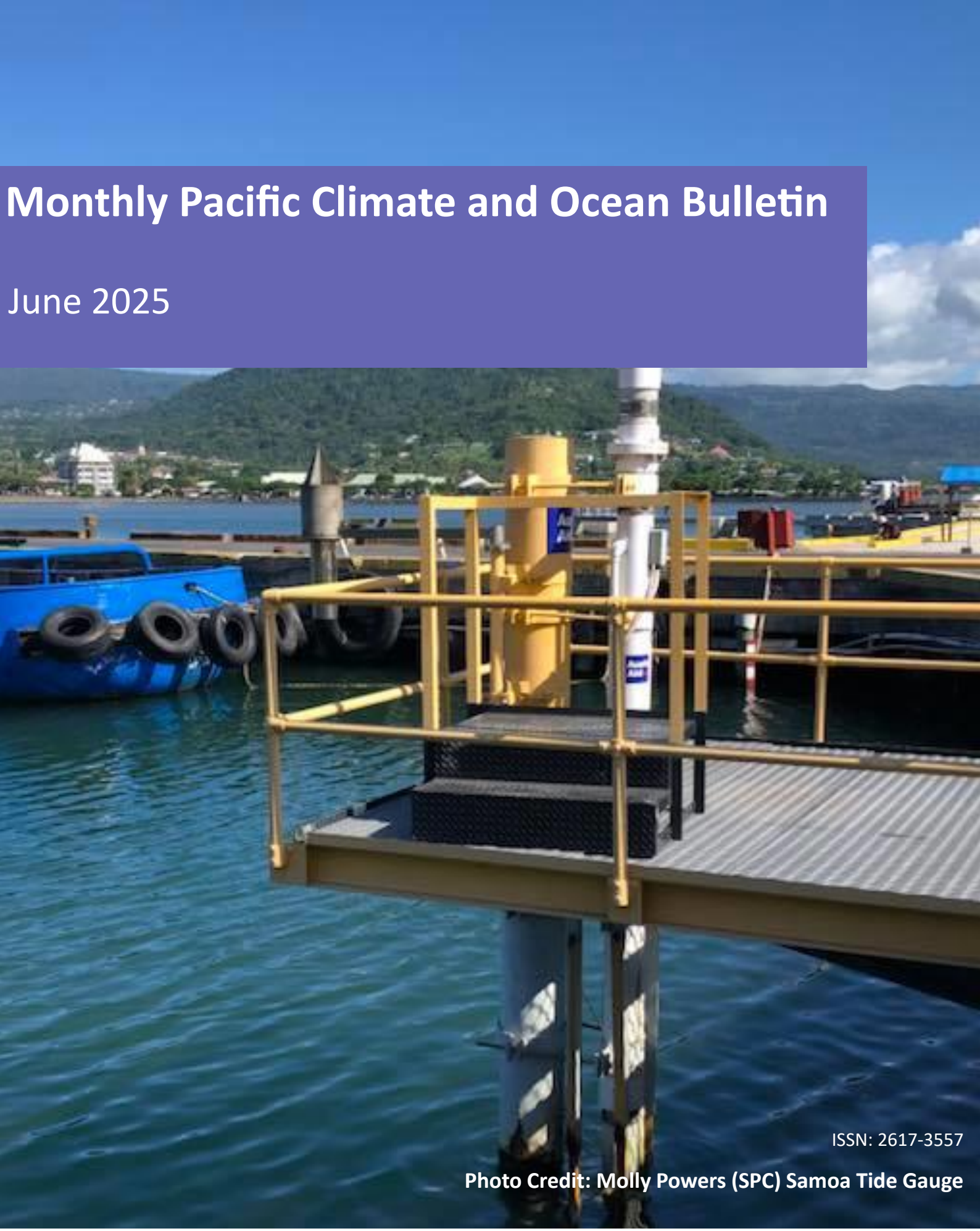
Monthly Pacific Climate and Ocean Bulletin

June 2025



ISSN: 2617-3557

Photo Credit: Molly Powers (SPC) Samoa Tide Gauge

SPREP
Secretariat of the Pacific Regional Environment Programme

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Australian Aid

Climate and Oceans Support Program in the Pacific

Pacific Community
Communauté du Pacifique

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Issued 23 July 2025

- The El Niño Southern Oscillation (ENSO) is neutral.
- The Madden Julian Oscillation (MJO) is currently moderately strong and located in the Maritime Continent.
- In June, the Intertropical Convergence Zone (ITCZ) was weak and displayed north of its normal location and observed mainly in the western Pacific along Philippines, Palau, western FSM, Guam, and RMI. The South Pacific Convergence Zone (SPCZ) was active and located over its normal average location over PNG, Solomon Islands and southern Tuvalu.
- Sea surface temperatures (SSTs) for June 2025 were near normal to above normal in the central and western Pacific.
- The Coral bleaching Outlook to 04 August shows 'Alert Level 1' over PNG and FSM.
- For July to September 2025, the models agree that above normal rainfall is likely or very likely in a band stretching from southern Palau, PNG, Solomon Islands, New Caledonia, Vanuatu, most of Fiji, and southern Tonga. Below normal rainfall is likely or very likely in a band stretching eastwards from northern FSM to central RMI, and from Nauru to Kiribati (Gilbert, Phoenix and southern Line Is.) in the northern Pacific, and northern Cook Islands to central French Polynesia in the southern Pacific.
- The weekly tropical cyclone forecasts from the ACCESS-S model shows significantly increased risks for Palau, FSM, Guam, and south China sea region for the 27 July to 2 August.

EL NIÑO–SOUTHERN OSCILLATION

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

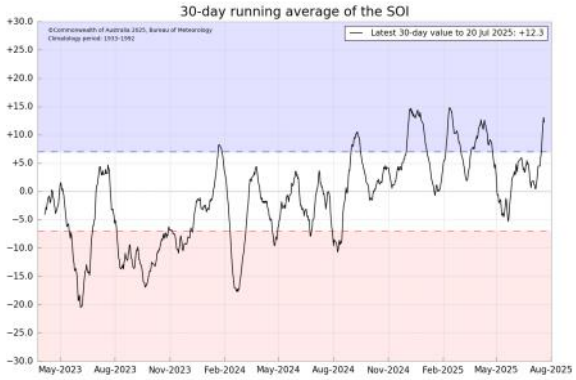
Click link to access Climate Driver Update issued on 15 July 2025

The El Niño-Southern Oscillation (ENSO) is neutral. The latest Niño 3.4 value for the week ending 13 July is -0.10 °C. Neutral ENSO values are between -0.8 °C and +0.8 °C. Sea surface temperatures (SSTs) from July 2024 to June 2025 have been the warmest or second warmest on record for each respective month. The Bureau's model predicts neutral ENSO (neither El Niño nor La Niña) until at least December. This is consistent with forecasts from 5 out of 8 international models assessed, with 3 indicating borderline La Niña levels during the southern spring. However, there is a relatively large spread in the model forecasts, indicating more uncertainty than usual in the forecast outcomes.

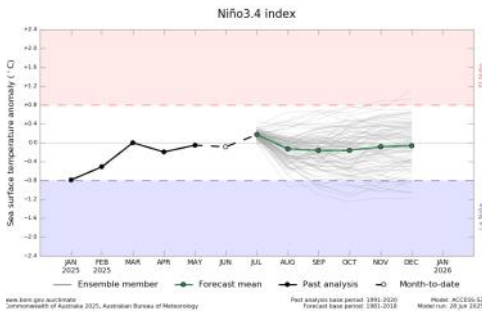
The Indian Ocean Dipole (IOD) is neutral. The Bureau's model predicts neutral state of the IOD until at least August, touching on the negative IOD threshold briefly before returning to neutral values. Of the 8 international models assessed, 7 forecast a negative IOD pattern developing at some point between August and November. Despite international model agreement, skill for IOD forecasts made at this time of year has been historically low beyond 2 to 3 months ahead.

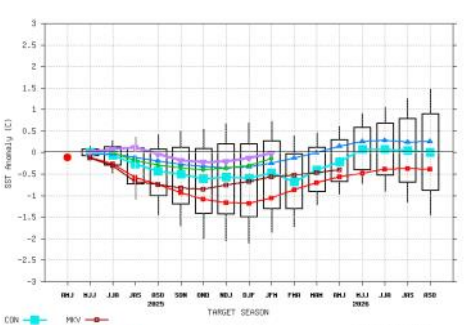
Global sea surface temperatures (SSTs) remain substantially above average. Monthly averaged SSTs for June 2025 were the third warmest on record. Monthly averaged SSTs were second warmest on record for each respective month from January to May 2025.

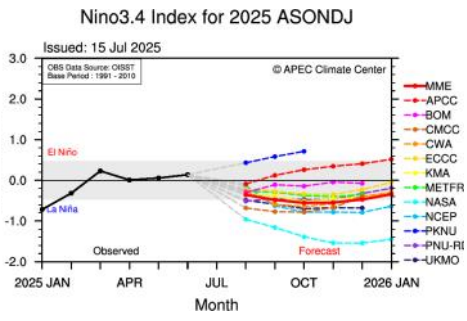
The 30 day average of the Southern Oscillation Index (SOI) for the period ending 20 July was +12.3.



