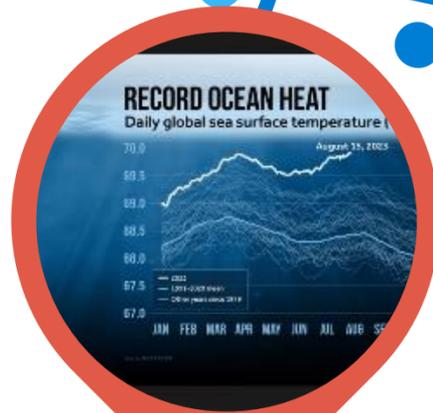


16TH SESSION OF THE PACIFIC ISLANDS CLIMATE OUTLOOK FORUM

PICOF-16

23 APRIL, 2025
ONLINE: ZOOM



LOOKING FORWARD — MONTHLY AND SEASONAL OUTLOOKS ATMOSPHERE

Jin Ho Yoo

Research Fellow

APEC Climate Center (APCC)

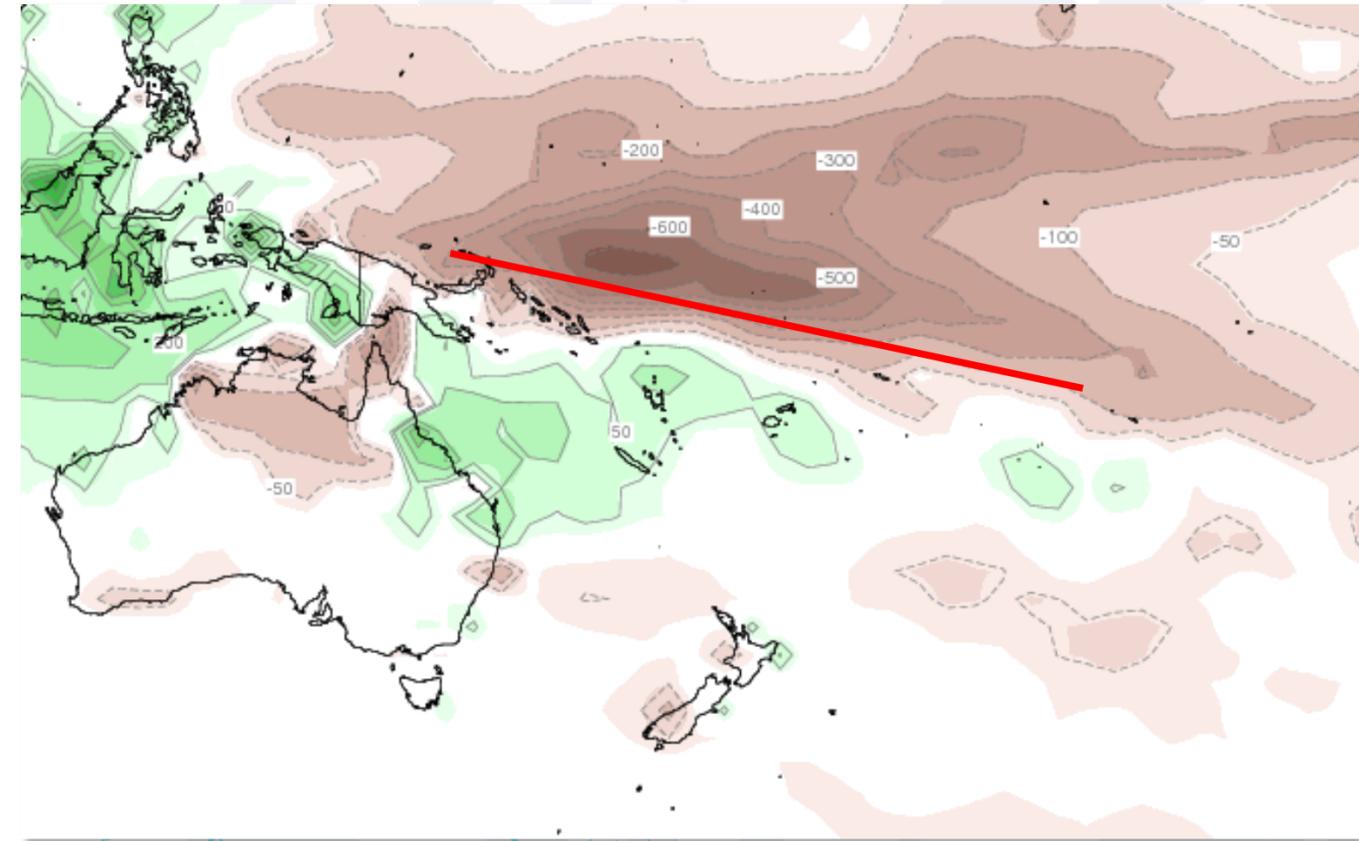
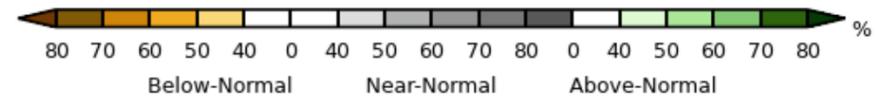
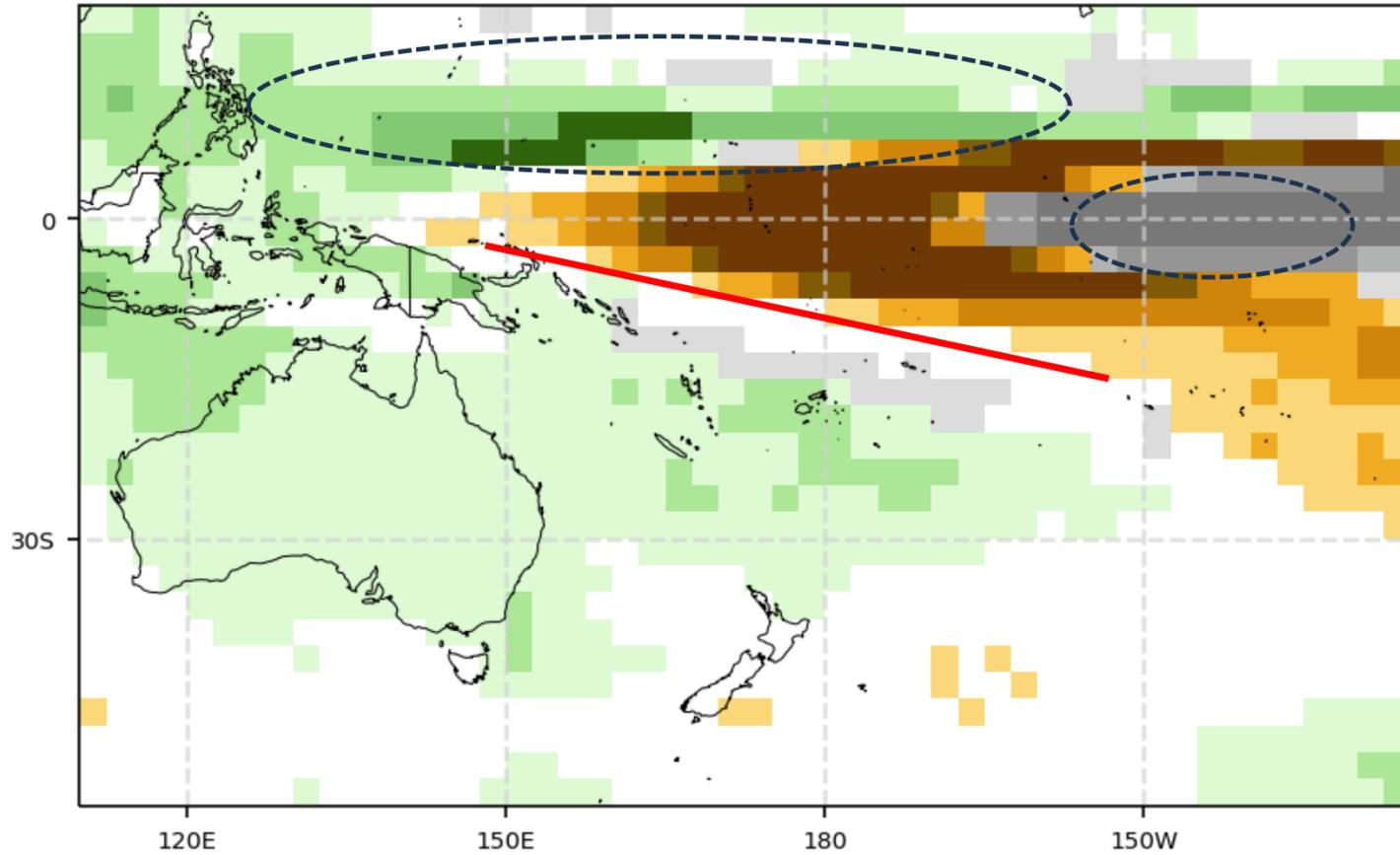


Previous outlook verification

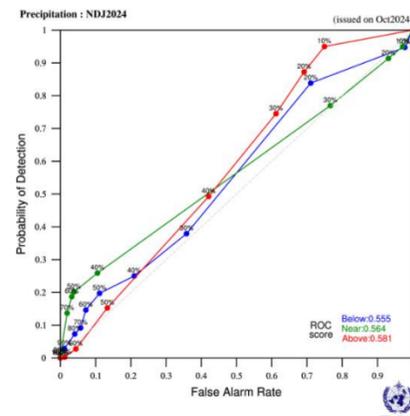
Source: WMO_LC-SP, IRI, APCC

Precipitation : NDJ2024

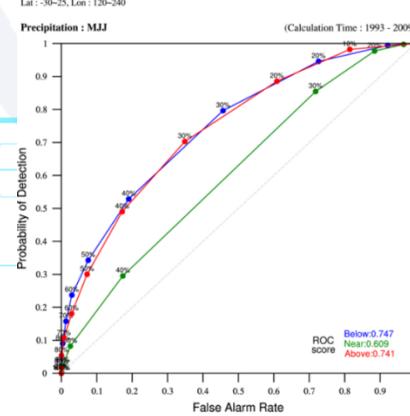
(issued on Oct2024)



ROC Curve and Score
-2147483647
Lat : -30-25, Lon : 120-240

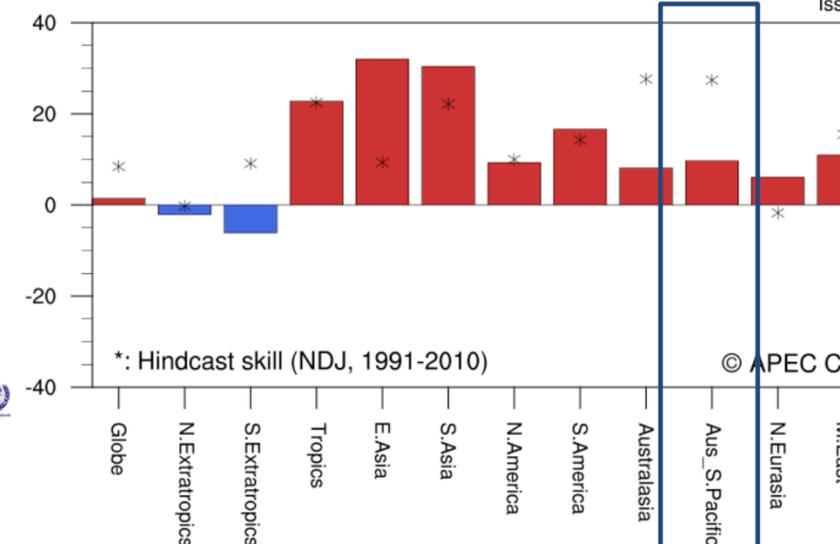


ROC Curve and Score
Beijing,CMCC,CPTEC,ECMWF,Exeter,Melbourne,Montréal,Moscow,Offenbach,Pretoria,Seoul,Tokyo,Toulouse,Washington
Lat : -30-25, Lon : 120-240



ROC score (2024) : 0.56(Below)/0.58(Above)
ROC score (Hcst) : 0.75(Below)/0.74(Above)
ROC score > 0.7 : useful to decision making

Heidke Skill Score : PREC, NDJ (2024)



- The rainfall outlook over November 2024 to January 2025 is consistent with rainfall patterns experienced during past La Niña's.
- Below normal rainfall is favoured in the equatorial Pacific between **Nauru and Phoenix Islands (Kiribati)**, as well as **Marquesas Islands (French Polynesia)**. Below average rainfall is expected for southernmost **FSM and RMI, Tuvalu, Tokelau, Northern Cook Islands and northern French Polynesia**.
- Farther south in the tropics, above-normal rainfall is favoured between **southern PNG** and the **southern Cook Islands** including **New Caledonia, Vanuatu, Fiji (except Rotuma), Tonga and Niue**. In the northwest Pacific above-normal rainfall is also likely between **Palau and eastern FSM**.

