FAMINE EARLY WARNING SYSTEMS NETWORK

Mozambique

Monthly Climate and Weather

12 September 2024

Highlights

- El Niño Southern Oscillation (ENSO)-neutral conditions continued during August 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 (71% chance) and is expected to persist through January-March 2025 (63% chance).

- During June - August 2024, rainfall was 10-100 mm above-average over central Mozambique, while rainfall was 10-50 mm below-average in the southern and areas of the northern regions. During October – December 2024, above-average rainfall is favored in northern and central regions of Mozambique.

- During June - August 2024, maximum temperatures were 1-5°C above average across Mozambique. Minimum temperatures were 1-3°C above average in southern Mozambique and were near-average elsewhere. During October – December 2024, temperatures forecasts favor above-average temperatures over much of northwestern, central, western and some parts of southern regions of Mozambique.

- During June - August 2024, many areas of Mozambique were seasonally dry. However, southern Mozambique and part of the north-central region experienced drier-than-average conditions. During the next four weeks, drier-than-average conditions could persist over local areas in the southern provinces.

- As of late August 2024, poor vegetation conditions remained across western and north-central Mozambique, whereas above-average biomass conditions were depicted in the southern and southeastern regions of the country.

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.

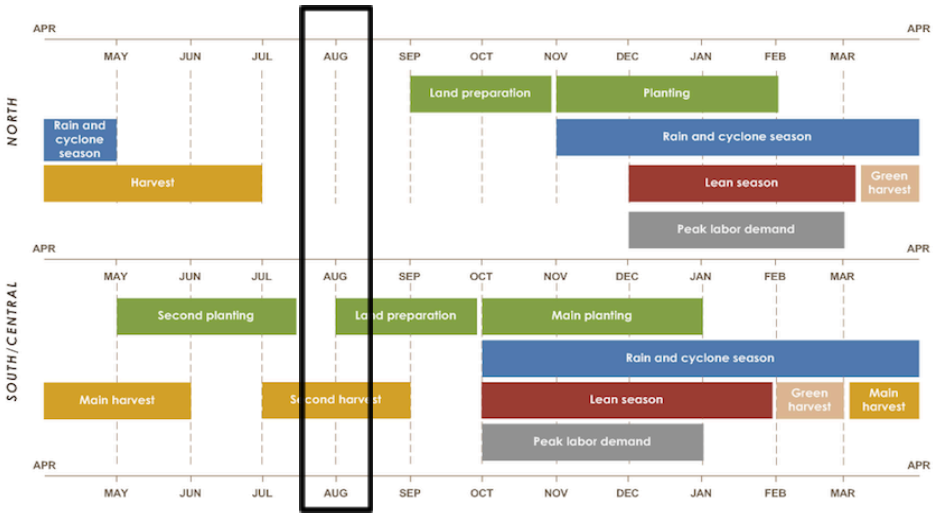


Figure 1: Seasonal calendar for Mozambique. **Source: FEWS NET**

Current Climate Modes and Teleconnections

- As of early-September 2024, ENSO-neutral conditions are present over the equatorial Pacific Ocean. The SSTs are above-average in the western Pacific and near-to-below-average in the east-central and eastern Pacific Ocean. Low-level wind anomalies were easterly in most of the Pacific Ocean, whereas upper-level wind anomalies were cross-equatorial and easterly over the east-central equatorial Pacific Ocean.
- The latest outlook indicates La Niña is favored to emerge in September-November (71% chance) and is expected to persist through January-March 2025 (63% chance) (Fig. 2). The latest update of the NOAA Climate Prediction Center's El Niño/Southern Oscillation diagnostic discussion can be found here.

