



14th Pacific Islands Climate Outlook Forum Statement

This statement was produced by the [WMO RA-V Pacific Regional Climate Centre Network](#) following the 14th Pacific Islands Climate Outlook Forum (PICOF-14) held on 16 April 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.

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Key messages

- The 2023/24 El Niño event which began in the second to third quarter of 2023 is in decline. However, the effects of this event may continue to be felt across the region for several more months.
- Several models suggest there is a chance of La Niña developing in the second half of this year, preceded by a period of ENSO neutral conditions.
- In the western North Pacific (WNP), the potential onset of La Niña later in 2024 would favour a reduced TC threat for Micronesia and Hawaii.
- During May-July, below normal rainfall is favoured in the off-equatorial South Pacific around New Caledonia, Vanuatu, and Fiji, along the equator (a change from previous seasons), and in the northwest Pacific. Models vary in the intensity and coverage of below normal rainfall near the equator.
- Above normal rainfall is favoured in an area extending from Papua New Guinea (PNG) to the Tuamotu Archipelago, including Solomon Islands, most of Tuvalu, Tokelau, Wallis & Futuna, Samoa, American Samoa, and the northern Cook Islands, and a narrow corridor from southern Palau to the southern Marshall Islands.
- August-October rainfall is favoured to be below normal near the equator and in parts of the northwest Pacific. This means that some equatorial island groups have the potential to experience consecutive seasons with below normal rainfall. Normal or above normal rainfall is generally favoured in the off-equatorial South Pacific with a La Niña-like pattern predicted to develop.
- May-October air temperatures are favoured to be above normal in all countries, with the possible exception of Kiribati in August-October, a continuation of recent anomalous warmth across the region.
- Stronger-than-normal easterly winds are favoured in the tropical South Pacific over May-October, with northerly winds forecast toward the equator.
- From May-October, warmer than average sea surface temperatures (SSTs) are favoured in most areas. This includes the potential for marine heatwaves, which can impact marine ecosystems and regional climate. The frequency and intensity of marine heatwaves (MHWs) has been increasing in recent decades; ocean temperature is increasing by 0.1°C to 0.2°C per decade in the Pacific region.
- Above normal sea levels are likely to develop around Palau, the Federated States of Micronesia (FSM), Marshall Islands, PNG, and Solomon Islands. This may lead to a risk for coastal inundation, especially during the highest tides.
- Coral bleaching alerts are in effect for much of western tropical Pacific, highest for Tuvalu, Tokelau, northern Cook Islands, and northern Solomon Islands.



Climate in review – November 2023 to April 2024

- As of mid-April 2024, the [Pacific Regional Climate Centre ENSO tracker \(click here\)](#) maintains an El Niño event based on status reports from the majority of RCC-N node on climate monitoring and long-range forecast members (BoM, NIWA, and NOAA). Officially the BoM (since 16 April) reports the El Niño event to be over.
- According to the majority of RCC-N members, the El Niño event has been present since September 2023. The 2023/24 event is unique as the expected cold water anomaly expected in the western part of the Pacific basin has barely been present.
- Unusual impacts from this El Niño may have been linked to excess heat in the western Pacific following a “triple dip” La Niña event and the long-term effect of climate change on rising ocean temperatures on a regional and global scale.
- The 2023/24 El Niño event has been in decline since January 2024 with SSTs steadily cooling over this period. Below normal ocean temperatures developed off the west coast of South America during March 2024.
- The South Pacific Convergence Zone was located north of its climatological position for the six month period ending in mid-April. This is characteristic of El Niño.
- Rainfall was above normal in an area from PNG to the northern Line Islands, including Solomon Islands, Nauru, and the Gilbert Islands. Another band of above normal rainfall spanned central Vanuatu, central Fiji, central Tonga, southern Niue, central French Polynesia, and Pitcairn Islands.
- Rainfall was below normal in Marshall Islands, FSM, Marshall Islands, southern Tuvalu, Wallis & Futuna, Samoa, southern Cook Islands, and southern and northern French Polynesia.
- Most countries experienced above normal air temperatures in the last six months, aside from the southern Cook Islands and Austral Islands.
- The PICO-13 statement favoured warmer than normal SSTs across most of the region, except in New Caledonia, Vanuatu, Fiji, and Niue where average SSTs were favoured. Over the December 2023 to March 2024 period, SST anomalies were above normal across most of the region. Peaking in January 2024, SST was exceptionally high across the central and eastern tropical Pacific Ocean. As forecast in the PICO-13 Statement, El Niño gradually waned in early 2024.
- Slightly higher than normal sea levels were predicted near the equator and lower than normal sea levels in the western part of the region, near Palau, FSM, Marshall Islands, PNG and Solomon Islands over November to April. Over this period above normal sea levels (5-20 cm) were observed across much of the eastern tropical Pacific Ocean. Below normal sea levels (5-20 cm) were observed in the northwest tropical Pacific near the equator extending southward to areas around the Solomon and Samoan Islands.
- The PICO-13 statement favoured an enhanced risk of coral bleaching in the central equatorial Pacific to the eastern part of the region. Bleaching was also likely around Tokelau, Tuvalu, Northern Cook and Marshall Islands. Over November to April, coral Bleaching due to a combination of lower sea levels and high SSTs was observed at many locations across the Pacific.