International Model Outlooks







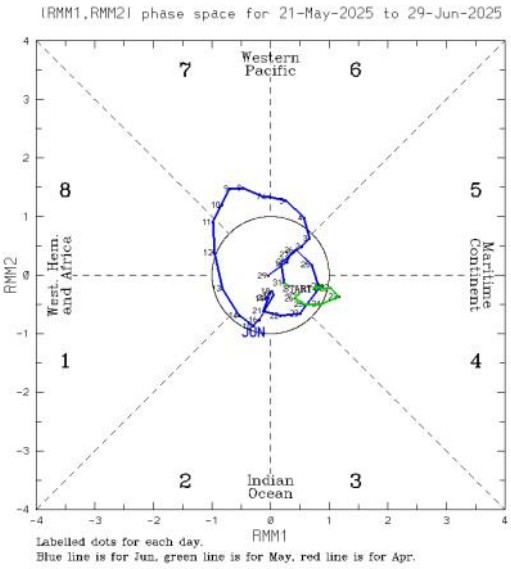
MADDEN–JULIAN OSCILLATION

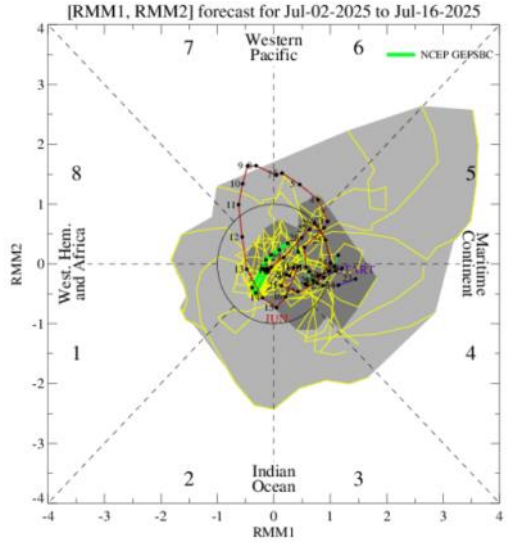
Click link to access *Tropical monitoring and outlook* [Issued on Tuesday 15 July 2025]

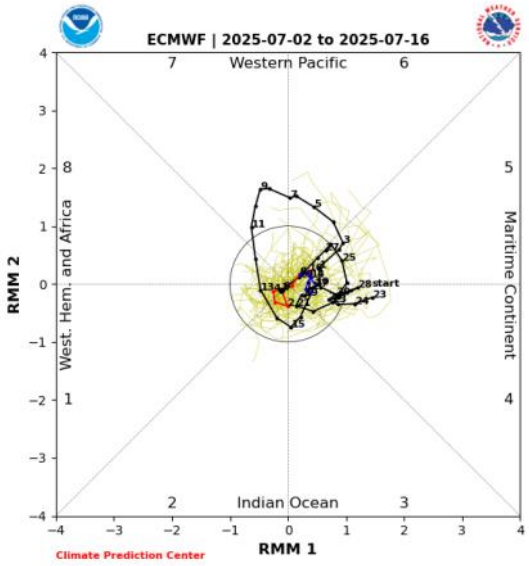
A Madden-Julian Oscillation (MJO) was indiscernible most of June except for parts of first and second week where it was active over the Western Pacific.

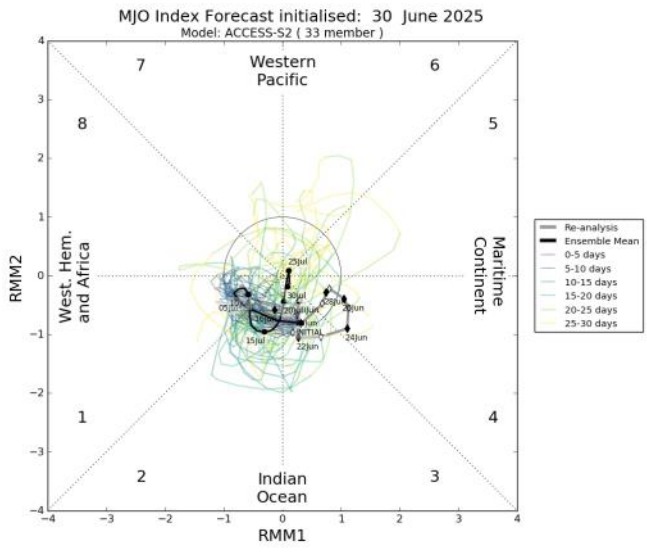
The Madden-Julian Oscillation (MJO) is currently moderately strong and located in the Maritime Continent. Most surveyed international models forecast that the MJO will strengthen in the coming week in the Western Pacific before a moderate to strong pulse progresses into the Western Hemisphere in late July. The predicted strengthening of the MJO to moderate to strong intensity would be the strongest the MJO has been since January 2025.

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







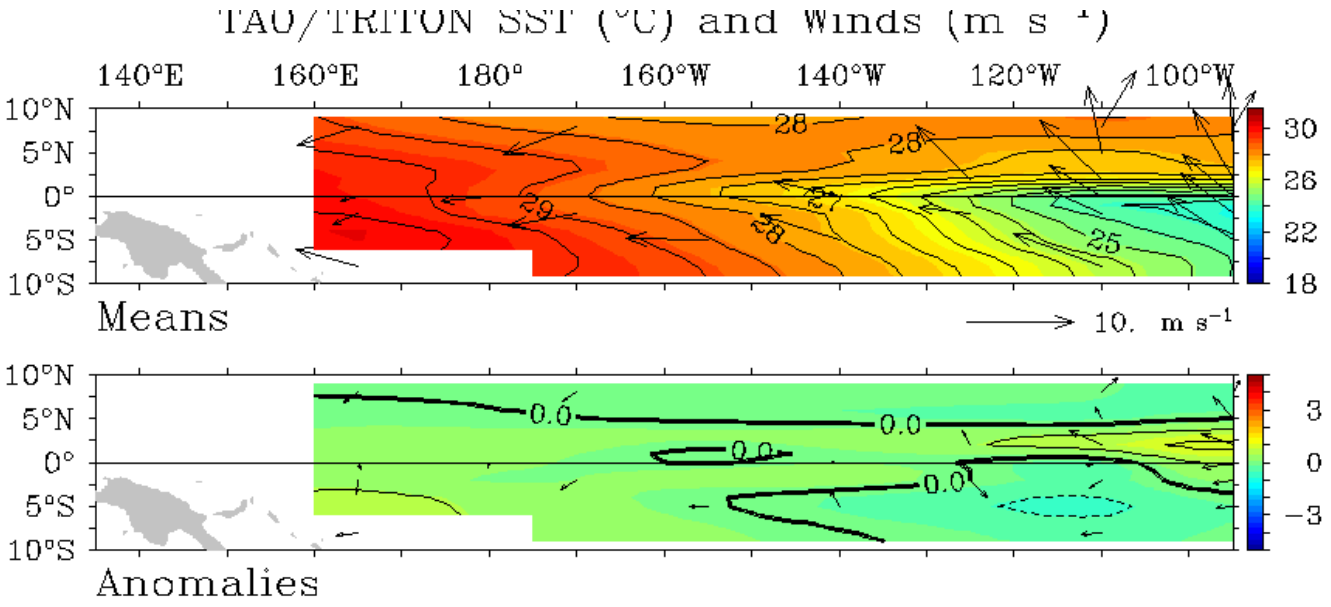


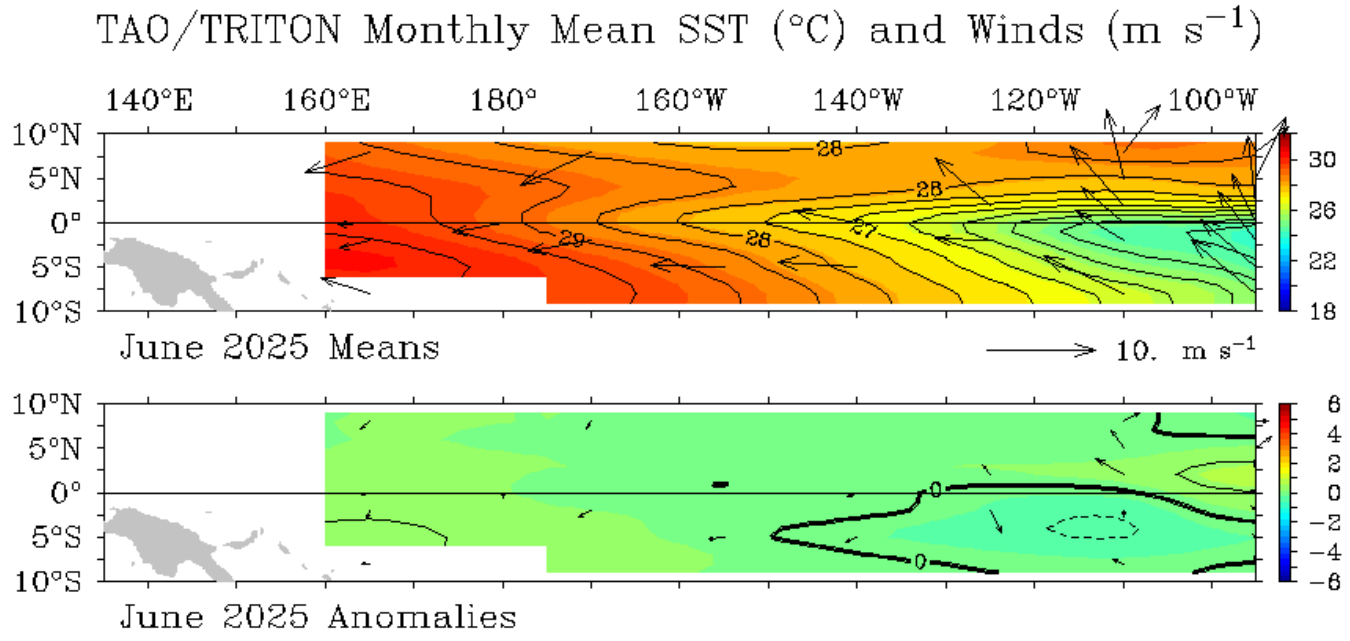
WIND

Click link to access Wind plots link

During June, the trade winds were generally average over the equatorial Pacific with some north-westerly winds east of the Dateline between 120° W and 130° W. For the five days ending 01 July 2025, the trade winds were generally average over the equatorial Pacific with some north-easterlies to north-westerlies east of the Dateline between 120° W and 130° W.