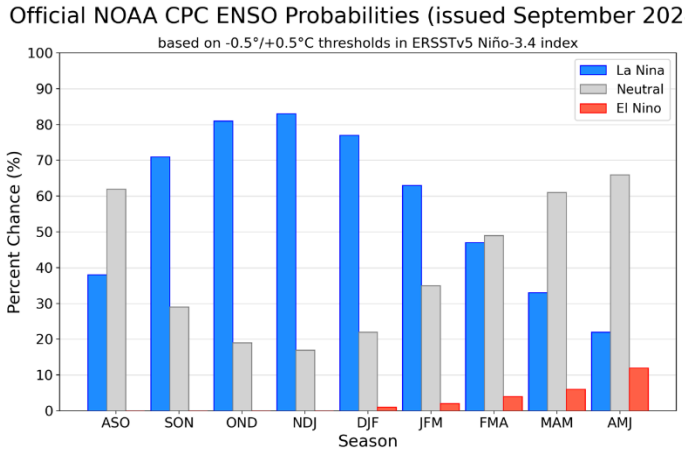


Figure 2: Official CPC ENSO probabilities outlook. **Source: NOAA/NCEP**

- Based on historical record, La Niña conditions are associated with above-average rainfall and near-average to below-average mean temperatures in southern Mozambique during October – December (**Figure S1**).

Extreme Events

- Over the past 30 days, stronger-than-average southeasterly winds were observed in southern Mozambique.
- The region with the most significant number of fire alerts (**340** fire alert) was Gaza over the past 4 weeks in Mozambique.

Rainfall/Precipitation

Past 3 months (June - August 2024):

- **Totals:** During June - August 2024, rainfall generally ranged between 25-75 mm across Mozambique. However pocket areas in central and northern Mozambique registered total rainfall over 100 mm (**Fig. 3a**).
- **Anomalies:** During June - August 2024, Mozambique experienced mixed conditions with rainfall between 10-100 mm above average in central Mozambique and totals between 10-50 mm below-average in the southern and part of the northern regions (**Fig. 3b**). Total rainfall was 19 mm above average in Zambézia (**Table 1**).

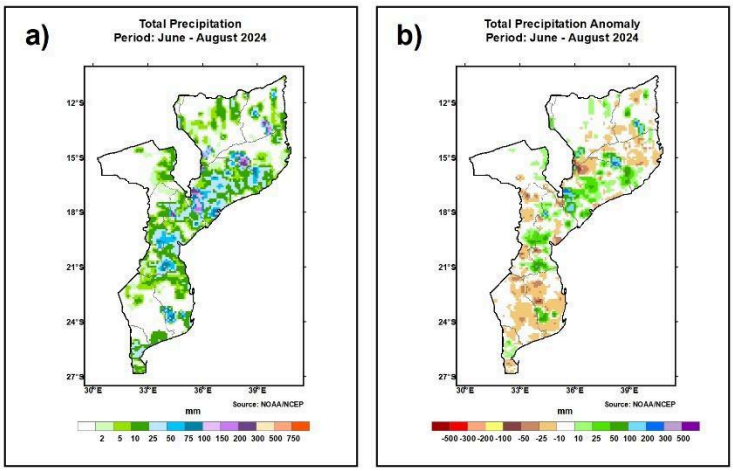


Figure 3: Spatial distribution for June - August 2024 (a) total precipitation and (b) total precipitation anomaly. **Source: NOAA/NCEP**

Past 1 month (August 2024):

- **Totals:** During August, rainfall totaled between 10-50 mm in central Mozambique, whereas dry conditions continued over the remainders of the country (**Fig. 4a**).
- **Anomalies:** During August, rainfall was 10-50 mm above average across central Mozambique and was near-average elsewhere (**Fig. 4b**).

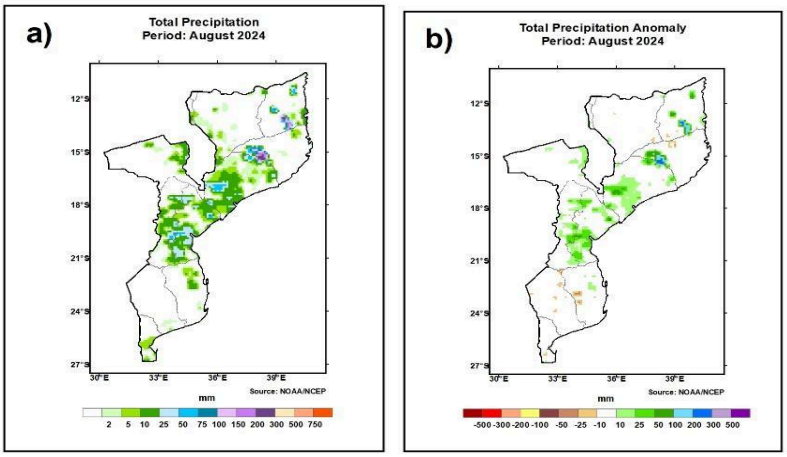


Figure 4: Spatial distribution for August 2024 (a) total precipitation and (b) total precipitation anomaly. **Source: NOAA/NCEP**

Monthly and Seasonal Forecasts (October 2024 and October – December 2024):

- **Monthly:** Based on the North American Multi-Model Ensemble (NMME) models (using observations in September 2024 to drive the models), there is a slight tilt in the odds to favor above-average rainfall in parts of Cabo Delgado, eastern Niassa, and northern and northeastern Nampula provinces of Mozambique during October 2024 (**Fig. 5a**).

