Monthly Climate Bulletin

August 2024

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Photo Credit: Molly Powers (SPC) Samoa Tide Gauge

Sustainable, transformative, and resilient for a Blue Pacific SPREP PROE

Australian Government
Department of Foreign Affairs and Trade
Bureau of Meteorology

Australian Aid

Climate and Oceans Support Program in the Pacific

Pacific Community
Communauté du Pacifique

CONTENTS

Issued 14 September 2024

- The El Niño Southern Oscillation (ENSO) is currently neutral.
- Currently in the Maritime Continent region, the Madden-Julian Oscillation (MJO) is forecast to strengthen slightly as the MJO propagates eastward in the coming week.
- In August, the Intertropical Convergence Zone (ITCZ) was northwards east of the Date Line, and a well-defined South Pacific Convergence Zone (SPCZ) extended east-southeast from PNG to the northern Cook Islands in the southern hemisphere.
- Sea surface temperatures (SSTs) for August 2024 were above average across much of the western tropical Pacific Ocean.
- The Coral bleaching Outlook to 29 September shows 'Alert Level 2' over eastern FSM, and southern RMI.
- For September to November 2024 the models agree that above normal rainfall is likely or very likely for Palau, western to central FSM, central RMI, most of the PNG mainland, the north of both Samoa and American Samoa, and the north-central Cook Islands. In addition, the models agree that below normal rainfall is likely or very likely for southeastern FSM, far southern RMI, Nauru, Kiribati, northern Tuvalu, northern Tokelau, northern French Polynesia, and Pitcairn Islands.
- The ACCESS-S weekly tropical cyclone outlook shows significantly increased risk over Philippines, Japan, and eastern Asia for the week from 15 to 21 September. There is also slight to moderate risk over the same region from 22 to 28 September.

EL NIÑO–SOUTHERN OSCILLATION

ENSO and IOD likely to remain neutral in the southern spring

Click link to access Climate Driver Update issued on 03 September 2024

The El Niño-Southern Oscillation (ENSO) is currently neutral.

Sea surface temperatures (SSTs) in the central equatorial Pacific Ocean are ENSO-neutral, having gradually cooled from El Niño levels since December 2023. This cooling is being sustained by deep waters surfacing in the central and eastern Pacific. Atmospheric patterns, including cloud and trade winds, remain largely ENSO-neutral.

Three of 7 climate models suggest the possibility of SSTs in the tropical Pacific exceeding the La Niña threshold (below -0.8 °C) from October, while the remaining 4 models, including the Bureau's, suggest SSTs are likely to remain at ENSO-neutral values (between -0.8 °C to +0.8 °C) throughout the forecast period. This means it is possible a La Niña may develop in coming months.

Global sea surface temperatures (SSTs) have been the warmest on record for each month between April 2023 and June 2024. July 2024 global SSTs were the second warmest on record, not as warm as July 2023 but much warmer than any other year. August 2024 is currently tracking as the second-warmest August for SSTs on record. The current global pattern of warmth differs from historical patterns of SSTs associated with ENSO and IOD. This means future predictions of ENSO and IOD based on SSTs during past events may not be reliable. Phenomena such as ENSO and the IOD are only broad indicators of the expected climate. The long-range forecast provides better guidance on local rainfall and temperature patterns.

The Southern Annular Mode (SAM) is currently positive (as of 1 September), having been neutral for most of the second half of August. The SAM index is forecast to become neutral during the coming week. A neutral SAM has no strong influence on Australian and Pacific rainfall and temperature patterns.

The 30-, 60- and 90-day Southern Oscillation Index (SOI) for the period ending 1 September were +8.3, -0.3 and -0.6 respectively. These values reflect ENSO-neutral conditions.

EL NIÑO–SOUTHERN OSCILLATION

ENSO and IOD likely to remain neutral in the southern spring

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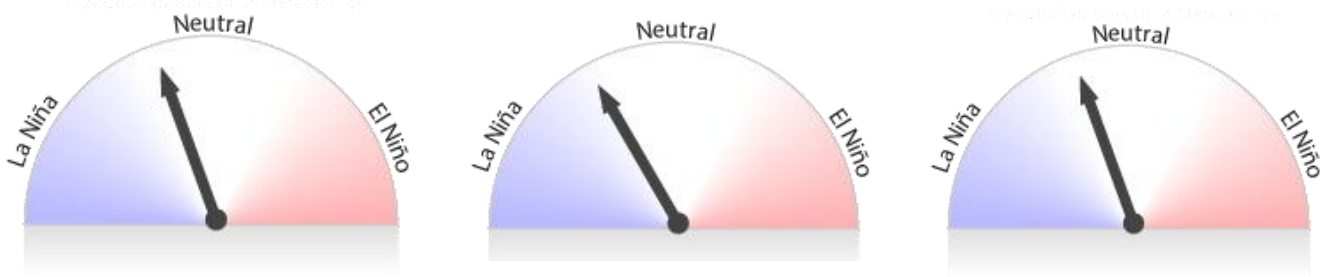
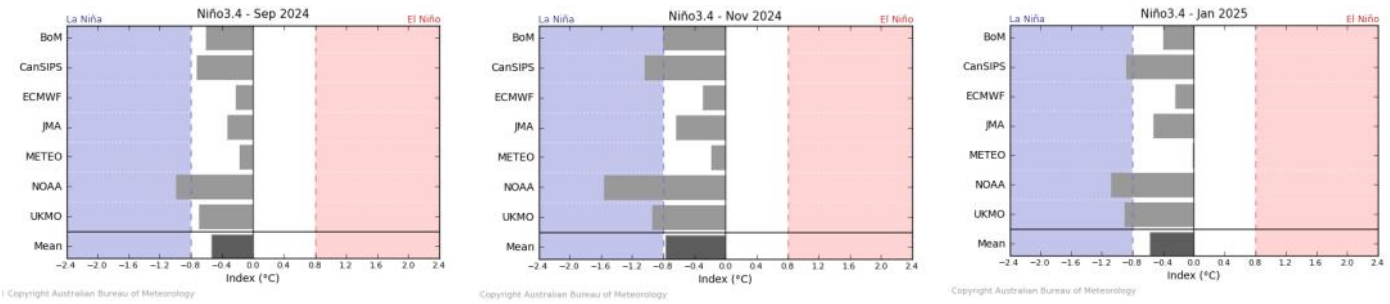
Bureau of Meteorology NINO3.4 ENSO Model Outlooks for September, November and January



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

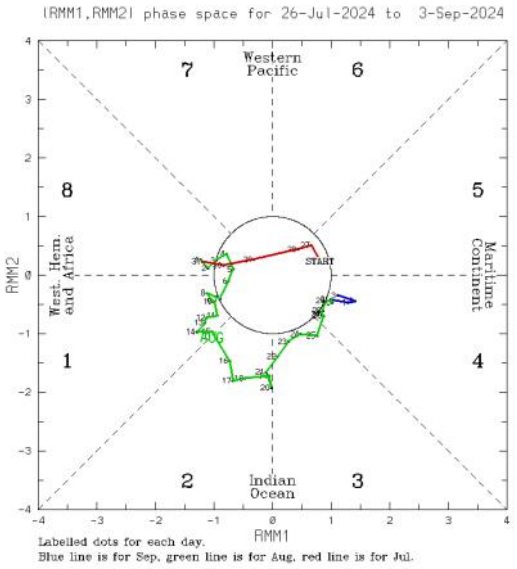
MADDEN–JULIAN OSCILLATION

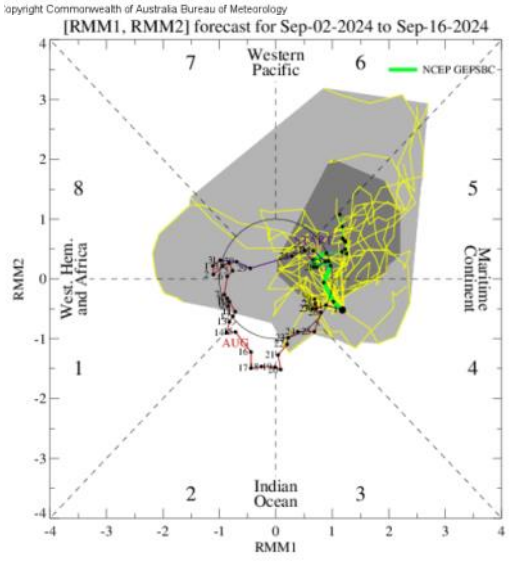
Click link to access *Tropical Climate Update* [Issued on Tuesday 03 September 2024]

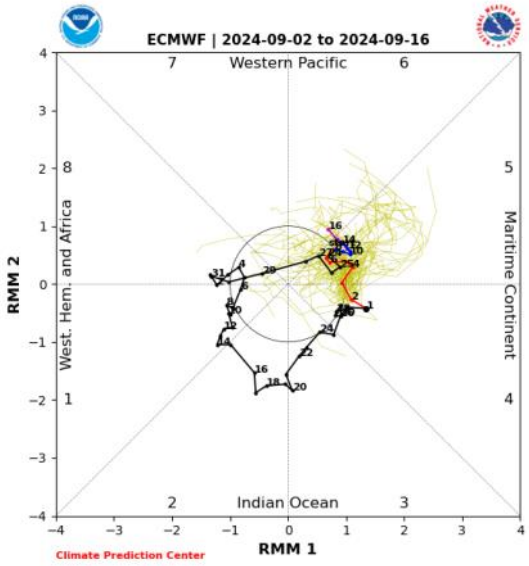
The Madden-Julian Oscillation (MJO) has been active over the Africa and Indian Ocean in August, while relatively week over the western Pacific.

