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Photo Credit: Molly Powers (SPC) Samoa Tide Gauge

SPREP
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Australian Aid

Climate and Oceans Support Program in the Pacific

Pacific Community
Communauté du Pacifique

CONTENTS

Issued 12 November 2024

- The El Niño Southern Oscillation (ENSO) remains neutral.
- The Madden-Julian Oscillation (MJO) active pulse will continue its eastward movement from the Western Hemisphere and Africa to the Indian Ocean during the next fortnight.
- In October, the Intertropical Convergence Zone (ITCZ) was active and north of the equator, and a well-defined South Pacific Convergence Zone (SPCZ) extended east-southeast from PNG to the southern French Polynesia in the southern hemisphere.
- Sea surface temperatures (SSTs) for October 2024 were warmer than average in the far western tropical equatorial Pacific Ocean.
- The Coral bleaching Outlook to 17 November shows 'Alert Level 2' over central and eastern FSM, southern RMI and northern PNG.
- For November to January 2025 the models agree that above normal rainfall is likely or very likely for Palau, most of FSM, central and northern RMI, PNG, Solomon Islands, New Caledonia, Vanuatu, and southern Fiji. The models agree that below normal rainfall is likely or very likely for northern PNG, southeast FSM, Nauru, and Kiribati extending to Tuvalu, Tokelau, northern American Samoa, northern Cook Islands, northern and southern French Polynesia, and Pitcairn Island.
- In the southwest Pacific, the 2024-25 tropical cyclone season started on 01st November 2024. The outlook for the season favoured normal or above normal TC activity is likely west of and including Vanuatu. East of Vanuatu, normal to below normal TC activity is likely. The ACCESS-S weekly tropical cyclone outlook shows significantly increased risk over the Philippines, Palau, and south China Sea region for the week from 13 to 19 November. There is also a slight to moderate increase risk over eastern Asia from 20 to 26 November.

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EL NIÑO–SOUTHERN OSCILLATION

ENSO remains neutral, recent IOD values tending negative

Click link to access Climate Driver Update issued on 29 October 2024

The El Niño-Southern Oscillation (ENSO) remains neutral, with sea surface temperatures (SSTs) in the central equatorial Pacific Ocean at ENSO-neutral levels. Atmospheric indices, such as those related to patterns of surface pressure, cloud and trade winds, are broadly consistent with an ENSO-neutral state. While some atmospheric indices have displayed La Niña-like signals over recent months, a consistent/sustained shift has not been observed.

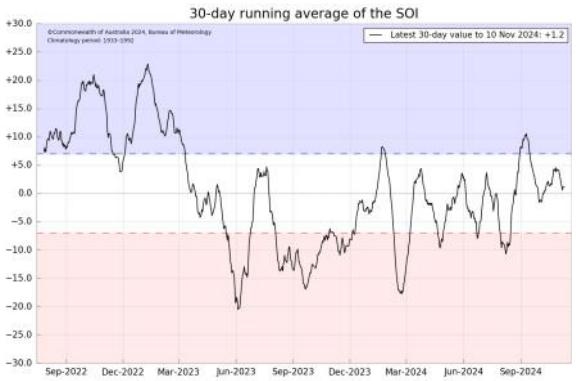
The Bureau's model suggests SSTs are likely to remain within the ENSO-neutral thresholds (-0.8 °C to -0.8 °C) throughout the forecast period to February 2025. Of the 6 other climate models surveyed, only one model suggests SSTs in the tropical Pacific are likely to exceed the La Niña threshold (below -0.8 °C) throughout November to February, which is sufficient time to be classified as a La Niña event. All models forecast neutral ENSO values by March.

The Indian Ocean Dipole (IOD) Index value is -0.94 °C for the week ending 27 October, marking the fifth week close to or below the negative IOD threshold (-0.40 °C). All models indicate that the IOD index will meet or exceed negative IOD thresholds in November.

Global sea surface temperatures (SSTs) remain at near record levels, with temperatures since July being just short of the record temperatures observed during 2023, yet above all other years since observations began in 1854. The sustained nature of this significant global ocean heat suggests that climate indicators such as ENSO and IOD may not behave or evolve as they have in the past.

The Southern Annular Mode (SAM) is neutral (as at 27 October) and is forecast to remain mostly neutral over the coming fortnight. The months of November and December are tending towards positive SAM.

The 30-, 60- and 90-day Southern Oscillation Index (SOI) for the period ending 27 October were +4.7, +3.2 and -3.3 respectively.



EL NIÑO–SOUTHERN OSCILLATION

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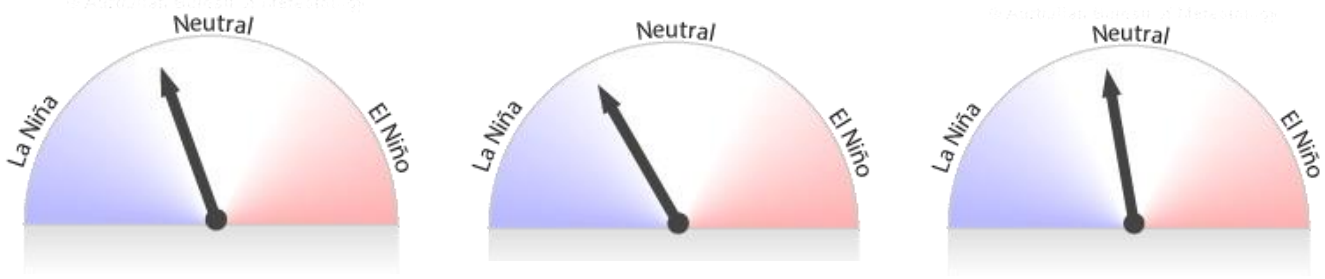
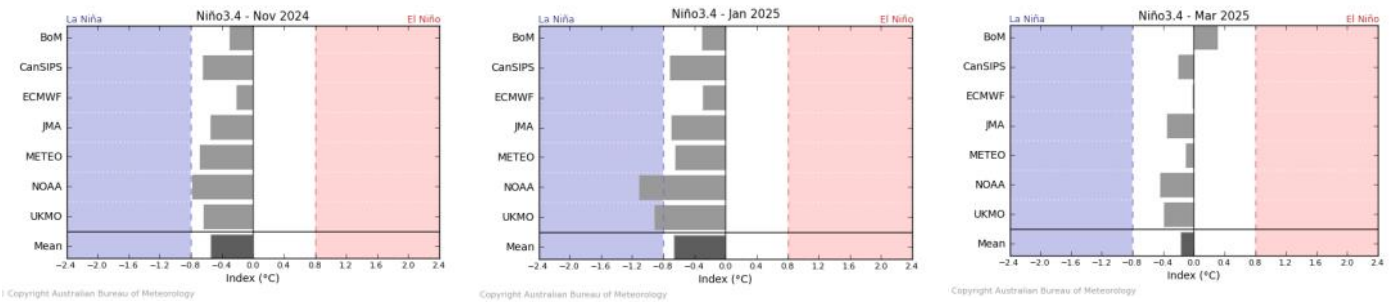
Bureau of Meteorology NINO3.4 ENSO Model Outlooks for November, January and March



Bureau of Meteorology NINO3.4 International Model Outlooks



Bureau of Meteorology summary of international model outlooks for NINO3.4: http://www.bom.gov.au/climate/model-summary/#tabs=Pacific-Ocean

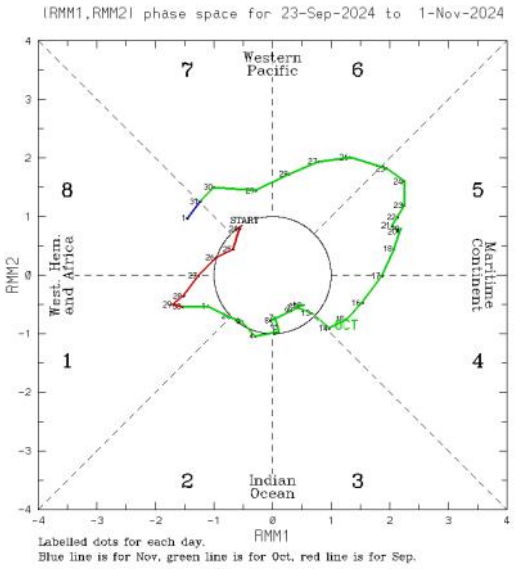
MADDEN–JULIAN OSCILLATION

Click link to access *Tropical Climate Update* [Issued on Tuesday 05 November 2024]

The moderately strong Madden-Jullian Oscillation (MJO) has been very active during much of October and moved across the Pacific to the Western Hemisphere during the past week.

Climate models surveyed by the Bureau are generally in good agreement that the MJO pulse will continue its eastward movement from the Western Hemisphere and Africa to the Indian Ocean during the next fortnight. The MJO signal is likely weaken as it propagates over the Indian Ocean.

This is an abbreviated version of the Tropical Climate Update. Click on the *Weekly Tropical Update* for more information .



