



12th Pacific Islands Climate Outlook Forum Statement

This statement was produced by the [WMO RA-V Pacific Regional Climate Centre Network](#) following the 12th Pacific Islands Climate Outlook Forum (PICO-12) held on 20th April 2023, 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 – May to October 2023

- The ENSO status is currently neutral (neither El Niño nor La Niña). However, as there are signs El Niño may form later in the year an El Niño Watch is currently in place.
- Drier than normal conditions are favoured for the off-equatorial region east of the Date Line which is likely to weaken towards the third quarter of this year.
- Wetter than normal conditions are favoured for islands along the equator and the Melanesian countries.
- Warmer than normal air temperature likely for the whole of the Pacific Islands.
- Sea surface temperatures (SSTs) are favoured to be above normal across most of western, central, and southwestern Pacific.
- The risk for coral bleaching is enhanced along the entire equatorial Pacific between 10°S and 10°N latitudes from July.
- Sea level is favoured to be notably higher than normal for most of the countries across central to eastern equatorial Pacific, and at PNG, Solomon Is., Vanuatu, and southern Fiji/Tonga/Niue.
- El Niño events are associated with increase cyclone activities in the tropical northwest Pacific.

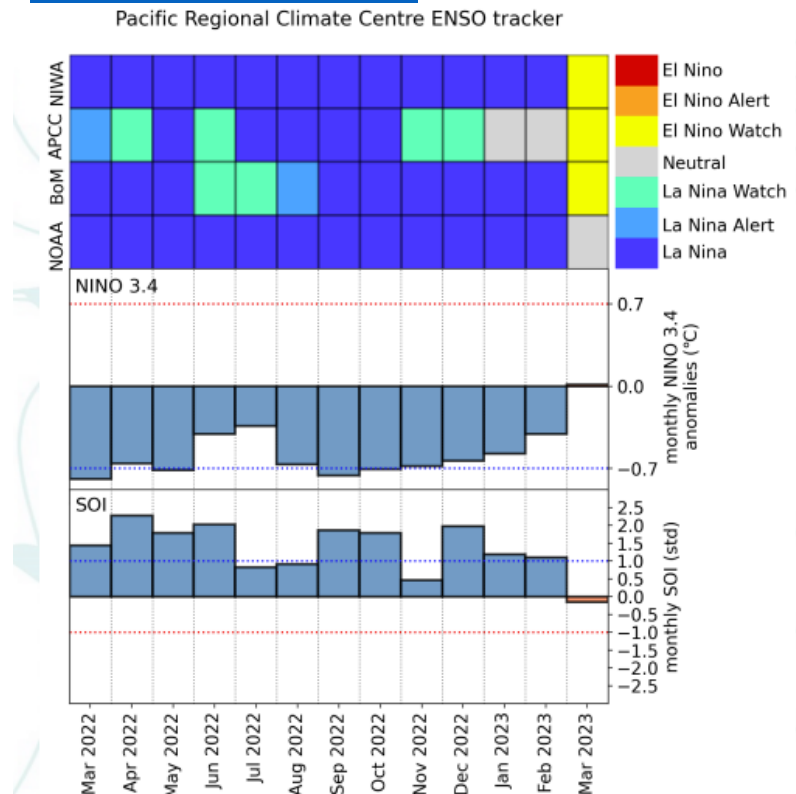
Climate in review – November 2022 to April 2023

- The tropical Pacific is currently ENSO-neutral ending a period of three consecutive La Niña's.
- Recent sea surface temperature observations show the extent of cooling along the equator decreasing and noticeable warming along the coast of South America
- Climate outlooks from October to December 2022 were assessed as being-consistent especially for near-equatorial regions while climate outlooks for January to March 2023 also verified well with strong model agreement throughout the South Pacific.
- Ocean conditions observed over the previous 6 months were consistent with the PICO-11 outlook with sea level generally remaining higher than normal in most countries.
- There have been 5 tropical cyclones (TCs) in the western South Pacific, with 3 of those categorised as severe TCs.
- The impacts were caused by strong winds generated from tropical cyclones caused damage to houses, fruit trees and crops. The La Niña event caused flooding in the western Pacific and drought in the central and eastern Pacific. It is also associated with higher sea levels in western Pacific. All extreme events have huge effects on sectors such as Infrastructure, Water, Health, Agriculture, Aviation, Shipping and Tourism sectors.

