IGAD Climate Prediction and Applications Centre Monthly Climate Bulletin, Climate Review for October and Forecasts for December 2018

1. INTRODUCTION

This bulletin reviews the October 2018 climate conditions over the Greater Horn of Africa (GHA) region and highlights the December 2018 rainfall and temperature forecasts together with the socio-economic impacts associated with both the observed and the forecasted climate conditions.

There are six sections in this bulletin. The major highlights from both the observed and expected climate conditions are outlined in section2. Section 3 discusses the climate patterns that prevailed in the month of October 2018, while the dominant weather systems are discussed in section 4. In section 5, the December 2018 climate forecasts over the GHA are presented. The socio-economic impacts associated with the observed climatic conditions and those expected from December 2018 climate forecasts are outlined in section 6.

For referencing within this bulletin, the GHA is generally divided into three sub-sectors: The equatorial sector lying approximately between 5^{o}N and 5^{o}S latitude, with the northern and southern sectors occupying the rest of the northern and southern part of the region respectively.

2. HIGHLIGHTS

Rainfall was concentrated mainly in the southern part of the northern sector, and over western equatorial sector of the GHA. Below normal rainfall was recorded over southern parts of the northern sector, and western and central parts of the equatorial sector of the GHA. Much of the rest of the GHA recorded near normal rainfall during the month of October 2018 (Figure 2 and 3).

Maximum temperature cooler than the long-term mean was experienced in western and southeast part of the northern sector as well as southwest part of the southern sector of the GHA (Figure 4a). Minimum temperature cooler than the long-term mean was recorded mainly in western part of the northern sector of GHA. Much of the rest of the GHA recorded minimum and maximum temperature warmer than or near the long-term average for the month of October 2018.

The general rainfall condition in the southern part of the northern sector as well as western equatorial sector of GHA resulted in continued good water and pasture conditions resulting

to prospects for good crop, and livestock productivity during the month of October 2018. Some places in coastal equatorial sector reported flooding.

By October 2018, the Oceanic Nino Index (ONI), one of the primary indices used to monitor the El Nino-Southern Oscillation (ENSO) showed a neutral signal transitioning into a positive phase (Figure 7a) and Indian Ocean Dipole (IOD) indicated a positive Indian Ocean Dipole (IOD) phase (Figure 7b).The ONI and IOD are forecasted to be in positive phases towards the end of 2018.

In the month of December 2018, rainfall is expected to be concentrated over much of southern sector and southern part of the equatorial sector of the GHA. Southeastern part of the northern sector of the GHA is also forecasted to record rainfall (Figure 8a).

3. CLIMATE PATTERNS IN OCTOBER 2018

The rainfall amounts (Figure 1) and performance as compared to the long-term mean (1981-2010) using percentage of long term average (Figure 2) and Standardized Precipitation Index (SPI) (Figure 3) for October 2018 are provided in this section. The minimum (Figure 4b) and maximum (Figure 4b) temperature anomalies relative to Long term mean (1981-2010) are also given.

Rainfall performance

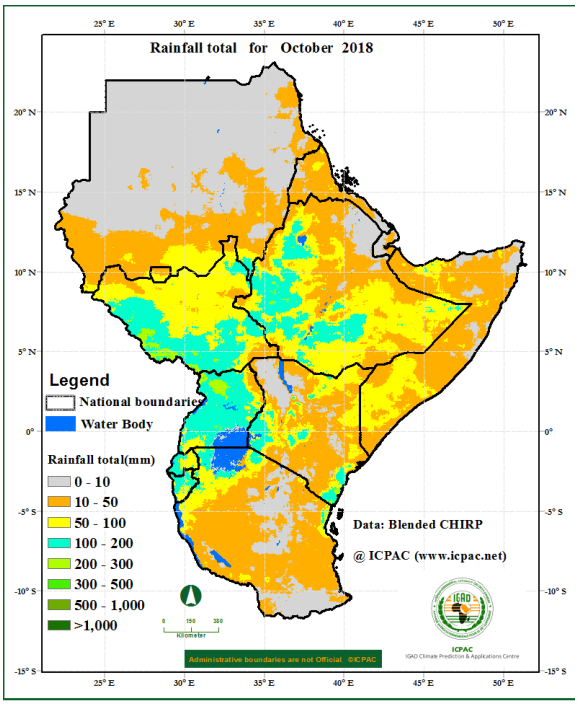

Figure 1: Spatial distribution of rainfall during the month of October 2018 *(Data Source : Blended CHIRPS)*