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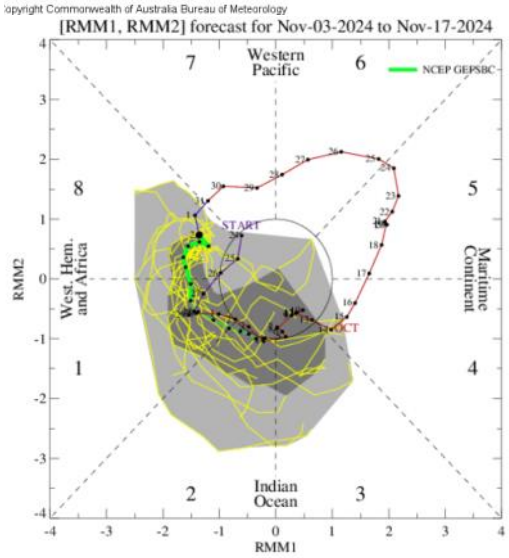
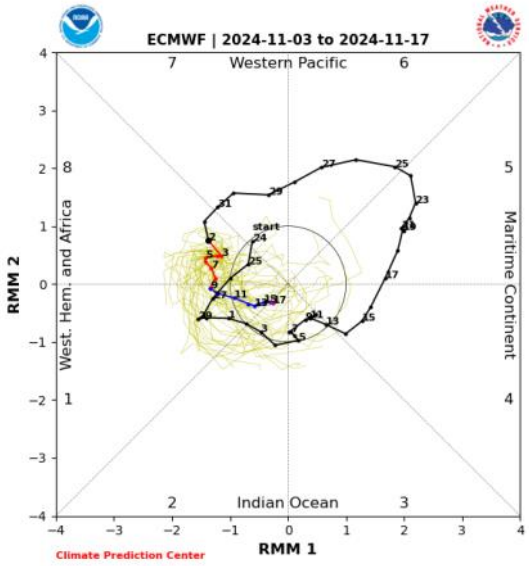
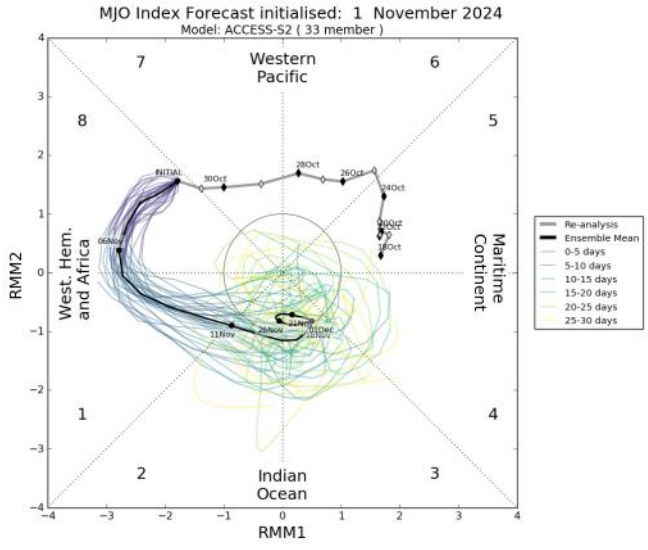




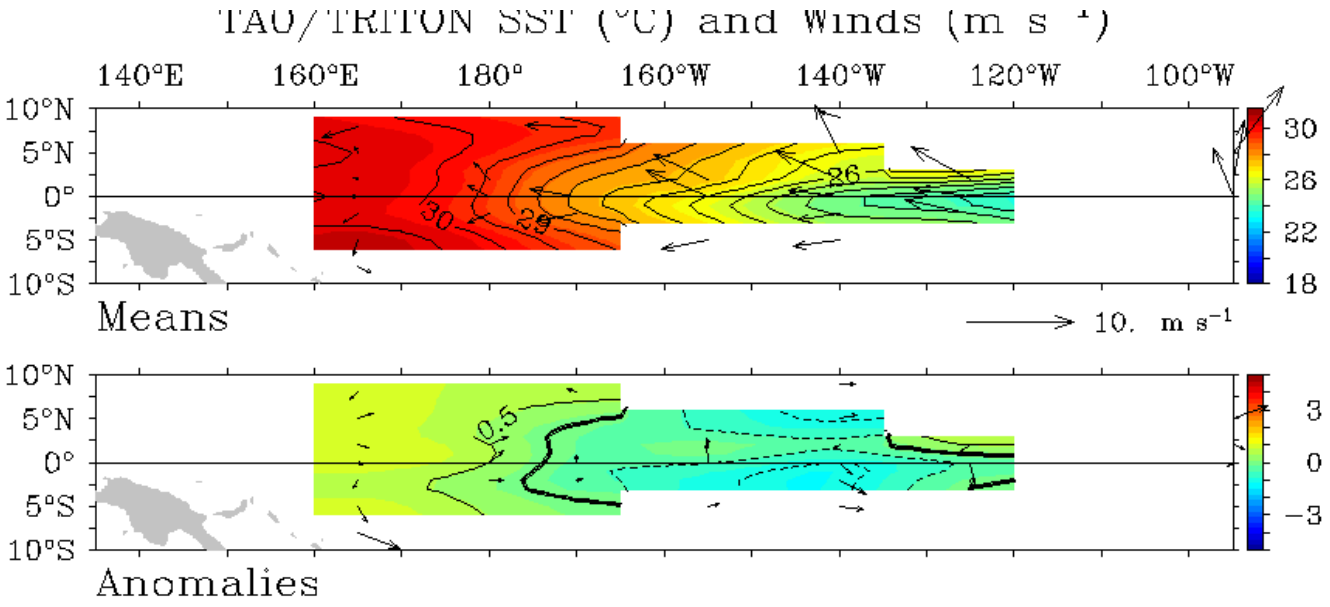


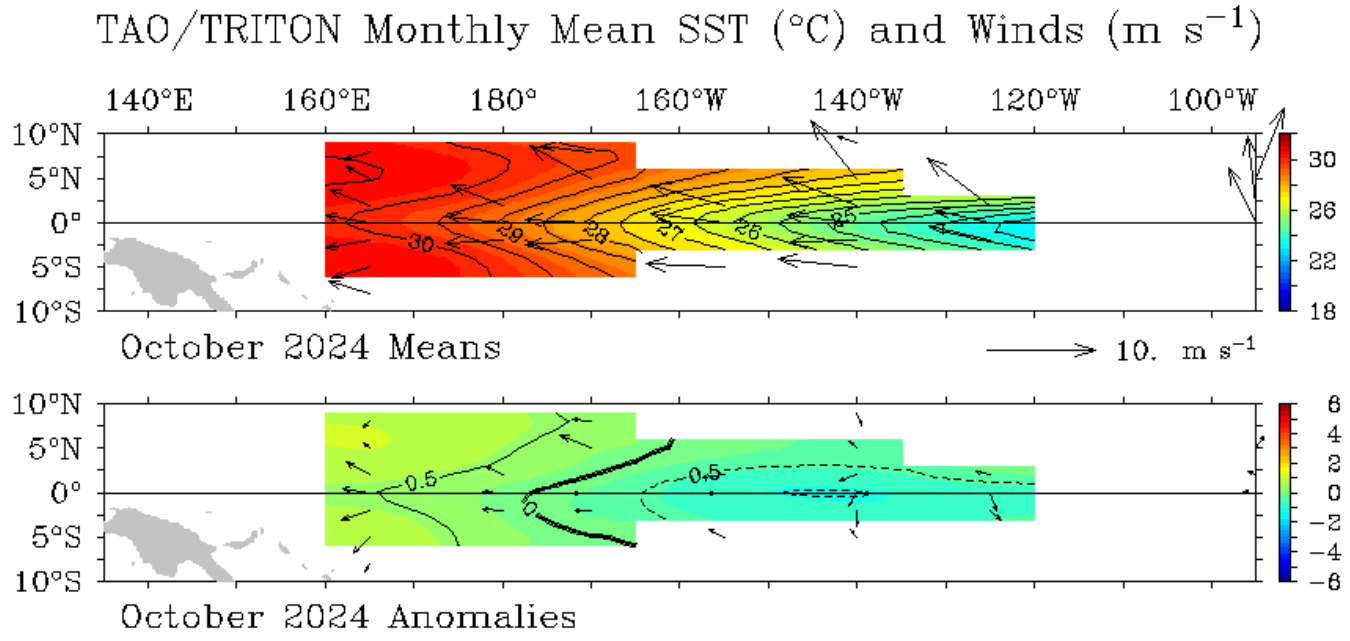
WIND

Click link to access [Wind plots link]

During October, the trade winds were generally stronger than average over the equatorial Pacific. For the five days ending 2 November 2024, the trades were also weaker than normal in the equatorial Pacific.

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

Nov 3 2024

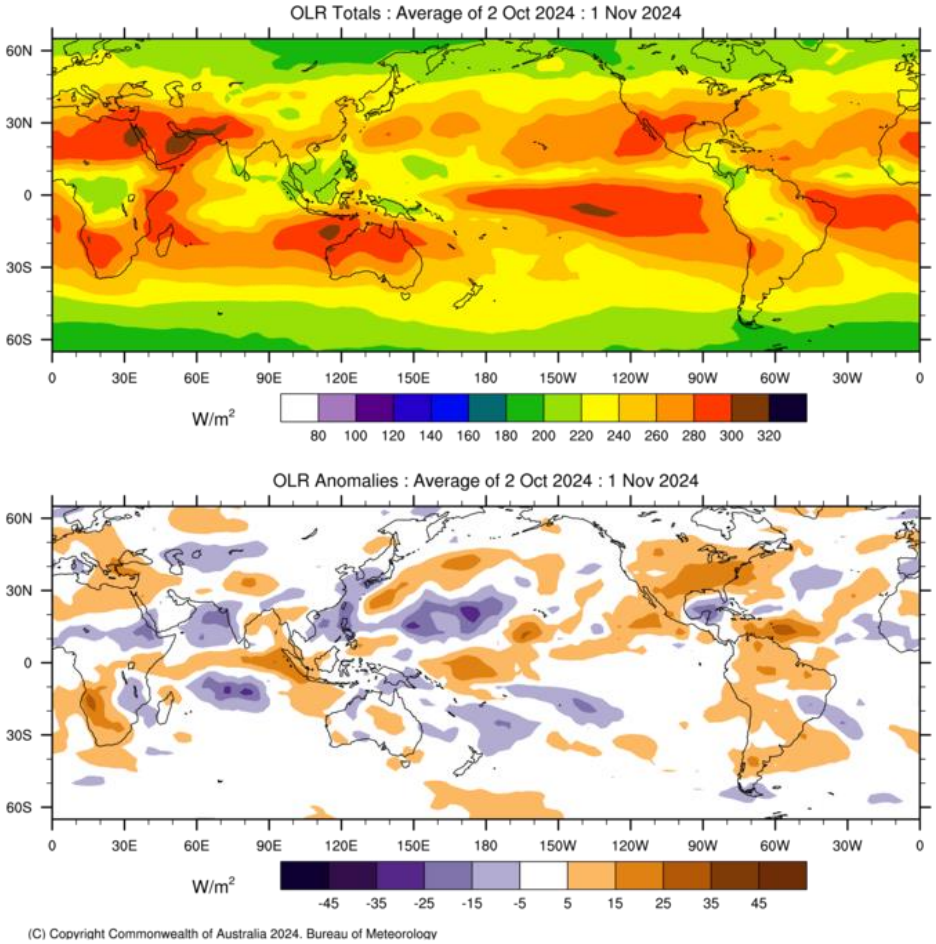
CLOUD AND RAINFALL

Click link to access OLR

The October 30-day OLR anomaly map shows a region of negative OLR (increased convection) over PNG, New Caledonia, southern Vanuatu, southern Fiji, southern Tonga, American Samoa to southern Cook Islands, and French Polynesia. There is another area of increased convection over CNMI, Guam and RMI in the northern hemisphere. Areas of anomalously high OLR (decreased convection) were evident over Palau, FSM, Nauru, Tuvalu, northern Fiji, Tokelau, and Kiribati.

