FAMINE EARLY WARNING SYSTEMS NETWORK

South Sudan

Monthly Climate and Weather

20 February 2025

Highlights

- La Niña conditions continued during January 2025 as indicated by below average sea-surface-temperatures (SSTs) across the central and east-central equatorial Pacific Ocean. La Niña conditions are expected to persist in the near-term, with a transition to El Niño Southern Oscillation (ENSO)-neutral likely during March - May 2025 with a 66% chance, according to the latest ENSO outlook.
- Based on historical records, La Niña conditions are associated with near average rainfall and near-average mean temperatures in South Sudan during March – May (MAM) season.
- During January 2025, many areas of eastern, southern, southwestern and central parts of the country received 10-50 mm rainfall, with the highest rainfall of 75 mm being recorded in the far western areas of Western Equatoria state. The remaining areas remained dry.
- The North American Multi-Model Ensemble (NMME) models indicate average to belowaverage rainfall for March 2025, except over few areas of southern Western Equatoria and southern Central Equatoria states, which show slightly above average rainfall.
- During January 2025, maximum temperatures were 1 to 4°C above average over most parts of the country, while minimum temperatures were 1-4°C below average over southern, central, and northwestern regions of the country.
- The NMME models suggest that most of South Sudan will experience above average temperatures in March 2025 and March - May 2025, with probabilities exceeding 50 to 60% in western, and southern parts of the country for MAM 2025.

The FEWS NET Monthly Climate and Weather information bulletin is based on current weather and climate information and monthly and seasonal outlooks from the NOAA CPC. Information on crops, soil moisture, flooding, and evapotranspiration data were produced by FEWS NET, USGS, NASA and USDA. Various sources were used to assess impacts 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.

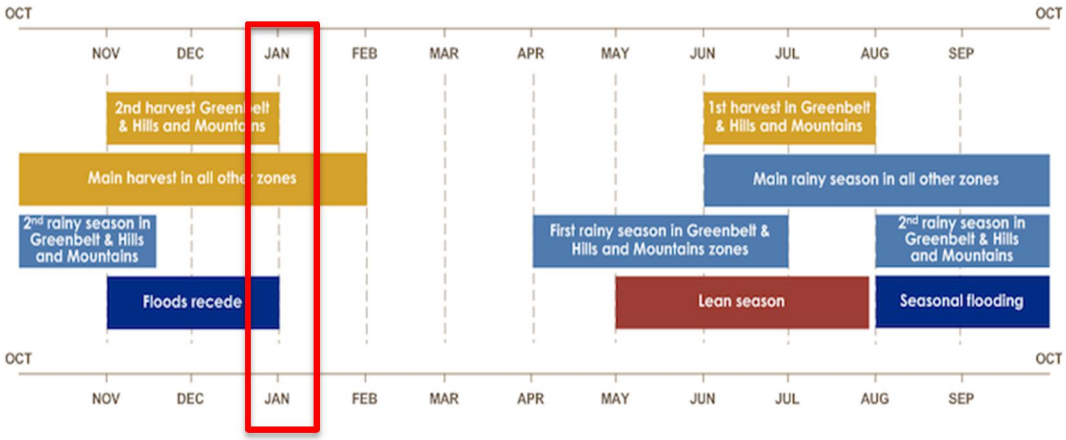


Figure 1: Seasonal calendar for South Sudan. **Source: FEWS NET**

Current Climate Modes and Teleconnections

- La Niña conditions continued this past month, as indicated by the below-average sea surface temperatures (SSTs) across the central and east-central equatorial Pacific Ocean. Below-average subsurface temperatures persisted, with below-average temperatures dominating the central and eastern equatorial Pacific Ocean. Low-level wind anomalies remained easterly over the western and central Pacific, while upper-level wind anomalies were westerly over the central Pacific. Collectively, the coupled ocean-atmosphere system indicated La Niña conditions.

- The latest ENSO outlook indicates that La Niña is expected to persist in the near-term, with a 66% chance for ENSO-neutral condition during March-May 2025 (Fig. 2). The latest update of the NOAA Climate Prediction Center's El Niño/Southern Oscillation diagnostic discussion can be found here.

- La Niña conditions are typically associated with near-average rainfall and near-average mean temperatures in South Sudan during the March-May (MAM) season (**Fig. S1**).