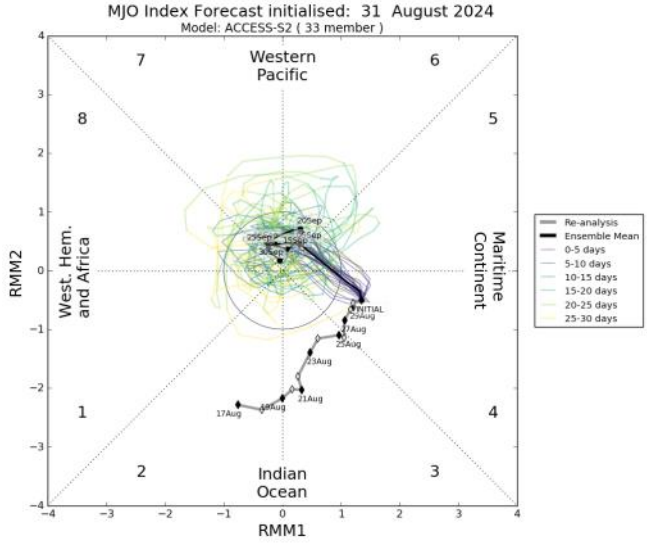
A pulse of the Madden-Julian Oscillation (MJO) is currently in the Maritime Continent region to Australia's north (as of 1 September). Most models suggest the pulse will either maintain its strength or strengthen slightly as the MJO progresses over the Maritime Continent in the coming week. When the MJO is in the Maritime Continent at this time of year, it may contribute towards strengthening trade winds, which can assist with La Niña development.

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







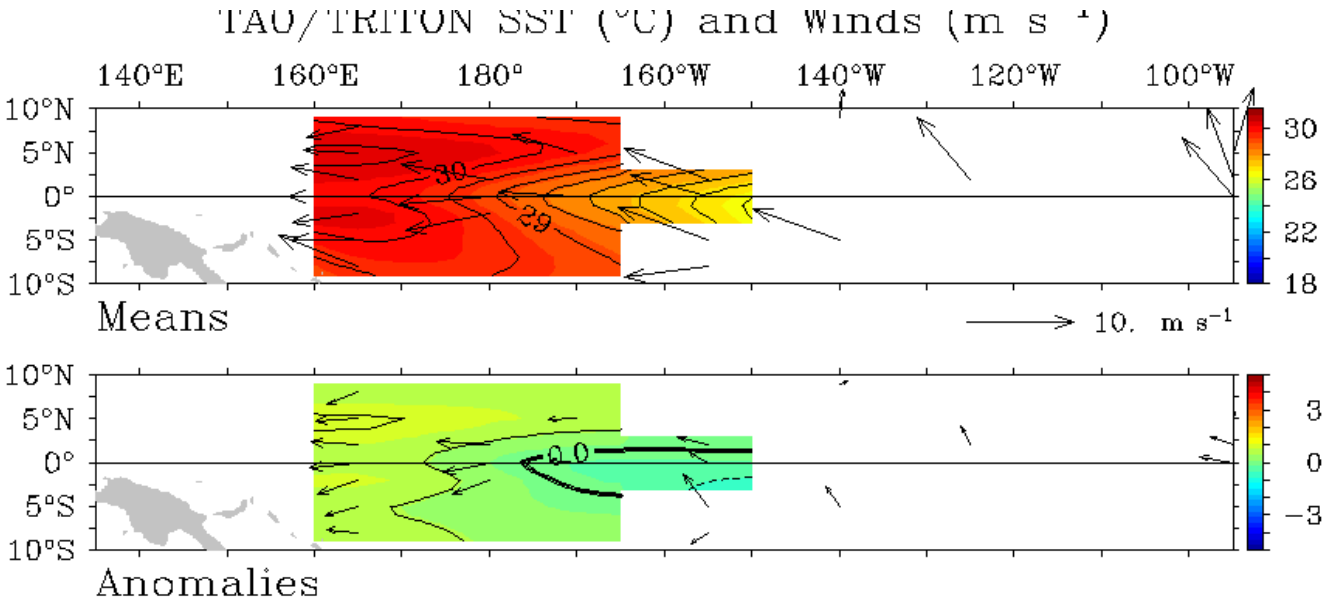


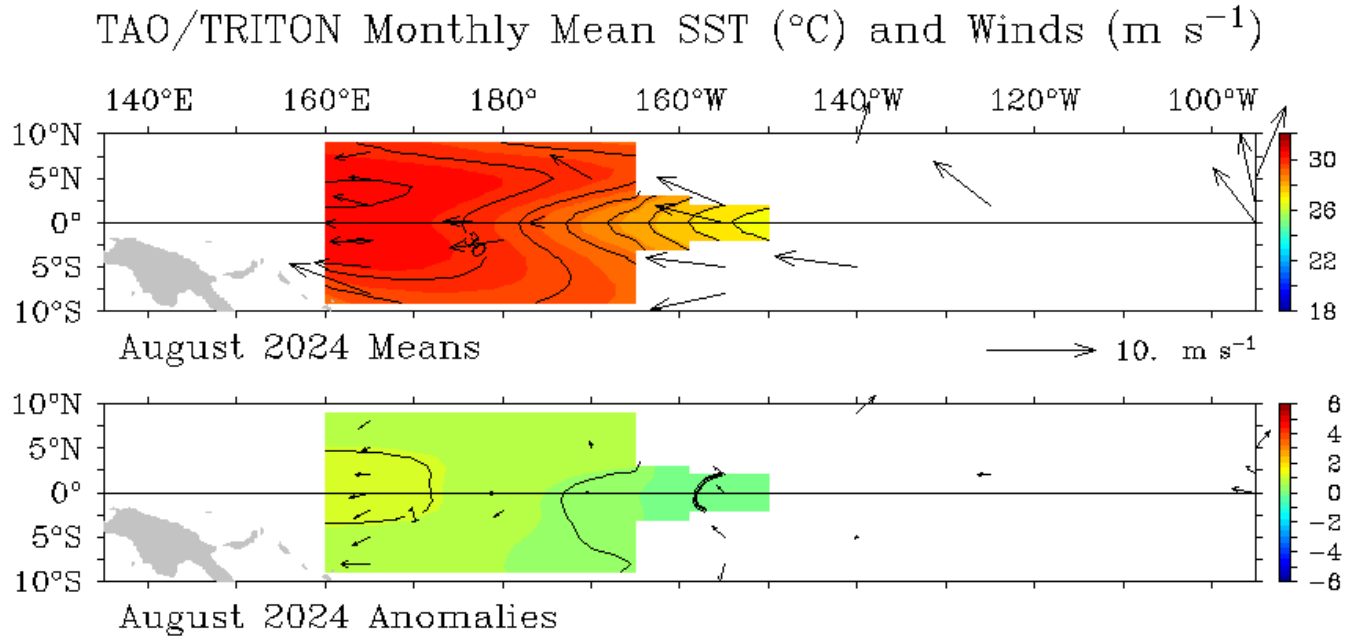
WIND

Click link to access [Wind plots link]

During August, the trade winds were generally stronger than normal over the equatorial Pacific west of the Date Line. For the five days ending 1 September 2024, the trades were also stronger than normal.

