Monthly Pacific Climate and Ocean Bulletin

July 2025

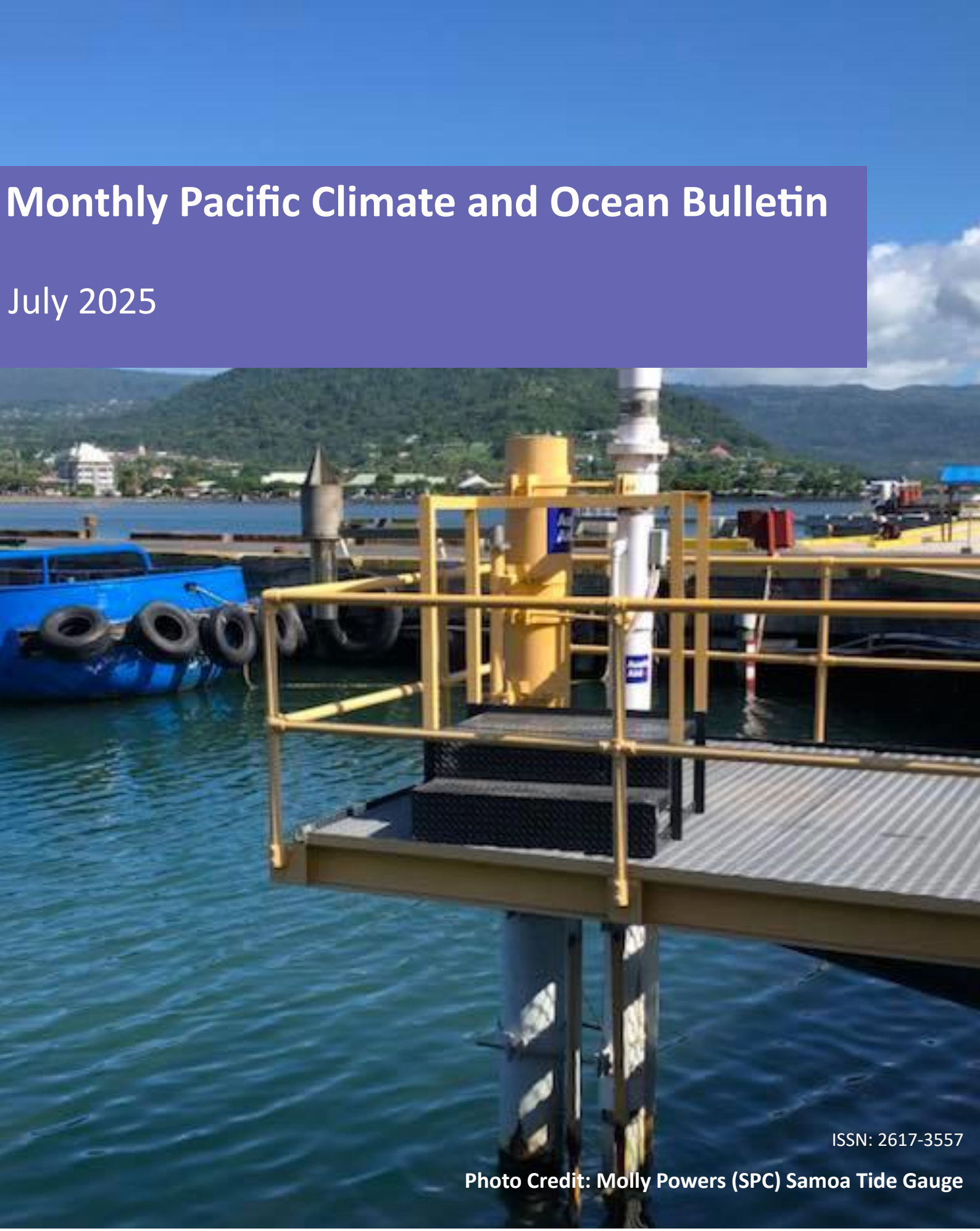

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Photo Credit: Molly Powers (SPC) Samoa Tide Gauge

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Climate and Oceans Support Program in the Pacific

Pacific Community
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CONTENTS

Issued 22 August 2025

- The El Niño Southern Oscillation (ENSO) and Indian Ocean Dipole remain neutral.
- The Madden Julian Oscillation (MJO) is currently weak, located over the western Indian Ocean. Most international models forecast the MJO to strengthen marginally and progress through the Indian Ocean toward the Maritime Continent in the coming fortnight.
- In July, the Intertropical Convergence Zone (ITCZ) was active and displayed north of its normal location and observed mainly in the western Pacific along Philippines, Palau, northern FSM, southern RMI, Nauru and Kiribati. The South Pacific Convergence zone was active over Samoa to Pitcairn Islands.
- Sea surface temperatures (SSTs) for July 2025 were near normal to above normal in the central and western Pacific.
- The Coral bleaching Outlook to 08 September shows patches of 'Alert Level 1' over PNG, Guam, Northern Mariana, and FSM.
- For August to October 2025, the models agree that above normal rainfall is likely or very likely in a band stretching from Palau, to PNG, and from Fiji to central French Polynesia. Below normal rainfall is likely or very likely in a band stretching eastwards from southeast FSM, Nauru to Kiribati (southern Gilbert, and Phoenix). Patches of below normal rainfall is also likely or very likely over northern FSM, northern RMI, and northern French Polynesia.
- The weekly tropical cyclone forecasts from the ACCESS-S model shows significantly increased risks for Palau, FSM, Guam, south China sea region, and Japan for the 26 August to 8 September.

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EL NIÑO–SOUTHERN OSCILLATION

A negative Indian Dipole event likely in the coming months

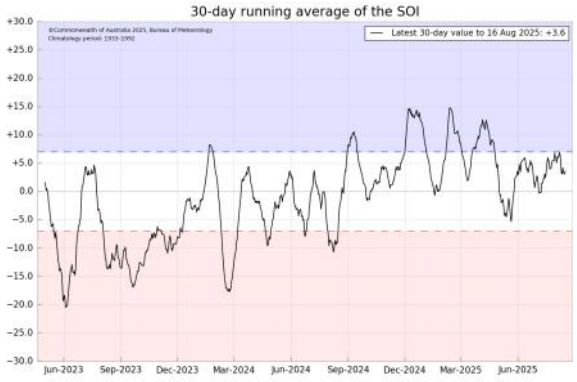
Click link to access Climate Driver Update issued on 12 August 2025

The El Niño-Southern Oscillation (ENSO) remains neutral. The latest Niño 3.4 value for the week ending 10 August is -0.12 °C. Neutral ENSO values for Niño 3.4 are between -0.8 °C and +0.8 °C. The Bureau's model predicts a neutral ENSO (neither El Niño nor La Niña) until at least January. This is consistent with forecasts from 6 out of 8 international models assessed, with 2 indicating borderline La Niña levels during the southern spring and early summer. There is a relatively large spread in the model forecasts, indicating more uncertainty than usual in the ENSO forecast.

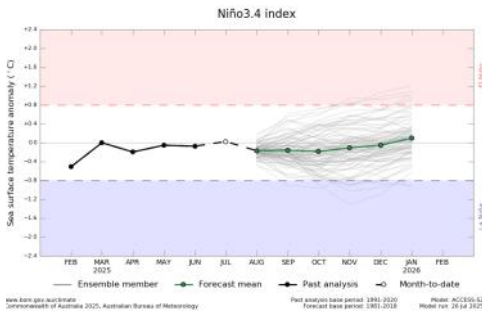
The sea surface temperatures (SST) analysis for July 2025 shows across the equatorial Pacific near normal temperatures, with warmer than usual SSTs present north of approximately 30 degrees north, and south of approximately 15 degrees south in the South Pacific. Warm anomalies persist in the western Pacific from the La Niña like conditions of 2024/2025 summer season (December to February).

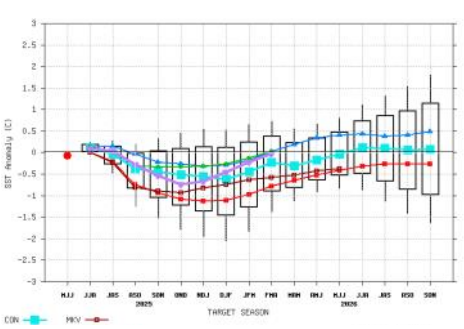
The Indian Ocean Dipole (IOD) Is neutral; however, the last 3 weeks of the IOD index have been below the negative IOD threshold. The latest IOD index value for the week ending 10 August is -0.84 °C. Sustained index values less than or equal to -0.4 °C for at least 8 weeks are typical of a negative IOD event.

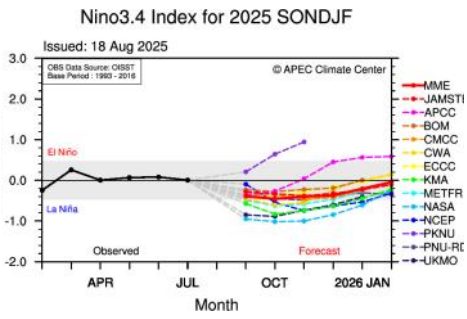
The 30 day average of the Southern Oscillation Index (SOI) for the period ending 16 August was +3.6.



International Model Outlooks







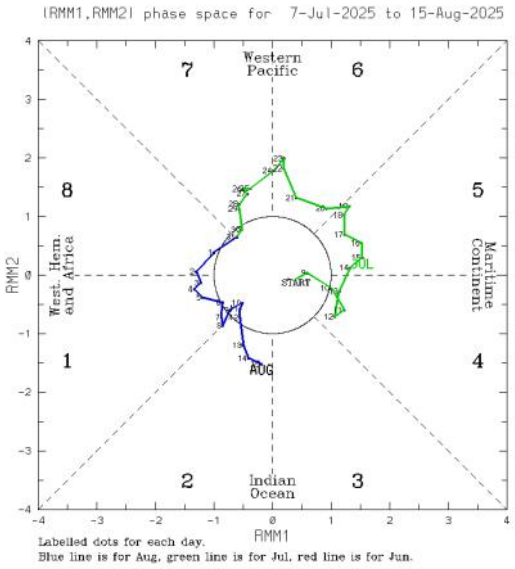
MADDEN–JULIAN OSCILLATION

Click link to access *Tropical monitoring and outlook* [Issued on Tuesday 12 August 2025]

The Madden-Julian Oscillation (MJO) was active over the second week to the end of July over the Maritime Continent and Western Pacific.