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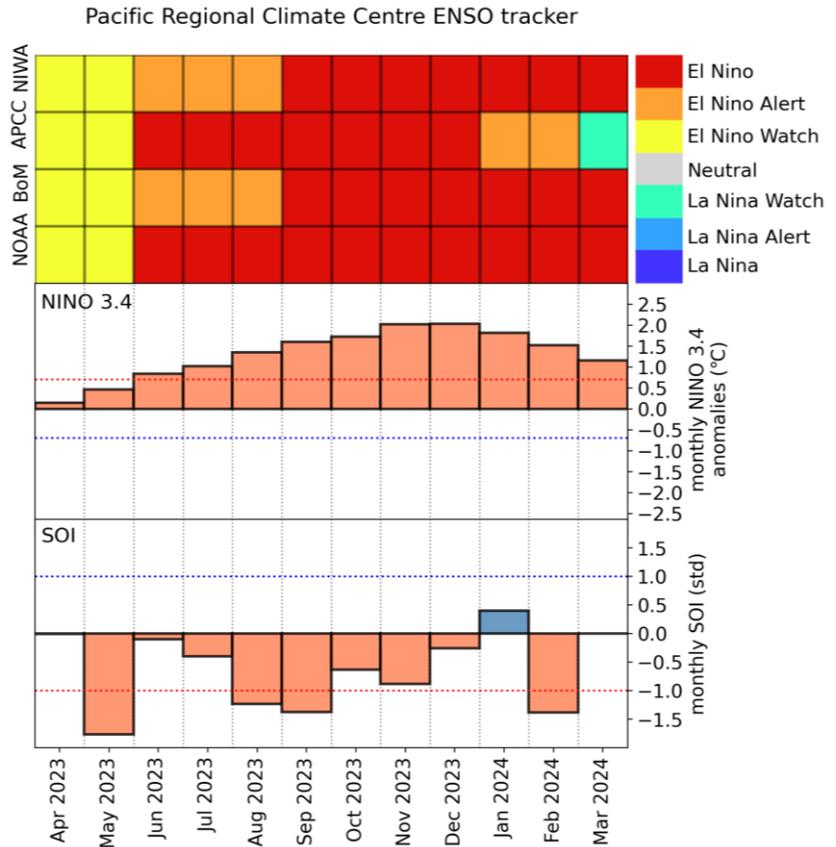
- Normal-to-enhanced tropical cyclone (TC) activity was favoured over the 2023/24 season in the eastern part of the SW Pacific basin and normal to reduced activity in the western part associated with an established El Niño event. The outlook confidence of the BoM outlook was low to very low. NIWA favoured 4-8 TCs reaching Category 3-5 (severe) status anywhere in the region;
- Seven TCs formed in the BOM forecast area (east of the tip of Cape York) to date (four severe) with one of the seven occurring in the pre-season month of October. This is below the long-term (1981/82-present) average of nine in terms of total numbers. The long-term average for severe Category 3-5 events is four. Nine occurred in the NIWA forecast area (east of Darwin, five severe). The official season ends on 30 April;
- There have been fewer TCs than forecast in the eastern SW Pacific basin (east of 165°E) to date and as predicted the western part of the basin has experienced normal to reduced activity;
- In the SW Pacific basin there has been a declining trend in the total number and severe TCs since 1981/82. The quieter than normal season contributes to this trend.
- In 2023, the TC pattern in the WNP was unconventional for an El Niño year. TC activity was well below normal with a distribution that did not follow expectations for an El Niño year.
- 2023 was the fourth year in a row with below normal typhoon count in the WNP. There have been no TCs in the basin so far in 2024.



