Climate Services Division

ENSO Update

El Niño–Southern Oscillation is currently 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 central tropical Pacific is likely to continue to cool in the coming months.
- ENSO-neutral conditions are likely to persist until at least July 2024, with a transition to La Niña state likely during August to October 2024 period.
- During neutral ENSO conditions, Fiji generally experiences average rainfall. However, local weather systems and lingering effects of previous El Niño event can still cause variations, especially during the dry season.
- Fiji Met Service will continue to monitor the ENSO conditions closely and provide updates accordingly.

History and Current Situation

History

The sea surface temperatures in the central and eastern equatorial Pacific Ocean warmed during July 2023, with most oceanic and atmospheric indicators implying an establishment of a weak El-Niño event. Since then the Pacific Ocean has been consistent with a weak El-Niño event. From October onwards, the event intensified into a moderate El Niño, peaked in December, and ended, returning to neutral state around mid-April 2024.

Current Situation

The El Niño–Southern Oscillation (ENSO) is currently neutral. SSTs were above average in the central and western Pacific Ocean, with near to below average SSTs evident in the east-central and eastern Pacific Ocean. Negative subsurface temperature anomalies have dominated the equatorial Pacific Ocean. Below average temperatures reached the surface in the eastern Pacific Ocean.

The SOI for April 2024 was –6.3, with the 5-month running mean of –2.9. The latest 30-days average SOI until 20th May 2024 was –0.6. Trade winds have been mostly close to average across much of the equatorial Pacific. Cloudiness near the equatorial Date Line is currently close to average, although it has been slightly above average during most of May. Overall, the oceanic and atmospheric indicators are indicative of neutral ENSO conditions.

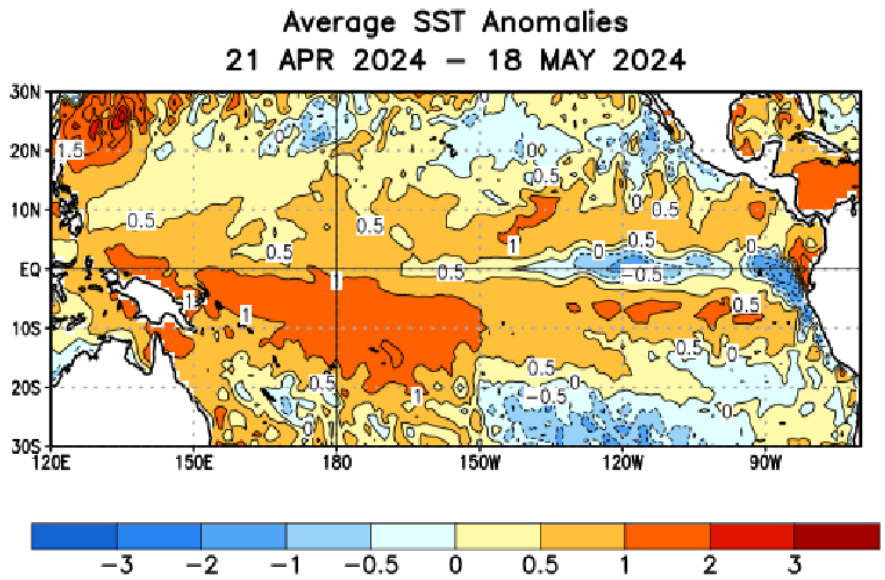
ENSO Outlook

Sea surface temperatures in the central Pacific are likely to cool in the coming months, with reaching to La Niña levels expected around the August to October 2024 period.

The current ENSO-neutral status continues, with a transition to La Niña state is likely during August to October 2024. FMS will continue to monitor the ENSO conditions closely and provide updates accordingly.

During ENSO-neutral conditions, Fiji is likely to experience average rainfall. However, local weather systems and other climate influences can still cause variations in rainfall during ENSO-neutral periods. Additionally, the lag effect of the past El Niño may continue to impact rainfall during the dry season.