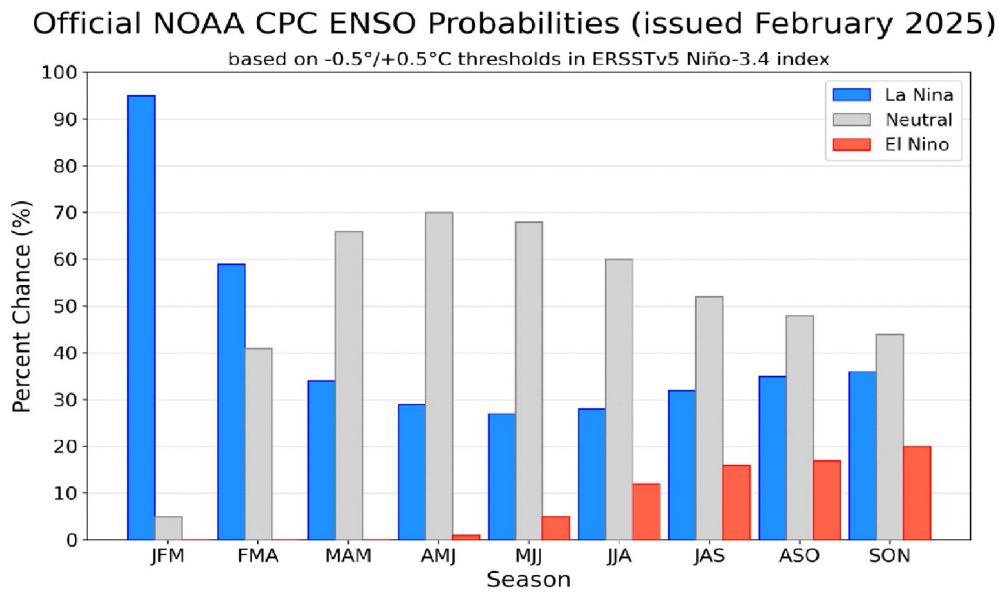


Figure 2: Official CPC ENSO probabilities outlook. **Source: NOAA/NCEP**

Extreme Events

- The Sudd wetlands in South Sudan were still experiencing inundation but with improvements along the upstream Nile and Lol rivers.
- There were no notable forest fires over the past 30 days across South Sudan.
- South Sudan had no notable wind anomalies over the past 30 days.

Rainfall/Precipitation

Past 3 Months (November 2024 to January 2025):

- **Totals:** Most of the southern half of South Sudan received moderate to heavy rainfall totals between 25-300 mm. The far southern borders in Western Equatoria and Central Equatoria states and the far eastern borders of the Jonglei, Eastern Equatoria, and Upper Nile states recorded heavy rainfall totals in excess of 150 mm **(Fig. 3a**)..

- **Anomalies:** Rainfall was below average in most places in South Sudan, with the largest rainfall deficits (50-100 mm) in the westernand eastern parts of the country. On the other hand, isolated areas in southern Western Equatoria, southern Lakes, eastern Upper Nile and central Jonglei, and central parts of Eastern Equatoria states experienced slightly above average rainfall of 10-50 mm **(Fig. 3b)**.

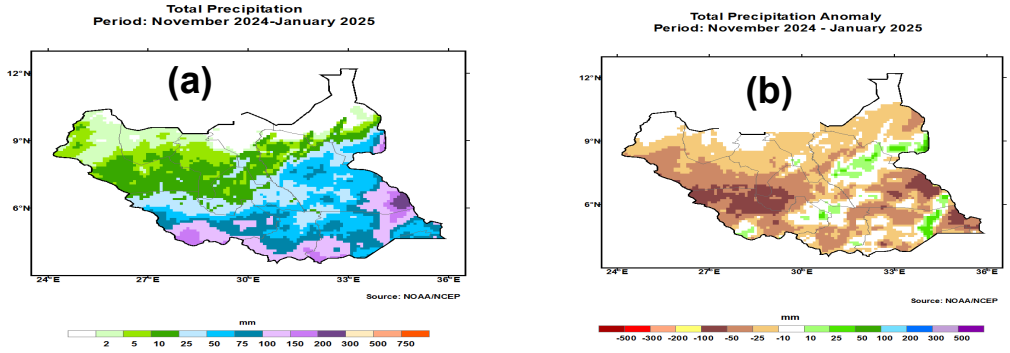


Figure 3: Spatial distribution for November 2024-January 2025: (a) total precipitation and (b) total precipitation anomaly. **Source: NOAA/NCEP**

Past 1 Month (January 2025):

- **Totals:** Monthly rainfall totals of 5-75 mm were limited to few places in the southern border areas of Western Equatoria, few areas in Eastern Equatoria, and isolated pockets in Jonglei states. Much of the remaining parts of the country remained largely dry **(Fig. 4a)**.