South Sudan, and Ethiopia: several parts of South Sudan, western and southern Ethiopia recorded rainfall of between 50mm to 200mm. Northeast Ethiopia recorded rainfall of less than 50mm. Some areas in southern Ethiopia, northeast and western South Sudan recorded below normal rainfall conditions, with much of the rest of these areas recording near normal rainfall conditions.

Rwanda, Burundi, and Uganda: Most of Uganda, western Rwanda, and northern Burundi recorded between 100mm and 200mm of rainfall. The rainfall was mainly below normal over southwestern and southeastern Uganda, and over western Burundi. Much of the rest of these areas recorded near normal rainfall.

Sudan, Eritrea, Djibouti and Somalia: southern parts of Sudan, western and central

Eritrea, eastern Djibouti, and much of Somalia recorded rainfall of between 10mm and 100mm. Southern part of Sudan, and central Somalia recorded below normal rainfall while much of the rest of these areas recorded near normal rainfall.

Kenya and Tanzania: western, central, northeastern, and coastal parts of Kenya, and northwestern Tanzania recorded rainfall of between 50mm and 200mm. northwester and eastern Kenya, north-central, central and southern Tanzania recorded less than 10mm of rainfall. Eastern and central parts of Kenya, and parts of eastern Tanzania experienced below normal rainfall, while much of the rest of these areas experienced near normal rainfall.

Much of the rest of the GHA recorded less than 10mm of rainfall that resulted to generally dry or below normal rainfall conditions.

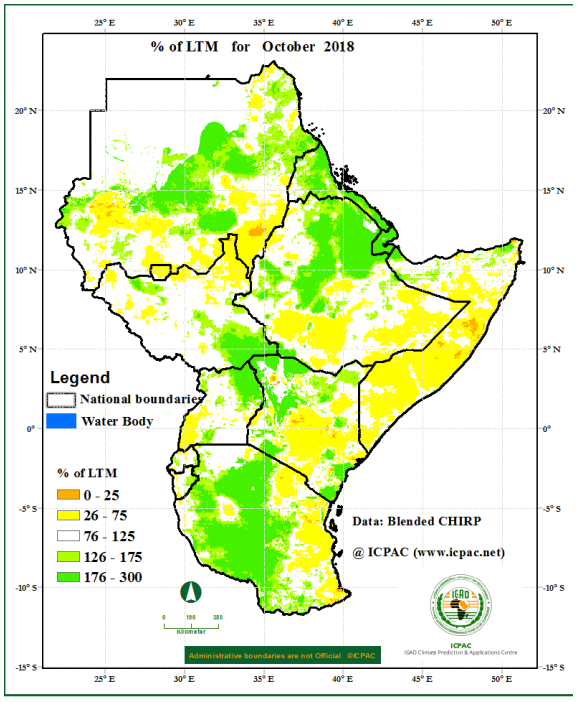

Figure 2: Percentage of average rainfall for October 2018*(Data Source: Blended CHIRPS)*

