



15th Pacific Islands Climate Outlook Forum Statement

This statement was produced by the [WMO RA-V Pacific Regional Climate Centre Network](#) following the 15th Pacific Islands Climate Outlook Forum (PICO-15) held on 14-15 October 2024, for use by National Meteorological and Hydrological Services (NMHSs) in the Pacific Islands. For more information, please see the [background section](#) and/or contact your local meteorological office.

Key messages

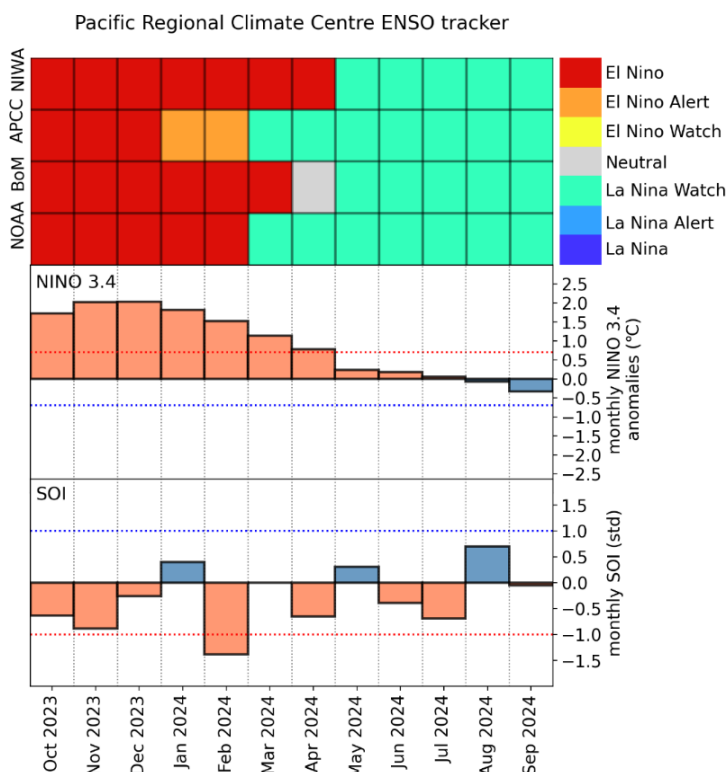
- The tropical Pacific is currently ENSO-neutral. While not meeting thresholds for a La Niña event, ocean and atmospheric patterns across the region are currently La Niña-like. La Niña or La Niña-like patterns are the most likely outcome for remainder of 2024. Climate models indicate that should La Niña develop, it would be relatively short-lived with a return to ENSO-neutral in early 2025.
- The 2024/25 southwest Pacific tropical cyclone (TC) season begins on 1 November 2024. TCs have occurred out-of-season in the months of May, June and October but such occurrences are rare during La Niña events.
- For the coming season, 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 is important to keep in mind that it does not take a direct hit or severe TC to cause considerable damage or life-threatening weather.
- The rainfall outlook over November 2024 to January 2025 is consistent with La Niña conditions. Below normal rainfall is likely between Nauru and the Phoenix Islands (Kiribati), Marquesas (French Polynesia), Tuvalu, Tokelau, Northern Cook Islands. Above normal rainfall is favoured between southern Papua New Guinea (PNG) and Southern Cook Islands. In the northwest Pacific above-normal rainfall is also likely between Palau and eastern Federated States of Micronesia (FSM). Confidence in this outlook is very high in the central equatorial Pacific and moderate in the subtropical Pacific.
- Above normal air temperatures are favoured in regions excluding the central and eastern equatorial Pacific.
- Sea level is favoured to be higher than normal around PNG, FSM, the Republic of the Marshall Islands (RMI), Palau, Solomon Islands, New Caledonia and southern part of Tonga. Below normal sea level is favoured around Kiribati, southern parts of Tuvalu, Samoa, northern Fiji, northern Tonga, Niue, parts of Cook Islands, parts of French Polynesia and the Pitcairn Islands.
- Higher than normal sea level is favoured near the Solomon Islands, PNG, Palau, FSM, RMI, New Caledonia and southern Tonga. In regions where higher tides are also predicted the combination higher tides and above normal sea levels may elevate their risk of coastal inundation.
- Coral bleaching alerts are present for PNG, FSM, RMI, Palau, and Nauru, and forecast through to December.