Climate outlook – May to October 2023

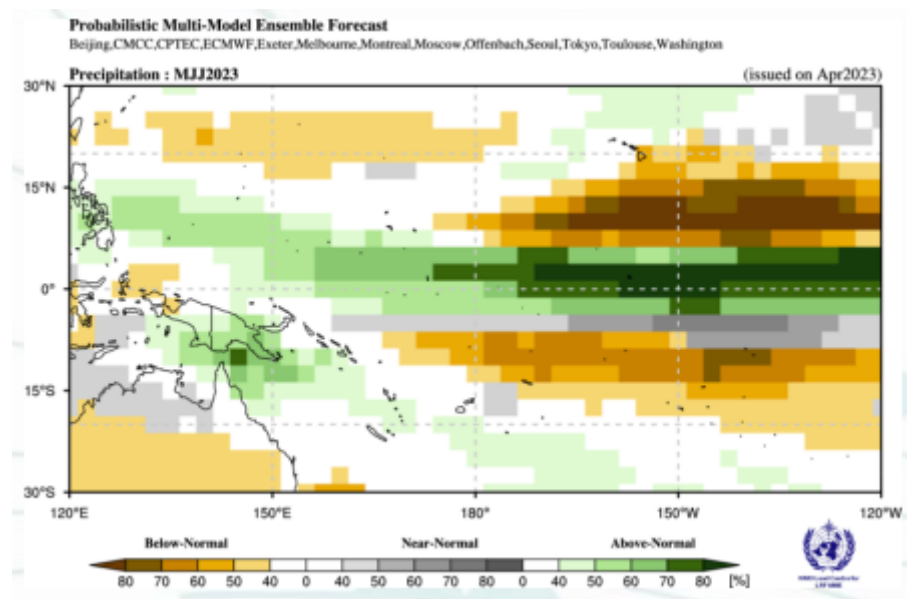
El Niño Southern Oscillation (ENSO) & [Pacific RCC ENSO Tracker](#)

- The Pacific RCC node ENSO tracker is currently at El Niño Watch
- Strong agreement from global models on a potential moderate to strong El Niño, however forecasts made at this time of year have lower accuracy than at other times.
- There is likely to be a major shift in climate patterns compared to the last several years if El Niño continues to develop, this is likely to result in changed rainfall and temperature patterns for the Pacific Islands.