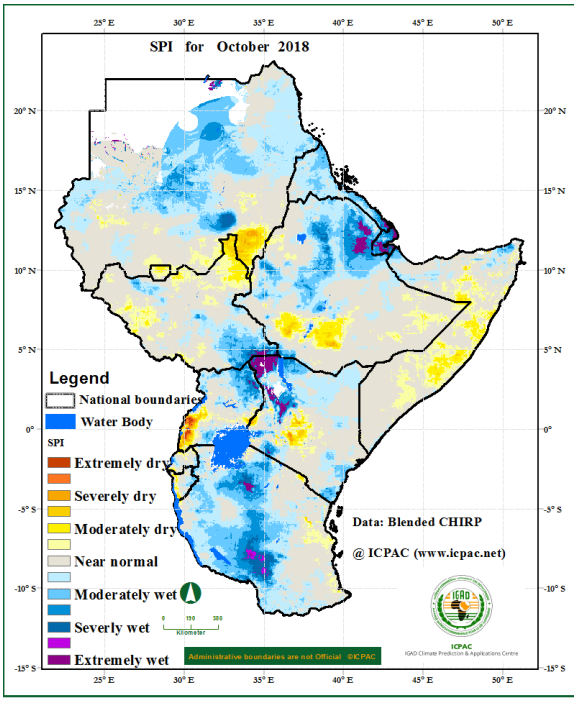

Figure 3: Standardized Precipitation Index for October 2018*(Data Source: Blended CHIRPS)*

Temperature Conditions

Sudan, Eritrea and South Sudan: northern Sudan recorded maximum and minimum temperatures warmer than the long-term mean. southern part of Sudan, and parts of northern South Sudan recorded maximum and minimum temperatures that were cooler than the long-term mean. western Eritrea recorded maximum temperature cooler than the mean. Much of the rest of these areas recorded minimum and maximum temperature that was near the long-term mean.

Ethiopia, Kenya, Uganda, and Rwanda: Most of these places recorded maximum and minimum temperature that was warmer or near the long term mean.

Somalia, Burundi and Tanzania: northern parts of Somalia, western Burundi, and western and north-central Tanzania recorded maximum temperature cooler than the long-term mean and only in western part of Tanzania minimum temperature cooler than the long-term mean recorded. Much of the rest of these areas recorded minimum and maximum temperature that was warmer than the long-term mean or near the long-term mean.

Much of the rest of the GHA recorded maximum and minimum temperature that was warmer than the long-term mean.

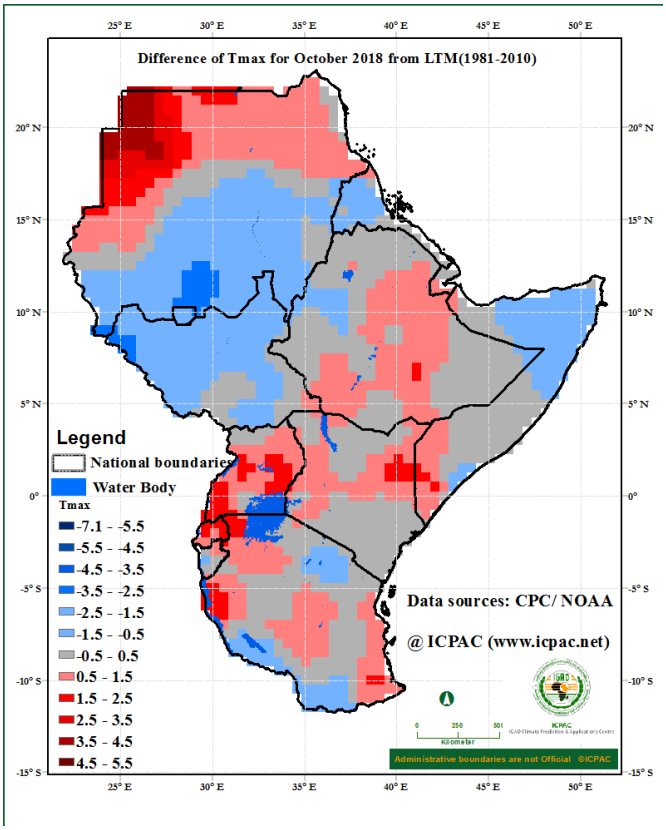

Figure 4a: Maximum temperature anomalies for October 2018 from LTM, 2008-2017 (*Data Source: NOAA/OAR/ESRL PSD)*