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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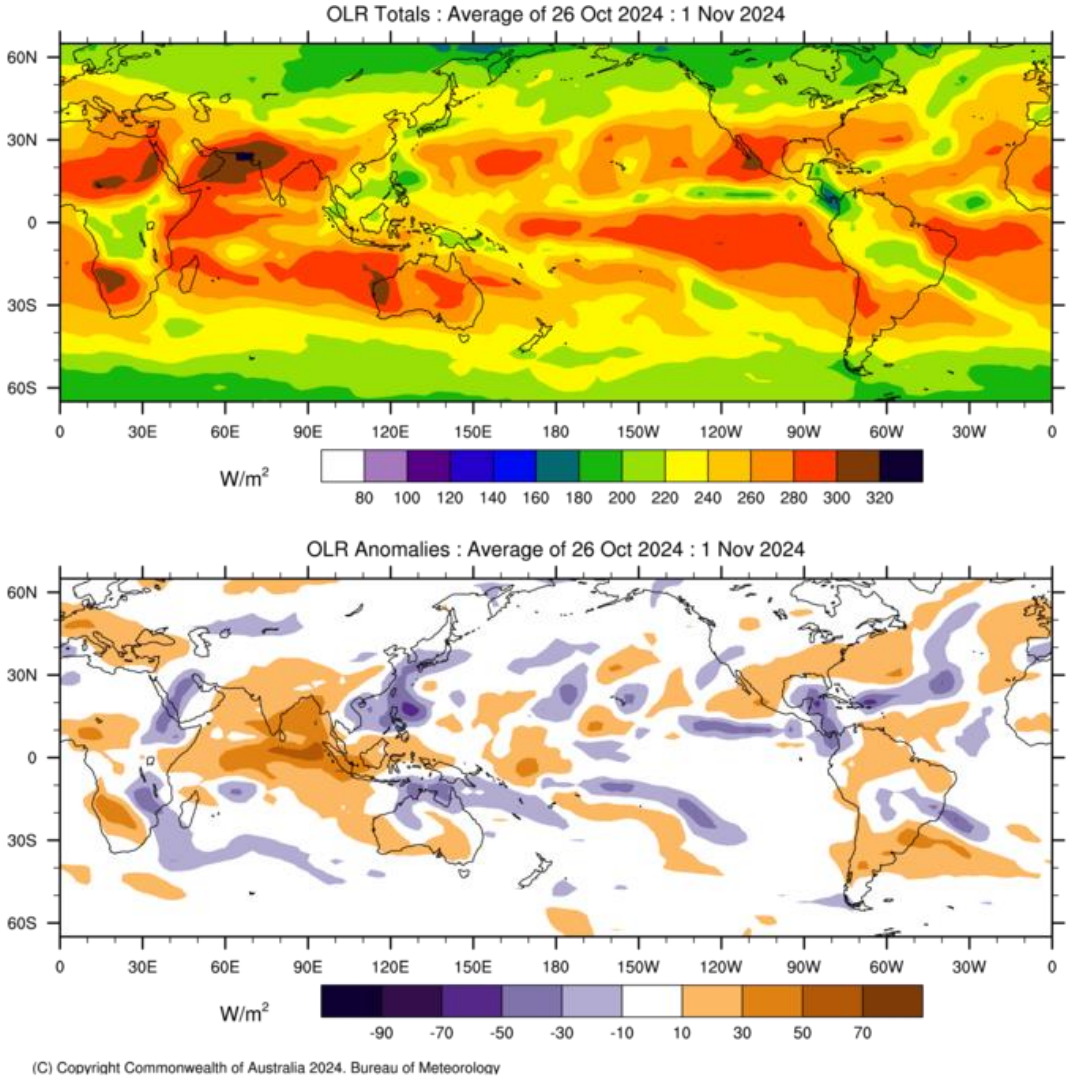
OLR Total and Anomalies, 7 Day OLR



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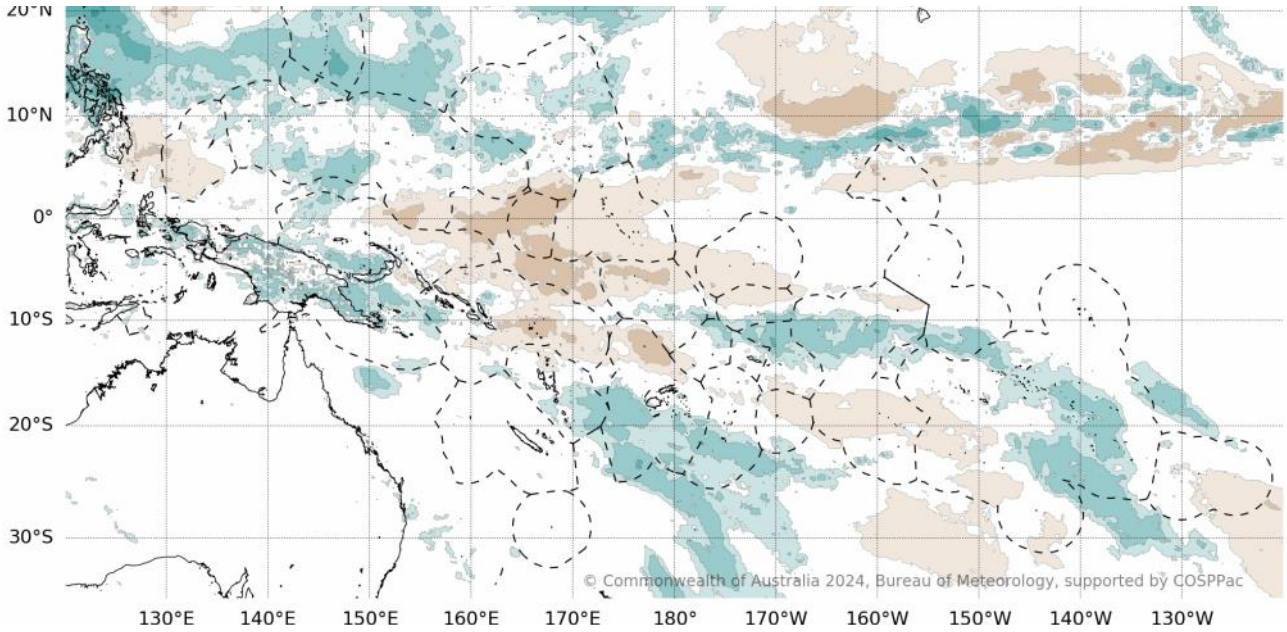
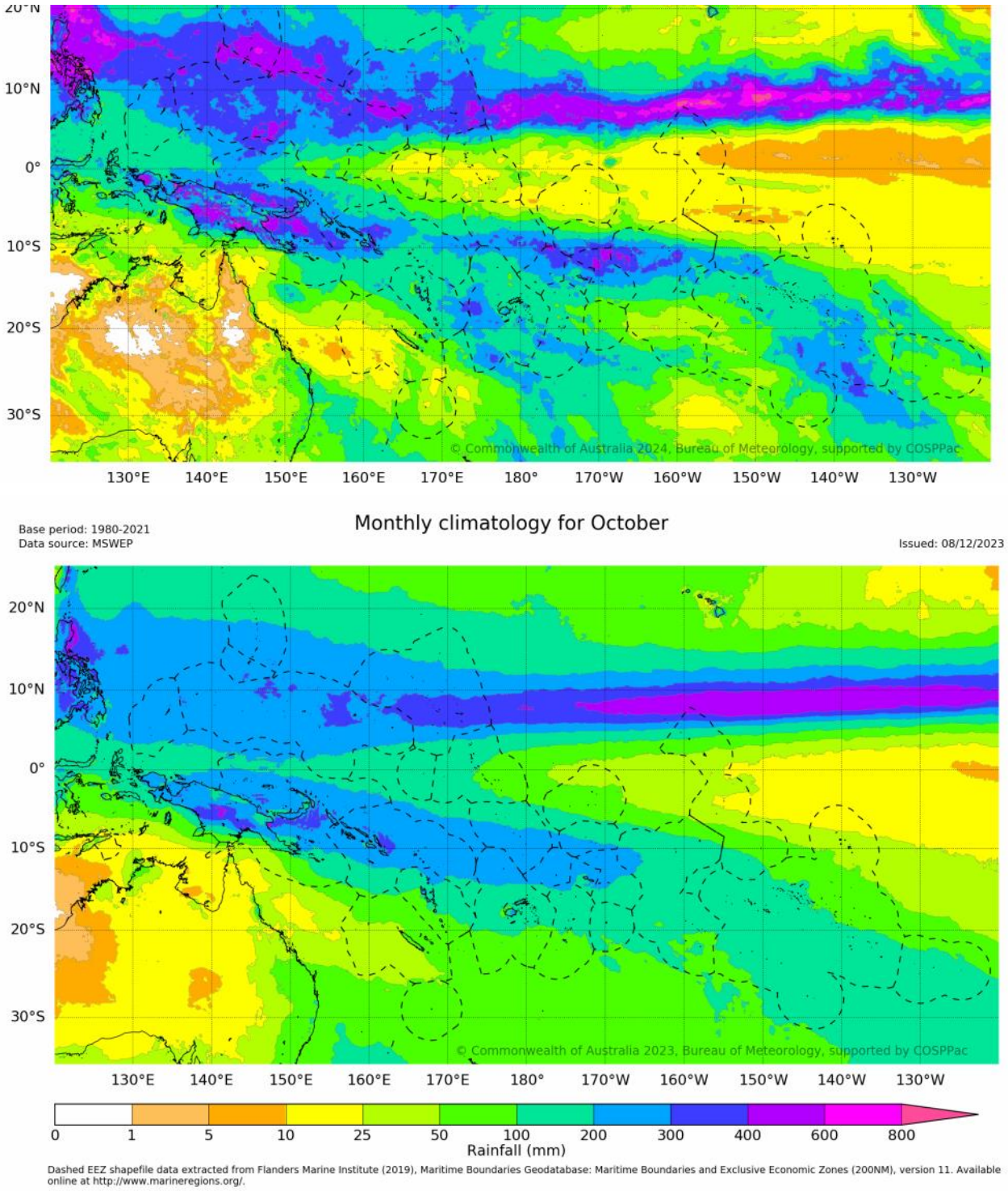