- **Anomalies:** Rainfall was 10-25 mm below-average in the cross border regions of Western Equatoria and Lakes states, isolated areas in the far southern borders of Central Equatoria and far southern and eastern borders of Eastern Equatoria states, and over eastern Jolglei state (**Fig. 4b**).. Isolated areas in southern Western Equatoria state received 10-25 mm above average rainfall.

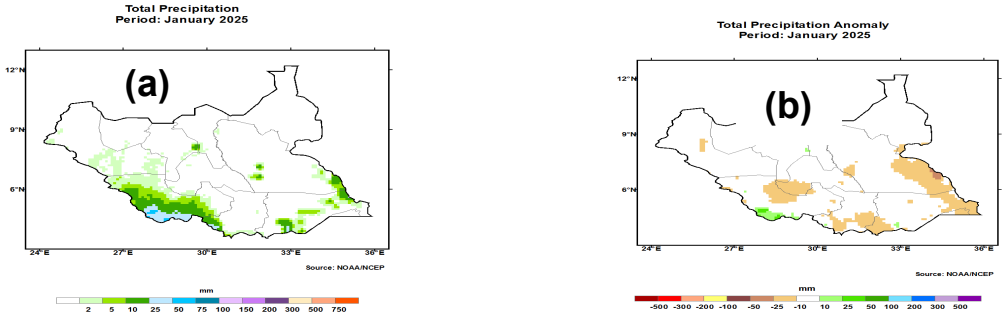


Figure 4: Spatial distribution for January 2025: (a) total precipitation and (b) total precipitation anomaly. **Source: NOAA/NCEP**

Monthly and Seasonal Forecasts (March 2025 and March 2025-May 2025):

- **Monthly:** The NMME model forecast suggests there are no dominant below or above average tercile categories with probabilities above 40%over South Sudan (**Fig. 5a**).

- **Seasonal:** The NMME seasonal rainfall forecast shows above 40% chance for above normal rainfall over isolated areas of central Jonglei and central Eastern Equatoria. On the other hand, probabilities for below-average rainfall are below 40% over the far western pockets of Western Equatoria and southwestern Central Equatoria states (**Fig. 5b**).

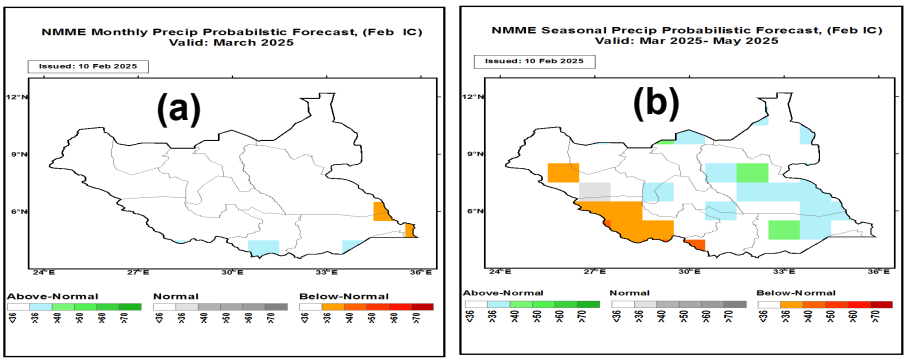


Figure 5: Rainfall forecast for (a) March 2025 and (b) March 2025 – May 2025. **Source: NOAA/NCEP**

Temperature

Past 3 months (November 2024 – January 2025):

- **Maximums:** Most of South Sudan recorded mean maximum temperatures of 30-40°C. Compared to the long-term average, many areas experienced above-average mean maximum temperatures (1-4°C). The far eastern parts of Eastern Equatoria state observed near-average conditions (**Fig. 6a**).
- **Minimums:** Much of South Sudan recorded mean minimum temperatures between 5-25°C. The southwestern Western Equatoria and eastern Upper Nile states saw above-average temperatures of 1 to 2°C. The Northern Bahr el Ghazal, Unity, Lakes, eastern and central parts of Western Bahr el Ghazal and far eastern parts of Eastern Equatoria recorded 1-2ºC below average minimum temperatures (**Fig. 6b**).