The Madden-Julian Oscillation (MJO) is currently weak, located over the western Indian Ocean. Most international models forecast the MJO to strengthen marginally and progress through the Indian Ocean toward the Maritime Continent in the coming fortnight. While some models forecast the MJO to weaken prior to reaching the Maritime Continent, some indicate a moderately strong pulse will continue to track east at moderate strength. If the MJO remains moderately strong as it tracks across the Indian Ocean, dry conditions over southern Australia become more likely. Apart from an increased likelihood of above-average rainfall along the coastal fringe of north-eastern Queensland, no significant influence on rainfall across northern Australia is expected.

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



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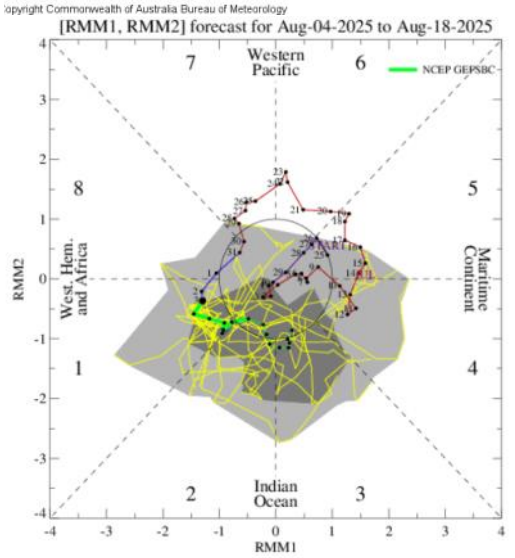
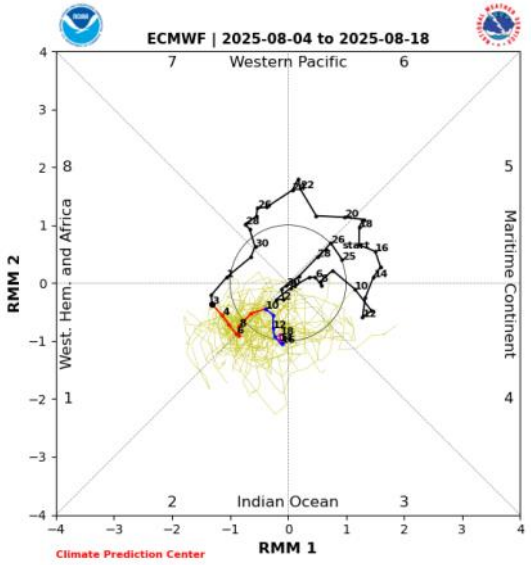
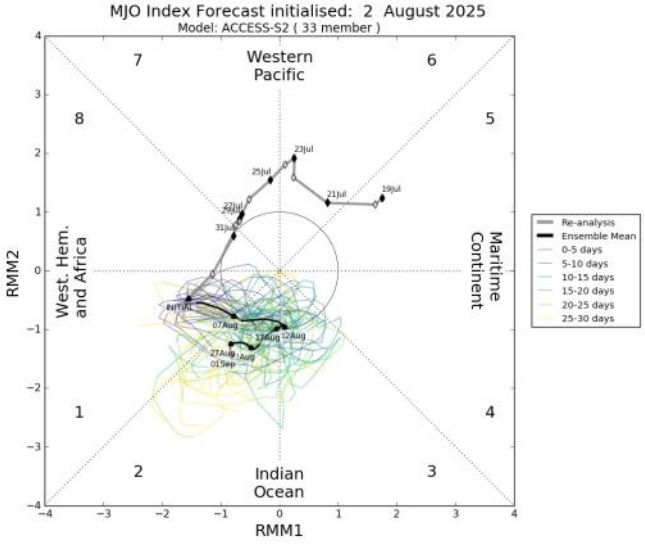




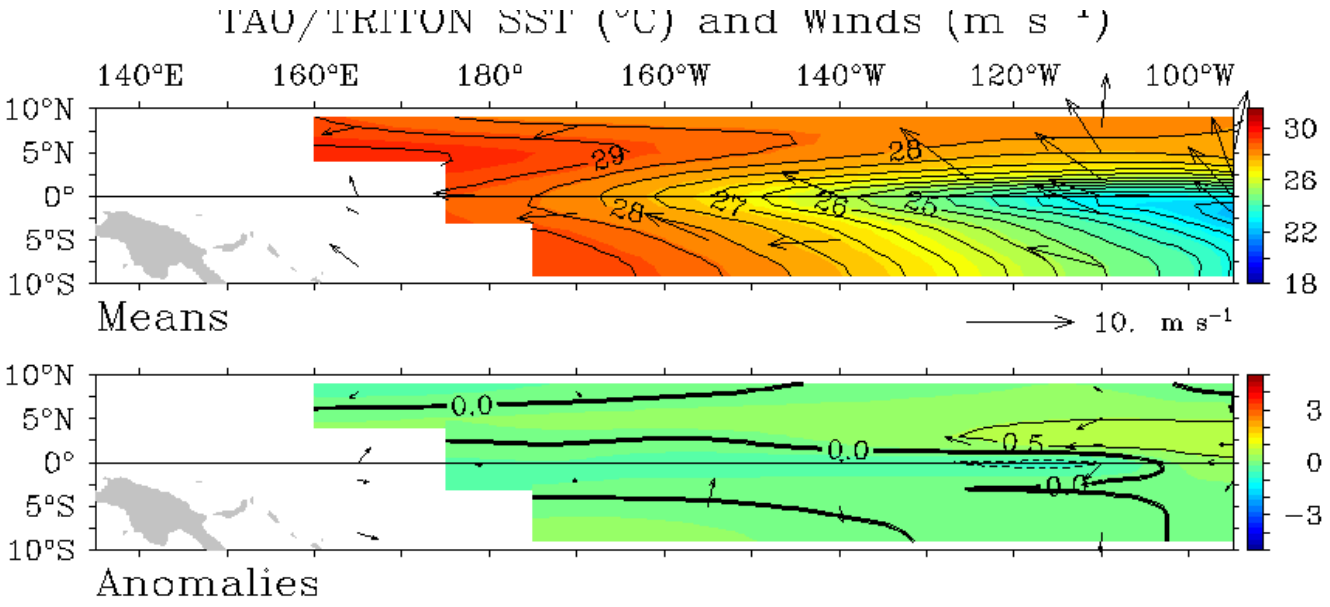


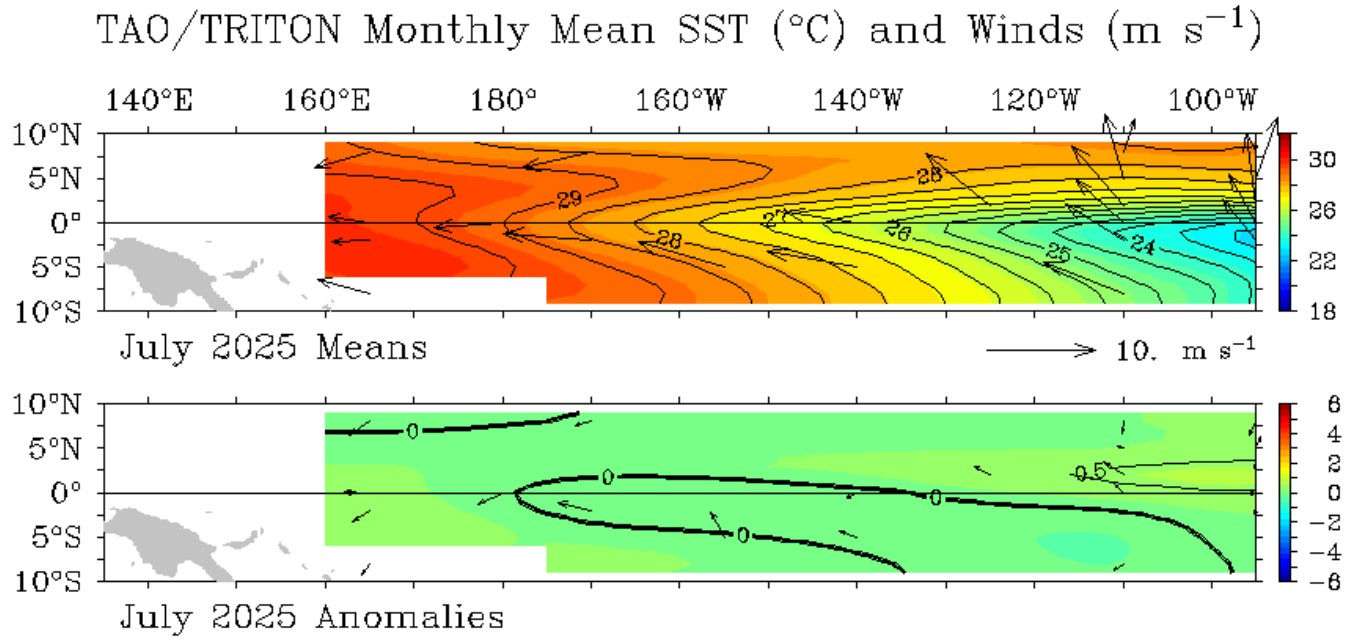
WIND

Click link to access Wind plots link

During July, the trade winds were generally average over the equatorial Pacific. For the five days ending 03 August 2025, the trade winds were weaker than average over the equatorial Pacific with some westerlies west of the Dateline between 165° E and 170° E.