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

Sep 2 2024

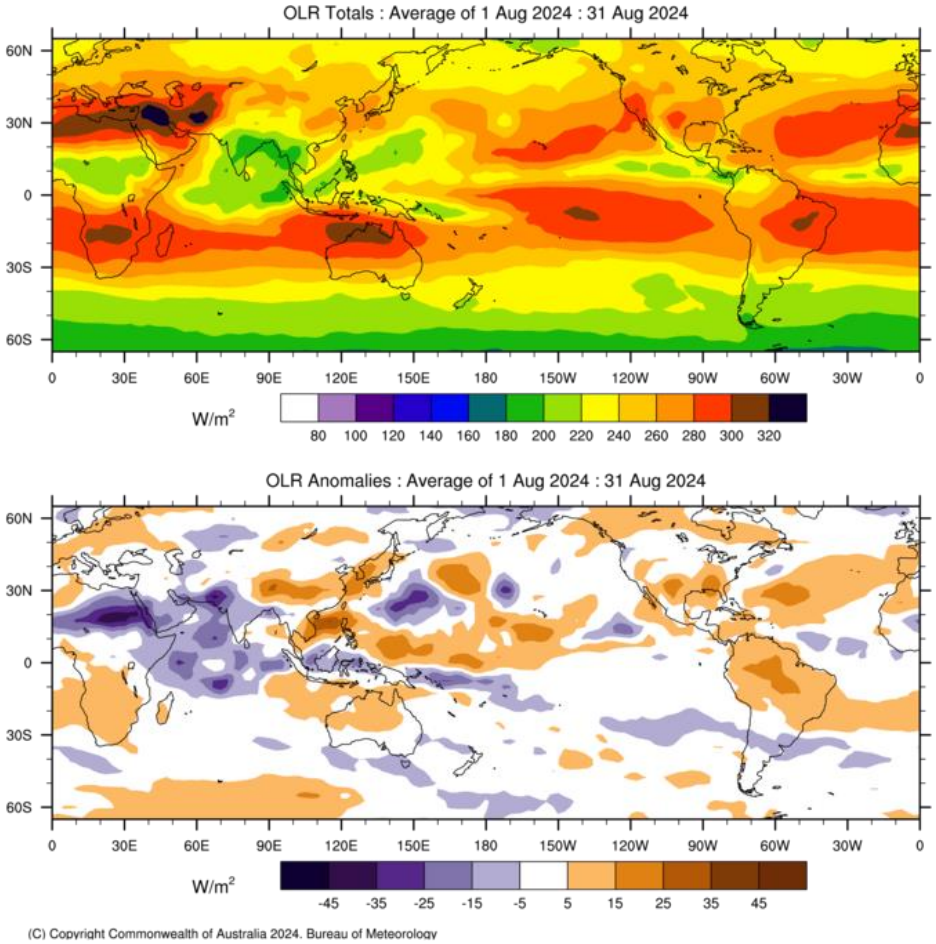
CLOUD AND RAINFALL

Click link to access OLR

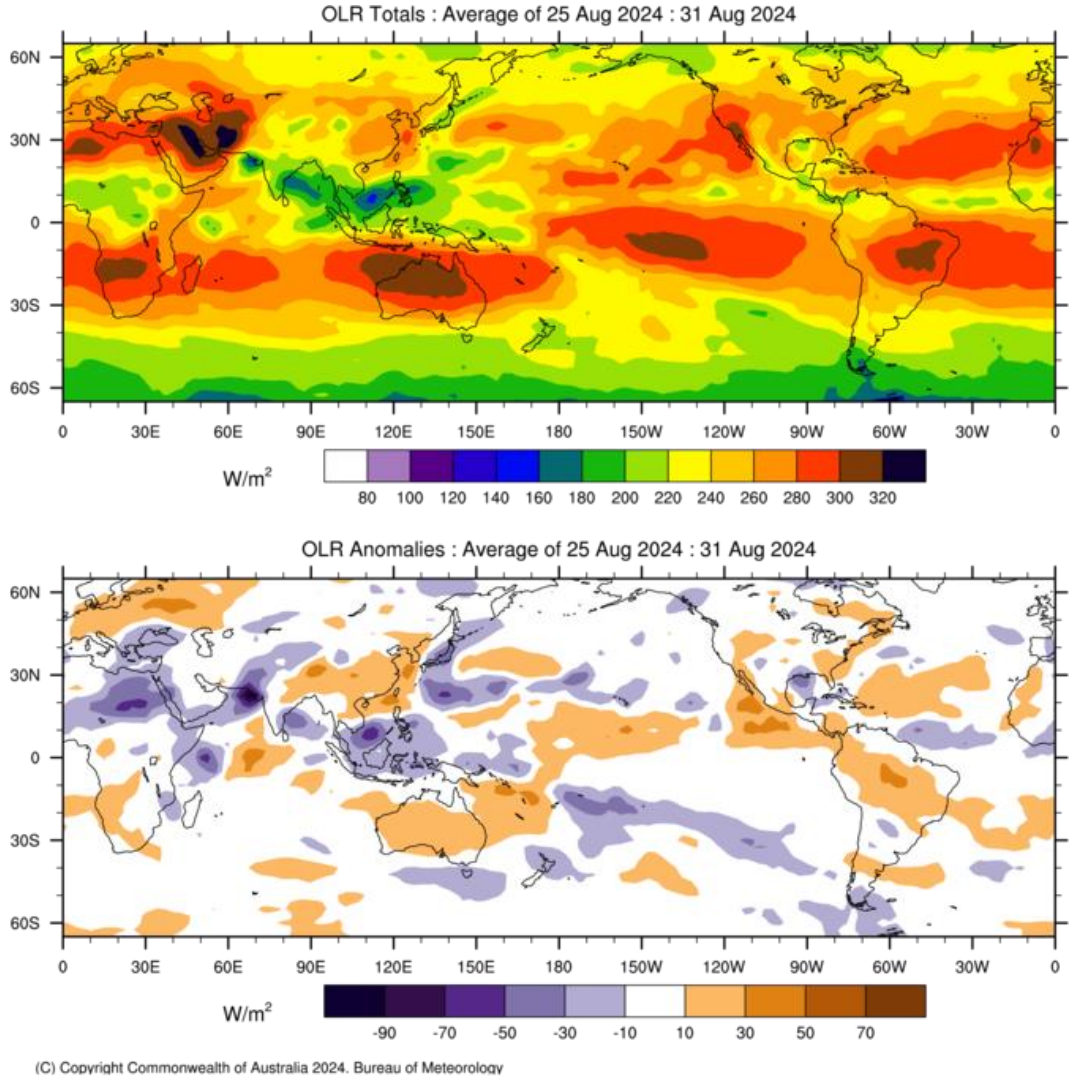
The August 30-day OLR anomaly map shows a region of negative OLR (increased convection) over northern PNG stretching eastwards to Tuvalu, Wallis and Futuna, Tokelau, American Samoa and central Cook Islands. There is another area of increased convection over the CNMI and Guam area in the northern hemisphere. Areas of anomalously high OLR (decreased convection) were evident over Palau, FSM, southern RMI, Nauru, and Kiribati in the northern hemisphere.

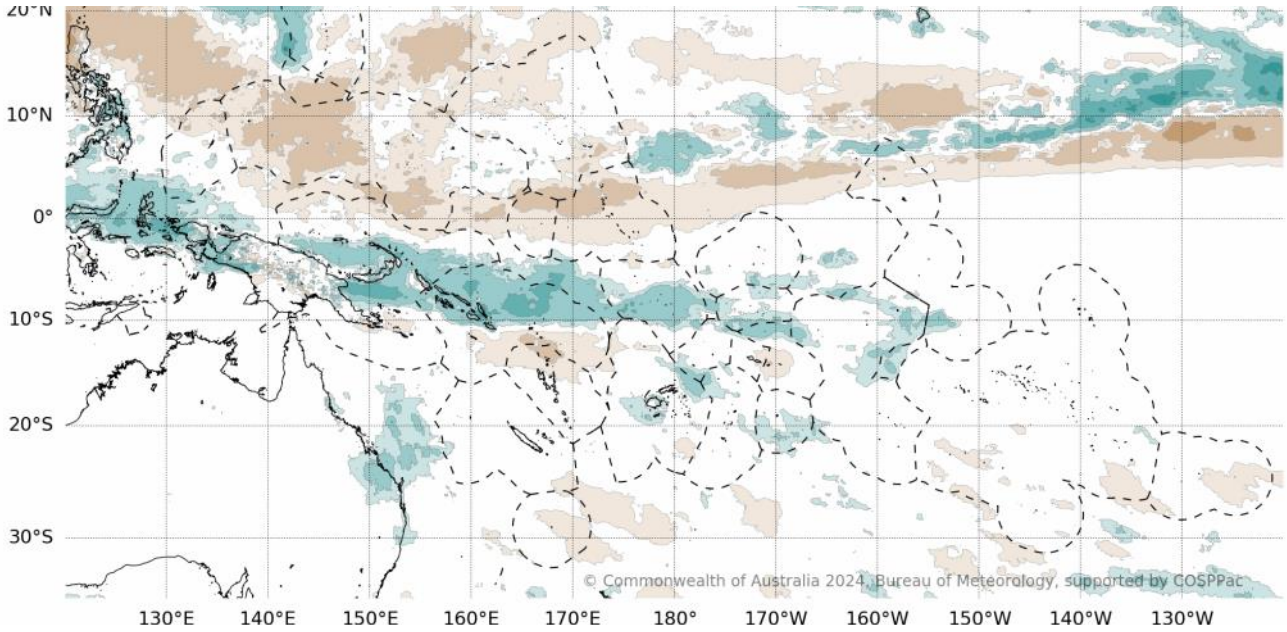
Note: Global maps of OLR below highlight regions experiencing increased or decreased cloudiness. The top panel is the total OLR in Watts per square metre (W/m^2) and the bottom panel is the anomaly (current minus the 1979-1998 climate average), in W/m^2. In the bottom panel, negative values (blue shading)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