Climate outlook – May to October 2024

El Niño Southern Oscillation (ENSO) & Pacific RCC ENSO Tracker

- Pacific RCC-N members agreed on El Niño conditions from September-December 2023, with most acknowledging a waning El Niño event as of April 2024.
- As of April 2024, ocean temperatures were below normal in the eastern equatorial Pacific, suggesting that oceanic El Niño was nearing its end. However, El Niño-like patterns may continue in the atmosphere for several more months.
- Several models suggest there is a chance of La Niña developing in the second half of this year, preceded by a period of ENSO neutral conditions.



Rainfall

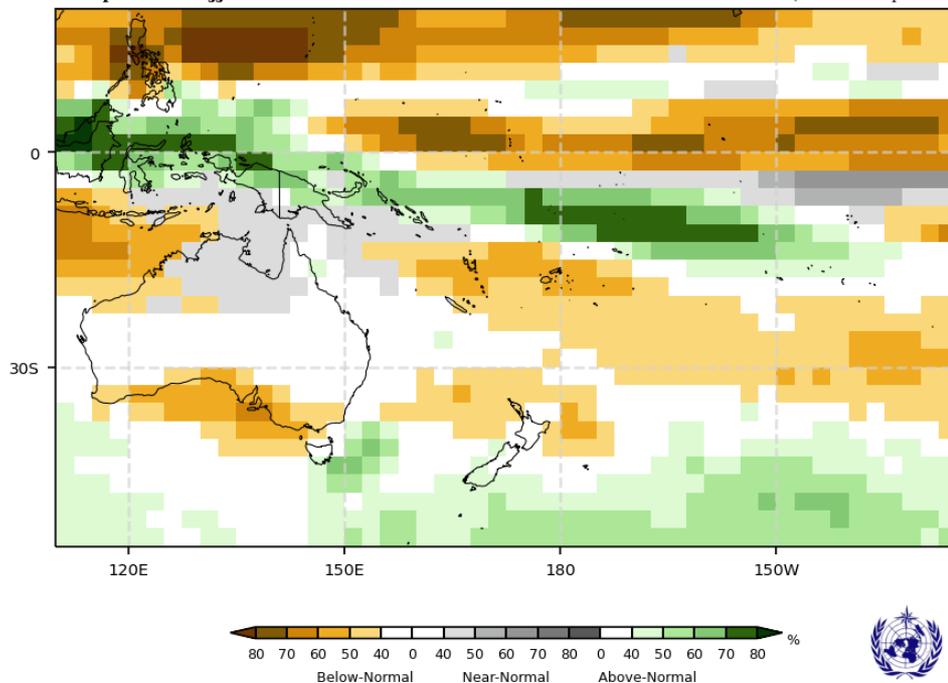
- May-July rainfall is favoured to be below normal (brown shading) in the off-equatorial South Pacific around New Caledonia, Vanuatu, and Fiji, along the equator (a change from previous seasons), and in the northwest Pacific. Note: models vary in the intensity and coverage of below normal rainfall near the equator.
- May-July rainfall is favoured to be above normal (green shading) in an area extending from Papua New Guinea to the Tuamotu Archipelago, including Solomon Islands, most of Tuvalu, Tokelau, Wallis & Futuna, Samoa, American Samoa, and the northern Cook Islands, and a narrow corridor from southern Palau to the southern Marshall Islands.
- Areas of near normal rainfall (gray shading) or no clear signal (white shading) may be found in the transition zones between above and below normal rainfall.
- May-July rainfall skill is generally good across the region and is highest near the equator.
- A key climate driver over the May-October period will be a waning El Niño, which is expected to give way to ENSO neutral conditions and possibly La Niña later on.

