MEMBER REPORT
Philippines

ESCAP/WMO Typhoon Committee
17th Integrated Workshop
(Video Conferencing)
29-30 November 2022

CONTENTS

I. Overview of the tropical cyclones which have affected/impacted Member's area since the last Committee Session

A total of 17 tropical cyclones (TCs) were observed within the Philippine Area of Responsibility (PAR) from 01 January to 03 November 2022 (tracks shown in Fig. 1.1). Twelve of the 17 TCs developed within the PAR. A total of 5 TCs made landfall over the Philippine archipelago – Tropical Storm Agaton (2202 Megi), Severe Tropical Storm Florita (2209 Ma-On), Super Typhoon Henry (2211 Hinnamnor), Super Typhoon Karding (2216 Noru), Typhoon Neneng (2220 Nesat), and Typhoon Paeng (2222 Nalgae).

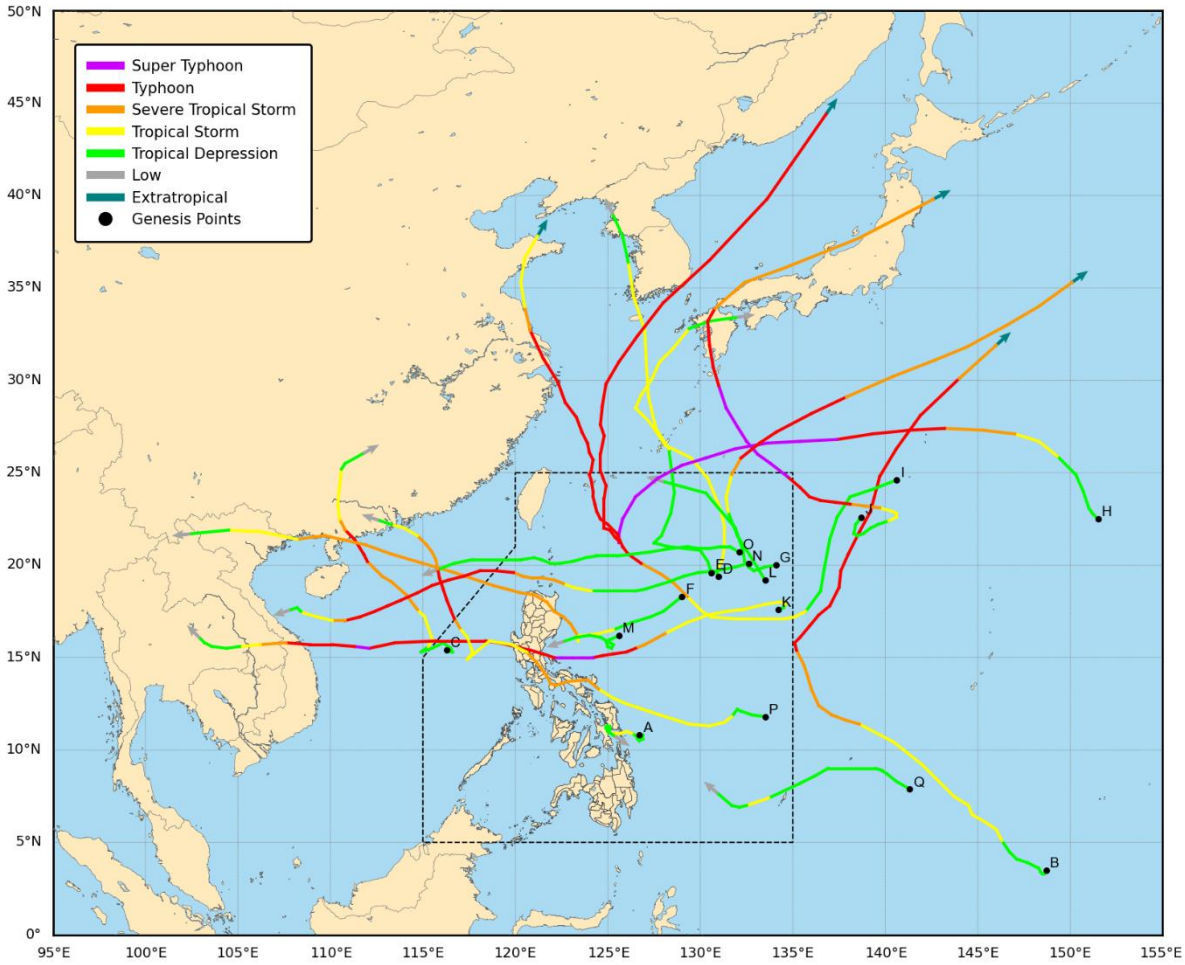


Fig. 1.1 PAGASA preliminary best track of TCs that entered or developed within the PAR in 2022. The filled circles in the tracks are the genesis points or locations where the TC was first noted as a tropical depression. The tracks are identified using the first letter of the domestic name of the TCs. Line color indicates the category of TC. The black dash line marks the limits of the PAR.

1. Meteorological and Hydrological Assessment (highlighting forecasting issues/impacts)

(1) Tropical Storm Agaton (2202 Megi)

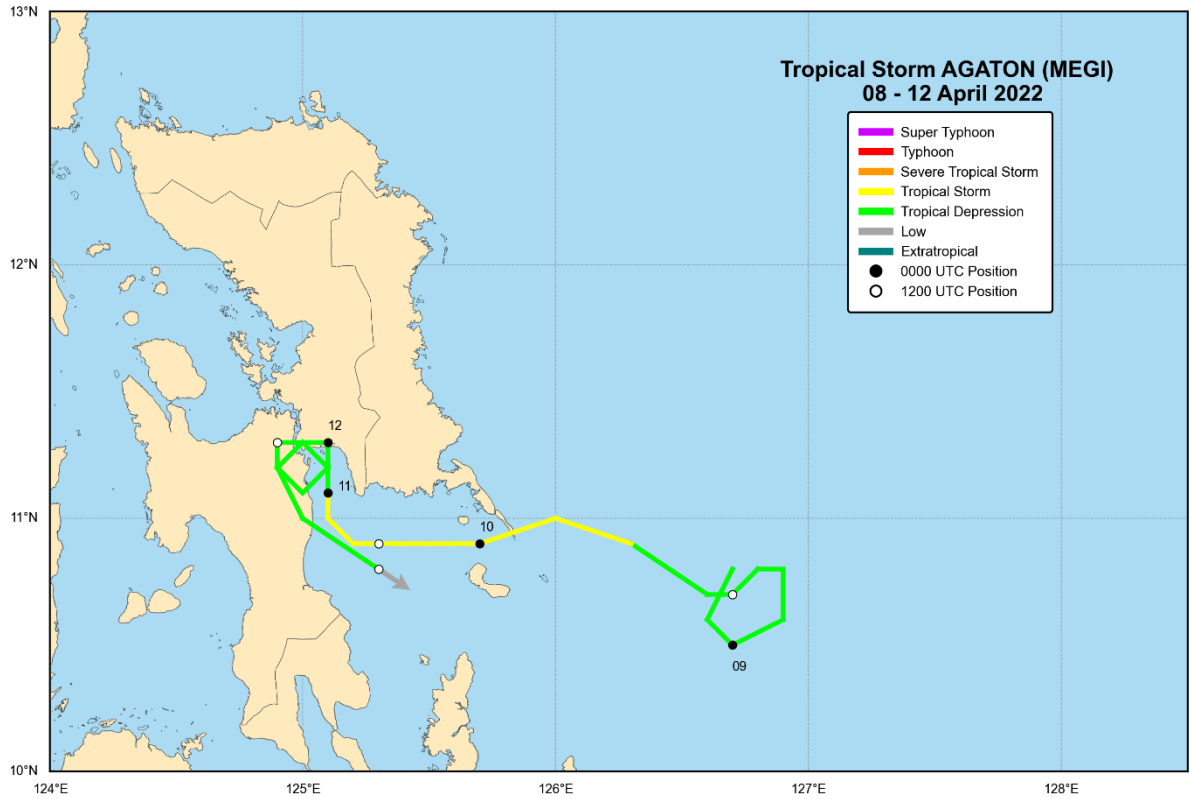


Fig. 1.2. Preliminary best track positions and intensities of Tropical Storm Megi.