Climate in review – May to October 2024

- As of mid-October 2024, the [Pacific Regional Climate Centre ENSO tracker](#) ([click here](#)) is at La Niña Watch based on status reports from the majority of RCC-N members.

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- Ocean temperatures at and below the surface in the central to eastern Pacific are currently cooler than usual but do not meet La Niña thresholds, as is typical of La Niña's a cool-to-warm west-to-east gradient is observed across the basin. Below the ocean surface the West Pacific Warm Pool is warming,
- Rainfall, tradewinds and atmospheric pressure patterns indicate a transition towards La Niña, however these patterns have yet to be sustained. Should these patterns persist, it would indicate coupling between the atmosphere and ocean.



- Atmospheric predictions such as rainfall and air temperature from PICO-14 for May to October 2024 verified well when compared to observations over the same period.
- The coral bleaching and marine heatwave risk regions were accurately forecast.
- Sea level forecasts were not as skilful and were generally lower than forecast in the western Pacific. As of September 2024, sea level was generally near or below normal, except within/near the Coral Sea and New Caledonia.
- Coral bleaching has been common this year, with several profound bleaching events. Record warm sea temperatures affected Tokelau, Tuvalu, Solomon Islands, PNG, Palau and FSM. Bleaching due to a combination of lower sea levels and high sea surface temperatures (SSTs) was observed at multiple locations across the Pacific, specifically the central Pacific including FSM, Palmyra Atoll and American Samoa.
- Western North Pacific 2024 TC activity, so far, has been indicative of a climate pattern shifting to La Niña with activity favouring western areas of the basin. 2024 activity was similar to that of 2020-2022. As of 10 October, there have been 21 TCs in the western North Pacific with four tropical cyclones forming near the U.S.-Affiliated Pacific Islands (USAPI) to date in 2024: Typhoon Shanshan (01W), west of the Marianas, Typhoon Bebinca (14W), southeast of the Marianas and passing over southern Guam as a borderline tropical depression/tropical storm with minimal impacts, Typhoon Pulasan (15W), west of the Marianas, and Storm Barijat (21W), over the Northern Mariana Islands.
- Significant weather and climate impacts experienced over the last six months include flooding in PNG, Fiji, Tonga, Tuvalu, and Samoa and drought in northern Vanuatu, Tonga, Samoa, and southern Cook Islands. Stronger than normal trade winds were experienced in Solomon Islands, Tuvalu, Tokelau, and Cook Islands. Sectors impacted

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by unusual rainfall patterns and windier conditions were infrastructure, agriculture, water, transportation, energy, and tourism.