- **Seasonal:** Based on the NMME models, there is a slight to moderate tilt in the odds to favor above-average rainfall in northern and central regions of Mozambique (**Fig. 5b**).

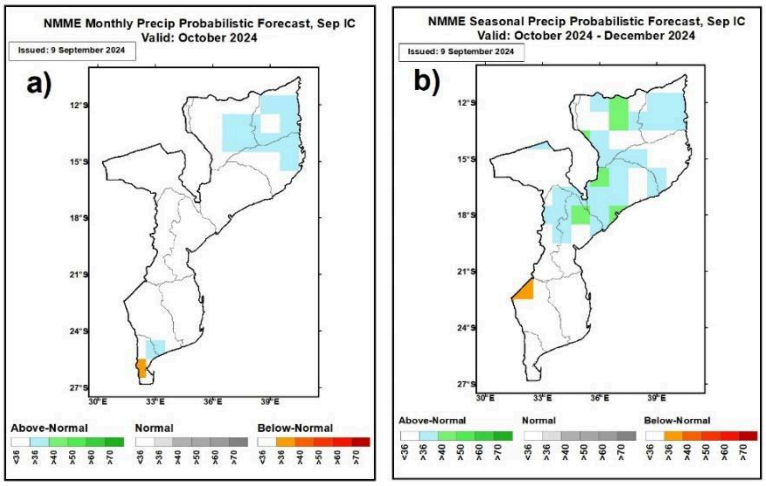


Figure 5: Rainfall forecast for (a) October 2024 and (b) October – December 2024. **Source: NOAA/NCEP**

Table 1: Total rainfall and anomalies for the past three months and one month and seasonal rainfall climatology and anomaly forecast over provinces of Mozambique.

Location	Past 3-Month		Past 1-Month		Seasonal Forecast	
	Total (mm)	Anomaly (mm)	Total (mm)	Anomaly (mm)	Climatology (mm)	Anomaly (mm)
Cabo Delgado province	11	4	9	7	229	14
Gaza province	4	-10	0	-3	275	5
Inhambane province	13	-6	2	-1	243	13
Manica province	15	0	8	5	325	21
Maputo	12	-3	2	-2		

province						
Nampula province	18	5	11	7	257	11
Niassa province	7	0	1	0	265	25
Sofala province	25	8	14	11	274	17
Tete province	3	0	2	2	284	30
Zambézia province	38	19	12	10	277	19

Temperature

Past 3 months (June - August 2024):

- **Maximums:** During June - August 2024, maximum temperatures were 1-5°C above average across Mozambique with the hottest conditions in Tete, Manica, and part of Niassa, Gaza, and Inhambane (**Fig. 6a**).
- **Minimums:** During June - August 2024, while minimum temperatures were 1-3°C above average in southern Mozambique, low temperatures were 1-2°C below average in southern Niassa (**Fig. 6b**).

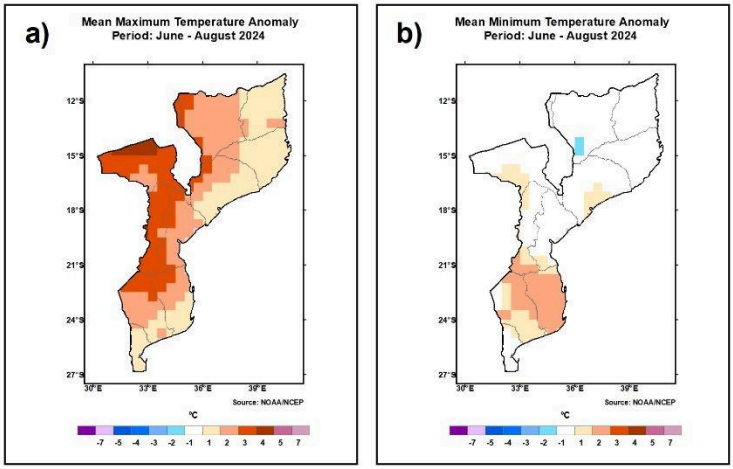


Figure 6: Spatial map for June - August 2024 (a) mean maximum temperature anomaly and (b) mean minimum temperature anomaly. **Source: NOAA/NCEP**