The 1st TC that made landfall over the Philippine archipelago, Megi, was first noted as tropical depression at 18 UTC of 08 April while over the Philippine Sea east of Visayas. It intensified into a tropical storm the next day as it moved towards the landmass of Eastern Visayas. Megi exhibited an erratic movement while over the landmass of northeastern portion of Leyte, then moved slowly southwestward and weakened into a remnant low on the evening of 12 April.

The genesis of Megi and its erratic movement were anticipated, however the scenario of tracking further inland was not well captured by the global models.

As this tropical storm meandered inland, it dumped torrential rains which resulted in massive flooding and landslides in Eastern Visayas. The station in Baybay, Leyte recorded a total accumulated rainfall of 996.8 mm and the rest of the synoptic stations located in Eastern Visayas reported more than 200 mm. As this tropical storm moved further inland, 453.8 mm of accumulated rainfall was observed in Mambusao, Capiz (located in Western Visayas) and more than 300 mm mostly in the northern portion of Central Visayas. In all PAGASA's stations with more than 100 mm of storm-duration rainfall, all except one exceed their monthly normal

values. In particular, nine stations received storm-duration rainfall that is more than twice of their monthly average rainfall.

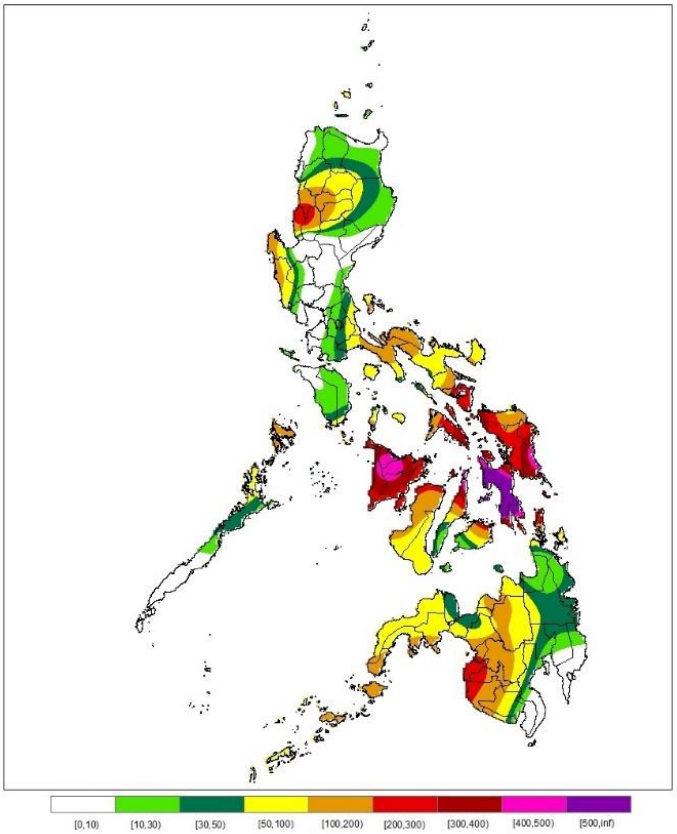


Fig. 1.3. Spatial interpolation of the accumulated rainfall (mm) for the period of 08 to 12 April 2022 from reports of PAGASA synoptic and agromet stations.

Fig. 1.4. Landslide in Baybay, Leyte. Photo by Buloron Kent.

Fig. 1.5. Floodings in Western Visayas. Photo by Ma. Theresa Ramil-Valencia.

(2) Typhoon Basyang (2201 Malakas)

Malakas was first noted as tropical depression at 00 UTC of 06 April 2022. While tracking generally northwestward, it intensified into a tropical storm on the morning of 08 April and was upgraded to severe tropical storm category at 06 UTC of 10 April. Malakas then recurved from its initial northwestward track to northeastward, entering the eastern boundary of the PAR. On the morning of 12 April, it further intensified into a typhoon. After reaching its peak intensity, while moving northeastward, it was downgraded into severe tropical storm category at 12 UTC of 15 April. After 12 hours, it transitioned into an extratropical low.

Due to the sheer distance of this tropical cyclone from the Philippine landmass, it did not directly affect the country.

(3) Typhoon Caloy (2203 Chaba)

Chaba developed into a tropical depression at 12 UTC of 28 June. It then intensified into a tropical storm on the morning of 30 June while moving northwestward over the West Philippine Sea. Chaba further intensified into a severe tropical storm on the early morning of the next day and into typhoon at 18 UTC of 01 July, as it moved towards the southern China. As it tracked inland, Chaba began to weaken and was noted as remnant low at 00 UTC of 04 July.

Chaba did not directly cause heavy rainfall over the country. However, the Southwest Monsoon and the monsoon trough enhanced by the tropical cyclone brought monsoon rains over Luzon and Western Visayas.

(4) Tropical Storm Domeng (2204 Aere)

The low pressure area along the monsoon trough developed into a tropical depression Aere on the afternoon of 30 June. It generally moved northward over the Philippine Sea and after 12 hours, it was upgraded to tropical storm. From northward to north northwestward track, it passed over Okinawa Islands, then gradually turned north northeastward towards the southwestern Japan's Kyushu region. As it moved further inland, it weakened into a tropical depression and into a remnant low on 18 UTC of 04 July and 06 UTC of 05 July, respectively.

Throughout the occurrence of Aere within the PAR, the Southwest Monsoon and the monsoon trough brought heavy rains over Northern Luzon and the western sections of Central and Southern Luzon. Heavy rainfall in the afternoon through evening due to thunderstorms were observed over most parts of Mindanao.

(5) Tropical Storm Ester (2206 Trases)

Trases was first noted as tropical depression on the early morning of 29 July. It intensified into a tropical storm at 00 UTC of 31 July as it moved over Okinawa. While tracking northward, the tropical cyclone made another landfall in Jeju Island, South Korea, and continued to move northward in the outskirts of Korean Peninsula. Due to land interaction, Trases was downgraded to remnant low at 00 UTC of 02 August.

Trases did not directly affect the country. However, the Southwest Monsoon enhanced by the tropical cyclone dumped heavy rains over several provinces in Luzon and Western Visayas.