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

Jul 2 2025

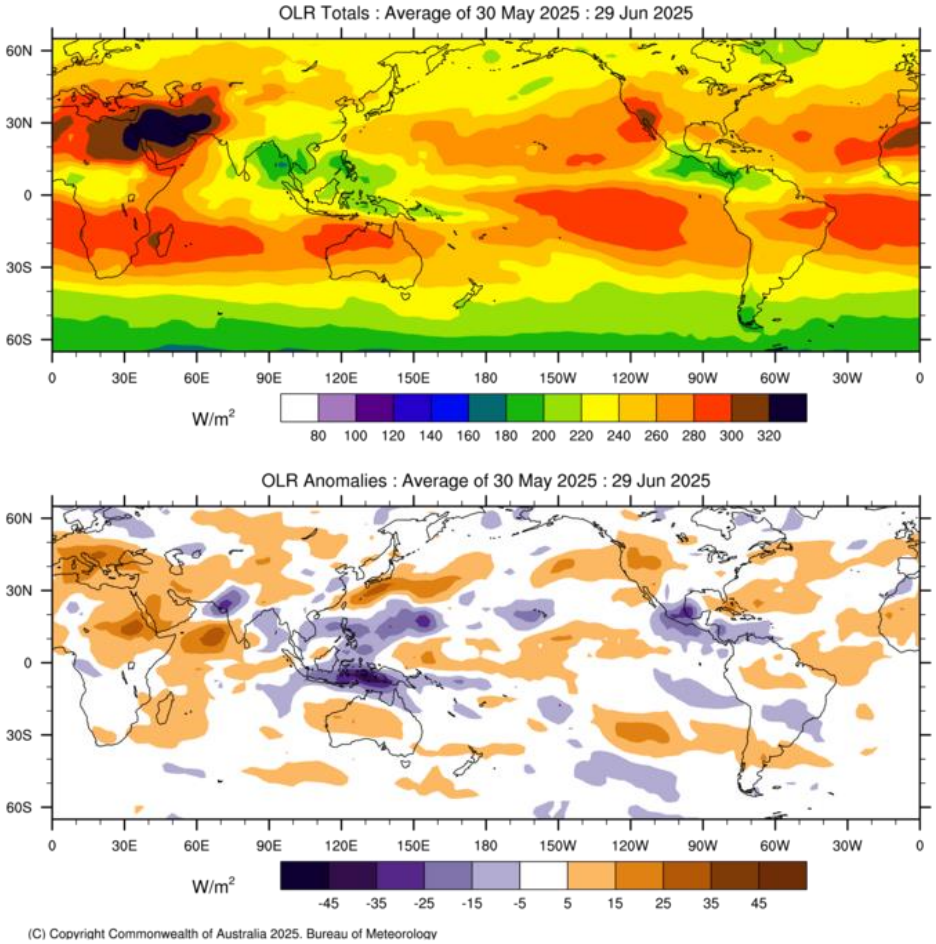
CLOUD AND RAINFALL

Click link to access OLR

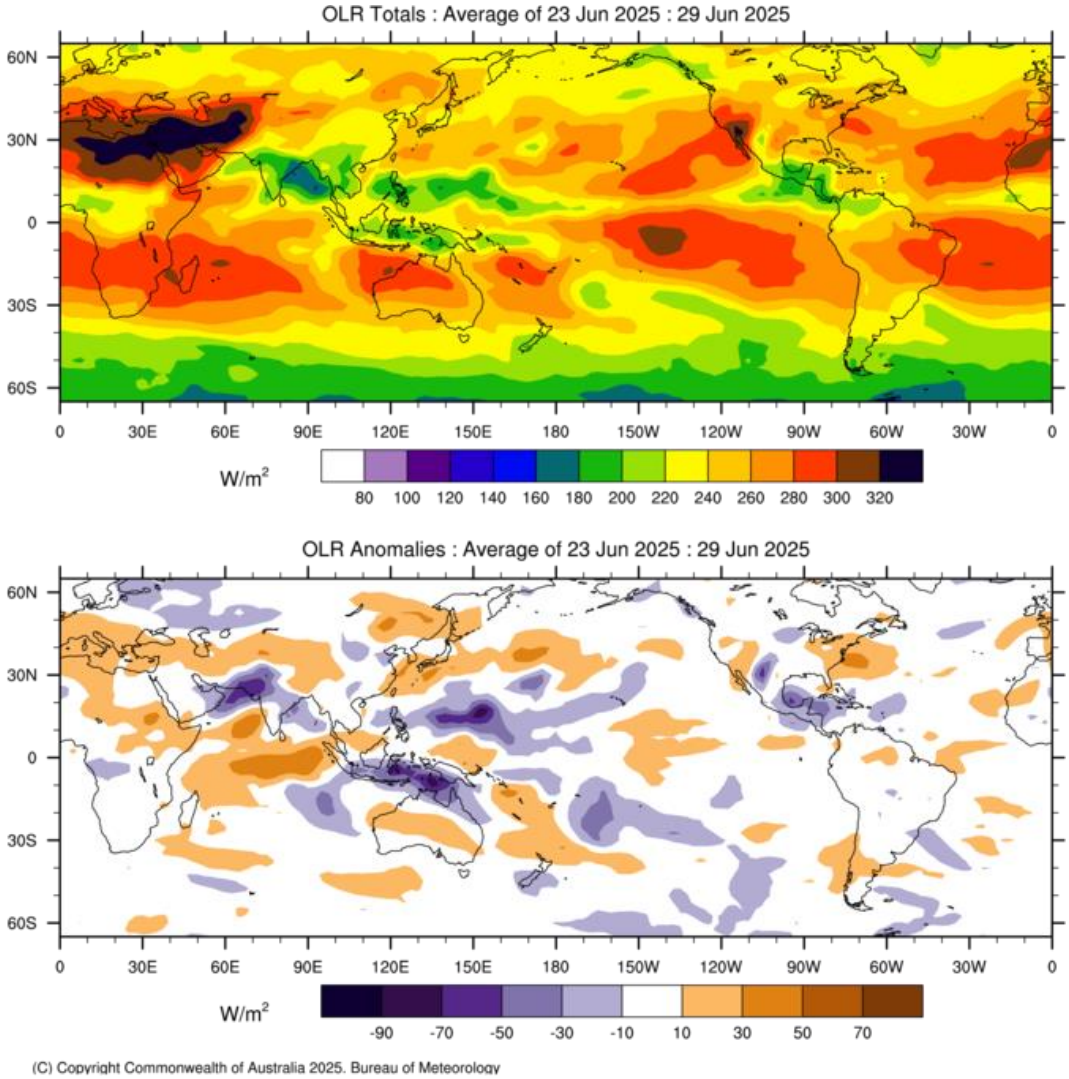
The June 30-day OLR anomaly map shows a region of negative OLR (increased convection) in a band stretched eastwards along the South Pacific Convergence Zone (SPCZ) from PNG, Solomon Islands to Tuvalu. Another area of negative OLR (increased convection) over Philippines, Palau, western FSM, Guam, and RMI. Areas of anomalously high OLR (decreased convection) were evident in a band stretched eastwards over southern FSM, Nauru, and Kiribati (Gilbert, Phoenix and northern Line Is.) in the north Pacific. Decreased convection were also evident over Fiji, and southern French Polynesia in the south Pacific.

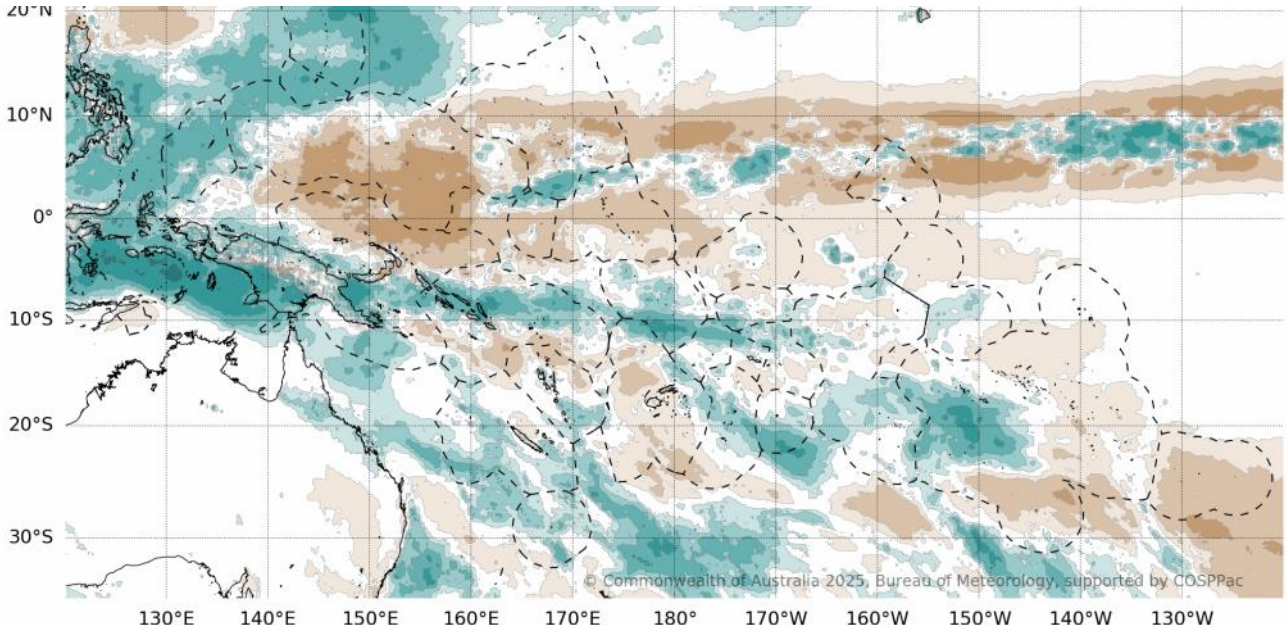
Note: Global maps of OLR below highlight regions experiencing increased or decreased cloudiness. The top panel is the total OLR in Watts per square metre (W/m^2) and the bottom panel is the anomaly (current minus the 1979-1998 climate average), in W/m^2. In the bottom panel, negative values (blue shading)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

