

Sub-seasonal to Seasonal (S2S) **Climate Forecast**

Presented by:

ENGR. REMEDIOS L. CIERVO Senior Weather Specialist, CLIMPS-CAD DOST-PAGASA

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OUTLINE

What is Sub-seasonal to 01 Seasonal (S2S) Forecasting?

Sources of Predictability of S2S (MJO)









- It is a **time-averaged** (i.e., pentad, weekly) climate forecast with \bullet timescales from 2 weeks up to \sim 2 months.
- The **goal** is to improve the forecast skill and understanding on high \bullet impact weather events (i.e., Rainfall, Tropical cyclones)

Main sources of S2S predictability



AFRICA AFRICA

Over the **Maritime Continent**, both the **MJO** and **ENSO** are important sources of S2S skill.

Madden-Julian Oscillation (MJO) – is an *eastward-moving* disturbance of clouds, winds, rainfall, and pressures that circles the tropical areas of the globe in 30 to 60 days.

(Named after the two scientists: Dr. Roland Madden and Dr. Paul Julian)

Video adapted from BOM



Why is the MJO important?

It can **enhance** or **suppress** the rainfall in the equatorial area including the Philippines.



Act as a modulator of tropical cyclone formation in and around the country.

2



Rainfall anomalies for each phase during Nov-Dec-Jan-Feb season.

Source: Bagtasa 2020



May result into:



MJO Recent Evolution



Update prepared by the Climate Prediction Center NWS / NCEP / CPC 23 June 2025

MJO phase in the past 40 days





Real-Time Multivariate MJO Index Series 1/2.

RMM1 and RMM2 are mathematical methods that combine cloud amounts and winds at upper and lower levels of the atmosphere to measure the strength and location of the MJO.

When this index is within the center circle the MJO is considered weak. Outside of this circle the index is stronger and will usually move in an anti-clockwise direction as the MJO moves from west to east.

The MJO signal has mostly been weak during the past weeks in the Maritime Continent.

Outgoing Longwave Radiation (OLR) Anomalies



OLR (Outgoing Longwave Radiation) is a measure of the amount of energy emitted to space by earth's surface, oceans and atmosphere.

Blue – Increased cloud formation (favorable for precipitation) Red - Less cloud formation (unfavorable for precipitation)

Upper-Level Wind Velocity Anomalies



Green – Increased cloud formation (favorable for rainfall) Brown – Less cloud formation (unfavorable for rainfall)

MJO Forecast Evolution (June 23 – July 07, 2025)

MJO phase forecast in the next 14 days



Dynamical model RMM forecasts depicts an eastward propagation toward the Indian Ocean or Maritime Continent.

However, the MJO signal has remained weak over the forecast period.

Source: NOAA CPC



Sub-seasonal to Seasonal (S2S) Climate Forecast (June 25 – July 08, 2025)

- 1. Tropical Cyclone (TC)-Threat Potential Forecast
- 2. Rainfall Exceedance Probability Forecast
- 3. Wind Anomaly Forecast



otential Forecast Forecast



Tropical Cyclone (TC)-Threat Potential

Date Issued: 25 June 2025 Validity: Valid within the forecast period unless superseded by a succeeding forecast.

Forecast Summary:

Week-1 (June 25 – July 01, 2025)

- and has no direct effect on the country.
- chance of TC development in week-1.

Week-2 (July 02 – July 08, 2025)

Therefore, the **TC-THREAT POTENTIAL IS LIKELY** during the forecast period.

needed.

PMD: PAGASA Monitoring D **PAR:** Philippine Area of Resp

Note: The information contained here is based on the 6-hourly forecasts of the NCEP-GEFS issued in the past 24 hours. This is for guidance purposes only For Weather Updates, kindly refer to: www.pagasa.dost.gov.ph/weather





Contact us at telephone no: (02) 8284-0800 loc. 4920/4921 or email: climps@pagasa.dost.gov.ph

Initialization: 24 June 2025 (8 PM)

• Tropical Depression (TD) is present over the northwestern boundary of the PMD

• Meanwhile, model forecasts indicate that a TC-like vortex (TCLV) 1 will likely emerge over the eastern boundaries of TCAD and the PAR with a low to moderate

• Models suggest that TCLV 1 will move toward the north of Luzon with a low to moderate likelihood of TC development over week-2.

However, any changes in the forecast pattern will be closely monitored, and updates will be issued as

Domain	TCAD: Tropical Cyclone Advisory Domain
oonsibility	TCID: Tropical Cyclone Information Domain

Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA)



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Tropical Cyclone Climatological Tracks for June in the Philippine Area of Responsibility (PAR)

Climatological tracks for the month of June suggest the 4 most common tracks:

1. TCs that enter the PAR moving towards the Philippine landmass but recurve before making landfall (**non-landfalling**); moving toward Japan

2. TCs that enter the PAR but recurve afterwards (**non-landfalling**), moving toward Taiwan or Japan

3. Landfalling TCs traversing the southern part of Luzon island, moving toward northern Vietnam or Hong Kong

4. Landfalling TCs traversing the eastern-northern parts of Visayas, moving toward northern Vietnam or Hong Kong





Philippine Atmospheric, Geophysical and **Astronomical Services Administration (PAGASA)**