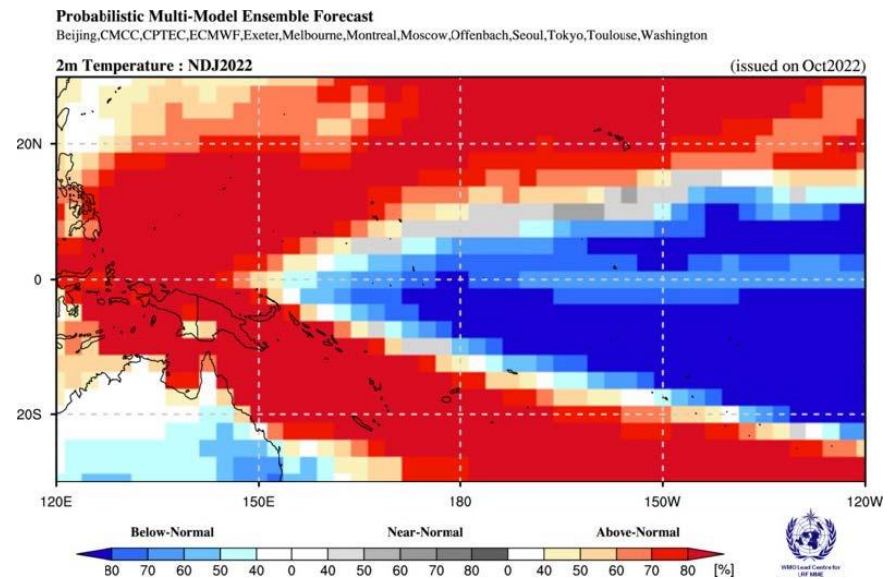
Rainfall

- For May – July 2023, wetter than normal conditions are favoured along the equator and for the Melanesian countries. Drier than normal conditions are favoured for the off-equatorial region east of the Date Line.
- For August–October 2023, wetter than normal conditions are likely to persist along the equator, with a reduction in the chances for drier than normal conditions for the off-equatorial region. Dry conditions are likely for Melanesia



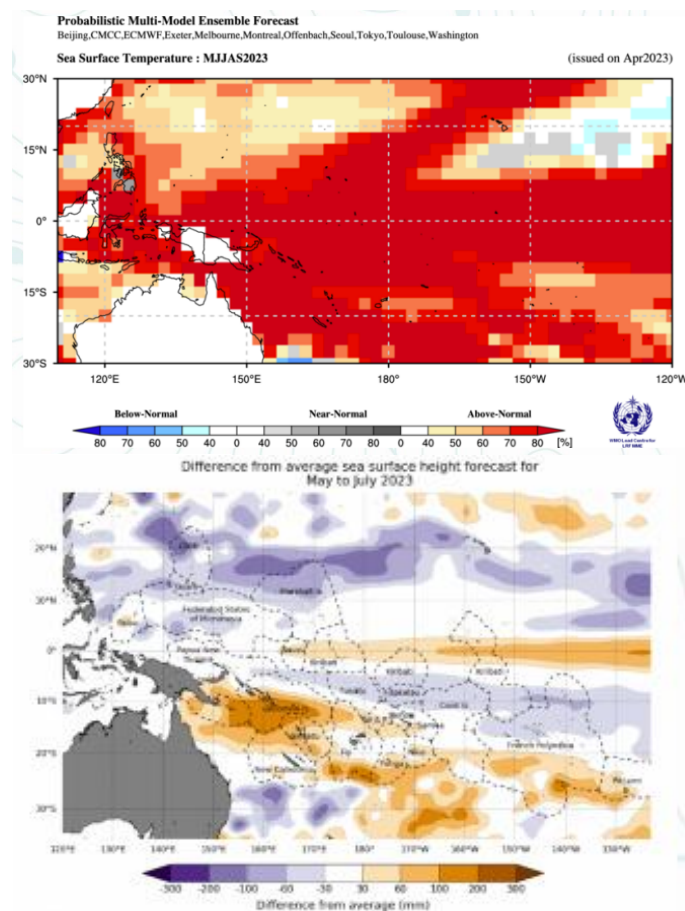
Air temperature & wind

- For May – July 2023, warmer than normal conditions are favoured for the whole Pacific Islands.
- Warmer than normal conditions are also favoured for August – October 2023.



Sea level, ocean surface temperature & coral bleaching

- SSTs are favoured to be above normal across most of western, central, and southwestern Pacific.
- El Niño-like warm tongue is likely to emerge across the equatorial Pacific, up to 4°C above average in ACCESS-S2, up to 2°C in most other models.
- Higher than normal sea levels are likely across central to eastern equatorial Pacific, and in PNG, Solomon Is., Vanuatu, and southern Fiji/Tonga/Niue.
- Many Pacific Island countries experience lower tides in June/July, but have tides in the top ten between August and October.



- The SST convergence zone that forms the boundary of the western warm pool is an important feature for tuna fisheries, with the area of skipjack abundance highly correlated within this region. The convergence zone is favoured to be displaced much further eastward along tropical Pacific in the upcoming seasons.
- Coral bleaching alerts are forecast to be present along the entire equatorial Pacific between 10°S and 10°N latitudes from July.