OLR Total and Anomalies, 30 Day OLR

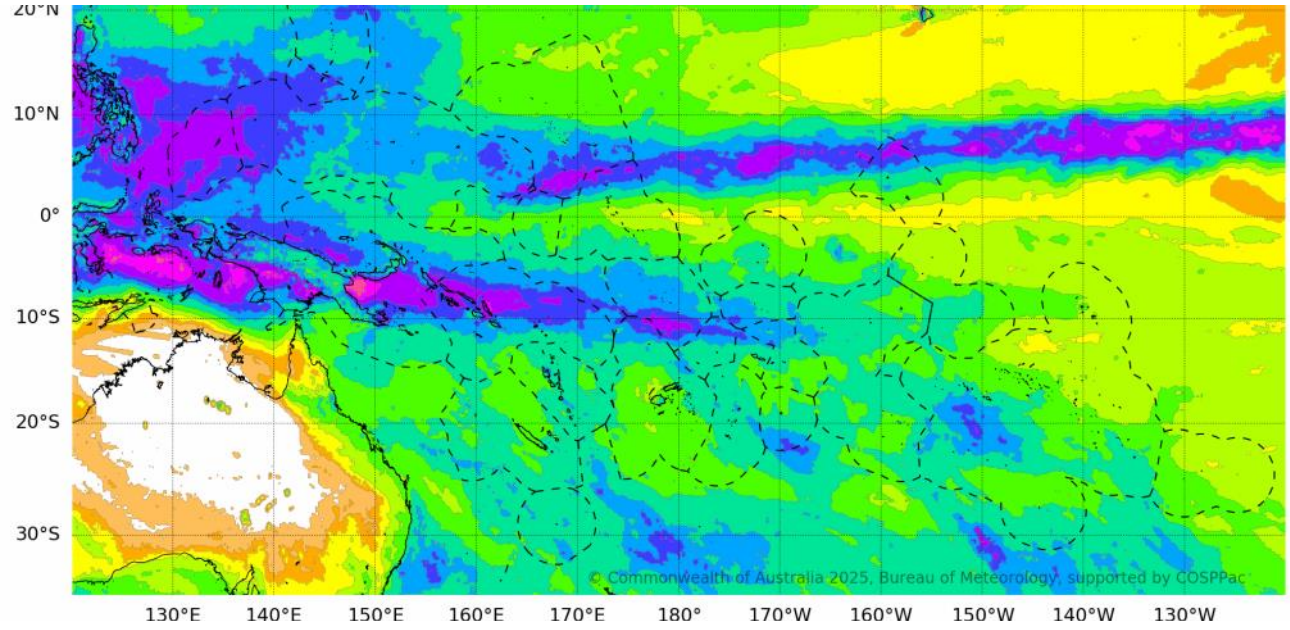


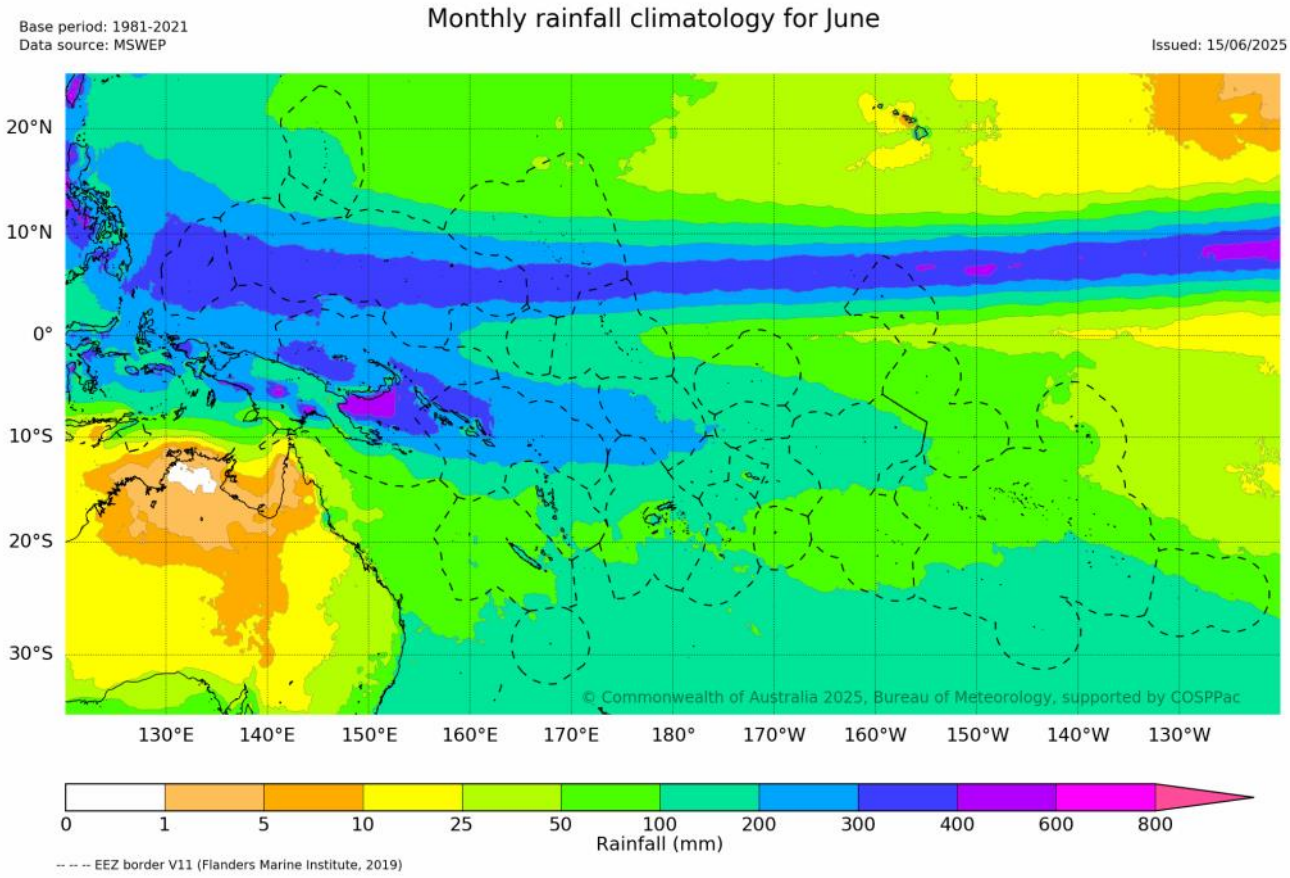
OLR Total and Anomalies, 7 Day OLR





30-Day Rainfall Accumulated





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

OCEAN CONDITIONS

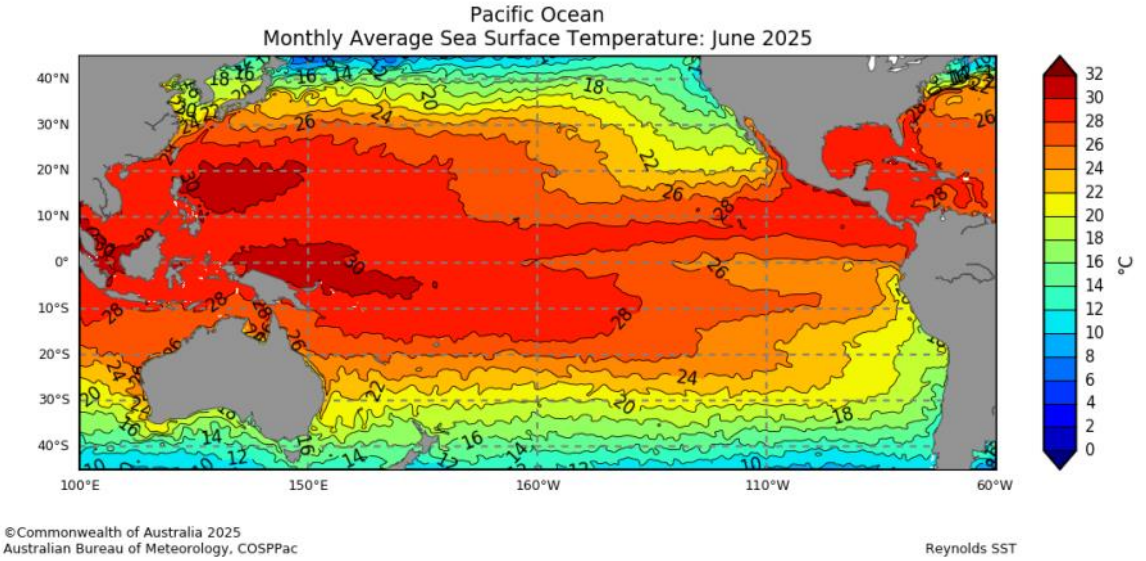
SEA SURFACE TEMPERATURE

Click link to access Pacific Community COSPPac Ocean Portal

Sea surface temperatures (SSTs) for June 2025 were near normal to above normal in the central and western Pacific.

Highest-on-record June SSTs occurred over parts of PNG, northern Mariana, and New Caledonia. The SSTs in decile 10 (very much above average) stretched south-eastwards from PNG, Solomon Islands, and Vanuatu with patches over Fiji, Tuvalu, Tonga, Samoa, Tokelau, Cook Islands, Pitcairn and French Polynesia. Additionally, SSTs in decile 10 (very much above average) were also observed in Guam, parts of FSM, and most of RMI. Above-average (8-9) deciles stretched north-eastwards from Palau, most parts of the FSM, to southern RMI. Another 8-9 decile band spanning eastwards from the Solomon Islands, Fiji, Tonga, Tuvalu, most of the Phoenix Islands, and the Line Islands, as well as most of the Cook Islands. Average SSTs (4-7) observed over southern RMI, Niue, Nauru, American Samoa, parts of Line Islands, southern Cook Islands and northern and southern French Polynesia. Below-average (2-3 decile) values were observed in parts of Niue, the southern Cook Islands, and southern French Polynesia.

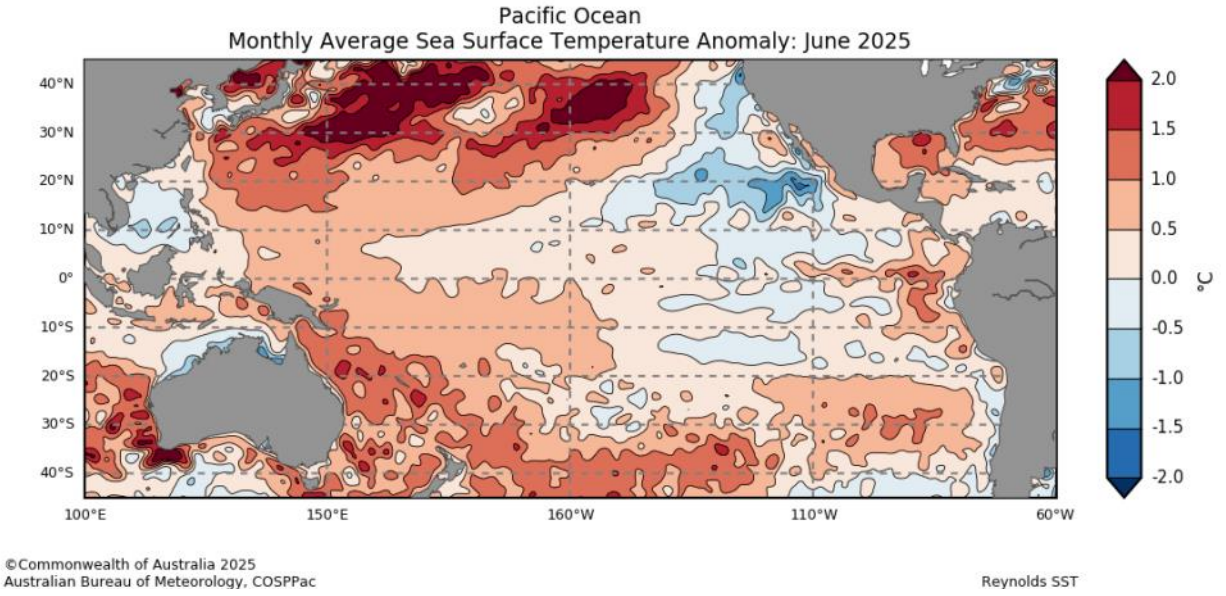
Mean Sea Surface Temperature

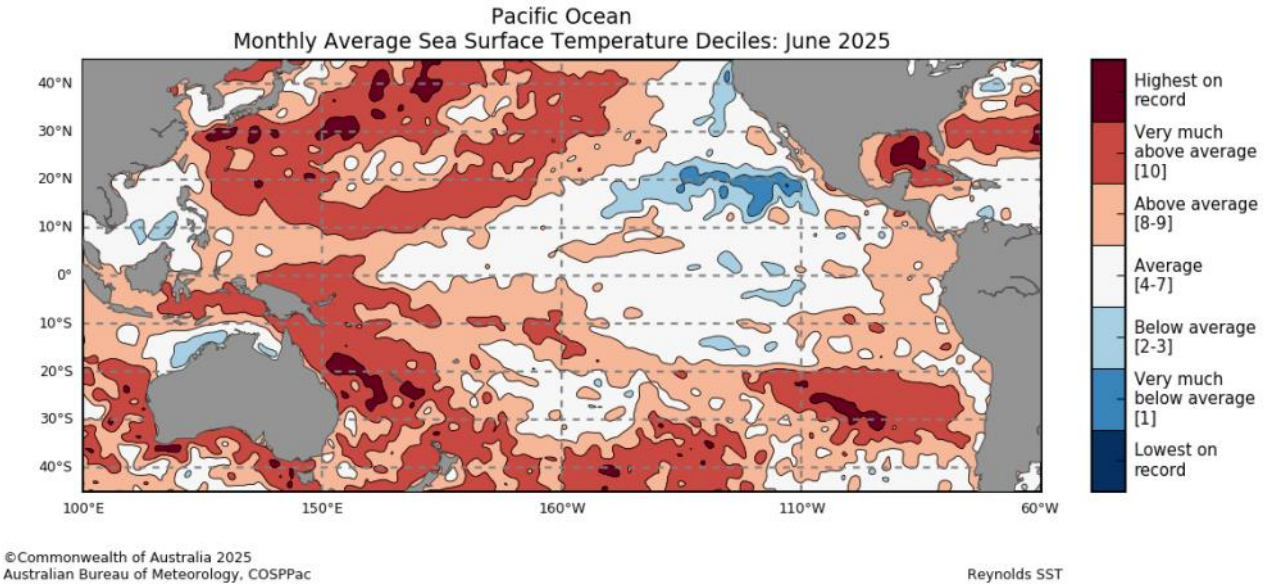


OCEAN CONDITIONS

Click link to access SEA SURFACE TEMPERATURE

Anomalous Sea Surface Temperature



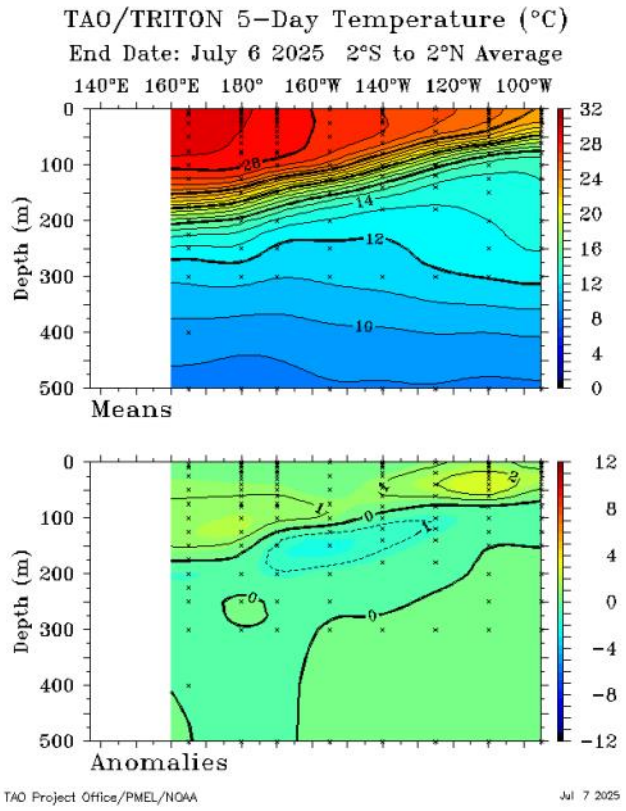


OCEAN CONDITIONS

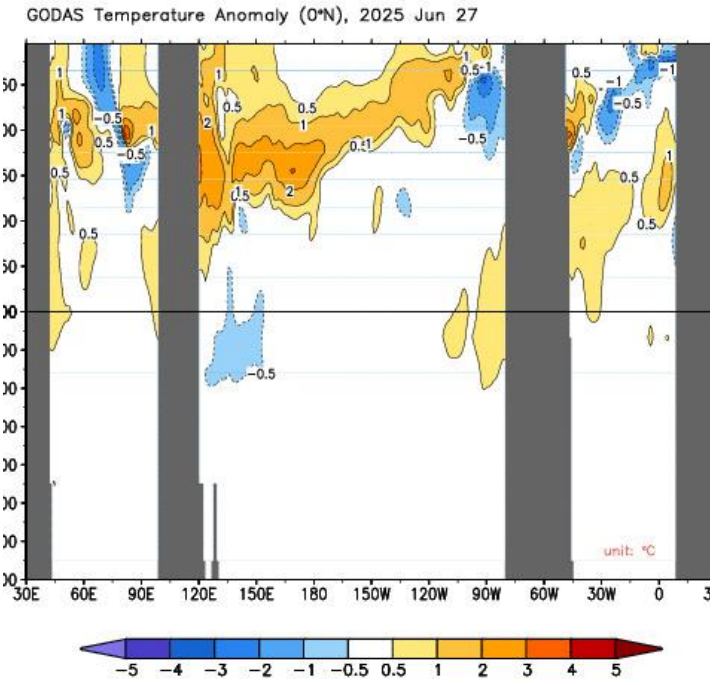
SUB SURFACE

The June equatorial Pacific sub-surface temperature anomalies along the equatorial region for June 27 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 150m. Warmer than average waters in the western half of the equatorial Pacific down to about 250 m depth in the far western Pacific. Waters are 2 °C warmer than average in the far western Pacific, between 100m and 200m depth.

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/

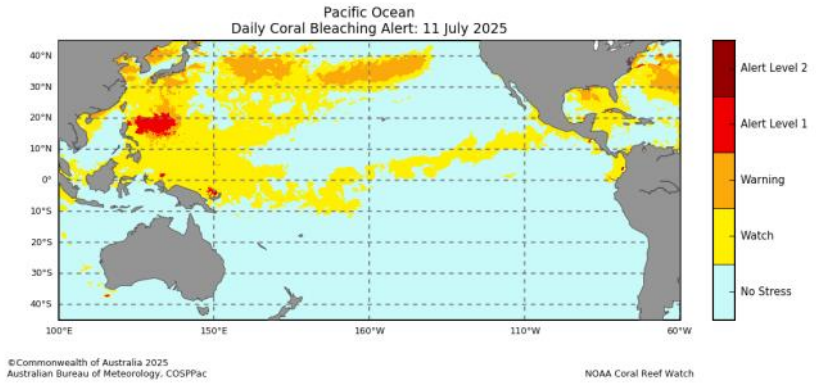
OCEAN CONDITIONS

CORAL BLEACHING

The daily Coral Bleaching Alert status for 20 July 2025 shows a patch of Alert Level 1 over PNG, a patch of Warning over FSM. Watch or No stress for the rest of the countries. The four-week Coral Bleaching Outlook to 4 August shows Alert Level 1 over PNG and FSM. Warning covers part of northern Palau, Guam, most of FSM and part of Nauru and RMI. Watch or No Stress over the rest of the countries.