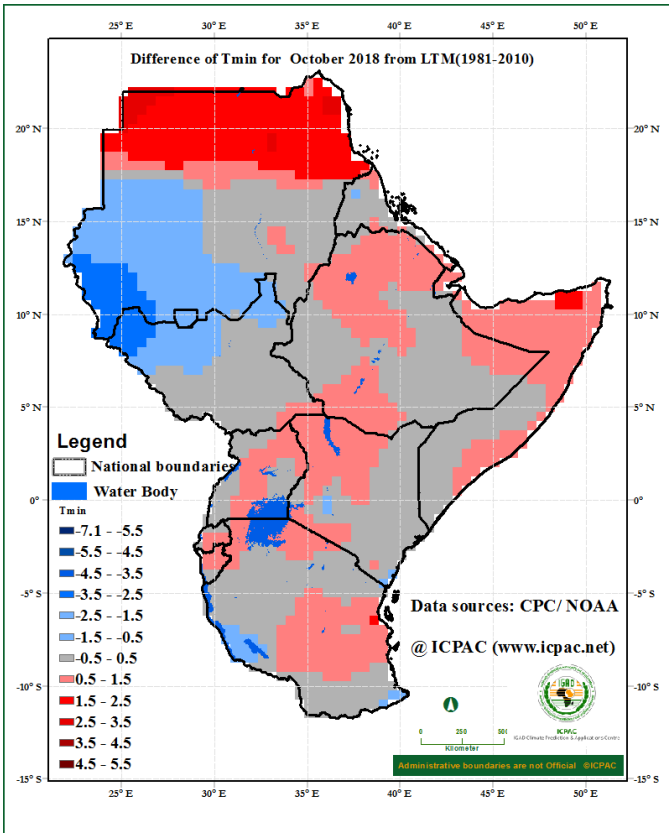

Figure 4b: Minimum temperature anomalies for October 2018 from LTM, 2008-2017 *(Data Source: NOAA/OAR/ESRL PSD)*

Vegetation Condition Indicators

The Normalized Difference Vegetation Index (NDVI) anomaly for October 2018 (Figure 9) indicates that:

Sudan and South Sudan: Southeastern and southwestern part of Sudan, and northern South Sudan showed signs of improved vegetative conditions as compared to the long-term average. However south-central part of Sudan, north-eastern and southeast South Sudan showed signs of deterioration in vegetative conditions.

Somalia and Ethiopia: central Ethiopia and southeastern parts of Somalia showed signals of deterioration in vegetative condition as compared to the long term average.

Kenya and Tanzania: south-central Kenya, and western and eastern Tanzania showed signs of improved vegetative conditions as compared to the long-term average.

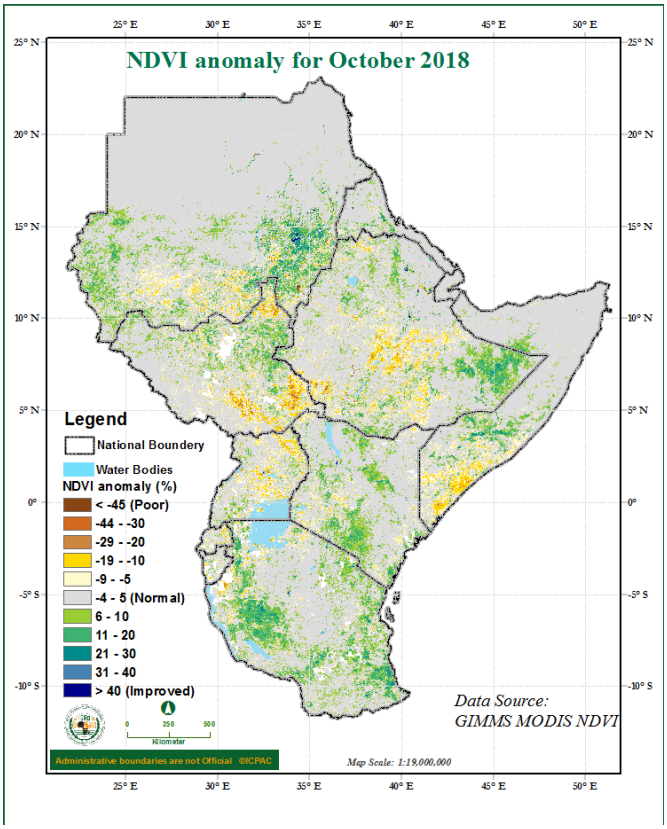

Figure 9: Normalized Difference Vegetation Index (NDVI) for October 2018 *(Data Source: USGS-NASA)*

Much of the rest of the GHA region indicated little or no change in vegetative conditions as compared to the long-term average for the month of October 2018. (Figure 9).

