Climate Services Division

ENSO Update

El Niño–Southern Oscillation remains neutral

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Fiji Meteorological Service

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Content

In Brief

- ENSO neutral conditions continues to persist in the tropical Pacific Ocean.
- Sea surface temperatures in the tropical Pacific are likely to reach or exceed the La Niña threshold in the coming months.
- ENSO-neutral state is likely to transition to a weak La Nina state during December 2024 to February 2025 period.
- During a La Niña event, Fiji generally experiences *above average* rainfall.
- Fiji Met Service will continue to closely monitor ENSO conditions and provide updates accordingly.

History and Current Situation

History

From October 2023, a moderate El Niño was established, which peaked in December 2023, before it slowly decayed and returned to neutral (neither El Niño nor La Niña) state by April 2024. From there onwards, ENSO remained neutral for most of the year.

Current Situation

The El Niño–Southern Oscillation (ENSO) is currently neutral. Sea surface temperatures (SSTs) were above average in the western Pacific Ocean, with near to below average SSTs observed in the eastern to central Pacific and across the eastern Pacific Ocean. Below average temperatures remain at depth in the eastern to central and eastern Pacific Ocean, while above average temperatures prevail at depth and near the surface in the western Pacific.

The SOI for October 2024 was 4.2, with a 5-month running mean of 0.2. The latest 30-days average SOI until 22nd November, 2024, was 3.8. Trade winds have been above average across the western tropical Pacific and close to average across the central Pacific. Cloudiness near the equatorial Date Line has been below average since September. The oceanic and atmospheric indicators are indicative of neutral ENSO conditions, while some indicators have shown La Niña like signals over recent months.

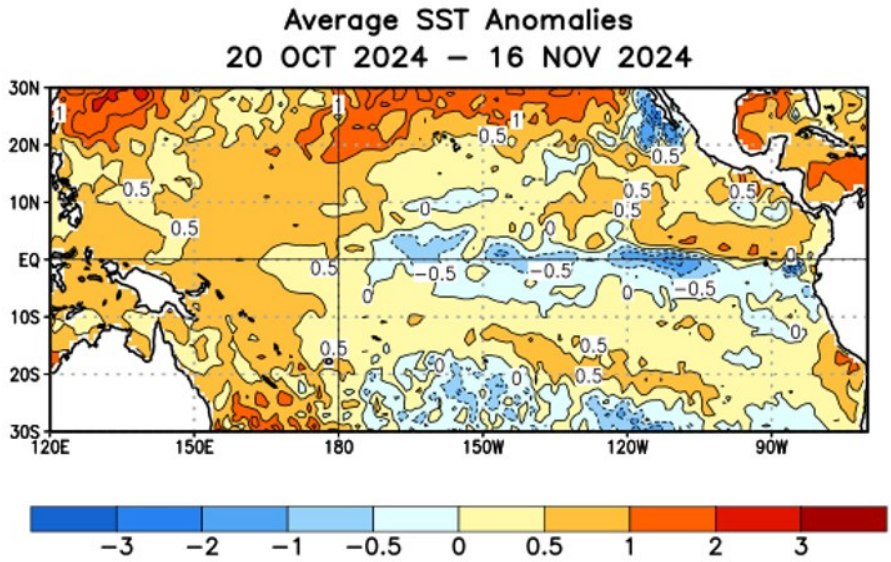
ENSO Outlook

Sea surface temperatures in the tropical Pacific remain at neutral levels. However, SSTs are likely to exceed the La Niña threshold in the coming months. Atmospheric indicators such as pressure, cloud cover, and trade winds are broadly consistent with an ENSO-neutral state. While some of the indicators have displayed La Niña-like signals over recent months, a consistent and sustained shift in the atmosphere has not been observed.

The current ENSO-neutral status continues, with a transition to a weak La Niña state likely during December 2024 to February 2025 period. FMS will continue to closely monitor the ENSO conditions and provide updates accordingly.

Fiji usually experiences *above normal* rainfall during a La Niña event.