Long-term trends

- There has been little change in annual and seasonal total rainfall at most locations over last 70 years. Drying trends exist in Hawai'i and in the South Pacific subtropics.
- There has been little change in annual and seasonal maximum 1-day rainfall at most locations over the last 70 years. The annual consecutive dry days (CDD) index represents change in the longest number of days in year where rainfall is less than 1 mm. Positive values represent longer periods of low rainfall in recent years. There has been little change in annual CDD at most locations over the last 70 years.
- The Interdecadal Pacific Oscillation (IPO) is a measure of decadal variability in the Pacific. Phases last 20 to 30 years. The IPO is currently in a near-neutral or weak negative phase. Negative phases are associated with the South Pacific Convergence Zone (SPCZ) being displaced further south than is usual for La Niña. Rainfall is generally lower than normal northeast of the SPCZ and in the central equatorial Pacific (Northern Cook Is. Tokelau, Kiribati and Tuvalu) and higher than normal southwest of the SPCZ (Solomon Is., Vanuatu, Fiji, Tonga).
- Land-based annual mean (average) air temperature increased 1.1°C between 1951-2020. Over land and sea, the increase was 0.7°C over 1950-2023 (ERA5). At a regional scale, land-based mean temperature increased over both halves of the 70-year period and in all seasons. The five warmest years on record have occurred in the last decade.
- The annual number of hot days has increased at most locations in the Pacific Islands. A hot day is defined as a day when the highest temperature is within the highest 10% of observations (for the respective location) between 1961 and 1990.
- The shift to a warmer climate in the Pacific is accompanied by fewer cold nights. The annual amount of cold nights has also decreased at most locations. A cold night is defined as when the lowest recorded temperature (in a 24-hour period) is within the lowest 10% of observations (for the respective location) between 1961 and 1990.
- Hot days were about three times as common in the 2010s as they were in the 1950s. Cold nights were about 60% less frequent in the 2010s, compared to the 1950s.
- Since the 1981/82 TC season there has been a significant decline in the total numbers of TCs east of Cape York, northern Australia. In the early 1980s the average number of TCs per season was 11. In recent years this has declined to about 7 per season. The average number of severe TCs has declined as well from about 6 per season in the early 1980s to about 3 per season in recent years. These trends are likely to be the better predictor of TC occurrence in the coming season.

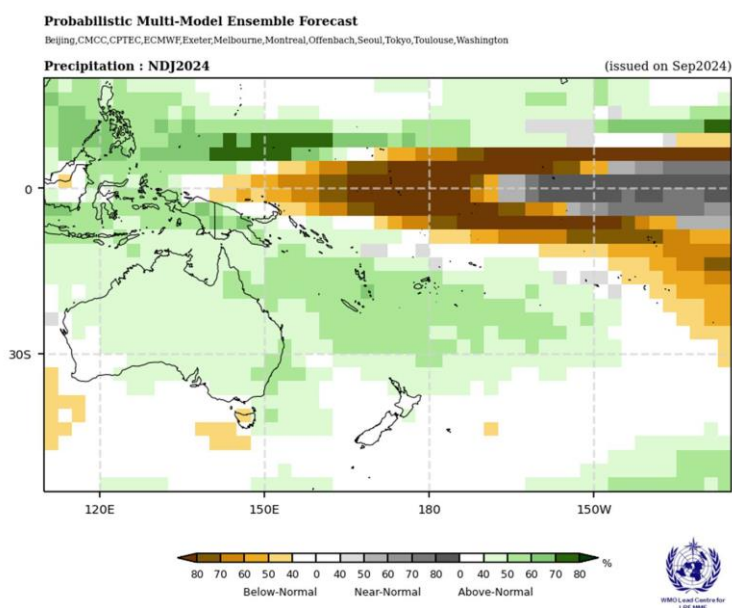
Climate outlook – November 2024 to April 2025

El Niño Southern Oscillation (ENSO)

- Regardless of whether the criteria for La Niña is met over the coming months, all climate models forecast La Niña-like patterns for the remainder of 2024 and early 2025.
- Most Pacific RCC Network members agree there is a moderate chance of La Niña emerging by the end of 2024.

Rainfall and Air Temperature

- The rainfall outlook over November 2024 to January 2025 is consistent with rainfall patterns experienced during past La Niña's.
- Below normal rainfall is favoured in the equatorial Pacific between Nauru and Phoenix Islands (Kiribati), as well as Marquesas Islands (French Polynesia). Below average rainfall is expected for southernmost FSM and RMI, Tuvalu, Tokelau, Northern Cook Islands and northern French Polynesia.
- Farther south in the tropics, above-normal rainfall is favoured between southern PNG and the southern Cook Islands including New Caledonia, Vanuatu, Fiji (except Rotuma), Tonga and Niue. In the northwest Pacific above-normal rainfall is also likely between Palau and eastern FSM.
- Confidence in this outlook is very high in the central equatorial Pacific and moderate in the subtropical Pacific.