4. STATUS OF THE CLIMATE SYSYEMS

The Sea Surface Temperature (SST) anomaly during the period of 7th October to 3rd November 2018 showed that equatorial Pacific Ocean was dominated by warmer than the average SST anomaly (Figure 5), this situation currently presents a neutral, Oceanic Nino Index (ONI) (Figure 7). Models forecasting El Niño Southern Oscillation ENSO event show a an increased likelihood of an El Niño phase toward the end of the year 2018. Near average to cooler than average SST conditions dominated eastern equatorial Indian Ocean (Figure 5), with near normal SST in the western equatorial Indian Ocean. This pattern has presented a positive phase of the Indian Ocean Dipole (IOD) (Figure 7). Models show a likelihood of a persistent positive IOD towards the end of the year 2018.

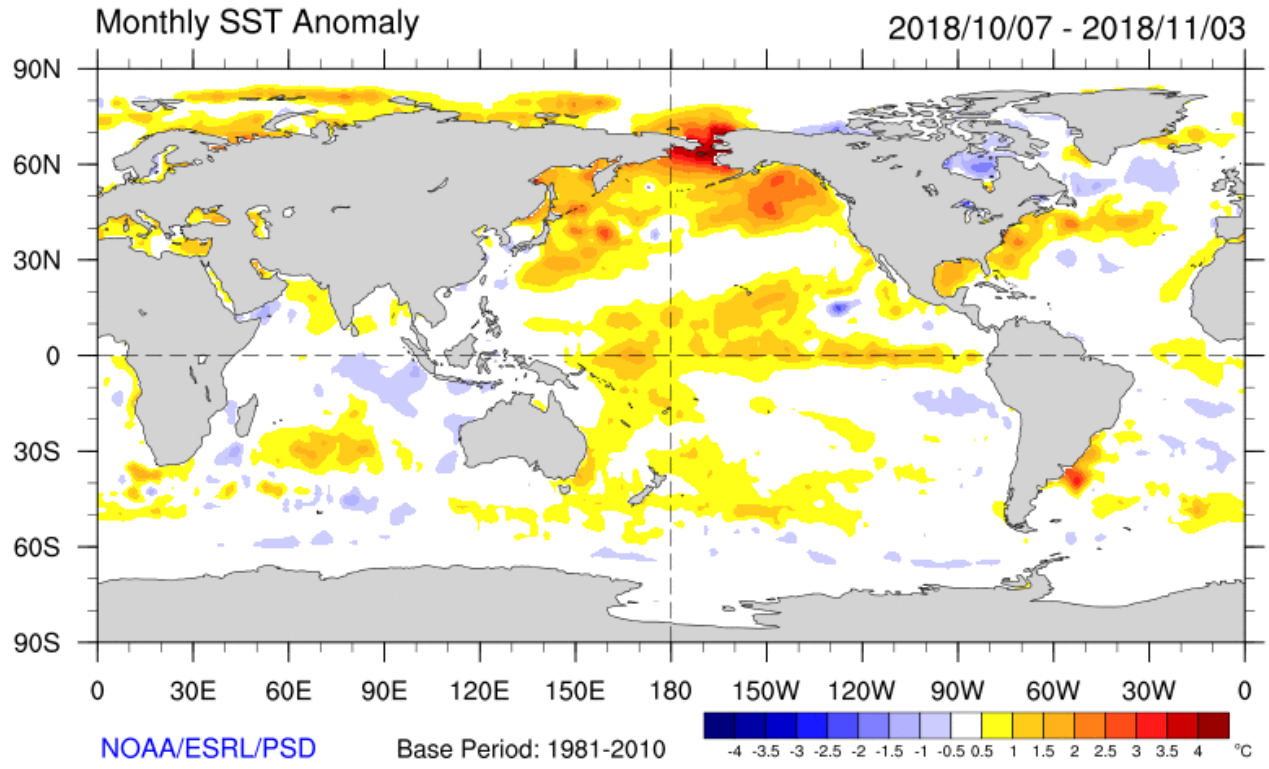

Figure 5: Sea Surface Temperature anomalies for the period 10th October 2018 to 3rd November2018 (*Source: NOAA/ESRL/PSD*)

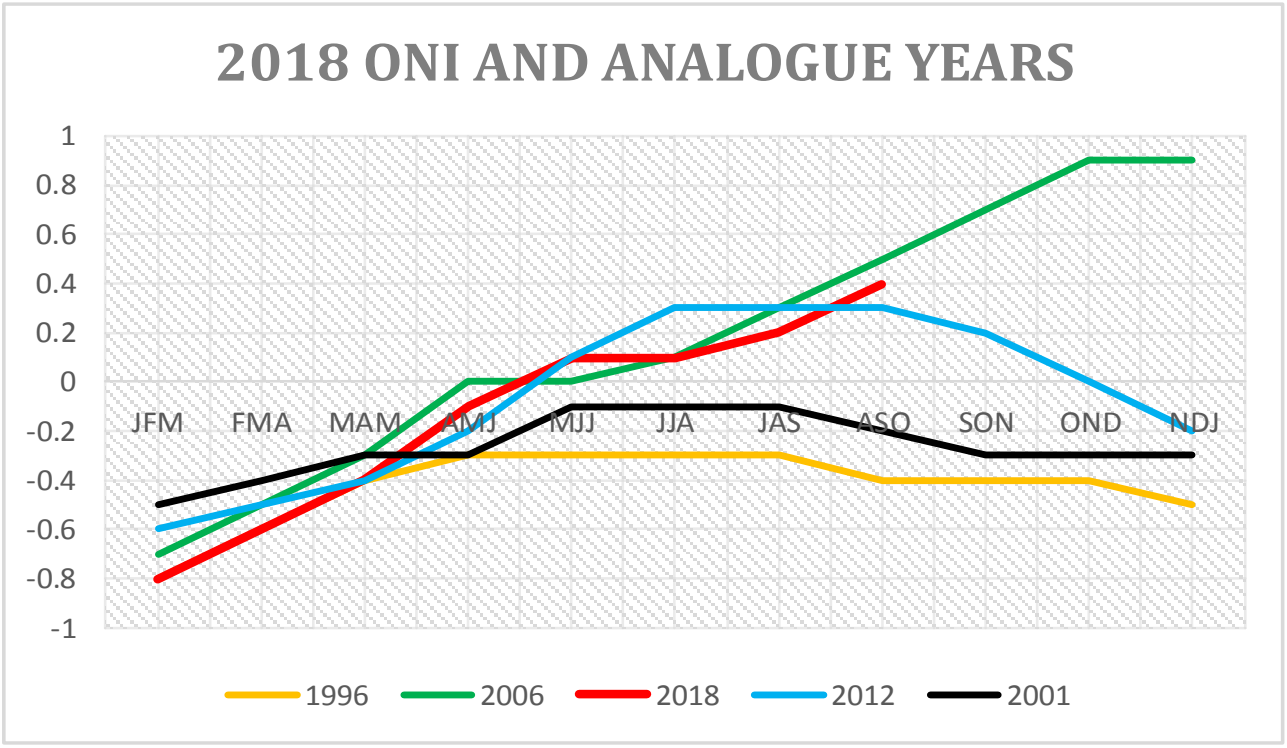

Figure 6: The Indian Ocean Dipole (IOD) during 2018 and analogue years.