Probabilistic Multi-Model Ensemble Forecast

Beijing, CMCC, CPTEC, ECMWF, Exeter, Melbourne, Montreal, Moscow, Offenbach, Pretoria, Seoul, Tokyo, Toulouse, Washington

Precipitation : MJJ2024

(issued on Apr2024)



https://wmo.org/seasonPmmeUI/plot_PMME#



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- Awareness around the Northern Hemisphere ENSO “spring predictability barrier” and slightly lower model skill for rainfall predictions during ENSO neutral periods is encouraged.
- August-October rainfall is favoured to be below normal near the equator and in parts of the northwest Pacific. This means that some equatorial island groups have the potential to experience consecutive seasons with below normal rainfall. Normal or above normal rainfall is generally favoured in the off-equatorial South Pacific with a La Niña-like pattern predicted to develop.

Air temperature & wind

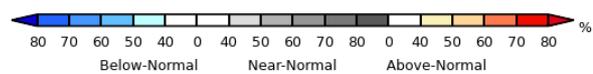
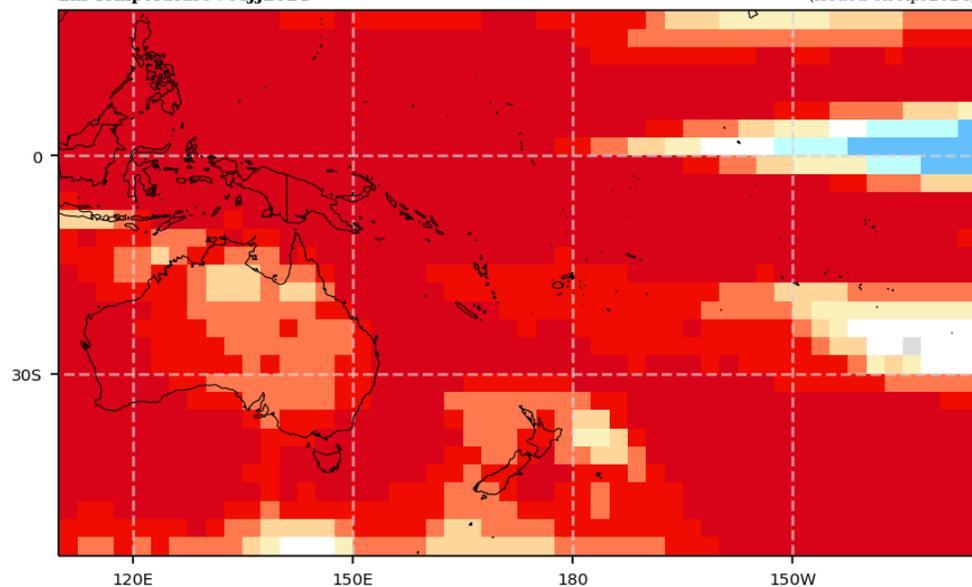
- May-July air temperatures are favoured to be above normal in all countries, a continuation of recent anomalous warmth across the region.
- August-October temperatures are favoured to be above normal except in Kiribati, consistent with a developing La Niña-like pattern.
- The combination of unusually warm temperatures and periods of higher humidity can contribute to heat stress.
- In the South Pacific, stronger-than-normal easterly winds are favoured over May-October, with northerly winds forecast toward the equator.

Probabilistic Multi-Model Ensemble Forecast

Beijing, CMCC, CPTEC, ECMWF, Exeter, Melbourne, Montreal, Moscow, Offenbach, Pretoria, Seoul, Tokyo, Toulouse, Washington