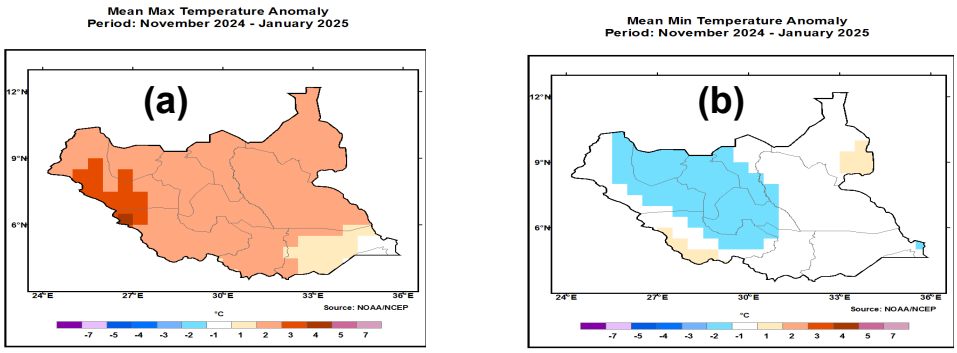


Figure 6: Spatial map for November 2024 – January 2025: (a) mean maximum temperature anomaly and (b) mean minimum temperature anomaly. **Source: NOAA/NCEP**

Past 1 month (January 2025):

- **Maximums:** In January, South Sudan reported average maximum temperatures between 30-40°C, with the highest temperatures exceeding 35°C covering most parts of South Sudan. Temperatures were generally 1 to 4°C above average over most parts of South Sudan. Anomalies exceeded 4°C in parts of Western Equatoria (**Fig. 7a**).
- **Minimums:** In January, much of South Sudan recorded mean minimum temperatures between 5-25°C. The lowest minimum temperatures of 10-15°C were registered over Western Bahr el Ghazal. Compared to the long-term average, most parts of the southern, central, and northwestern parts of the country experienced 1-3°C below average minimum temperatures. On the other hand, the eastern Upper Nile and western boarder of Western Equatoria regions reported 1 to 2°C above average minimum temperatures (**Fig. 7b**).

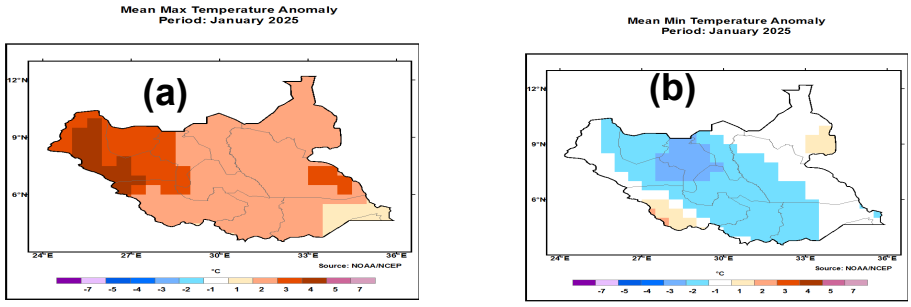


Figure 7: Spatial map for January 2025: (a) maximum temperature anomaly and (b) mean minimum temperature anomaly. **Source: NOAA/NCEP**

Monthly and Seasonal Forecasts (March 2025 and March–May 2025):

- **Monthly:** During March 2025, probabilities for above-average mean temperatures exceed 40 to 60% over much of the country, except over isolated area of western and eastern Jonglei, Lakes and the cross-border areas of Western Bahr el Ghazal and Western Equatoria states, where no dominant tercile category is indicated (**Fig. 8a**).
- **Seasonal:** Above-average mean temperatures are expected over most parts of country, except over southeastern regions where no dominant tercile category is indicated. Probabilities for above-average temperatures are greater than 70% over Western Bahr el Ghazal and western areas of Western Equatoria (**Fig. 8b**).