Precipitation forecast

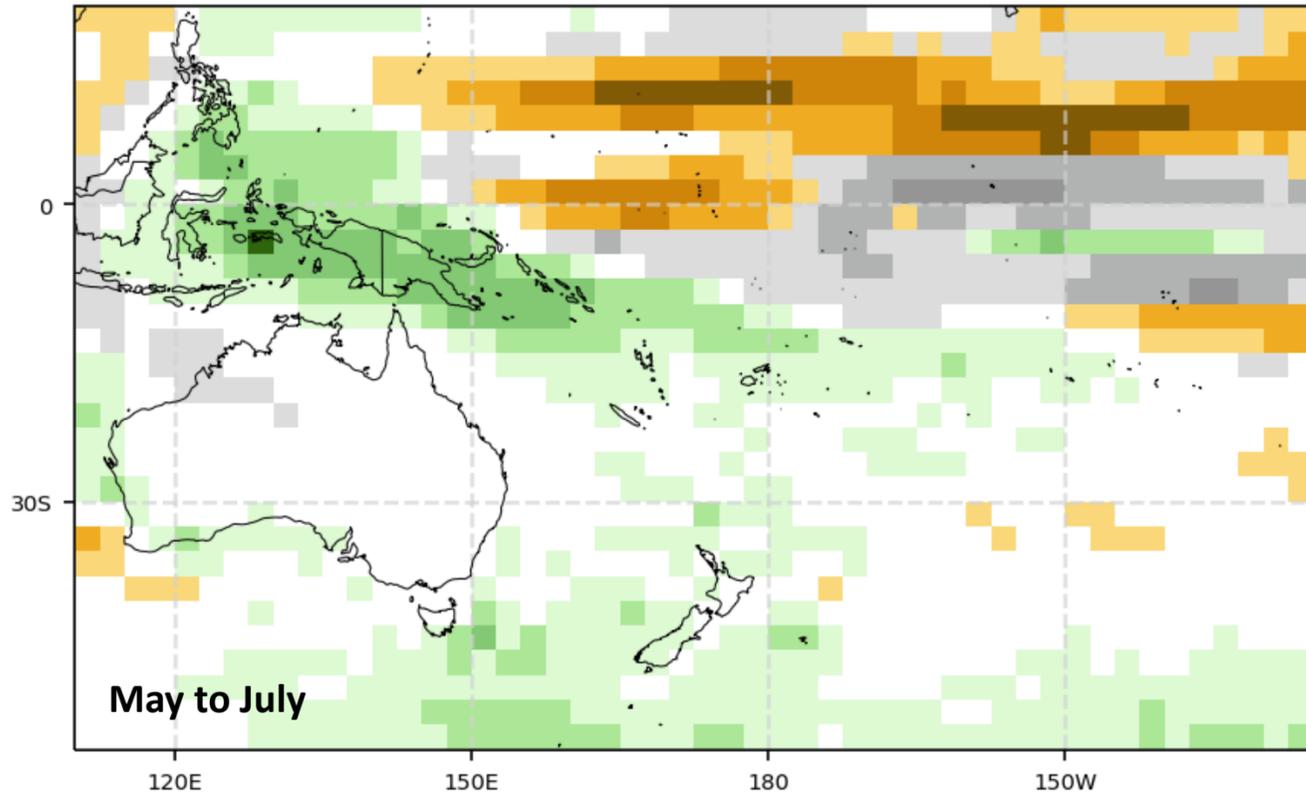
Source: WMO LC-SP

Probabilistic Multi-Model Ensemble Forecast

CMCC, CPTEC, ECMWF, Exeter, Montreal, Moscow, Seoul, Tokyo, Toulouse, Washington

Precipitation : MJJ2025

(issued on Apr2025)



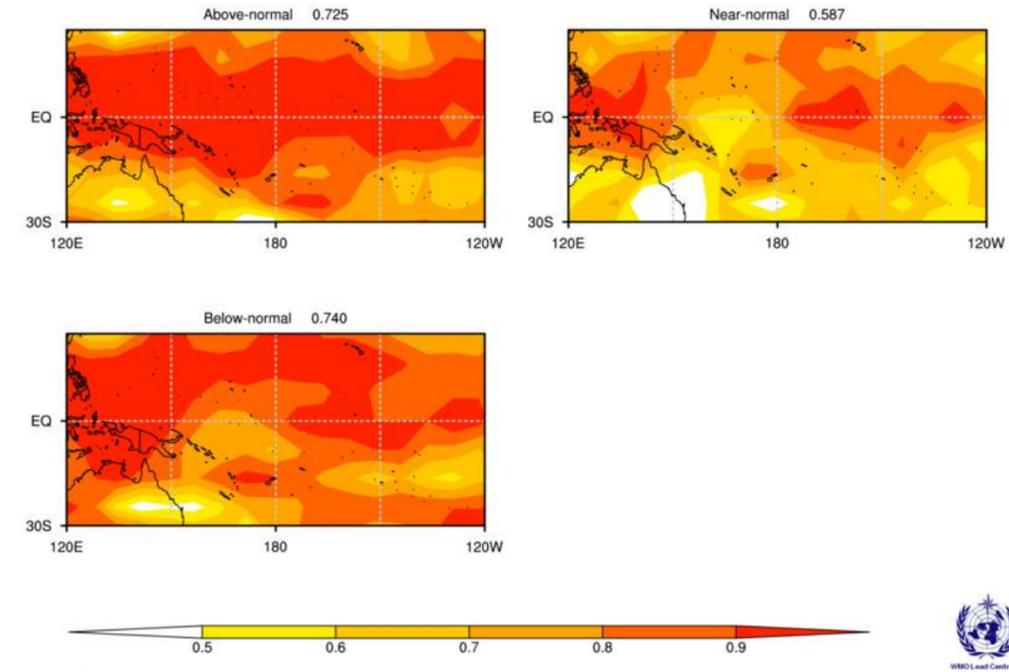
Relative Operating Characteristic(ROC) map

Beijing, CMCC, CPTEC, ECMWF, Exeter, Melbourne, Montreal, Moscow, Offenbach, Pretoria, Seoul, Tokyo, Toulouse, Washington

Precipitation : MJJ

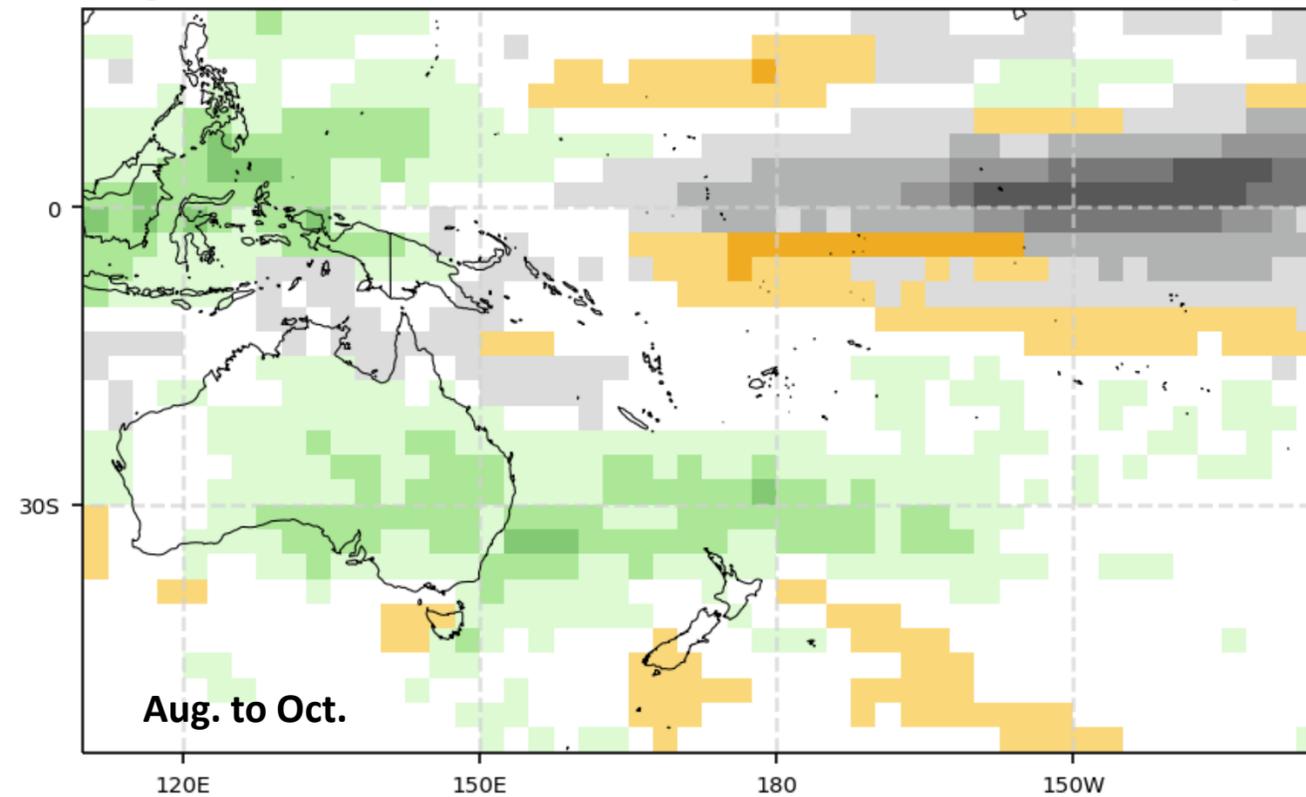
Lat : -30-25, Lon : 120-240

(Calculation Time : 1993 - 2009)



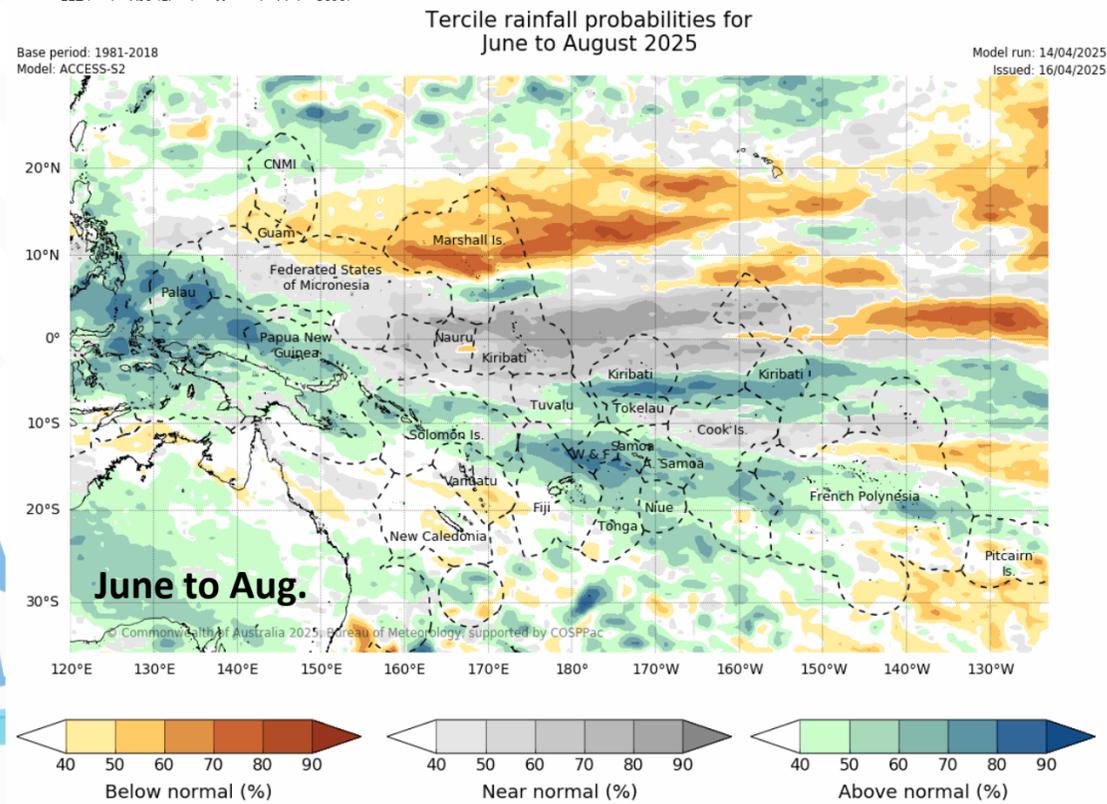
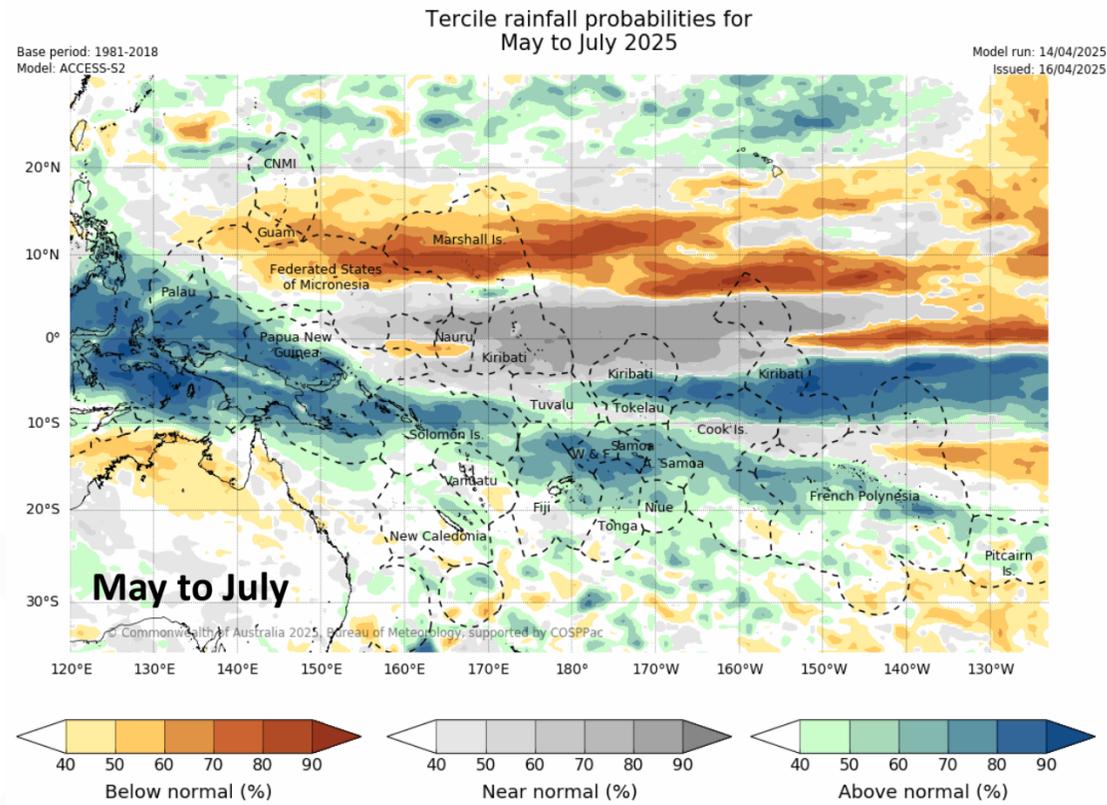
Precipitation : ASO2025

(issued on Apr2025)

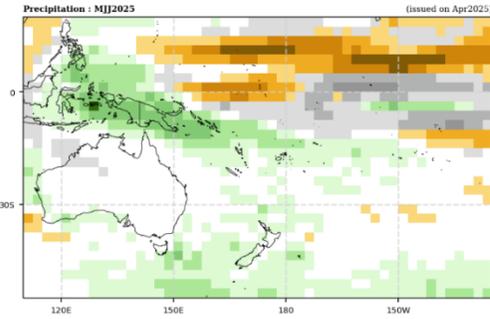
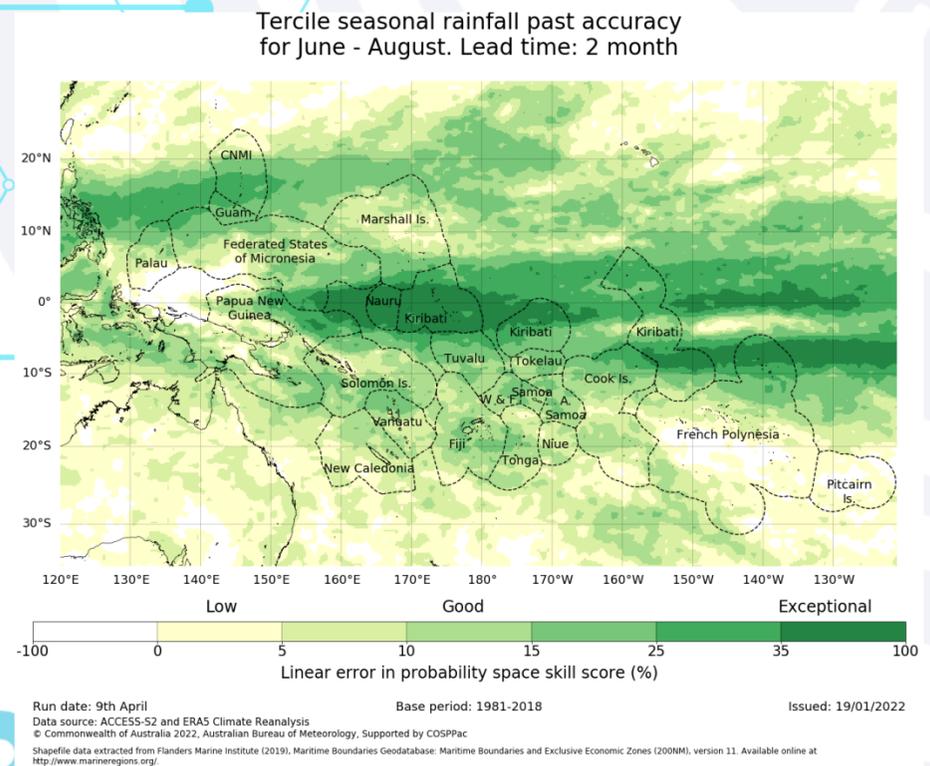
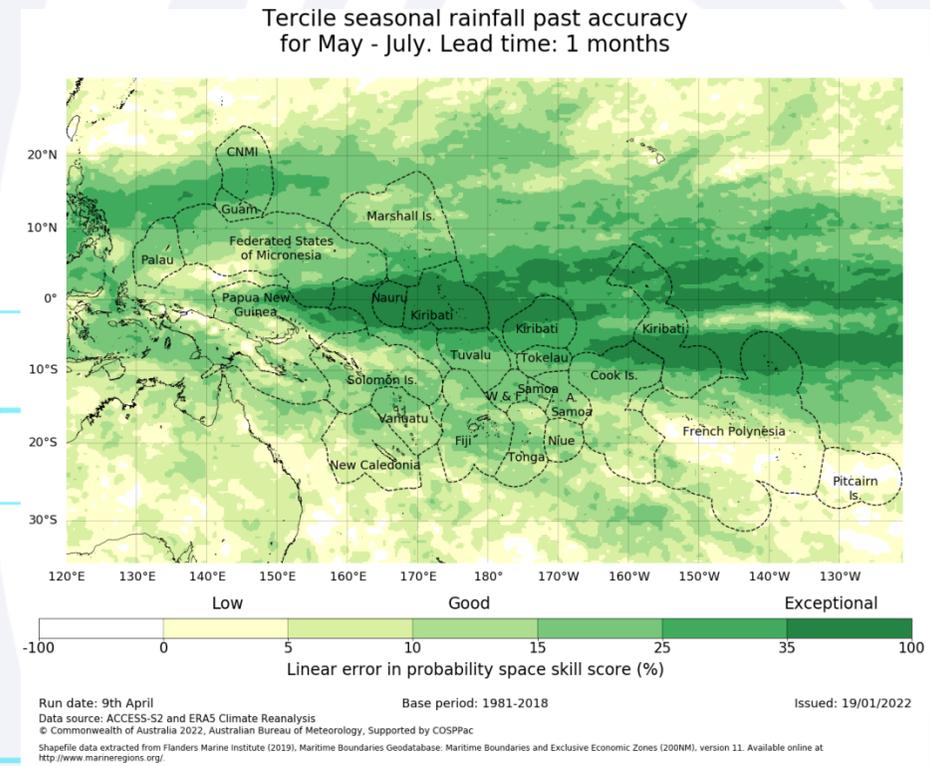


Precipitation forecast

Source: BoM

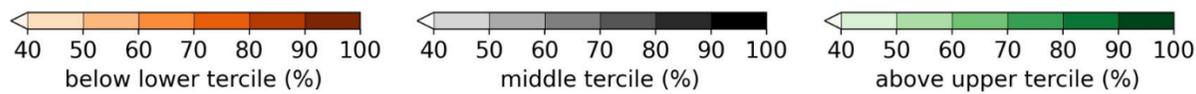
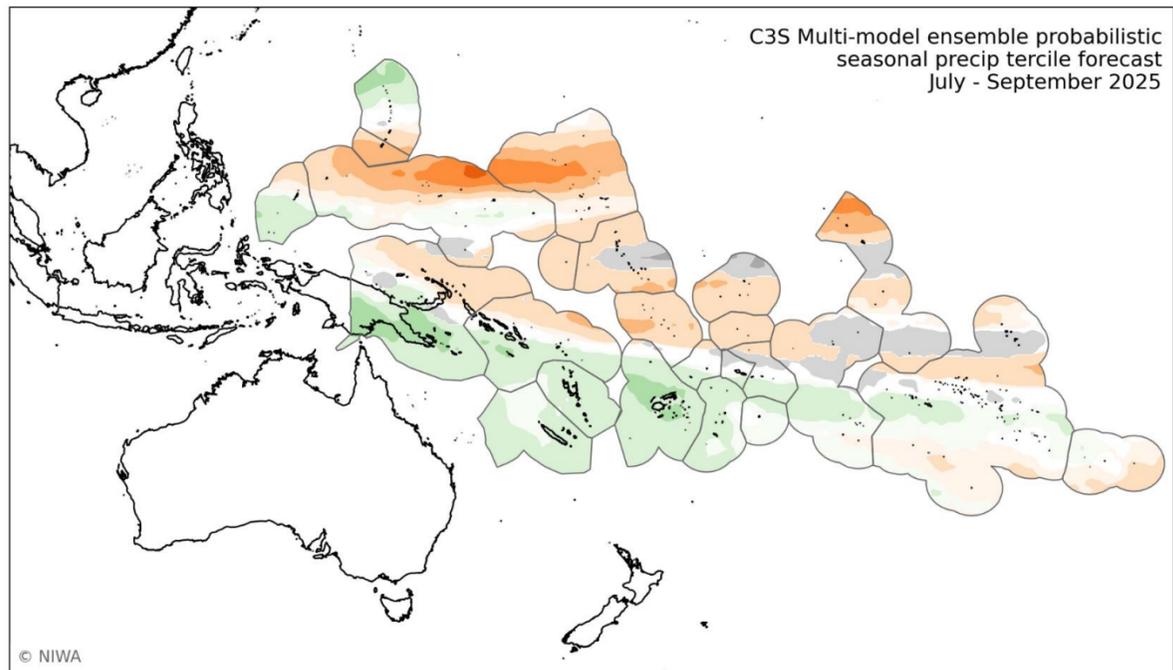
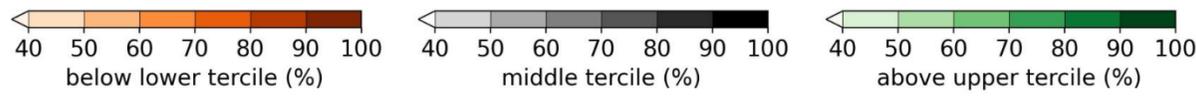
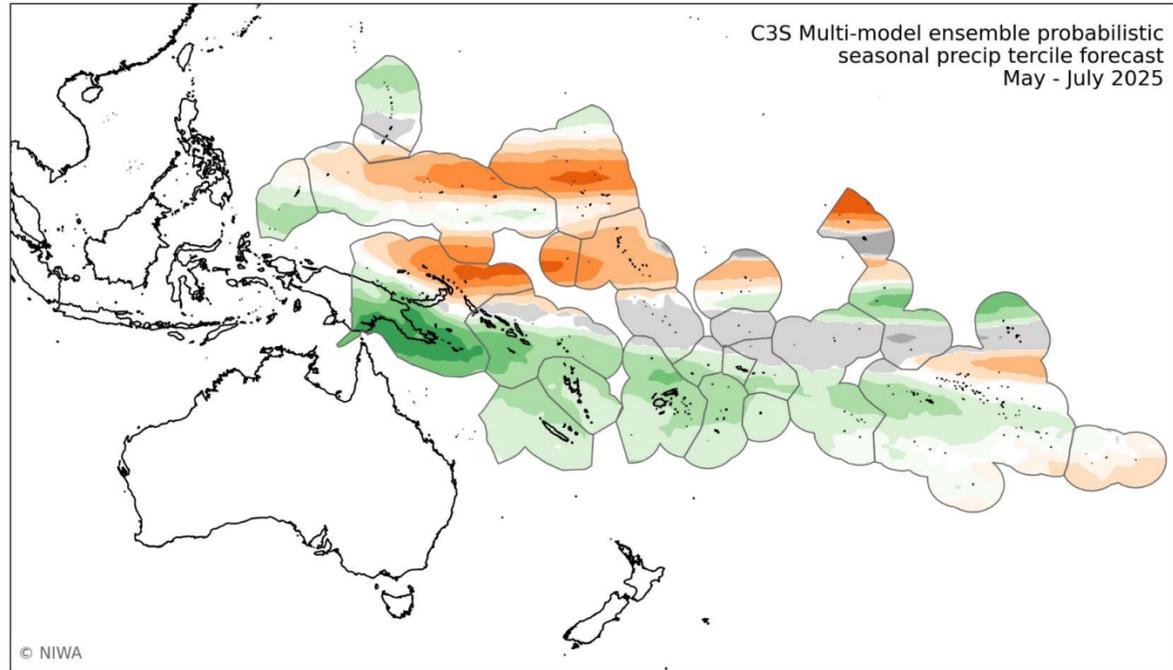


--- EEZ border V11 (Flanders Marine Institute, 2019).

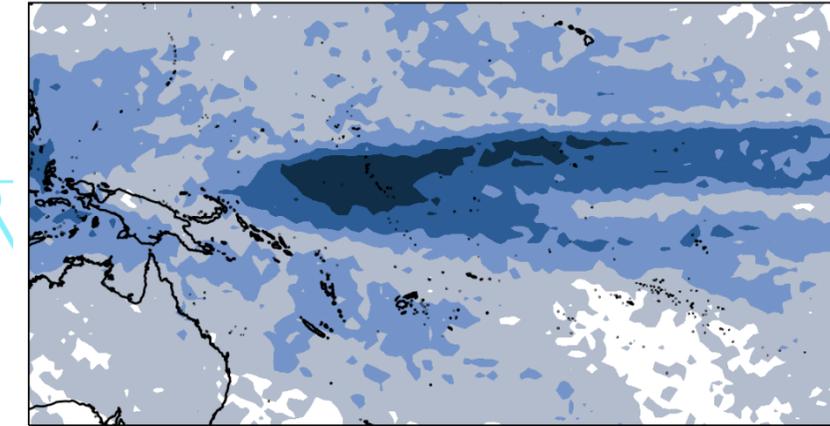


Precipitation forecast

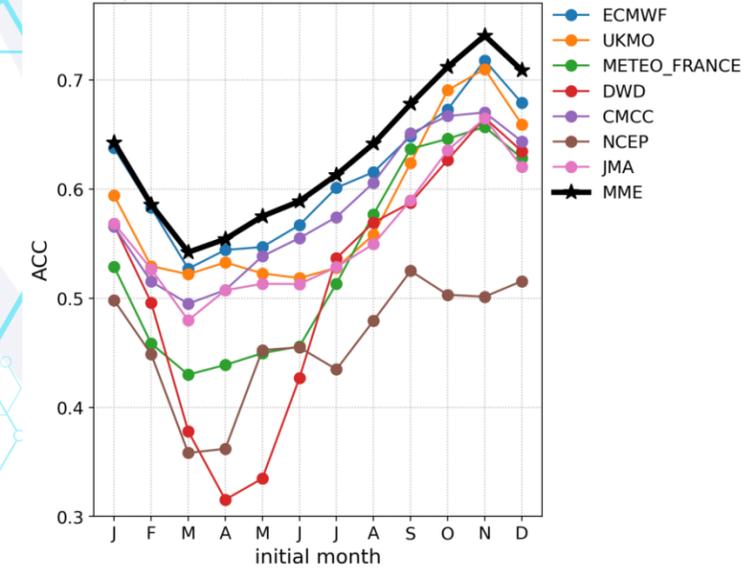
Source: NIWA



C3S MME, Accuracy [0 - 1], 1 season ahead



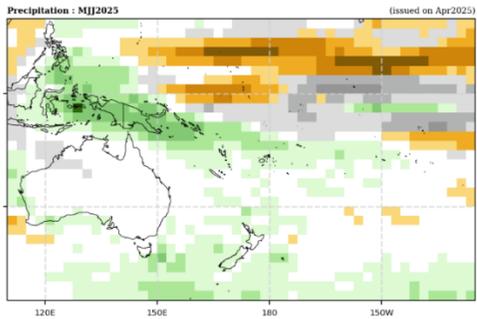
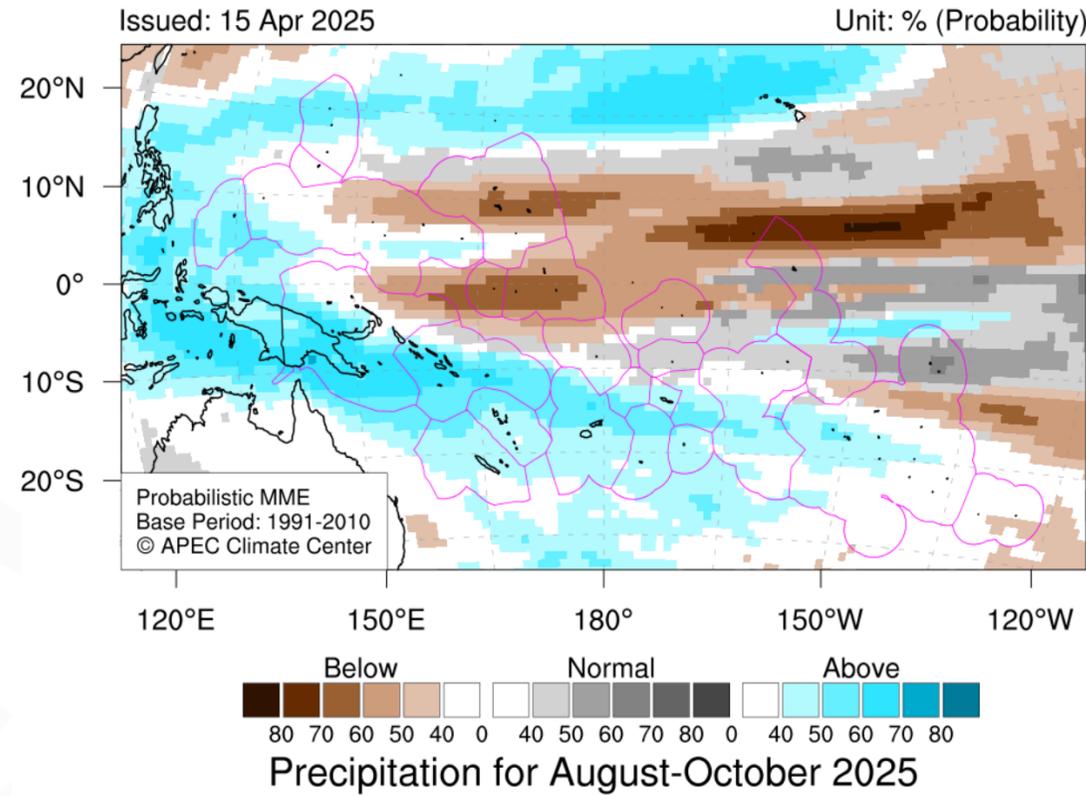
ACC per initial month, seasonal, 1 season ahead



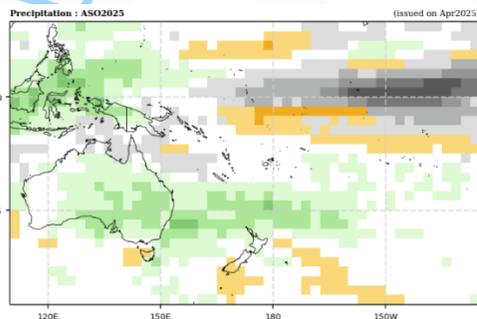
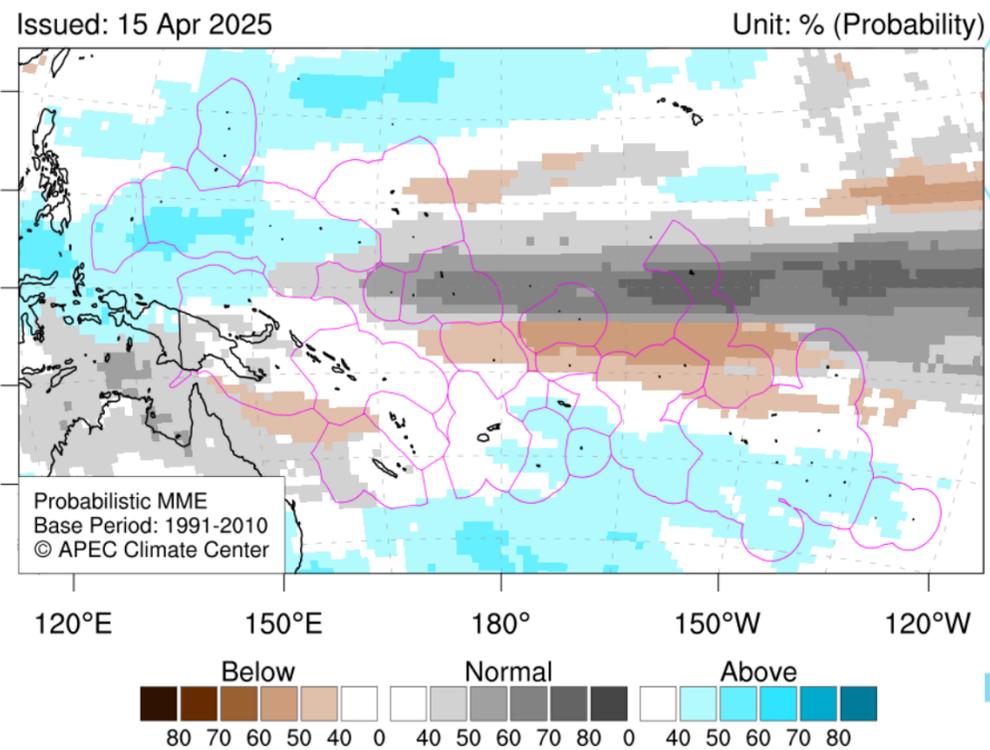
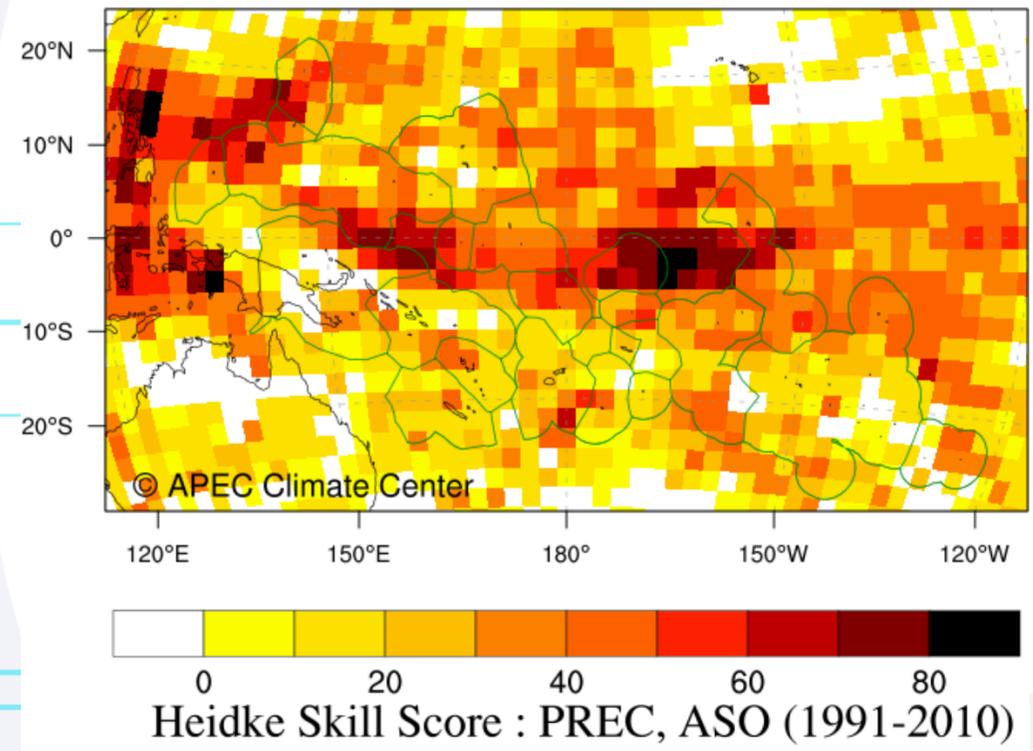
Precipitation forecast

Source: APCC

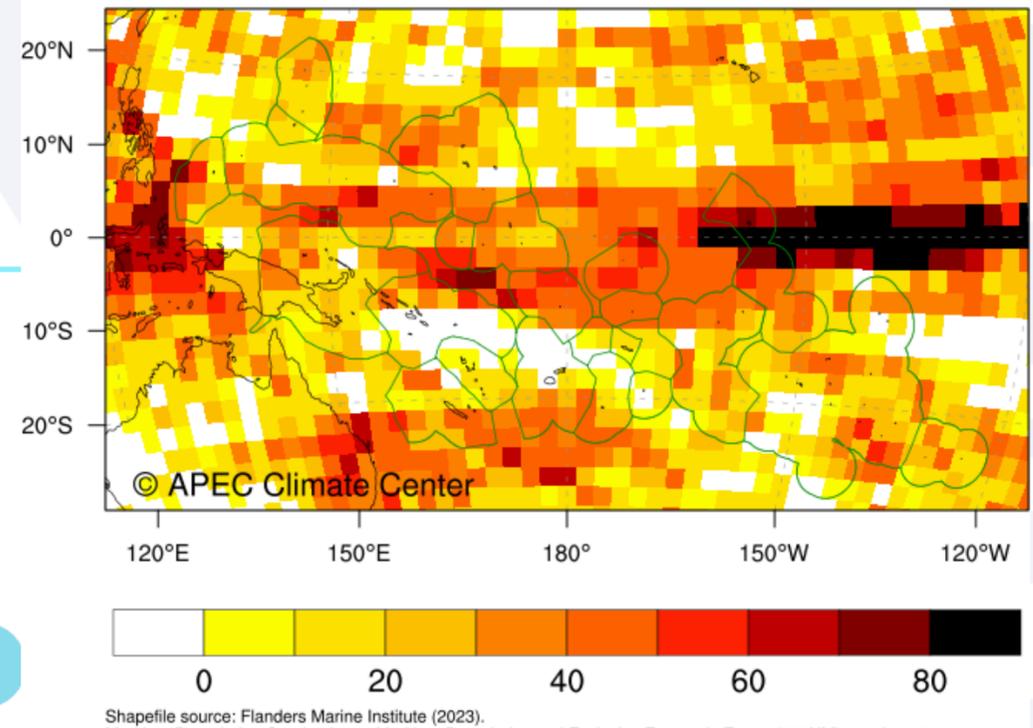
Precipitation for May-July 2025



Heidke Skill Score : PREC, MJJ (1991-2010)



Heidke Skill Score : PREC, ASO (1991-2010)

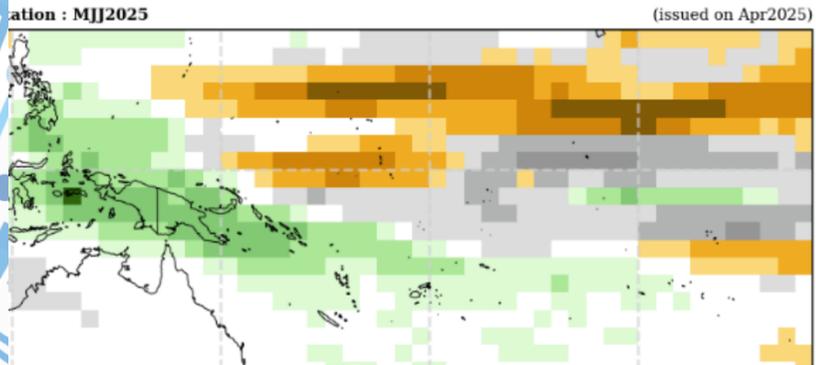
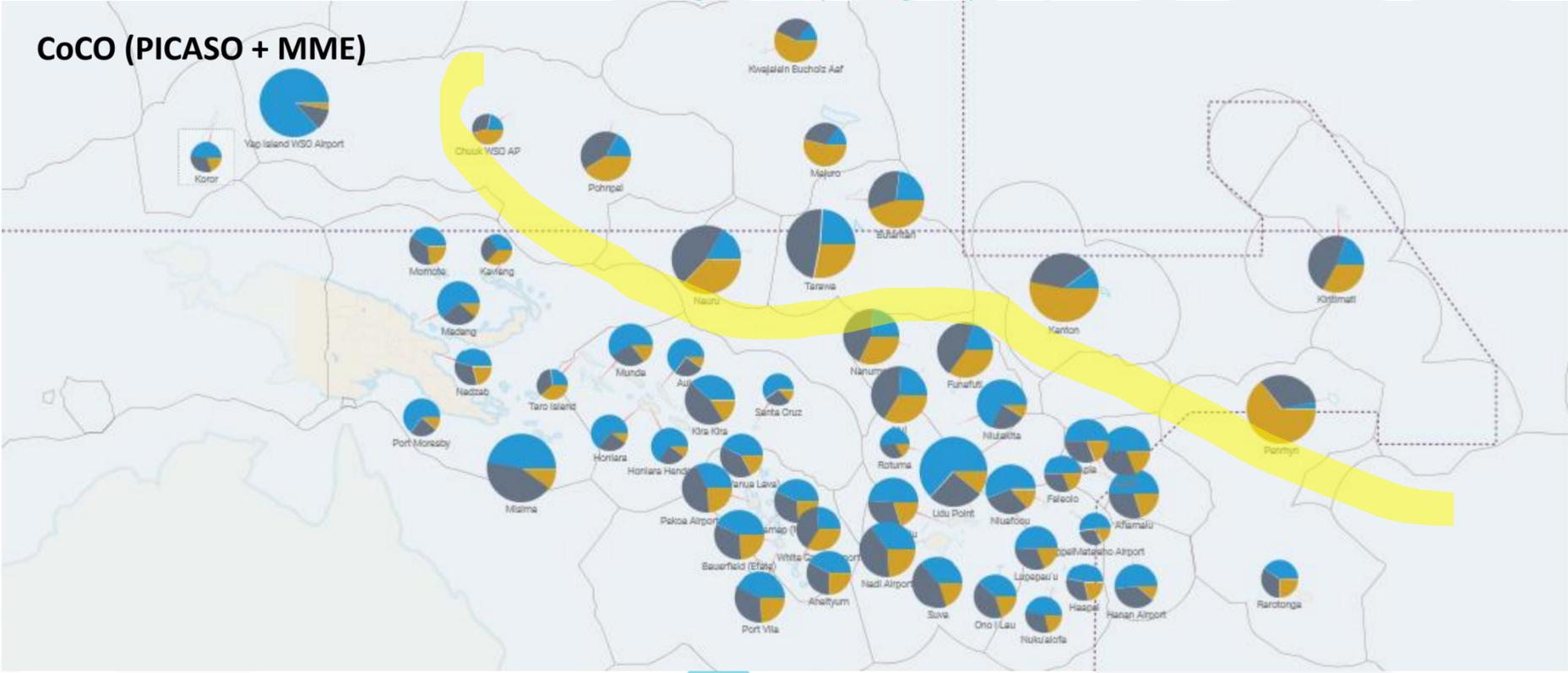
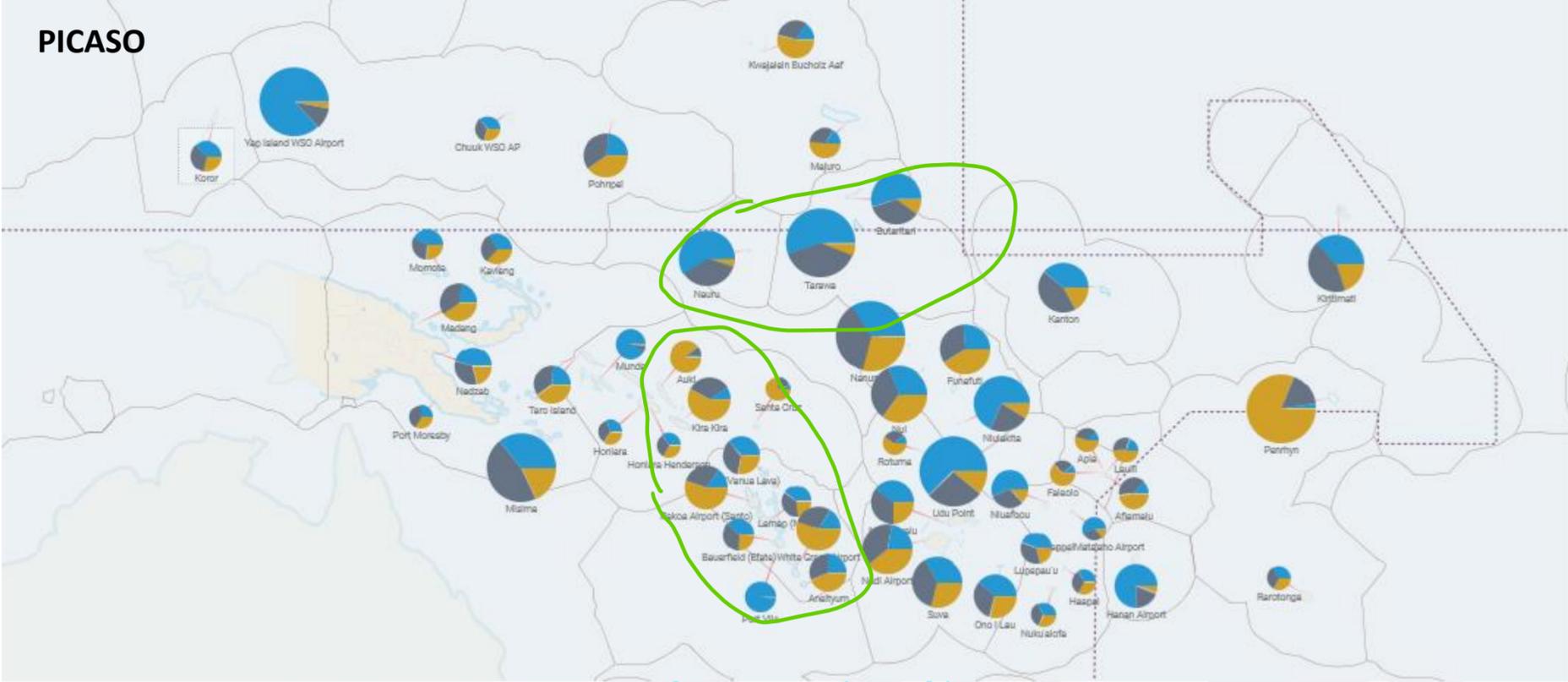


Shapefile source: Flanders Marine Institute (2023). Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 12. Available online at <https://www.marinerregions.org/>. <https://doi.org/10.14284/632>

Shapefile source: Flanders Marine Institute (2023). Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 12. Available online at <https://www.marinerregions.org/>. <https://doi.org/10.14284/632>

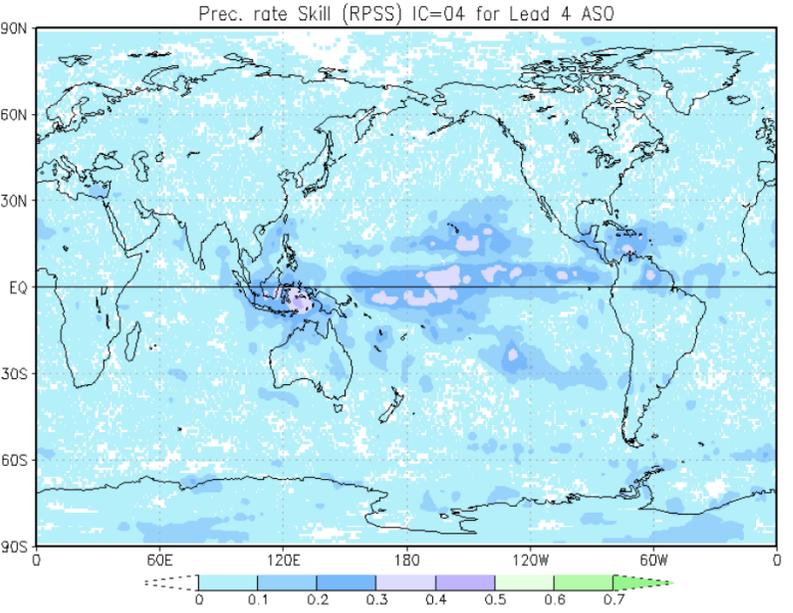
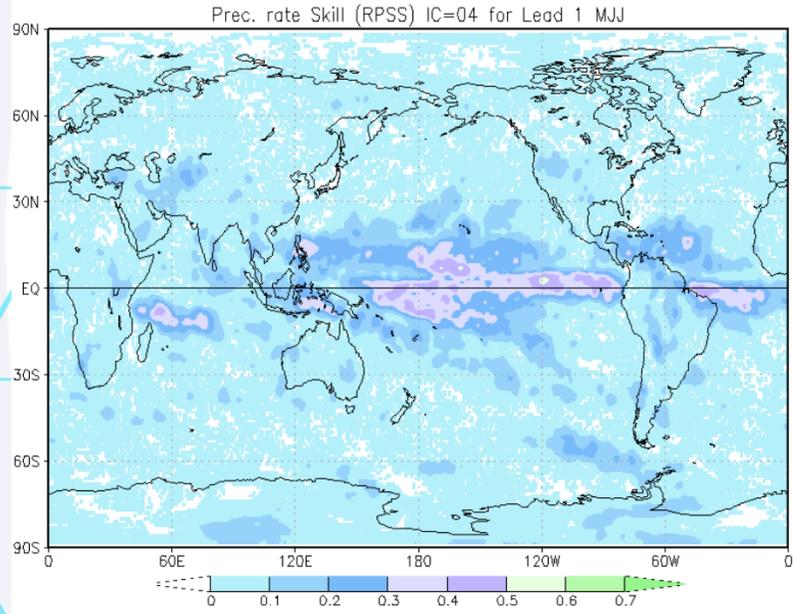
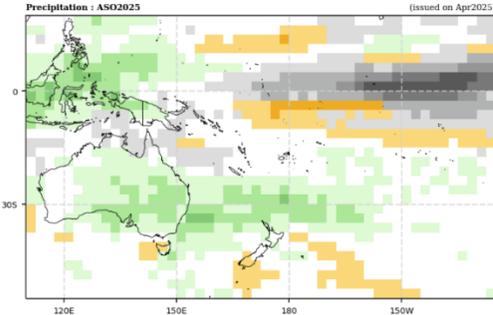
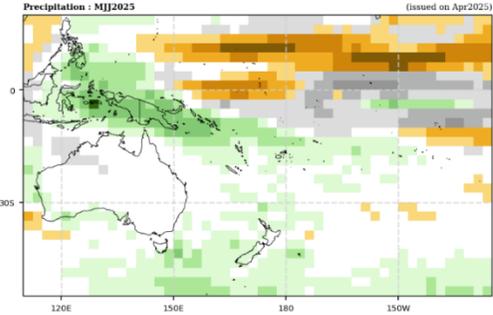
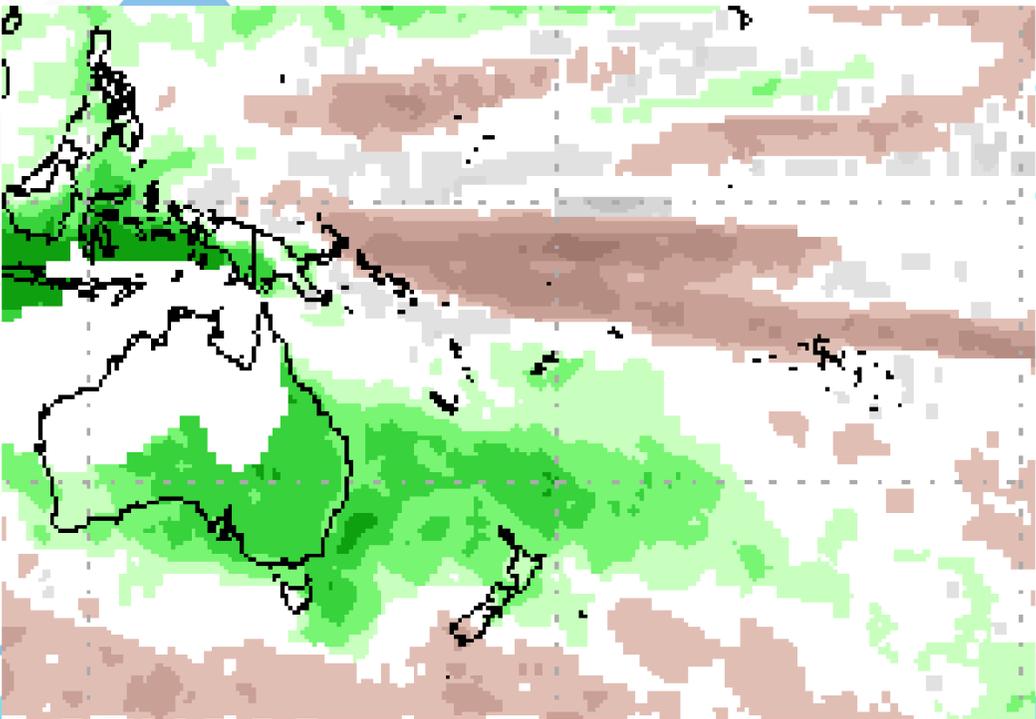
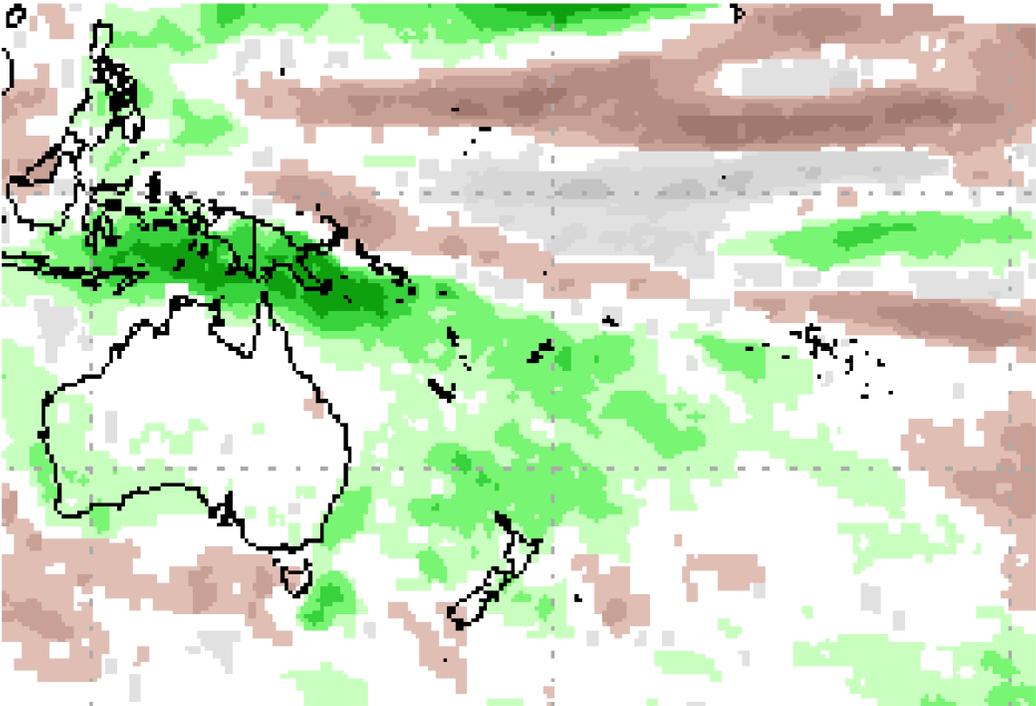
Precipitation forecast

Source: APCC



Precipitation forecast

Source: NMME (NOAA)



ENSO status

Source: BoM, PSL/NOAA

Temperature forecast

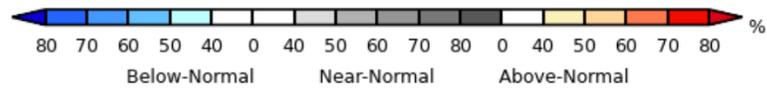
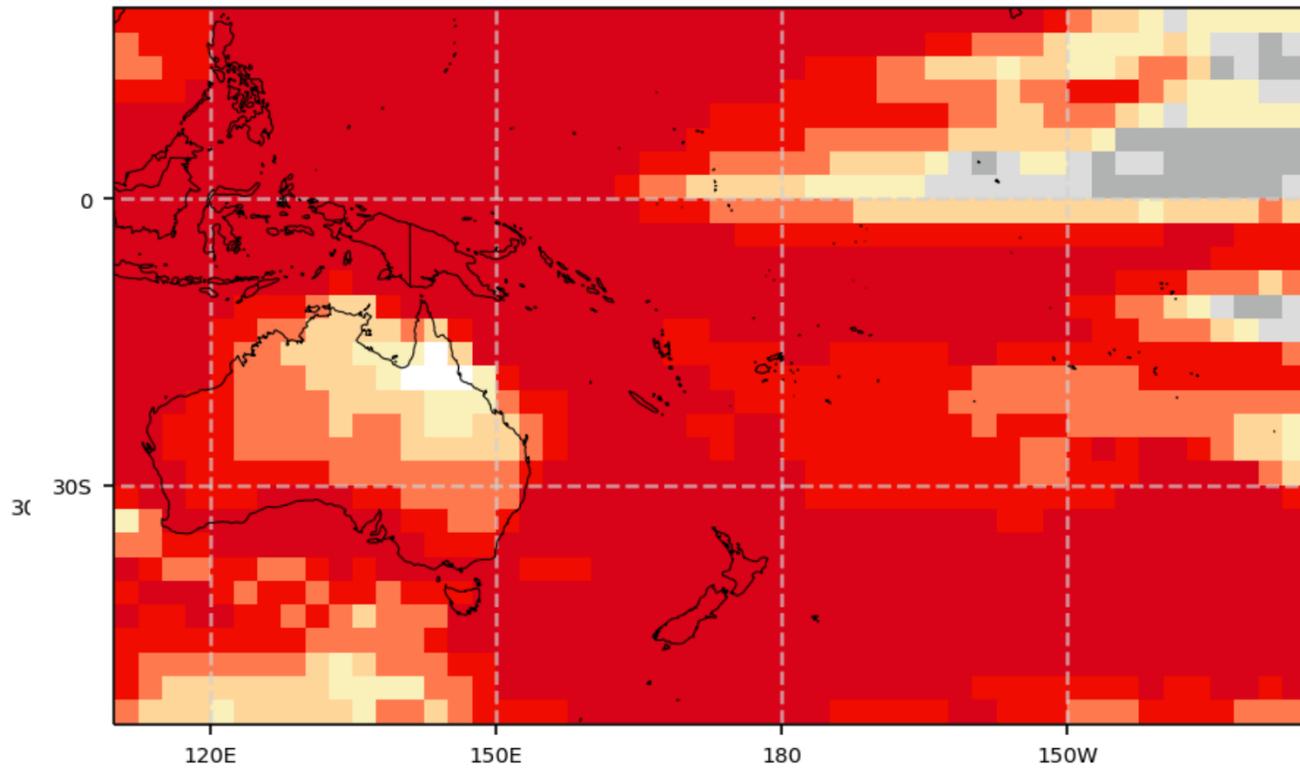
Source: WMO LC-SP

Probabilistic Multi-Model Ensemble Forecast

CMCC, CPTEC, ECMWF, Exeter, Montreal, Moscow, Seoul, Tokyo, Toulouse, Washington

2m Temperature : MJJ2025

(issued on Apr2025)



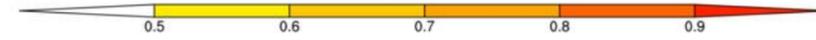
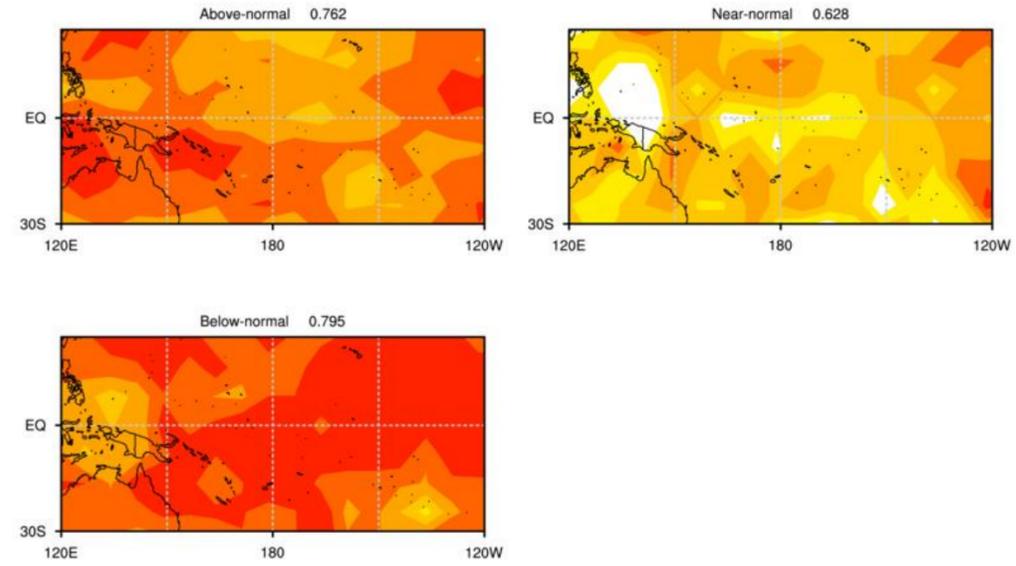
Relative Operating Characteristic(ROC) map

Beijing, CMCC, CPTEC, ECMWF, Exeter, Melbourne, Montreal, Moscow, Offenbach, Pretoria, Seoul, Tokyo, Toulouse, Washington

2m Temperature : MJJ

Lat : -30~25, Lon : 120~240

(Calculation Time : 1993 - 2009)

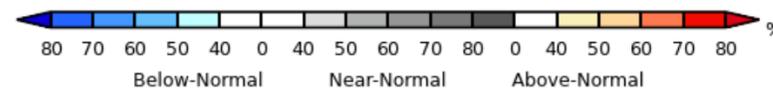
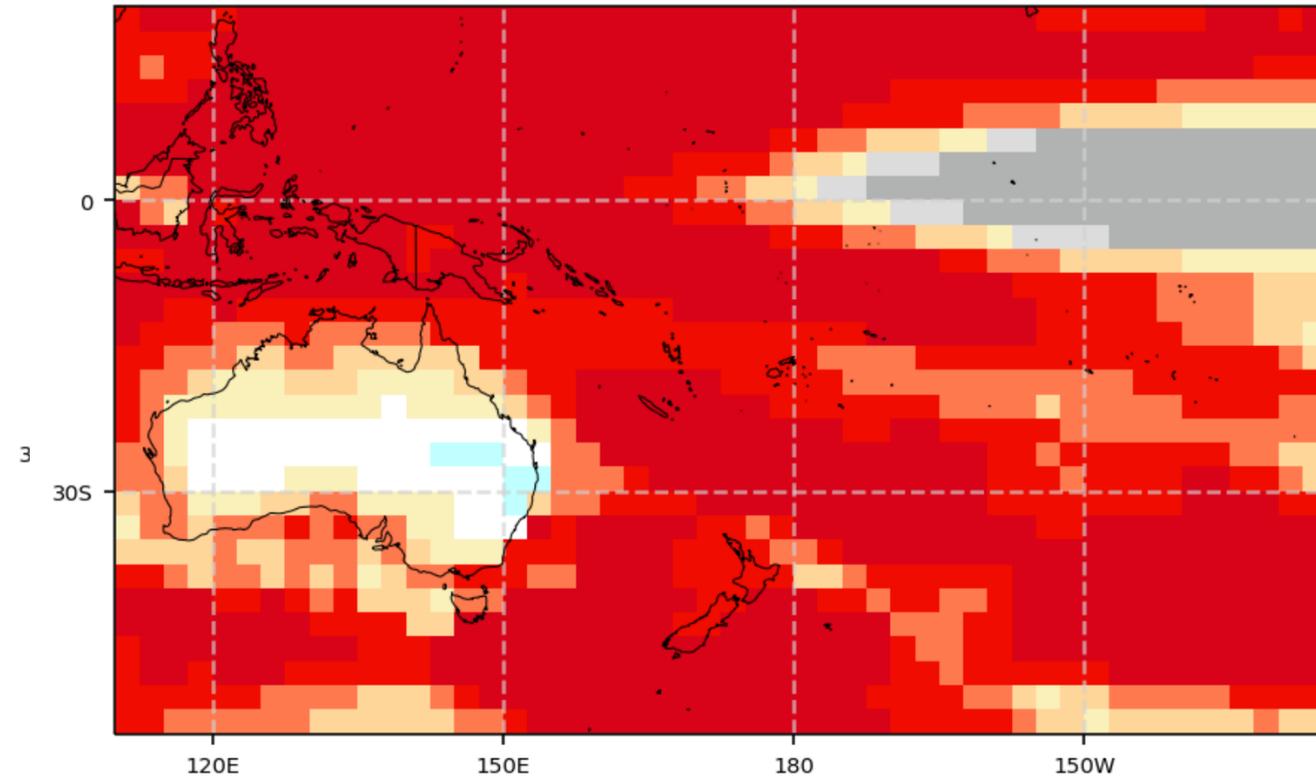


Probabilistic Multi-Model Ensemble Forecast

Montreal, Seoul, Tokyo, Washington

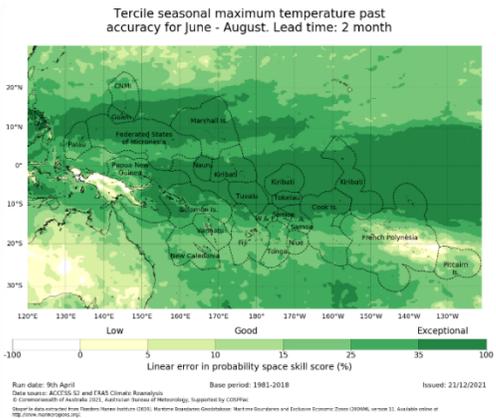
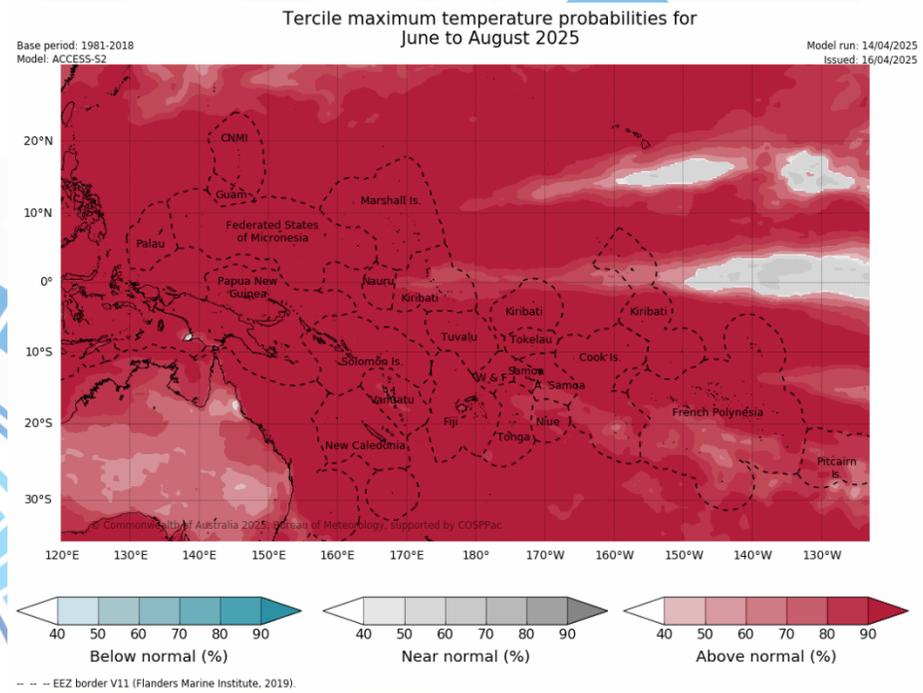
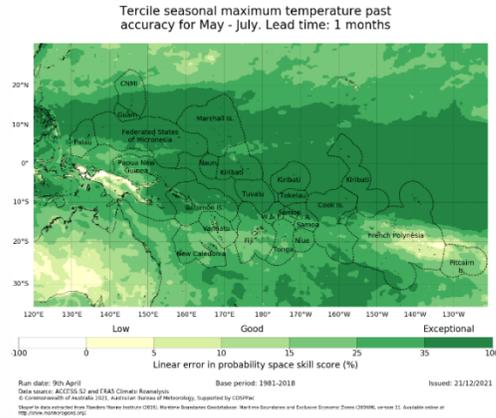
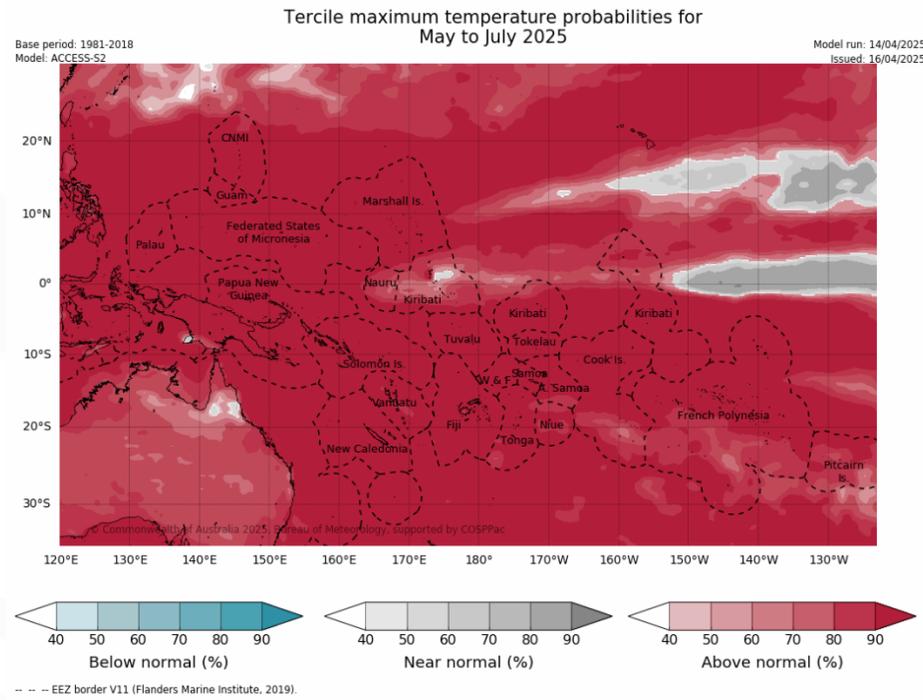
2m Temperature : ASO2025

(issued on Apr2025)

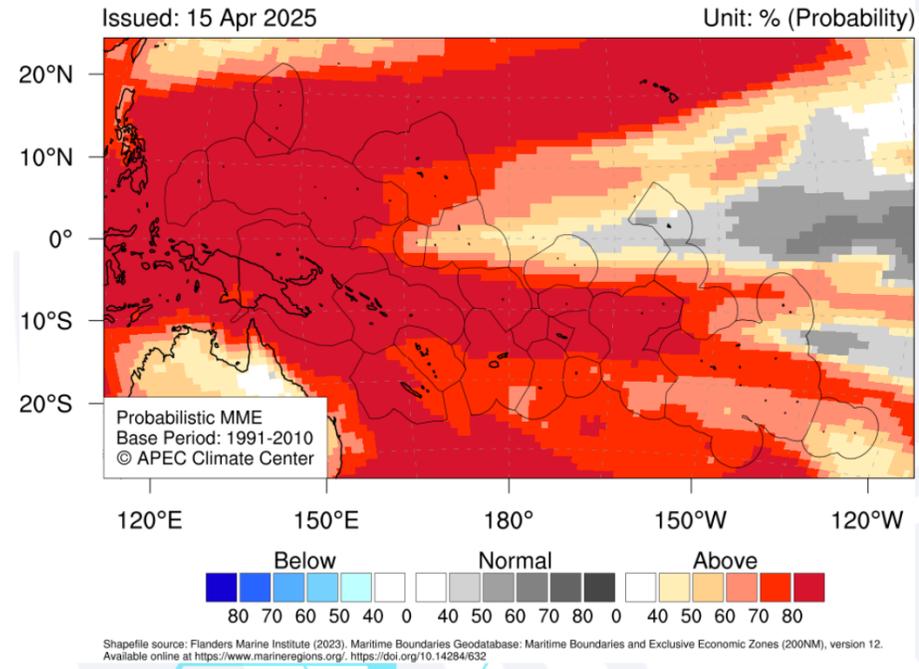


Temperature forecast

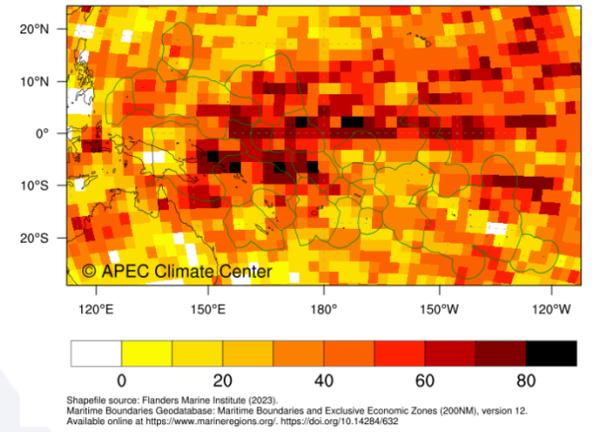
Source: BoM, APCC



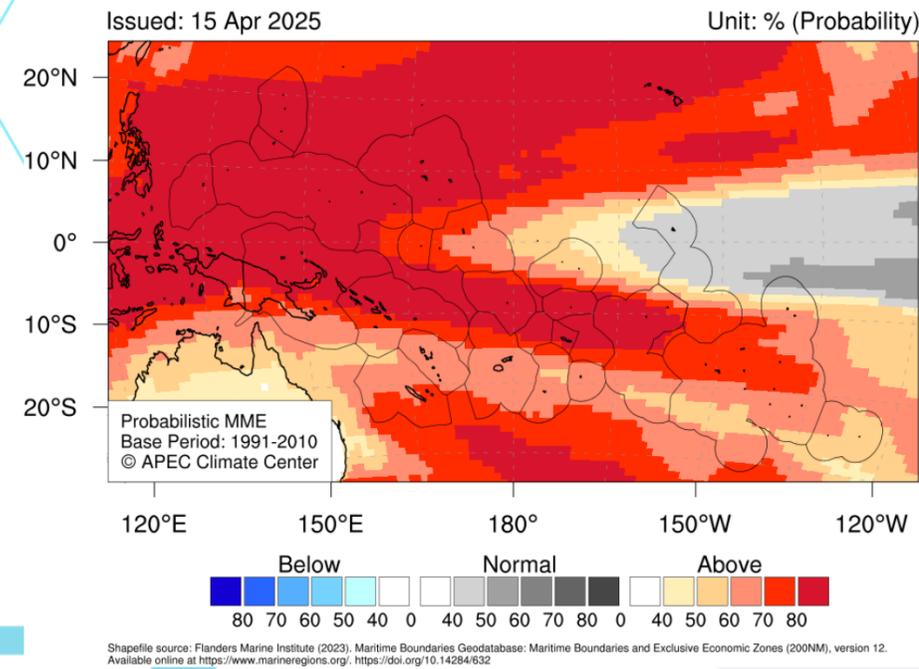
Temperature at 2m for May-July 2025



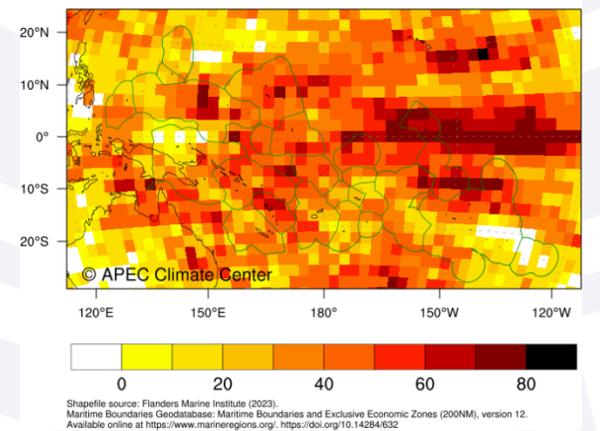
Heidke Skill Score : T2M, MJJ (1991-2010)



Temperature at 2m for August-October 2025



Heidke Skill Score : T2M, ASO (1991-2010)



GSCU (issued 20. Mar)

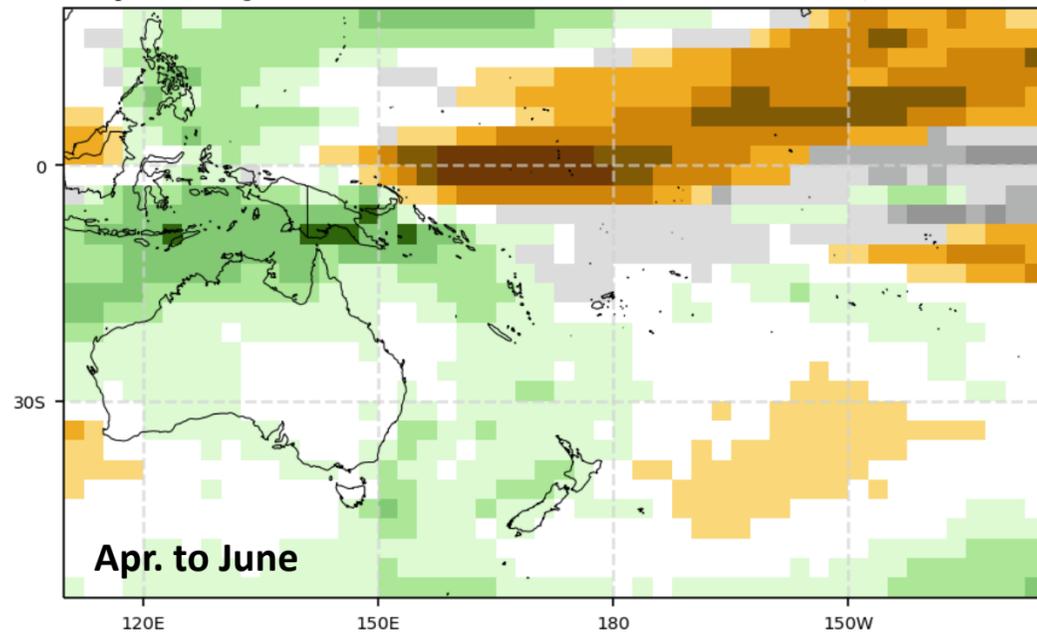
Source: WMO LC-SP

Probabilistic Multi-Model Ensemble Forecast

CMCC, CPTEC, ECMWF, Exeter, Melbourne, Montreal, Moscow, Offenbach, Seoul, Tokyo, Toulouse, Washington

Precipitation : AMJ2025

(issued on Mar2025)

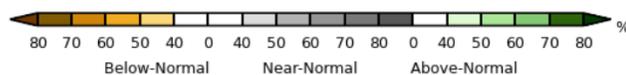
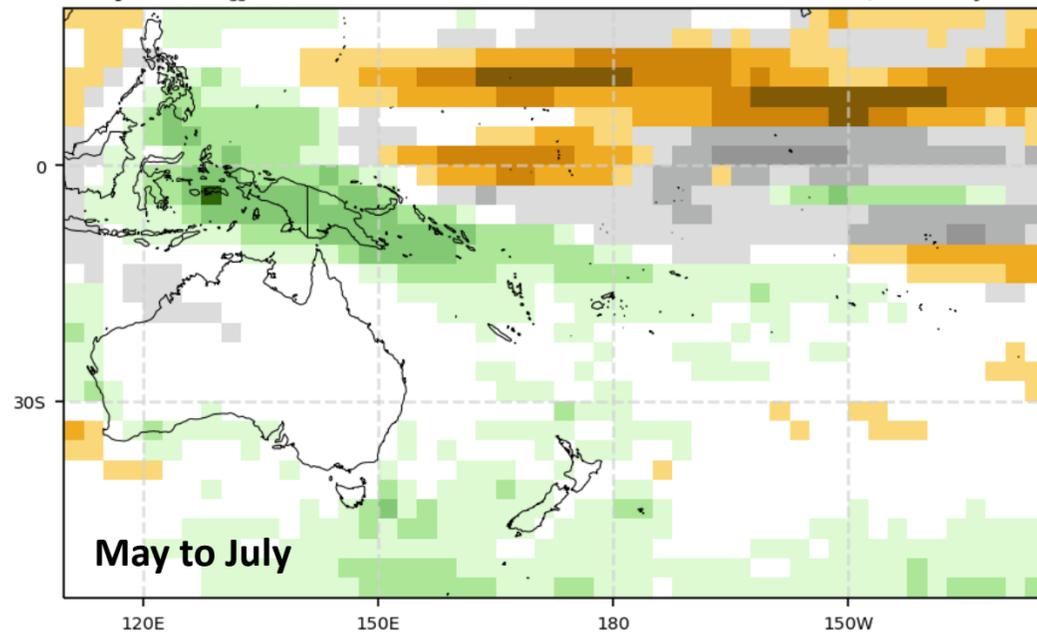


Probabilistic Multi-Model Ensemble Forecast

CMCC, CPTEC, ECMWF, Exeter, Montreal, Moscow, Seoul, Tokyo, Toulouse, Washington

Precipitation : MJJ2025

(issued on Apr2025)



For April–June 2025, **sea surface temperature** anomalies in the Niño 3.4 and Niño 3 regions are forecast to **decline to near-average** levels, indicating a **neutral** state for the El Niño–Southern Oscillation (ENSO). In the Niño 4 region farther west, sea surface temperature anomalies are also projected to **decrease to near-average**.

Rainfall predictions for **April–June 2025** align with the **typical** enhanced positive east-to-west sea surface temperature gradient observed **during La Niña**, **despite** the Niño indices pointing to an **ENSO-neutral state**. Enhanced probabilities for **below-normal** rainfall are forecast **along and north of the equator**, extending eastward from 150°E to 150°W and arching north-eastward toward the southwestern region of North America. Probabilities for near-normal rainfall are expected along the equator from 150°W to 90°W. Moderately enhanced probabilities for **above-normal** rainfall are predicted over the central and **eastern Maritime Continent**. **South of this**, the region of above-normal rainfall probabilities extends to **northern and western parts of Australia and south-eastward to 150°W**.

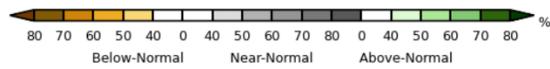
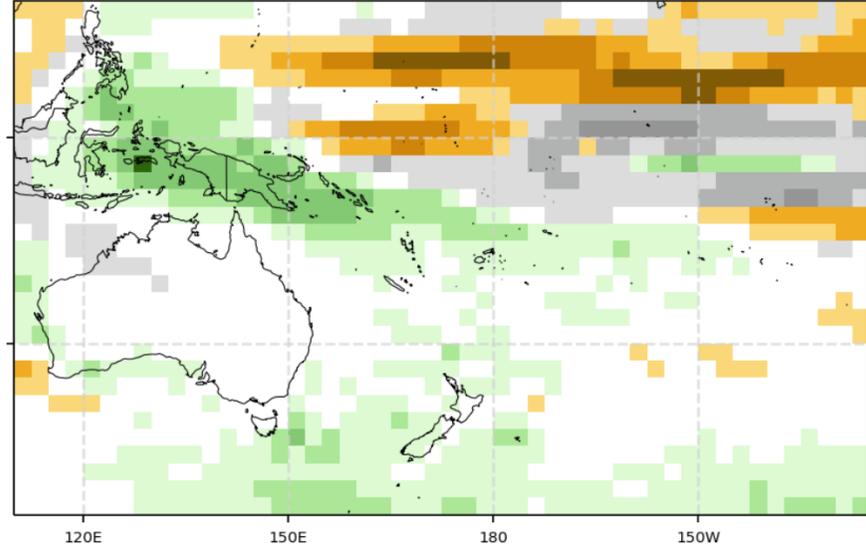
Changes (AMJ -> MJJ)

- West (wet) – East (dry) structure somehow holds but weakens
- Equatorial dry region is split and shifted northward
- Near normal region is expanded
- Rainfall along the SPCZ seems to be more structured and enhanced

Summary

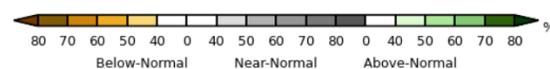
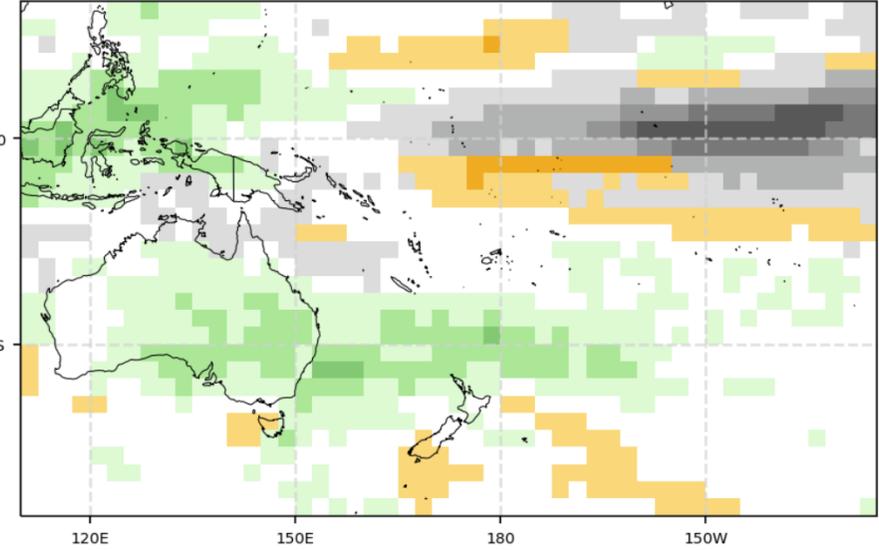
Probabilistic Multi-Model Ensemble Forecast
CMCC, CPTec, ECMWF, Exeter, Montreal, Moscow, Seoul, Tokyo, Toulouse, Washington

Precipitation : MJJ2025 (issued on Apr2025)



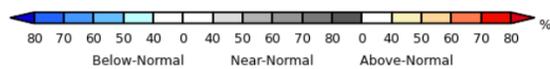
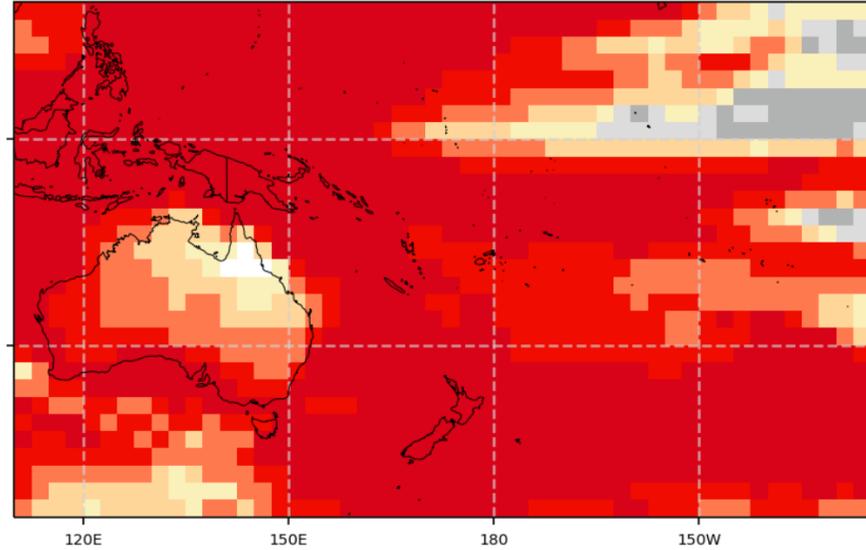
Probabilistic Multi-Model Ensemble Forecast
Montreal, Seoul, Tokyo, Washington

Precipitation : ASO2025 (issued on Apr2025)



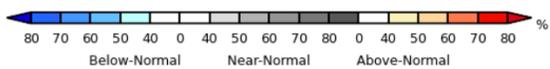
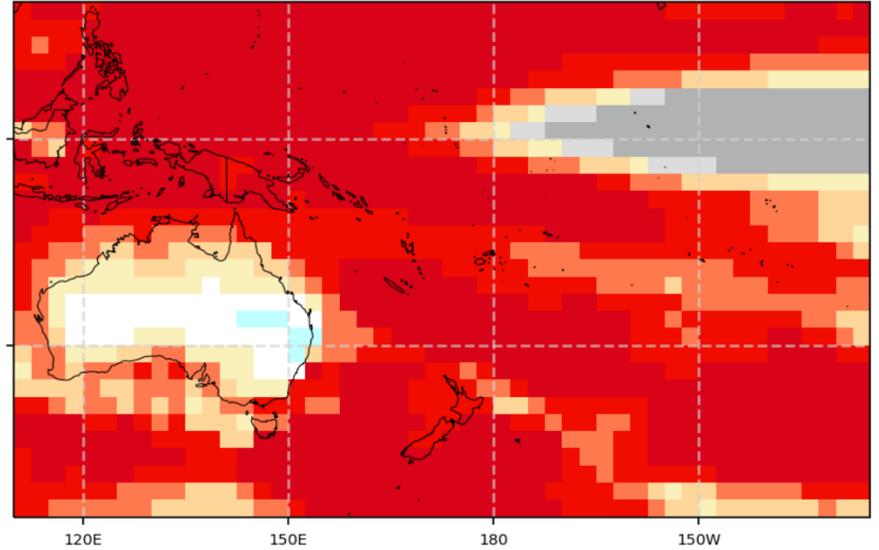
Probabilistic Multi-Model Ensemble Forecast
CMCC, CPTec, ECMWF, Exeter, Montreal, Moscow, Seoul, Tokyo, Toulouse, Washington

2m Temperature : MJJ2025 (issued on Apr2025)



Probabilistic Multi-Model Ensemble Forecast
Montreal, Seoul, Tokyo, Washington

2m Temperature : ASO2025 (issued on Apr2025)



Precipitation

- For May – July 2025, Below normal rainfall is expected at central equatorial Pacific over Nauru, Phoenix Islands (Kiribati) as well as eastern FSM and RMI. Above normal rainfall is expected over Palau, PNG, Solomon islands. A tendencies for above normal rainfall is forecasted over Vanuatu, Fiji, Samoa.
- For Aug. – Oct. 2025, Below normal rainfall is expected at southern off-equatorial central Pacific near Tuvalu, Kiribati, northern Cook islands. Above normal rainfall is favoured at the western North Pacific over Palau and FSM

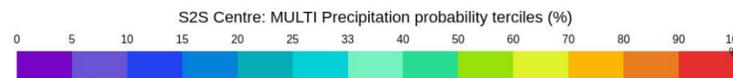
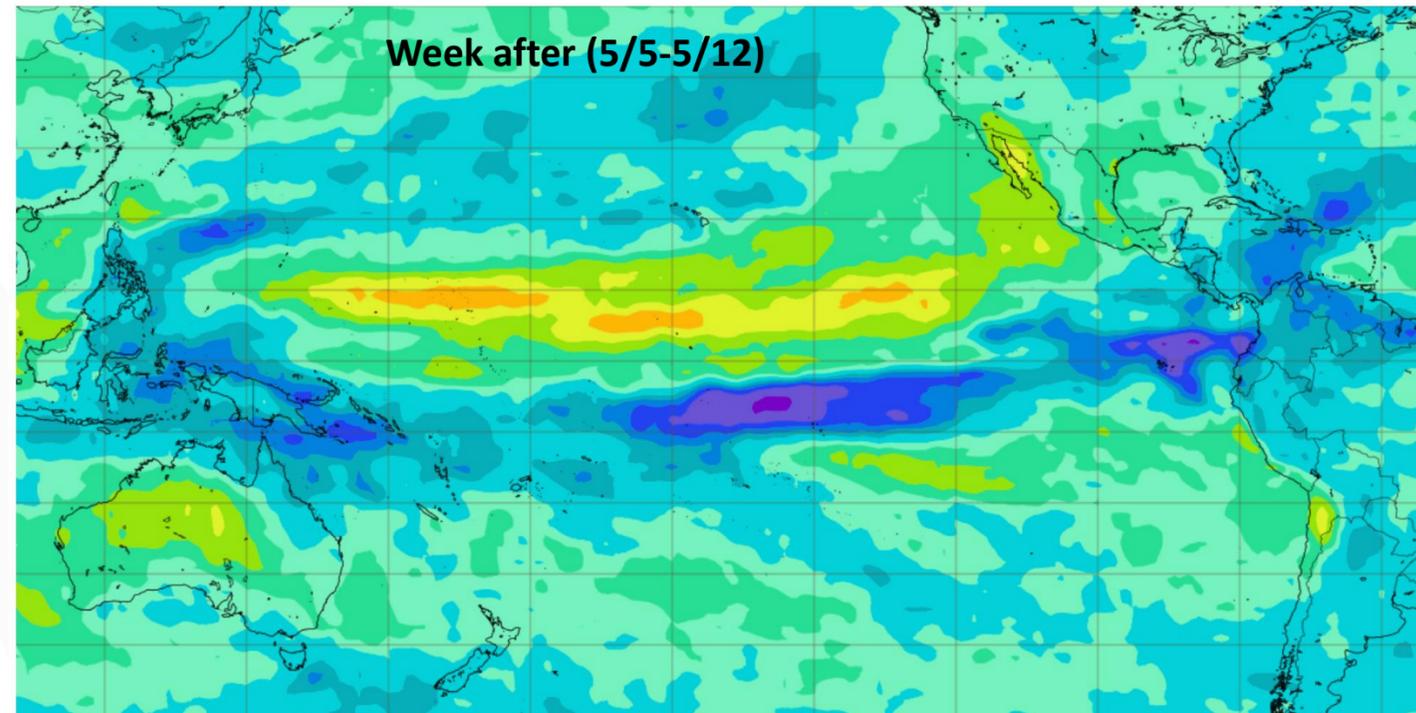
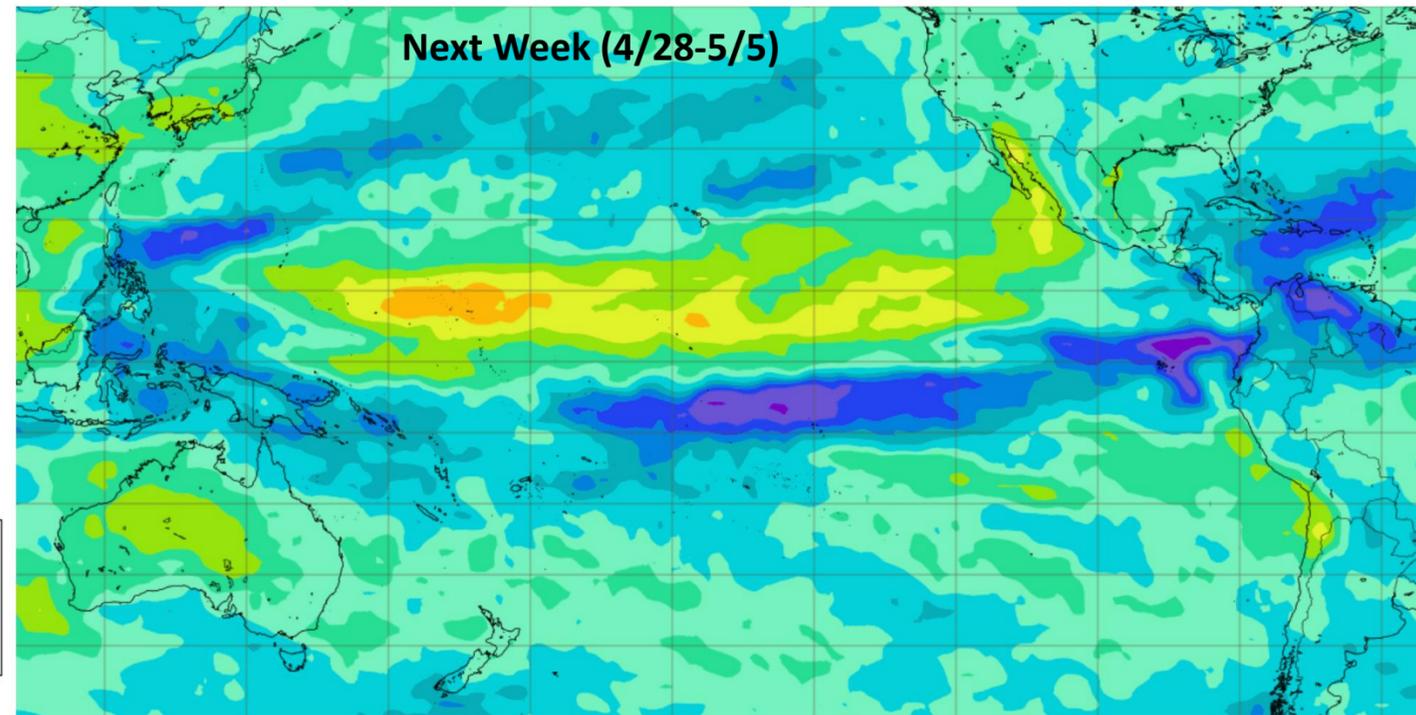
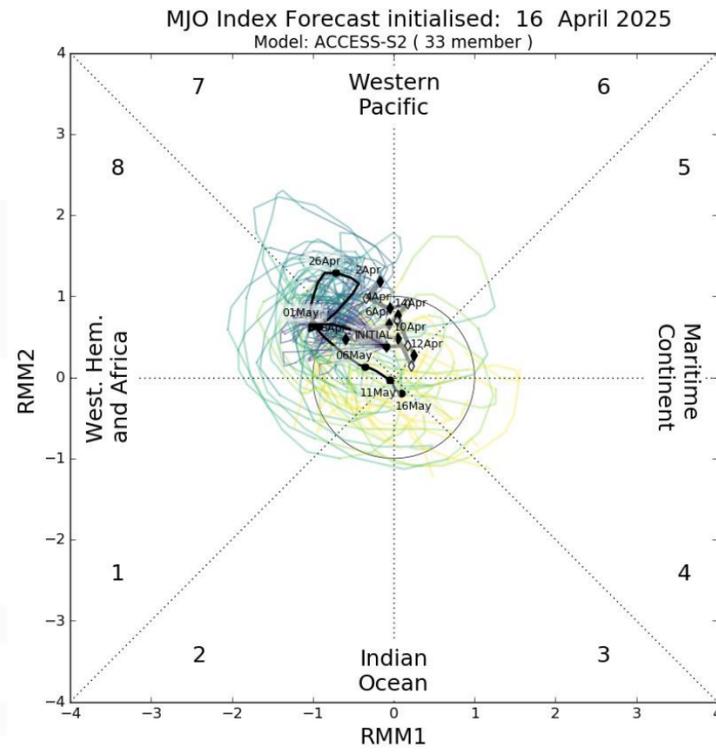
Temperature

For May – Oct. 2025, Above normal temperature is expected over the whole Pacific except for the central to eastern equatorial Pacific.

Subseasonal forecast

Source: BoM, CPC, WMO LC-SSP

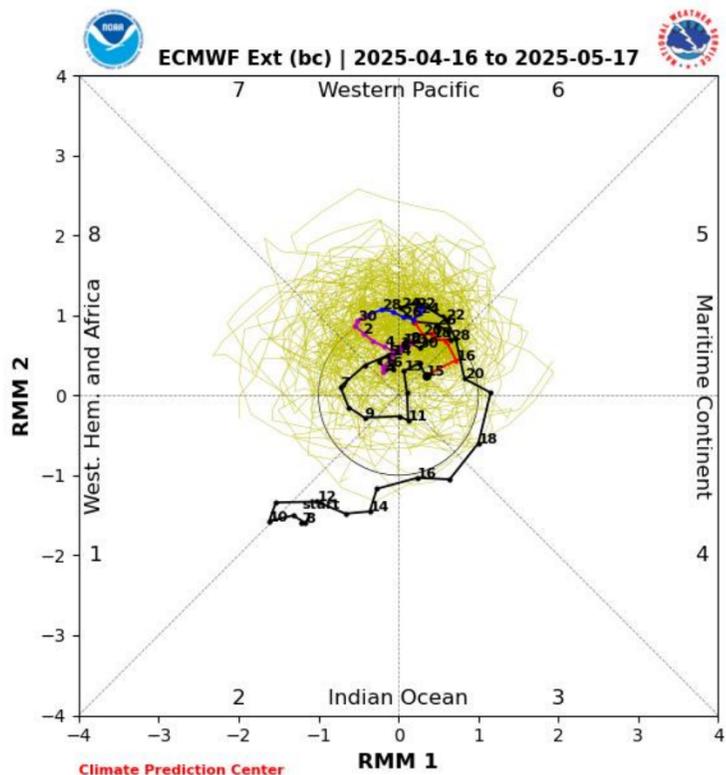
Issued at 4/10



Probability for below normal rainfall

MJO : Not significant
Possibility of enhanced convection at the western Pacific in coming weeks

Weekly Forecast (WMO LC-SSP)
Below normal rainfall : along the equator and its north
Above normal rainfall : Off-equatorial south pacific and western-end of subtropical Pacific



THANK YOU!

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