



El Niño Still Underway

The El Niño is still in place but with chances gradually decreasing as early as February 2024 and transitioning into ENSO-neutral by April-May-June next week. Although, there was increased awareness about this event to be close to or similar in strength to the 2015/16 event, based on the assessment of the underlining climatic situation, it is turning out to be otherwise. One of the key underlining reason is that this El Niño occurred straight after the 3 consecutive La Niñas of 2020, 2021 and 2022. The “memory “of these La Niña events or the pre-existing La Niña conditions are responsible for the wet weather we are experiencing across the country, unlike an El Niño year.

The International climate models are indicating warming of the equatorial Pacific has likely peaked, although the sea surface temperatures are expected to remain within the El Niño threshold into the Christmas and New Year period.

The rainfall forecast for Jan-Feb-Mar shows slightly above normal rainfall scenario for the greater parts of the country implying a wetter Christmas and New Year this year.

According to our December 2023 Drought Update bulletin, there is a small area of drought critical emerging towards the southern end of the Western Province. Drought watch conditions persists for Hela Province at the 3-month timescale. The rest of the country are in non-drought conditions resultant of recent rainfall.

Sea Surface Temperature (SST) Anomaly (BOM)

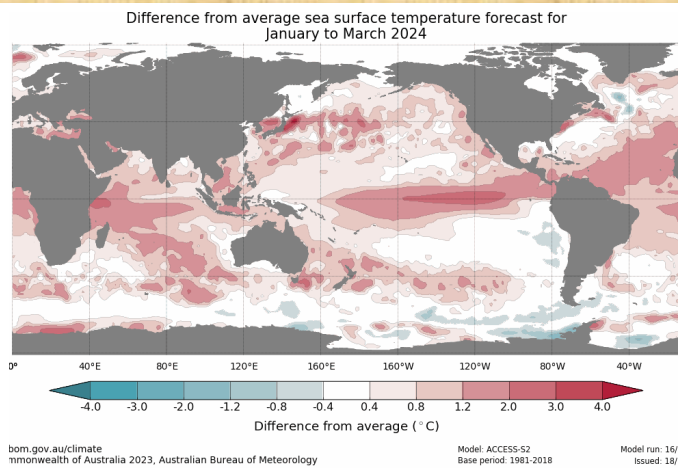


Figure 1: SST anomaly for JFM 2024

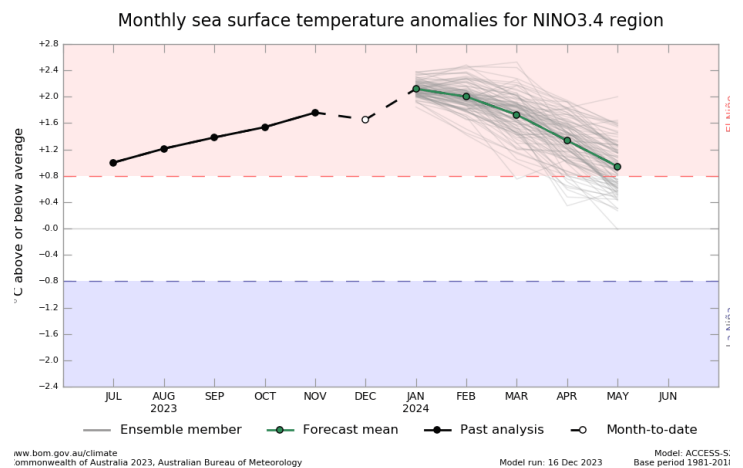


Figure 2: Monthly SST anomaly for NINO3.4 region

Figure 1 and 2 above shows the forecasted sea surface temperature (SST) anomalies for the Pacific Ocean for the periods JFM 2024 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. Anomalies were more than 2.0°C warmer than the average in the eastern tropical Pacific, increasing to more than 4.0°C warmer than average in the South American coasts. The sea closer to PNG, the Coral Sea were close to average.

El Niño in the Pacific is related to the east-west movement of warm water (SST) in the Tropics. When warm SST anomalies are closer to Australia, PNG receives above normal rainfall (La Niña) and when cooler SST anomalies are present closer to Australia, PNG receives below normal rainfall (El Niño). In a neutral (Non-ENSO) year, PNG receives normal rainfall.

PNG Satellite Rainfall Monitoring & Drought Early Warning System

Background

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 November 2023 with Figure B showing the 3-month Standardized Precipitation Index (SPI) ending also November 2023 whilst Figure C shows the 3-month drought indicator for December 2023.