OLR Total and Anomalies, 30 Day OLR

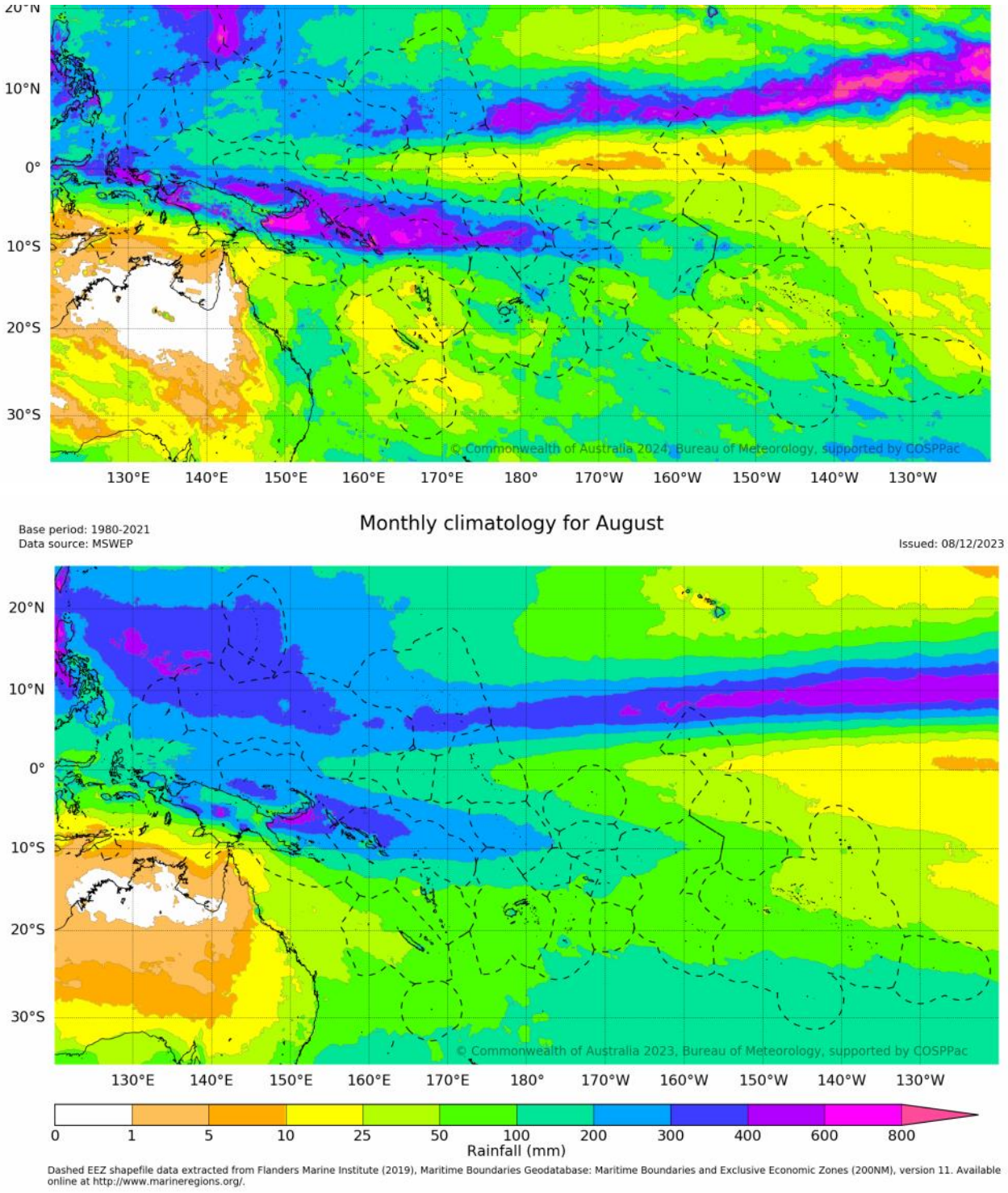


OLR Total and Anomalies, 7 Day OLR





30-Day Rainfall Accumulated



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

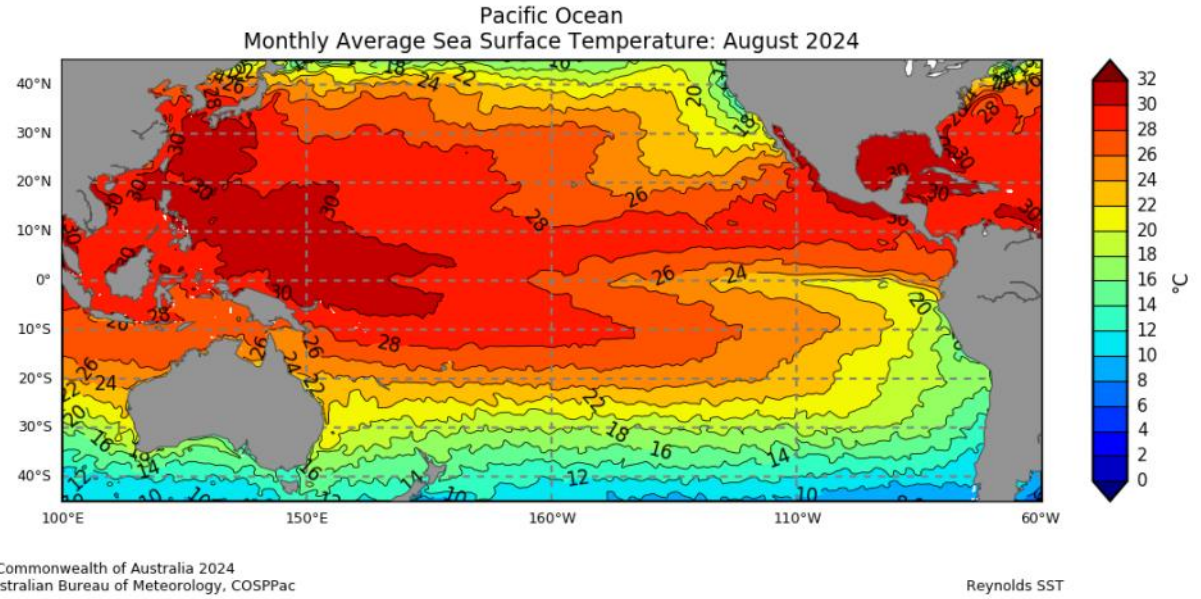
OCEAN CONDITIONS

SEA SURFACE TEMPERATURE

Click link to access Pacific Community COSPPac Ocean Portal

Sea surface temperatures (SSTs) for August 2024 were up to 1.0 °C above average across much of the western tropical Pacific Ocean, reaching up to 2 °C warmer above average in the far east. SSTs were up to 0.5 °C below average in the equatorial Pacific east of 150°W. There were also patches of SSTs 1.0 °C to 2.0 °C and along parts of the South American coast.

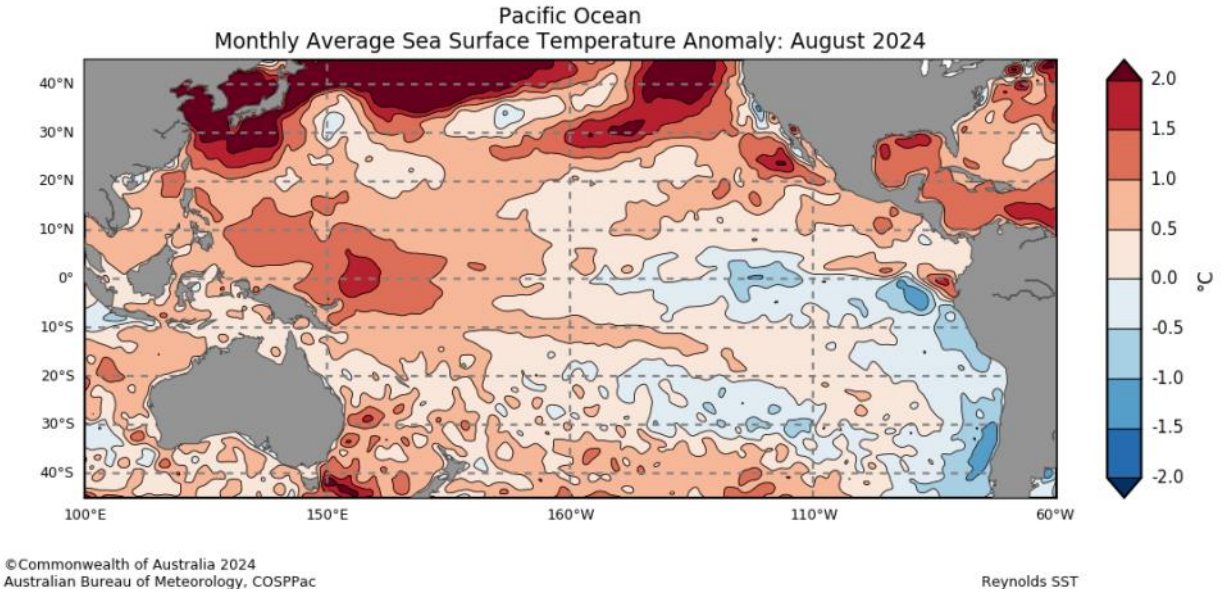
Highest-on-record August SSTs occurred in FSM, parts of Palau, northern PNG, southern RMI and western Nauru. The SSTs in decile 10 (very much above average) stretched east-northeastwards from Palau, FSM to Marshall Islands. Another band stretched east-southeastwards from PNG to northern French Polynesia.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