(6) Severe Tropical Storm Florita (2209 Ma-on)

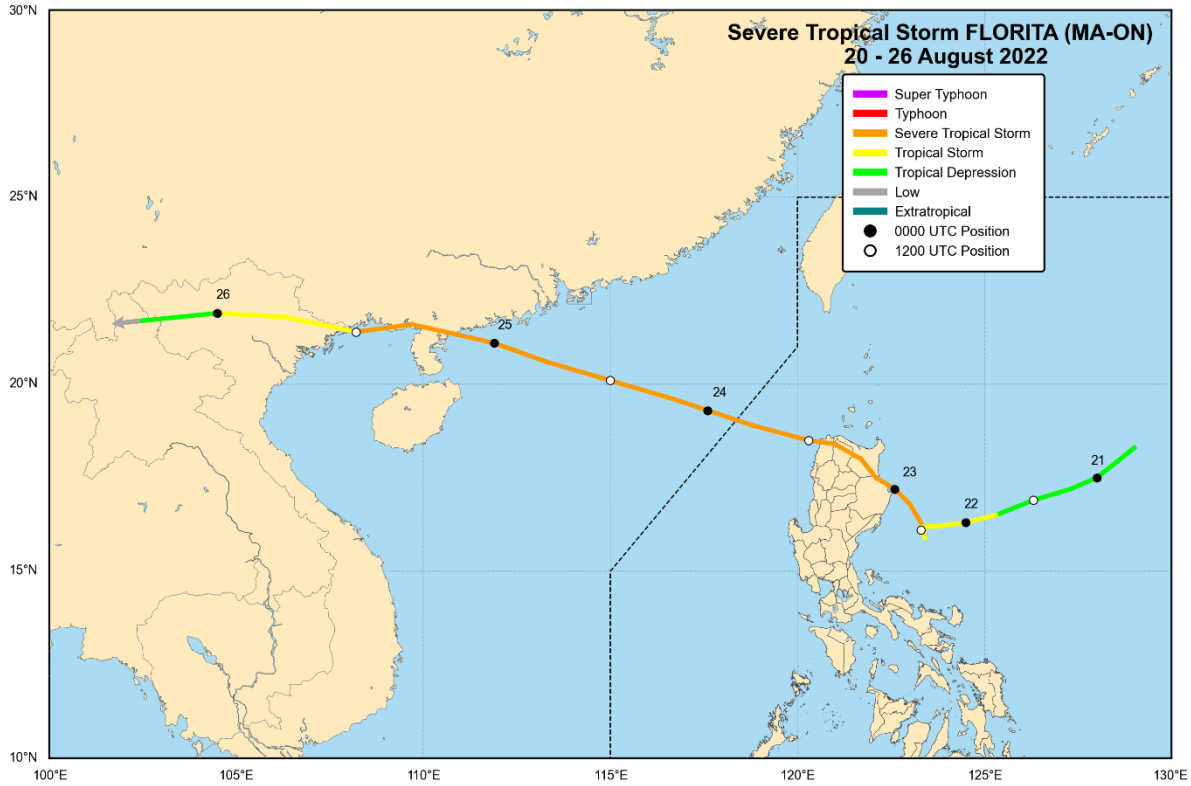


Fig. 1.6. Preliminary best track positions and intensities of Severe Tropical Storm Ma-on.

The 2nd TC that made landfall over the Philippine archipelago, Ma-on, developed into a tropical depression at 18 UTC of 20 August. The next day, while moving generally southwestward, it intensified into a tropical storm. After the low-level circulation center of the tropical cyclone has been obscured by a convection burst, at 18 UTC of 22 August, Ma-on was upgraded into a severe tropical storm and began to move north northwestward. After 6 hours, it reached its peak intensity of estimated maximum winds of 60 kt and central pressure of 985 hPa and made landfall in the vicinity of Maconacon, Isabela at 0230 UTC. After the landfall, the tropical cyclone slightly weakened but remained severe tropical storm while traversing the rugged terrain of Northern Luzon. Ma-on re-intensified while moving over the West Philippine Sea. After it made its another landfall in the southern portion of China, it weakened into a tropical storm on the evening of 25 August. Further weakening was observed as the tropical cyclone moved further inland and it was downgraded into a remnant low at 06 UTC of 26 August.

The main challenge in forecasting this tropical cyclone was the timing of the shift from southwestward to northwestward track, considering its proximity to the landmass and the sharp north northwestward turn.

The passage of MA-ON brought heavy rains in Northern Luzon and the western portion of Central Luzon which resulted in floodings and landslides.

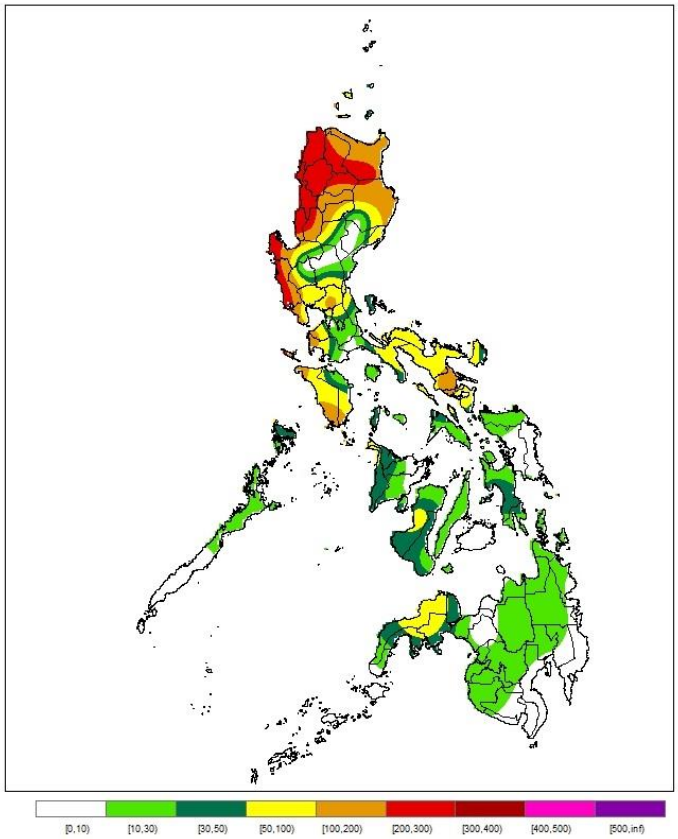


Fig. 1.7. Spatial interpolation of the accumulated rainfall (mm) for the period of 20 to 23 August 2022 from reports of PAGASA synoptic and agromet stations.

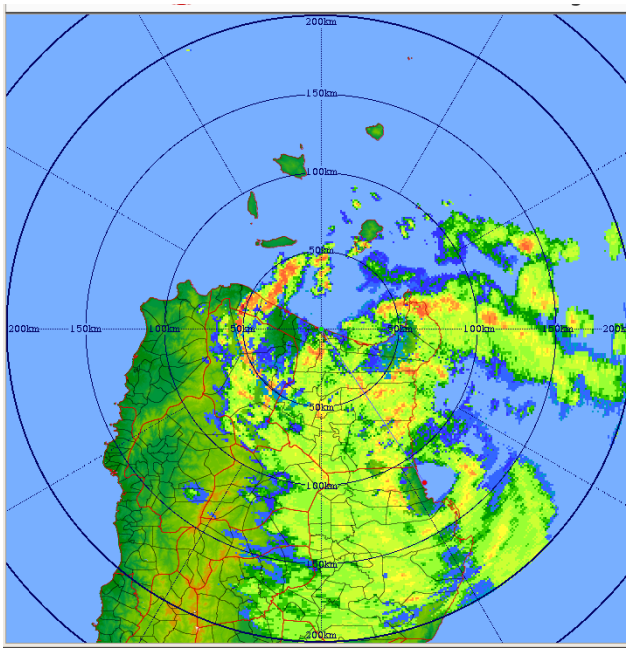


Fig. 1.8. Aparri Doppler Radar image at 0155 UTC, 23 August 2022.

Fig. 1.9. Flooding in Batac City, Ilocos Norte (left) and Dagupan Pangasinan (right). Photo by VPI Travel Ilocos and PIA Pangasinan.

