



La Niña Conditions Present and Likely

La Niña conditions are present and are expected to continue through February-April 2025, with a transition to ENSO neutral likely in March-May 2025. La Niña conditions emerged strongly in December 2024 and were reflected in below-average sea surface temperatures (SSTs) across the central and equatorial Pacific Ocean.

Despite this, the El Niño Southern Oscillation (ENSO) has remained neutral for the past 6 months despite changes in the SST patterns consistent with a developing La Niña over this period. However, in the recent observations, both the ocean and the atmosphere indicators are showing signs of a stronger coupling, that is more consistent with a La Niña event. Traditionally, La Niña events tends to form during winter (MAM) and spring (SON) and declines over autumn (JJA). Since this La Niña event is very late and outside of the typical ENSO cycle, it will be a short-lived and a weak event.

The rainfall forecast for Feb-Mar-Apr shows below average rainfall for the greater New Guinea Islands including AROB, the greater Highlands region and MOMASE regions. Normal rainfall forecasts are expected for Western, Gulf, Central and Milne bay provinces.

According to our January 2025 Drought Early Warning System (DEWS) forecast, there are several provinces who are on drought watch and drought alert status at the 3-month level. The drought alert provinces are AROB, Enga and Jiwaka whilst the drought watch provinces are ENB, EHP, Hela, Manus, NCD, NIP and WNB. The provinces in drought alert categories has been in this stage for some time now and therefore requires close attention as these provinces can easily change over to drought critical status very quickly.

Sea Surface Temperature (SST) Anomaly (BOM)

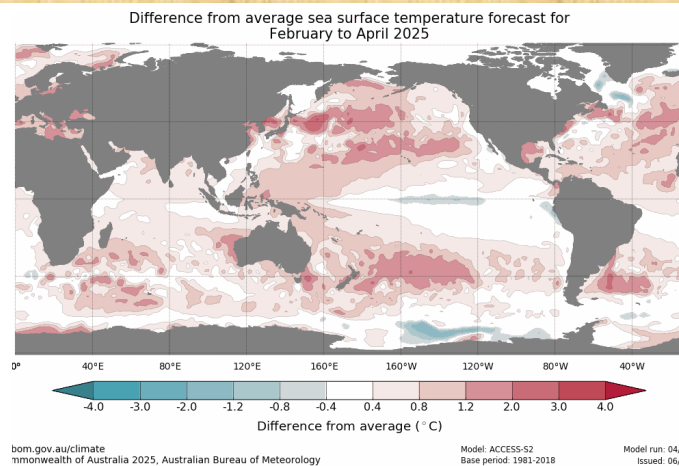


Figure 1: SST anomaly for FMA 2025

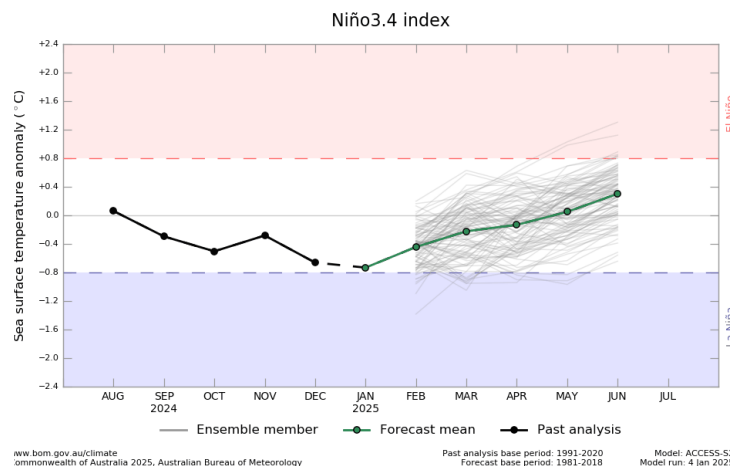


Figure 2: Monthly SST anomaly for NINO3.4 region

The Pacific Ocean is closely monitored for the current state of the El Niño Southern Oscillation (ENSO), which refers to the saw-saw pattern between warmer (El Niño) and cooler (La Niña) states of the central and eastern tropical Pacific region. ENSO is important for PNG as it is one of the key dominant drivers of climate variability in PNG. The ENSO signal is characterized by sea surface temperature (SST) patterns in the central and eastern tropical Pacific where cooler than average SSTs are associated with La Niña and warmer than average SSTs are associated with El Niño.