Tropical cyclones

- Tropical Cyclone guidance is for Northern Hemisphere (West Pacific).
- El Niño conditions support increased TC activity.

Status of key variables

- Air temperature was examined as a key variable for long-term trends as it is recognized as an important indicator of climate change and variability. Higher mean temperatures tend to be associated with more frequent and intense heat events. Higher mean and extreme temperatures lead to human and animal health issues and affect agricultural production. Higher temperatures are associated with an increase in energy usage required to maintain indoor comfort. Land-based annual mean air temperature increased by 1.1°C between 1951–2020. At a regional scale, mean temperature increased over both halves of the 70-year period (1951–1985, 0.5°C [0.9°F] and 1986–2020, 0.6°C [1.1°F]) and in all seasons. On a regional scale, 2020 was the warmest year on record, 0.9°C (1.6°F) above the 1961–1990 average of 24.9°C (76.8°F). Seven of the warmest eight years on record occurred from 2007. Every year since 1983 has been above the 1961–1990 average.
- Projected changes are tracking quite closely and it should be noted that near-term and short-term trends could be higher or lower than long-term trends appearing like ‘steps’ rather than a smooth change. Past and future warming indicate more warming over land than ocean and highest over the Arctic. Higher resolution modeling show details in current climate such as daily cycle and is likely to show different projected trends over land including enhanced warming.
- Ocean acidification also examined as a key variable for long-term trends as its effects are often exacerbated by warming oceans and other stressors. For coastal communities in the region, livelihoods, security, health and general wellbeing can be impacted by ocean acidification. It was however noted that there is a gap in observations and the establishment of the Pacific Islands Ocean Acidification Centre could be a centre of excellence to strengthen observations for ocean acidification, capacity building and knowledge sharing.
- As for future projections, there is a continuous trend of increasing ocean acidification. Greenhouse gas emissions pathways are important to understand the magnitude of impact. Only under RCP2.6 will the values of pH and aragonite/calcite saturation state begin to increase again towards the end of the century.



PICOF-11 outlook review

- La Niña was a dominant driver of atmospheric patterns across the Pacific between November 2022 and April 2023. Rainfall, air temperatures and winds reflected an established event. The atmospheric response to La Niña begun showing signs of weakening during March 2023, with atmospheric indicators of ENSO returning to ENSO-neutral levels during April.
- Climate outlooks from October to December 2022 were assessed as being good, especially for near-equatorial regions while climate outlooks for Jan – Mar 2023 also verified well with strong model agreement throughout the South Pacific.
- Ocean conditions observed were consistent with the outlook and well aligned with the La Niña and recent ENSO neutral state. For sea surface temperature, peak negative anomalies close to -1.5°C were observed in Kiribati and peak positive anomaly of more than 2°C observed in Vanuatu.
- Sea level generally remained higher than normal for most of the countries with countries close to the Coral Sea region experiencing peak anomalies of up to 30cm.
- Coral bleaching alert levels remained in western Pacific towards the end of last year and most recently, alert levels were for countries south of 10°S.
- PICOF-11 tropical cyclone outlook was generally consistent with more TC activity in the west and the predictability likely linked to La Niña
- Good guidance on the number of severe tropical cyclones, despite a lower overall number of tropical cyclones (5 total – fewest since 2016-17)
- Vanuatu especially hard-hit with TC Judy & Kevin in the same week; 3 total tropical cyclones passed near the island group.
- The very unusually warm seas toward the sub-tropics may affected stability profiles across the region, leading to fewer tropical cyclones overall.
- The impacts of the La Niña event since November 2023 were observed in all countries in the Pacific causing drought in northeast PNG islands, Nauru, Kiribati, Tuvalu, Tokelau, northern Cook Islands, and northern French Polynesia. Flooding was observed in Palau, PNG, New Caledonia, Vanuatu, Fiji, Tonga, Samoa, Niue and parts of French Polynesia. Coastal inundation was recorded in Marshall Islands, Solomon Islands, Kiribati and Tuvalu.