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

Aug 4 2025

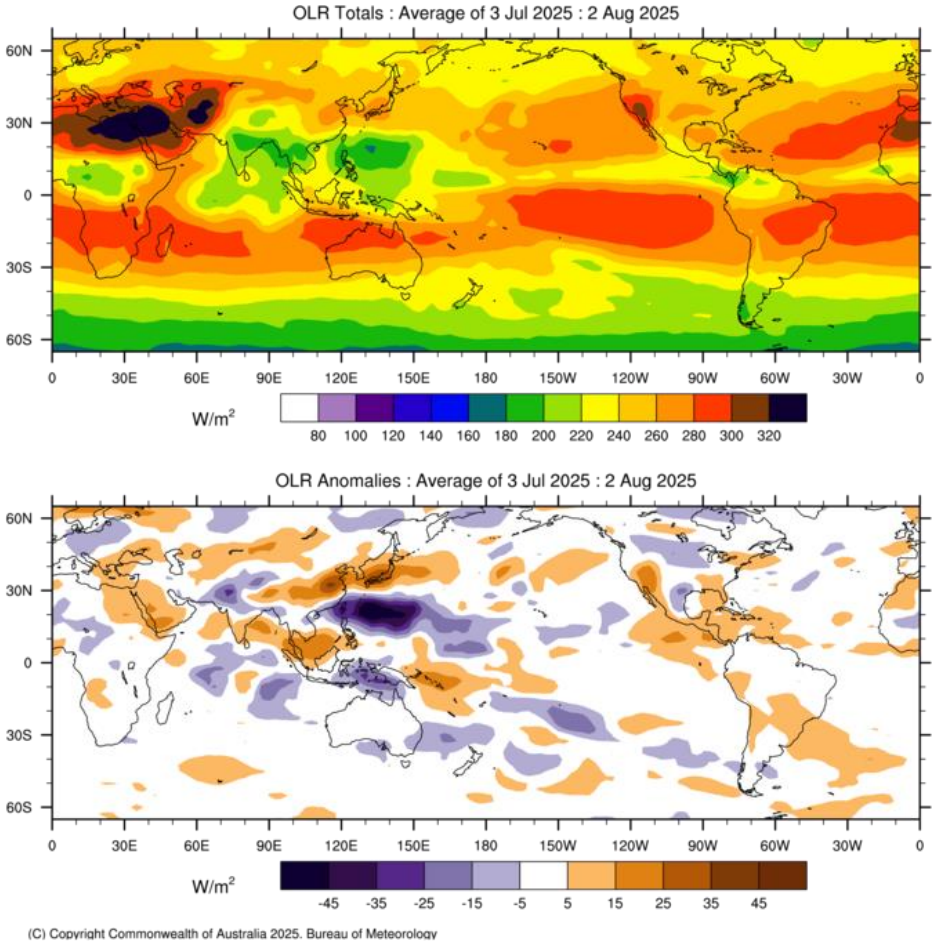
CLOUD AND RAINFALL

Click link to access OLR

The July 30-day OLR anomaly map shows a region of negative OLR (increased convection) in a band stretched eastwards north of the Intertropical Convergence Zone (ITCZ) across northern Philippines, Palau, northern FSM, southern RMI, Nauru and Kiribati (Gilbert). The ITCZ is north of its usual position. Areas of anomalously high OLR (decreased convection) were evident in a band stretched southeastwards over southern FSM, PNG Islands, Solomon Islands, New Caledonia, Vanuatu, and Tuvalu. Decreased convection were also evident over Tokelau and northern Cook Islands in the south Pacific. The South Pacific Convergence zone was active over Samoa to Pitcairn Islands.

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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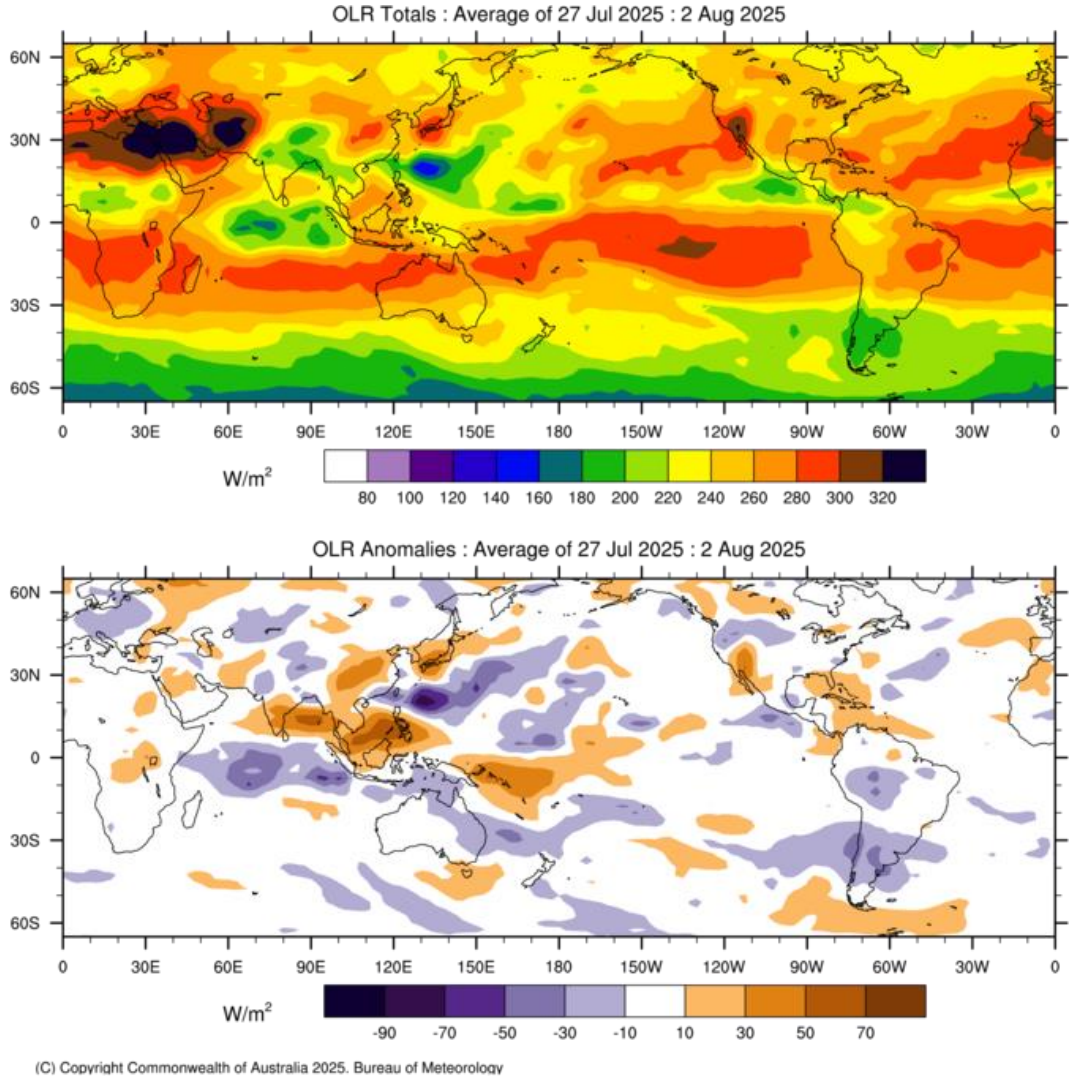
OLR Total and Anomalies, 7 Day OLR