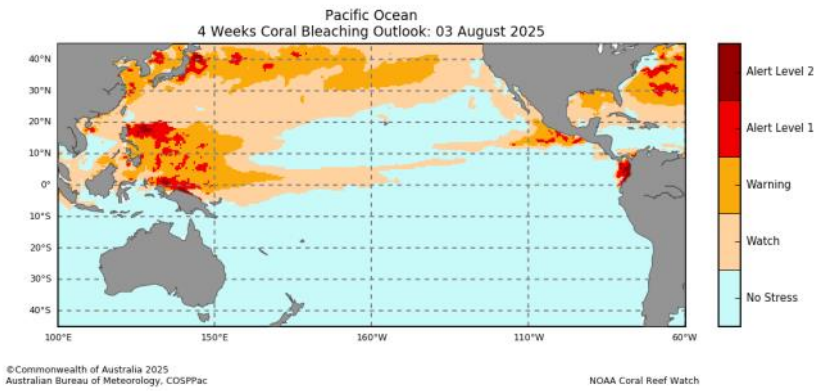
Daily Coral Bleaching Alert

(Source: Pacific Community COSPPac Ocean Porta Coral Bleaching)



4 Weeks Coral Bleaching Outlook

(Source: Pacific Community COSPPac Ocean Portal)



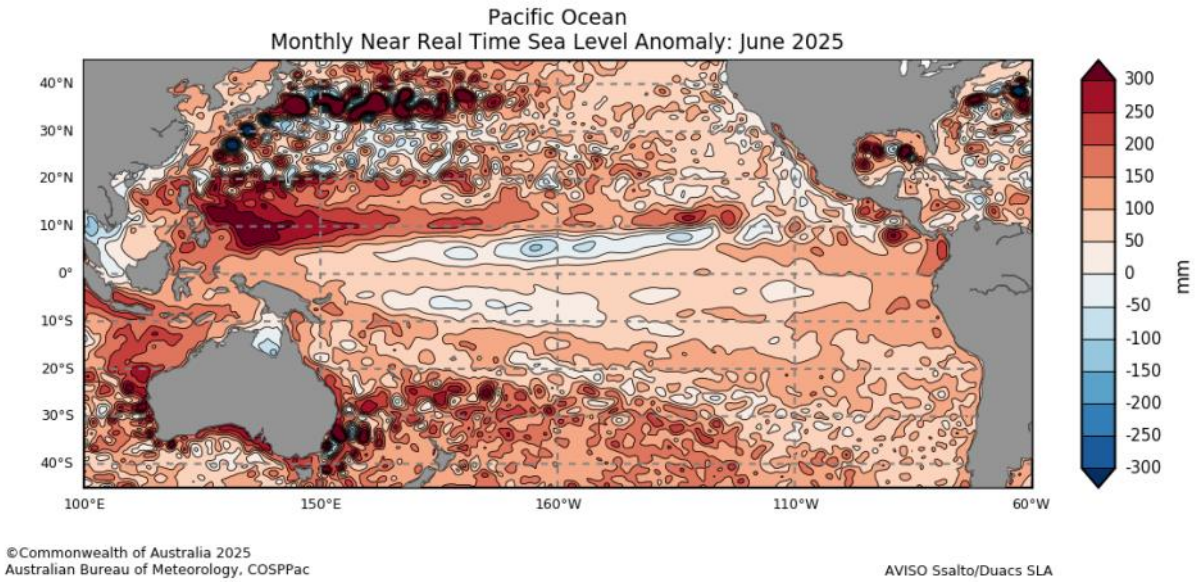
OCEAN CONDITIONS

OCEAN SURFACE CURRENTS AND SEA LEVEL

Sea levels observed in June, sea levels were generally above normal across most COSPPac countries. However, near-normal sea levels were recorded in parts of Kiribati (northern Line Islands), parts of Nauru, northern Vanuatu, southern Solomon Islands, northern Fiji and northern Tonga. Patches of near-normal sea levels were also observed over the Cook Islands. Positive sea level anomalies exceeding +250 mm were observed in Palau, with patches also present over New Caledonia, southern Tonga, southern Fiji, southern Cook Islands and southern French Polynesia. Positive anomalies between +50 mm and +250 mm were observed across FSM and RMI, +50 and +100 much of Tuvalu, Nauru, Tokelau, Phoenix Islands and most parts of PNG. The rest of the countries were mostly between +50 and +150.

Monthly Sea Level Anomalies

Source: Pacific Community COSPPac Ocean Portal

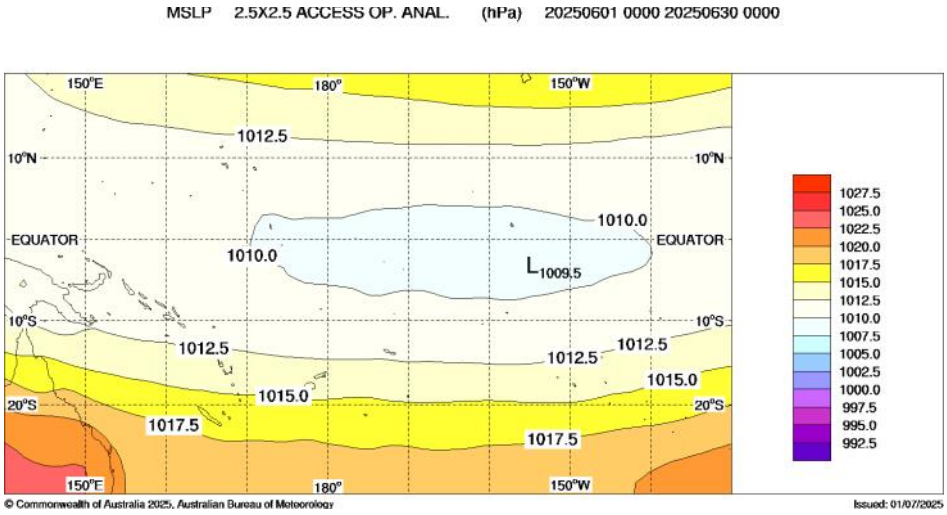


MEAN SEA LEVEL PRESSURE

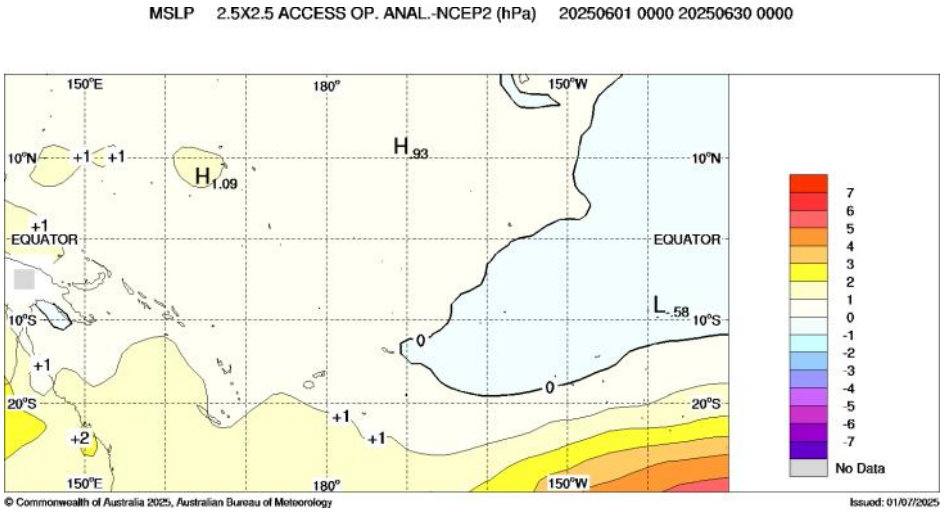
The June sea level pressure (MSLP) anomaly map displays positive anomalies of 1 hPa or greater south of Coral Sea region, New Caledonia, south of Vanuatu, south of Fiji, south of Tonga, and south of French Polynesia and towards New Zealand. Negative anomalies of 1 hPa or greater was observed over east of Samoa towards northern Cook Islands, and northern French Polynesia.

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

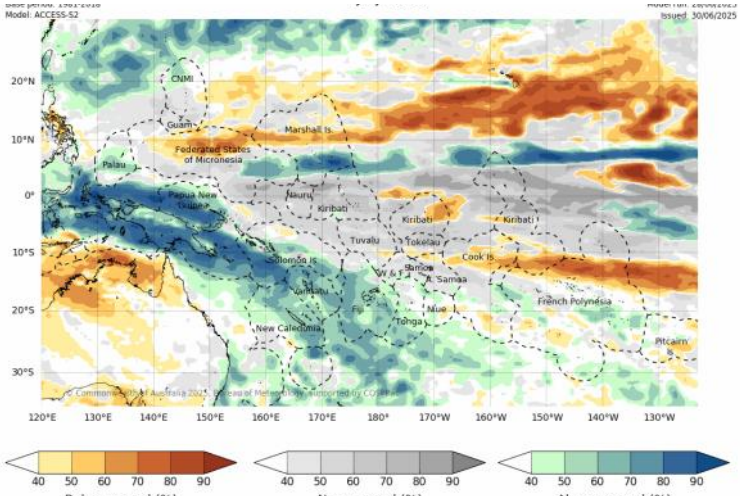
SEASONAL RAINFALL OUTLOOK

July—September 2025

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

The ACCESS-S three-month rainfall outlook (July to September 2025) is very similar to the July outlook, but the drier than normal region covers most of northern RMI, most of Nauru, Kiribati (central Gilbert, most of Phoenix, and central and southern Line Is.), and most of Tokelau. The above normal rainfall region has a more stronger signal over Palau, and extend to Niue and most of southern Cook Islands.

Monthly ACCESS-S Maps



The Copernicus multi-model outlook for July to September 2025 is very similar to the ACCESS-S outlook. However, the above normal rainfall region do not extend to northern Tonga, Niue, and southern American Samoa.