Figure 1: Sea Surface Temperatures (SSTs) in the Pacific Ocean

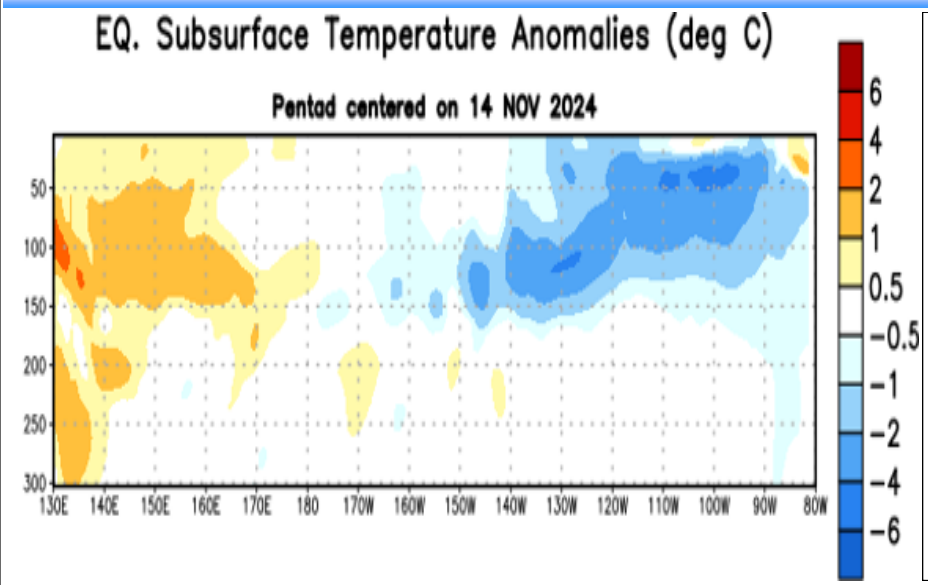


Sea surface temperatures (SSTs) were *above average* in the western Pacific Ocean. In contrast, SSTs ranged from *near to below average* in the east to central Pacific and the across the eastern Pacific Ocean.

[Sustained warm SSTs in the equatorial Pacific Ocean are associated with El Niño events and cool anomalies with La Niña events].

Image source: USA's National Oceanic and Atmospheric Administration (NOAA).

Figure 2: Sub-surface Waters in the Equatorial Pacific Ocean

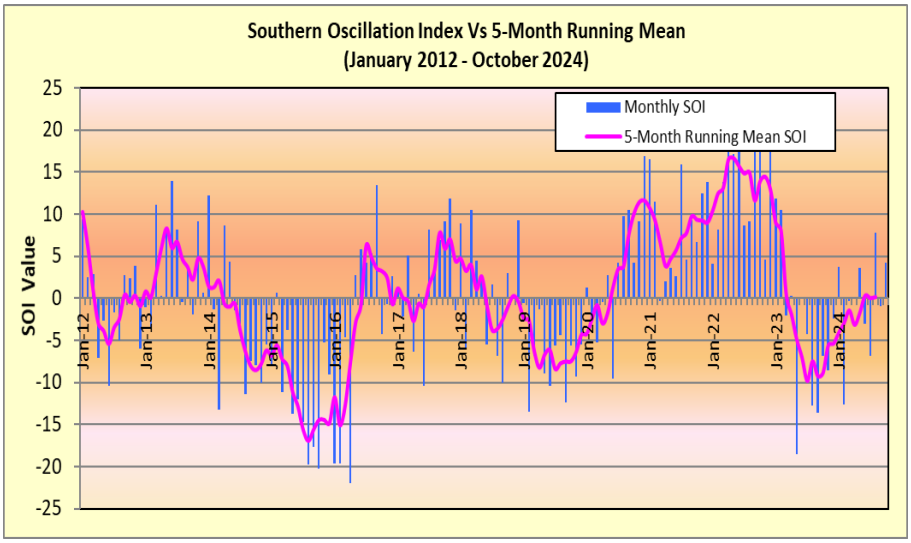


Negative subsurface temperature anomalies have persisted in the eastern equatorial Pacific Ocean and has extended to the surface. *Below average* temperatures remain at depth in the east to central and eastern Pacific Ocean, while *above average* temperatures prevail at depth and near the surface in the western Pacific.

[Waters below the surface of the ocean are good indicator of what may eventually happen at the surface in the coming months].

Image source: NOAA.

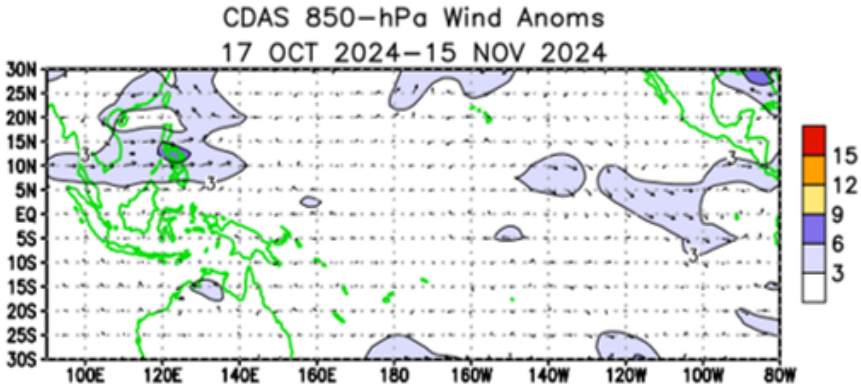
Figure 3: Southern Oscillation Index (SOI)



The SOI for October 2024 was 4.2, with the 5-month running mean of 0.2. The latest 30-days average SOI to 22nd November 2024 was 3.8, which is still within the neutral category.