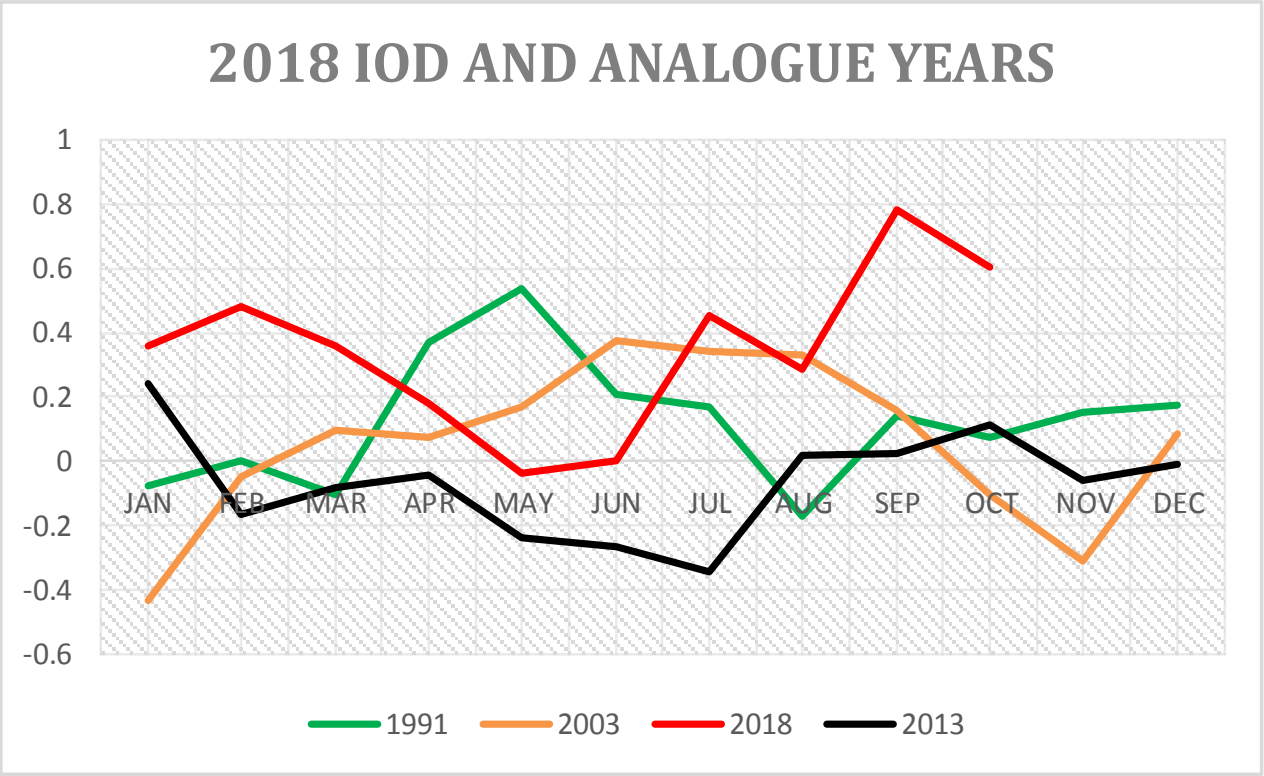

Figure 7: The Oceanic Nino Index (ONI) during 2018 and analogue years.

5. CLIMATE OUTLOOK FOR DECEMBER 2018

The climate outlook for temperature and precipitation for the month of December 2018 are generated from the GHA region customized Weather Research and Forecasting (WRF) model.

The December 2018 rainfall forecast

During the month of December 2018, rainfall will be concentrated over Tanzania, Rwanda, Burundi, southern part of Uganda, and southern parts of Kenya. Southeaster Ethiopia and central parts of Somalia are expected to record some rainfall (Figure 8a). Much of the areas covering Sudan, Eritrea, Djibouti, South Sudan, northern Kenya, north, west and southern Ethiopia and northern Somalia are expected to record small amount of rainfall or remain generally dry.

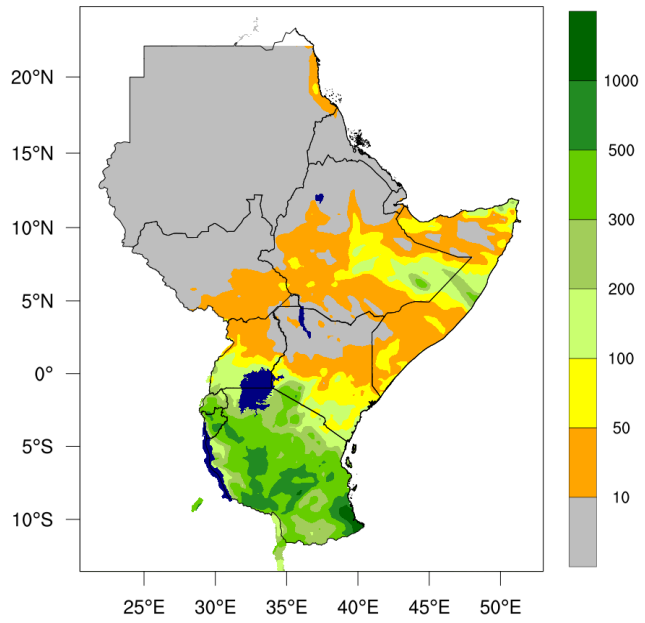

Figure 8a: Forecast of rainfall total for December 2018

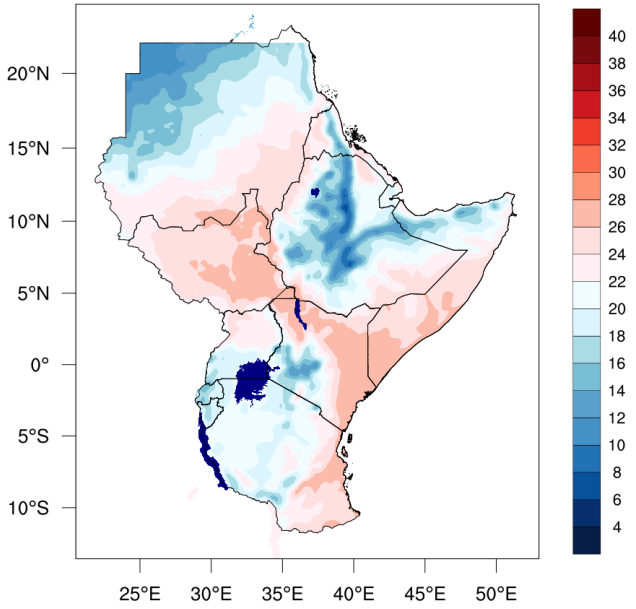

Figure 8b: Mean temperature forecast for December 2018.

December 2018 Temperature forecast

Average temperature of cooler than 22°C is likely to be observed over northern parts of Sudan, western and central Ethiopian highlands, northern Somalia, southern parts of Uganda, western and central Kenya, over much of Rwanda, Burundi, and over parts of northwest and central Tanzania. Much of the rest of the GHA is likely to record average temperatures warmer than 22°C (Figure 8b).

6. IMPACTS ON SOCIO-ECONOMIC SECTORS

The socio-economic impacts associated with observed climate conditions are provided below.

Impacts of observed climate conditions during October 2018

During the month of October 2018, Flooding was reported over coastal Kenya.

Potential impacts for December 2018 climate outlook

In the month of December 2018, the forecasted climate is likely to result to improved water availability, improved crop and pasture conditions leading to good prospects for crop and livestock performance especially in south-western parts of the equatorial sector as well as much of the southern sector of the GHA. the central and eastern part of the equatorial sector are likely to experience dry conditions.

For more information contact
ICPAC
P.O. Box 10304, 00100
Nairobi, KENYA;
Tel: +254-020-3514426
E-mail: director@icpac.net
Website: www.icpac.net

THIS BULLETIN IS PRODUCED IN COLLABORATION WITH THE NATIONAL METEOROLOGICAL AND HYDROLOGICAL SERVICES (NMHSs) IN THE GREATER HORN OF AFRICA (GHA)