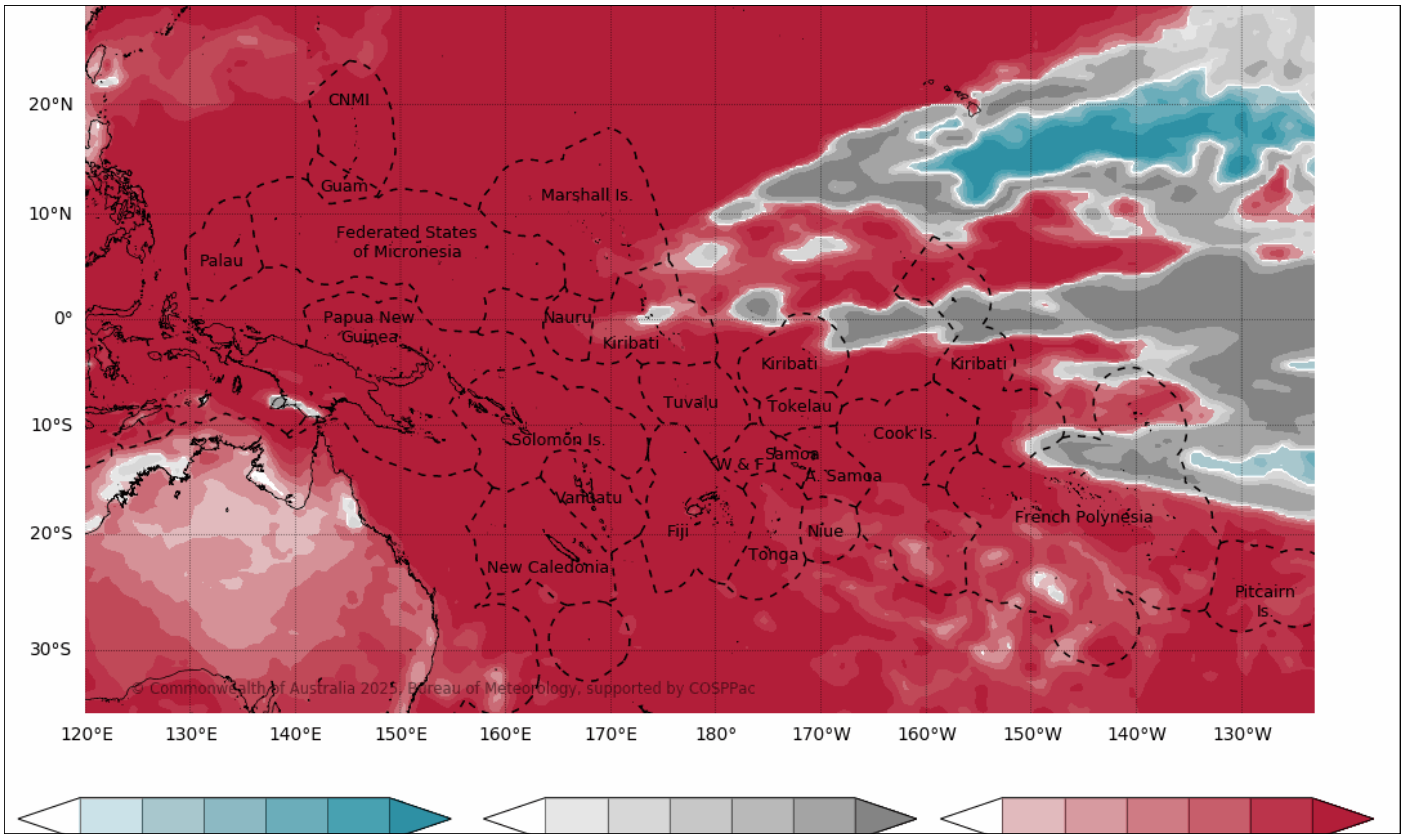
The APEC Climate Centre multi-model outlook (July to September 2025) is similar to the other two models.

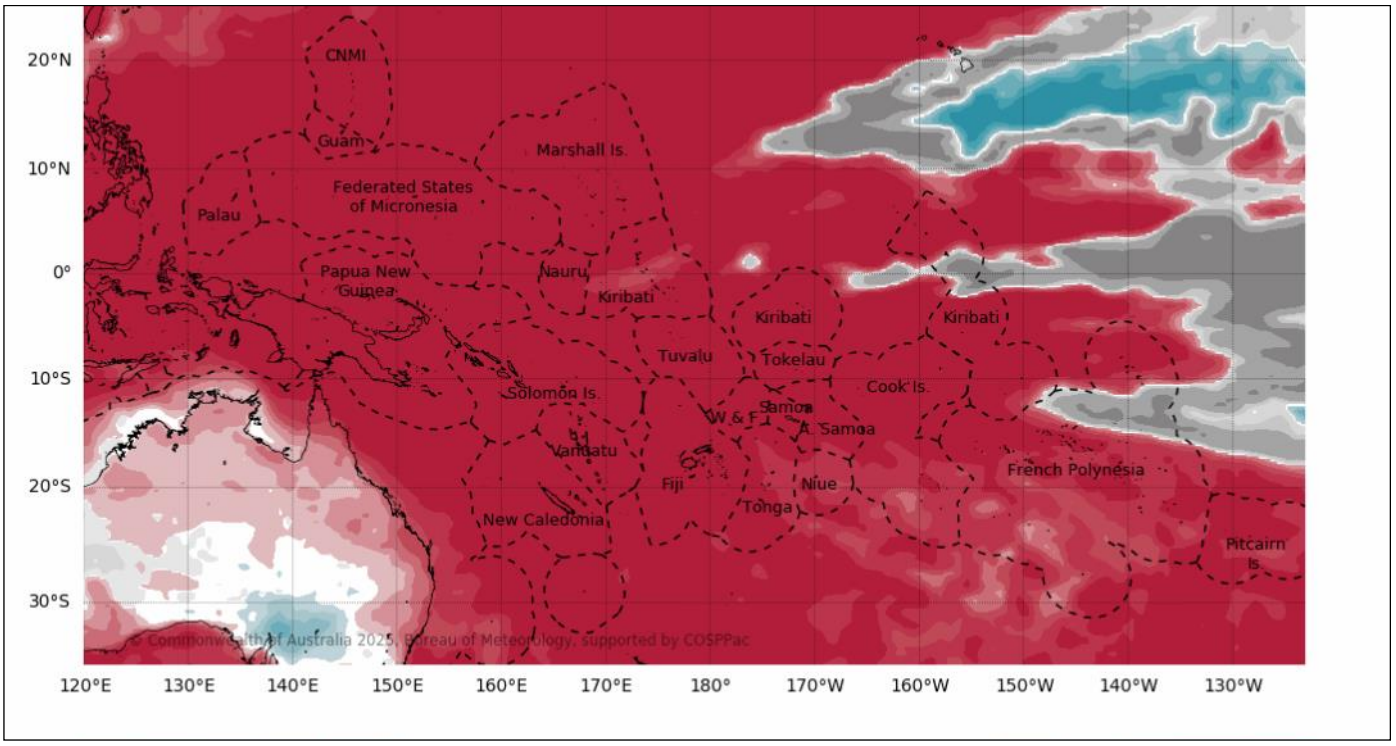
For July to September 2025, the models agree that above normal rainfall is likely or very likely in a band stretching from southern Palau, PNG, Solomon Islands, New Caledonia, Vanuatu, most of Fiji, and southern Tonga. Below normal rainfall is likely or very likely in a band stretching eastwards from northern FSM to central RMI, and from Nauru to Kiribati (Gilbert, Phoenix and southern Line Is.) in the northern Pacific, and northern Cook Islands to central French Polynesia in the southern Pacific.