The New Guinea Islands including AROB, interestingly appears to be receiving very good rains for the last 3 months (Figure 1) therefore tends to show no signs of dry spells at this stage. Parts of Western, Milne Bay, Madang and Hela provinces are beginning to show drought-like situations (Figures 2 and 3).

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, southern parts of Western, Milne Bay 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 agrometeorological 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 forecasted.
- 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 evident that much of the country are doing really well with no signs of drought critical conditions.

3-month total rainfall ending November 2023

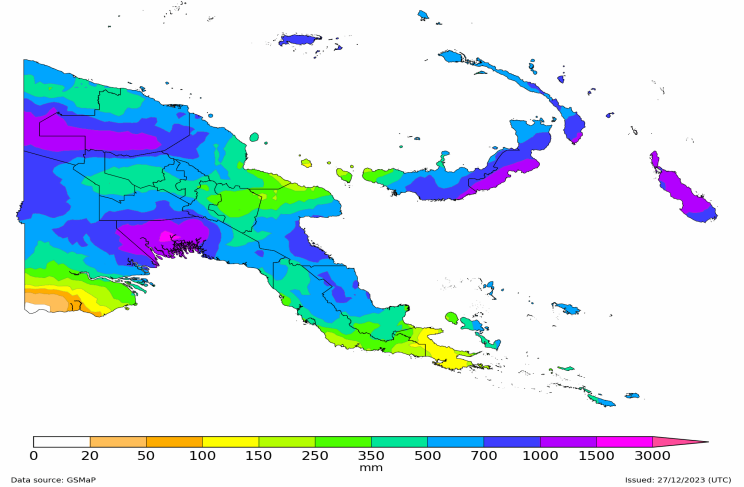


Figure A

3-month SPI ending November 2023

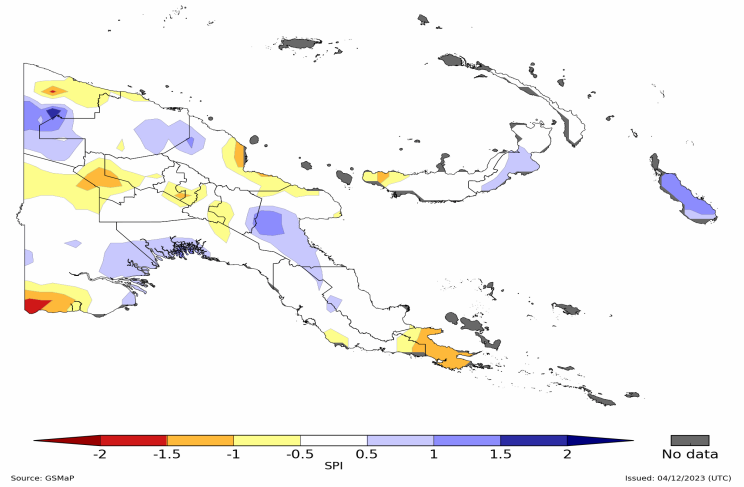


Figure B

December 2023 DEWS (3-month SPI & VHI with seasonal rainfall forecast)

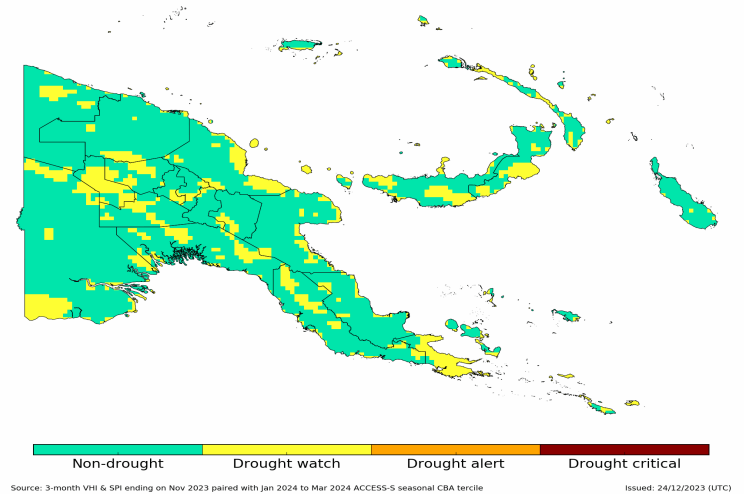


Figure C

Country Situation

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

The highest rainfall for the month of November was recorded at Goroka, Eastern Highlands province (246.0mm) with Kiunga (150.6mm) recording the lowest rainfall amount.