Past 1 month (August 2024):

- **Maximums:** During August, maximum temperatures were 1-4°C above average across Mozambique with the western regions experiencing the hottest conditions (**Fig. 7a**). Maximum temperatures averaged 3.6°C above-average in Tete (**Table 2**).
- **Minimums:** During August, minimum temperatures were 1-3°C above average over southern Mozambique. In contrast, minimum temperatures were 1-2°C below average in western Niassa (**Fig. 7b**).

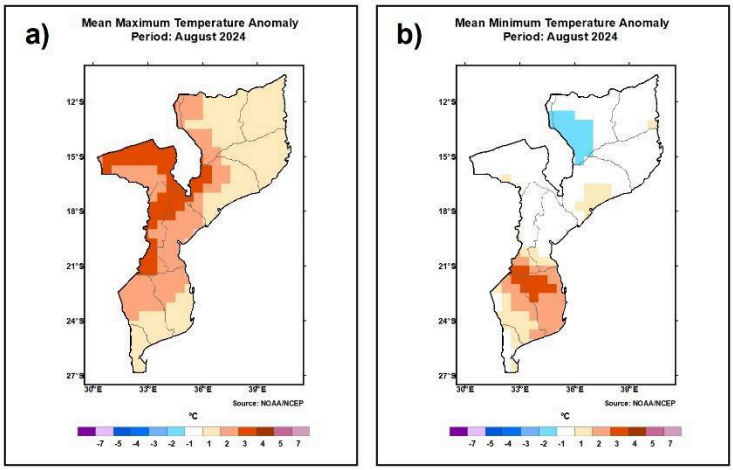
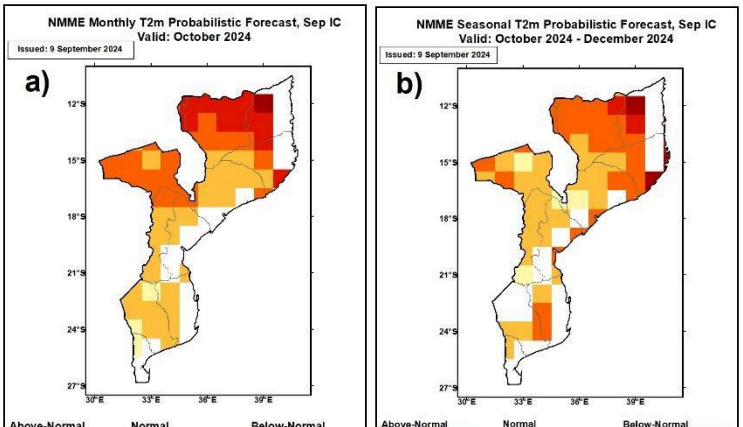


Figure 7: Spatial map for August 2024 (a) mean maximum temperature anomaly and (b) mean minimum temperature anomaly. **Source: NOAA/NCEP**

Monthly and Seasonal Forecasts (September and October – December 2024):

- **Monthly:** Based on the NMME models, there is a slight to moderate tilt in the odds to favor above-average temperature over much of northwestern, central, western and southwestern parts of Mozambique during October 2024 (**Fig. 8a**).
- **Seasonal:** Based on NMME forecasts, there is a slight to moderate tilt in the odds to favor above-average temperature over much of northwestern, central, western and



some parts of southern regions of Mozambique during Oct 2024 – Dec 2024 (**Fig. 8b**).

Figure 8: Spatial map for (a) October 2024 mean temperatures forecast and (b) October 2024 – December 2024 mean temperatures forecast. **Source: NOAA/NCEP**

Table 2: Maximum temperature and minimum temperature and anomaly for the past three months and one month and seasonal mean temperatures and anomaly forecast over provinces of Mozambique.

