# Eighth Meeting of the Pacific Meteorological Council (PMC-8)

## Weather Ready for a Secured and Sustainable Pacific

*10, 11, 14 September 2026 | Nuku'alofa, Tonga*

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**Agenda Item 15.2: El Niño-Southern Oscillation (ENSO) Update**

**Purpose:**

1. To report on the state of ENSO and potential impacts, noting that climate models forecast a strong to very strong El Niño event over 2026–2027.

**Background:**

1. This update is provided by the Pacific Regional Climate Centre Network nodes on seasonal prediction and climate monitoring. This paper provides a broad overview of the latest information; however, detailed monitoring and prediction information is not included due to the deadlines associated with submitting the paper. More detailed information will be prepared and presented closer to the PMC meeting to ensure that the PMC receives the latest available monitoring and prediction information.

2. Monitoring and predicting ENSO is critical for the Pacific region because ENSO is a major driver of year-to-year climate variability across Pacific Island countries. Changes in ENSO conditions can significantly influence rainfall, temperature, tropical cyclone activity, ocean temperature and sea level. Timely and reliable ENSO monitoring enables Pacific countries to anticipate potential climate impacts and strengthen preparedness across climate-sensitive sectors, including water resources, agriculture, fisheries, health, tourism and disaster risk management.

3. Continued ENSO monitoring and prediction along with the provision of seasonal climate outlooks through the Pacific Regional Climate Centre Network and National Meteorological and Hydrological Services (NMHSs) is therefore important for strengthening climate services, supporting early warning systems and improving the resilience of Pacific communities to climate-related hazards.

**ENSO Update:**

1. In June 2026, the node leads for climate monitoring and seasonal prediction (NOAA, ESNZ and BoM) reported that El Niño had developed in the tropical Pacific. Further strengthening has occurred since June, with continued intensification likely over the coming months.

2. Equatorial sea surface temperatures (SSTs) are above average across the central and eastern Pacific Ocean. Model forecasts indicate that the tropical Pacific is likely to continue warming

through the Southern Hemisphere spring (September–November, SON), with El Niño expected to peak in late spring or summer (December–February, DJF). The strength of the developing event, together with the typical life cycle of El Niño, suggests that El Niño conditions may persist into, and potentially through, autumn (March–May, MAM) 2027.

3. Atmospheric indicators, including trade winds, atmospheric pressure and cloud patterns, are consistent with El Niño conditions. Trade winds are weaker than average or reversed across parts of the western tropical Pacific, cloudiness is enhanced near the International Date Line and suppressed over the Maritime Continent, and the Southern Oscillation Index (SOI) remains strongly negative.

4. Forecasts indicate the potential for a strong to very strong El Niño event, based on the magnitude and extent of warming across the central tropical Pacific. The majority of models indicate that the event is likely to peak at levels among, or potentially exceeding, the highest observed since 1950.

**Impacts:**

1. A strong El Niño signal in the Niño 3.4 region is likely to result in significant impacts on the climate of Pacific Island nations, given that ENSO is a primary driver of seasonal climate variability across the Pacific. However, the influence of long-term climate change may modify the nature and magnitude of these impacts during 2026–2027, increasing uncertainty when compared with historical El Niño events.

2. Historically, the impacts of El Niño have been delayed in countries such as the Federated States of Micronesia (FSM), Fiji and Tonga, which are located away from the equatorial Pacific. This means that there may be a lag of one or more months between the onset of El Niño conditions and the emergence of impacts in these countries. Similarly, impacts may persist for one or more months after El Niño conditions begin to weaken or conclude.

3. During El Niño events, rainfall typically exhibits a strong spatial contrast across the Pacific, with below-normal rainfall favoured across much of the western, northwestern and southwestern tropical Pacific. In contrast, above-normal rainfall is generally favoured across parts of the central equatorial Pacific. Current outlooks broadly reflect this expected El Niño rainfall pattern.

   Areas with a strong likelihood of below-normal rainfall may face an increased risk of drought, reduced freshwater availability, agricultural impacts and increased pressure on water resources. Prolonged dry conditions may also increase vegetation stress and the risk of wildfires. Conversely, areas favoured to receive above-normal rainfall may experience improved water availability, but also an increased risk of heavy rainfall, flooding, waterlogging and landslides. These conditions could affect agriculture, infrastructure, transport and public health. The magnitude of impacts will depend on the persistence and intensity of the rainfall anomalies, as well as local conditions and the occurrence of shorter-term weather events.

4. El Niño events are often associated with a pronounced east–west gradient in sea surface height across the tropical Pacific, with below-average sea surface heights across much of the western

Pacific and above-average sea surface heights across the central and eastern equatorial Pacific. Current outlooks indicate a similar pattern, consistent with the expected ocean response to a strong El Niño event.

Areas experiencing above-normal sea surface heights will be at higher risk of coastal inundation and flooding during high tides, large waves and tropical cyclone events. The combination of elevated sea surface heights and storm surge could further increase coastal impacts during tropical cyclones. Higher-than-normal sea surface heights may also contribute to increased coastal erosion and exposure of low-lying infrastructure, settlements, roads, ports and other critical facilities. In low-lying Pacific Island countries, coastal inundation can also increase the risk of saltwater intrusion into freshwater lenses and agricultural areas.

Conversely, below-normal sea surface heights may experience increased exposure of shallow coastal environments, particularly during low tides. This may temporarily expose shallow coral reefs, reef flats and other intertidal ecosystems to greater levels of solar radiation and atmospheric heating, potentially increasing thermal and physical stress. Lower sea levels may also affect lagoon circulation and water exchange in some atoll environments, with potential implications for water quality and marine ecosystems.

5. El Niño is typically associated with significantly above-average SSTs across the central and eastern equatorial Pacific, while below-average SSTs occur across parts of the western and southwestern Pacific. The current outlook indicates a similar pattern, with substantial positive SST anomalies forecast across the central and eastern equatorial Pacific and cooler-than-normal conditions across parts of the western Pacific.

   The forecast of above-normal sea surface temperatures across much of the central and eastern Pacific may have significant implications for marine ecosystems, fisheries and climate conditions across the region. Prolonged elevated ocean temperatures can increase thermal stress on coral reefs and other marine ecosystems, potentially contributing to coral bleaching and changes in marine productivity and species distribution. Changes in ocean temperatures associated with ENSO can also influence the distribution and availability of important fisheries resources, including tuna, with potential implications for fishing activities and livelihoods. Warmer ocean conditions may also contribute to conditions favourable for tropical cyclone development in some areas, although cyclone activity is influenced by a range of atmospheric and oceanic factors. Conversely, cooler-than-normal ocean conditions in some areas may reduce thermal stress on coral reefs and provide temporary relief from heat-related impacts such as coral bleaching.

5. During El Niño events, tropical cyclone activity in the western Pacific generally shifts eastward, with a tendency for reduced cyclone formation in the western Pacific and increased activity towards the central and eastern Pacific. This eastward displacement can alter the areas at greatest risk of tropical cyclone impacts across Pacific Island countries. However, the relationship between ENSO and tropical cyclone activity varies by location and season, and individual severe cyclones can still occur even where overall cyclone activity is reduced.

6. The past may not be a reliable guide to future impacts. The 1997–1998 El Niño event is often used as a benchmark for understanding the potential impacts of a strong El Niño in the Pacific. However, the Pacific has changed significantly since then. Population has increased across the

region, particularly in Melanesian countries, and more people and critical infrastructure are located in coastal areas. At the same time, water resources remain constrained in many Pacific Island countries, while the climate system is substantially warmer than during the 1997–1998 event. Global mean surface temperature was approximately 0.6°C above pre-industrial levels in 1998, compared with approximately 1.45°C in 2026. Consequently, the impacts of the 2026–2027 El Niño may differ from those experienced during previous strong El Niño events, and preparedness should account for the possibility of unexpected or unprecedented impacts.

**Advocacy to date, Products and Services:**

1. Public awareness campaigns have been far more prominent for the 2026 El Niño event than for similar events in the past. There have been strong social media campaigns from countries including Niue, Cook Islands, Samoa, Tonga and Fiji, providing information on the potential impacts of El Niño in their respective countries, as well as advice on preparedness and risk reduction.

2. There have also been social media campaigns by NMHS stakeholders and other key service providers, such as Energy Fiji Limited, encouraging customers to reduce electricity consumption where possible. These initiatives demonstrate the broader use of climate information to support preparedness and promote practical actions in response to potential El Niño impacts.

3. Unlike during the severe El Niño events of the 1980s and 1990s, NMHSs now have access to a wide range of climate products and services to support monitoring, prediction and preparedness. These include products and services provided by international and Pacific Rim agencies, including the United Nations, WMO, BoM, ESNZ and Météo-France. Regional support is also available through organisations such as the Pacific Regional Climate Centre, SPREP and SPC, as well as a range of regionally and nationally funded aid programmes and projects, including, but not limited to, COSPPac, SPREP ClimSA and UNEP CIS-Pac5.

**Recommendations:**

The Meeting is invited to:

- **Note** that El Niño conditions developed in June 2026 and are likely to strengthen to a strong to very strong event, with the potential to result in significant climate impacts across the tropical Pacific Island region. The magnitude and nature of these impacts remain subject to some uncertainty due to the influence of long-term climate change.

- **Note** that the end of phase or conclusion of three major climate service programs COSPPac, ClimSA and UNEP CIS-Pac5 coincides with a period of heightened climate risk. El Niño is forecast to strengthen significantly, persist into and potentially through 2027, and potentially

rank among the strongest events in the historical record. This timing highlights the critical importance of maintaining strong climate services, early warning systems and preparedness capacity across the Pacific.

- **Request** urgent engagement by donors and implementation partners to ensure continuity of critical climate services, technical expertise and institutional capacity through and beyond 2027. Without sustained investment, the Pacific risks losing hard-won capabilities and creating significant gaps in the services required to anticipate, prepare for and respond to future climate extremes.

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