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

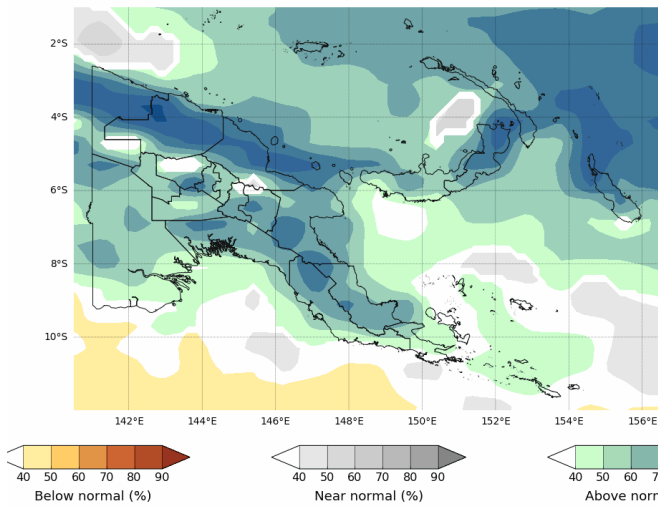
Note:

The tercile rainfall probability forecast for SON and OND 2023 from ACCESS-S2 model is as depicted in the figure below.

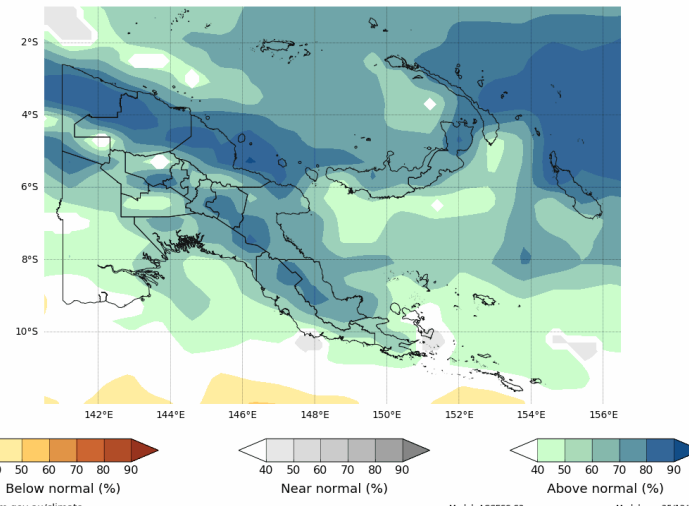
| Station | Sep | Oct | Nov |
|--------------|-------|-------|-------|
| Madang | - | - | - |
| Momote | - | - | - |
| Kavieng | - | - | - |
| Nadzab | - | - | - |
| Tokua | - | - | - |
| Goroka | - | 285.8 | 246.0 |
| Kiunga | 555.0 | 222.8 | 150.6 |
| Port Moresby | 50.8 | 21.8 | - |
| Wewak | - | - | - |
| Vanimo | 246.4 | 149.0 | 187.2 |

Rainfall Outlook (Jan-Feb-Mar & Feb-Mar-Apr 2024)

Tercile rainfall probabilities for January to March 2024



Tercile rainfall probabilities for February to April 2024



Rainfall forecast for JFM 2024

Rainfall forecast for FMA 2024



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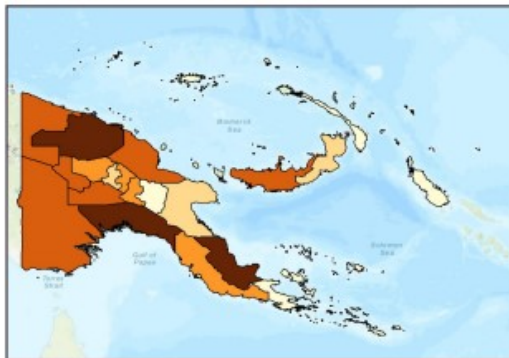
PNG DROUGHT RISK MONITOR

Drought Risk Status for December 2023

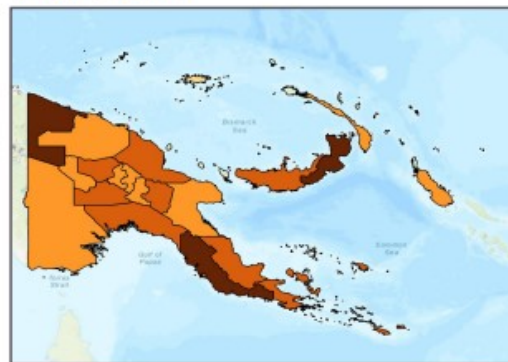
An indication of past drought risk based on: ***Drought Risk = Hazard x Exposure x Vulnerability.***

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:

- ◆ Hela has a majority Drought Watch status with Moderate exposure levels and Severe vulnerability levels.