SEASONAL TEMPERATURE OUTLOOK

July—September 2025

Monthly Tmax and Tmin ACCESS-S Maps

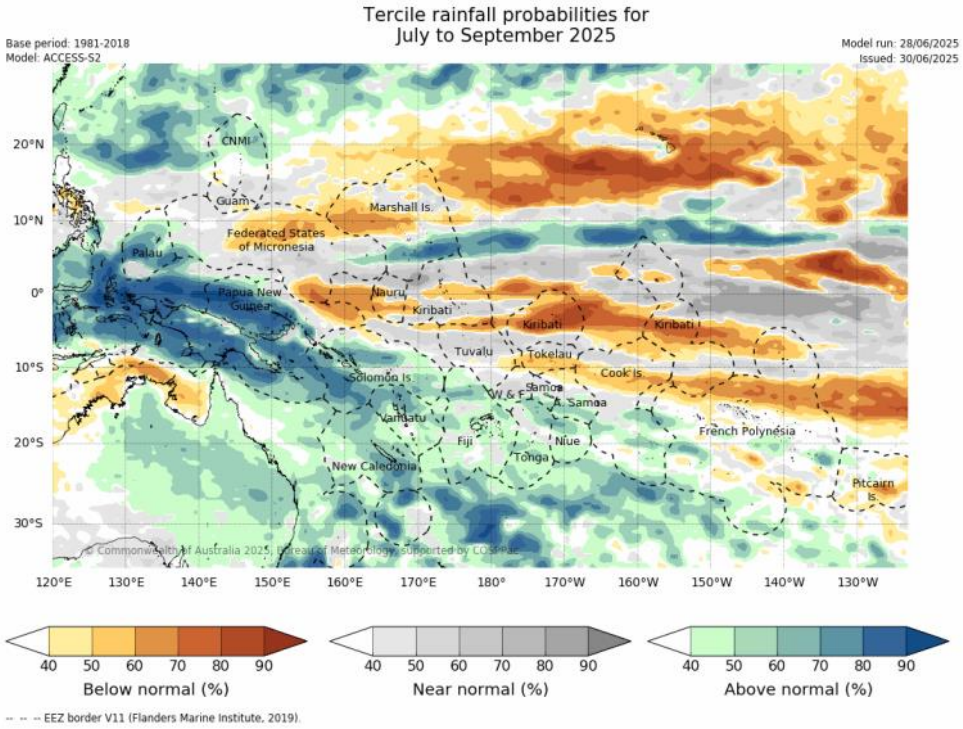


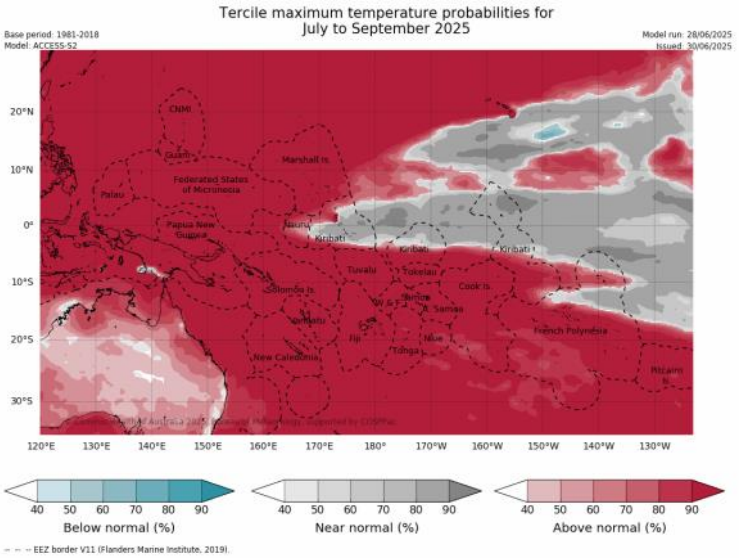


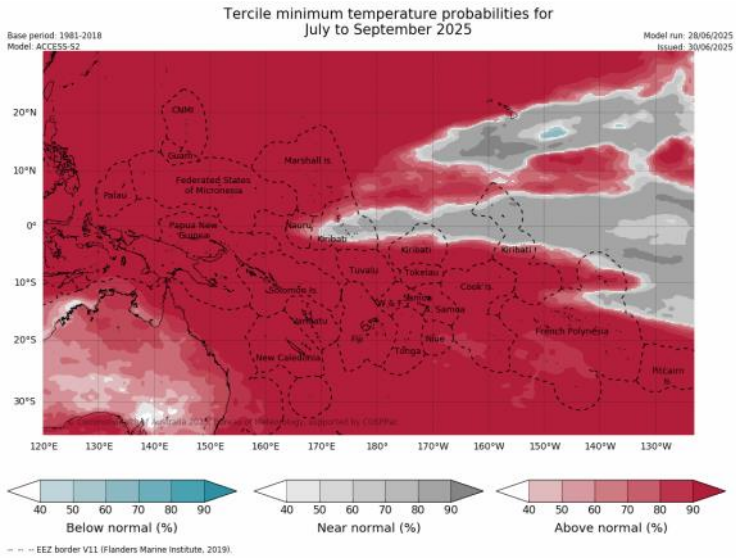
SEASONAL RAINFALL OUTLOOK

July—September 2025

Seasonal ACCESS-S maps



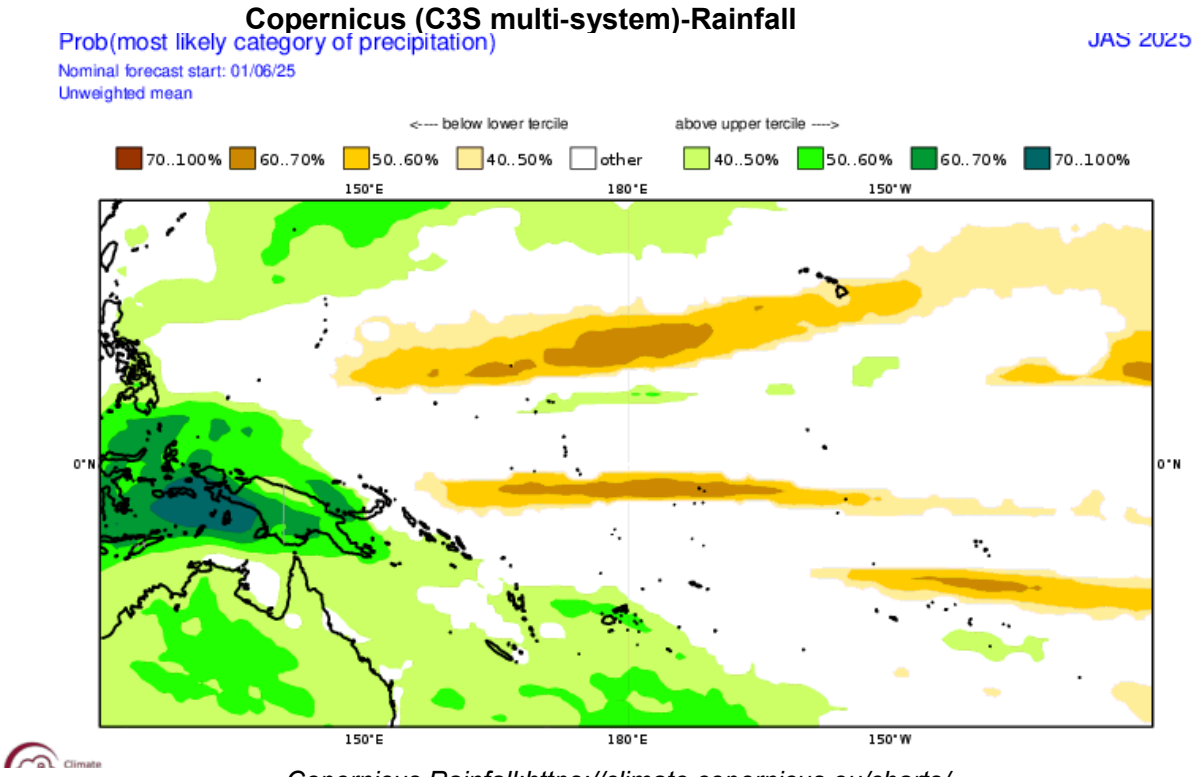




'About ACCESS-S http://access-s.clide.cloud/

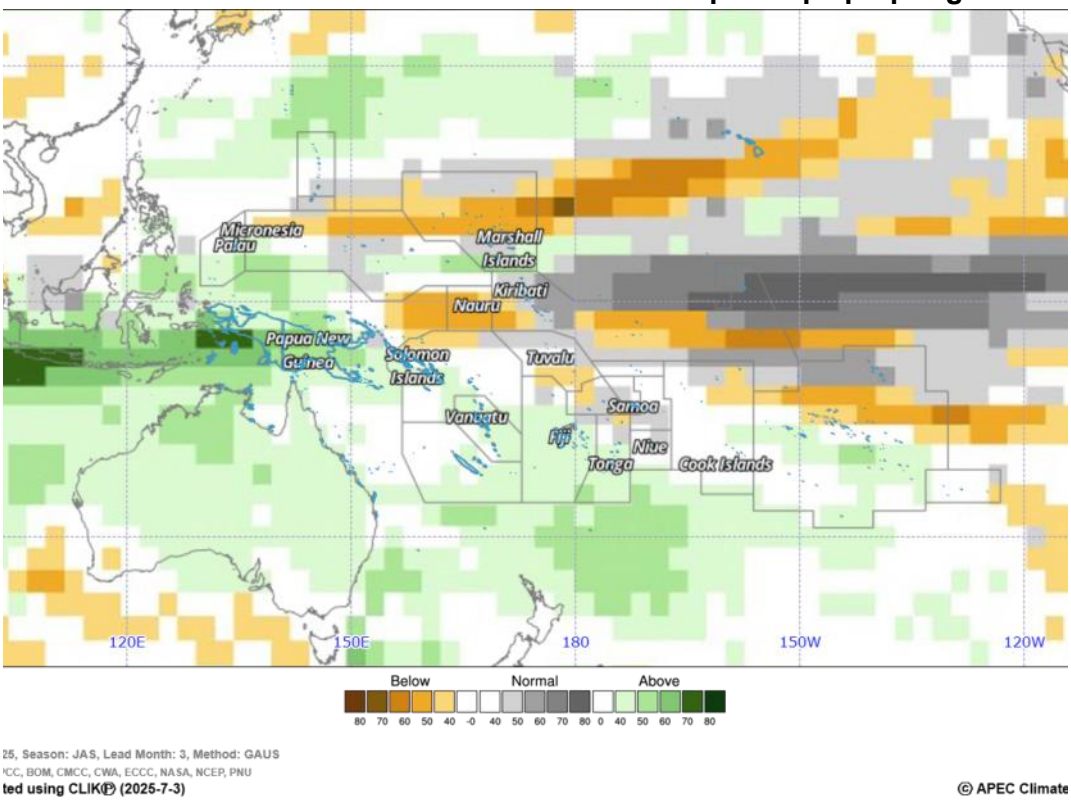
SEASONAL RAINFALL OUTLOOK

July—September 2025



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

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



TROPICAL CYCLONE

2024/2025 Season

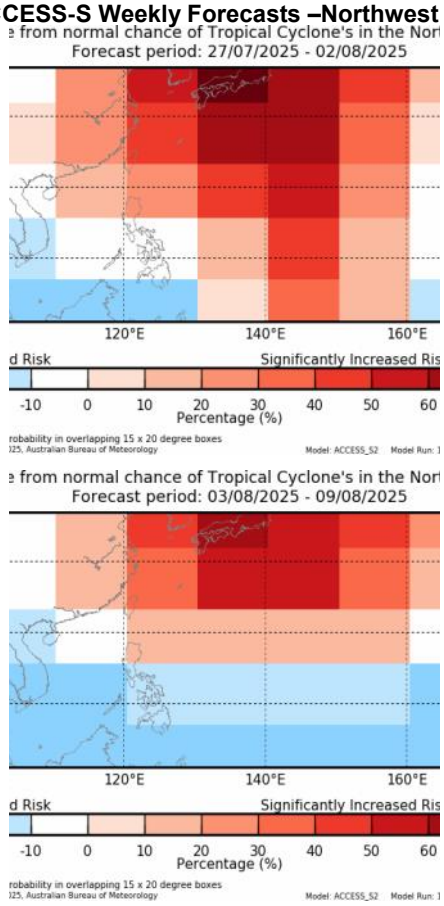
The northwest Pacific (WNP) tropical cyclone season is year-round, with most cyclones occurring between May and December. The 2024/25 Southwest Pacific tropical cyclone (TC) season has been remarkably inactive. There have been 11 disturbances overall, and five named storms to date (Alfred, Pita, Rae, 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 significantly increased risks for Palau, FSM, Guam, and south China sea region for the 27 July to 2 August. There are some risks also for south China sea region from 3 to 9 August.

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.

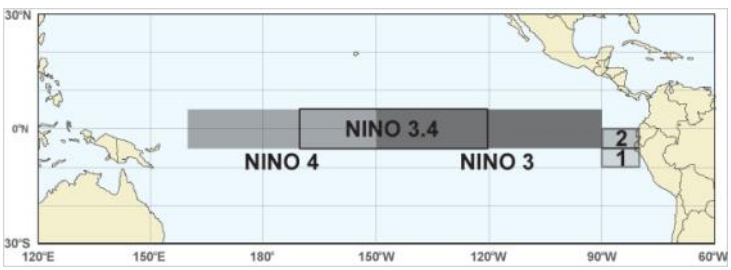
20 degrees Celsius Isotherm Depth

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