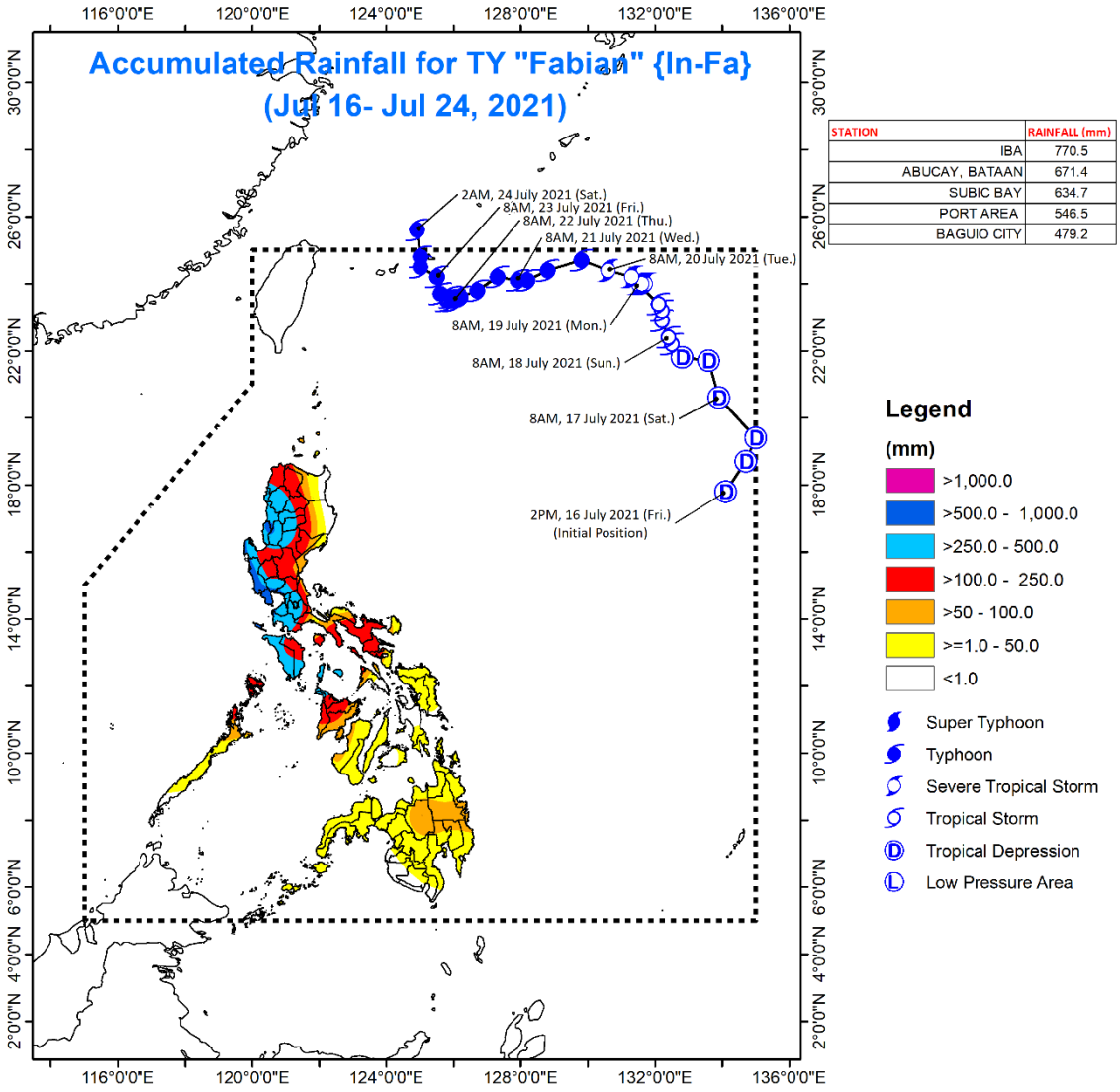


Figure IIA. Accumulated rainfall with operational track of Ty In-Fa from 16- 24 July 2021.

"**In-Fa**" brought heavy to at times intense rains over the eastern Luzon.

- Damages to Infrastructure - ₱459.80M (US$9.15M)
- Damages to Agriculture - ₱ 743.22M (US$14.80M)
- Casualties: Dead – 6, Injured – 7, Missing – 1

Source: NDRRMC Sitrep #12 (21 September 2021)

## 1. Meteorological Assessment (highlighting forecasting issues/impacts)

- Prediction of direct tropical cyclone (TC) and TC-induced high precipitation events especially those involving weak systems or systems with complex environmental interaction, and an integrated flash-flood and landslide model to guide high impact weather warnings.
- Intensity forecasts struggle to capture rapid intensification or rapid weakening events, especially in cases wherein a TC is compact and not captured well by the model guidance (e.g., Typhoon Conson)
- Availability and ease of accessibility of model guidance for the prediction of radii for winds of at least BF6, BF8, BF10, and BF12 to aid in the provision of land and sea warnings for severe winds.
- Storm surge prediction and shallow water wave prediction remain an issue due to the absence of high-resolution modeling and high-resolution bathymetry data for coastal and inshore waters. In addition, there is an immediate need to establish an integrated ocean prediction system to provide a seamless prediction of waves, currents, and storm surges (with the possibility of employing a coastal inundation model).
- In general, cases when numerical models struggle to handle weak or complex TC progenitors such as monsoon depressions, merger systems, and weak depressions pose a difficulty when providing an early warning when these systems are close to the Philippine landmass
- Model guidance data that are provided via the WMO Global Telecommunication System are usually available in the table-driven format, without a counterpart alphanumeric format that can be easily interpreted manually. However, during rapidly-developing situations when fast decisions are needed, using table-driven formats may not always be the best format to handle due to the need for additional processing.
- The decommissioning of MetOp-A (and its ASCAT instrument), as well as the imminent retirement of other legacy satellites, poses a big challenge in TC operations, especially in developing countries that rely on open accessibility of data from these sensors.
- Much of the openly accessible TC datasets are provided in graphical formats only, with only a handful that has accessible raw data formats that can be further processed or ingested in natively-developed workstation suites of other centers.

## 2. Hydrological Assessment (highlighting water-related issues/impact)

- The 7 tropical cyclones that made landfall, caused widespread impacts like flooding, landslides, which results in damages to infrastructures and agricultures. Some infrastructures are partially damaged while some are

damaged. There were several casualties especially during the passage of typhoon Conson and severe tropical storm Kompasu. However, there are also tropical cyclones that indirectly affect the Philippines (e.g., Typhoon Surigae and Typhoon In-fa) that cause heavy flooding (source: NDRRMC's situational reports on tropical cyclones).

- PAGASA issued Flood Bulletins for the telemetered River Basin and Flood Advisories for Non-Telemetered River Basin in Luzon and some regions in Visayas and Mindanao during the passage of these tropical cyclones.