Location	Past 3-Month		Past 1-Month		Seasonal Forecast	
	Max/Min Temp (°C)	Max/Min Anomaly (°C)	Max/Min Temp (°C)	Max/Min Anomaly (°C)	Temp (°C)	Above/Below-average (°C)
Cabo Delgado province	29/18	1.7/0.5	30/18	1.4/0.5	26.6	0.7
Gaza province	29/14	2.6/1.8	29/15	2.2/2	26.1	0.7
Inhambane province	27/17	2.3/2.4	28/18	2/2.6	26.2	0.6
Manica province	28/14	3.4/1	29/15	3/1.2	25.4	0.7
Maputo province	28/13	1.6/0.7	28/15	1.5/0.9		
Nampula province	28/17	1.9/0.2	29/17	1.4/0.4	26.8	0.7
Niassa province	27/145	2.5/-0.3	28/14	1.9/-0.6	25.7	0.8
Sofala province	28/16	2.8/0.2	29/17	2.7/0.4	27.1	0.6
Tete province	29/15	3.6/0.7	30/16	3.1/0.3	26.9	0.7
Zambézia province	28/16	2/0.6	29/16	2/0.7	27.0	0.7

Flooding and Areas of Inundation

- Currently, there is no flooding in Mozambique.
- Concerns for flooding are nonexistent or minimal for Mozambique over the next 30 days.

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 (June - August 2024):

- During June - August 2024, while many areas of Mozambique were seasonally dry, the southern provinces and part of the north-central region experienced drier-than-average conditions. (**Fig. 9a**).

Past 1 month (August 2024):

- During August, Mozambique was seasonally dry (**Fig. 9b**).

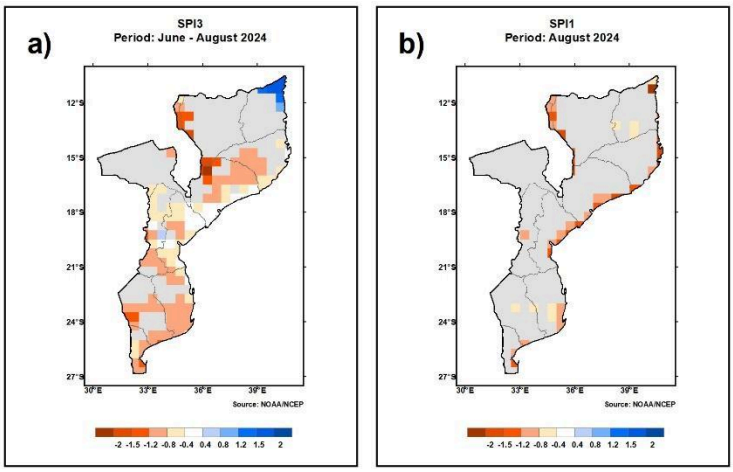


Figure 9: Spatial structure of (a) June - August 2024 Standardized Precipitation Index (SPI) and (b) August 2024 SPI. **Source: NOAA/NCEP**

Current/Forecast (2 July – 29 September 2024):

- SPI forecast, which is constructed from observed precipitation from 2 July 2024 to 1 September 2024 and forecasted rainfall data from 2 September to 29 September 2024 suggests that while most areas of Mozambique will remain seasonally dry, drier-than-average conditions could persist over areas of the southern provinces (**Fig. 10**).

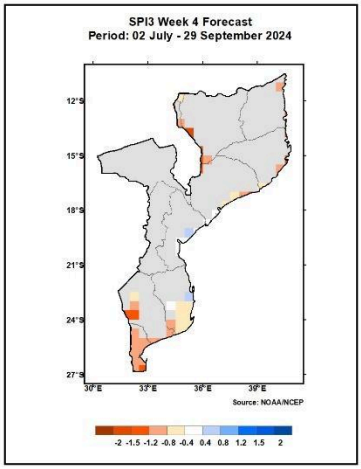


Figure 10: Spatial structure of SPI constructed from observations for 2 July to 1 September 2024 and 4 weeks forecast ending on 29 September 2024. **Source: NOAA/NCEP**

Normalized Difference Vegetation Index (NDVI)

NDVI is a measure of vegetation health, where high NDVI values are indicative of healthy, dense vegetation, and low NDVI values are indicative of less or no vegetation. Therefore, negative NDVI anomalies suggest deteriorated vegetation health relative to the long-term average.