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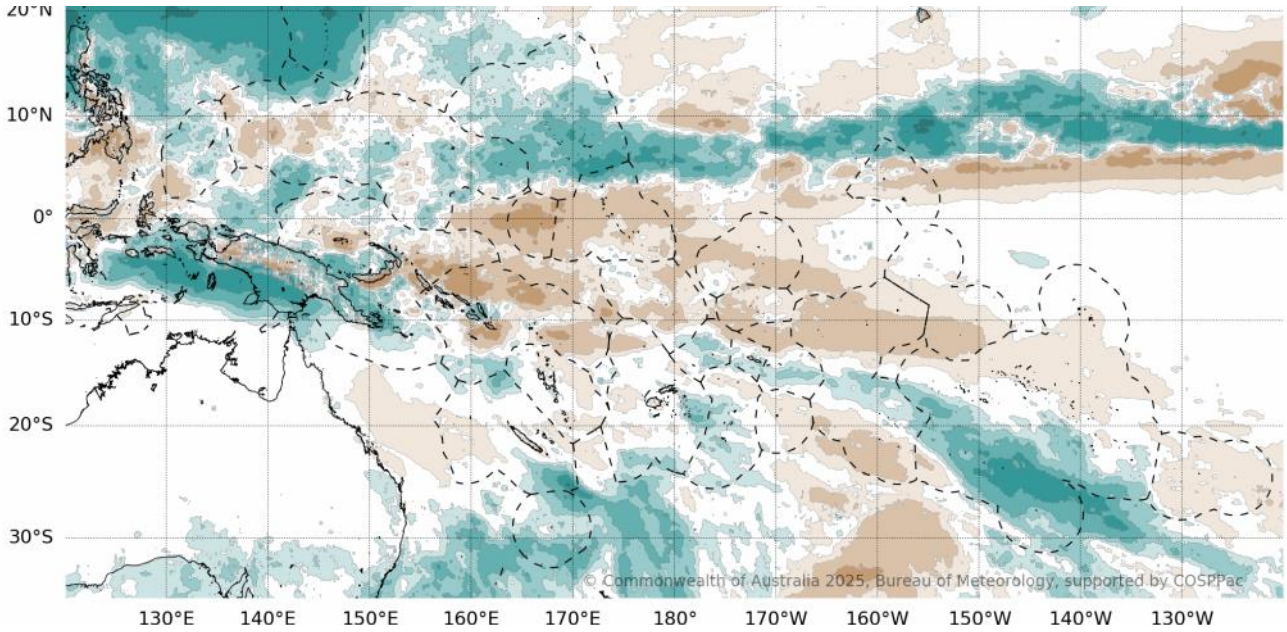
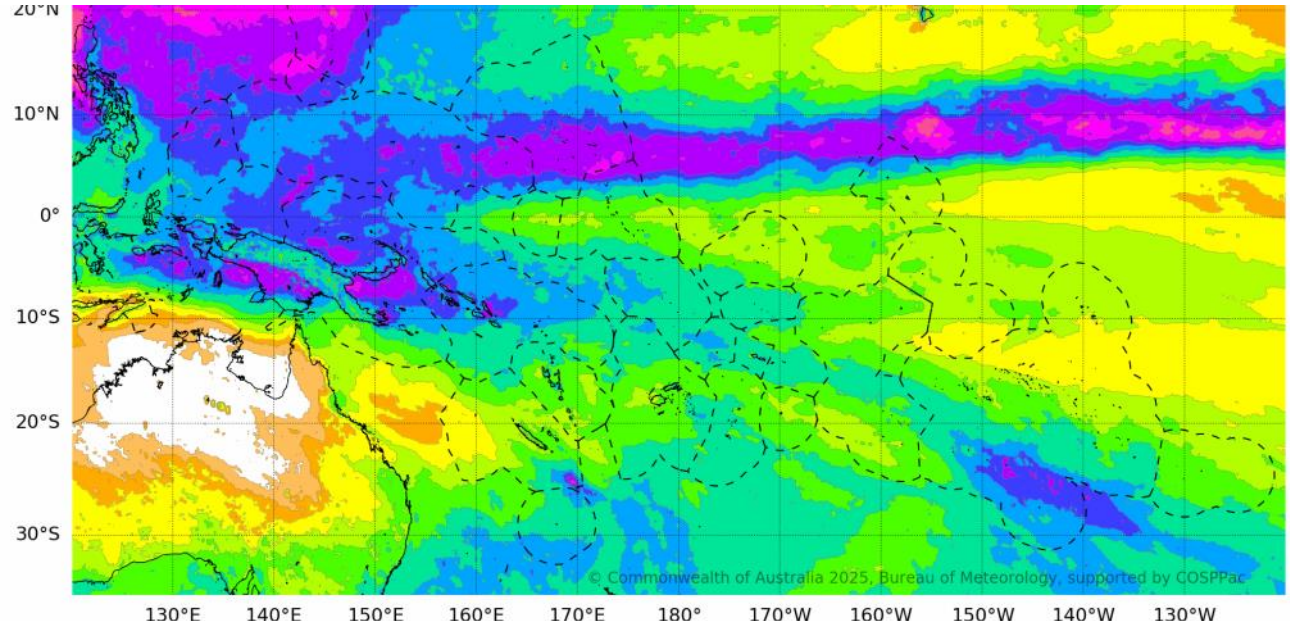
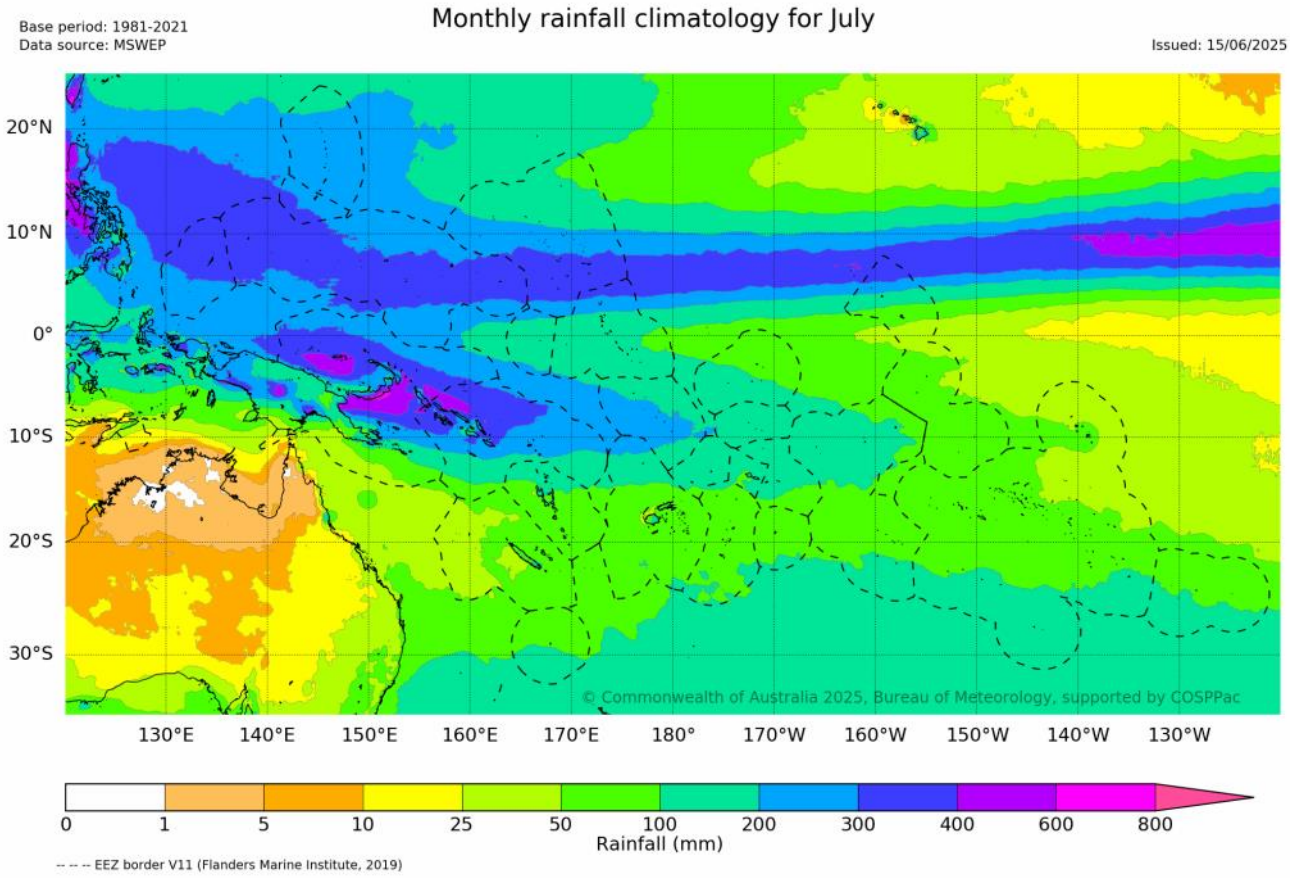


30-Day Rainfall Accumulated





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

OCEAN CONDITIONS

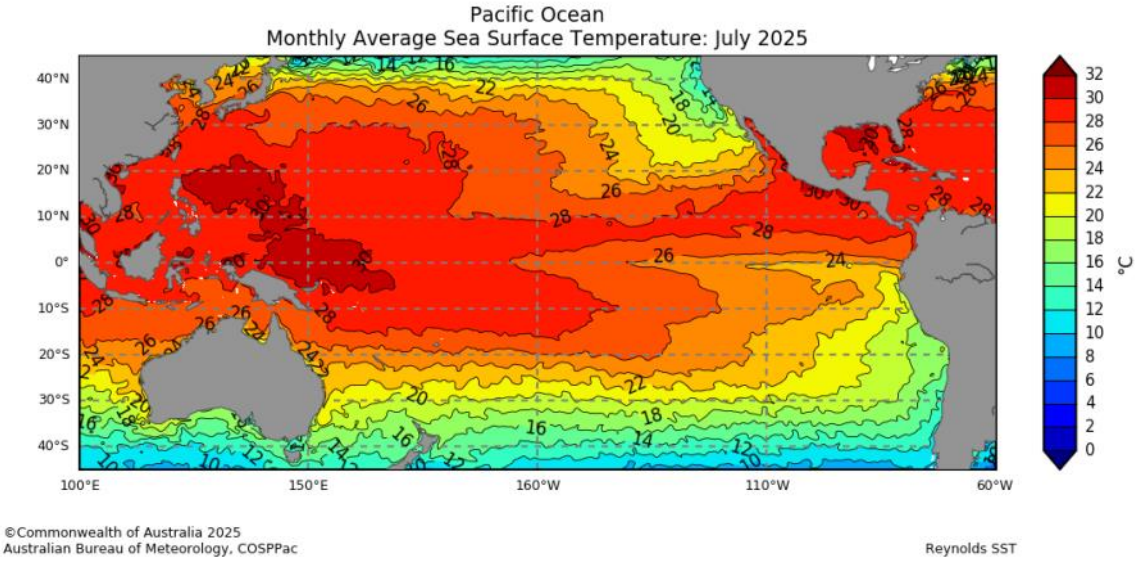
SEA SURFACE TEMPERATURE

Click link to access Pacific Community COSPPac Ocean Portal

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

Patches of Highest-on-record in July SSTs were recorded over PNG, FSM, northern Mariana, New Caledonia, Solomon Islands, Vanuatu, Tonga, and French Polynesia. The SSTs in decile 10 (very much above average) observed over PNG extended eastwards to Solomon Islands, New Caledonia, Vanuatu, central and southern Fiji, southern Nauru, Cook Islands and French Polynesia with patches over Tuvalu, Tonga, Samoa, American Samoa, Tokelau, and Niue. Additionally, SSTs in decile 10 (very much above average) were also observed in Guam, most of FSM with patches over Palau, RMI, and Northern Mariana. Above average (8-9) deciles were observed over most of Palau, parts of FSM, northern RMI, Nauru, Tuvalu, Tokelau, southern Phoenix Islands, most parts of Cook Islands, Samoa, Fiji, Tonga, Niue, eastern Solomon Islands and central Niue. Average SSTs (4-7) observed over most of RMI, Kiribati (Gilbert Islands, most of Phoenix Islands and Line Islands), southern American Samoa, Tonga, Niue and Cook Islands and southern French Polynesia. Below-average (2-3 decile) values were observed in parts of southern French Polynesia.

