FAMINE EARLY WARNING SYSTEMS NETWORK

Mali

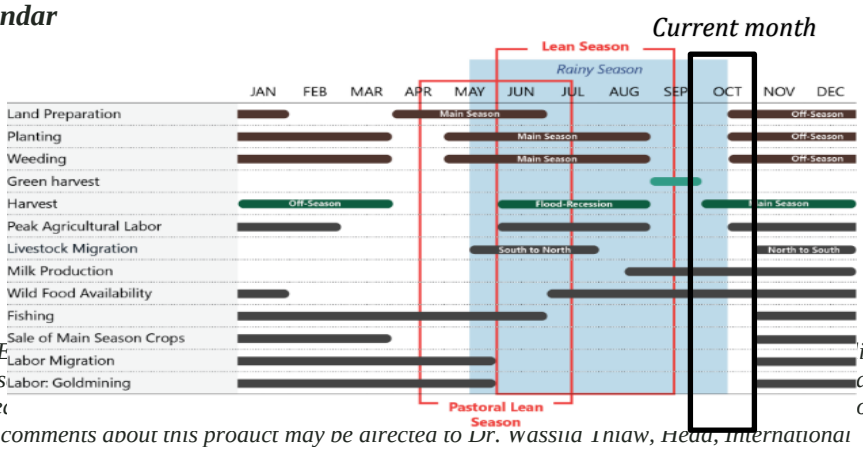
Monthly Climate and Weather

17 October 2024

Highlights

- El Niño Southern Oscillation (ENSO)-neutral conditions continued during September 2024. Equatorial sea surface temperatures (SSTs) are above average in the western Pacific and near-to-below-average in the east-central and eastern Pacific Ocean. Based on dynamical models, La Niña is favored to emerge in September-November 2024 (60% chance) and is expected to persist through January-March 2025 (60% chance).
- The rainy season in Mali typically begins in May and extends through October.
- During September 2024, rainfall accumulations in Mali ranged from a few millimeters to more than 300 mm. Rainfall accumulations exceeding 300 mm were registered in Kayes and Sikasso regions. Many other southern and central portions of the country received 100 – 200 mm, while the northernmost portions of the country received less than 10 mm.
- The NMME models predict no signal for above or below average rainfall across Mali during November 2024. This is because very little rainfall is climatologically expected during the upcoming month. The SPI forecast for the next 4 weeks suggests that above-average (wetter) conditions (0.5 to more than 2.0 standard deviations above the mean) will prevail across the entire country except for a few small northern parts.

Mali Seasonal Calendar



The FEWS NE imate information and monthly and s d evapotranspiration data were produce of extreme conditions. Questions or comments about this product may be directed to Dr. Wassila Thiaw, Head, International Desks/NOAA, wassila.thiaw@noaa.gov. Questions about the USAID FEWS NET activity may be directed to Dr. James Verdin, Program Manager, FEWS NET/USAID, jverdin@usaid.gov.

Figure 1: Seasonal calendar for Mali. **Source: FEWS NET**

Current Climate Modes and Teleconnections

- ENSO-neutral conditions are present. According to the NOAA ENSO Diagnostic Discussion, as of early October 2024, La Niña conditions are expected to emerge during the September - November season (60% chance) and continue through January - March 2025 (Fig. 2). For the latest update from the NOAA Climate Prediction Center (CPC) on ENSO, check here.