30-Day Rainfall Accumulated



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

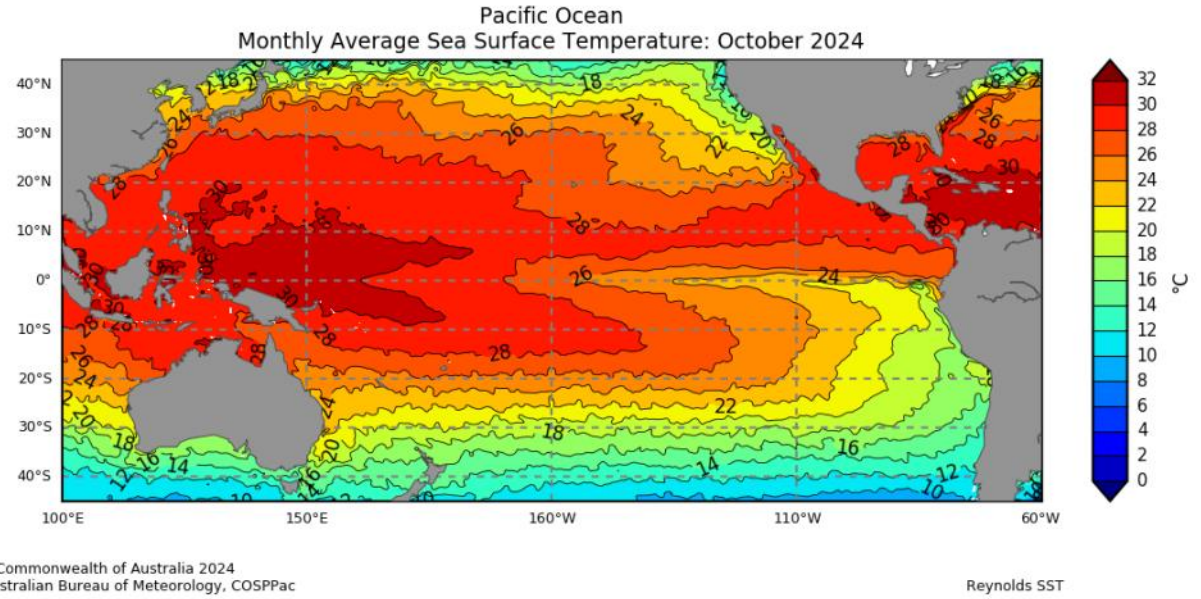
OCEAN CONDITIONS

SEA SURFACE TEMPERATURE

Click link to access Pacific Community COSPPac Ocean Portal

Sea surface temperatures (SSTs) for October 2024 were up to 1.5 °C warmer than average in the far western tropical equatorial Pacific Ocean. This warming SSTs were particularly over northern PNG Islands, most of FSM, and southern RMI, where SSTs were up to 1.5°C. Conversely SSTs were up to 1.0 °C cooler than average in the central equatorial Pacific over Kiribati (northern Line Islands), and also in parts of the tropical eastern south Pacific such as parts of southern Cook Islands and southern French Polynesia.

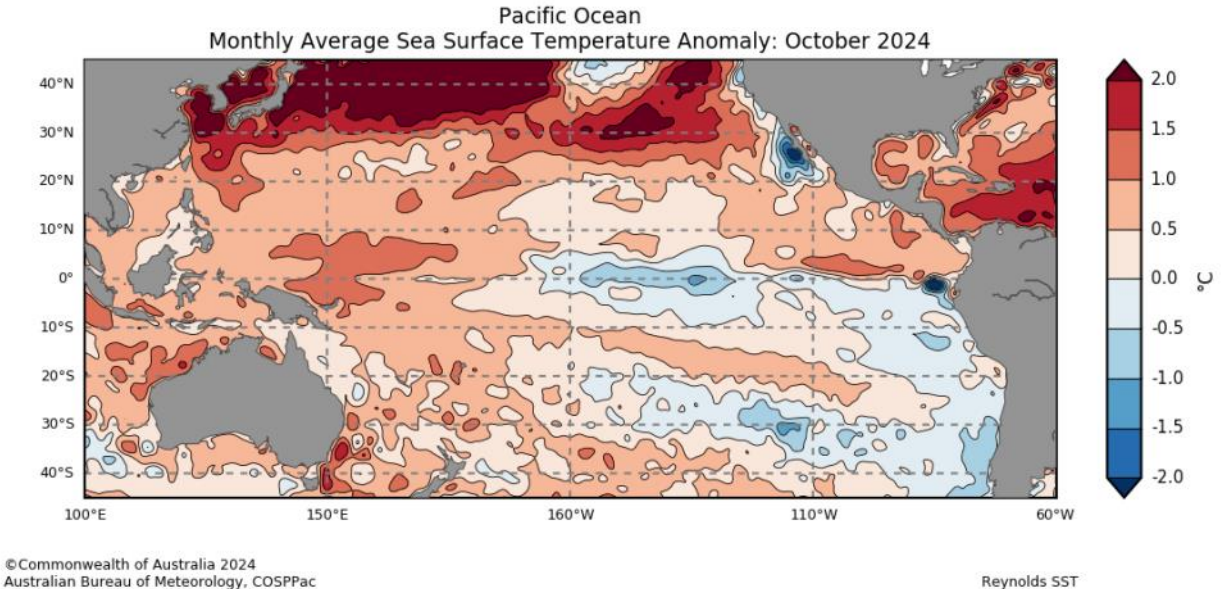
Highest-on-record October SSTs occurred in eastern FSM, northern and southern RMI, and northern PNG. The SSTs in decile 10 (very much above average) stretched east-northeastwards from Palau, FSM to the Marshall Islands. Another band stretched east-southeastwards from PNG, Solomon Islands, southern Tokelau, northern Cook Islands, and northern French Polynesia. Above average (8-9) deciles were observed for majority of the Pacific Island Countries, spanning east-south-eastwards from southern PNG, New Caledonia, Vanuatu, Fiji, Tuvalu, northern Wallis and Futuna, northern Samoa, most of American Samoa, Tokelau, northern Cook Islands and northern French Polynesia. Patches of above average (8-9) deciles were observed in Nauru, and Kiribati (northern and southern Gilbert Is., and southern Line Is.). Average SSTs (4-7) were observed in Nauru, Kiribati, northern and southern Tuvalu, northern Fiji, southern Wallis and Futuna, southern Samoa, southern American Samoa, Niue, southern Cook Island, and northern French Polynesia. Decile 2-3 (below average) patches were observed in Kiribati (northern Line Is.), southern Cook Islands, French Polynesia, and Pitcairn Islands.