Figure 1 and 2 above shows the forecasted sea surface temperature (SST) anomalies for the Pacific Ocean for the periods FMA 2025 and Monthly SST anomaly for NINO3.4 region respectively. SSTs were warmer than average across almost the entire equatorial regions of the tropical Pacific Ocean with cooler than average SSTs in the eastern Pacific, a signature of a developing La Niña episode.

PNG Satellite Rainfall Monitoring & Drought Early Warning System

Provided below are products from the Australian Bureau of Meteorology under the Space-based weather and climate extremes monitoring demonstration project (SEMDP) and the Drought Early Warning System products from CREWS-PNG project.

Figure A shows the space-based rainfall estimate for the 3 month total ending December 2024 with Figure B showing the 3-month Standardized Precipitation Index (SPI) ending November 2023 whilst Figure C shows the 3-month drought indicator for December 2024.

December last year was one of the wettest month as we witnessed a lot of massive floods in the highlands, Morobe and NCD. This is clearly evident in Figure 1 where the 3-month total for Oct-Dec was very wet for most part of the country in excess of 200mm or more. Only a few isolated pockets of Daru, Central and Milne Bay received less than 100mm over the 3-month period.

Standardized Precipitation Index (SPI)

The SPI is an index commonly employed as a proxy to characterize drought. It compares how different the observed rainfall is to the climatology for that period by measuring the number of standard deviations it is away from the mean. Typically, values below -1.5 are considered 'severely dry' and those below -2 are considered 'extremely dry', whilst values above $+2$ are indicative of 'extremely wet' conditions.

With the above in mind, it is fair to say that parts of West Sepik, Enga, Hela, Central and southern eastern Bougainville provinces are showing signs of drought-like situation at the 3-months timescale.

Drought Early Warning System (DEWS)

The traffic-light drought maps provide a quick snapshot of agro-meteorological drought in PNG. For the interpretation of the color codes, see below:

Non-drought:	No rainfall deficit, healthy vegetation and above avg rainfall forecasted.
Drought watch:	Rainfall deficit or stressed vegetation or increase chance of below avg rainfall forecast.
Drought alert:	Rainfall deficit or Rainfall deficit or stressed vegetation and increased chance of below avg rainfall forecasted.
Drought critical:	Rainfall deficit and stressed vegetation and increased chance of below avg rainfall forecasted.

From Figure C, It is clear that there are certain parts of the country in drought critical conditions such as Hela, Enga, Jiwaaka and parts of New Guinea islands including AROB at the 3 month timescale.