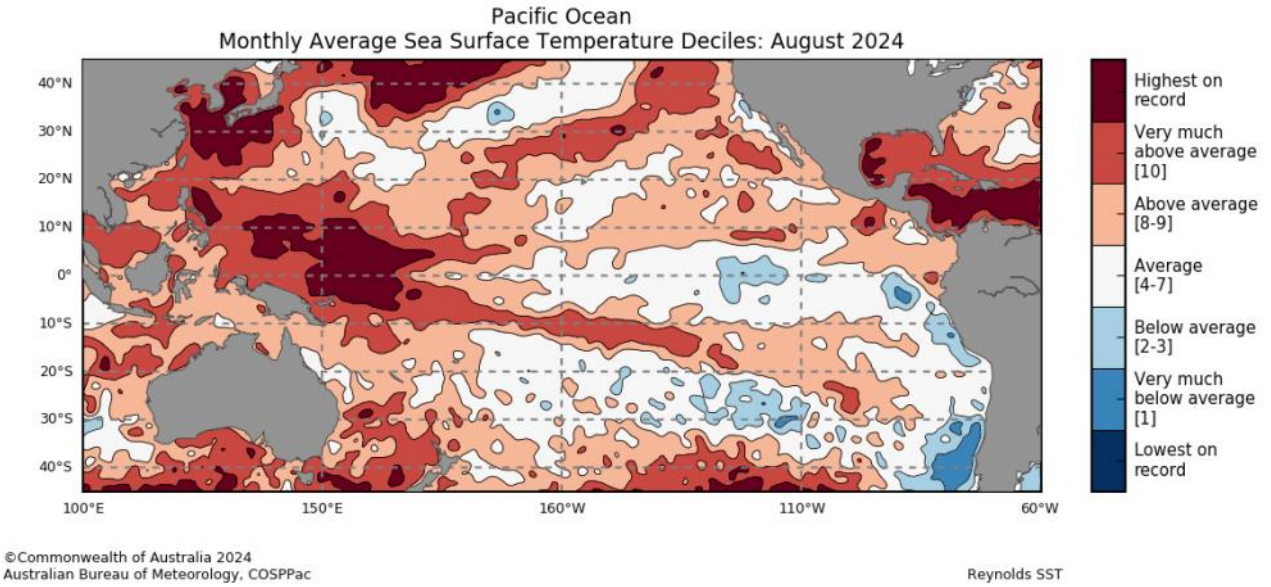


OCEAN CONDITIONS

Click link to access SEA SURFACE TEMPERATURE

Anomalous Sea Surface Temperature



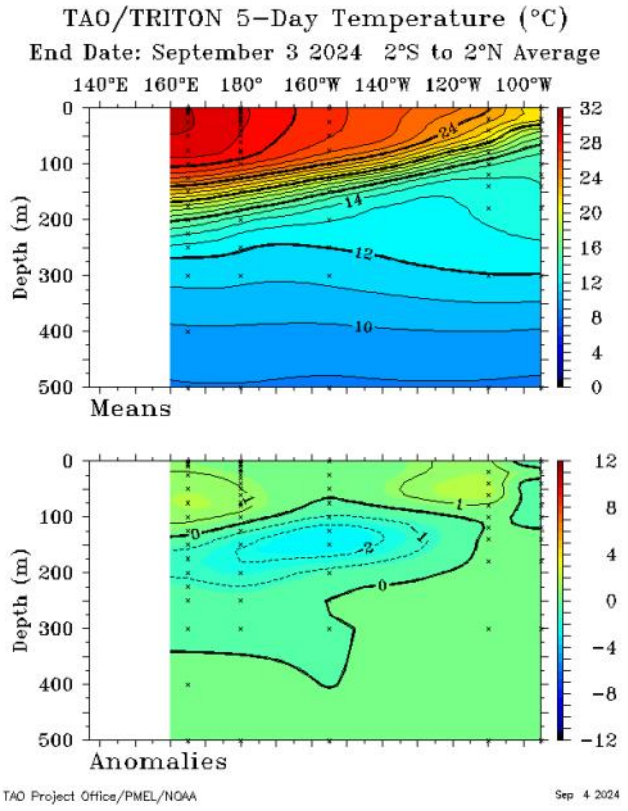


OCEAN CONDITIONS

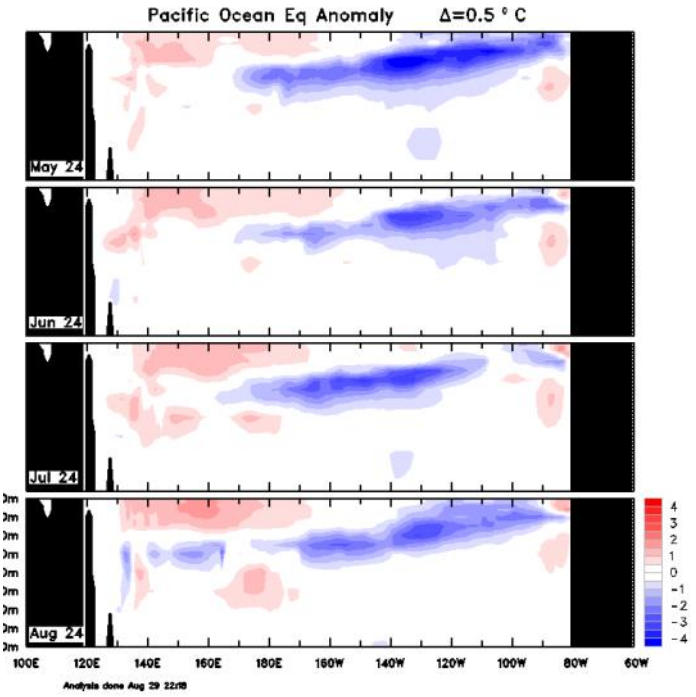
SUB SURFACE

The four-month sequence of equatorial Pacific sea sub-surface temperature anomalies to (29 August 2024) shows sustained cool anomalies in the central and eastern Pacific during August, up to 2.5 °C below average between the 180°E and 80°W. There is increased cool anomalies in the western Pacific during August, with waters cooling to 1.5 °C below average between depths of 125-300 m and longitudes of 130°E and 160°E. The warm anomalies in the top 100 m of the central and western equatorial Pacific (between 130°E and 180°E) strengthened slightly during August, reaching up to 2 °C warmer than average.

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/

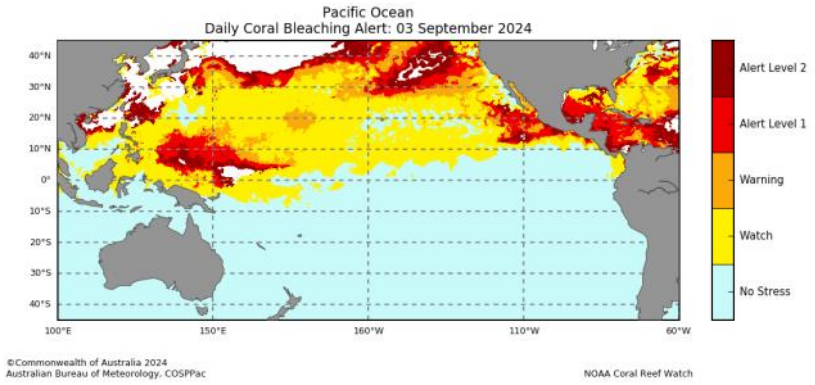
OCEAN CONDITIONS

CORAL BLEACHING

The daily Coral Bleaching Alert status for 03 September 2024 shows an area of 'Alert Level 2' over parts of southern FSM, and eastern Palau. 'Alert Level 1' over parts of northern FSM, southern RMI, northern PNG, and Kiribati (northern Gilbert islands). 'Warning' status over CNMI, Guam, and northern RMI. 'Watch' or 'No stress' for the rest of the countries. The four-week Coral Bleaching Outlook to 29 September shows 'Alert Level 2' over eastern FSM, and southern RMI. 'Alert Level 1' rating over northern FSM, southern RMI, and northern PNG's EEZ. 'Warning' covers northern PNG, northern FSM, and southern RMI. 'Watch' or ' No Stress' over the rest of the countries.

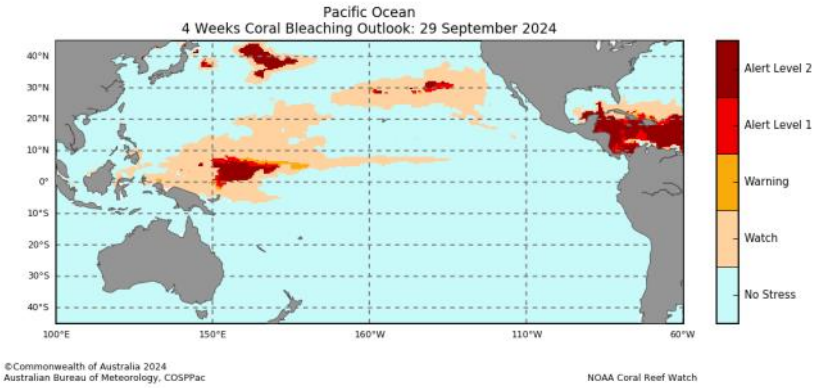
Daily Coral Bleaching Alert

(Source: Pacific Community COSPPac Ocean Porta Coral Bleaching)



4 Weeks Coral Bleaching Outlook

(Source: Pacific Community COSPPac Ocean Portal)



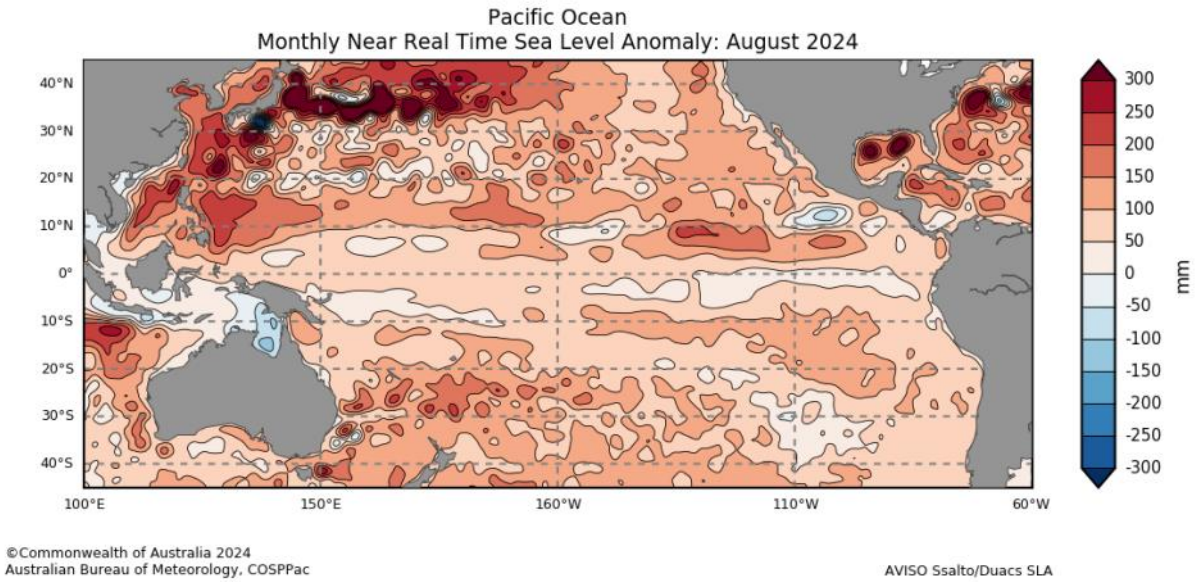
OCEAN CONDITIONS

OCEAN SURFACE CURRENTS AND SEA LEVEL

Sea levels observed in August were above normal over most COSPPac countries. Patches of anomalies from +200mm were observed over northern Palau, southern New Caledonia, southern Fiji, and southern Tonga. Anomalies of +100mm to +200mm were observed over most of Palau, most of FSM, northern RMI, northern New Caledonia, most of Vanuatu, Fiji, Tonga, Niue, Wallis and Futuna, Samoa, Cook Islands, 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