[Sustained values of SOI above +7 indicate presence of La Niña event and sustained values below -7 signify El Niño event].

Figure 4 : Near surface winds in the Pacific Ocean

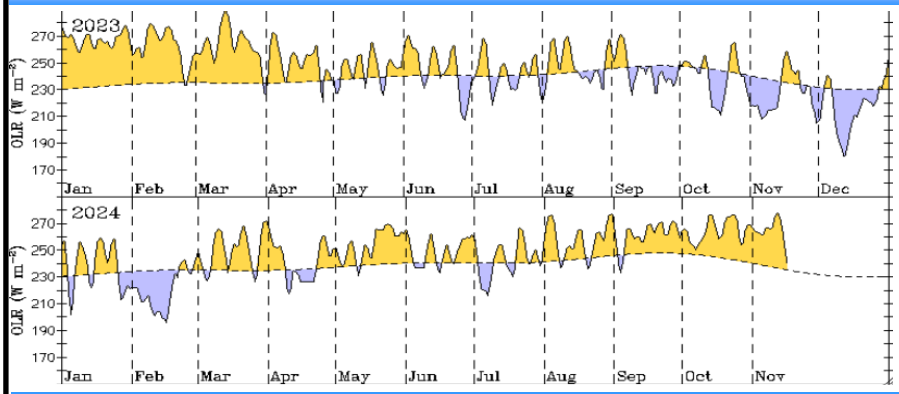


Trade winds have been slightly *above average* across the western tropical Pacific and close to *average* across the central Pacific.

[During El Niño there is a sustained weakening, or reversal, of the trade winds across much of the tropical Pacific. Conversely, during La Niña, there is a sustained strengthening of the trade winds].

Image source: NOAA.

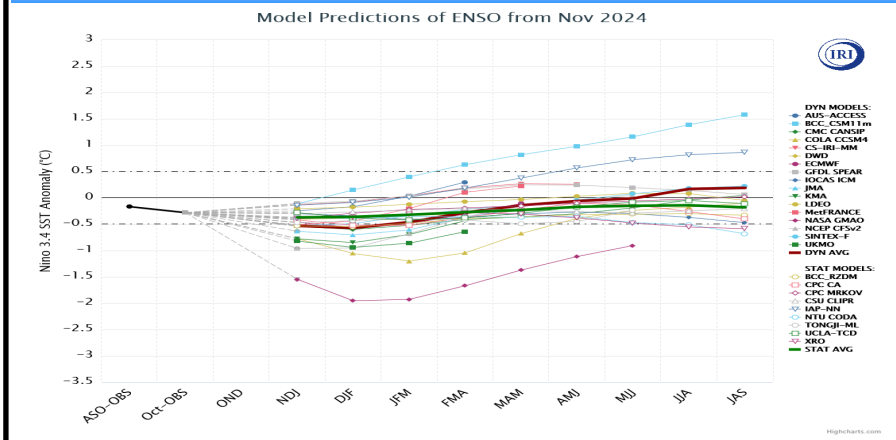
Figure 5 : Cloudiness near the Dateline



Cloudiness near the equatorial Date Line is currently *below average*. Prior to September, cloudiness fluctuated around average for most of the year.

[Equatorial cloudiness near the Date Line typically increases during El Niño (negative OLR anomalies) and decreases during La Niña (positive OLR anomalies)].
Image source: Australian Bureau of Meteorology.

Figure 6: Climate Model Predictions of ENSO



Climate models on average show that the current ENSO-neutral state is likely to transition to a weak La Nina state during December 2024 to February 2025.

Image source: International Research Institute for Climate and Society.

Explanatory Note - El Niño and La Niña

ENSO is an irregular cycle of persistent warming and cooling of SSTs in the tropical Pacific Ocean. The warm extreme is known as El Niño and cold extreme, La Niña.

The term El Niño was given to a warming of the ocean near the Peruvian coast in South America that appears around Christmas. Scientists now refer to an El Niño event as sustained warming over a large part of central and eastern equatorial Pacific Ocean. This warming is usually accompanied by persistent negative values of Southern Oscillation Index (SOI), a decrease in the strength or reversal of the Trade winds, increase in cloudiness near Dateline in the equatorial Pacific and a reduction in rainfall over most of Fiji (not immediate effect as there is a lag period) which can, especially during moderate to strong events, lead to drought.

La Niña is a sustained cooling of the central and eastern equatorial Pacific Ocean. The cooling is usually accompanied by persistent positive values of SOI, an increase in strength of the equatorial Trade winds, decrease in cloudiness near the Dateline in the equatorial Pacific and higher than average rainfall for most of Fiji (not immediate effects as there is a lag period), with frequent and sometimes severe flooding, especially during the wet season (November to April).