(7) Tropical Depression Gardo (Unnamed)

Gardo is a short-lived tropical cyclone, embedded in a monsoon gyre, it was first noted as tropical depression on the morning of 30 August. Due to the binary interaction with Hinnamnor, the tropical cyclone moved generally westward before it turned north northwestward. Gardo weakened into a remnant low at 00 UTC of 01 September and was assimilated with the circulation of Hinnamnor.

(8) Super Typhoon Henry (2211 Hinnamnor)

Hinnamnor developed into a tropical depression on the morning of 27 August. The tropical cyclone initially moved northwestward and was upgraded into tropical storm at 06 UTC of 28 August. Afterwards, it tracked westward and further intensified into a severe tropical storm at 18 UTC of 28 August and into typhoon at 06 UTC of 29 August. As Hinnamnor continued to move westward, it was upgraded to super typhoon category on the morning of 30 August. On the next day, the tropical cyclone began to move southwestward as it entered the northern boundary of the PAR region. While moving over the northern part of the Philippine Sea, Hinnamnor slowed down and weakened into a typhoon at 18 UTC of 01 September. Afterwards, it gradually gained speed while tracking generally northward and cross over the southern Ryukyu Islands. Then, it continued to move northward and made landfall in the eastern portion of South Korea. As it moved towards the sea of Japan, Hinnamnor transitioned into an extratropical low at 12 UTC of 06 September.

Due to the large wind field of Hinnamnor, Tropical Cyclone Wind Signals were hoisted over the Batanes and some localities in Cagayan. Furthermore, the outer rainbands of the tropical cyclone and the enhanced Southwest Monsoon dumped heavy rains over Extreme Northern and the western sections of Luzon.

(9) Typhoon Inday (2212 Muifa)

Muifa was first noted as tropical depression at 06 UTC of 05 September. It initially moved west southwestward before turning generally southward. On the morning of 07 September, Muifa intensified into a tropical storm as it began to gradually turned westward, entering the eastern boundary of the PAR region. After 48 hours, from westward to northwestward track, the tropical cyclone further intensified into a severe tropical storm. While maintaining its northwestward track over the northern part of the Philippine Sea, Muifa was upgraded to typhoon category and on 12 September, it made landfall in the Ishigaki Island. Afterwards, it moved to a more northwestward track over the East China Sea, and crossed over Zhoushan, then made another landfall in the vicinity of Shanghai. Muifa then weakened into a severe tropical storm at 00 UTC of 15 September and after 6 hours, it was downgraded to tropical depression. It transitioned into an extratropical low at 00 UTC of 16 September.

Throughout the occurrence of Muifa, the outermost rainbands of the tropical cyclone and the Southwest Monsoon brought scattered rainshowers and thunderstorms over Batanes and the western sections of Central and Southern Luzon.

(10) Super Typhoon Josie (2214 Nanmadol)

Nanmadol was first noted as tropical depression at 00 UTC of 12 September. From a southwestward track, it turned to northeastward and intensified into a tropical storm at 18 UTC of 13 September. Afterwards, it sharply turned to northwestward and further intensified into a severe tropical storm at 18 UTC of 14 September. After 12 hours, Nanmadol was upgraded to typhoon category. After it underwent extremely rapid intensification, it was upgraded to super typhoon category at 12 UTC of 16 September. Nanmadol passed the northeastern edge of the PAR region, then maintained its northwestward heading towards the southern portion of Japan. Just before it moved in the vicinity of southern Japan, it was downgraded into typhoon category. Afterwards, it turned gradually from northwestward to northeastward. As it moved over the landmass, it weakened into a severe tropical storm at 00 UTC of 19 September and transitioned into an extratropical low after 24 hours.

Nanmadol did not directly affect the country due to its sheer distance from the archipelago and its short period of passage within the PAR.

(11) Super Typhoon Karding (2216 Noru)

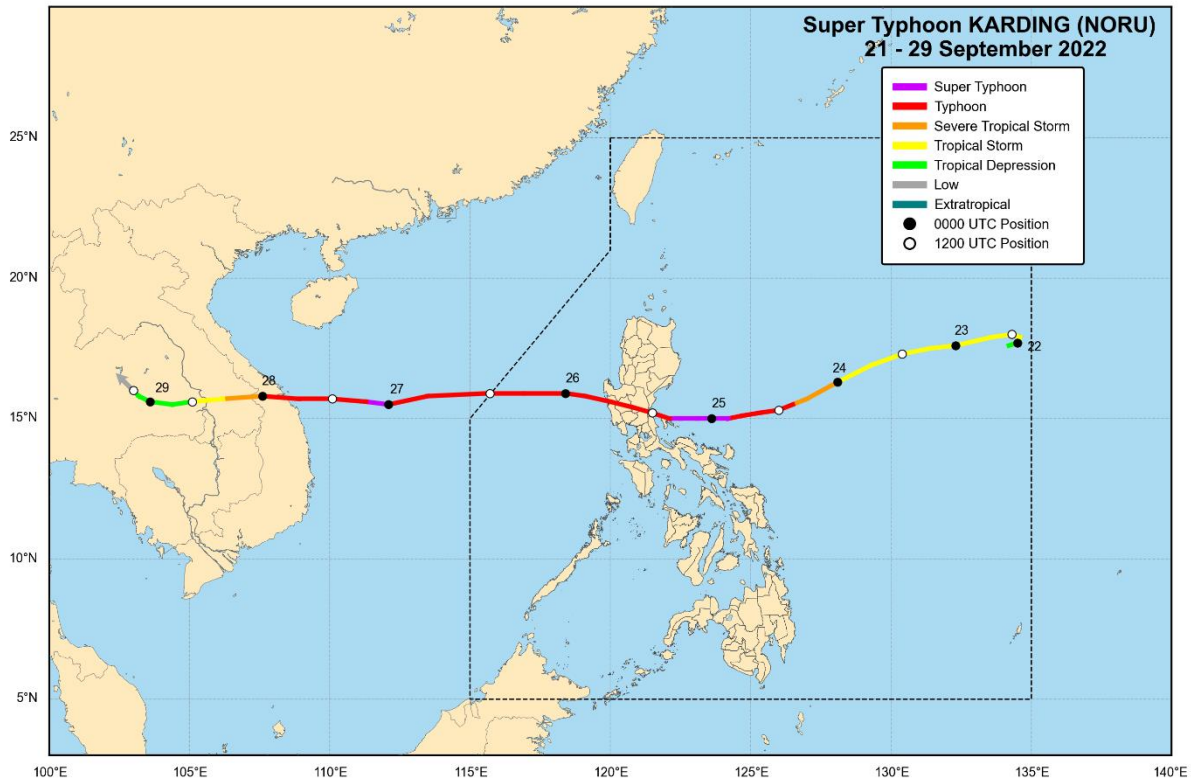


Fig. 1.10. Preliminary best track positions and intensities of Super Typhoon Noru.

Noru is the 3rd tropical cyclone that made landfall over the Philippine archipelago. It developed into a tropical depression at 18 UTC of 21 September. After a sharp turn from northeastward to northwestward, it was upgraded to tropical storm at 06 UTC of 22 September. Afterwards, Noru moved west southwestward. It further intensified into a severe tropical storm at 00 UTC of 24 September and after 12 hours, it was upgraded into a typhoon category. At 21 UTC of

the same day, as Noru began to shift from southwestward to westward track, it was upgraded to super typhoon category. At 00 UTC of 25 September, NORU underwent extremely rapid intensification reaching a peak intensity of estimated maximum winds of 105 kt and central pressure of 920 hPa. At 06 UTC of the same day, it slightly weakened and was downgraded to typhoon category at 09 UTC, prior to its landfall in the vicinity of Burdeos, Quezon. At around 1230 UTC, the center of Noru made another landfall in the vicinity of Dingalan, Aurora and continued to move over Central Luzon. It slightly weakened but remained typhoon category while traversing the landmass. After emerging over the West Philippine, Noru re-intensified and reached super typhoon category at 00 UTC of 27 September. After 6 hours, it weakened and was downgraded to typhoon category. It maintained its westward track towards the central portion of Vietnam. After it made landfall over the area, it was downgraded into a severe tropical storm at 00 UTC of 28 September. Moving further inland resulted to weakening into a remnant low at 12 UTC of 29 September.