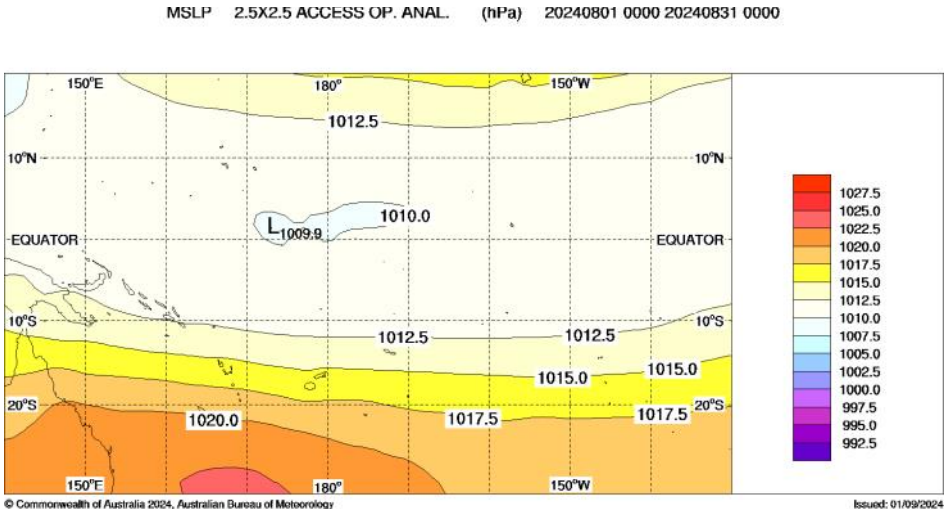


MEAN SEA LEVEL PRESSURE

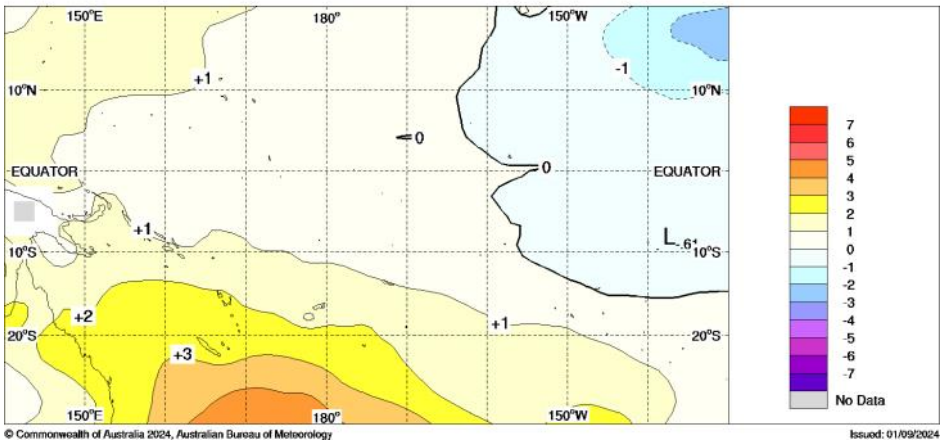
The August mean sea level pressure (MSLP) anomaly map displays positive anomalies of 1 hPa or greater over the southwest and south-central Pacific.

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

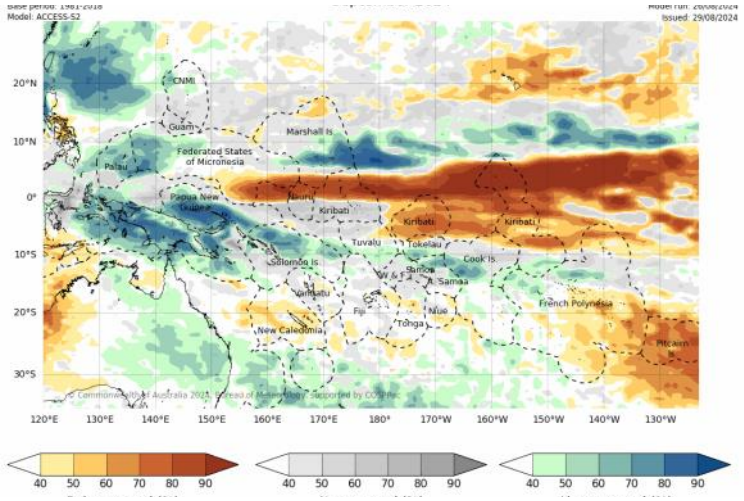
SEASONAL RAINFALL OUTLOOK

September—November 2024

The ACCESS-S model forecast for September 2024, shows above normal rainfall is likely or very likely for most of Palau, western FSM, northern CNMI, central RMI, and in a narrow band stretching southeast from the PNG to western French Polynesia. Below normal rainfall is likely or very likely for southeast FSM, northern Nauru, Kiribati (northern Gilbert Is., Phoenix Is., and central and northern Line Is.), far northern Cook Islands, northern and central French Polynesia, and Pitcairn Islands. In addition, below normal rainfall is likely in New Caledonia, and in small patches over Vanuatu, Fiji, RMI, Tonga, and Niue.

The ACCESS-S three-month rainfall outlook (September to November 2024) is very similar to the August outlook, but with a stronger and broader equatorial dry signal over Nauru, and Kiribati extending to Tuvalu, and Tokelau. The above normal rainfall region in the southern hemisphere is also more pronounced, extending over most of Palau, western to central FSM, PNG, Solomon Islands, New Caledonia, Vanuatu, Fiji, and the central to southern Cook Islands.

Monthly ACCESS-S Maps



The Copernicus multi-model outlook for September to November 2024 is very similar to the ACCESS-S outlook, but with a stronger dry signal from northern RMI to CNMI, and Guam.

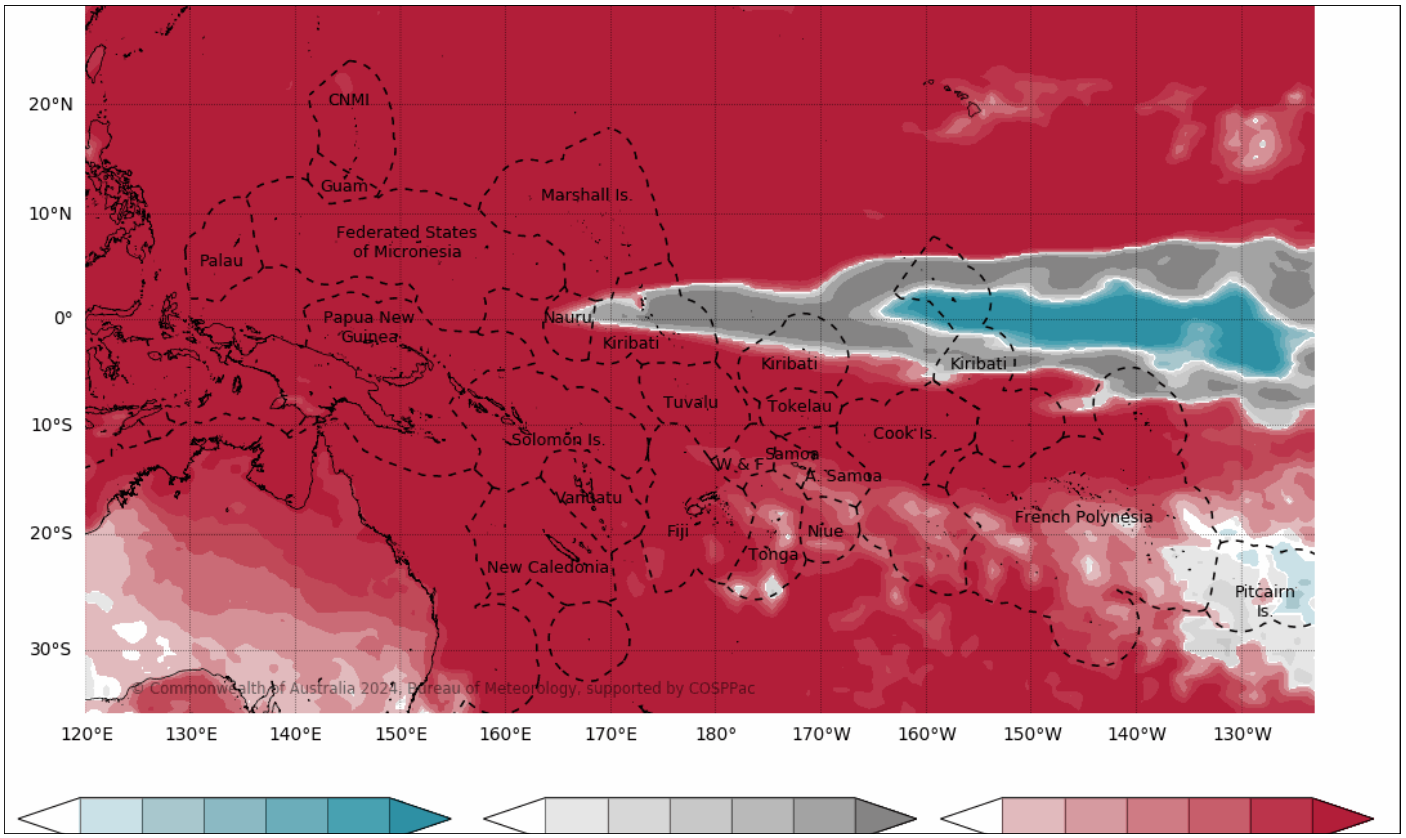
The APEC Climate Centre multi-model outlook (September to November 2024) is similar to the other two models.