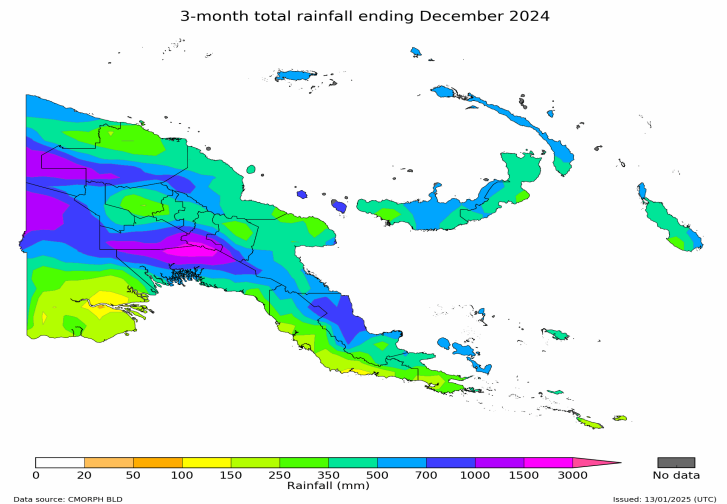


Figure A

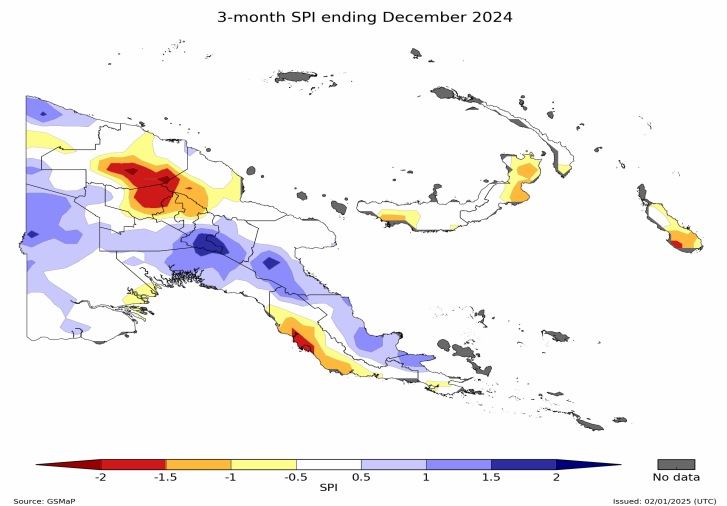


Figure B

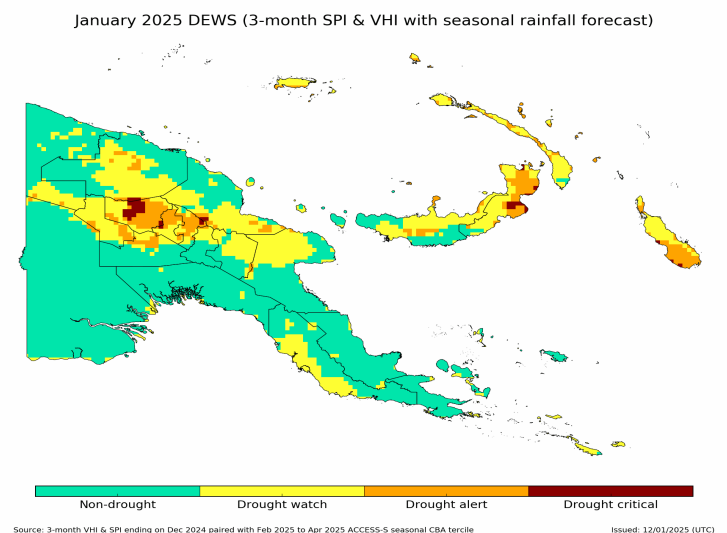


Figure C

Country Situation

The monthly rainfall for the country is as shown in Table 1 below.