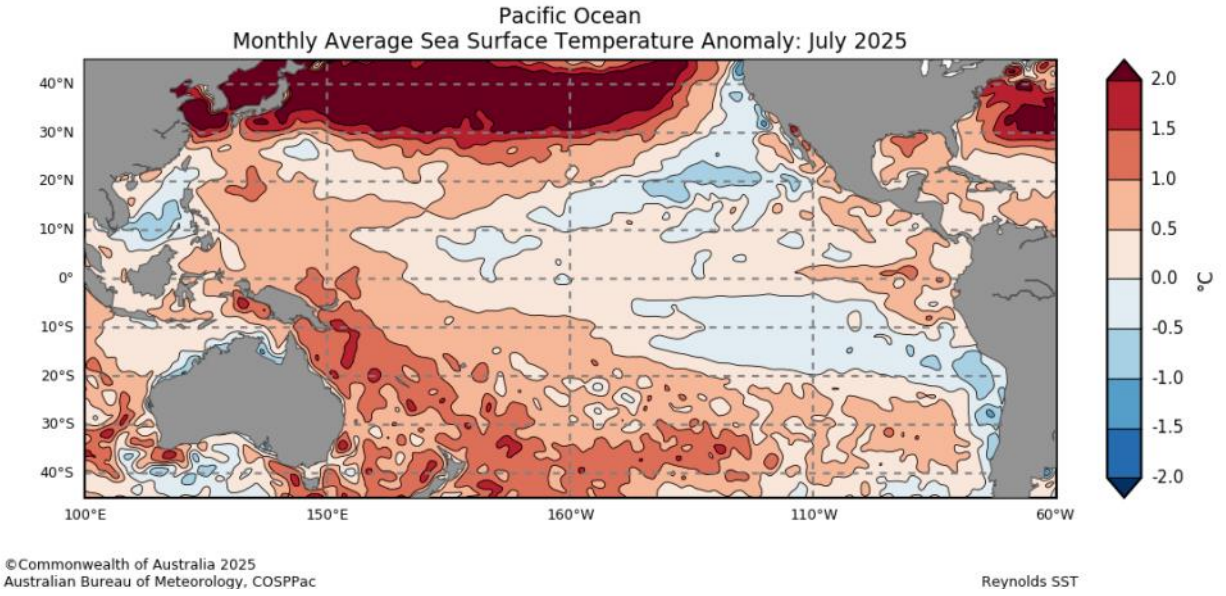
Mean Sea Surface Temperature

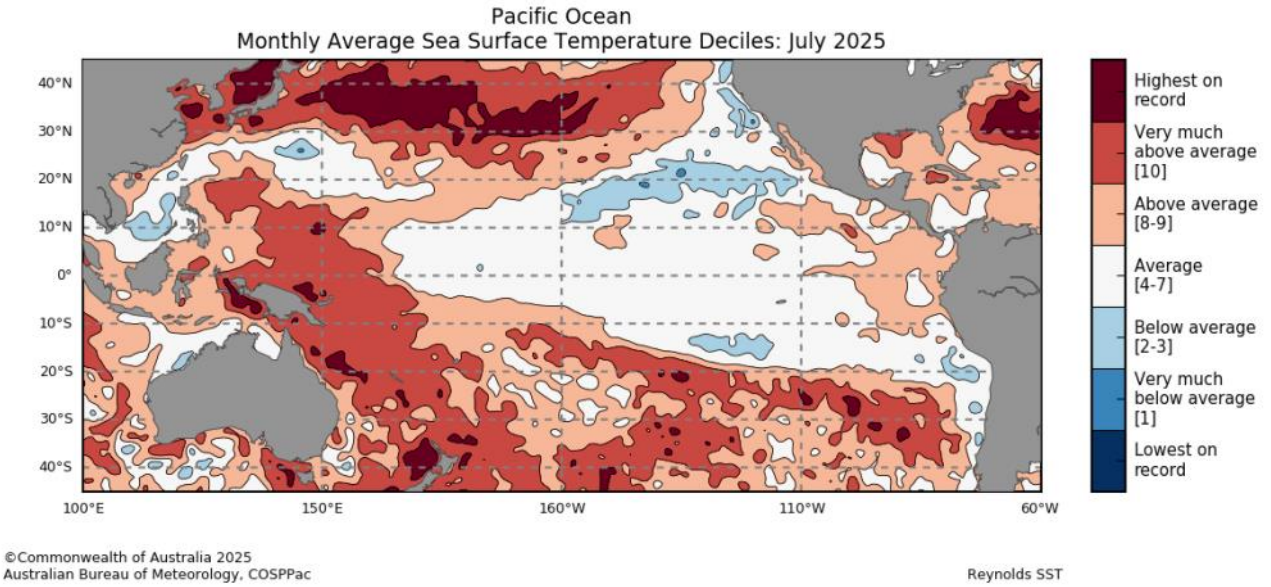


OCEAN CONDITIONS

Click link to access SEA SURFACE TEMPERATURE

Anomalous Sea Surface Temperature



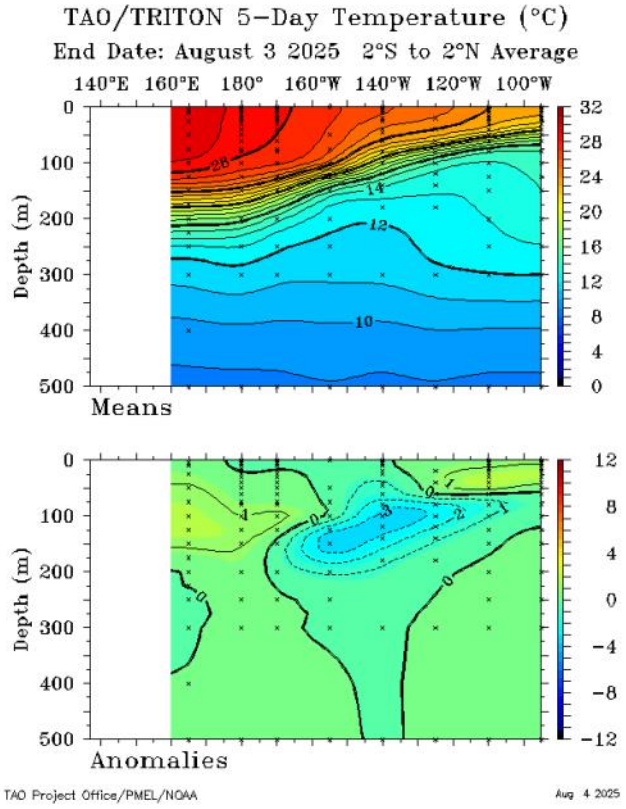


OCEAN CONDITIONS

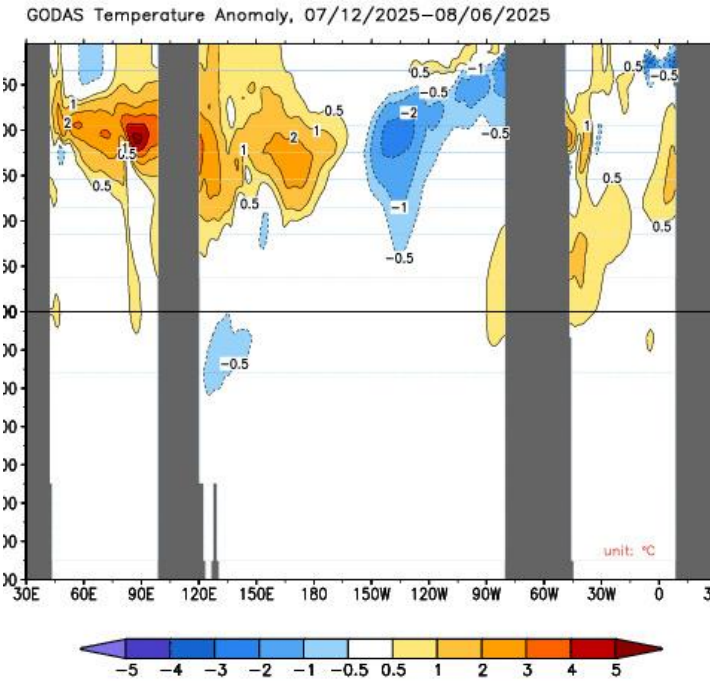
SUB SURFACE

The July equatorial Pacific sub-surface temperature anomalies along the equatorial region from 27 June to 22 July showed cooler than average waters in the far eastern Pacific of the equatorial region down to about 100 m depth. Adjacent westward to it was a warmer anomaly extending westwards with shallower depth of 75m. 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/

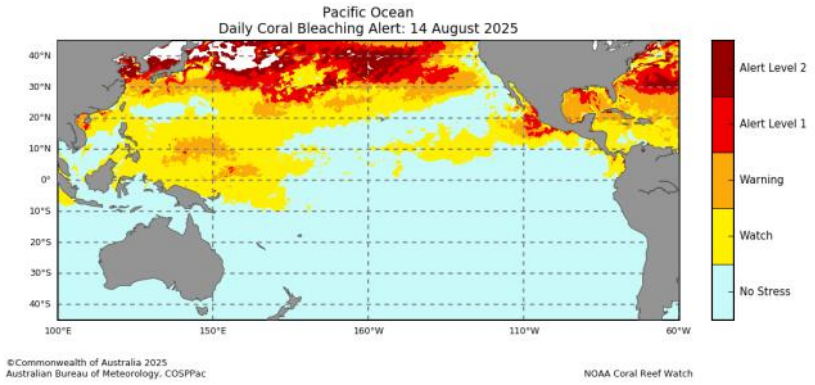
OCEAN CONDITIONS

CORAL BLEACHING

The daily Coral Bleaching Alert status for 18 August 2025 shows a patch of Alert Level 2 over PNG, a patch of Alert Level 1 over Palau and FSM. A patch of Warning over FSM and Palau. Watch or No stress for the rest of the countries. The four-week Coral Bleaching Outlook to 8 September shows patches of Alert Level 1 over PNG, Guam, Northern Mariana, and FSM. Warning covers Guam, PNG, and most of FSM. Watch or No Stress over the rest of the countries.