Tropical Cyclone Climatological Tracks for July in the Philippine Area of Responsibility (PAR)

Climatological tracks for the month of July suggest the 3 most common tracks:

Recurving TCs towards the northern part of PAR (non-landfalling), moving towards Taiwan or Japan

Landfalling TCs in the extreme northern islands of the Philippines, moving towards China or Hong Kong

Landfalling TCs traversing the north-central parts of Luzon island, moving towards Vietnam

WEEK - 1: RAINFALL EXCEEDANCE PROBABILITY FORECAST June 25 – July 01, 2025



Probability to Exceed 50mm

- High to very high over Ilocos Region, CAR, Nueva Vizcaya, Quirino, Central Luzon, and most of Central Mindanao;
- Moderate to high over the rest of the country.



Probability to Exceed 100mm

- Moderate to high over most of Northern Luzon and Zambales;
- Low to moderate over the rest of Luzon;
- Low over the rest of the country.



Probability to Exceed 150mm

- Ifugao;
- Central Luzon;
- Low over the rest of the country.



- Moderate Probability
- Low Probability

GEFS Week-1 Exceedance Prob. > 200mm Valid: 2025-06-25 to 2025-07-01 22.5°N 20°N 17.5°N 15°N 12.5°N 10°N 7.5°N 5°N 120°E 122°E 124°E 126°E 128°E 118°E

• High to very high over Mountain Province and

• Low to moderate over the rest of Northern and

Probability to Exceed 200mm

• Low across the country

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WEEK - 2: RAINFALL EXCEEDANCE PROBABILITY FORECAST July 02 – July 08, 2025



Probability to Exceed 50mm

- High to very high over the western sections of Northern and Central Luzon; Moderate to high over the rest of Luzon and Antique;
- •Low to moderate over the rest of the country.



Probability to Exceed 100mm

- Moderate to high over llocos region, Abra, Benguet; most of Central Luzon, and Occidental Mindoro;
- Low to moderate over the rest of Luzon;
- Low over the rest of the country.



Probability to Exceed 150mm

- Moderate to high over most of llocos Region, Zambales, Bataan and Occ. Mindoro;
- •Low to moderate over the rest of Central Luzon;
- Low over the rest of the country.



Moderate Probability Low Probability



Valid: 2025-07-02 to 2025-07-08 118°E 120°E 122°E 124°E 126°E 128°E

Probability to Exceed 200mm

- Moderate over Pangasinan, Zambales and Bataan:
- Low to moderate over most of Western Luzon;
- Low over the rest of the country.

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GEFS Week-1 & 2 Forecasts: Wind Forecast





850mb Wind Week 1: June 25 – July 01, 2025

Forecast suggest that SW Monsoon will likely affect Western Luzon and Western Visayas during the forecast period.

Forecast suggest that SW Monsoon will likely affect most parts of the country during the forecast period

GEFS Week-2 850-hPa Wind Total

850mb Week 2: July 02 - 08, 2025

S2S OUTLOOK SUMMARY



The MJO signal has remained weak in recent days. The GEFS model indicates a weak MJO signal over the next two weeks.



https://bagong.pagasa.dost.gov.ph/tropical-cyclone/tc-threat-potential-forecast https://bagong.pagasa.dost.gov.ph/climate/climate-prediction/sub-seasonal2



TC-Threat Potential Forecast

PAGASATC Threat Potential Forecast(TTPF) was formulated in order to detect/evaluate likelihood of TC formation within the Philippine Area of Responsibility and the possibility forecast in track and direction for the next 2-w utilized to objectively detect probability of TC formation in the global numerical weather prediction models.

This product was part of the collaboration between PAGASA and CWB through the MECO/TECO VOTE Project.

Disclaimer: The information contained herein are based on the 8-hourly forecasts of the NCEP-GEFS issued in the past 24hrs where the CWB TC Tracking algorithm was applied and on some climate indicators that are know requiring more specific information related to TC forecasts are advised to use the bulletins being used by PAGASA once the TC is already developed and observed inside the Philippine Area of Responsibility(PAR).

For your questions and queries please contact us: Tel: (02)8248-0800 loc. 906 (CLIMPS-CAD) or email: pagasa.climps@gmail.com Tel: (02)8248-0800 loc. 805 (Weather Forecasting Section



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WEEK 1	WEEK 2		
Rainfall	Temperature	Wind	
Initial Cond Week Validi	ition: June 25, 2023 ty: June 26- Jul 02, 20	23	



Rainfall deficit of more than 100mm is expected in most parts of CAR and llocos Sur 20-80mm for the rest of the country except in some areas in eastern Luzon and Davao Region where 20-60mm increase of rainfall will likely have.



GEFS

NCEP



and llocos Sur; 20-80mm for High to a very high probability to exceed 25mm of rainfall over most parts of the country. rao Region where 20-60mm



High to a very high probability to exceed 50mm of rainfall in most parts of the county except Catanduanes, Palawan, Leyte provinces and some areas in Western and Southern Mindanao where a moderate likelihood is likely.



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