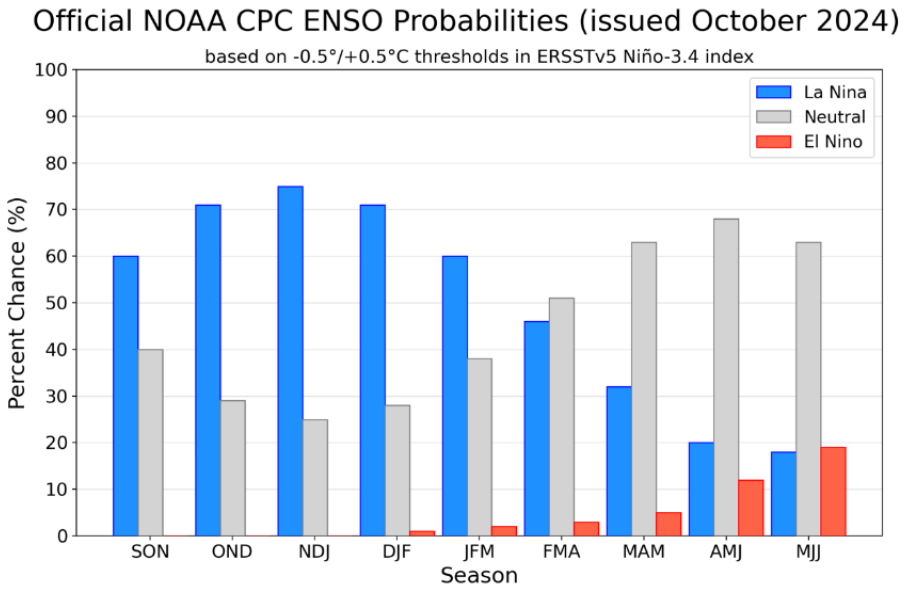


Figure 2. Official ENSO probabilities for the Niño 3.4 SST index (5ºN-5ºS, 120ºW-170ºW). Figure updated 10 October 2024. **Source: NOAA/CPC**

- Implications of ENSO conditions: As November – January (NDJ) is the dry season for Mali, La Niña has little implication for rainfall during the season. Based on historical records, La Niña conditions are generally associated with above-average mean temperatures for much of Mali during the rainfall season. The ENSO-precipitation teleconnection pattern can be found here, and the pattern for temperature can be found here (**Fig. A1b** and **A1c**).

Extreme Events

- Above average cumulative rainfall during the monsoon season led to widespread flooding in the country through September. The flooding has become one of the worst humanitarian crisis in recent years resulting in the declaration of a national disaster by the Mali government. At least 19 regions of the country were affected with nearly 180,000 affected people and at least 62 fatalities. The regions of Segou, Timbuktu, Gao, Bamako and Mopti are impacted the worst. Inundation along the Niger River will, by nature, be slow to recede.

- Due to wet conditions, there have been negligible reports of fire activity in Mali during September.

Rainfall/Precipitation

- In September, climatological rainfall values across Mali range between 5 and 300 mm. The highest values typically occur in southern portions of the country, while the northern region of Timbuktu typically contains the driest conditions.

Past 3 months (July to September 2024):

- **Totals:** During the last three months, rainfall accumulations in Mali ranged from a few millimeters to more than 750 mm. Rainfall accumulations exceeding 750 mm were widely registered in the South. Totals decreased steadily with higher latitude down to less than 25 mm in northern Timbuktu region.

- **Anomalies:** Above-normal rainfall anomalies were prevalent across Mali. The largest rainfall surpluses of over 300 mm were observed in southern Gao and portions of several southern regions. Positive anomalies of at least 25 mm covered most of the remainder of the country, though pockets of small negative anomalies (10 – 50 mm) were observed in northern Timbuktu and Kidal regions.

Past 1 Month (September 2024):

- **Totals:** During September, rainfall accumulations in Mali ranged from a few millimeters to more than 300 mm. Rainfall accumulations exceeding 300 mm were registered in Kayes and Sikasso regions. Many other southern and central portions of the country received 100 – 200 mm, while the northernmost portions of the country received less than 10 mm. (**Fig. 2a**).

- **Anomalies:** CMORPH satellite-based rainfall estimates indicate above-normal rainfall anomalies were the dominant feature across Mali (**Fig. 2b**). Rainfall Surpluses of over 100 mm were observed in Kayes and Sikasso regions, as well as localized portions of Timbuktu and Gao. Positive anomalies of at least 25 mm covered most of the remainder of the country, though a few pockets of small negative anomalies were observed in Koulikoro region.