Forecasting the track and intensity of Noru were a challenge. First, the timing of when will the tropical cyclone shift from southwestward to westward heading. Second, the model guidance was not able to capture well the structure of the TC, thus intensity forecasts guidance struggle to predict the extremely rapid intensification.

Noru dumped heavy rains which resulted to widespread flooding in Central Luzon and CALABARZON.

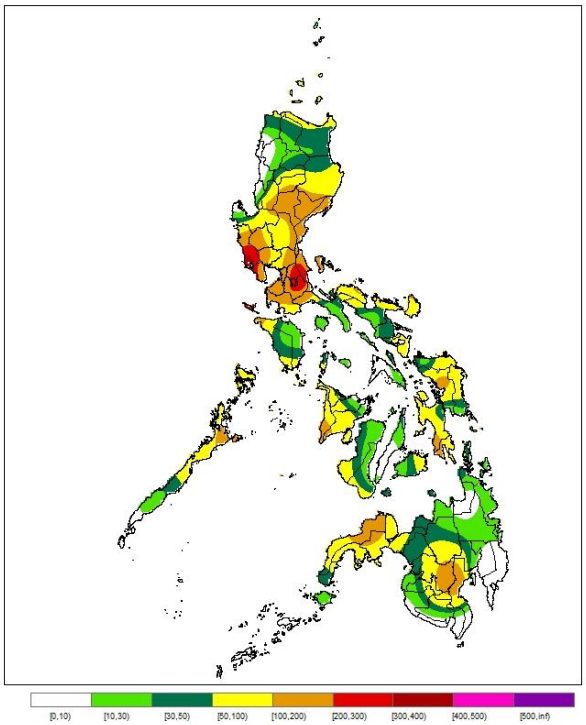


Fig. 1.11. Spatial interpolation of the accumulated rainfall (mm) for the period of 21 to 26 September 2022 from reports of PAGASA synoptic and agromet stations.

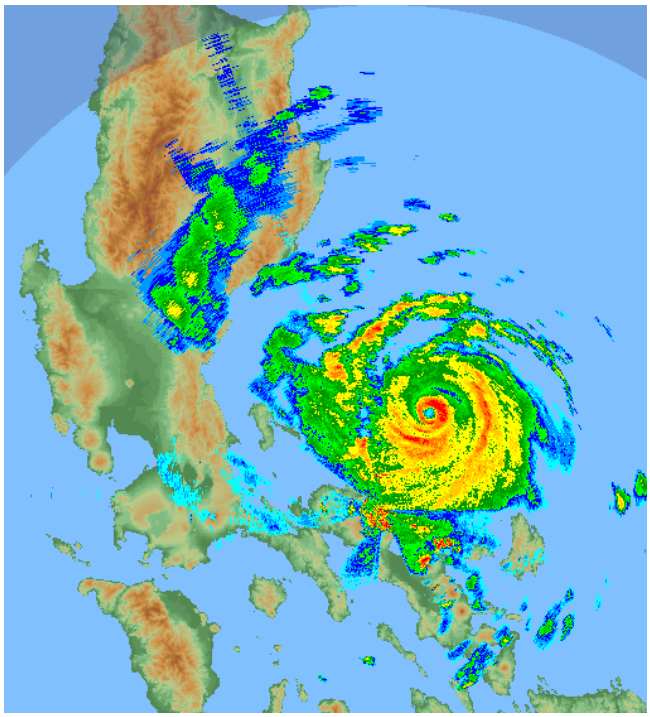


Fig. 1.12. Daet Doppler Radar image at 0120 UTC, 25 September 2022.

Fig. 1.13. (Left) Flooding in San Miguiel, Bulacan. (Right) Downed trees and electricity lines in Dingalan, Aurora. Photo by INQUIRER.net and Jenny Dongon.

(12) Typhoon Luis (2218 Roke)

Roke was first noted as tropical depression at 18 UTC of 27 September while moving north northwestward. On the evening of the next day, it intensified into a tropical storm and after 12 hours, it was upgraded into severe tropical storm. After it underwent rapid intensification, it was upgraded to typhoon category on the afternoon of 29 September and further intensified reaching its peak intensity with estimated maximum winds of 75 kt and central pressure of 970 hPa. After reaching its peak intensity, it began to weaken. It was downgraded to severe tropical storm at 06 UTC of 30 September and transitioned into an extratropical low at 18 UTC of 01 October while moving over the sea east of Japan.

(13) Tropical Depression Maymay (Unnamed)

Maymay developed into a tropical depression at 12 UTC of 10 October. It initially moved southwestward, then made a loop before tracking northwestward. Afterwards, due to the interaction with the northeasterly surge, it began to move a more west southwestward track. The hostile environmental condition resulted to Maymay becoming a remnant low at 18 UTC of 21 October, just before its approached to Central Luzon.

(14) Typhoon Neneng (2220 Nesat)

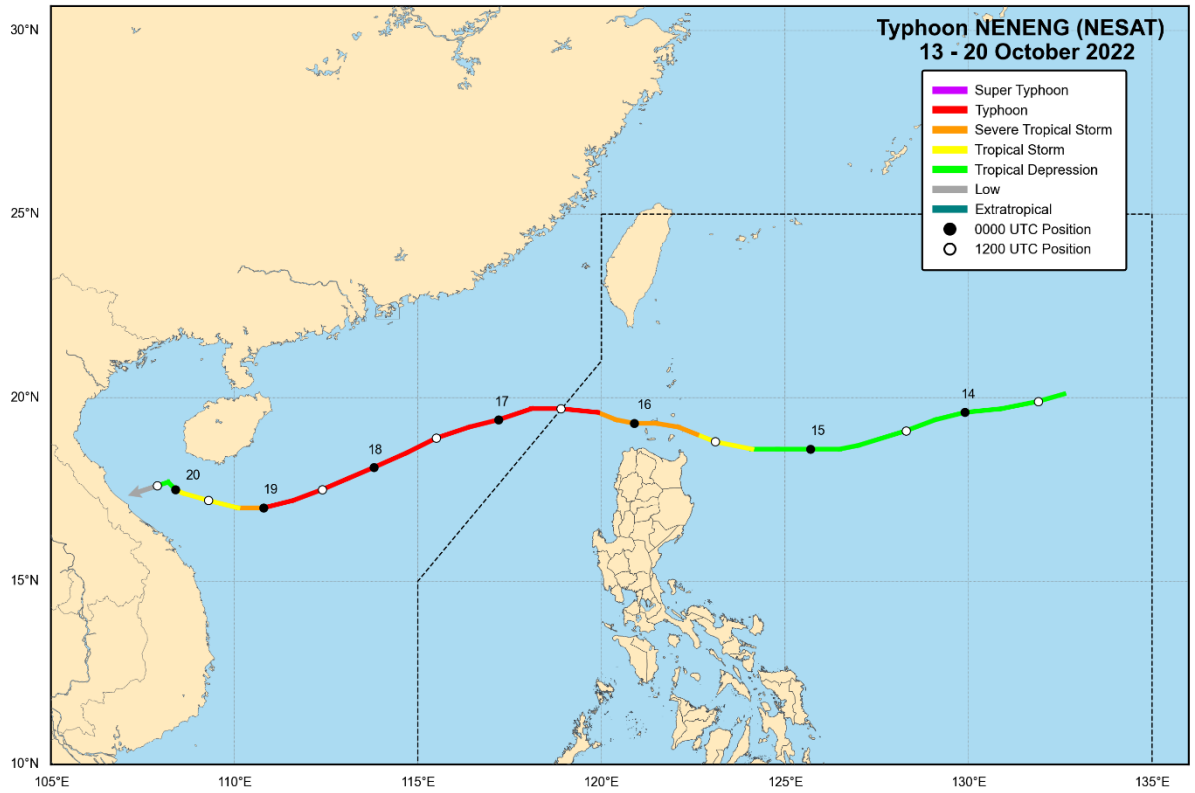


Fig. 1.14. Preliminary best track positions and intensities of Typhoon NESAT.

Nesat is the 4th landfalling tropical cyclone in the Philippines. It was first noted as tropical depression at 06 UTC of 13 October. For the next 2 days, it moved generally west southwestward, then turn west northwestward and was upgraded into a tropical storm at 06 UTC of 15 October. It further intensified into a severe tropical storm at 15 UTC of the same day. Afterwards, it made landfall over Calayan Island, Cagayan at 2050 UTC and further intensified into a typhoon at 06 UTC of 16 October while moving over the Luzon Strait. The next day, it began to move southwestward while over the West Philippine Sea and reached its peak intensity of estimated maximum winds of 80 kt and central pressure of 960 hPa. After reaching its peak intensity, weakening trend commenced and was downgraded into severe tropical storm at 00 UTC of 19 October. After 6 hours, it weakened into a tropical storm and further weakened into a remnant low at 12 UTC of 20 September, before it reached the coast of central Vietnam.

The passage of Nesat in Luzon Strait brought heavy rains in Northern Luzon. Due to the significant antecedent rainfall in the area, it resulted to scattered floodings and landslides.

(15) Tropical Depression Obet (Unnamed)

Obet was first noted as tropical depression at 18 UTC of 18 October. It remained as tropical depression throughout its lifespan while moving generally westward and pass very close to Batanes. Due to the dry entrainment from the northeasterlies, Obet weakened into a remnant low at 06 UTC of 23 October.

(16) Severe Tropical Storm Paeng (2222 Nalgae)

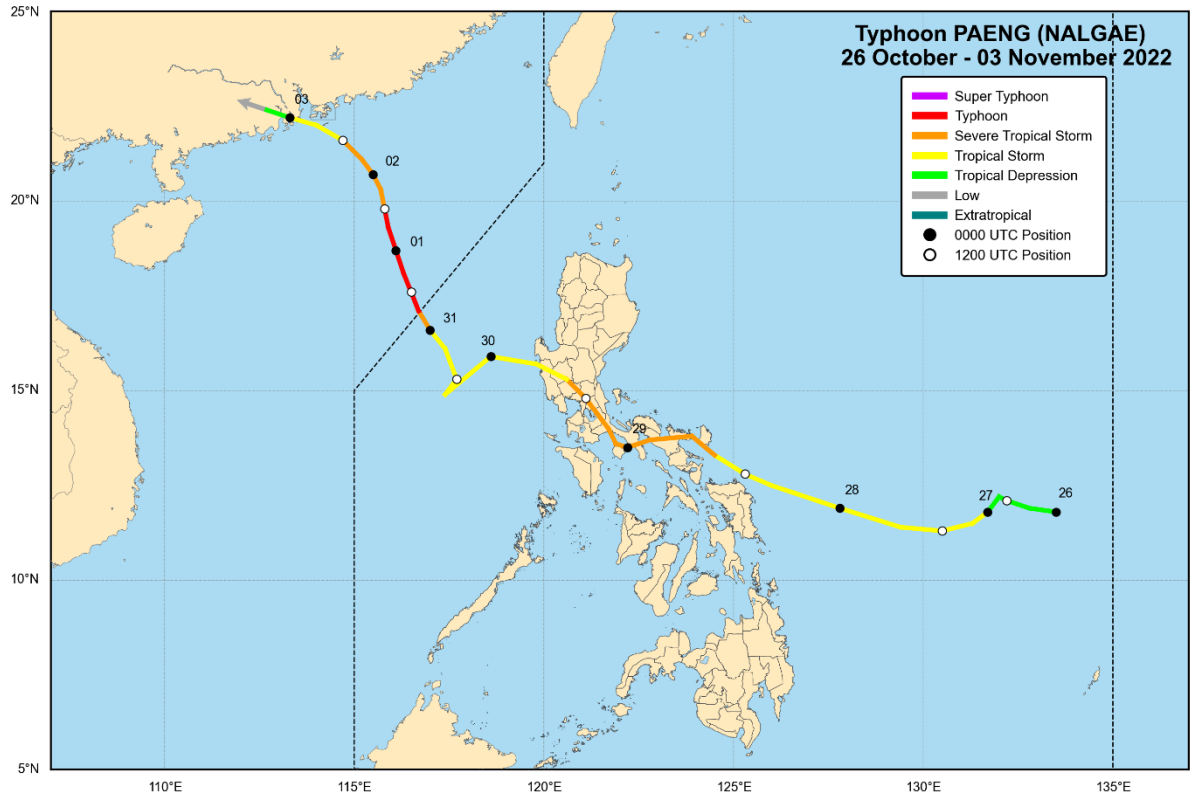


Fig. 1.15. Preliminary best track positions and intensities of Severe Tropical Storm Nalgae.

Nalgae is the 5th tropical cyclone that made landfall over the archipelago. It developed into a tropical depression at 00 UTC of 26 October. On the next day, it intensified into a tropical storm while it moved generally southwestward. Afterwards, it turned to northwestward heading and passed close to the northeastern portion of Eastern Visayas. At 15 UTC of 28 October, Nalgae intensified into a severe tropical storm. At 1710 UTC of the same day, it made landfall in the vicinity of Virac, Catanduanes and shortly after 30 minutes, it made its second landfall in Caramoan, Camarines Sur. Then, it traversed the Bicol Peninsula, exited into the Sibuyan Sea, and made its third landfall in Buenavista, Quezon. Due to the influence of terrain, Nalgae moved southwestward, and made its fourth landfall in Mogpog, Marinduque at 22 UTC. It then began to moved generally north northwestward and made its fifth landfall in the vicinity of Sariaya, Quezon at 0540 UTC of 29 October. It maintained its north northwestward track while over the landmass and was downgraded into a tropical storm at 15 UTC of 29 October. On the next day, it exited the landmass and moved over the West Philippine Sea. Nalgae re-intensified into a severe tropical storm at 00 UTC of 31 October, then after 6 hours, it was upgraded into typhoon category. As it moved northwestward over the sea, it weakened into severe tropical storm at 12 UTC of 01 November and further weakened into tropical storm as it approached the Pearl River Delta. Further weakening was observed as Nalgae moved further inland and at 06 UTC of 03 November, it become a remnant low.

The potential of Nalgae's genesis was anticipated, though uncertainty existed both in the specific timing of when and the location where the tropical cyclone ultimately developed. There

is also difficulty in forecasting the track due to the large uncertainty shown by the model guidance. The forecasted northwestward track for the next 48 hours didn't happen, instead, Nalgae moved west northwestward, then turned generally southwestward before eventually back to its west northwestward movement.