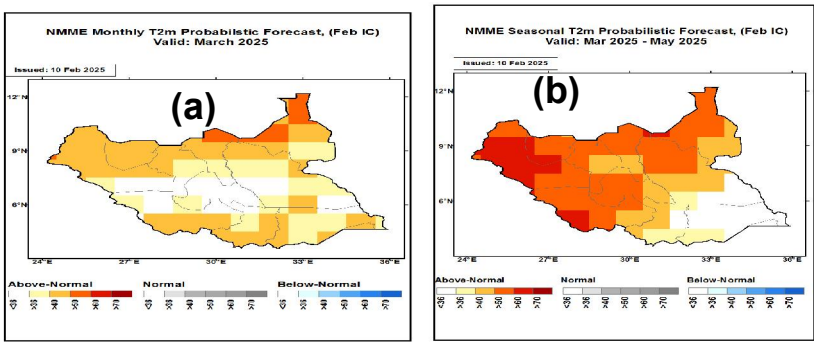


Figure 8: Spatial map for (a) March 2025 mean temperatures forecast and (b) March 2025 – May 2025 mean temperatures forecast. **Source: NOAA/NCEP**

Flooding and Areas of Inundation

- Floods affect mostly areas along the Nile and Lol rivers and Sudd marshland. In recent years, up to half of all counties in South Sudan were affected by the floods. Jonglei, Unity and Upper Nile States are the hardest hit, representing three quarters of the affected people.

- In South Sudan, the Sudd marshlands, in the states of Jonglei, Unity, and Upper Nile experienced the most severe inundation, impacting a large portion of the population due to rising water levels from heavy rains and controlled water releases from Lake Victoria. Recent reports indicated that over a million people were affected across multiple counties, with significant displacement occurring in Northern Bahr el Ghazal and Unity states. A month into the cholera outbreak, suspected cases continue to be recorded in flood-hit locations.

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 that 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 (November 2024-January 2025):

- The SPI analysis for November 2024 to January 2025 indicated drier-than-average conditions across southern, southeastern and southwestern parts of South Sudan. On the other hand, northern and central areas experienced wetter-than-average conditions (**Fig. 9a**).

Past 1 month (January 2025):

- The SPI analysis for January 2025 indicates that climatologically dry conditions were observed in most parts of the country. However, southern border areas in Western Equatoria and Central Equatoria and eastern parts of Eastern Equatoria experienced drier-than-average conditions (**Fig. 9b**).

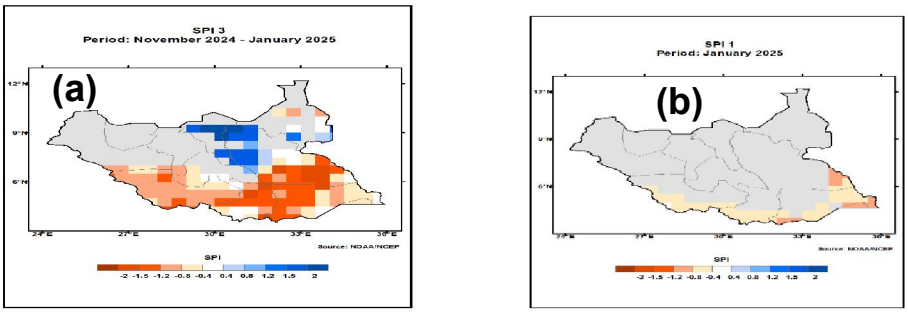


Figure 9: Spatial structure of Standardized Precipitation Index (SPI) (a) November 2024 – January 2025 (b) January 2025. Source: NOAA/NCEP. **Source: NOAA/NCEP**

Current/Forecast (05 December 2024 to 03 March 2025):

- The SPI forecast suggests that drier-than-average conditions will cover southeastern Jonglei, Eastern Equatoria, and southern borders of Central Equatoria and Western Equatoria, while wetter-than-average conditions will cover parts of Jonglei and Unity and isolated pockets in southern Upper Nile states.

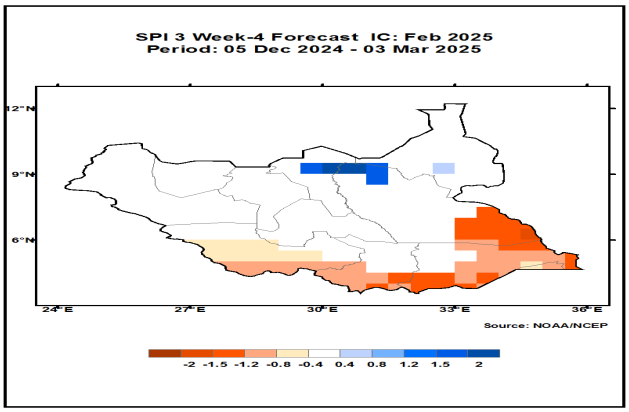


Figure 10: Spatial structure of SPI constructed from observations for 5 December 2024 to 5 February 2025 and 4 weeks forecast ending on 3 March 2025. **Source: NOAA/NCEP**

Water Requirement Satisfaction Index (WRSI) updated

- WRSI values during the 3rd Dekad of January 2025 indicated very good conditions for crop in southern and eastern parts of Eastern Equatoria.