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

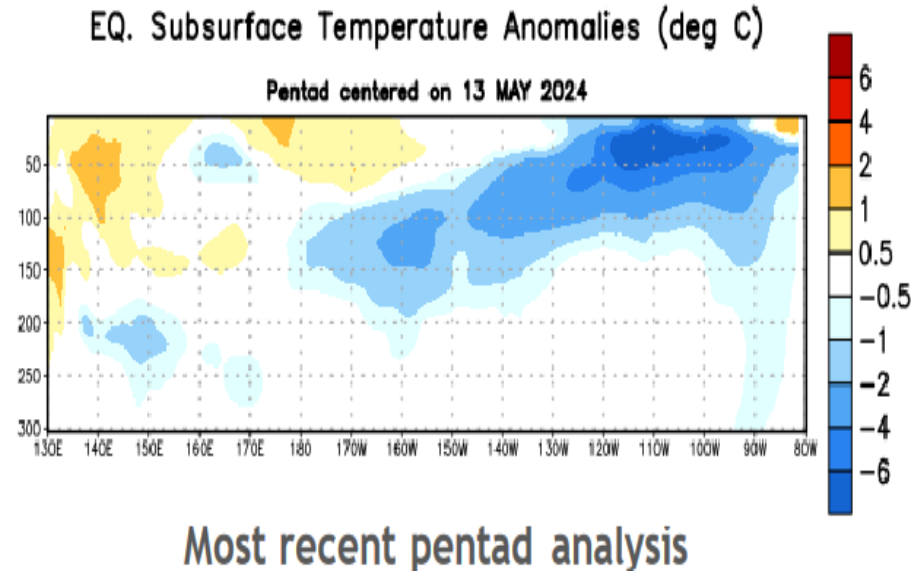


Sea surface temperatures (SSTs) were *above average* in the central and western Pacific Ocean. In contrast, SSTs ranged from *near average to below average* in the east-central and eastern Pacific Ocean.

[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

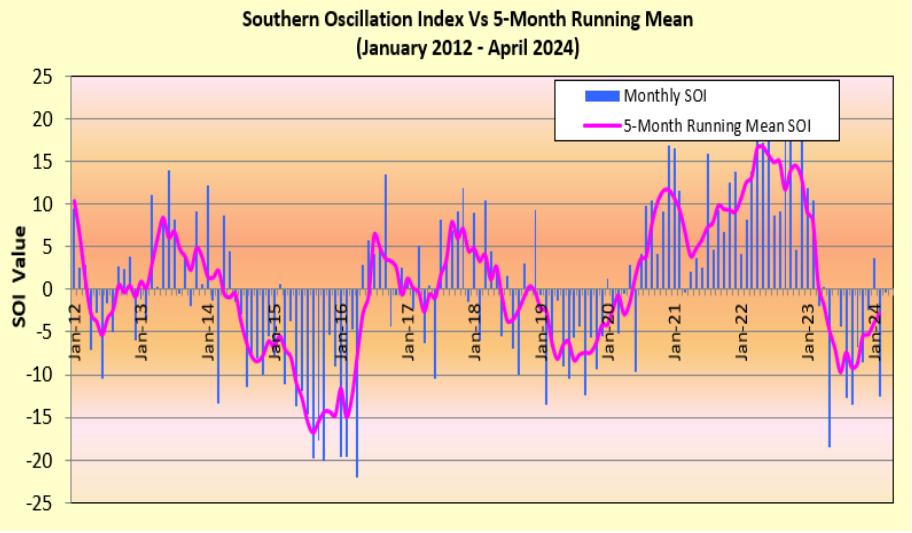


The equatorial Pacific Ocean has experienced persistent negative subsurface temperature anomalies. These *below average* temperatures have reached the surface in the eastern Pacific Ocean, specifically in the region between 130ºW and 90ºW.

[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.