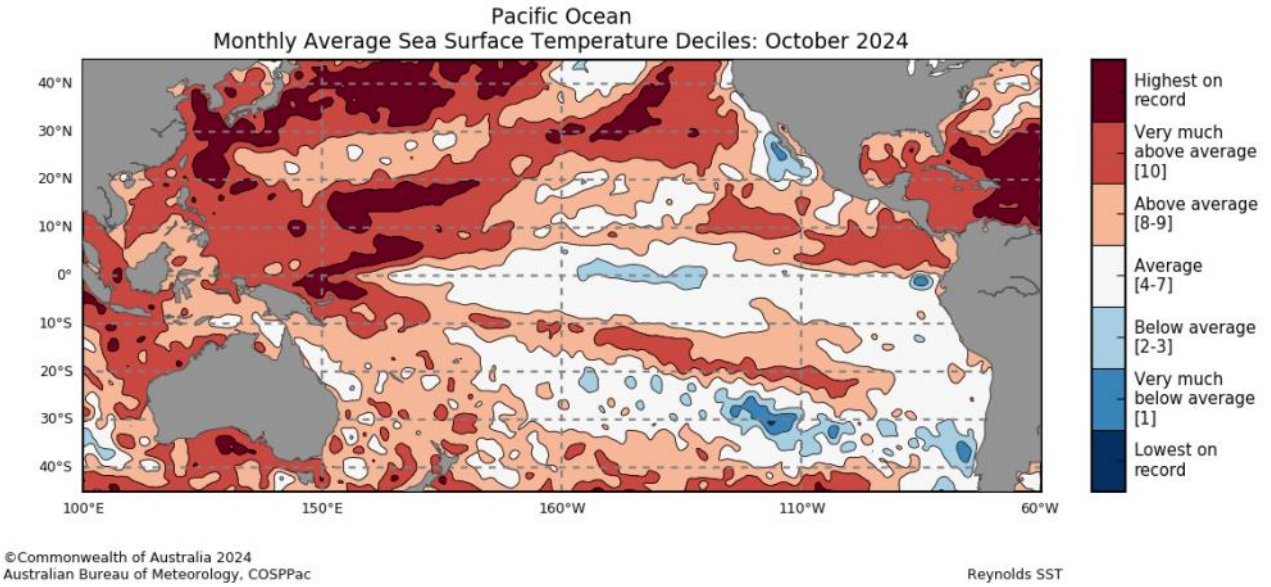


OCEAN CONDITIONS

Click link to access SEA SURFACE TEMPERATURE

Anomalous Sea Surface Temperature



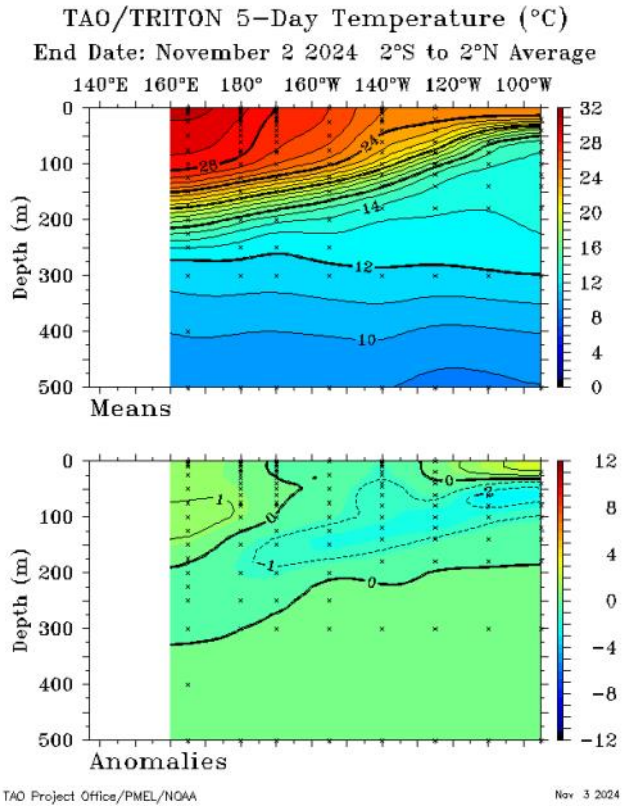


OCEAN CONDITIONS

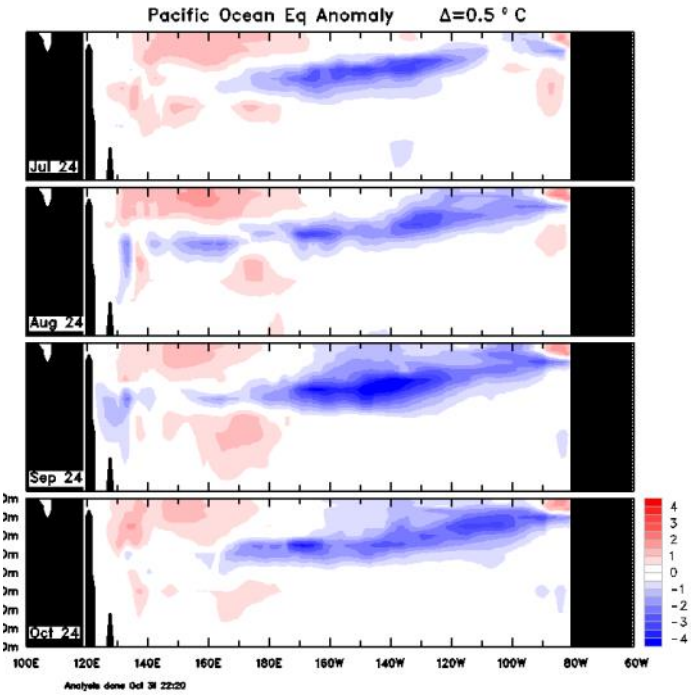
SUB SURFACE

The October equatorial Pacific sub-surface temperature anomalies for the 30 days ending 20 October 2024 shows cooler than average waters in the eastern half of the equatorial Pacific down to about 175 m depth; cooler waters peak around 75 to 125 m depth just east of the dateline where they are more than 4 °C than average. There were warmer than average waters in the western half of the equatorial Pacific down to about 200 m depth, increasing to 300 m depth in the far west. Waters are 2 to 3 °C warmer than average in a few small pockets between 75m and 150 m 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/

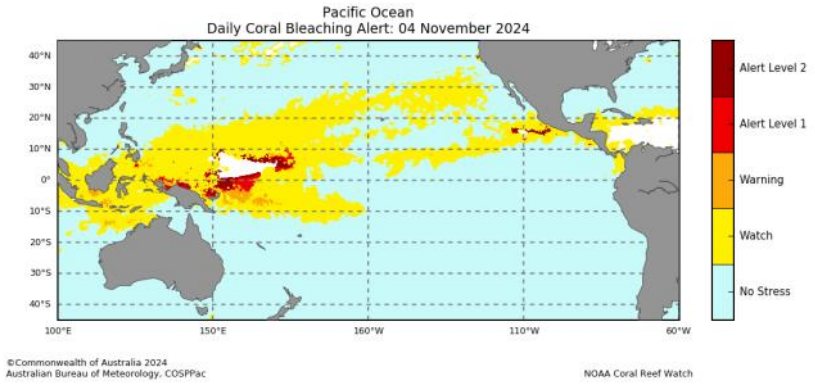
OCEAN CONDITIONS

CORAL BLEACHING

The daily Coral Bleaching Alert status for 4 November 2024 shows an area of 'Alert Level 2' over southeastern FSM, southern RMI, and northern most part of PNG, and Kiribati (Gilbert Islands). 'Alert Level 1' over parts of southern RMI, Nauru and patches over northern PNG, and Kiribati (northern Gilbert Islands). 'Warning' status over eastern PNG and western Solomon Islands. 'Watch' or 'No stress' for the rest of the countries. The four-week Coral Bleaching Outlook to 17 November shows 'Alert Level 2' over central and eastern FSM, southern RMI and northern PNG. 'Alert Level 1' rating over northern and southern FSM, central RMI, and northern PNG's EEZ. 'Warning' covers eastern PNG, northern Solomon Islands, and patches over central RMI, and Kiribati (northern Gilbert Islands). 'Watch' or ' No Stress' over the rest of the countries.

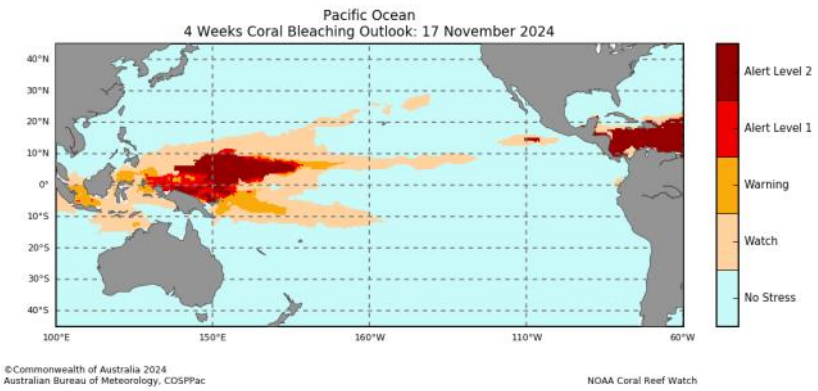
Daily Coral Bleaching Alert

(Source: Pacific Community COSPPac Ocean Porta Coral Bleaching)



4 Weeks Coral Bleaching Outlook

(Source: Pacific Community COSPPac Ocean Portal)



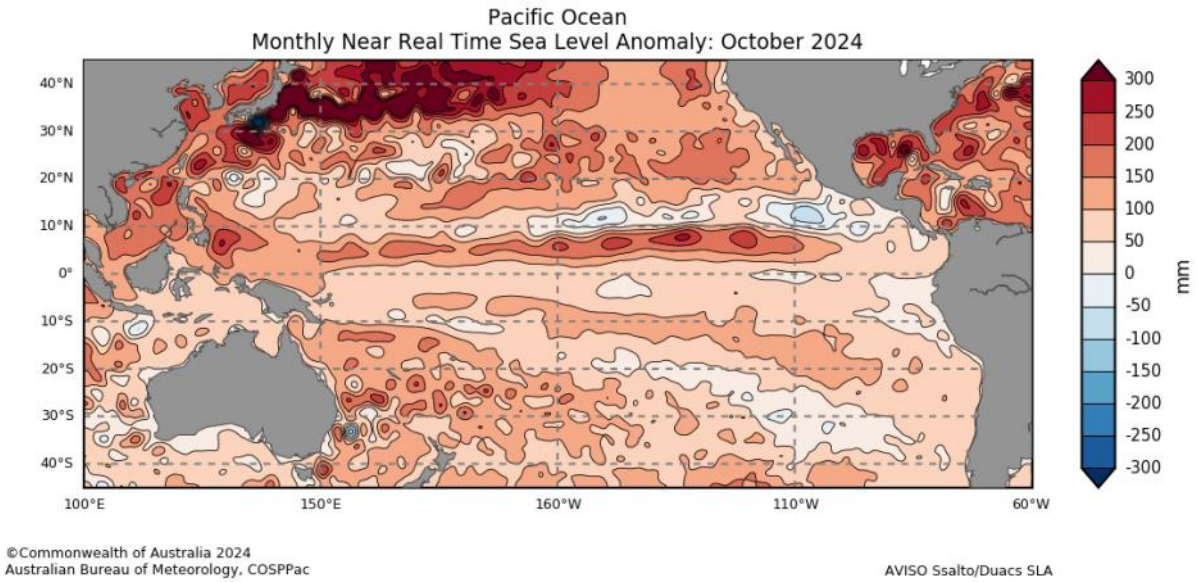
OCEAN CONDITIONS

OCEAN SURFACE CURRENTS AND SEA LEVEL

Sea levels observed in October were above normal over most COSPPac countries. Patches of anomalies from +200mm were observed over central Palau, southern New Caledonia, southern Fiji, and southern Tonga. Anomalies of +100mm to +200mm were observed over most of Palau, eastern FSM, northern and southern RMI, Kiribati (northern Gilbert and Line Islands), most of New Caledonia, southern Solomon Islands, northern Vanuatu, central and southern Fiji, central Tonga, and patches over southern Cook Islsnds, and southern French Polynesia. The rest of the region were observed with anomalies between +50 and +100mm.