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 PICOOF since 2015. PICOOF is a platform used to discuss the seasonal outlook (ENSO, tropical cyclones, precipitation, temperature, and oceanic conditions) for the upcoming seasons, capacity build, and enable knowledge exchange between NMHSs and strengthen relationships between NMHSs and stakeholders.

PICOOF 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. PICOOF 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.

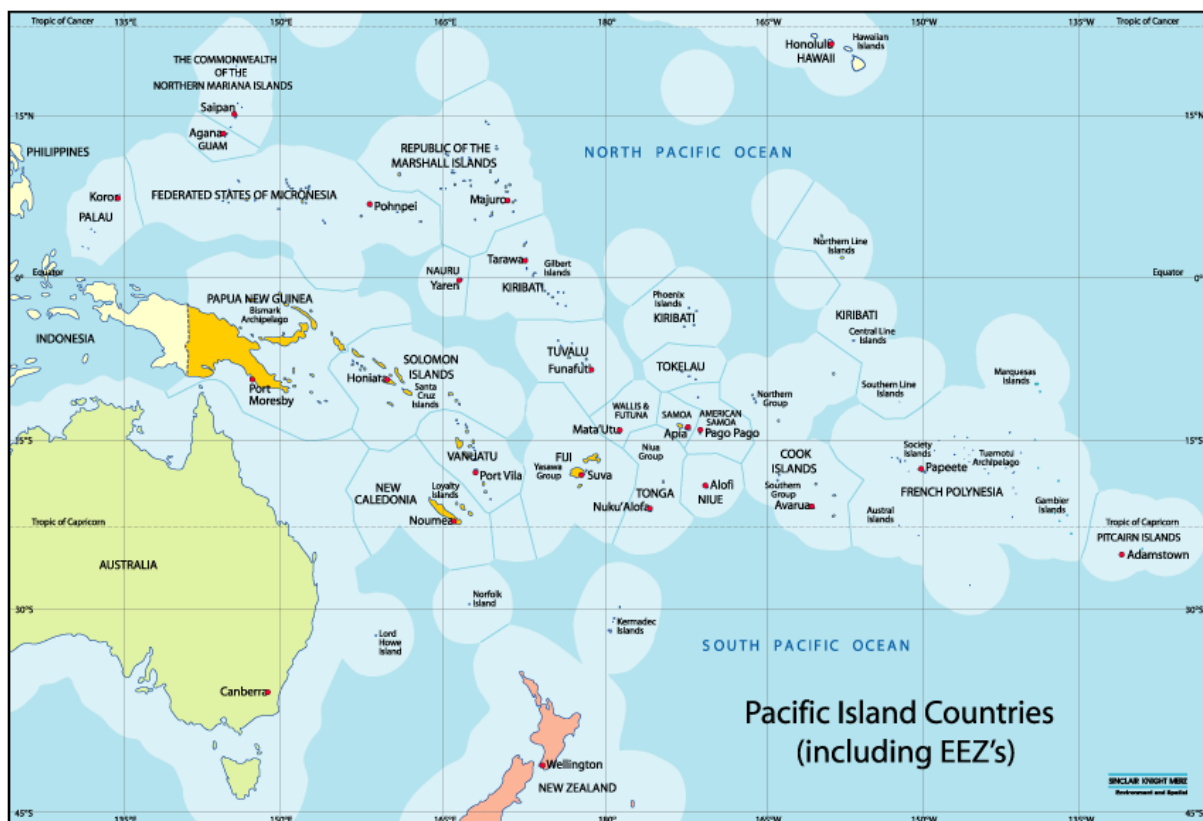
PICOOF-12 was attended virtually by members from American Samoa, Australia, Cook Islands, Fiji, Belgium, Cook Islands, French Polynesia, Guam, Italy, Kiribati, Micronesia, Nauru, New Caledonia, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, South Korea, Tonga, Tuvalu, United States 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), Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Asia-Pacific Economic Cooperation (APEC) Climate Center (APCC).

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 PICO. [Source](#).

Important links



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