Nalgae has a monsoon depression-like circulation having large wind field, as such hazards were well extended beyond the center. It dumped heavy to intense rains in most parts of Visayas, western portions of Mindanao, and Central and Southern Luzon. Also, torrential rains were observed in some localities in Southern Luzon. These heavy rains resulted to massive flooding and landslides.

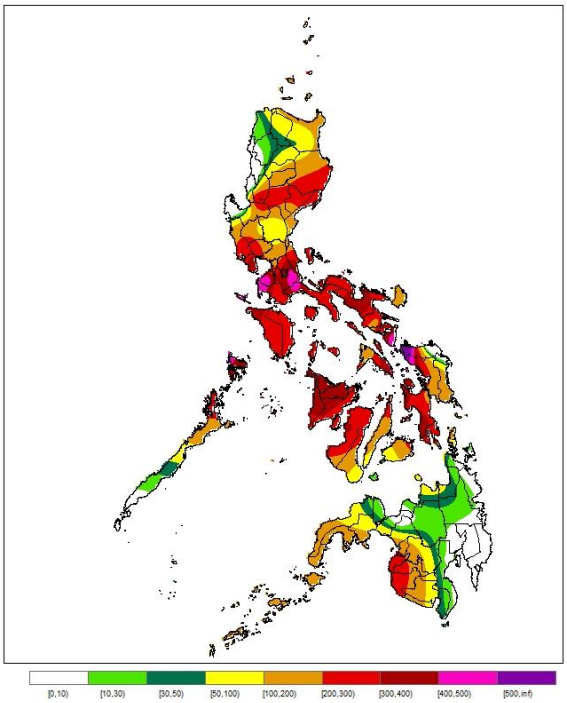


Fig. 1.16. Spatial interpolation of the accumulated rainfall (mm) for the period of 26 to 31 October 2022 from reports of PAGASA synoptic and agromet stations.

Fig. 1.17. Flooding in Capiz Province in Western Visayas.

Fig. 1.17. Floodings in Bangsamoro.

Fig. 1.18. Bridge collapsed in Antique, Western Visayas.

(17) Tropical Storm Queenie (2223 Banyan)

Banyan was noted as tropical depression at 12 UTC of 28 October. It remained as tropical depression while moving over the sea and at 00 UTC of 31 October, it was upgraded to tropical storm category. However, due to strong wind shear, after 12 hours, Banyan was downgraded into tropical depression. It further weakened and become a remnant low at 06 UTC of 01 November.

2. Socio-Economic Assessment (highlighting socio-economic and DRR issues/impacts)

Based on the official report provided by the National Disaster Risk Reduction and Management Council (NDRRMC), the 16 TCs directly and indirectly (e.g., distant precipitation through monsoon) resulted in 768 casualties – 386 dead, 211 injured, and 171 missing individuals.

Combined cost of damage to agriculture and infrastructure amounted to PHP 27.9 billion nationwide with agricultural damages accounting for 59.61 % of the total damage cost.

Table 2.1. Official report of casualties and cost of damage directly and indirectly associated with the TC events in 2022. Data provided by the NDRRMC.

TROPICAL CYCLONE NAME	CASUALTIES			COST OF DAMAGE (PHP)		
	Dead	Injured	Missing	Agriculture	Infrastructure	Total
Agaton (2202 Megi)	214	8	132	7.0M	51.7M	58.7M
Basyang (2201 Malakas)	0	0	0	-	-	-
Caloy (2203 CHABA)	0	0	0	-	-	-
Domeng (2204 Aere)	0	0	0	-	-	-
Ester (2206 Trases)	0	0	0	-	-	-
Florita (2209 Ma-On)	3	4	0	1.9B	571.1M	2.4B
Gardo (Unnamed)	0	0	0	-	-	-
Henry (2211 Hinnamnor)	1	0	0	-	61.4M	61.4M
Inday (2212 Muifa)	0	0	0	-	-	-
Josie (2214 Nanmadol)	0	0	0	-	-	-
Karding (2216 Noru)	12	68	5	3.0B	304.2M	3.3B
Luis (2218 Roke)	0	0	0	-	-	-
Maymay (Unnamed)	1	0	0	114.4M	14.3M	128.6M
Neneng (2220 Nesat)	0	2	0	503.7M	450.7M	954.4M
Obet (Unnamed)	0	0	0	-	-	-
Paeng (2222 Nalgae)	155	129	34	2.8B	4.2B	7.0B
Queenie (2223 Banyan)	0	0	0	-	-	-
TOTAL	**386**	**211**	**171**	**16.6B**	**11.3B**	**27.9B**

3. Regional Cooperation Assessment (highlighting regional cooperation success and challenges)

None.

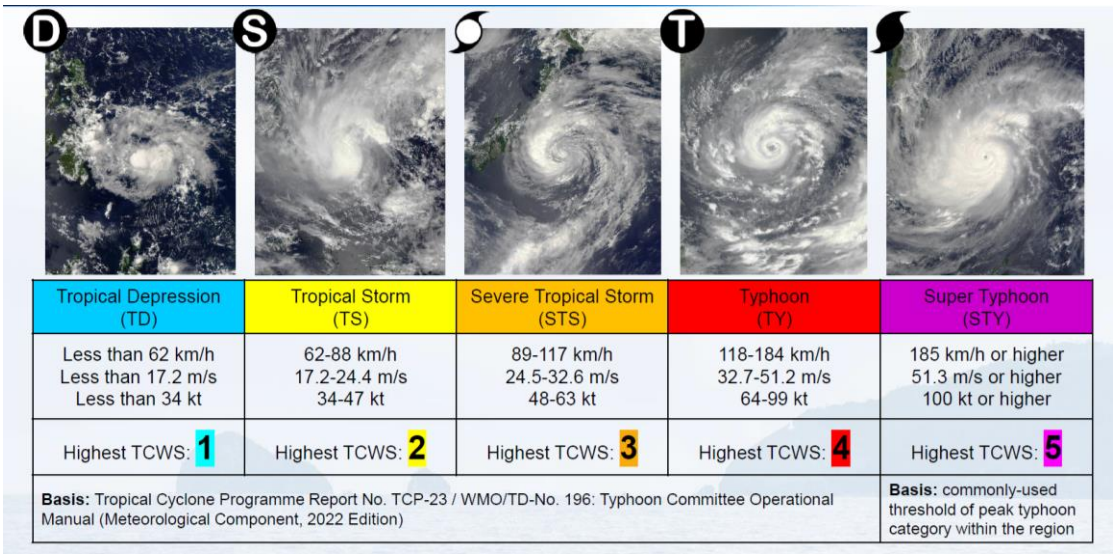
II. Summary of Progress in Priorities Supporting Key Result Areas

1. PAGASA Modified Tropical Cyclone Warning System

Main text:

On 21 March 2022, PAGASA announced the updates in the Tropical Cyclone Warning System, namely, (1) Revised definition of the Super Typhoon Category, (2) Modified Tropical Cyclone Wind Signal System, and (3) Updated Tropical Cyclone Forecast Chart.

(1) Under the new classification, tropical cyclone with maximum sustained winds of 100 kt or higher is categorized as Super Typhoon.