Monthly Sea Level Anomalies

Source: Pacific Community COSPPac Ocean Portal

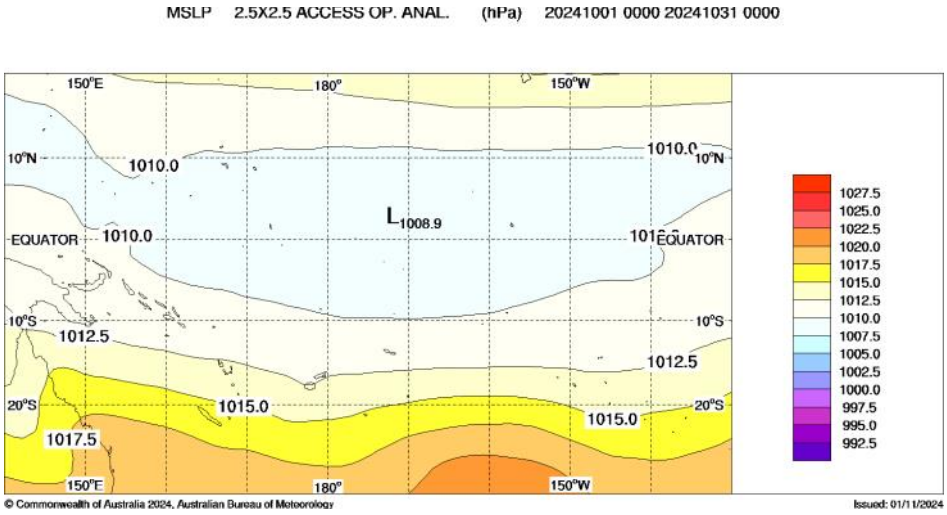


MEAN SEA LEVEL PRESSURE

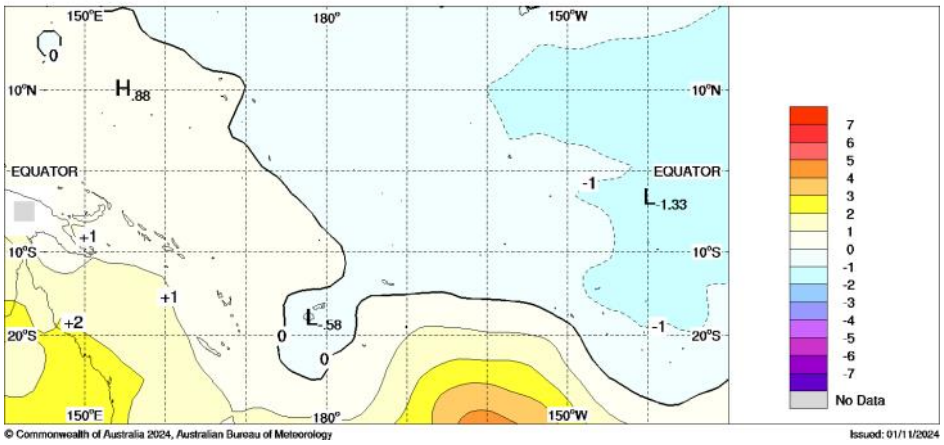
The October mean sea level pressure (MSLP) anomaly map displays positive anomalies of 1 hPa or greater over southern PNG, the Coral Sea region, southern Niue, southern Cook Islands towards New Zealand. The negative anomalies of 1 hPa or greater were present over northern French Polynesia and towards the south American coast.

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

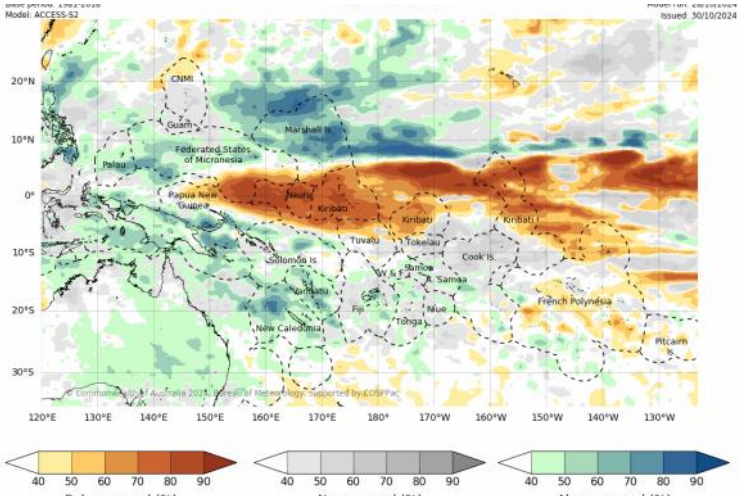
SEASONAL RAINFALL OUTLOOK

November 2024—January 2025

The ACCESS-S model forecast for November 2025, shows above normal rainfall is likely or very likely for most of Palau, western and central FSM, most of RMI, and in a band stretching southeast from the PNG to Vanuatu. Patches of above normal rainfall is likely or very likely for Fiji, northern Tonga, Wallis and Futuna, Samoa, Niue, American Samoa, southern Cook Islands, and southern French Polynesia. Below normal rainfall is likely or very likely for northern CNMI, northern PNG, southeast FSM, Nauru, Kiribati (Gilbert Is., most of Phoenix Is., and central and northern Line Is.), northern Tuvalu, northern and central French Polynesia, and patches in Pitcairn Islands.

The ACCESS-S three-month rainfall outlook (November to January 2025) is very similar to the November outlook, but with a stronger equatorial dry signal over northern PNG, southeast FSM, Nauru, and Kiribati extending to Tuvalu, Tokelau, northern American Samoa, northern Cook Islands, northern and southern French Polynesia, and Pitcairn Island. The above normal rainfall region has a more stronger signal extending northeastwards over Palau, most of FSM, central and northern RMI. Another band stretches from PNG, Solomon Islands, New Caledonia, Vanuatu, and southern Fiji. Patches of above normal rainfall is likely or very likely over Tonga, Niue, Wallis and Futuna, southern American Samoa, southern Cook Islands, and southern French Polynesia.

Monthly ACCESS-S Maps



The Copernicus multi-model outlook for November to January 2025 is very similar to the ACCESS-S outlook.

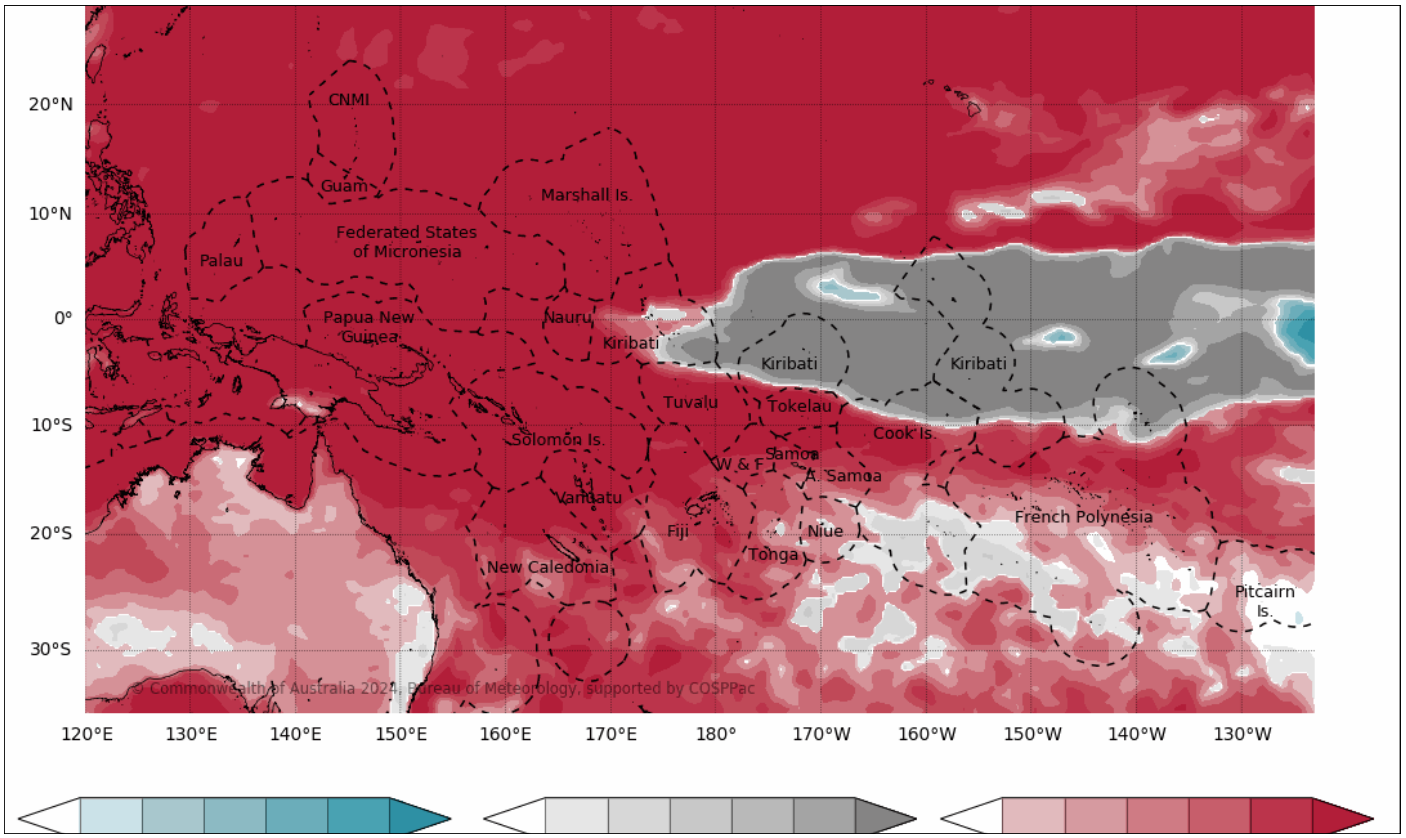
The APEC Climate Centre multi-model outlook (November to January 2025) is similar to the other two models.