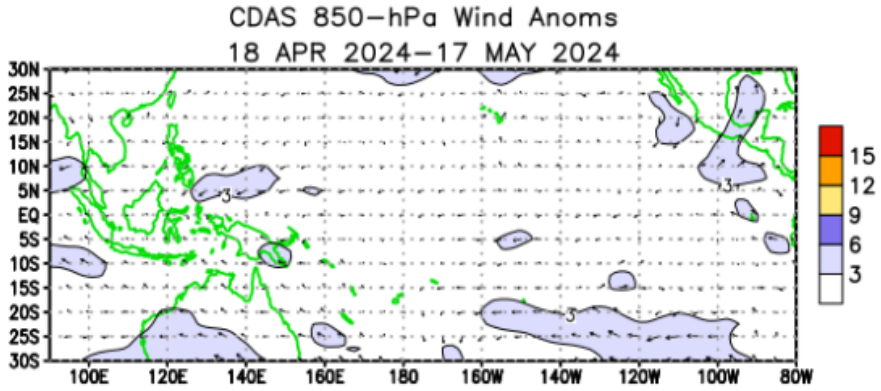
Figure 3: Southern Oscillation Index (SOI)



The SOI for April 2024 was –6.3, with the 5-month running mean of –2.9. The latest 30-days average SOI to 20th May 2024 was –0.6.

[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

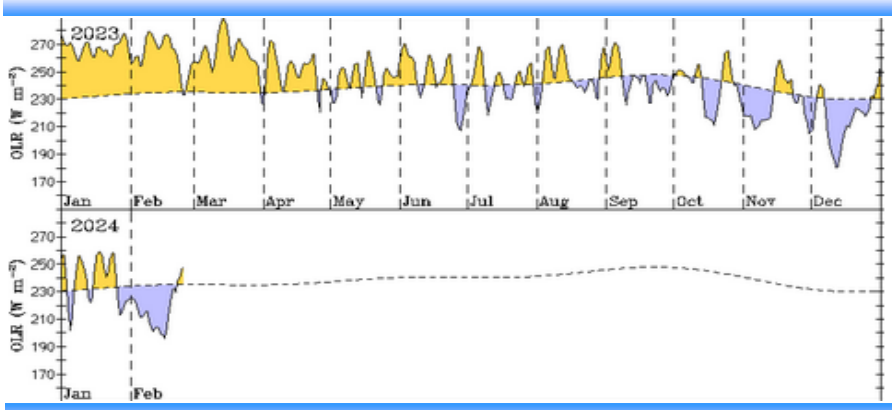


Trade winds have been mostly close to average across much of the equatorial Pacific, with slightly stronger than average winds observed over the central Pacific.

[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

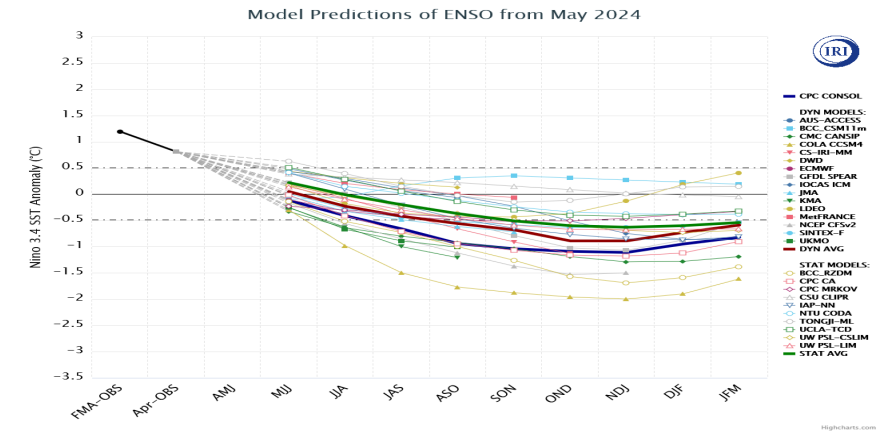


Cloudiness near the equatorial Date Line is currently close to average. For most of May, cloudiness has been slightly above average.

[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 will persist until at least July 2024 and then transition to La Niña during August to October 2024.

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).