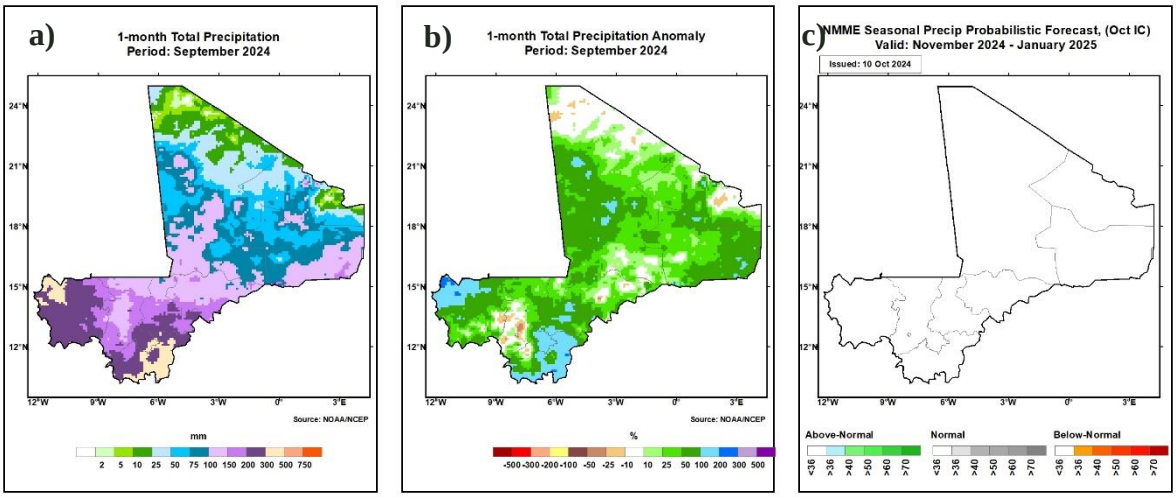


Figure 2. Satellite estimates of precipitation (CMORPH) for September 2024. **(a)** 1-month total accumulation and **(b)** 1-month anomaly. **(c)** NMME seasonal rainfall probabilistic forecast for November 2024 – January 2025. **Source: NOAA/NCEP**

Monthly and Seasonal Forecasts (November 2024 and November 2024 – January 2025):

- **Monthly:** Based on the North American Multi-Model Ensemble (NMME) models, utilizing observations from October 2024 for model initialization, the forecast indicates no dominant signal for above or below average rainfall across Mali during November 2024. This is because very little rainfall is climatologically expected during the upcoming month.

- **Seasonal:** The NMME seasonal forecast for November 2024 – January 2025 suggests no dominant signal for above or below average rainfall across Mali. This is because very little rainfall is climatologically expected during the upcoming season (**Fig. 2c**).

Temperature

Past 3 months (July – September 2024):

- **Maximums:** The country observed maximum temperatures between 30°C in the South and 50°C in the North. Regarding anomalies, near-average conditions prevailed in southern and central Mali, with values ranging from -1°C to 1°C. Meanwhile, warmer than average conditions were recorded in parts of northern Mali, with temperature anomalies between 1°C and 4°C above average.

- **Minimums:** Minimum temperatures varied between 5°C and 35°C across Mali. Warmer temperatures were observed in the South and West, while cooler temperatures were observed in the North and East. Mean minimum temperatures did not vary far from average across the county. There were a few scattered patches of 1 to 2°C positive anomalies and one patch of 1 to 2°C negative anomalies in Gao region.

Past 1 Month (September 2024):

- **Maximums:** Similar to the conditions in the past 3 months, the country observed maximum temperatures between 30 °C and 45°C. Negative temperature anomalies, ranging from 1°C to 2°C below average, were noted mainly in Mali's southwestern parts. A small part of eastern Gao region registered 1°C to 2°C positive anomalies. Otherwise, most of the remainder of Mali observed near-normal conditions with values between -1°C and 1°C of average (**Fig. 3a**).

- **Minimums:** Minimum temperatures were between 20°C and 30°C across Mali. Warmer temperature were present to the north and cooler to the south. Mali registered mostly near-average minimum temperatures with anomaly values between -1°C and 2°C (**Fig. 3b**). However, there were a few scattered patches of small positive anomalies as well as negative anomalies in Gao region.