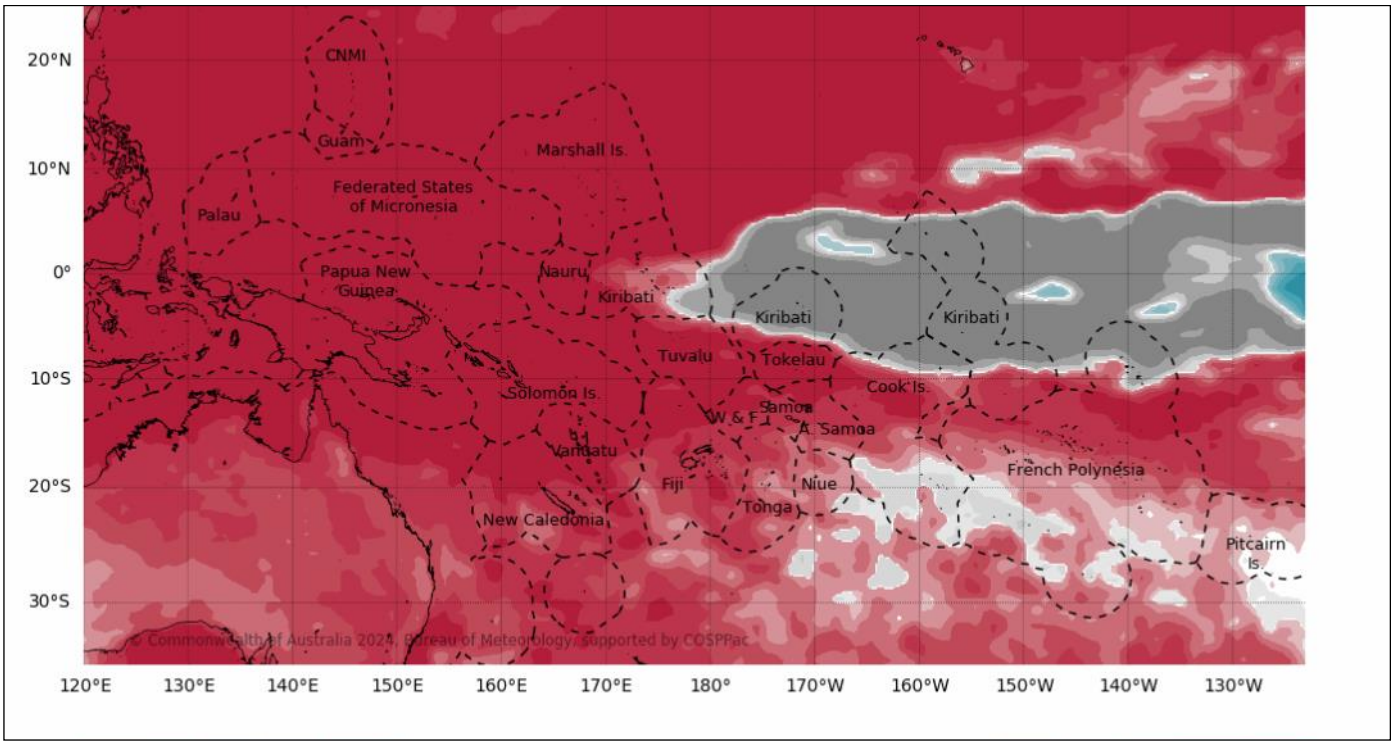
For November to January 2025 the models agree that above normal rainfall is likely or very likely for Palau, most of FSM, central and northern RMI. Another band stretches from PNG, Solomon Islands, New Caledonia, Vanuatu, and southern Fiji. Patches of above normal rainfall is likely or very likely over Tonga, Niue, Wallis and Futuna, southern American Samoa, southern Cook Islands, and southern French Polynesia. The models agree that below normal rainfall is likely or very likely for northern PNG, southeast FSM, Nauru, and Kiribati extending to Tuvalu, Tokelau, northern American Samoa, northern Cook Islands, northern and southern French Polynesia, and Pitcairn Island.