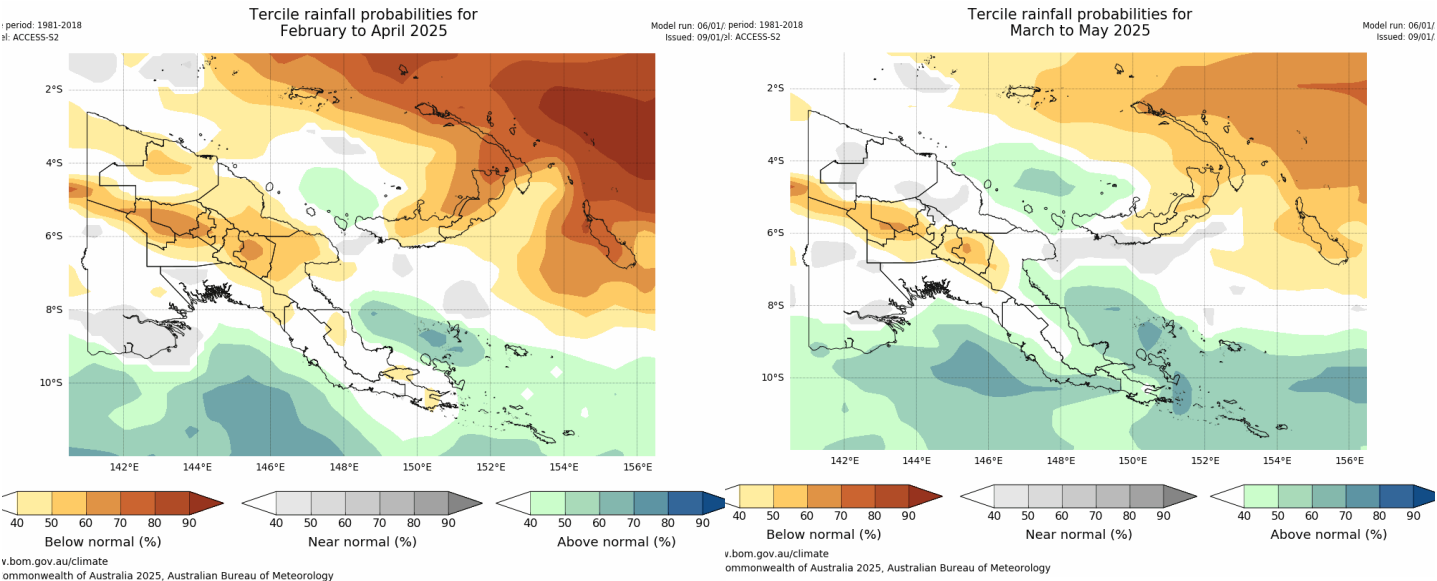
The highest rainfall for the month of December was recorded at the Port Moresby Weather Office (178.6mm) beating Wewak (162.6mm), a rare feat. This heavy rainfall resulted in widespread flooding in the city.

Sadly, other station's report were not available at the time of this write up.

Station	Oct	Nov	Dec
Madang	-	-	-
Momote	-	-	-
Kavieng	-	-	-
Nadzab	85.2	117.8	-
Tokua	-	-	-
Goroka	72.6	-	-
Kiunga	-	-	-
Port Moresby	45.8	7.4	178.6
Wewak	-	-	162.6
Vanimo	-	-	-

- Note:**
- The tercile rainfall probability forecast for SON and OND 2023 from ACCESS-S2 model is as depicted in the figure below.
 - Please note that couple of the stations have closed due to airport improvement programs so could not provide data here.

Rainfall Outlook (Feb-Mar-Apr & Mar-Apr-May 2025)



Rainfall forecast for FMA 2025

Rainfall forecast for MA M 2025



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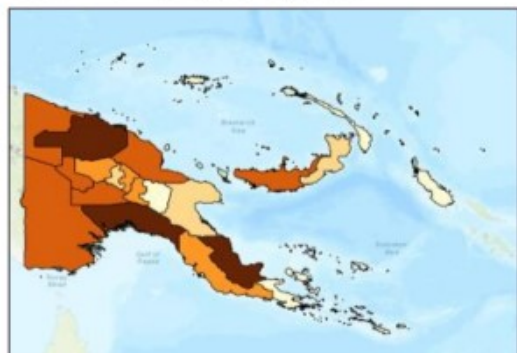
PNG DROUGHT RISK MONITOR

Drought Risk Status for December 2024

An indication of past drought risk based on: ***Drought Risk = Hazard x Exposure x Vulnerability.***

Drought risk is the probability of harmful impacts resulting from interactions between drought hazard, exposure, and vulnerability. Hazard information is given by the Early Warning Status, with drought exposure and vulnerability levels shown in the maps below.

Exposure - Extent of exposed aspects of the total population and its livelihoods in an area which drought may occur.



Vulnerability - Likelihood of exposed factors to suffer negative impacts when drought occurs.



Provinces of concern:

- ◆ New Ireland province has a Drought Alert status with mild exposure and severe vulnerability levels.