2m Temperature : MJJ2024

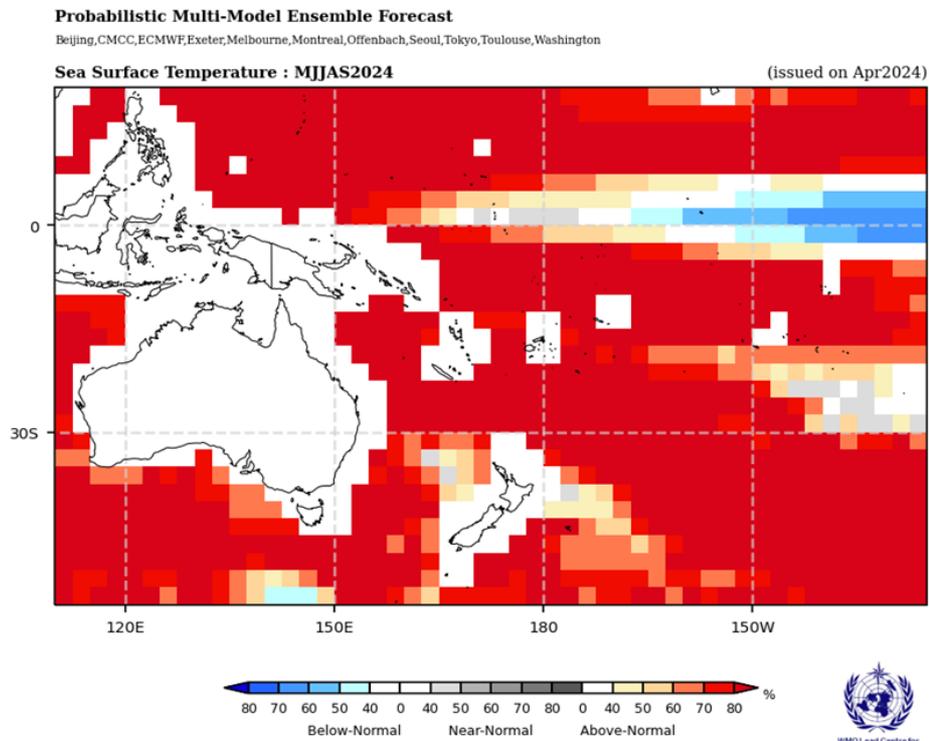
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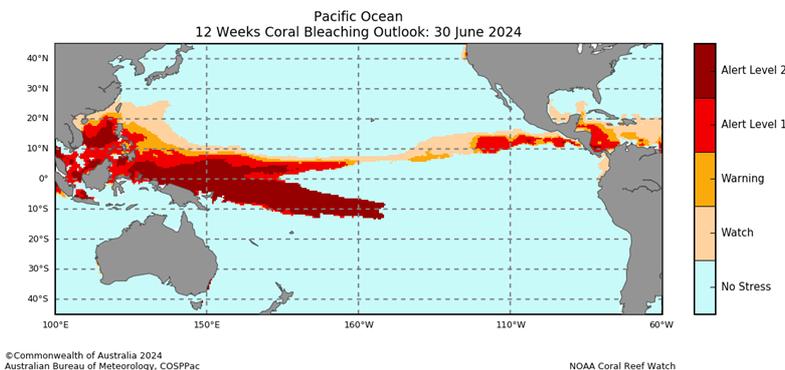
Ocean surface temperature, sea level & coral bleaching

- Near average to cooler than average SSTs are favoured to develop along equator, particularly east of 160E.
- Warmer than average SSTs are favoured in most of the non-equatorial regions, except around French Polynesia where near average conditions are favoured.
- Higher than normal sea levels are likely to emerge in Western Warm Pool regions such as Palau, FSM, Marshall Islands, PNG, and Solomon Islands. This may raise the risk for coastal inundation, especially with significant swells or surf.
- Lower than normal sea levels are forecast across the central to eastern equatorial Pacific, including central and eastern Kiribati.



https://wmo.org/seasonPmmeUI/plot_PMME#

- Coral bleaching alerts are forecast to be high across the tropical Pacific in upcoming weeks, moving towards the Western Warm Pool region over the next three months, but remaining high at Tuvalu, Tokelau, northern Cooks Islands, and northern Solomon Islands. While ocean heat stress is the major factor causing coral bleaching, other localised environmental stressors could also lead to coral bleaching.



- The SST convergence zone that forms the boundary of the western Pacific warm pool is an important feature for tuna fisheries, with a high correlation to skipjack abundance. This feature is predicted to expand further east across the tropical Pacific, with the exception being near the equator where the forecast position is much closer to average for July to September.

- PICOF-14 included a special presentation on the impacts of MHWs in the Pacific including likely scenarios under different climate projections. MHWs were found to have increased in occurrence and intensity in the tropical Pacific over the past 40 years.
- MHW projections under a high emissions scenario (SSP5-8.5) would be expected to have serious implications for food security, livelihoods and health of communities in Pacific Island countries. Adaptation options for



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communities to strong MHWs may be insufficient in the future in the absence of aggressive emissions reduction.