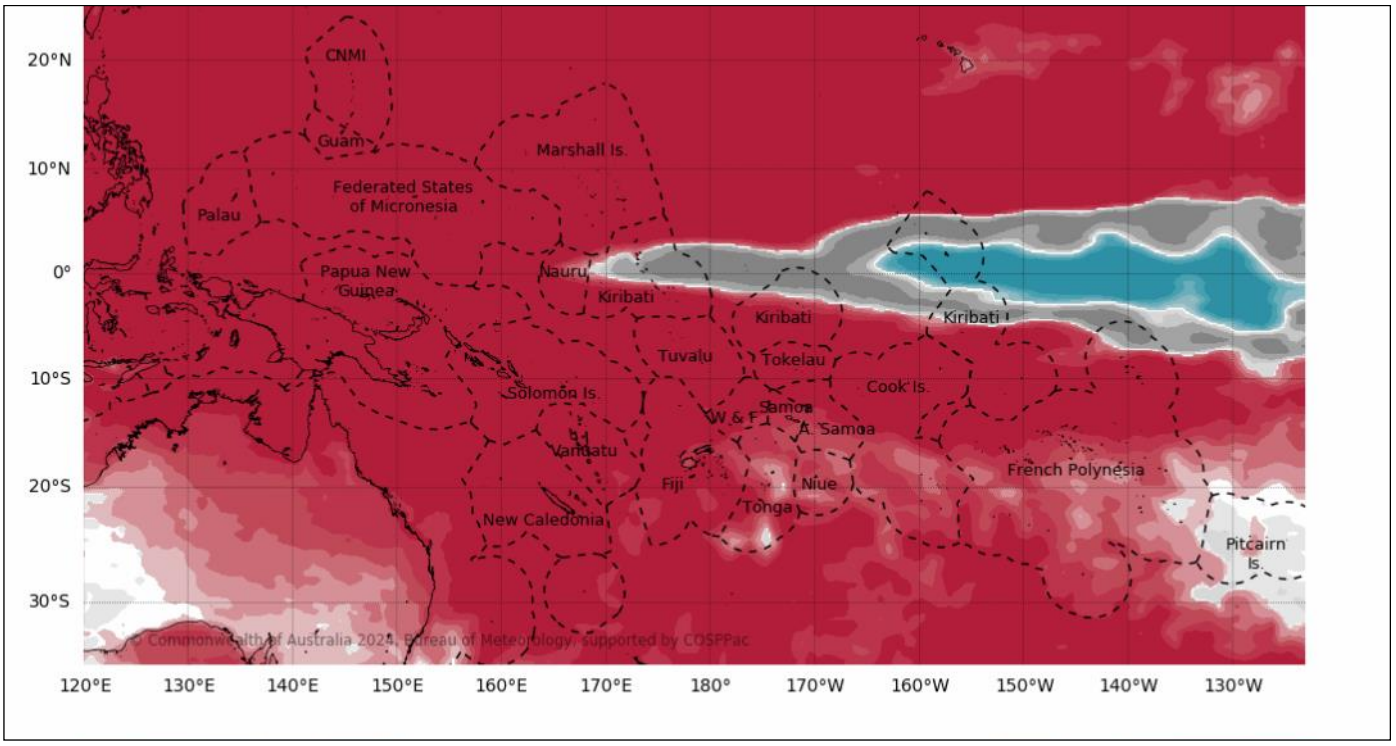
For September to November 2024 the models agree that above normal rainfall is likely or very likely for Palau, western to central FSM, central RMI, most of the PNG mainland, the north of both Samoa and American Samoa, and the north-central Cook Islands. In addition, the models agree that below normal rainfall is likely or very likely for southeastern FSM, far southern RMI, Nauru, most of Kiribati, northern Tuvalu, northern Tokelau, northern French Polynesia, and Pitcairn Islands.