SEASONAL TEMPERATURE OUTLOOK

November 2024—January 2025

Monthly Tmax and Tmin ACCESS-S Maps

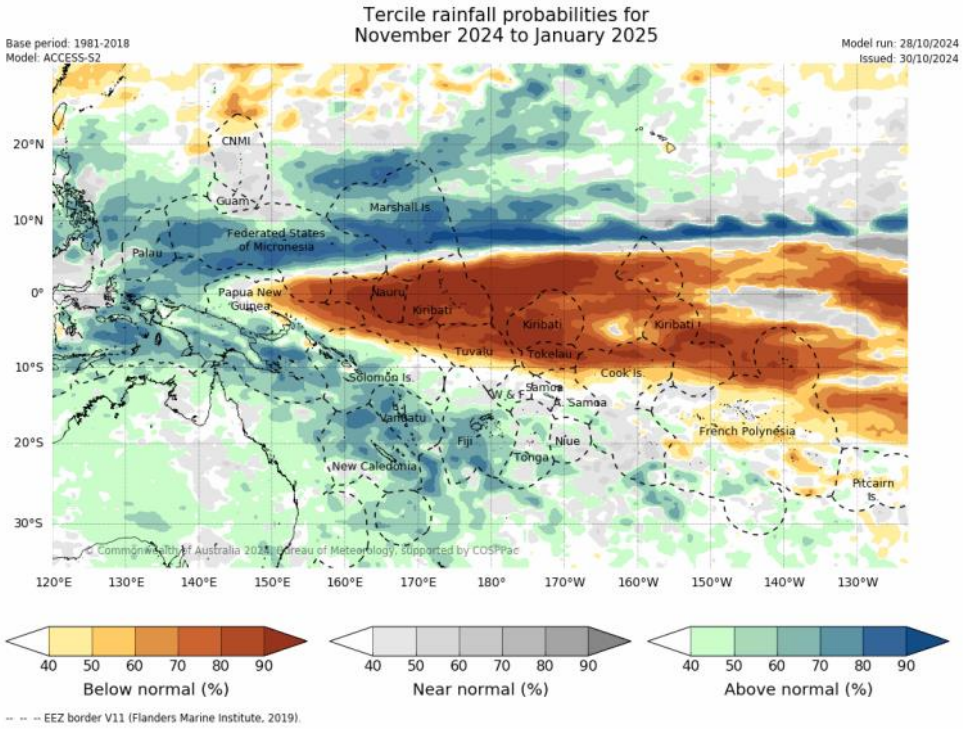


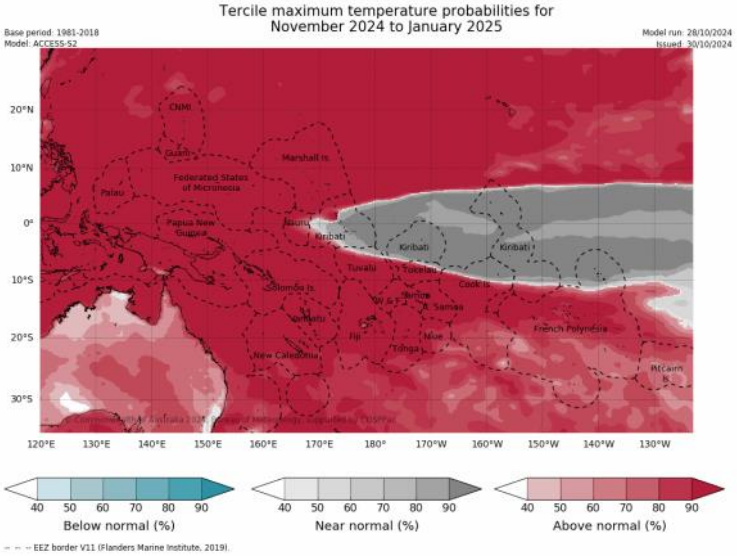


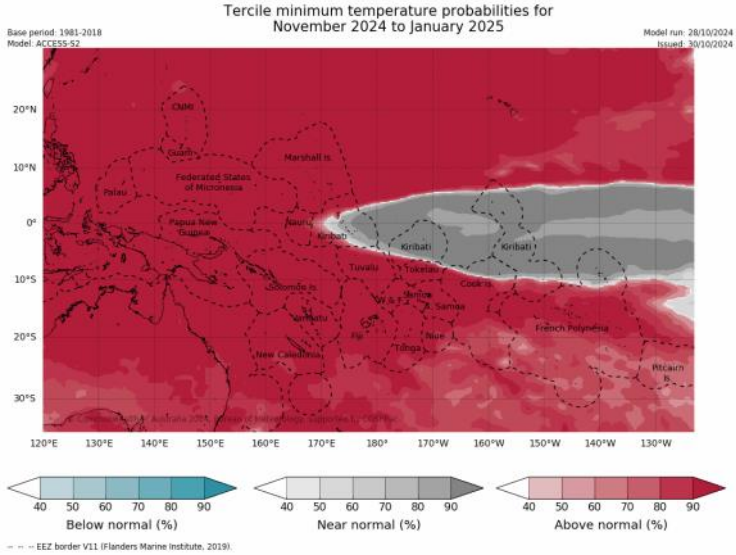
SEASONAL RAINFALL OUTLOOK

November 2024—January 2025

Seasonal ACCESS-S maps



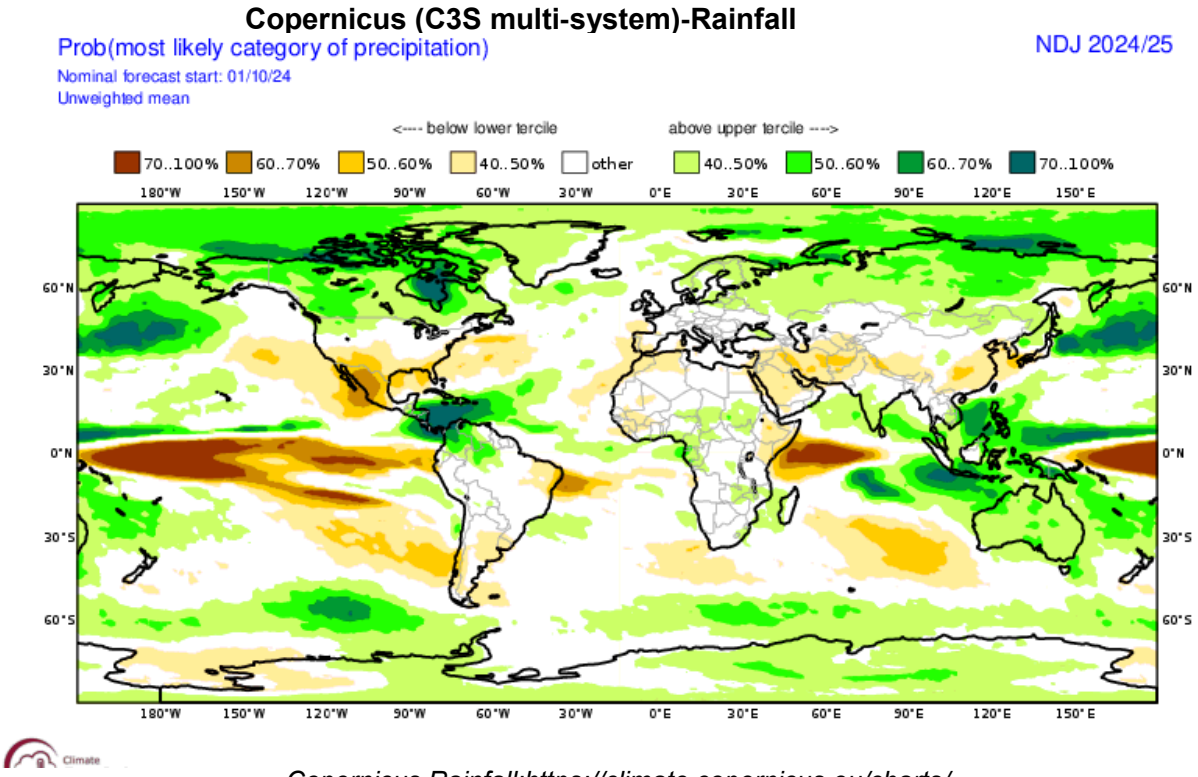




'About ACCESS-S http://access-s.clide.cloud/

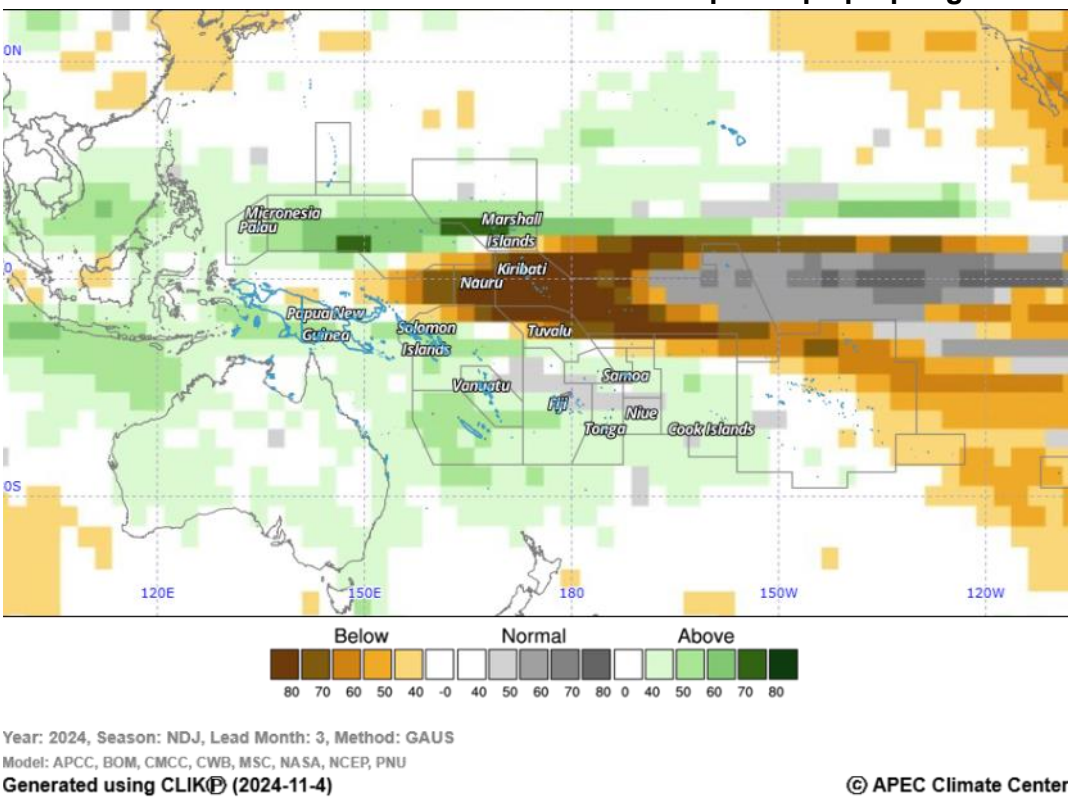
SEASONAL RAINFALL OUTLOOK

November 2024—January 2025



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

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



TROPICAL CYCLONE

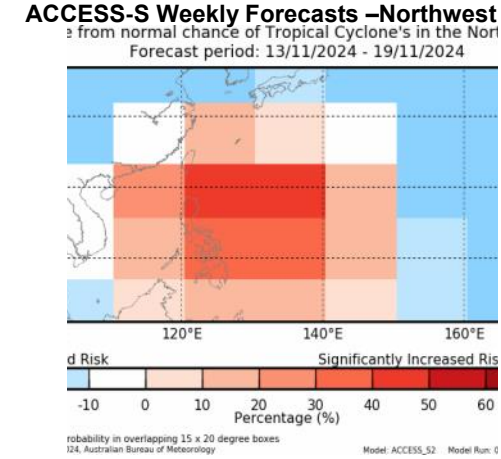
2024/2025 Season

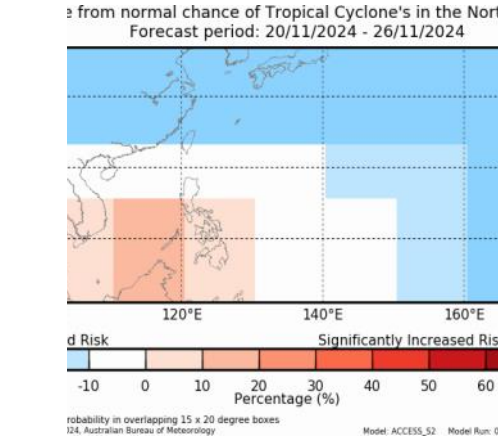
The northwest Pacific tropical cyclone season is year-round, with most cyclones occurring between May and December. In the WNP, the genesis and track of TCs show a relationship with the ENSO cycle: activity typically shifts eastward during El Niño and westward during La Niña. In the southwest Pacific, the 2024-25 tropical cyclone season started on 01st November 2024. The outlook for the season favoured normal or above normal TC activity is likely west of and including Vanuatu. East of Vanuatu, normal to below normal TC activity is likely.

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).

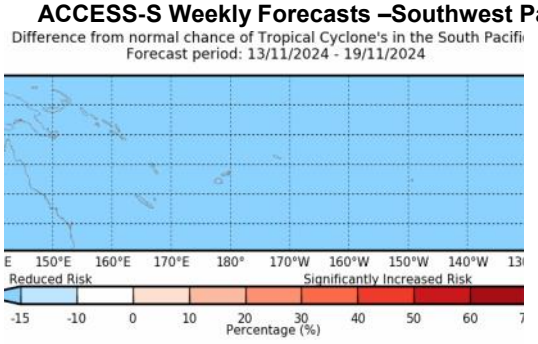
The weekly tropical cyclone forecasts from the ACCESS-S model shows significantly increased risk over the Philippines, Palau, and south China Sea region for the week from 13 to 19 November. There is also a slight to moderate increase risk over eastern Asia from 20 to 26 November.

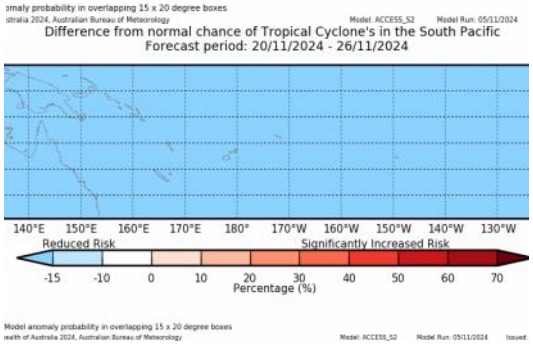
ACCESS-S Weekly Forecasts –Northwest Pacific





ACCESS-S Weekly Forecasts –Southwest Pacific





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.

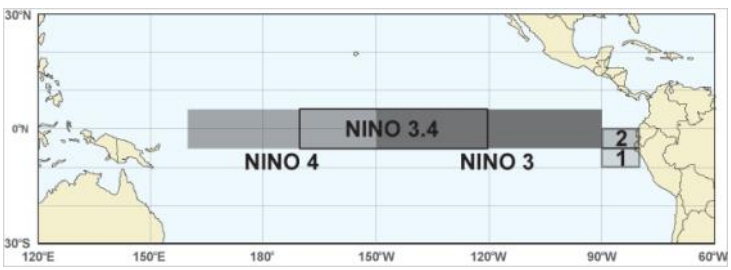
20 degrees Celsius Isotherm Depth

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