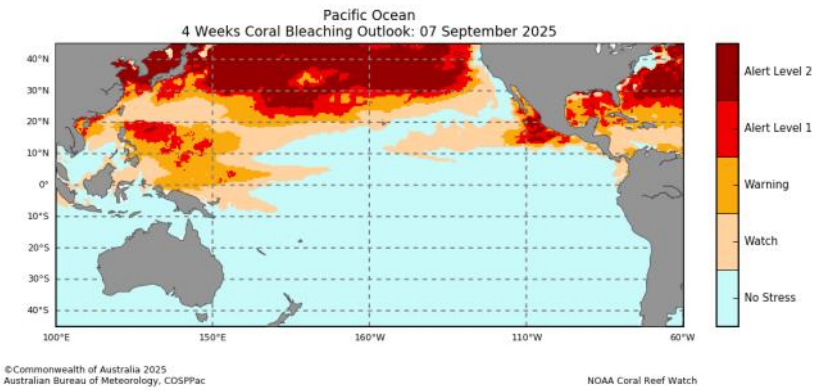
Daily Coral Bleaching Alert

(Source: Pacific Community COSPPac Ocean Porta Coral Bleaching)



4 Weeks Coral Bleaching Outlook

(Source: Pacific Community COSPPac Ocean Portal)



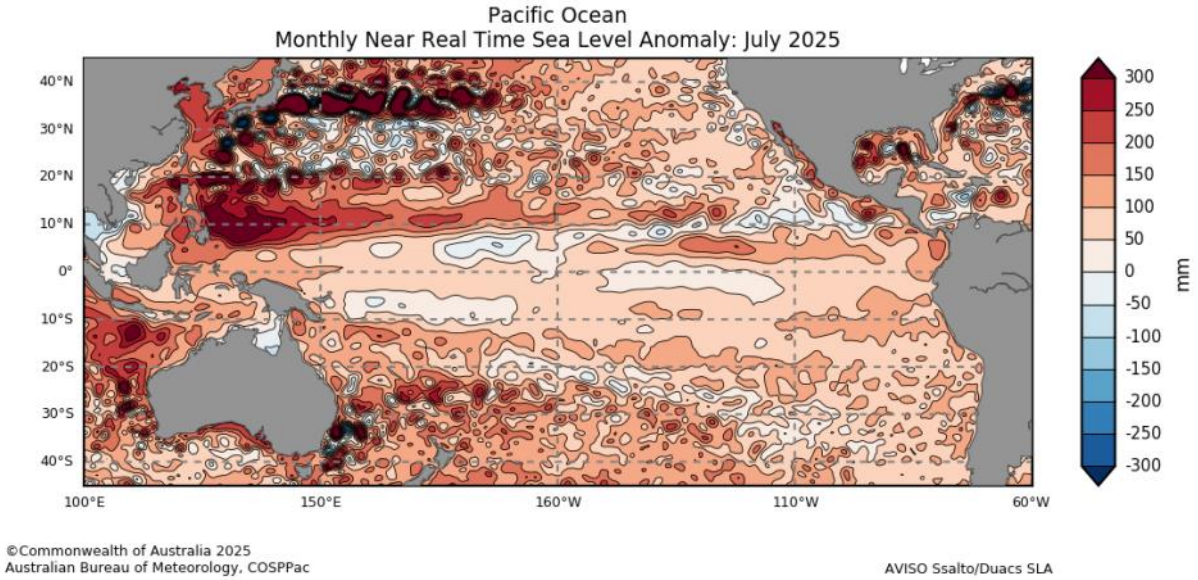
OCEAN CONDITIONS

OCEAN SURFACE CURRENTS AND SEA LEVEL

Sea levels observed in July, sea levels were generally above normal across most countries in the Pacific. However, near-normal sea levels were recorded in the northern half of Solomon Islands, most part of Tuvalu, Tokelau, part of Niue, the southern Cook Islands, French Polynesia and the Pitcairn Islands. Patches of near-normal sea levels were also observed over the Solomon Islands, Tonga, Niue, and the Cook Islands. Positive sea level anomalies exceeding +200 mm were observed in Palau, Marshall Islands and the Federated States of Micronesia (FSM) with patches recorded over southern Fiji, southern Tonga and southern French Polynesia. Countries which experienced sea levels up to +200mm included the Solomon Islands and Vanuatu; up to 150mm included Samoa, and the Cook Islands; up to +100mm included Nauru, Niue, Tuvalu and Kiribati.

Monthly Sea Level Anomalies

Source: Pacific Community COSPPac Ocean Portal

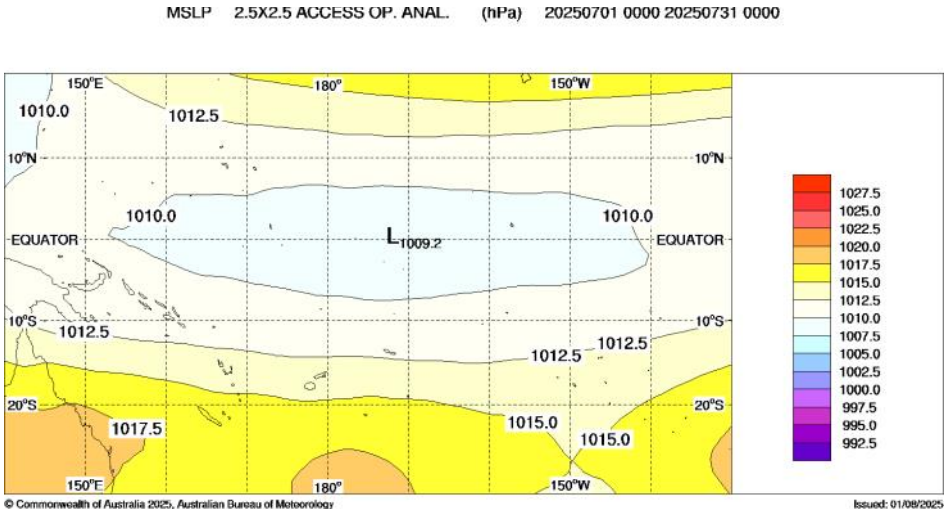


MEAN SEA LEVEL PRESSURE

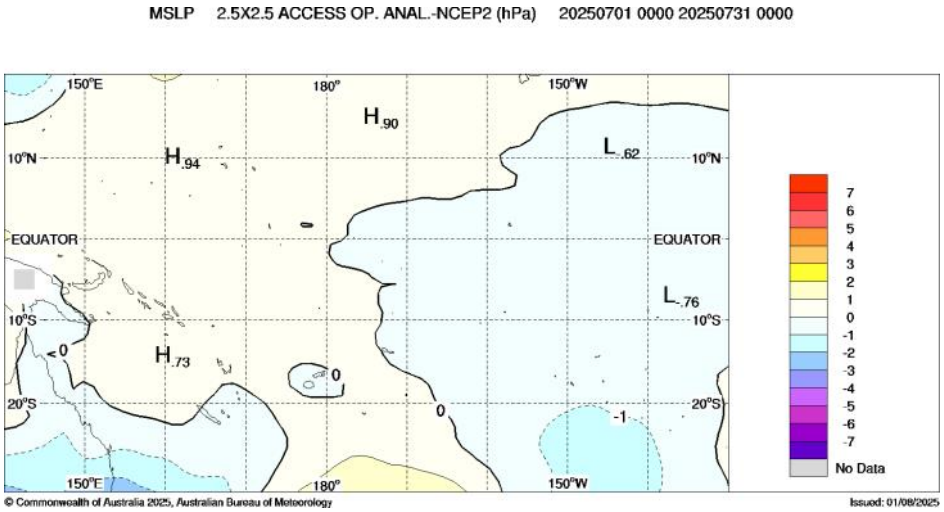
The July sea level pressure (MSLP) anomaly map displays negative anomalies of 1 hPa or greater over southeast Australia, and southern French Polynesia.

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

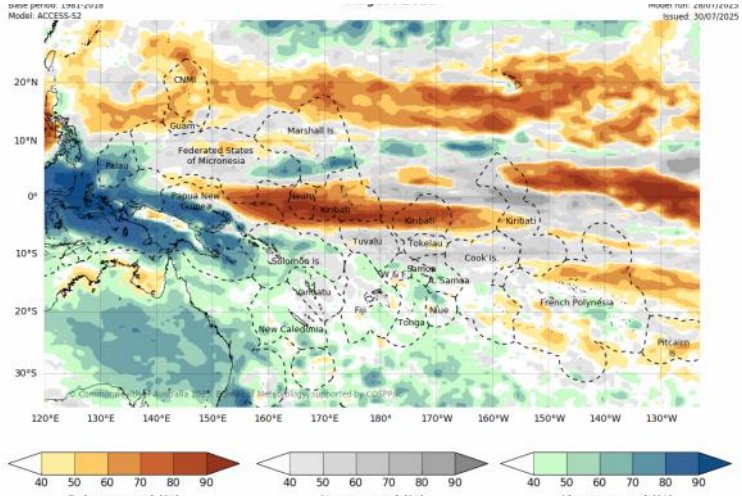
SEASONAL RAINFALL OUTLOOK

August—October 2025

The ACCESS-S model forecast for for August 2025, shows above normal rainfall is likely or very likely for Palau, eastern FSM, and southern RMI in the northern Pacific. Above normal rainfall is likely or very likely in a band stretching southeast from PNG, over most of Solomon Islands, northern and southern New Caledonia, northern Vanuatu, northern and eastern Fiji, northern Wallis and Futuna, most of Tonga, Samoa, and Niue. Patches of above normal rainfall is likely or very likely for central American Samoa, central Cook Islands, and central French Polynesia. Below normal rainfall is likely or very likely in a band stretching eastwards from Guam, Guam, and northern RMI in the northern Pacific. Another band of below normal rainfall is likely or very likely for northern PNG Is., southern FSM, Nauru, Kiribati (Gilbert, most of Phoenix Is., and part sof northern, central and southern Line Is.), and northern Tuvalu. Patches of Below normal rainfall is likely or very likely for northern FSM, southern Cook Is., southern and northern French Polynesia, and Pitcairn Islands.

The ACCESS-S three-month rainfall outlook (August to October 2025) is very similar to the August outlook, but the drier than normal region band covers most of northern RMI, central and southeast FSM, northern and central Tuvalu, Tokelau, northern Cook Islands, most of Kiribati (central Gilbert, most of Phoenix, and most of Line Is.), northern Cook Is., and northern French Polynesia. The above normal rainfall region has a more stronger signal over Palau, and extend to central Cook Islands. Patches of above normal rainfall is likely or very likely for central French Polynesia.

Monthly ACCESS-S Maps



The Copernicus multi-model outlook for August to October 2025 is very similar to the ACCESS-S outlook. However, the above normal rainfall region shift south and only extend over southern Palau, most of PNG, southern Solomon Islands, New Caledonia, Vanuatu, Fiji, and southern Tonga.