SEASONAL TEMPERATURE OUTLOOK

September—November 2024

Monthly Tmax and Tmin ACCESS-S Maps

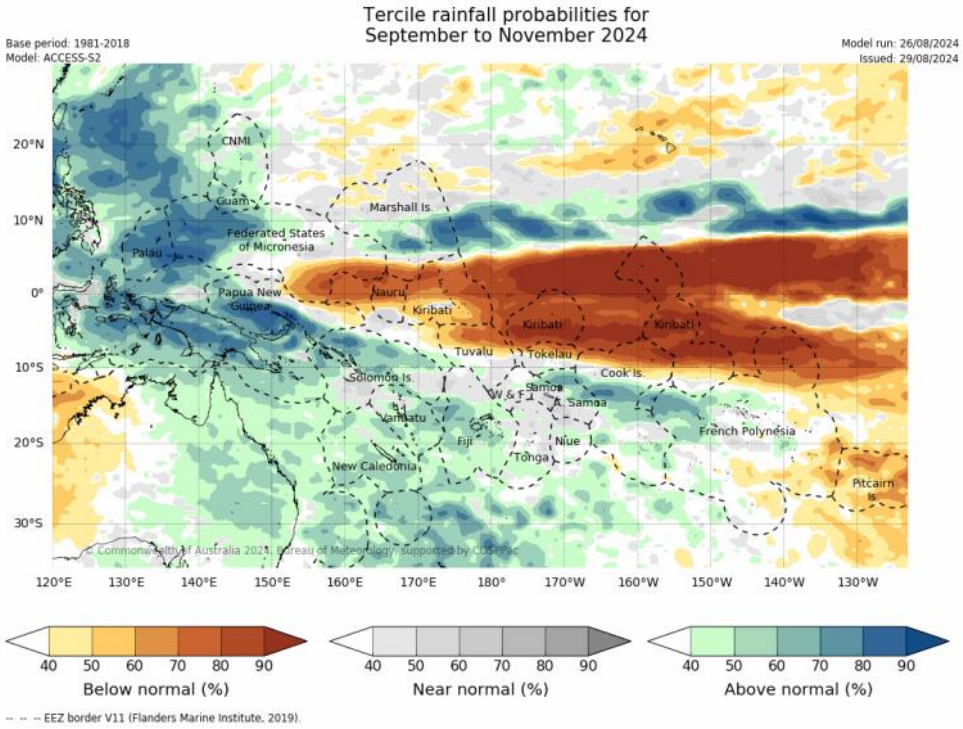


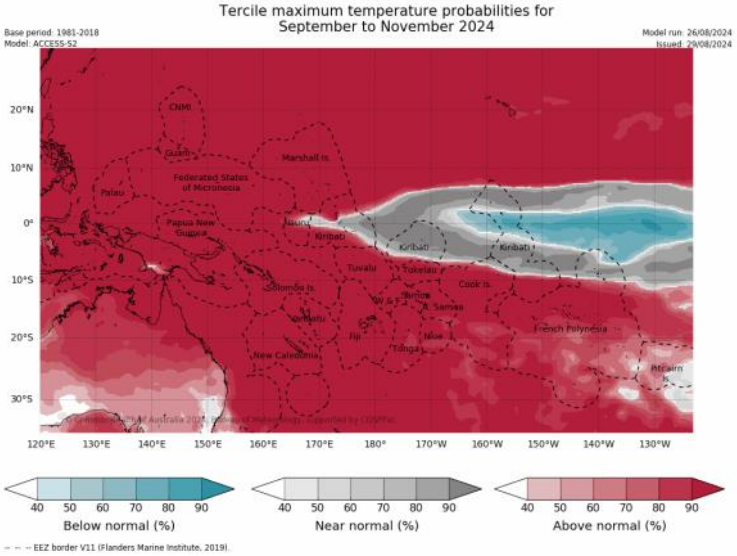


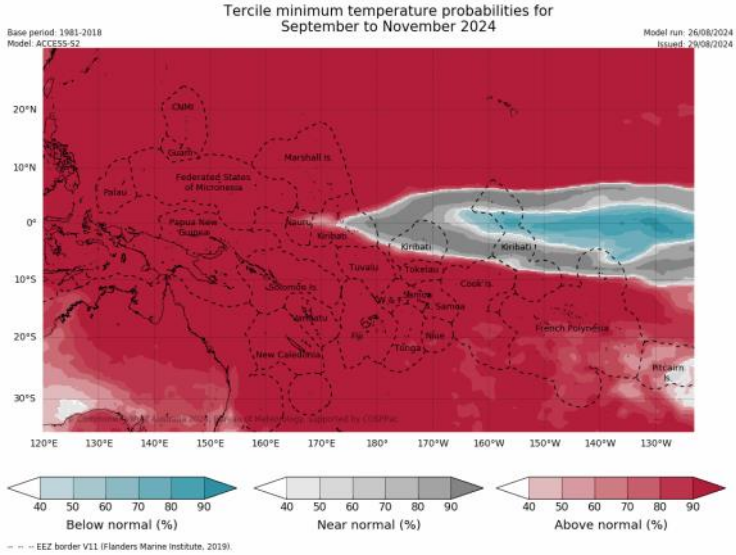
SEASONAL RAINFALL OUTLOOK

September—November 2024

Seasonal ACCESS-S maps



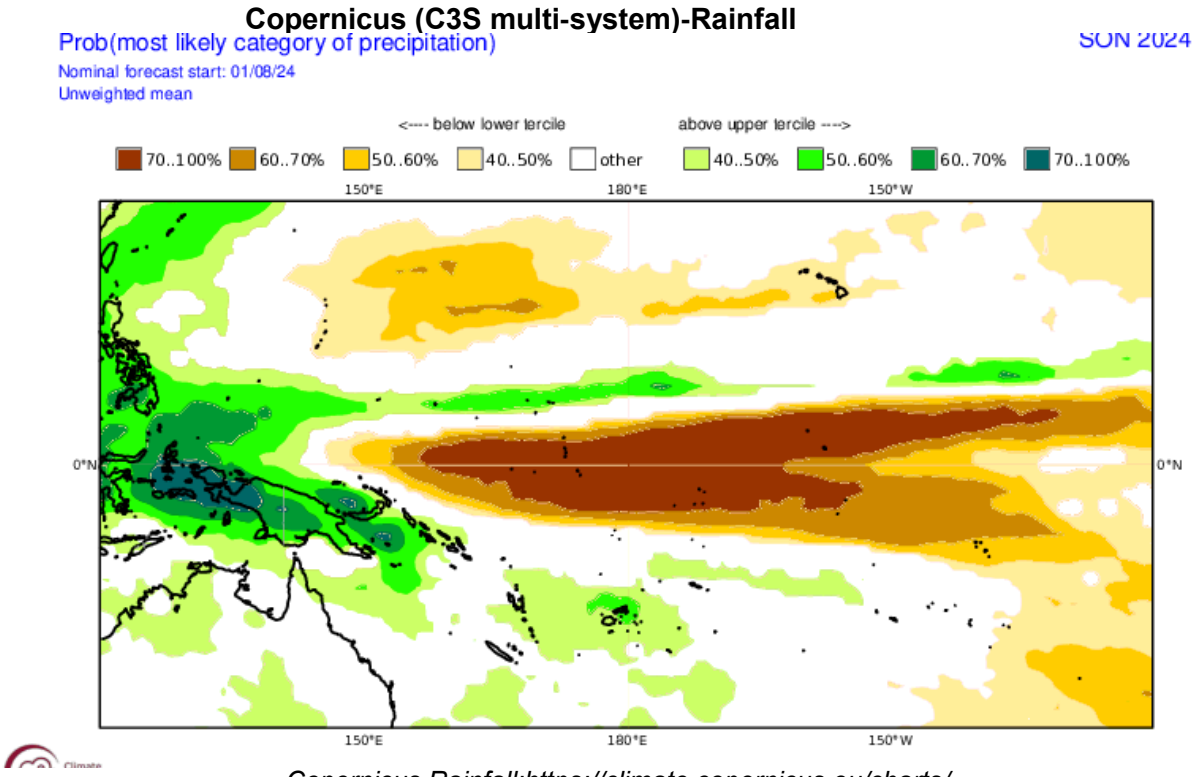




'About ACCESS-S http://access-s.clide.cloud/

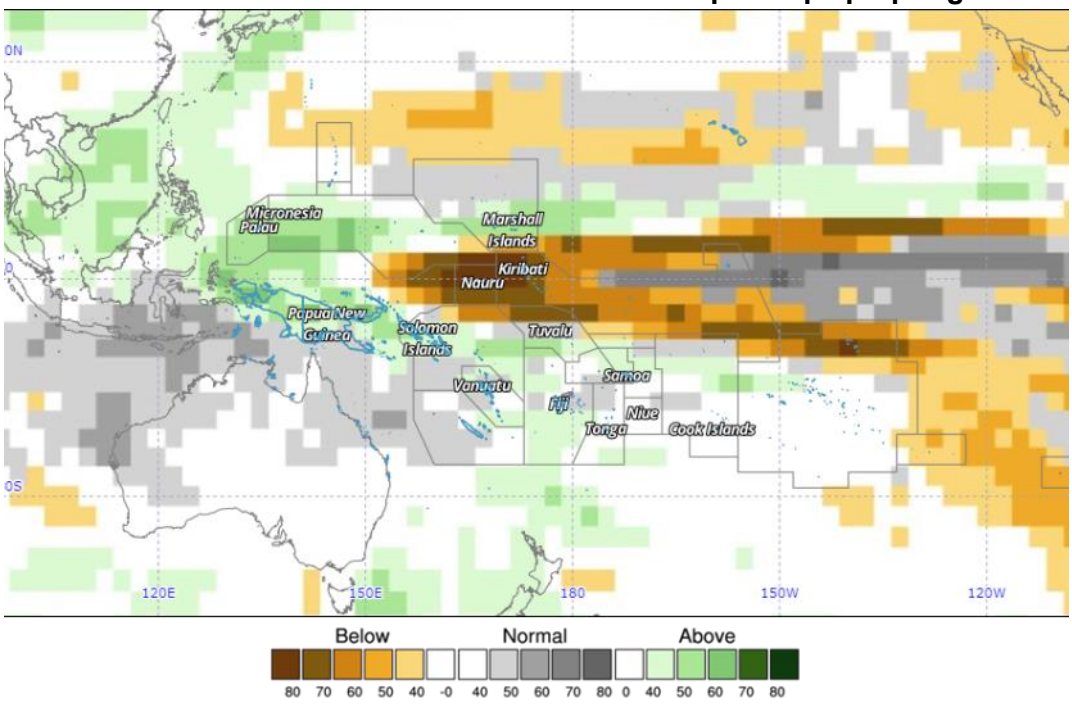
SEASONAL RAINFALL OUTLOOK

September—November 2024



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

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



Year: 2024, Season: SON, Lead Month: 3, Method: GAUS
Model: APCC, BOM, CMCC, CWB, MSC, NASA, NCEP, PNU
Generated using CLIK(P) (2024-9-3)

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TROPICAL CYCLONE

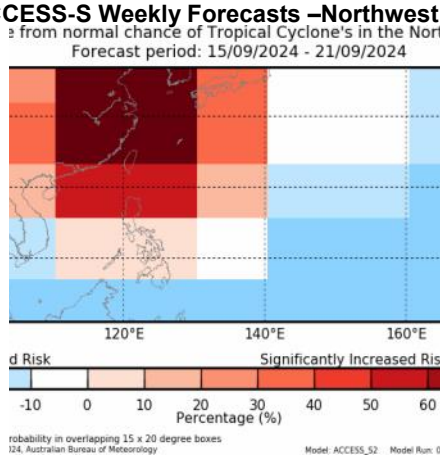
2023/2024 Season

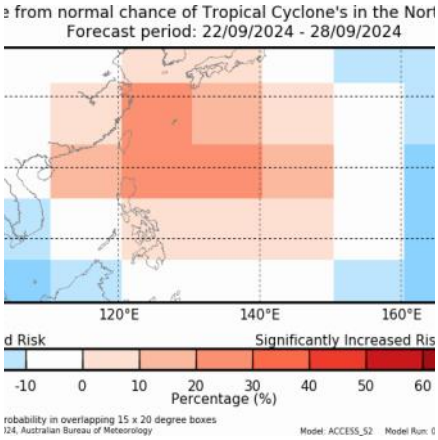
The northwest Pacific tropical cyclone season is year-round, with most cyclones occurring between May and December. In the WNP, the genesis and track of TCs show a relationship with the ENSO cycle: activity typically shifts eastward during El Niño and westward during La Niña.

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, Japan, and eastern Asia for the week from 15 to 21 September. There is also a slight to moderate increase risk over the same region from 22 to 28 September.

ACCESS-S Weekly Forecasts –Northwest Pacific





ACCESS-S Weekly Forecasts –Southwest Pacific

OUT OF SEASON

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OUT OF SEASON

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are for November to April

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.

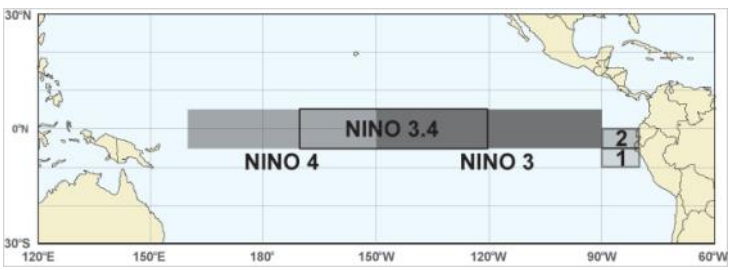
20 degrees Celsius Isotherm Depth

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