



Fiji Meteorological Service

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Climate Outlook for Hydro-electricity Generation from October to December 2023

Current Conditions

Fiji's Climate

The weather across the country during 1st to 27th September, was affected by a series of troughs of low pressure systems. Rain was experienced over most parts of the country, with some places experiencing heavy falls with flooding.

Overall, out of the 18 rainfall stations that reported in, in time for the compilation of this bulletin, 6 stations recorded *well above average* rainfall, 5 *above average*, 4 *average*, and 1 *below average* rainfall and 2 recorded *well below average*.

We noted, Monasavu, continued to receive rainfall, recording more than twice its normal rainfall. In comparison against the station's 30 years average, *well above average* was observed at the station.

The total monthly rainfall for Monasavu (until 27th September) was 770.9 mm, which was 286% of the *normal*. During July to 27th September, Monasavu recorded 1407mm of rainfall, which was 194% of the *normal*, while in the past 6 months (April to 27th September), 2165mm of rainfall was registered (122% of the *normal*) (Figure 1).

El Niño Southern Oscillation (ENSO) Status

The Pacific Ocean is now into a weak El Niño state. The sea surface temperatures (SSTs) are warmer than average over most of the tropical and southern Pacific Ocean and are near average in the Western Pacific Ocean. The sub-surface ocean waters across the equatorial Pacific Ocean continue to be significantly warmer than normal.

The Southern Oscillation Index (SOI) for August 2023 was -12.7, with the 5-month running mean of -7.0. The latest 30-day value to 26 September 2023 was -15.0.

Trade wind strength has been generally close to average, but was slightly weaker than average across the tropical Pacific. Equatorial cloudiness near the Date Line has alternated between brief periods of above and below average values since late April.

Overall, oceanic and atmospheric indicators for the tropical Pacific Ocean are indicative of a weak El Niño event.

El Niño-Southern Oscillation and Monasavu Climate Predictions

El-Niño Southern Oscillation Prediction

Climate models on average show that the current El Niño is expected to gradually strengthen through to the December 2023 to February 2024 period.

Minimum & Maximum Air Temperature Predictions - October & October to December 2023:

Minimum air temperatures are likely to be *near normal* across most parts of the country, while *near normal* to *above normal* day time temperatures are favored during October and October to December period (Figure 3).

Rainfall Predictions: Fortnightly: 1st - 14th & 8th - 21st October

Rainfall is likely to be below median across Viti Levu during the above mentioned fortnights.

October 2023

There is 75% chance of receiving at least 56 mm of

rainfall at Nadarivatu station, 75% chance of at least 65 mm of rainfall at Nadarivatu Dam and Monasavu, and 75% chance of at least 71 mm of rainfall at Wailoa. There is moderate confidence in this forecast (Table 1).

October to December 2023

For the October to December 2023 period, there is 75% chance of receiving at least 376 mm of rainfall at Nadarivatu station and 75% chance of at least 402 mm of rainfall at Nadarivatu Dam and Monasavu, and 75% chance of receiving at least 433 mm of rainfall at Wailoa. There is high skill on the generated outlook (Table 1).

Summary

Taking note of the already established El Niño event, overall, drier than usual conditions are likely to be experienced across Viti Levu during October, as well as the October to December 2023 period.

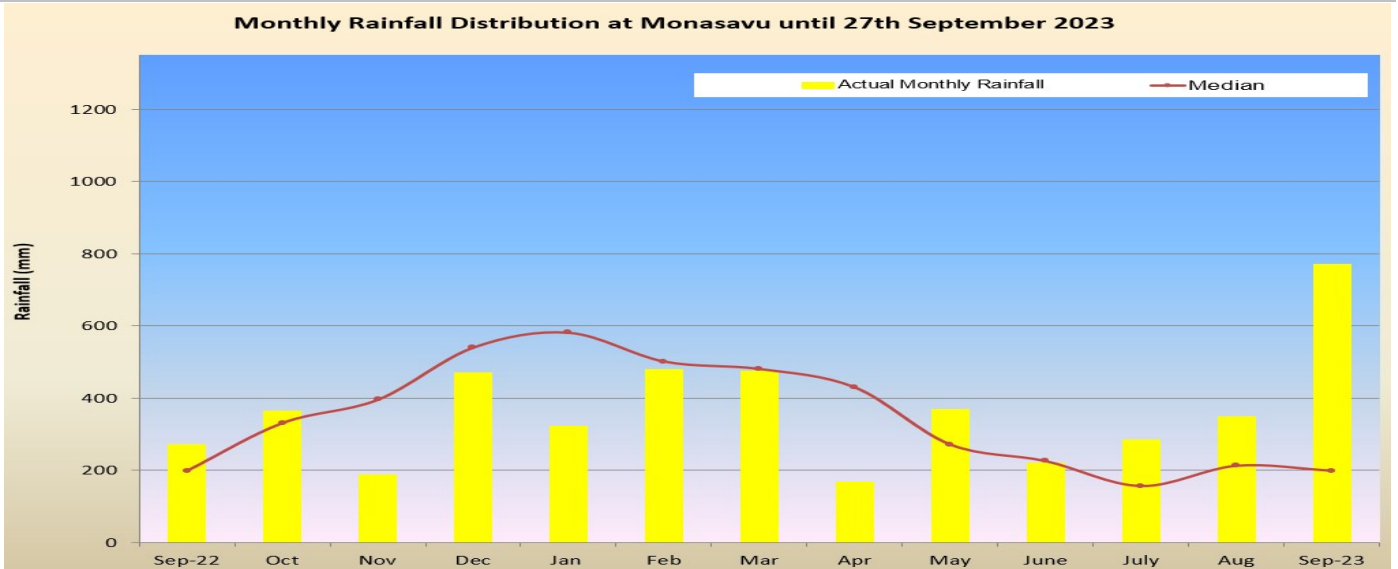


Table 1: Rainfall Outlook: October 2023 & October - December 2023

October Outlook				
	25% chance of at least (mm)	50% chance of at least (mm)	75% chance of at least (mm)	Forecast Confidence
Nadarivatu station	183	89	56	Moderate
Nadarivatu Dam	196	96	65	Moderate
Monasavu Dam	196	96	65	Moderate
Wailoa	207	106	71	Moderate
October to December Outlook				
	25% chance of at least (mm)	50% chance of at least (mm)	75% chance of at least (mm)	Forecast Confidence
Nadarivatu station	743	508	376	High
Nadarivatu Dam	764	530	402	High
Monasavu Dam	764	530	402	High
Wailoa	767	552	433	High

The table above provides 25%, 50% and 75% chances of each station receiving the amount of rainfall mentioned above.

Figure 1: Rainfall Outlook: Fortnightly; 1st - 14th October & 8th - 21st October

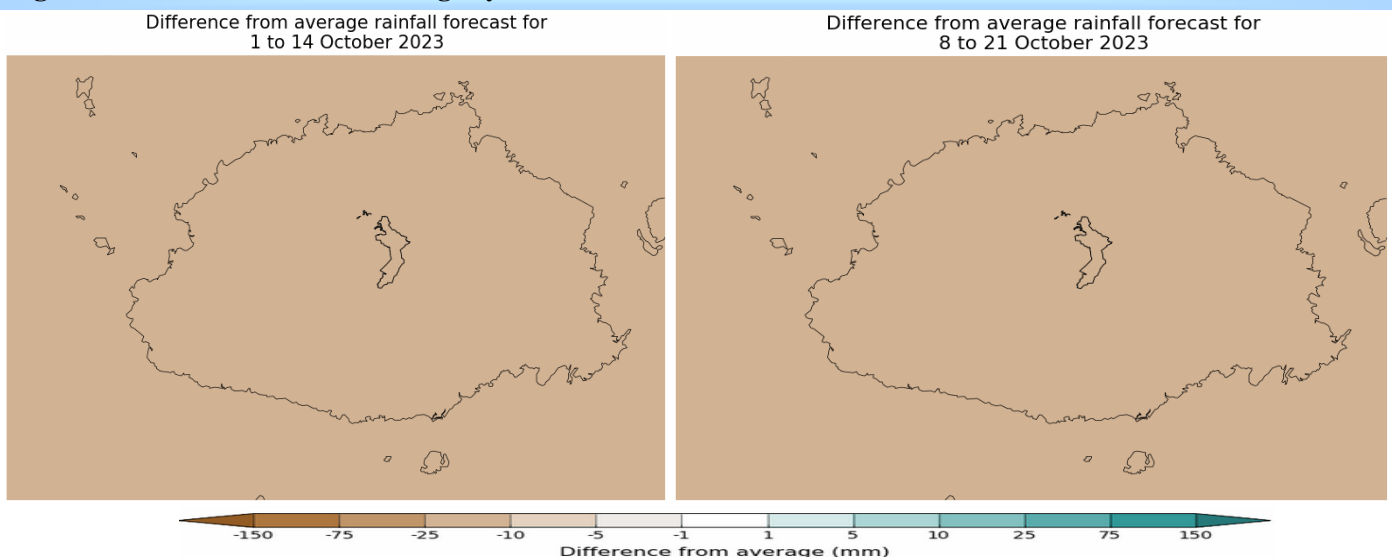


Figure 2: Rainfall Outlook: October 2023 & October - December 2023

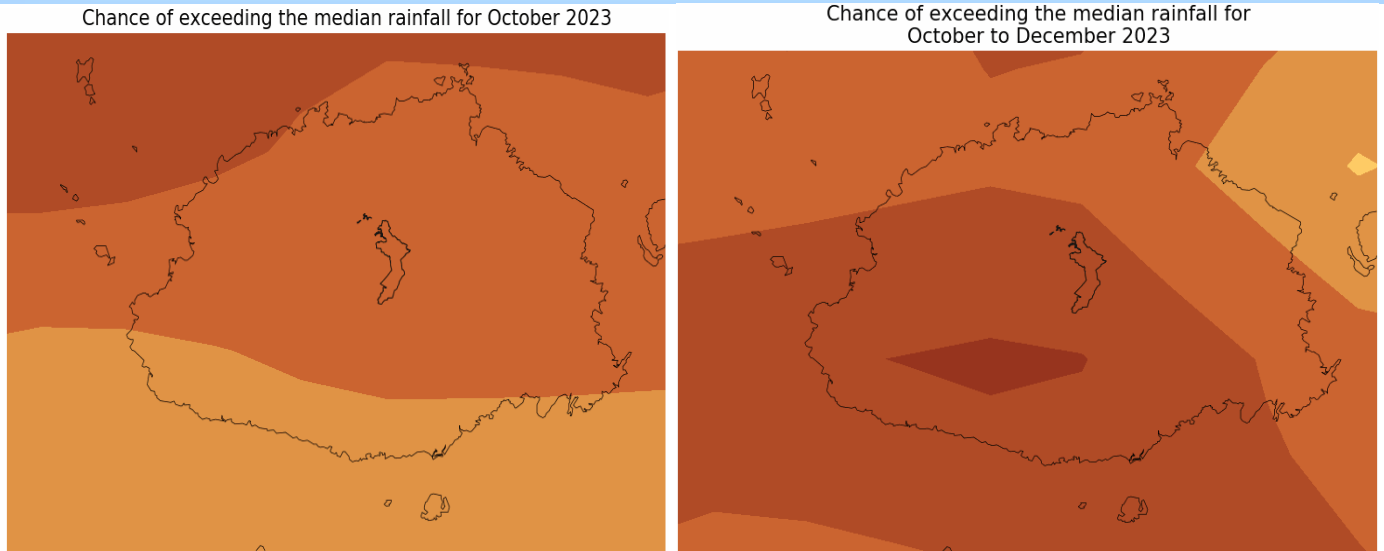
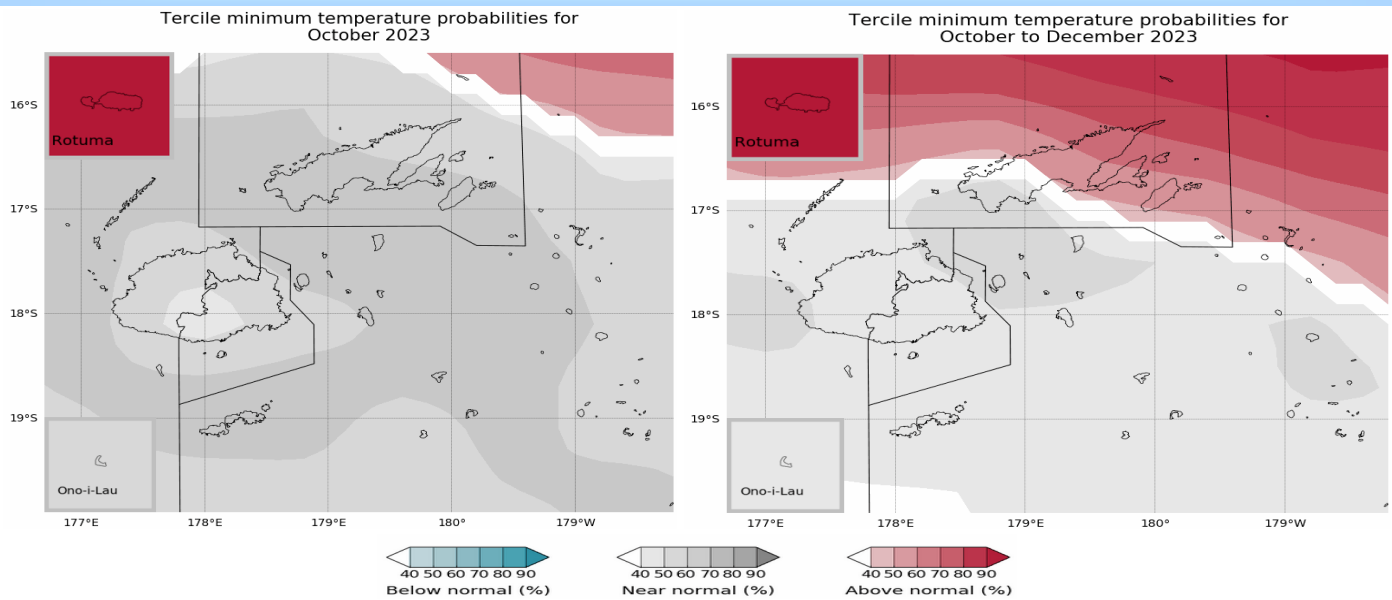
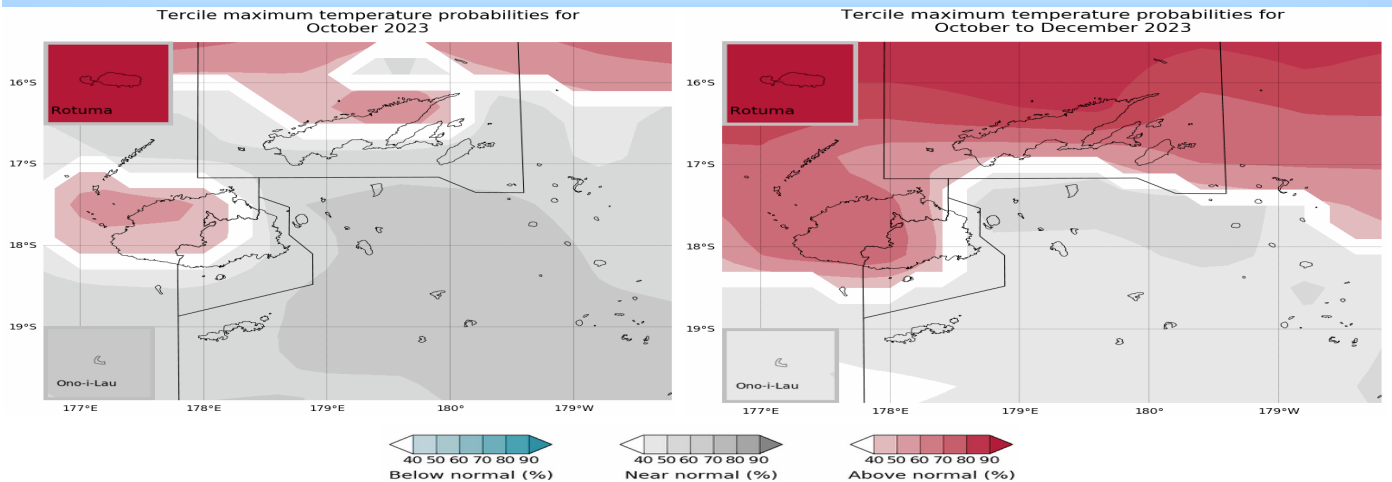


Figure 3: Minimum Air Temperature Predictions: October & October to December 2023



Minimum air temperatures are expected to be *near normal* to *above normal* across Viti Levu and Vanua Levu, during October and October to December 2023 period. *Source: ACCESS-S2 Model.*

Figure 3: Maximum Air Temperature Predictions: October & October to December 2023



Maximum air temperatures are likely to be *near normal* to *above normal* across Viti Levu and Vanua Levu, during October and October to December 2023 period. *Source: ACCESS-S2 Model.*

Explanatory Notes

Climate Outlook for Hydro-electricity Generation is produced to provide advisories to Energy Fiji Limited (EFL). It aims to provide advanced warning on climate abnormalities for planning on economic generation mix and hydro-storage optimization.

Climate (Rainfall/Air Temperature) Outlook

Above normal – indicates that the rainfall/temperature value lies in the highest third of observation recorded in the standard 30 year normal period.

Near normal – indicates that the rainfall/temperature value lies in the middle third of observation recorded in the standard 30 year normal period.

Below normal – indicates that the rainfall/temperature value lies in the lowest third of observation recorded in the standard 30 year normal period.

Climatology – means that there are equal chances of receiving below normal, normal and above normal rainfall.

Median – rainfall value which marks the level dividing the ranked data set in half, that is, the midpoint of the ordered (lowest to highest) monthly or yearly rainfall totals.

Above Median – rainfall value that lies above the median value.

Below Median – rainfall value that lies below the median value.

El Niño Southern Oscillation (ENSO)

ENSO is the principal driver of the year-to-year variability of Fiji's climate. There are three phases of this phenomenon, *El Niño*, *La Niña* and *Neutral* conditions. El Niño or La Niña events are a natural part of the global climate system and usually recur after every 2 to 7 years. It normally develops around April to June, attains peak intensity between December to February and usually starts to decay around April to June period the following year. While most events last for a year, some have persisted for up to 2 years. It should be also noted that no two El Niño or La Niña events are the same. Different events have different impacts, but most exhibit some common climate characteristics.

Usually there is a lag effect on Fiji's climate with ENSO events, that is, once an El Niño or La Niña event is established in the tropical Pacific, it may take 2-6 months before its impact is seen on Fiji. Similarly, once an event finishes, it can take 2-6 months for climate to normalise.

El Niño events are associated with warming of the central and eastern tropical Pacific. El Niño events usually result in reduction of Fiji's rainfall. Often the whole of Fiji is affected in varying degrees and it is quite unusual for one part of the country to experience a prolonged dry spell, while the other is in a wet spell. The relationship and level of rainfall suppression is greater in the Dry Zone than in the Wet Zone. It is the suppression of rainfall during the Cool/Dry Season (May to October) that is normally of most concern. A reduction in Cool/Dry Season rainfall in the Dry Zone results in little or no rainfall until the next Wet Season. While usually the strength of an ENSO event is proportional to its impact on Fiji, at times weak event can also have a significant impact.

La Niña events are associated with cooling of the central and eastern tropical Pacific. Usually La Niña results in wetter than normal conditions for Fiji, occasionally leading to flooding during the Warm/Wet Season (November to April).

During *Neutral* condition, neither El Niño nor La Niña is present, it has little effect on global climate, meaning other climate influences are more likely to dominate.

Lag effects – means that there is a delay in a change of some aspect of climate due to influence of other factors that is acting slowly.

Climate bulletins that can be viewed together with this bulletin include:

- 1) *Fiji Climate Summary* at <https://www.met.gov.fj/index.php?page=FijiClimateSummary> (issued monthly)
- 2) *Fiji Climate Outlook* at <https://www.met.gov.fj/index.php?page=ClimateOutlook> (issued monthly)

This information is prepared as soon as ENSO, climate and oceanographic data is received from recording stations around Fiji and Meteorological Agencies around the world. While every effort is made to verify observational data, Fiji Meteorological Service does not guarantee the accuracy and reliability of the analyses presented, and accepts no liability for any losses incurred through the use of this information and its contents. The information may be freely disseminated provided the source is acknowledged. For further clarification and expert advice, please contact the Fiji Meteorological Service HQ, Namaka, Nadi.

For further information, contact: The Director of Meteorology, Fiji Meteorological Service, Private Mail Bag NAP0351, Nadi Airport, Fiji. Phone: (679) 6724888, Fax: (679) 6720430, E-mail: fms@met.gov.fj or climate@met.gov.fj. URL: <http://www.met.gov.fj>