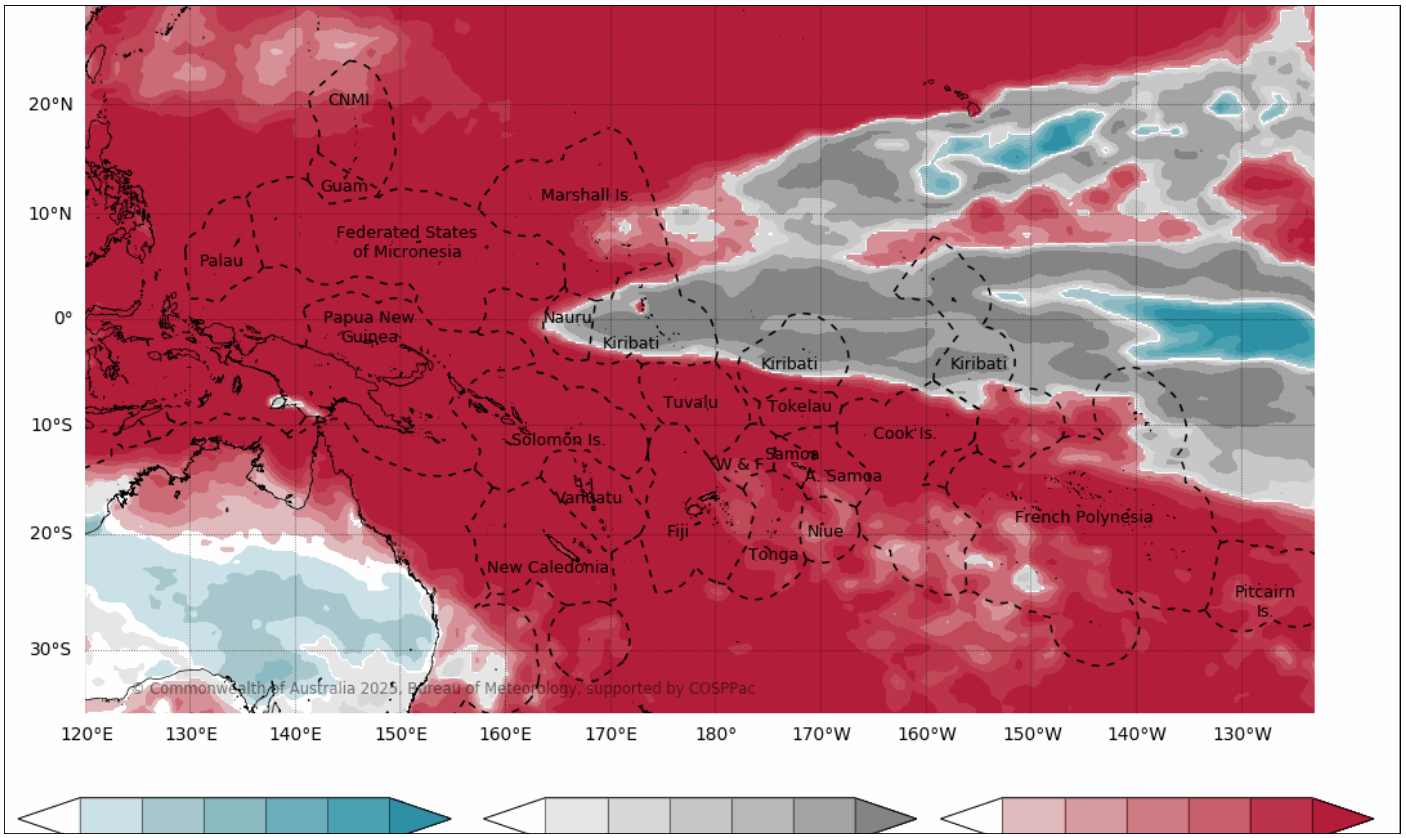
The APEC Climate Centre multi-model outlook (August to October 2025) is similar to the other two models but the drier than normal region excludes CNMI, southern Cook Islands, southern French Polynesia, and Pitcairn Islands. The wetter than normal region is also likely or very likely over Palau, western FSM, southern RMI, most of PNG, southern New Caledonia, eastern Fiji, southern Tonga, Niue, southern Cook Islands, and central French Polynesia

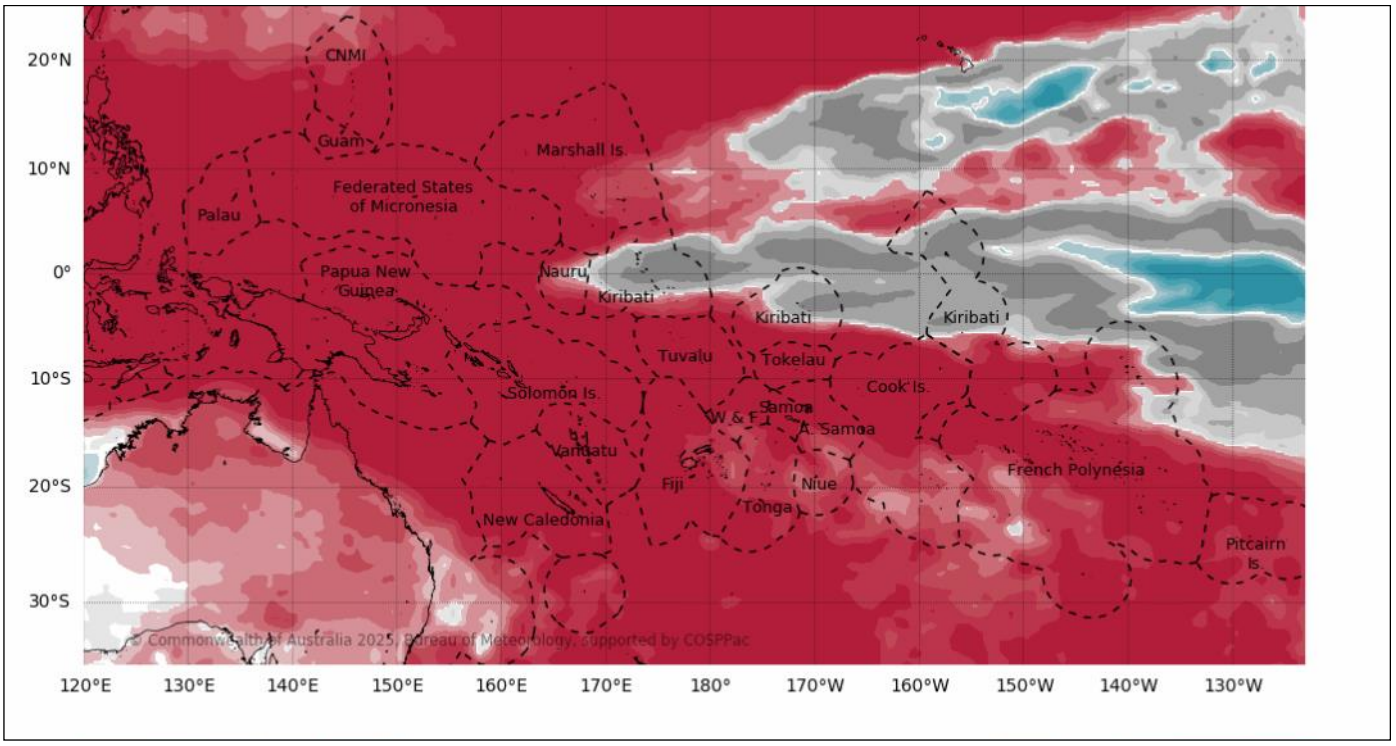
For August to October 2025, the models agree that above normal rainfall is likely or very likely in a band stretching from Palau, to PNG, and from Fiji to central French Polynesia. Below normal rainfall is likely or very likely in a band stretching eastwards from southeast FSM, Nauru to Kiribati (southern Gilbert, and Phoenix). Patches of below normal rainfall is also likely or very likely over northern FSM, northern RMI, and northern French Polynesia.