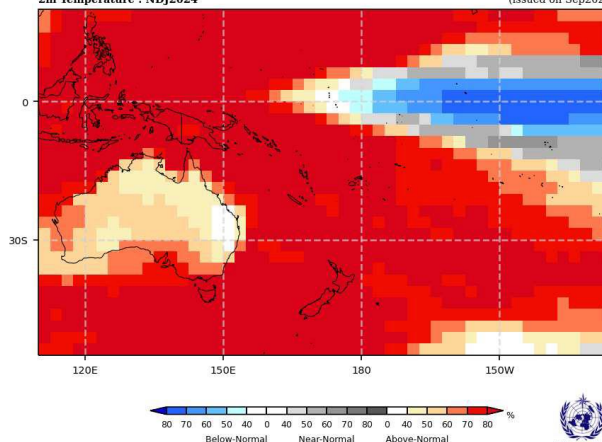


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- The La Niña-like rainfall outlook pattern is forecast to continue over January to March 2025, noting model skill is reduced at this lead time. For this period there is an above normal rainfall outlook for Marshall Islands, and below-normal rainfall is favoured for Kiritimati (Kiribati).
- Widespread above-normal temperatures are favoured over all the Pacific islands outside of the near equatorial eastern Pacific.

Probabilistic Multi-Model Ensemble Forecast
Beijing, CMCC, CMCC, CPTEC, CPTEC, ECMWF, ECMWF, Exeter, Exeter, Melbourne, Melbourne, Montreal, Montreal, Offenbach, Offenbach, Seoul, Seoul, Tokyo, Tokyo, Toulouse, Toulouse, Washington, Washington

2m Temperature : NDJ2024 (issued on Sep2024)

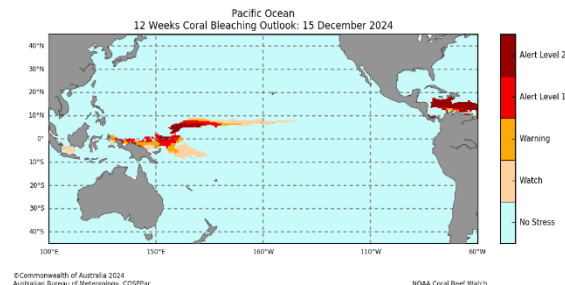
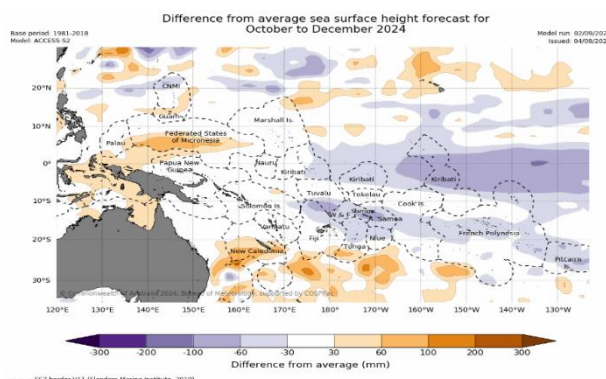
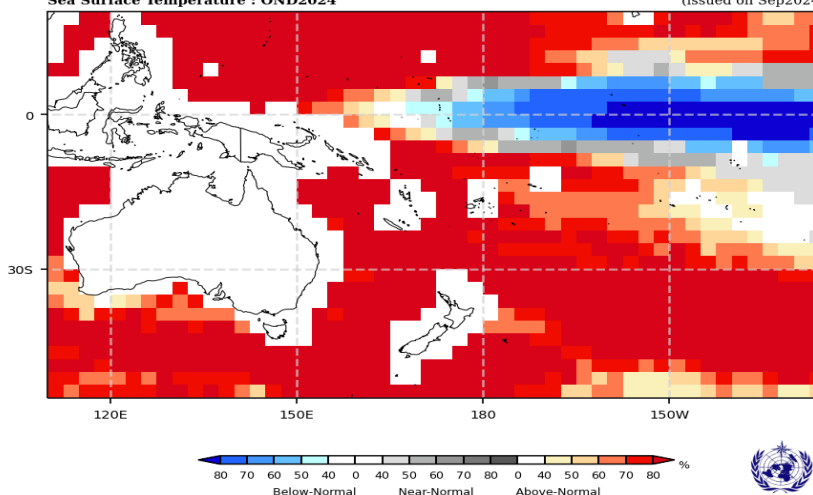