GEOGLAM Crop Monitor Updated

In **South Sudan**, harvesting of main season cereals finalized in unimodal areas of the north, central, and southeast under poor conditions as this season was impacted by a mix of severe flooding, pest infestations, and prolonged dry spells. Harvests are likely to be significantly below-average in unimodal north and central areas most severely affected by the flooding. In these areas, the conclusion of the May to September rainy season was followed by a decline in the flooded area extent, though parts of the Sudd wetlands remained inundated as of mid-January. Conversely, in the unimodal Kapoeta region located in the southeast, prolonged dry spells are expected to result in yield declines. Additionally, harvesting of second season cereals also finalized in bimodal areas of the south-central and southwest under favorable conditions as weather outcomes were conducive to crop development in these regions. At the country level, harvests are expected to be similar to the previous year and near-average as some farmers were able to harvest before the flooding impacts or planted in less flood-prone areas.

Additional Resources

https://www.inam.gov.mz/index.php/pt/

https://www.sadc.int/pillars/meteorology

https://fews.net/node/32023/print/download

Annex:

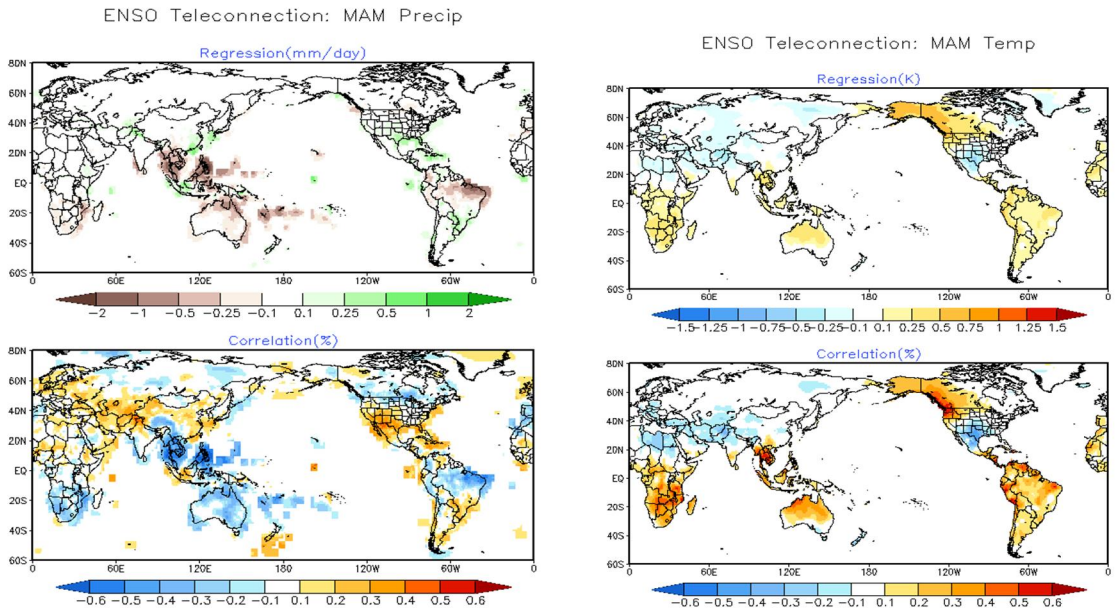
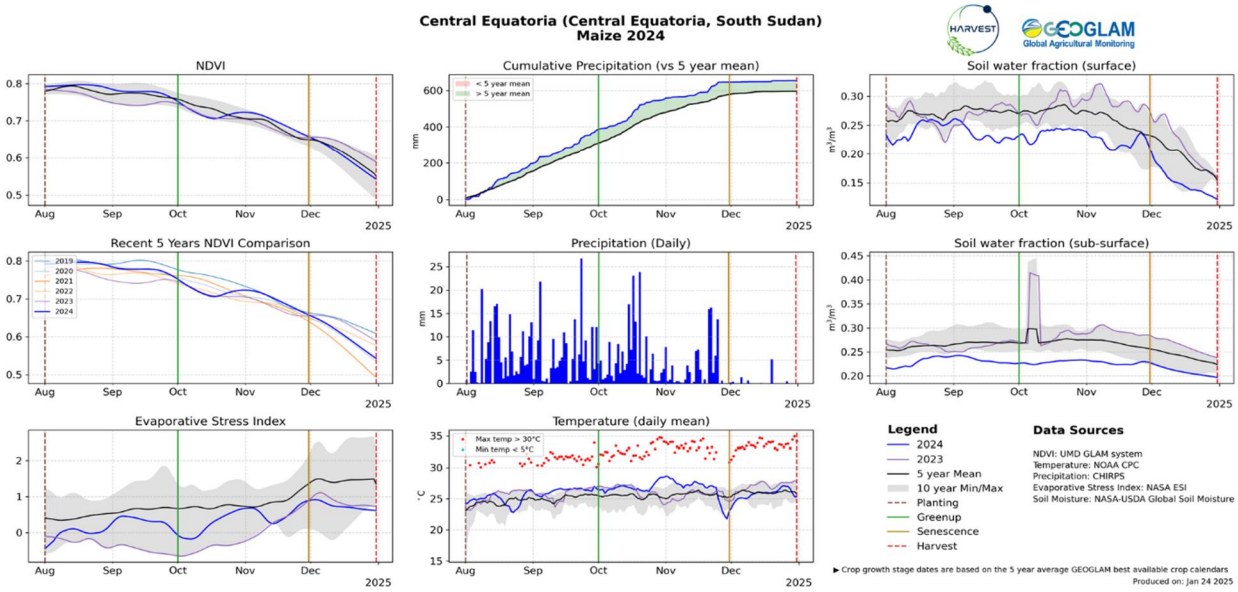