SEASONAL TEMPERATURE OUTLOOK

August—October 2025

Monthly Tmax and Tmin ACCESS-S Maps

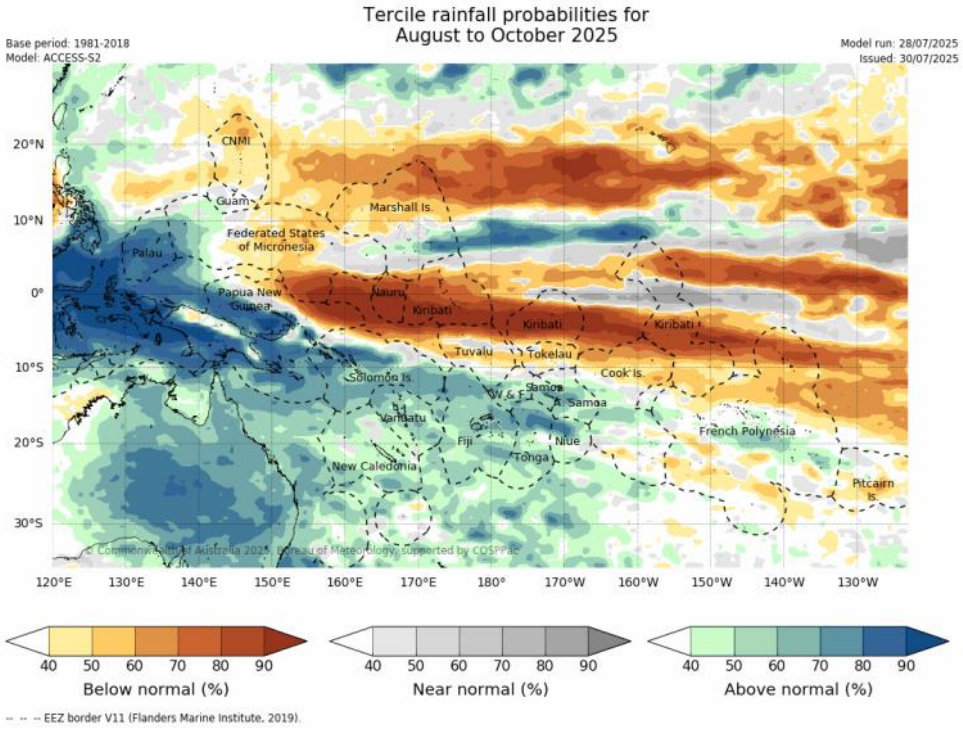


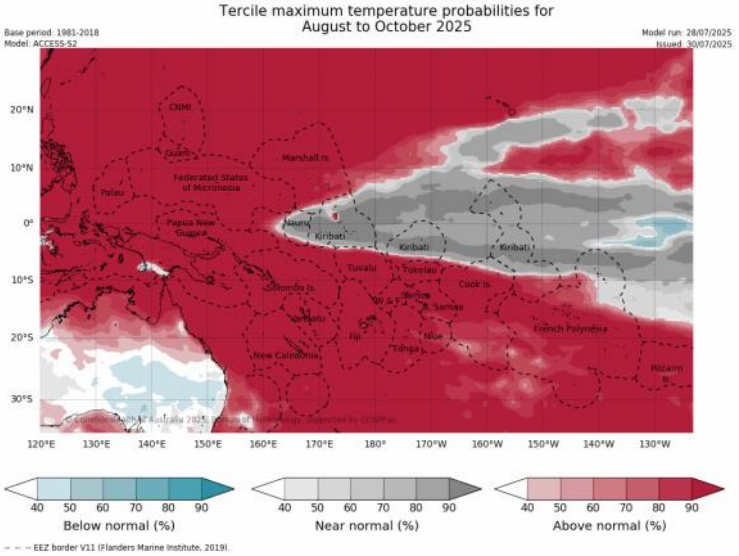


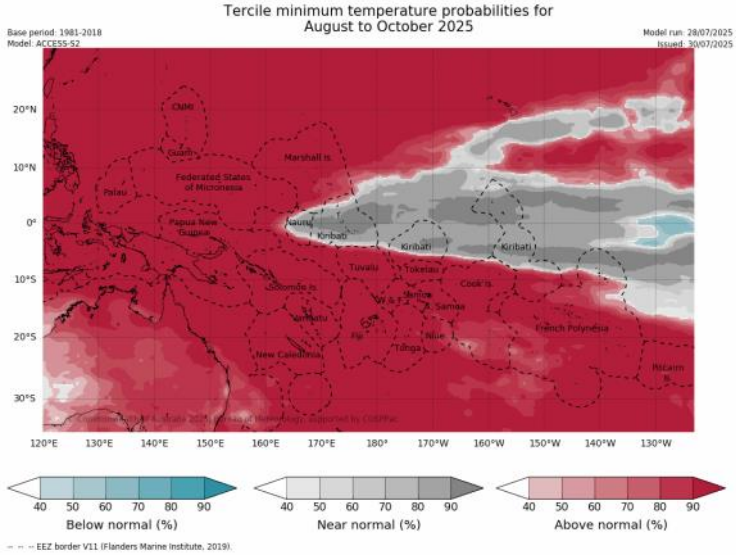
SEASONAL RAINFALL OUTLOOK

August—October 2025

Seasonal ACCESS-S maps



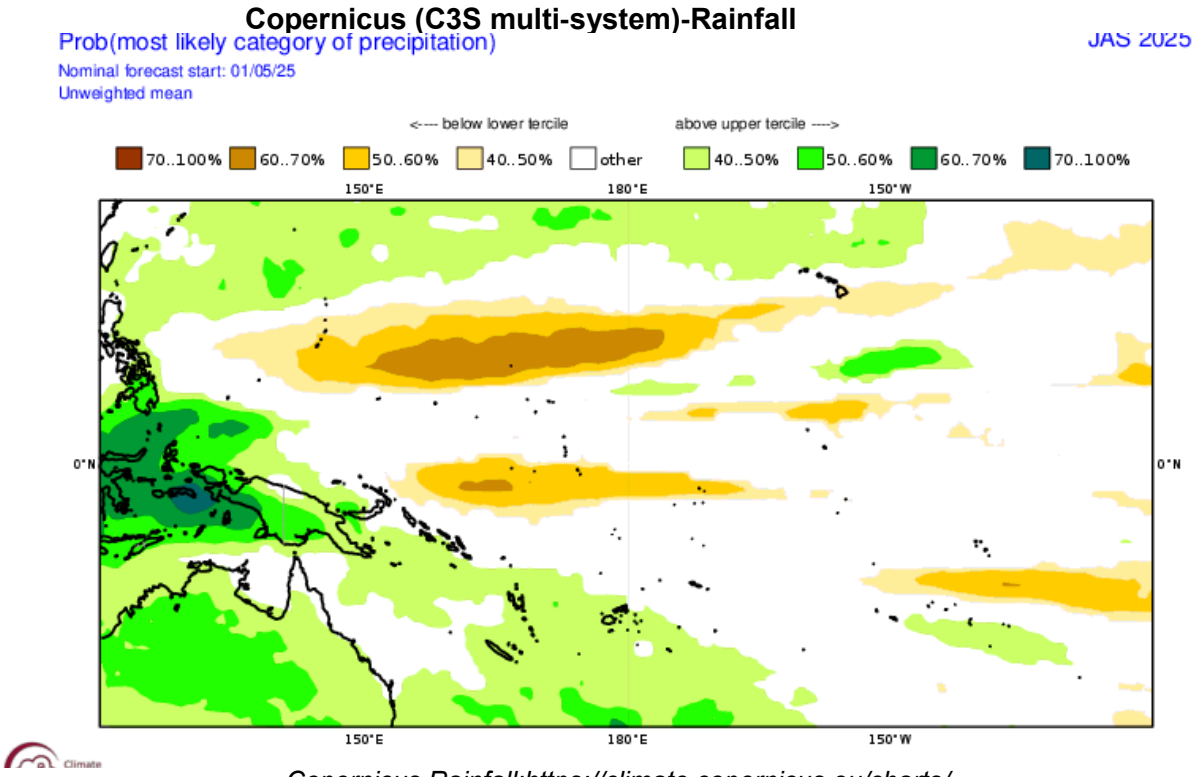




'About ACCESS-S http://access-s.clide.cloud/

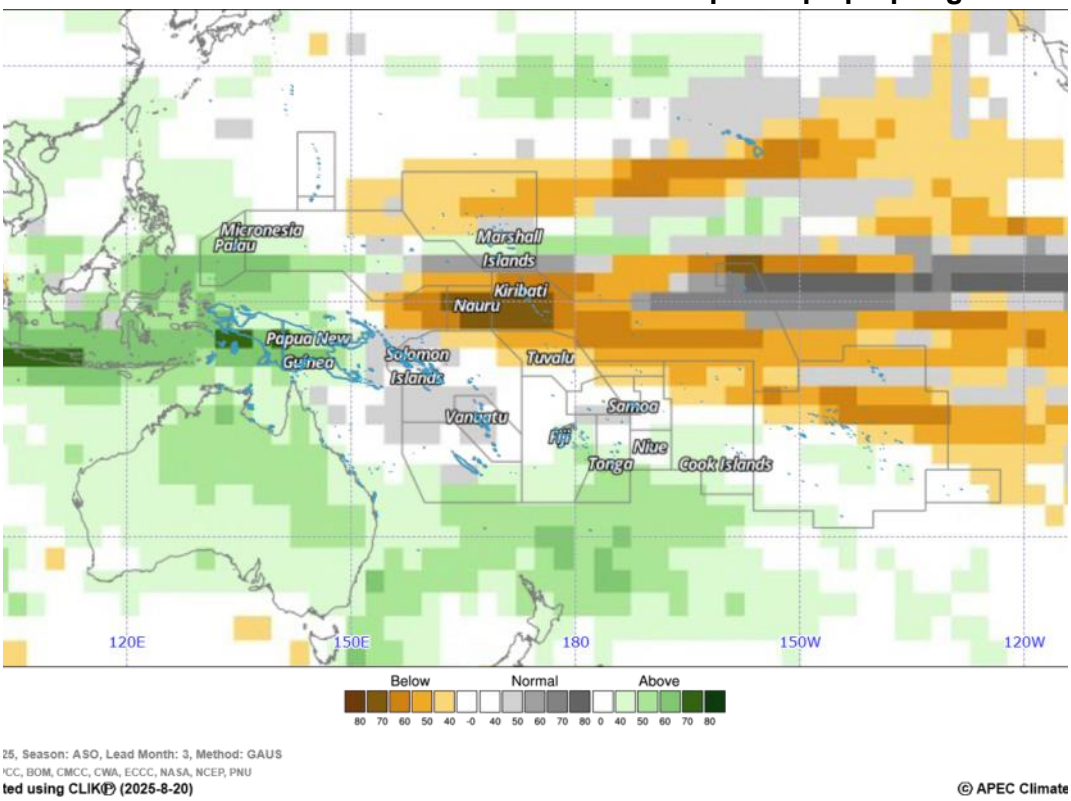
SEASONAL RAINFALL OUTLOOK

August—October 2025



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

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



TROPICAL CYCLONE

2024/2025 Season

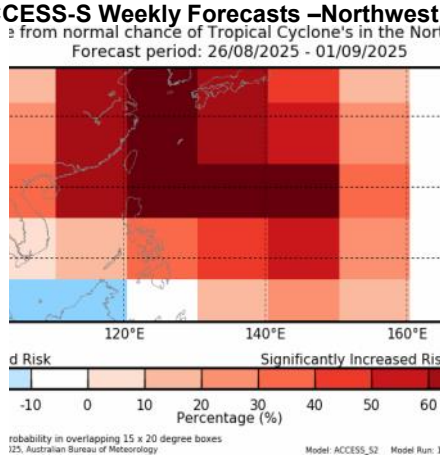
The northwest Pacific (WNP) tropical cyclone season is year-round, with most cyclones occurring between May and December. The 2024/25 Southwest Pacific tropical cyclone (TC) season has been remarkably inactive. There have been 11 disturbances overall, and five named storms to date (Alfred, Pita, Rae, 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 shows significantly increased risks for Palau, FSM, Guam, south China sea region, and Japan for the 26 August to 8 September.

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.

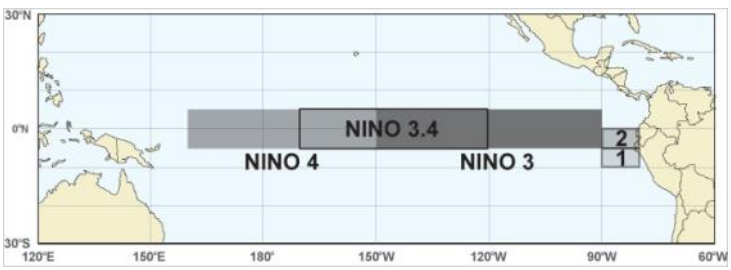
20 degrees Celsius Isotherm Depth

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