Current (21 – 31 August 2024):

- From 21 – 31 August, vegetation conditions remained poor (NDVI values between 60-90% of the average) across the western and north-central regions of Mozambique (**Fig. 11**). In contrast, vegetation conditions were above-average in southern Mozambique.

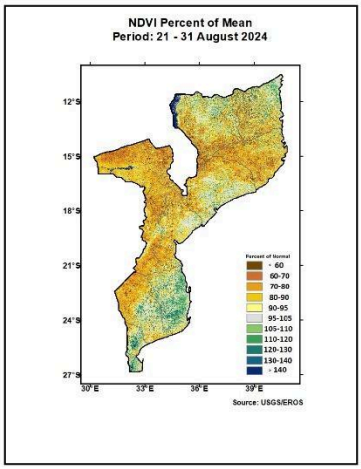


Figure 11: Spatial structure of NDVI anomaly for 21 – 31 August 2024. **Source: USGS/EROS**

Water Requirement Satisfaction Index (WRSI)

- NA

GEOGLAM Crop Monitor

- In Mozambique, aggregate cereal production is estimated to 14 percent below-average, with significant reductions in Mozambique due to El Niño-induced drought and high temperatures conditions.

Additional Resources

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

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

https://fews.net/southern-africa/mozambique

https://fews.net/sites/default/files/2024-09/Global-Weather-Hazards-09122024.pdf

Annex

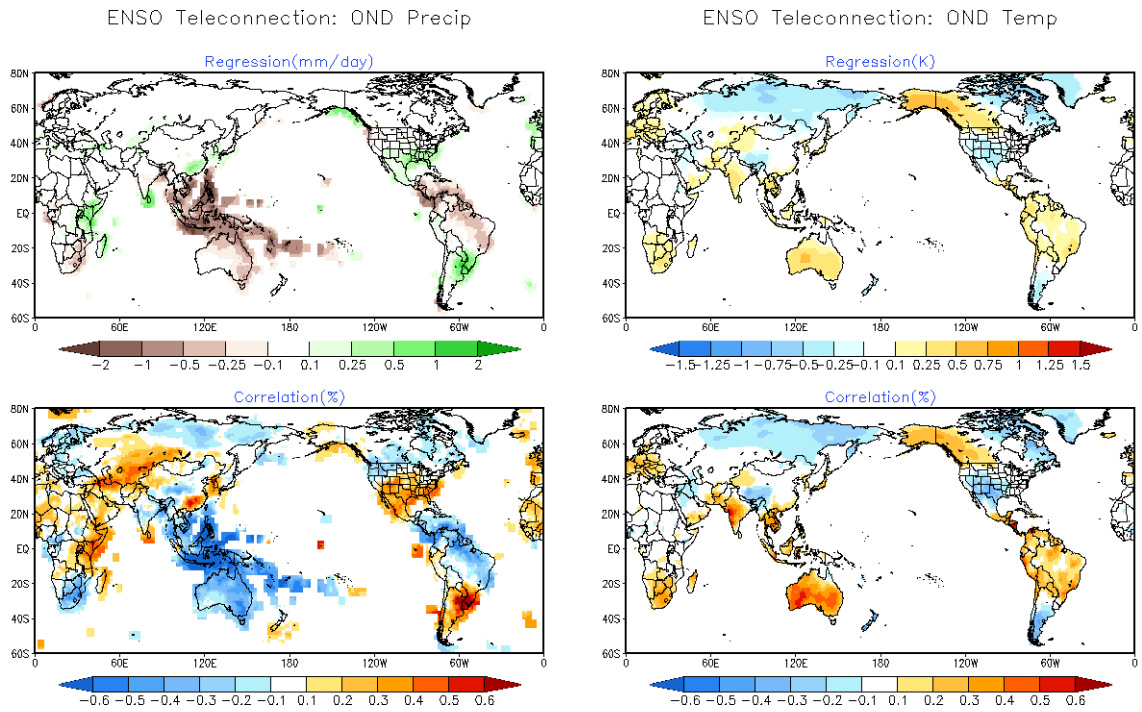


Figure S1: For three month season (OND), precipitation and temperature anomalies are regressed onto the standardized Niño-3.4 index (upper panel). In the bottom panel, the correlation is calculated between Nino-3.4 and the anomalies.

GEOGLAM Agro-meteorological Earth Observation Indicators:

[Crop Type]

[Location]: