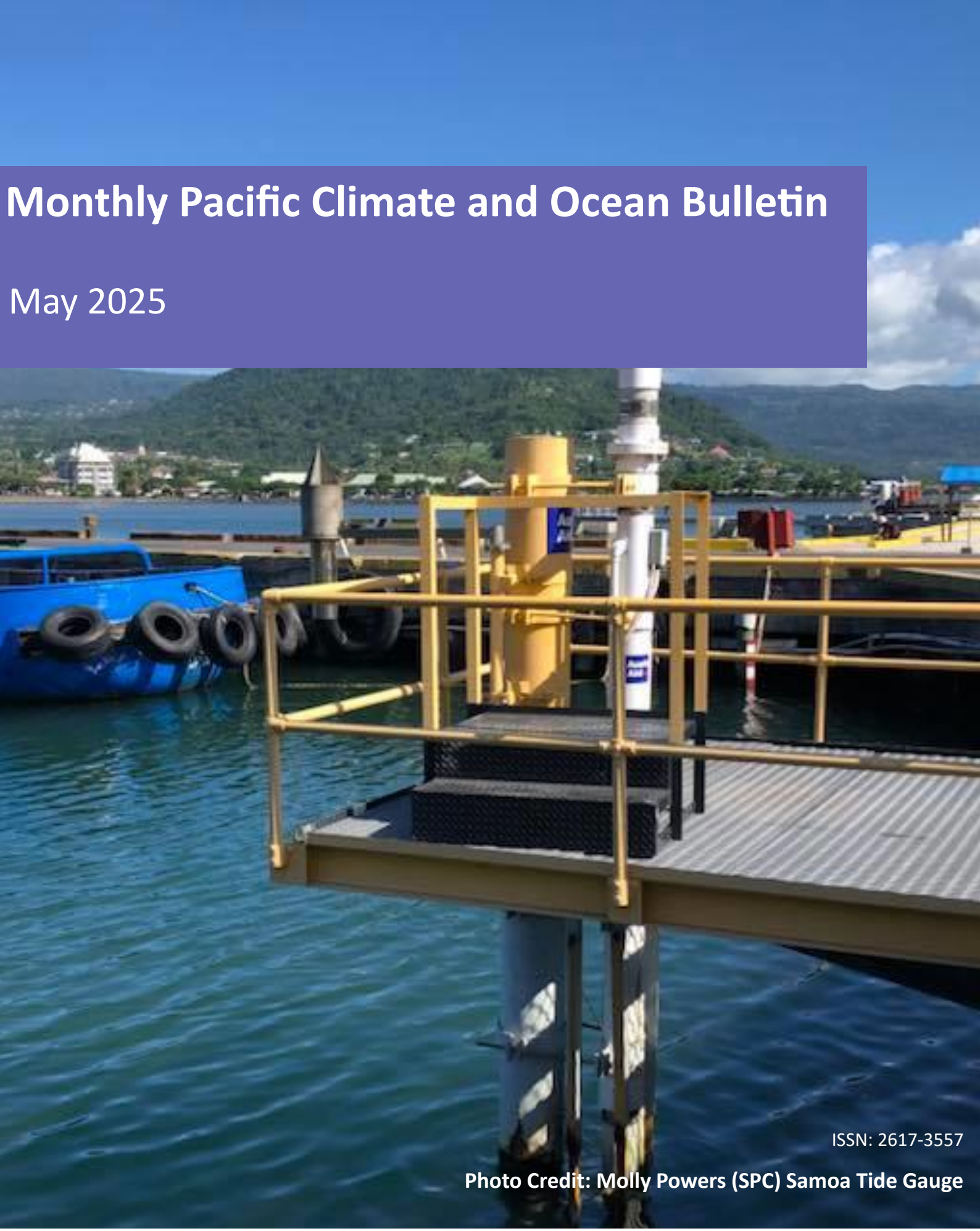
Monthly Pacific Climate and Ocean Bulletin

May 2025



ISSN: 2617-3557

Photo Credit: Molly Powers (SPC) Samoa Tide Gauge

SPREP
Secretariat of the Pacific Regional Environment Programme

NEW ZEALAND
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Australian Aid

Climate and Oceans Support Program in the Pacific

Pacific Community
Communauté du Pacifique

CONTENTS

Issued 24 June 2025

- The El Niño Southern Oscillation (ENSO) is neutral.
- The Madden Julian Oscillation (MJO) is currently indiscernible.
- In May, the Intertropical Convergence Zone (ITCZ) was located mainly in the western Pacific along the equator around southern FSM, with another portion stretched from eastern Gilbert to northern Kiribati. The South Pacific Convergence Zone (SPCZ) was active and displaced south of PNG and stretched southeastwards to southern French Polynesia.
- Sea surface temperatures (SSTs) for May 2025 were average or near normal in waters eastwards of 150 °E along the tropical equatorial Pacific.
- The Coral bleaching Outlook to 07 July shows 'Alert Level 2' over PNG.
- For June to August 2025, the models agree that above normal rainfall is likely or very likely for northern CNMI, and southern RMI in the northern Pacific. Above normal rainfall is also likely or very likely in a band stretching from Palau, PNG, southern Solomon Islands, northern Vanuatu, southern Fiji, southern Tonga, and central French Polynesia. Below normal rainfall is likely or very likely in a band stretching eastwards from northern FSM to central RMI in the northern Pacific, and northern French Polynesia in the southern Pacific.
- The weekly tropical cyclone forecasts from the ACCESS-S model shows some risks for Philippines and south China sea region for the 25 June to 1 July. There are some risks also for Palau, Guam and northern from 2 to 8 July.

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EL NIÑO–SOUTHERN OSCILLATION

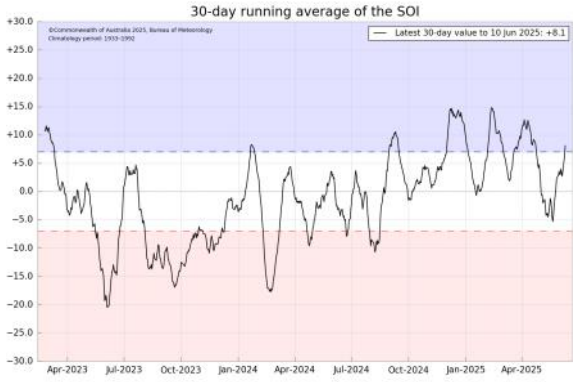
El Niño-Southern Oscillation (ENSO) and Indian Dipole are neutral

Click link to access Climate Driver Update issued on 12 June 2025

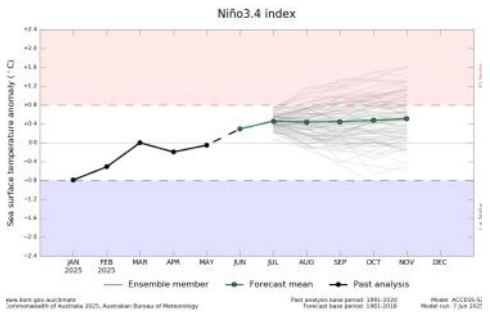
The El Niño-Southern Oscillation (ENSO) is neutral. The latest Niño3.4 value for the week ending 8 June is -0.07 ° C. Neutral ENSO values are between -0.8 °C and +0.8 °C. Sea surface temperatures (SSTs) in the western Pacific region during May 2025 were warmer than average. The Bureau's model predicts neutral ENSO (neither El Niño nor La Niña) until at least November. This is consistent with forecasts from 7 out of 8 international models. However, there is a large spread in the model forecasts towards the end of the outlook period, indicating greater uncertainty towards the end of spring.

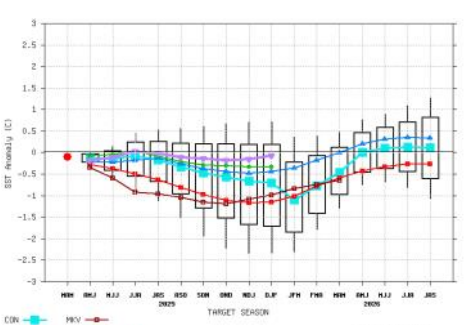
The Indian Ocean Dipole (IOD) is neutral. The Bureau's model predicts neutral state of the IOD until at least July, after which it forecasts a shift towards a negative IOD. This is consistent with 6 of 8 international models assessed which also forecast a negative IOD pattern developing at some point between June and September. Despite international model agreement, skill for IOD forecasts made at this time of year has been historically low beyond 2 months ahead. Global sea surface temperatures (SSTs) remain substantially above average. Monthly averaged SSTs in 2025 have been the second warmest on record for each respective month, second only to temperatures recorded in 2024. The Southern Annular Mode (SAM) is neutral, as of 8 June. Models suggest the SAM is most likely to remain neutral over the next fortnight.

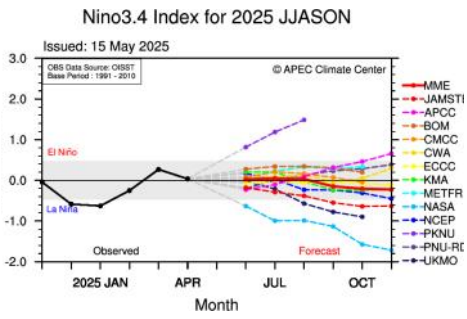
The 30 day average of the Southern Oscillation Index (SOI) for the period ending 13 June was +6.9.



International Model Outlooks







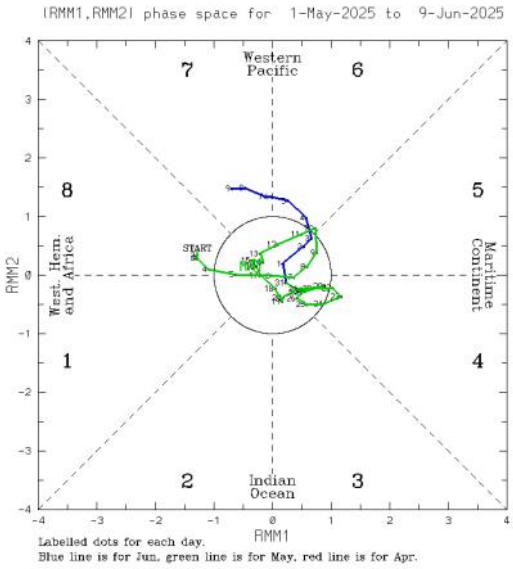
MADDEN–JULIAN OSCILLATION

Click link to access *Tropical monitoring and outlook* [Issued on Tuesday 10 June 2025]

A Madden-Julian Oscillation (MJO) was indiscernible during May.

The Madden-Julian Oscillation (MJO) at the start of June, was of a moderate strength pulse moved across the Western Pacific then weakened in the Western Hemisphere and Africa. As of 14 June, the MJO signal is indiscernible. The majority of MJO forecast models indicate the MJO will remain indiscernible until the end of June. A weak MJO has minimal influence on Australian rainfall at this time of year.

This is an abbreviated version of the Tropical monitoring and outlook. Click on the *Tropical Update* for more information .



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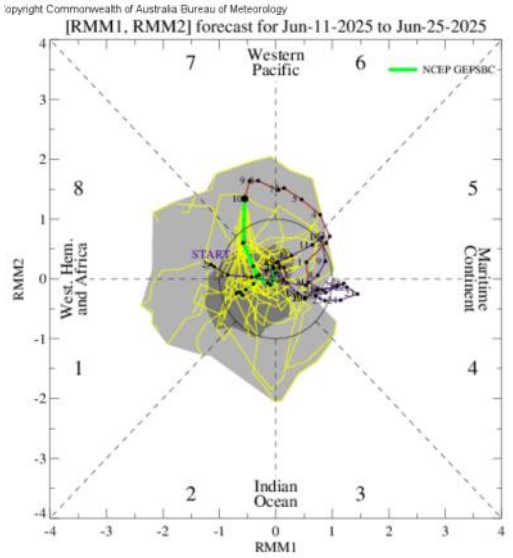
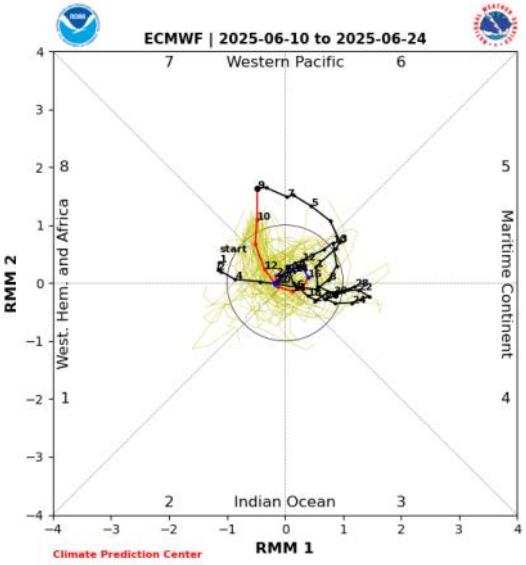
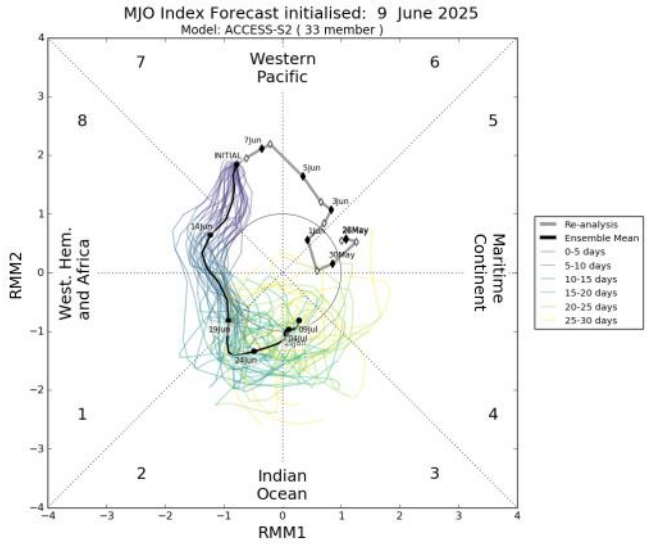




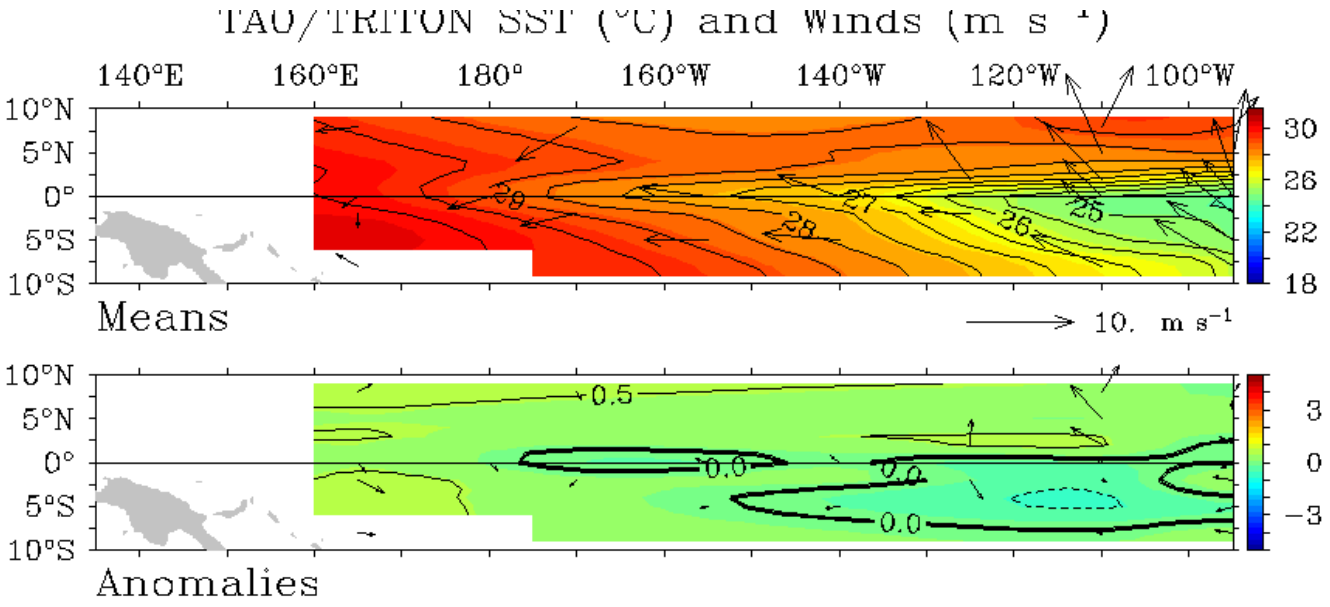


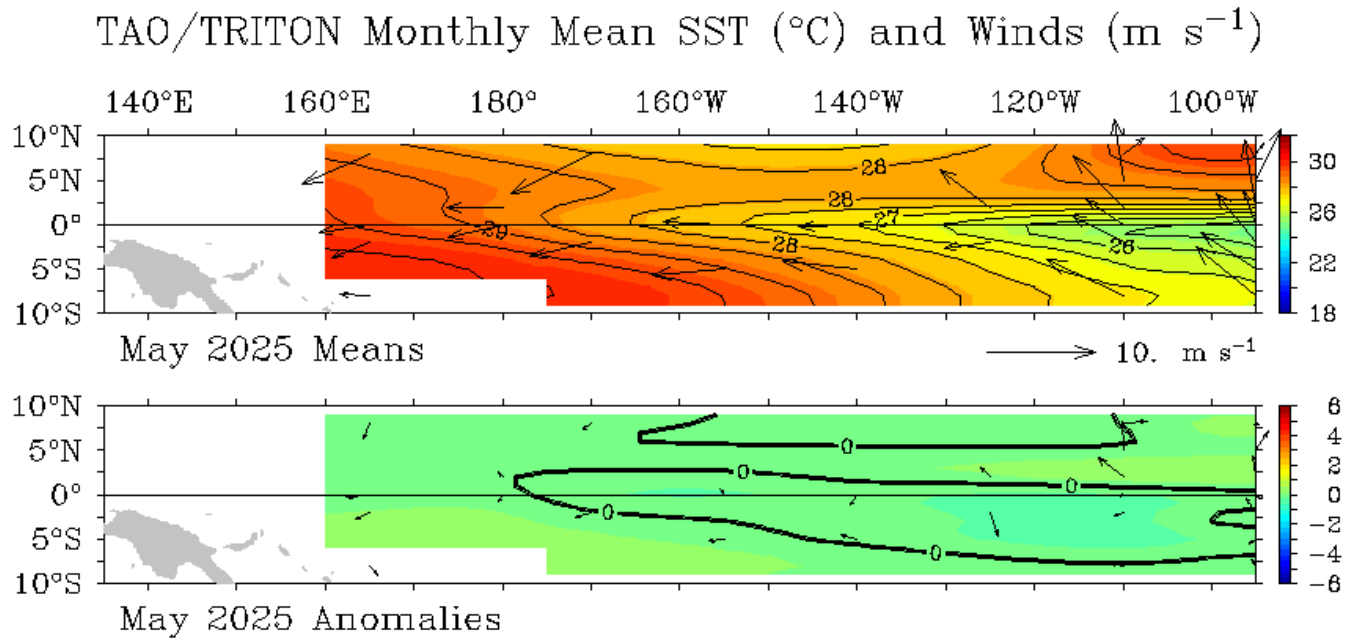
WIND

Click link to access [Wind plots link]

During May, the trade winds were generally average over the equatorial Pacific with some northerly winds east of the Dateline. For the five days ending 10 June 2025, the trade winds were weaker than average in the western equatorial Pacific west of the Dateline with more westerlies dominating. Close to average elsewhere.

During El Niño events there is a sustained weakening, or even reversal, of the trade winds across much of the tropical Pacific, while during La Niña, there is a sustained strengthening of the trade winds.





TAO Project Office/PMEL/NOAA

Jun 11 2025

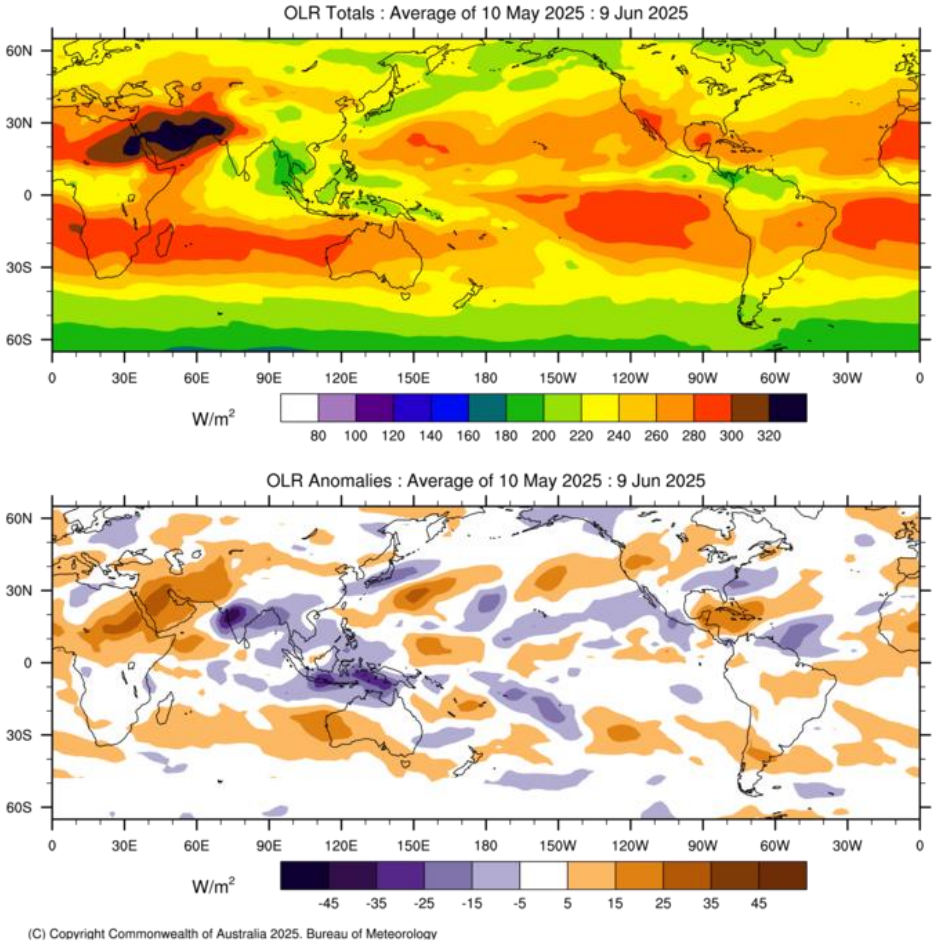
CLOUD AND RAINFALL

Click link to access OLR

The May 30-day OLR anomaly map shows a region of negative OLR (increased convection) in a band stretched eastwards along the South Pacific Convergence Zone (SPCZ) from PNG, and Solomon Islands. Another band of negative OLR (increased convection) in a band stretched southeast over Tuvalu, Tokelau, Wallis and Futuna, Samoa, American Samoa, Niue, and southern Cook Islands. Areas of anomalously high OLR (decreased convection) were evident over FSM, Nauru, southern RMI, and Kiribati (Gilbert and northern Line Is.) in the north Pacific. Decreased convection were also evident over New Caledonia, Vanuatu, and Fiji in the south Pacific.

Note: Global maps of OLR below highlight regions experiencing increased or decreased cloudiness. The top panel is the total OLR in Watts per square metre (W/m^2) and the bottom panel is the anomaly (current minus the 1979-1998 climate average), in W/m^2. In the bottom panel, negative values (blue shading) represent above normal cloudiness while positive values (brown shading) represent below normal cloudiness.

OLR Total and Anomalies, 30 Day OLR



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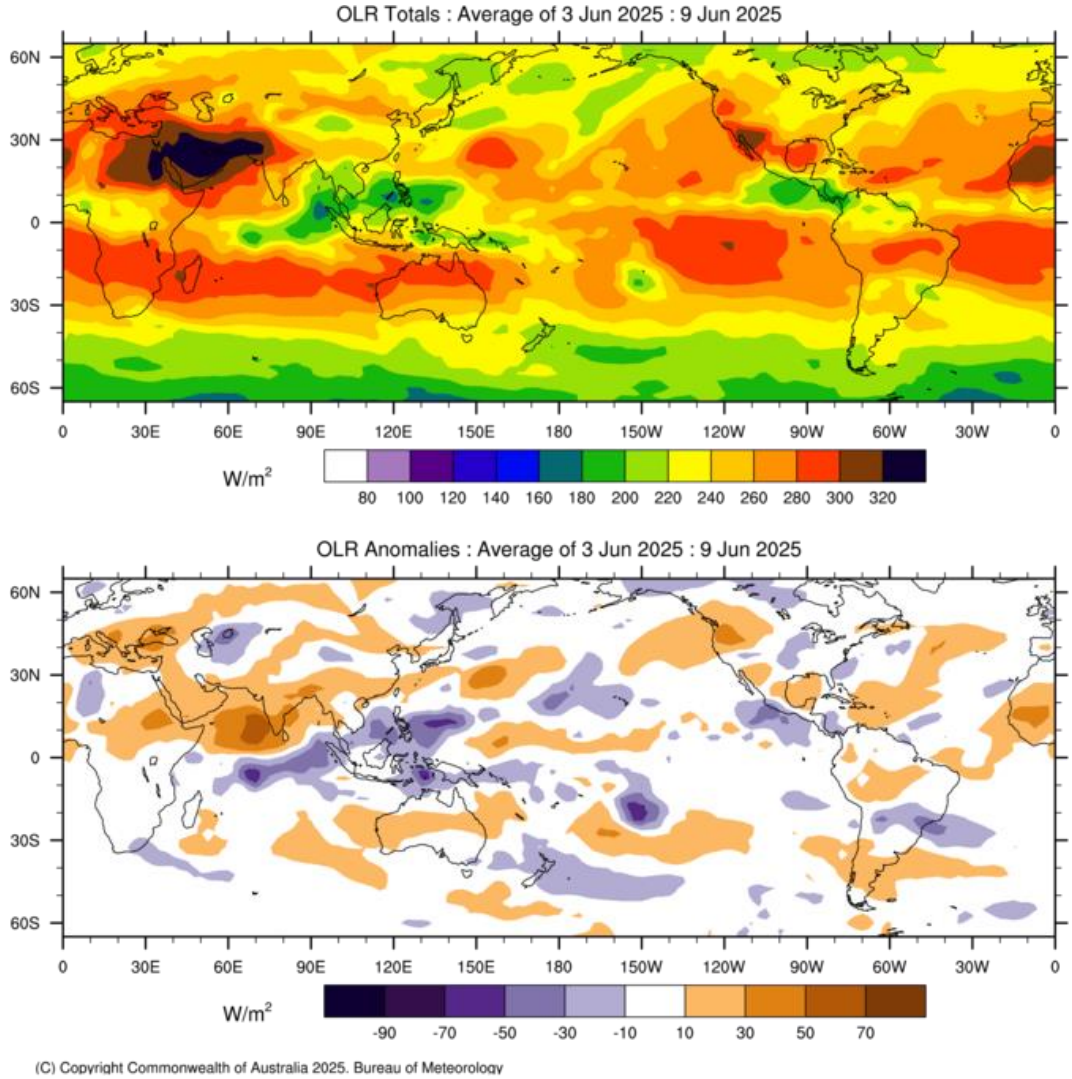
OLR Total and Anomalies, 7 Day OLR



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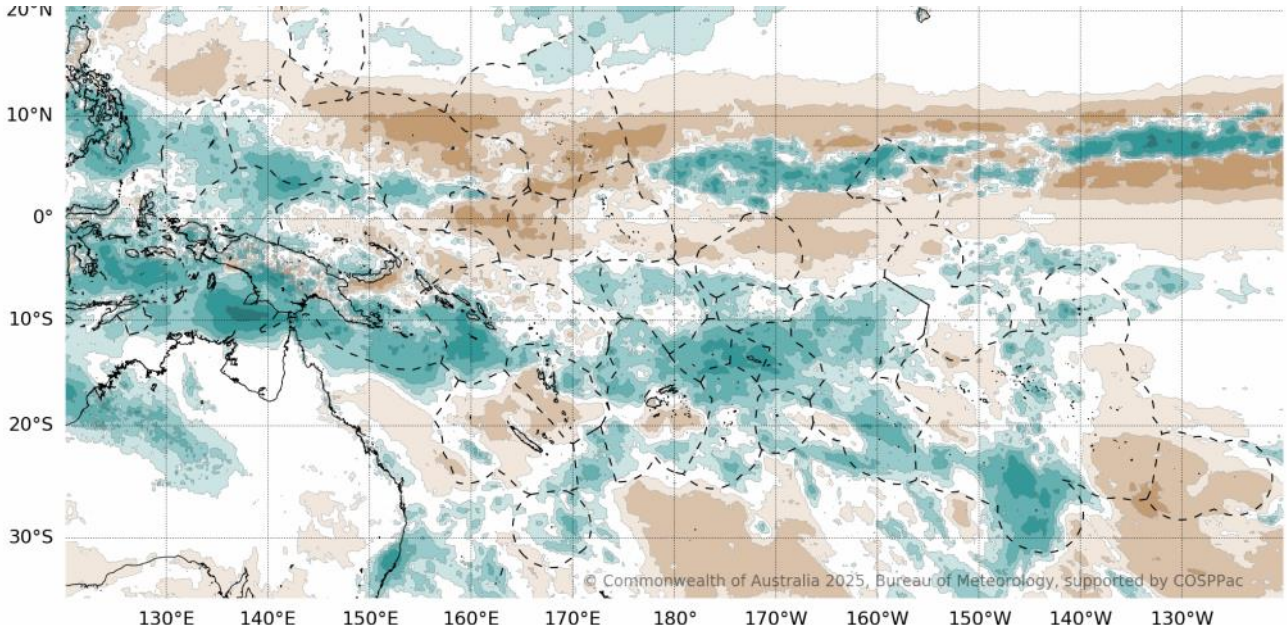
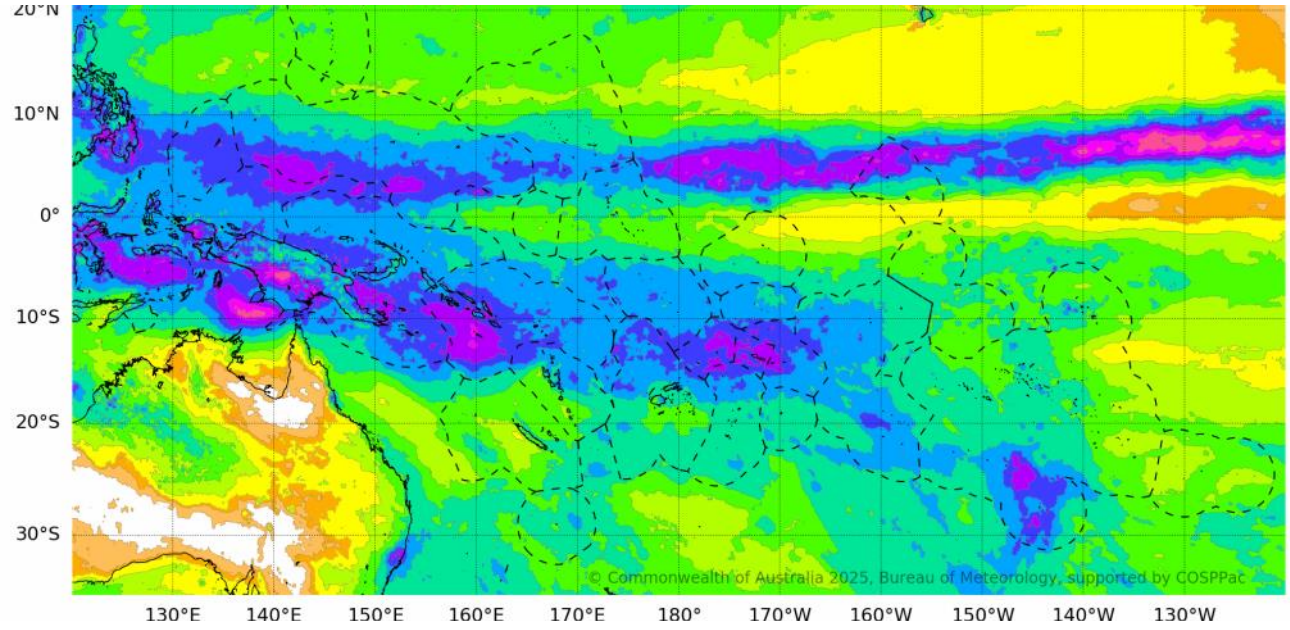
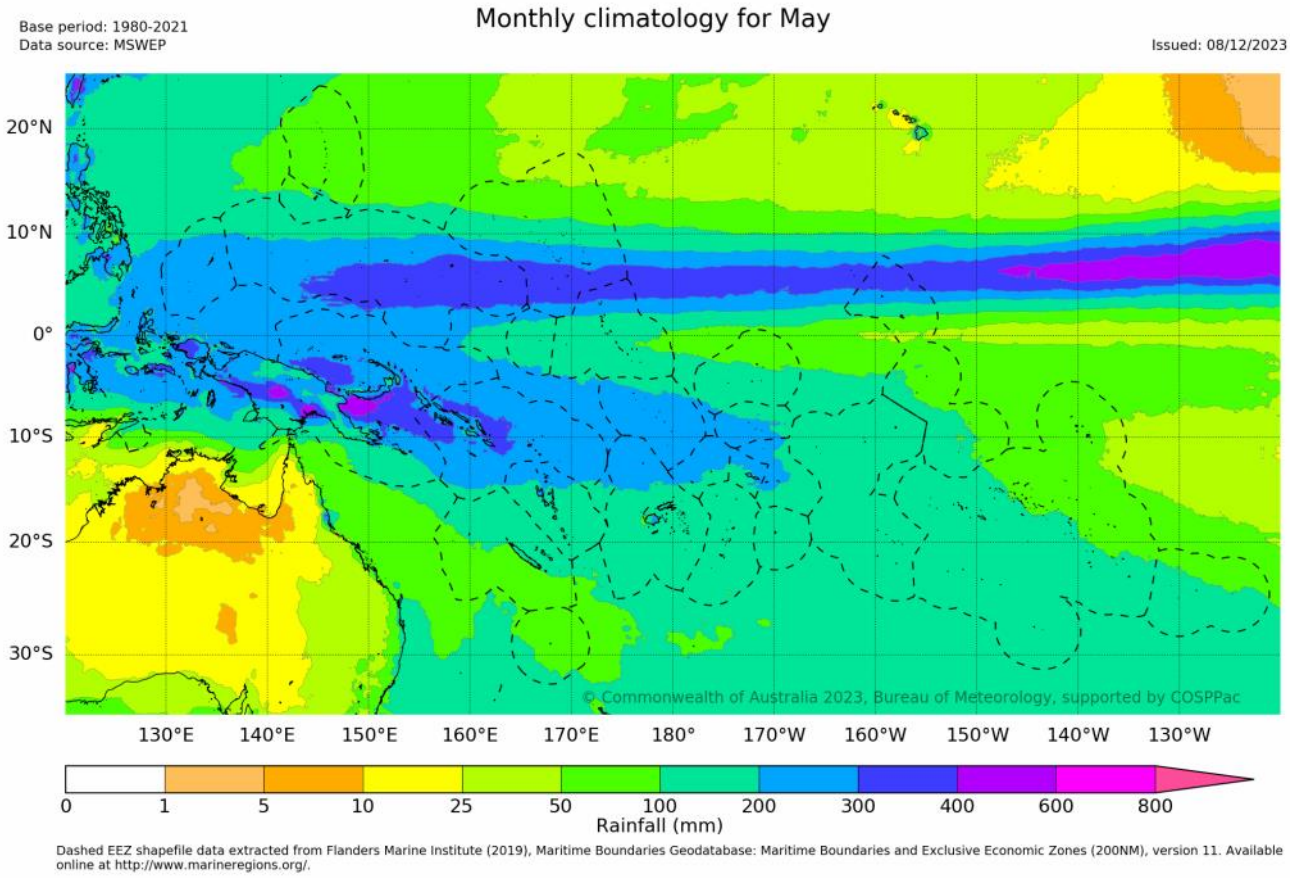


30-Day Rainfall Accumulated





Global and Pacific ACCESS-S outlook and Pacific Climate Monitoring - ACCESS-S precipitation:
http://access-s.clide.cloud/

OCEAN CONDITIONS

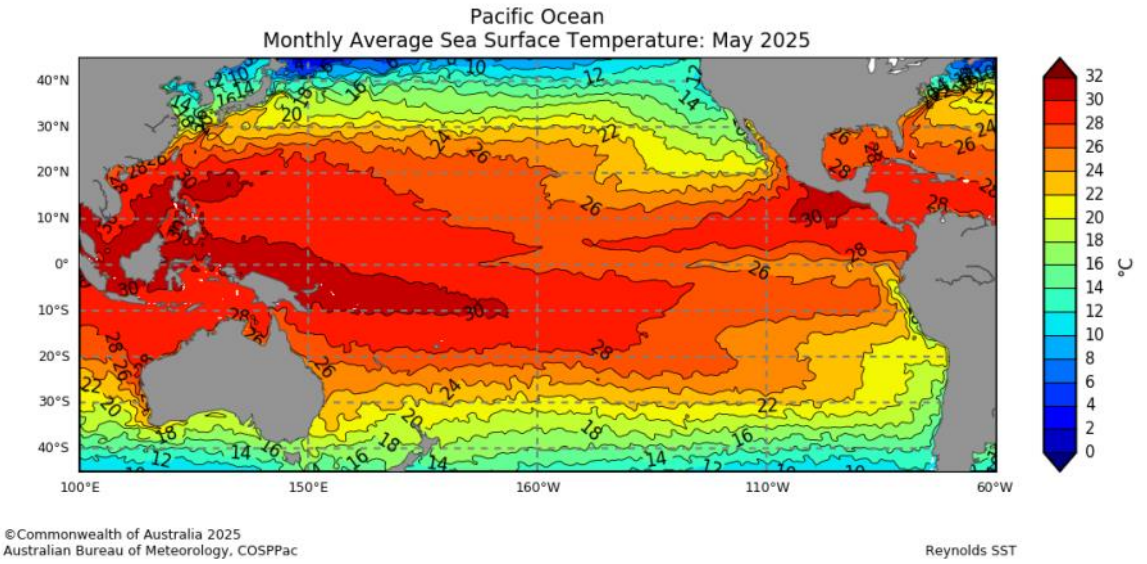
SEA SURFACE TEMPERATURE

Click link to access Pacific Community COSPPac Ocean Portal

Sea surface temperatures (SSTs) for May 2025 were average or near normal in waters eastwards of 150°E along the tropical equatorial Pacific, which was surrounded by above average waters.

Highest-on-record May SSTs occurred over eastern PNG, Solomon Islands, Fiji, Tonga, Vanuatu, Marshall Islands, and New Caledonia. The SSTs in decile 10 (very much above average) stretched southeastwards from southern Palau, PNG, Solomon Islands, Vanuatu, Fiji, Tuvalu, Tonga, Samoa, American Samoa, and northern half of Cook Islands. Patches of SSTs in decile 10 (very much above average) were observed in Niue, FSM and Kiribati (southern Line and Phoenix Islands). Additionally, another band covered northern Marshalls Islands. Above average (8-9) deciles stretched northeastwards from Palau, northern FSM, to northern RMI. Another 8-9 deciles band spanning eastwards from PNG, southern Nauru, northern Tuvalu, Tokelau, most of Phoenix Islands, and southern Line Islands, and most part of Cook Islands. Patches over Solomon Islands, Fiji, Tonga, Samoa, American Samoa, and Niue. Average SSTs (4-7) observed over eastern FSM, southern RMI, eastern Niue, and Nauru. Average SSTs (4-7) and below average (2-3 decile) were observed in Kiribati (Gilbert and northern Line Islands) and southern Cook Islands.

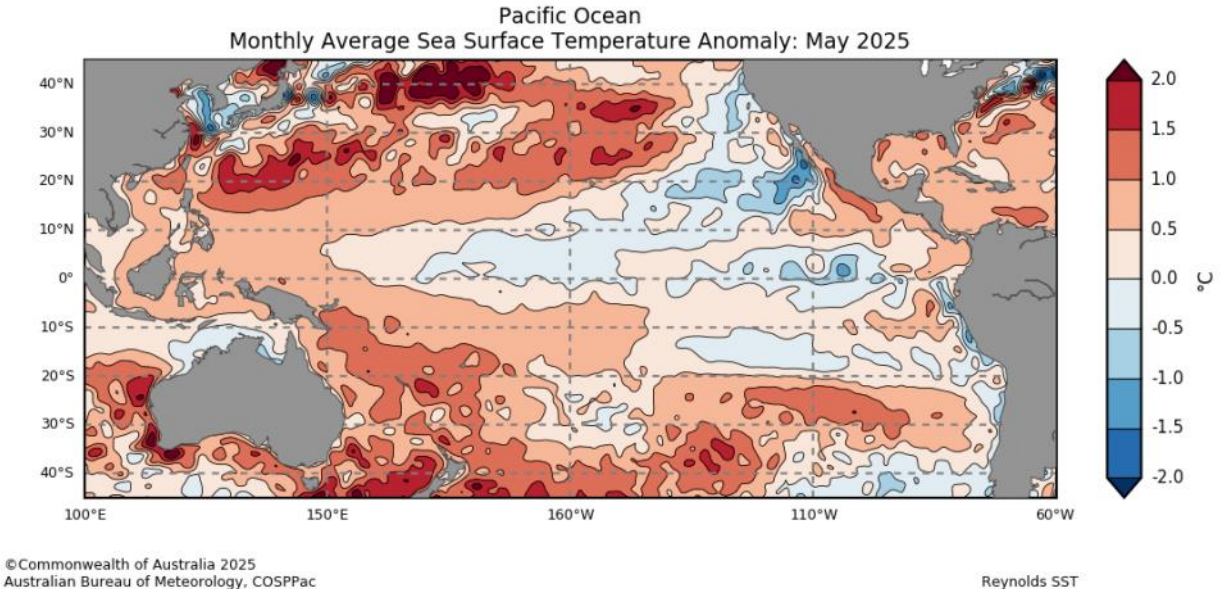
Mean Sea Surface Temperature

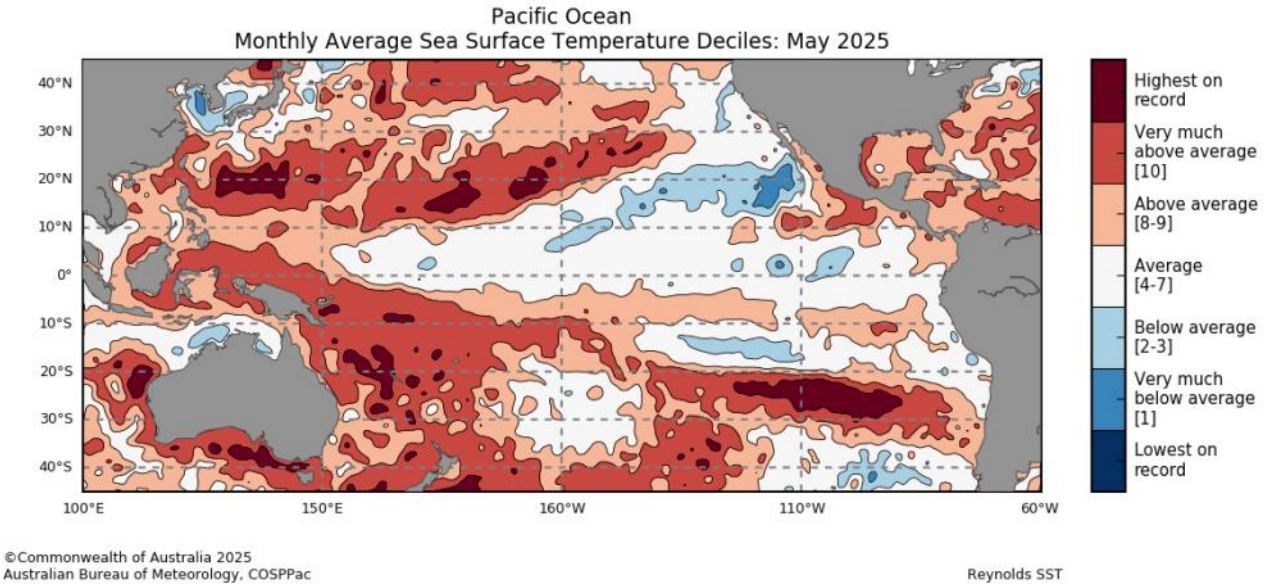


OCEAN CONDITIONS

Click link to access SEA SURFACE TEMPERATURE

Anomalous Sea Surface Temperature



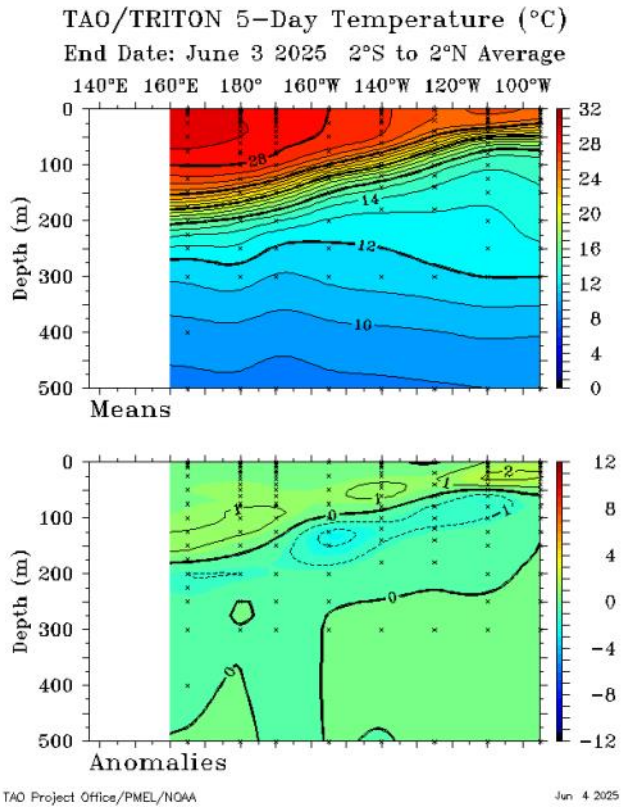


OCEAN CONDITIONS

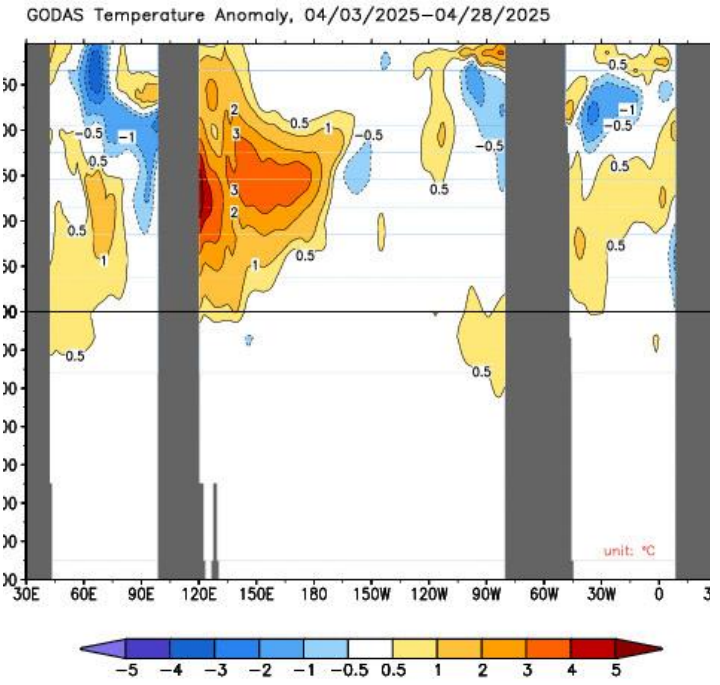
SUB SURFACE

The May equatorial Pacific sub-surface temperature anomalies for the 30 days ending 28 May 2025 show warmer than average waters in the far eastern Pacific of the equatorial region down to about 50 m depth. Beneath 50m depth are cooler waters are present, extending in depth to 200 m, especially skewing towards the west. Warmer than average waters in the western half of the equatorial Pacific down to about 200 m depth in the far western Pacific. Waters are 1 °C warmer than average in the far western Pacific, between 100m and 200m depth underneath the warm pool area.

Weekly Temperatures Mean and Anomalies



Monthly Temperatures Anomalies



Bureau of Meteorology Sea Temperature Analysis: http://www.bom.gov.au/marine/sst.shtml

TAO/TRITON Data Display: http://www.pmel.noaa.gov/tao/jsdisplay/

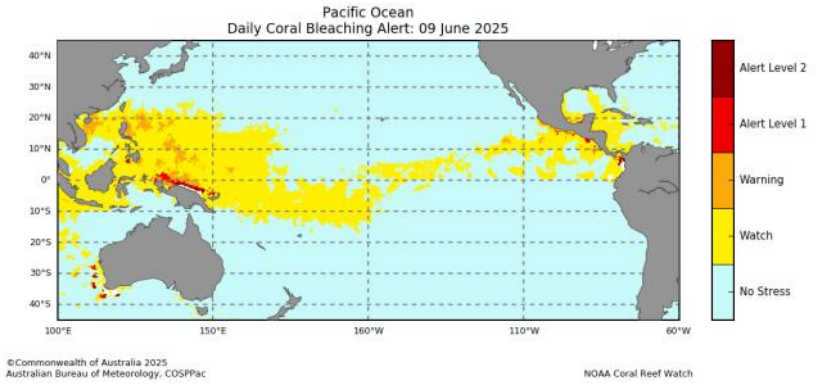
OCEAN CONDITIONS

CORAL BLEACHING

The daily Coral Bleaching Alert status for 9 June 2025 shows Alert Levels 2 and 1 over PNG. Warning over PNG. Watch or No stress for the rest of the countries. The four-week Coral Bleaching Outlook to 7 July shows Alert Levels 2 and 1 over PNG and Alert Level 1 for the southern edge of Palau. Warning covers most of Palau, the eastern and southern parts of FSM and PNG. Watch or No Stress over the rest of the countries.

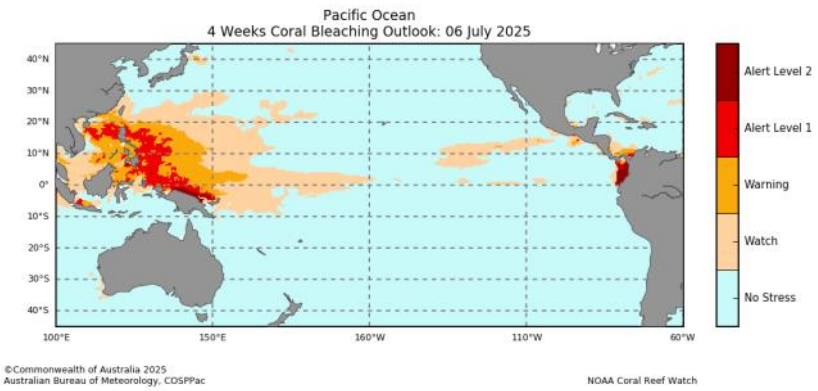
Daily Coral Bleaching Alert

(Source: Pacific Community COSPPac Ocean Porta Coral Bleaching)



4 Weeks Coral Bleaching Outlook

(Source: Pacific Community COSPPac Ocean Portal)



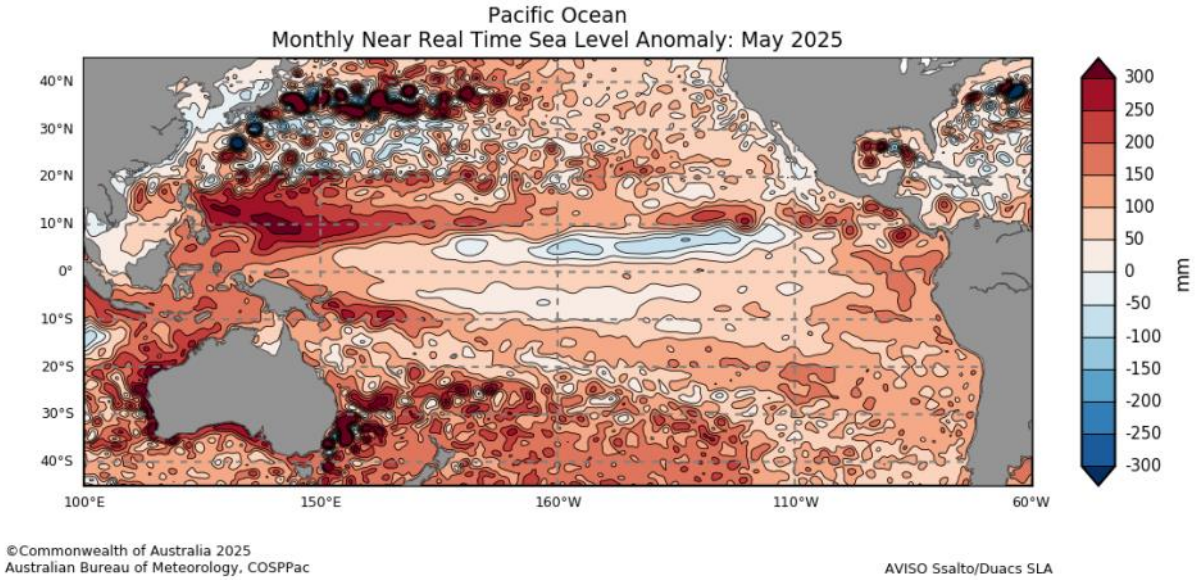
OCEAN CONDITIONS

OCEAN SURFACE CURRENTS AND SEA LEVEL

Sea levels observed in May were above normal over most COSPPac countries. Anomalies from -200mm were observed over FSM, eastern PNG, and the Solomon Islands, with patches also present in southern Fiji, Vanuatu, New Caledonia, Tonga, and French Polynesia. Above-normal sea levels of 50 to 150mm were observed over Nauru, Samoa, Tuvalu, the Cook Islands, Niue, Tonga, Vanuatu, New Caledonia, and French Polynesia. Near-normal SST (-50 to +50mm) for northern Tuvalu, northern Tokelau, and Kiribati (southern Phoenix Islands and southern Line Islands) with patches over the Cook Islands and French Polynesia.

Monthly Sea Level Anomalies

Source: Pacific Community COSPPac Ocean Portal

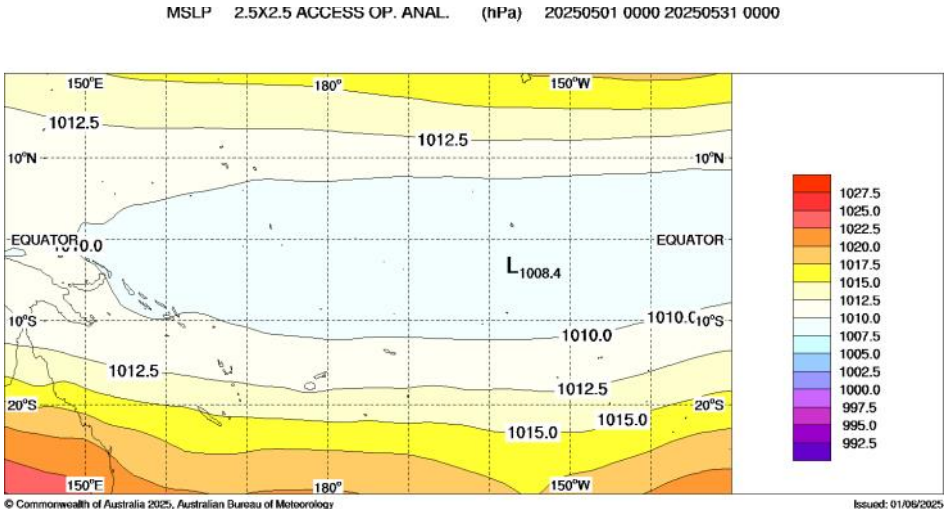


MEAN SEA LEVEL PRESSURE

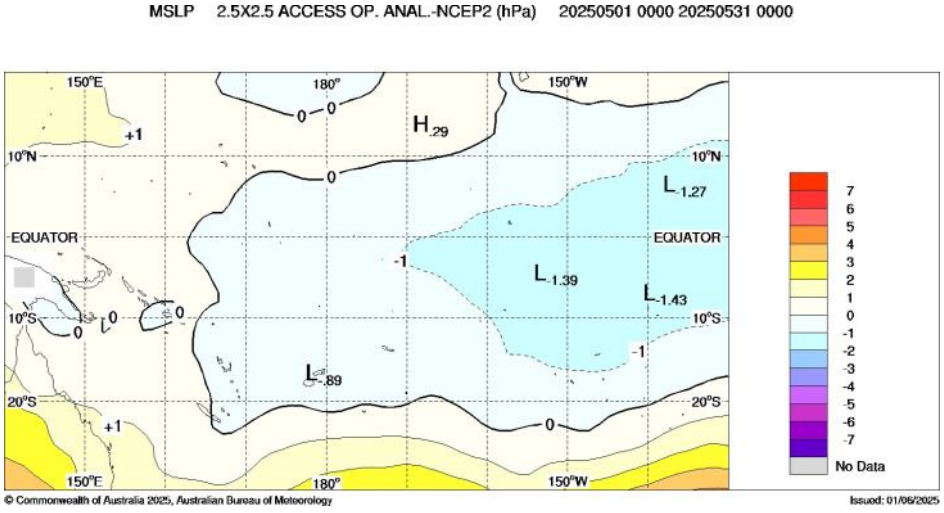
The May mean sea level pressure (MSLP) anomaly map displays positive anomalies of 1 hPa or greater southern of 23 °S. Negative anomalies of 1 hPa or greater was observed over east of Phoenix Islands(Kiribati).

Areas of above (below) average MSLP usually coincide with areas of suppressed (enhanced) convection and rain throughout the month.

Mean



Anomalous



Bureau of Meteorology South Pacific Circulation Patterns: http://www.bom.gov.au/cgi-bin/climate/cmb.cgi?variable=mslp&area=spac&map=anomaly&time=latest

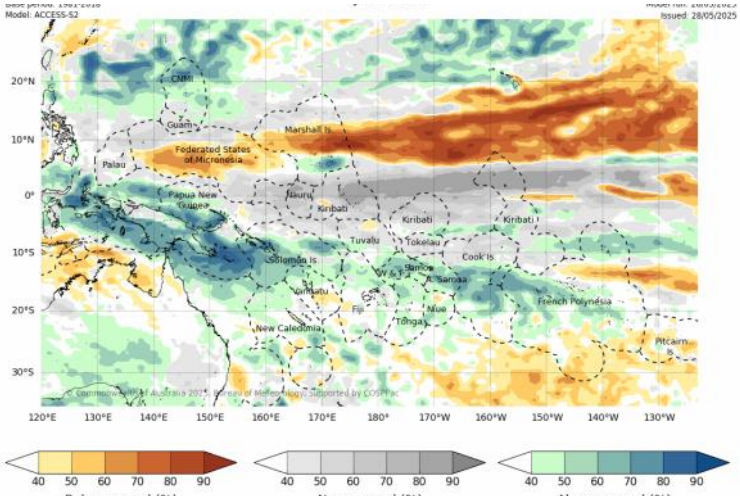
SEASONAL RAINFALL OUTLOOK

June—August 2025

The ACCESS-S model forecast for June 2025, shows above normal rainfall is likely or very likely for northern CNMI, and southern RMI in the northern Pacific. Above normal rainfall is likely or very likely in a band stretching from PNG, Solomon Islands, northern and southern New Caledonia, northern Vanuatu, northern Fiji, most of Tonga, Wallis and Futuna, Samoa, American Samoa, Niue, central and southern Cook Islands, and French Polynesia (Tubuai, Groupe Acteon, and Marquesas). Patches of above normal rainfall is likely or very likely for Kiribati (southern Phoenix, and central Line Is.). Below normal rainfall is likely or very likely in a band stretching eastwards from central FSM to central RMI in the northern Pacific. Patches of below normal rainfall is also likely or very likely for central Vanuatu, western Fiji, southern Cook Is., southern and northern French Polynesia, and Pitcairn Islands.

The ACCESS-S three-month rainfall outlook (June to August 2025) is very similar to the June outlook, but the drier than normal region covers the entire northern RMI and only the northeast FSM. The above normal rainfall region has a more stronger signal but displace south and extend from Palau to northern Pitcairn Islands. Reduce areas for above normal likely or very likely over Fiji, Tonga, Wallis and Futuna, and Samoa.

Monthly ACCESS-S Maps



The Copernicus multi-model outlook for June to August 2025 is very similar to the ACCESS-S outlook, but the above normal rainfall region is likely or very likely extend to Fiji and Tonga.

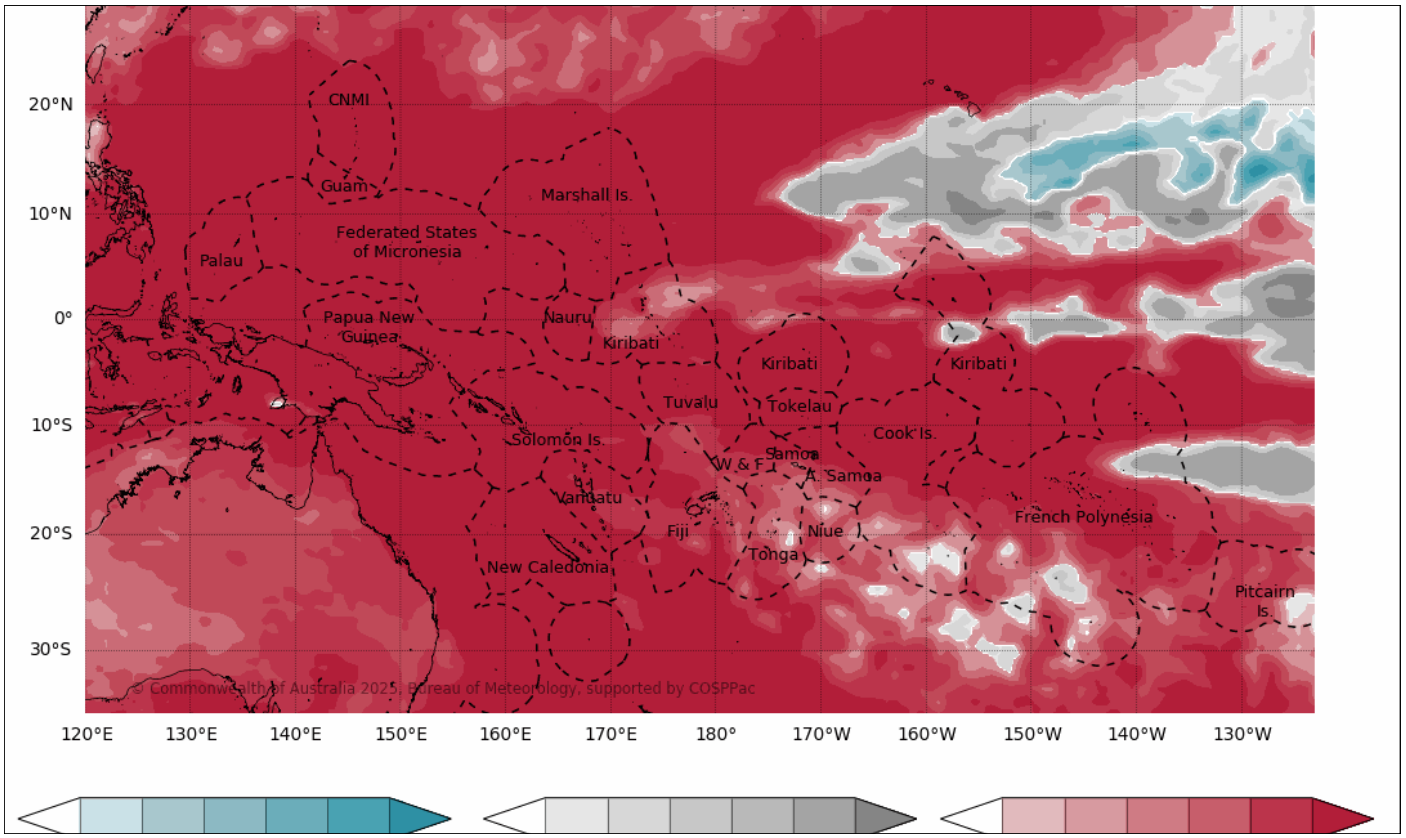
The APEC Climate Centre multi-model outlook (June to August 2025) is similar to the other two models.

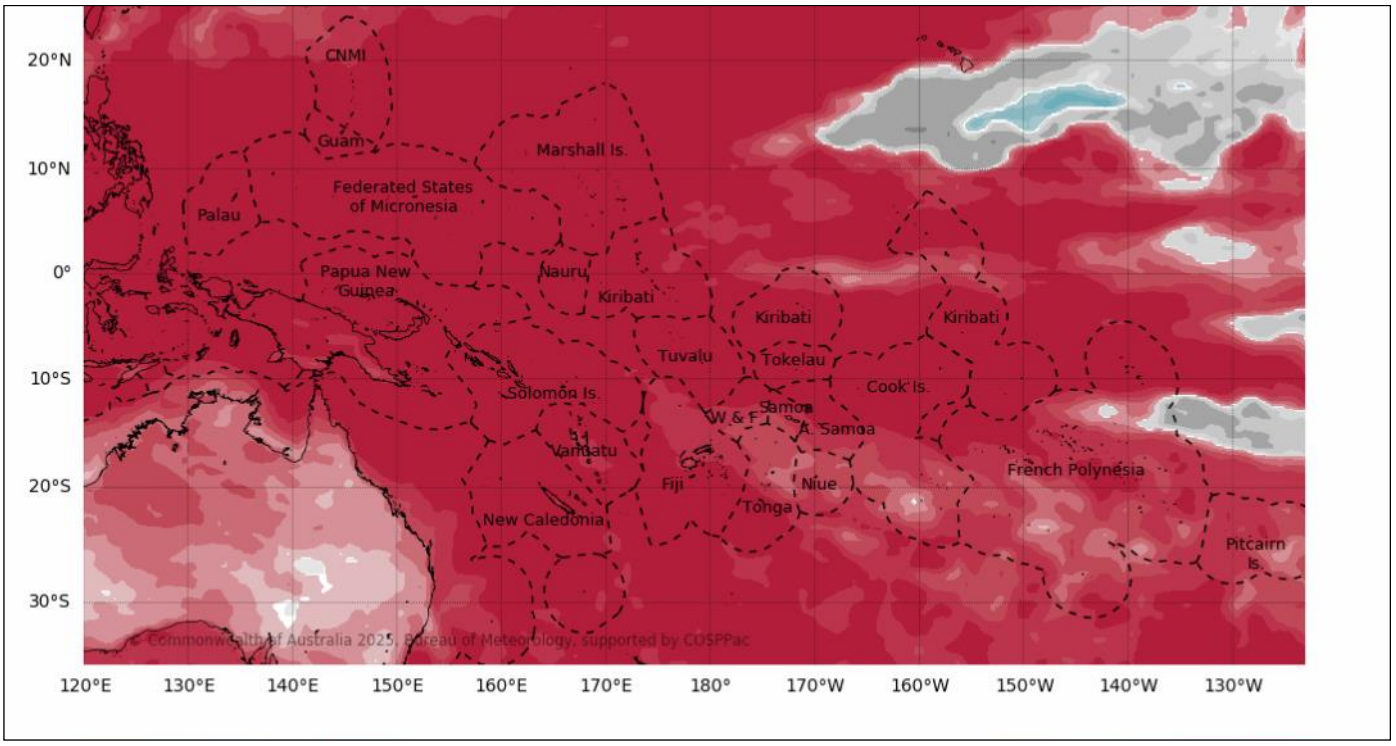
For June to August 2025, the models agree that above normal rainfall is likely or very likely for northern CNMI, and southern RMI in the northern Pacific. Above normal rainfall is also likely or very likely in a band stretching from Palau, PNG, southern Solomon Islands, northern Vanuatu, southern Fiji, southern Tonga, and central French Polynesia. Below normal rainfall is likely or very likely in a band stretching eastwards from northern FSM to central RMI in the northern Pacific, and northern French Polynesia in the southern Pacific.

SEASONAL TEMPERATURE OUTLOOK

June—August 2025

Monthly Tmax and Tmin ACCESS-S Maps

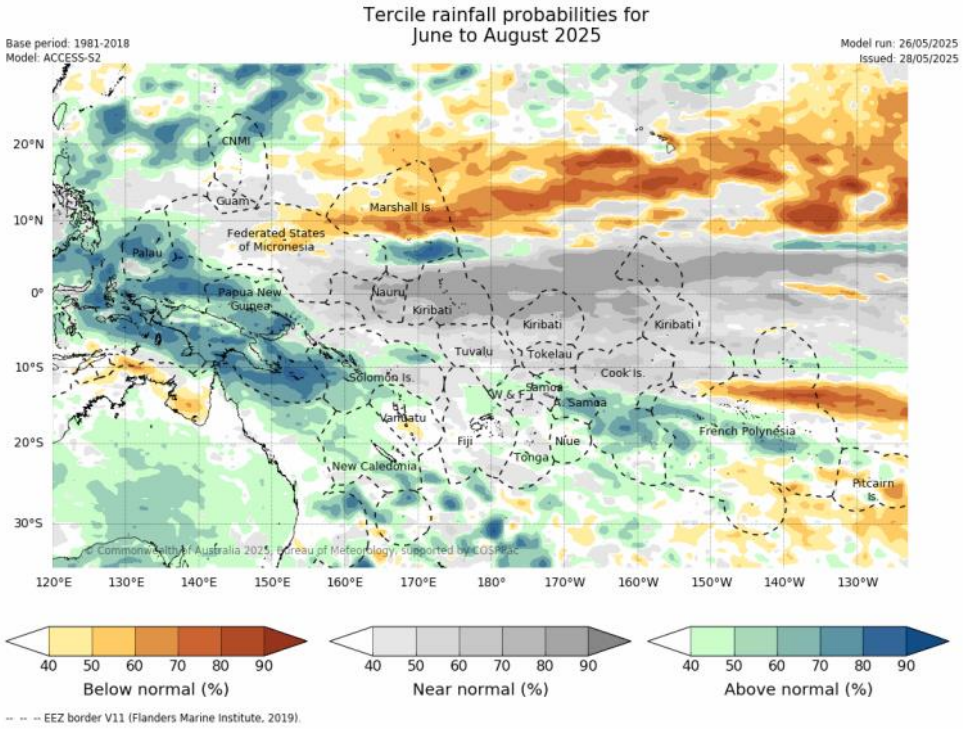


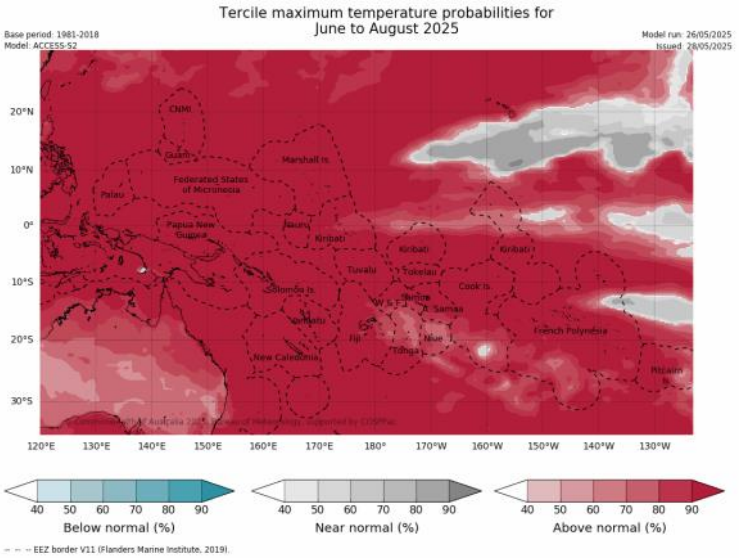


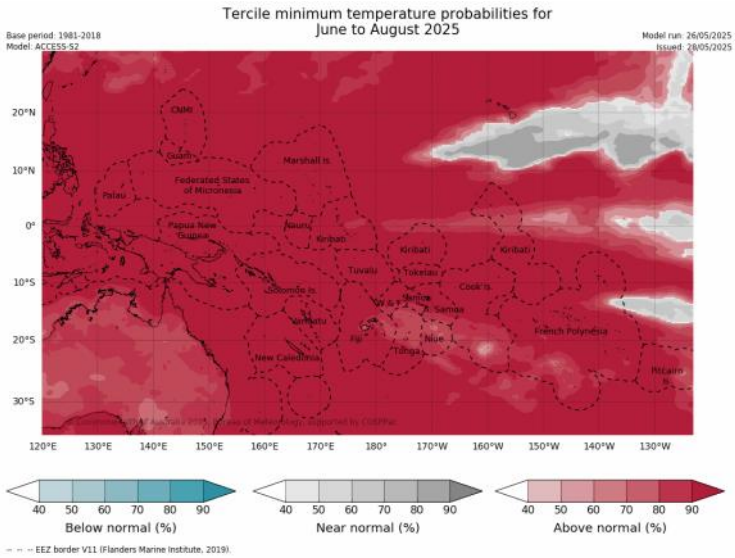
SEASONAL RAINFALL OUTLOOK

June—August 2025

Seasonal ACCESS-S maps





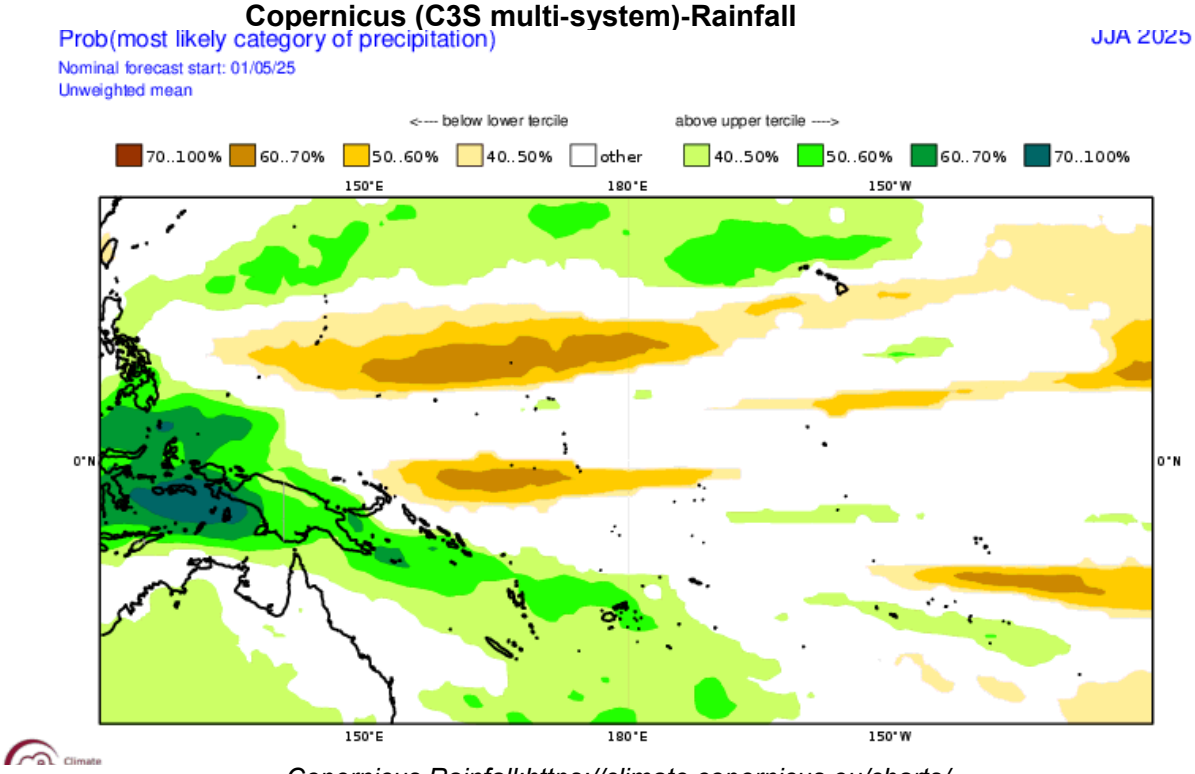


'About ACCESS-S http://access-s.clide.cloud/

SEASONAL RAINFALL OUTLOOK

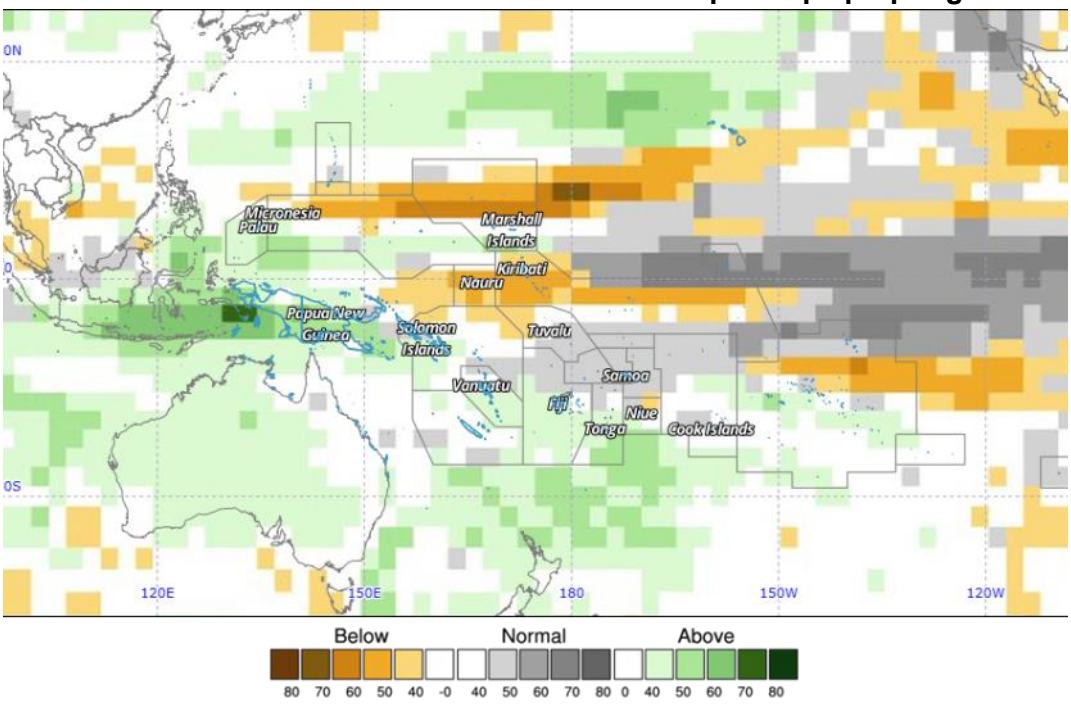
June—August 2025

Copernicus (C3S multi-system)-Rainfall



Copernicus Rainfall:https://climate.copernicus.eu/charts/

APEC Climate Information Toolkit for the Pacific: http://clikp.sprep.org/



Year: 2025, Season: JJA, Lead Month: 3, Method: GAUS
Model: APCC, BOM, CMCC, CWA, ECCC, NASA, NCEP, PNU
Generated using CLIKP (2025-6-9)

© APEC Climate Center

TROPICAL CYCLONE

2024/2025 Season

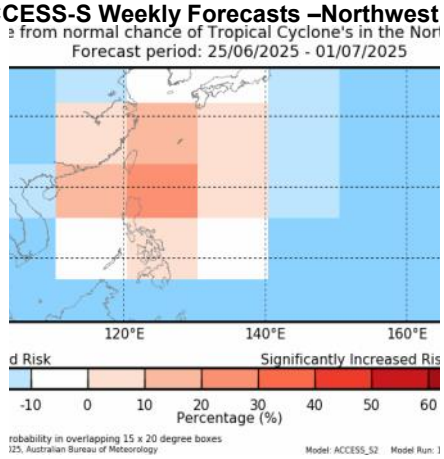
The northwest Pacific (WNP) tropical cyclone season is year-round, with most cyclones occurring between May and December. The 2024/25 Southwest Pacific tropical cyclone (TC) season has been remarkably inactive. There have been 11 disturbances overall, and five named storms to date (Alfred, Pita, Rae, Seru, Tam). Lower than normal TC activity in the central Pacific tends to be associated with La Niña conditions. Therefore, the 2024/25 TC season is consistent with this pattern.

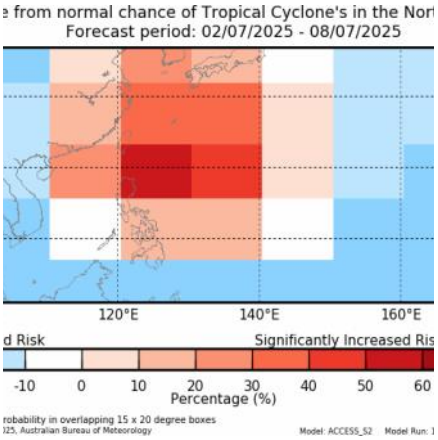
In the WNP, the genesis and track of TCs show a relationship with the ENSO cycle: activity typically shifts eastward during El Niño and westward during La Niña. The outlooks currently favour a near-average TC season for the Western and Central North Pacific basins. In the southwest Pacific, the 2025-26 tropical cyclone season starts on 01st November 2025.

It's important to remember that history shows that tropical cyclones can happen outside the normal cyclone season, and it does not take a severe cyclone to produce severe impacts. Coastal and river flooding rainfall can occur with a distant, weak, or former cyclone, especially if the system is slow-moving. Communities should remain vigilant, and follow forecast information provided by their National Meteorological and Hydrological Service (NMHS).

The weekly tropical cyclone forecasts from the ACCESS-S model some risks for Philippines and south China sea region for the 25 June to 1 July. There are some risks also for Palau, Guam and northern from 2 to 8 July.

ACCESS-S Weekly Forecasts –Northwest Pacific





ACCESS-S Weekly Forecasts –Southwest Pacific

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Individual Model Links

UKMO Global long-range model probability maps: http://www.metoffice.gov.uk/research/climate/seasonal-to-decadal/gpc-outlooks/glob-seas-prob

ECMWF Rain (Public charts) - Long range forecast: http://www.ecmwf.int/en/forecasts/charts/seasonal/rain-public-charts-long-range-forecast

POAMA Pacific Seasonal Prediction Portal: http://poama.bom.gov.au/experimental/pasap/index.shtml

APEC Climate Center (APCC): http://www.apcc21.org/eng/service/6mon/

OTHER INFORMATION

Southern Oscillation Index

The Southern Oscillation Index, or SOI, gives an indication of the development and intensity of El Niño and La Niña events across the Pacific Basin. The SOI is calculated using the difference in air pressure between Tahiti and Darwin. Sustained negative values of the SOI below −7 often indicate El Niño episodes. These negative values are usually accompanied by sustained warming of the central and/or eastern tropical Pacific Ocean, and a decrease in the strength of the Pacific Trade Winds. Sustained positive values of the SOI greater than +7 are typical of La Niña episodes. They are associated with stronger Pacific Trade Winds and sustained cooling of the central and eastern tropical Pacific Ocean. In contrast, ocean temperatures to the north of Australia usually become warmer than normal.

Multivariate ENSO Index (MEI)

The Climate Diagnostics Center Multivariate ENSO Index (MEI) is derived from a number of parameters typically associated with El Niño and La Niña. Sustained negative values indicate La Niña, and sustained positive values indicate El Niño.

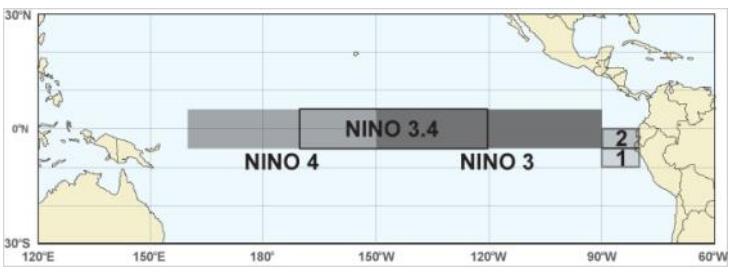
20 degrees Celsius Isotherm Depth

The 20°C Isotherm Depth is the depth at which the water temperature is 20°C. This measurement is important, as the 20°C isotherm usually occurs close to the thermocline, the region of most rapid change of temperature with depth, or the division between the mixed surface layer and deep ocean. A 20°C isotherm that is deeper than normal (positive anomaly) implies a greater heat content in the upper ocean, while a shallower 20°C isotherm (negative anomaly) implies a lower-than- normal heat content in the upper ocean.

Regions

SST measurements may refer to the NINO1, 2, 1+2, 3, 3.4 or 4 regions. These descriptions simply refer to the spatially averaged SST for the region described. The NINO regions (shown in the figure below) cover the following areas:

Region	Latitude	Longitude
NINO1	5-10°S	80-90°W
NINO2	0-5°S	80-90°W
NINO3	5°N to 5°S	150-90°W
NINO3.4	5°N to 5°S	120-170°W
NINO4	5°N to 5°S	160°E to 150°W



NOTE: NINO1+2 is the combined areas 1 and 2