Tropical Depression (TD)	Tropical Storm (TS)	Severe Tropical Storm (STS)	Typhoon (TY)	Super Typhoon (STY)
Less than 62 km/h Less than 17.2 m/s Less than 34 kt	62-88 km/h 17.2-24.4 m/s 34-47 kt	89-117 km/h 24.5-32.6 m/s 48-63 kt	118-184 km/h 32.7-51.2 m/s 64-99 kt	185 km/h or higher 51.3 m/s or higher 100 kt or higher
Highest TCWS: 1	Highest TCWS: 2	Highest TCWS: 3	Highest TCWS: 4	Highest TCWS: 5
Basis: Tropical Cyclone Programme Report No. TCP-23 / WMO/TD-No. 196: Typhoon Committee Operational Manual (Meteorological Component, 2022 Edition)				**Basis:** commonly-used threshold of peak typhoon category within the region

Fig. 2.1. Classification of TCs used by PAGASA since March 2022.

(2) Under the Modified Tropical Cyclone Wind Signal System, the five-tier wind warning scheme was retained but the following changes were introduced:

- The range of wind speed of each wind signal level exactly corresponds to the wind speed categories provided under the WMO Beaufort Scale. This allowed for the provision of equivalent values of wind speed ranges in Beaufort number, knots (kt), and meters per second (m/s).
- The highest level of wind warning, Wind Signal No. 5, was revised to match the new minimum intensity of the STY category (i.e., 185 km/h, 100 kt, or 51.3 m/s)
- Reassignment of wind signals: Typhoon-force wind speeds were assigned to higher wind signals (i.e., Wind Signal Nos. 4 and 5) to indicate the actual severity of such meteorological conditions. In addition, the old Wind Signal Nos. 2, which roughly coincided with Beaufort 8 to 11, was divided into gale-force (Beaufort 8-9) and storm-force (Beaufort 10-11) Wind Signal Nos. 2 and 3, respectively.

- The general statements for the of impact of winds were slightly revised to match the damage descriptors associated with the TORRO Scale and Enhanced Fujita Scale.

TCWS No.	Wind Threat		Warning Lead Time (Hours before onset of wind threat)	Issued for what TC categories?	Potential Impacts
	Old	New			
1	30-60 km/h	39-61 km/h (Beaufort 6-7) 22-33 kt, 10.8-17.1 m/s	36 hours	TD or higher	Minimal to minor threat to life and property
2	61-120 km/h	62-88 km/h (Beaufort 8-9) 34-47 kt, 17.2-24.4 m/s	24 hours	TS or higher	Minor to moderate threat to life and property
3	121-170 km/h	89-117 km/h (Beaufort 10-11) 48-63 kt, 24.5-32.6 m/s	18 hours	STS or higher	Moderate to significant threat to life and property
4	171-220 km/h	118-184 km/h (Beaufort 12) 64-99 kt, 32.7-51.2 m/s	12 hours	TY or higher	Significant to severe threat to life and property
5	Greater than 220 km/h	185 km/h or higher (Beaufort 12) 100 kt or higher, 51.3 m/s or higher	12 hours	STY	Extreme threat to life and property

Fig. 2.2. Modified Tropical Cyclone Wind Signal System

(3) Updated Tropical Cyclone Forecast Chart

The following are the changes:

- Improved the depiction of the probability cone
- Added areas with at least strong winds (yellow-orange region) and at least storm-force winds (maroon region)
- Simplified the observed track segment to ensure that disaster managers and public focus on the track and intensity forecast.

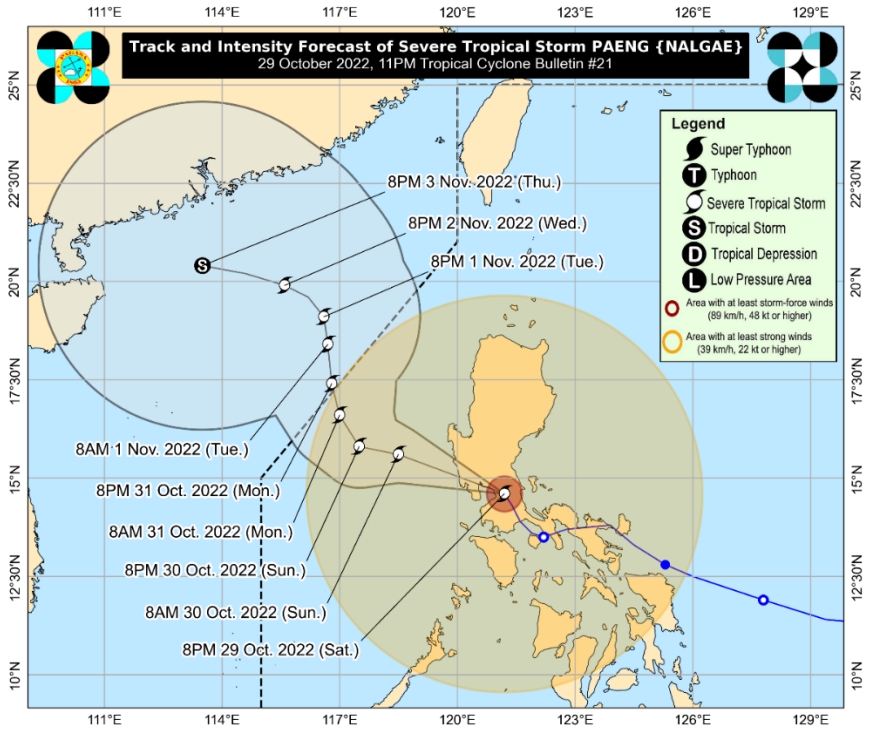


Fig. 2.3. PAGASA's updated tropical cyclone chart.

Identified opportunities/challenges, if any, for further development or collaboration:
To be able to forecast the tropical cyclone wind radii (22kt, 34kt, 50kt, and 64kt)

Priority Areas Addressed:
Enhance the capacity to monitor and forecast typhoon activities particularly in genesis, intensity, and structure change.

Contact Information:
Member: Philippines
Name of contact for this item: Christopher F. Perez
Telephone: +63 – 89272031
Email: typhoon.ops@pagasa.dost.gov.ph

(2). Information, Education, and Communication (IEC) Activities

Main text:
The following are the IEC conducted by PAGASA in 2022:

Typhoon and Flood Awareness Week
PAGASA observes Typhoon and Flood Awareness week every third week of June to give emphasis on the importance of early warning systems and early action in strengthening disaster action and preparedness to ensure the safety of communities during calamities.

IEC activities and programs were lined up for this observance which include:

- *Media Seminar Workshop***.** PAGASA conducted on 18-20 July 2022, a 3-day seminar and workshop to the media practitioners. This workshop aims to inform the participants of the products and services provided by the agency and to have a good understanding of the weather-related terms.

- *Maagang Aksyong at Akmang Gawin Ayon sa Panahon (MAAGAP).* An awareness webinar was conducted for science teachers and school disaster risk reduction (DRR) coordinators.

National Disaster Resilience Month. PAGASA imparts information to the DRR coordinators and local government units of the updates of the tropical cyclone warning system, hazards, and how to use the information provided by the agency to prepare before the onslaught of TCs.

Weather Update. PAGASA conducts tropical cyclone briefings throughout the season for the disaster managers to provide useful and timely information about the developing hazards.

Identified opportunities/challenges, if any, for further development or collaboration:
Outreach and education activities are essential to inform and train the general public in disaster preparedness that will eventually leads to a more resilient community.

Priority Areas Addressed:
Strengthen capacity development activities in meteorology, hydrology, DRR, and civil protection sectors, to enhance nationally to locally coordinated mechanism for tropical cyclone early warning information to reach the last mile; and combine public awareness with appropriate response to protect life and property from tropical cyclones.

Contact Information:
Member: Philippines
Name of contact for this item: Sharon Juliet M. Arruejo
Telephone: +63 – 89256943
Email: s_arruejo@yahoo.com