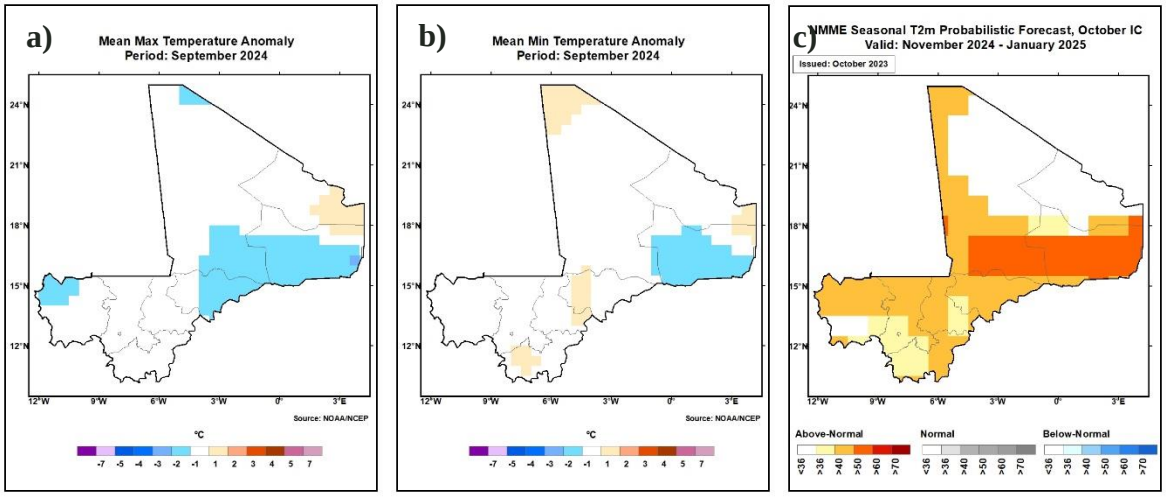


Figure 3. Spatial structure of temperature for September 2024. **(a)** maximum temperature anomaly and **(b)** minimum temperature anomaly. **(c)** NMME probabilistic forecast of seasonal 2-m temperature anomaly for November 2024 – January 2025. **Source: NOAA/NCEP**

Monthly and Seasonal Forecasts (September 2024 and September – November 2024):

- **Monthly:** The NMME forecast indicates that there is a 40% to 60% chance of above-average temperatures over the southern and central parts of Mali and lesser chances in the North during November 2024 across the country.

- **Seasonal:** For the November 2024 – January 2025 season, there is a 36% to 60% chance of above-average temperatures over the southern, central, and northwestern parts of Mali. Meanwhile, there is no clear signal for above or below average temperatures across northeastern portions of the country (**Fig. 3c**).

Drought and Dryness

The Standardized Precipitation Index (SPI) is used to characterize meteorological drought. SPI compares the precipitation over a specific period of time with the climatology from that same period. Therefore, the SPI values can be thought of as the number of standard deviations the observed anomaly deviates from the climatology. The 1-month SPI values are a good representation of the monthly precipitation anomaly as well as the soil moisture and vegetation health. The 3-month SPI values are a good representation of seasonal precipitation anomalies. The Standardized Precipitation Evapotranspiration Index (SPEI) is similar to the SPI, but it also takes evapotranspiration into account (and therefore the impact of temperatures on water demand).

Past 3 Months (July September 2024):

- Mali showed extreme wetness (1.5 to more than 2.0 standard deviations above the mean) over much of the country, especially in southern, eastern and northwestern portions during the July–September season. On the contrary, a few far-northern portions were near to or drier than normal with SPI values near or below zero.

Past 1 Month (September 2024):

- Wet conditions were present across all of southern Mali as well as some scattered portions of northern Mali with positive SPI values of 0.7 to more than 2.0 standard deviations above the mean. Meanwhile, mild dryness, indicated by SPI values between 0.5 and 1.2 standard deviations below the mean, is present in a few scattered parts of Timbuktu region. Near-normal conditions were registered in central portions of Mali with SPI values ranging between -0.5 and 0.5 standard deviations.

Current/Forecast (10 October to 25 October 2024):

- The SPI forecast for the next 4 weeks suggests that above-average (wetter) conditions (0.5 to more than 2.0 standard deviations above the mean) will prevail across the entire country except for a few small northern parts.