Tropical cyclones - South Pacific & Western North Pacific

- TC season runs from November-April in the South Pacific. Out-of-season (May-October) tropical cyclone activity sometimes occurs in the South Pacific. Therefore, it is important to keep up-to-date with forecasts from national meteorological services across the region.
- 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 potential onset of La Niña later in 2024 would favour a reduced TC threat for Micronesia and Hawaii. The official NOAA TC outlook for the region will be issued in May.
- It does not take a severe TC to produce severe impacts. Flooding rainfall can occur with a weaker or former TC especially when high river flows are already present. All communities should remain vigilant, monitor tide predictions, and follow forecast information provided by their National Meteorological and Hydrological Service (NMHS).

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 National Meteorological and Hydrological Services (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-14 had attendees from Fiji, Tonga, Tuvalu, BoM, CSIRO, NOAA, SPREP. The countries attended in person includes Australia, Fiji, French Polynesia, Kiribati, Marshall Islands, Micronesia (Chuuk and Pohnpei), New Caledonia, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Singapore, 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



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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), New Zealand MetService, the Asia-Pacific Economic Cooperation (APEC) Climate Centre (APCC), and the UN Environment Programme (UNEP).

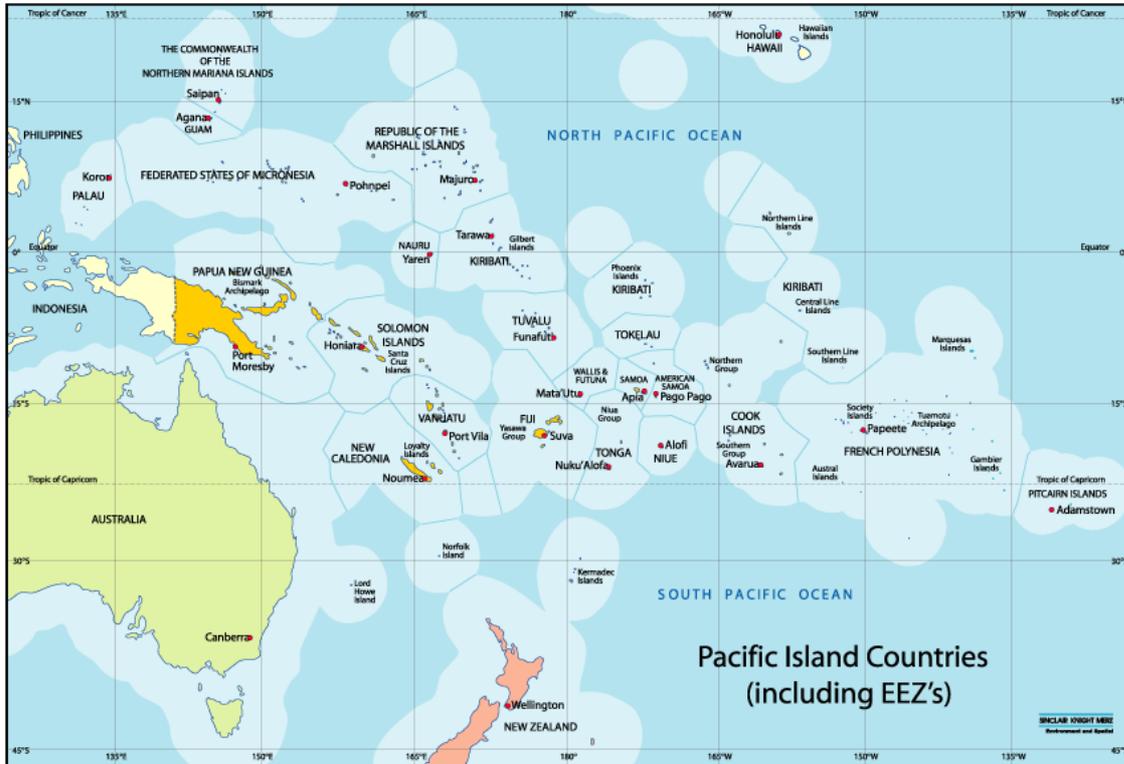
Close working relationships between Pacific rim and Pacific Island NMHSs, regional organisations, and WMO are critical to effective warning of climate hazards leading to early preparedness. Further enhancement of these relationships is essential, as well as relationships between NMHSs, their primary 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.

This statement is consistent with the Nuku'alofa Ministerial Declaration and Honiara Ministerial Statement 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 information



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

Important links



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<https://www.pacificmet.net/rcc>