Ocean surface temperature, sea level & coral bleaching

- Near-normal to above normal SST is favoured for the off equatorial countries and the far western Pacific. SSTs are predicted to be cooler than normal in the central and eastern equatorial Pacific.
- Sea level is favoured to be higher than normal around the southern Mariana Is., Guam, northern PNG, the

Probabilistic Multi-Model Ensemble Forecast
Beijing, CMCC, ECMWF, Exeter, Melbourne, Montreal, Offenbach, Pretoria, Seoul, Tokyo, Toulouse, Washington

Sea Surface Temperature : OND2024 (issued on Sep2024)



central and southern FSM, far northeast RMI, southern Palau, New Caledonia and southern Tonga. Below normal sea level is favoured around most of Kiribati,

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southern Tuvalu, Samoa, northern Fiji, central and northern Tonga, Niue, parts of Cook islands and French Polynesia, and the Pitcairn Islands.

- Pacific NMHSs are requested to note regions where abnormally higher tides are predicted, especially those regions where higher than normal sea level is also favoured, such as Solomon Islands, PNG, Palau, FSM, RMI, New Caledonia and southern Tonga. The combined higher tides and above normal sea levels may elevate their risk of coastal inundation.
- Coral bleaching alerts are forecast to continue for PNG, FSM, RMI and Nauru through to December.
- The fisheries convergence zone is forecast to expand slightly eastward.

Tropical cyclones

- The 2024/25 Southwest Pacific TC season begins on 1 November 2024 and will continue until 30 April 2025. TCs have occurred out-of-season in the months of May, June and October but these occurrences are rare outside El Niño events.
- TCs are categorised in strength from 1 to 5, with 5 being most intense. TCs that reach category 3 or higher are classified as severe.
- For the coming season normal or above normal TC activity is likely west of and including Vanuatu. East of Vanuatu, normal to below normal TC activity is likely.
- Monitoring multi-week weekly TC outlooks through the season is highly recommended as well as monitoring daily weather forecasts when the chance of TC occurrence is higher than normal.
- It does not take a direct hit or severe TC to cause considerable damage or life-threatening weather. When dangerous weather is forecast, please heed the advice of your local meteorological service, civil defence, or disaster management office.

Climate Projections

- Global and Pacific climate is changing due to increases in atmospheric greenhouse gas concentrations, for example, temperatures have increased on land and in the oceans, and sea levels have risen.
- With further increases in greenhouse gas emissions:
 - Air temperatures will continue to increase
 - Rainfall patterns may change in different ways in different regions: increase, decrease or stay the same
 - Sea level will continue to rise, with greater chance of coastal inundation
 - Tropical cyclones are projected to reduce in frequency, with the proportion of severe TCs increasing, and an increase in TC rain rates. Impacts from TCs may increase with corresponding sea level rises and increased TC rain rate
 - Extreme climate events are projected to increase in frequency and magnitude



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Background

This statement has been crafted using the [WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble](#). Where an element forecast is not available (e.g., for TCs or coral bleaching), outlooks are obtained from [Pacific RCC Network Node for LRF](#).

These outlook statements are for use by NMHSs. They do not constitute an official outlook for any nation. For more information, please contact your local meteorological office.

The [Pacific Islands Climate Services Panel](#) and [Pacific Regional Climate Centre \(RCC\) Network Node for Long Range Forecasting](#), in collaboration with the World Meteorological Organisation (WMO), have been coordinating PICOF since 2015. PICOF is a platform used to discuss the seasonal outlook (ENSO, TCs, precipitation, temperature, and oceanic conditions) for the upcoming seasons, capacity build, and enable knowledge exchange between NMHSs and strengthen relationships between NMHSs and stakeholders.