Water Requirement Satisfaction Index (WRSI)

- USGS/EROS crop WRSI Current conditions during the 3rd Dekad of September 2024 depicted mostly '*Average'* to '*very Good*' crop conditions across southern portions of the country. Local areas of Mopti region depicted '*Mediocre'* conditions.

GEOGLAM Crop Monitor

- GEOGLAM Corp Monitor synthesis conditions during September 2024 were marked by '*Favorable*' conditions across southern Mali, and '*poor*' conditions through central Mali.

Additional Resources

- https://protectioncivile.gouv.ht/
- https://www.meteo-haiti.gouv.ht/

Annex

- La Niña precipitation impacts graphic.

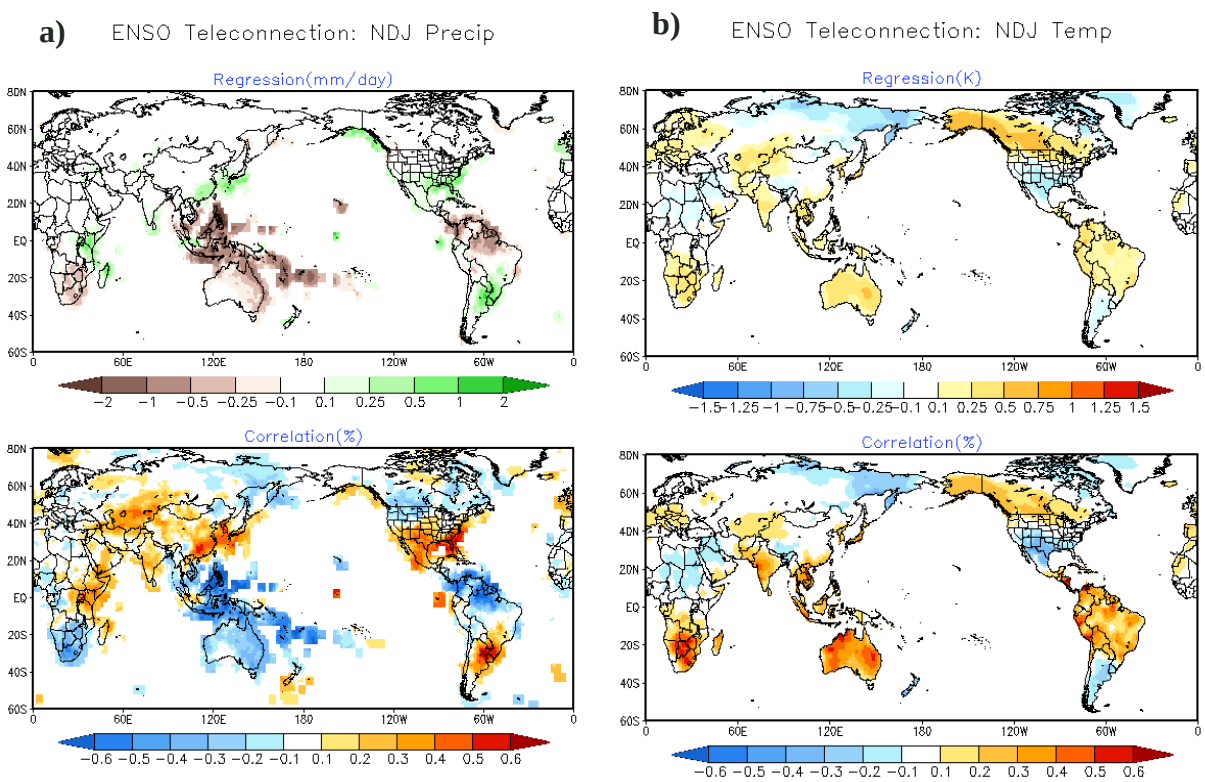


Figure A1. For three month season (November-January; NDJ), precipitation and temperature anomalies are regressed onto the standardized Niño-3.4 index (upper panel). In the bottom panel, the correlation is calculated between Nino-3.4 and the anomalies.