Figure S1: For three month season (MAM), precipitation and temperature anomalies are regressed onto the standardized Niño-3.4 index (upper panel). In the bottom panel, the correlation is calculated between Nino-3.4 and the anomalies.

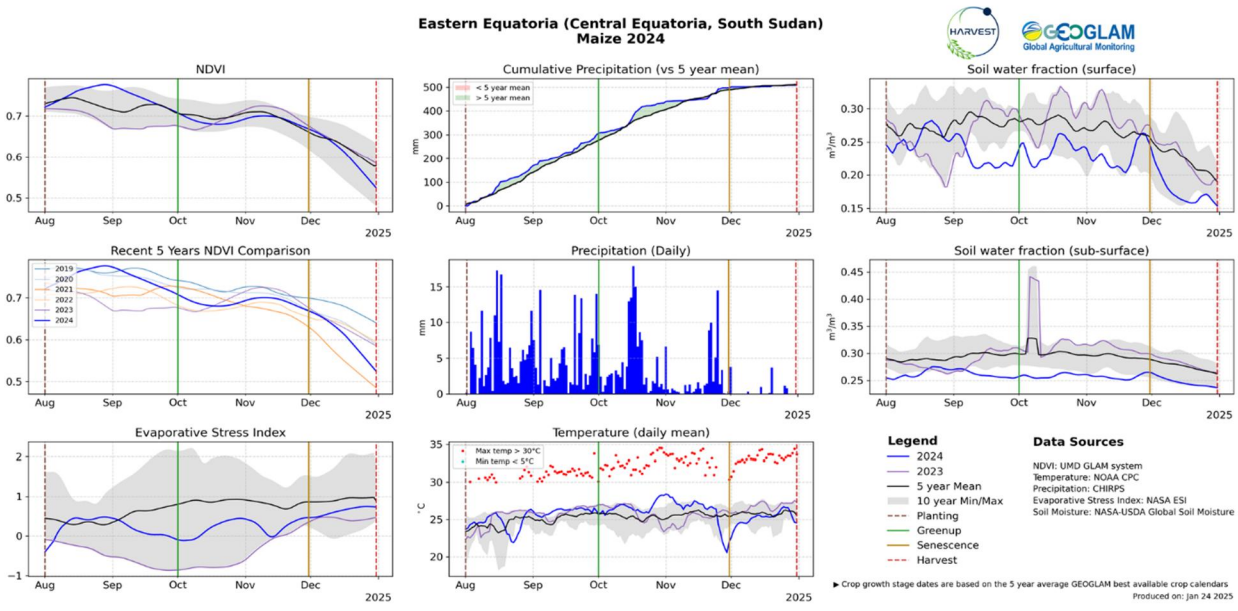
GEOGLAM Agro-meteorological Earth Observation Indicators:

Second-Season Maize

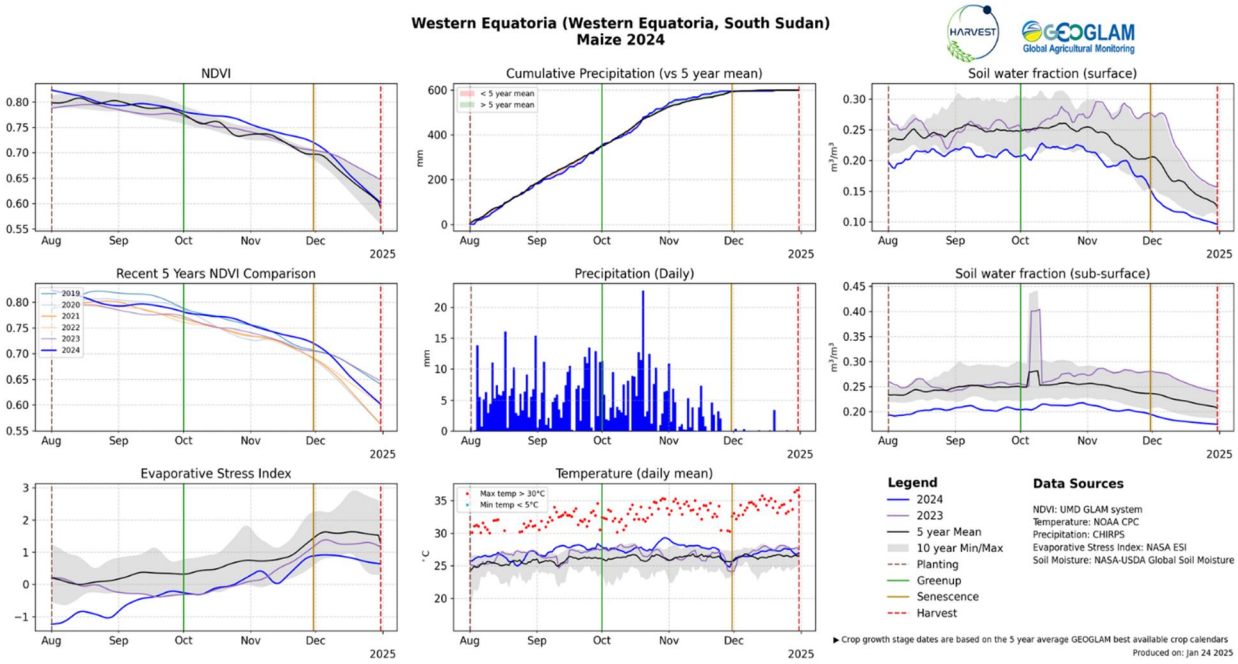
Central Equatoria:



Eastern Equatoria:



Western Equatoria:


Western Equatoria (Western Equatoria, South Sudan)
Maize 2024
HARVEST
GEOGLAM
Global Agricultural Monitoring
NDVI
Cumulative Precipitation (vs 5 year mean)
< 5 year mean
> 5 year mean
mm
Soil water fraction (surface)
m³/m³
Recent 5 Years NDVI Comparison
2019
2020
2021
2022
2023
2024
Precipitation (Daily)
Soil water fraction (sub-surface)
Evaporative Stress Index
Temperature (daily mean)
Max temp > 30°C
Min temp < 5°C
°C
Aug
Sep
Oct
Nov
Dec
2025
Legend
2024
2023
5 year Mean
10 year Min/Max
Planting
Greenup
Senescence
Harvest
Data Sources
NDVI: UMD GLAM system
Temperature: NOAA CPC
Precipitation: CHIRPS
Evaporative Stress Index: NASA ESI
Soil Moisture: NASA-USDA Global Soil Moisture
▶ Crop growth stage dates are based on the 5 year average GEOGLAM best available crop calendars
Produced on: Jan 24 2025