PICOF is an important mechanism for sharing climate and ocean information, best practices, and lessons learnt on climate and ocean prediction and its likely implications on sectors where productivity is heavily dependent on the state of climate. PICOF is held twice a year: an in-person session, when possible, in October, focusing on November to April and a virtual session in April, focusing on May to October.

PICOF-15 had attendees from Australia, Cook Islands, Fiji, French Polynesia, Kiribati, Marshall Islands, Micronesia (Chuuk and Pohnpei), New Caledonia, New Zealand, Palau, Papua New Guinea, Samoa, Solomon Islands, South Korea, Tonga, Tuvalu, United States of America, and Vanuatu. Representatives from the following organisations also participated: Secretariat of the Pacific Regional Environment Programme (SPREP), World Meteorological Organisation (WMO), Pacific Community (SPC), Australian Bureau of Meteorology (BoM), United States National Oceanic and Atmospheric Administration (NOAA), Météo-France, New Zealand National Institute of Water and Atmospheric Research (NIWA), the Asia-Pacific Economic Cooperation (APEC) Climate Centre (APCC), and the UN Environment Programme (UNEP).

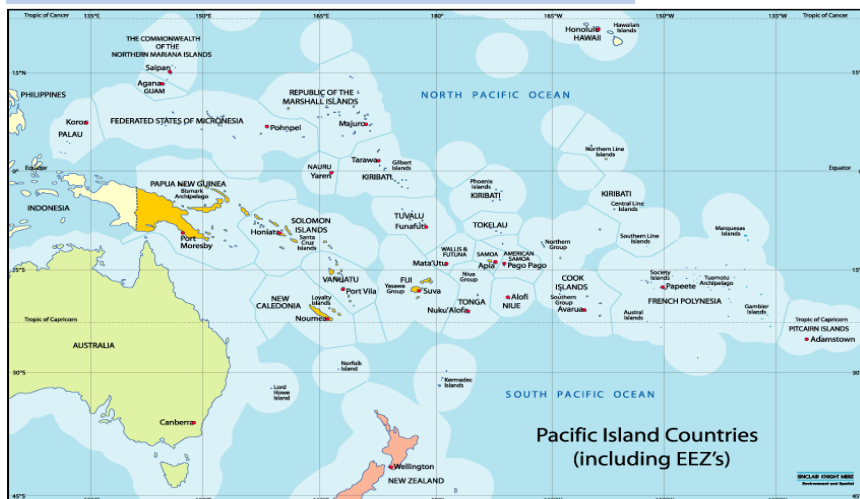
Close working relationships between Pacific rim and Pacific Island NMHSs, regional organisations, and WMO are critical to effective warning of climate hazards leading to early preparedness. Further enhancement of these relationships is essential, as well as relationships between NMHSs, their primary stakeholders, and the community. These can be frequent meetings such as one-on-one discussions, cluster group meetings, and national climate outlook forums.

In addition to the production of national seasonal climate outlooks, there is a need for simplified products and messaging especially for rural and remote communities. Sectoral impacts are most often related to prolonged drier or wetter than normal conditions. NMHSs should continue to develop climate products tailored for national sectors, relevant to their needs, and incorporating where possible traditional knowledge elements.

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This statement is consistent with the Nuku'alofa Ministerial Declaration, Honiara Ministerial Statement, and Namaka Declaration for Sustainable Weather, Water, Ocean and Climate Services for the Resilient Pacific, which recognises the importance of Meteorological and Hydrological Services in support of relevant national needs, including protection of life and property, sustainable development and safeguarding the environment. The same noted that weather and climate services are not an option but are a responsibility and a basic human right.

Figures & supporting



Map of the Pacific Islands region, including countries and territories involved in PICOF. [Source](#).

Important links



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