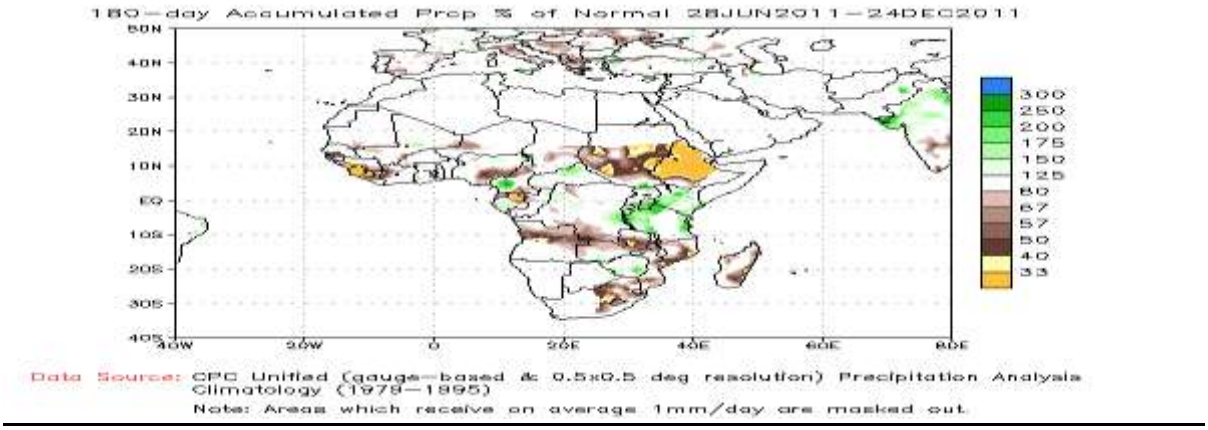
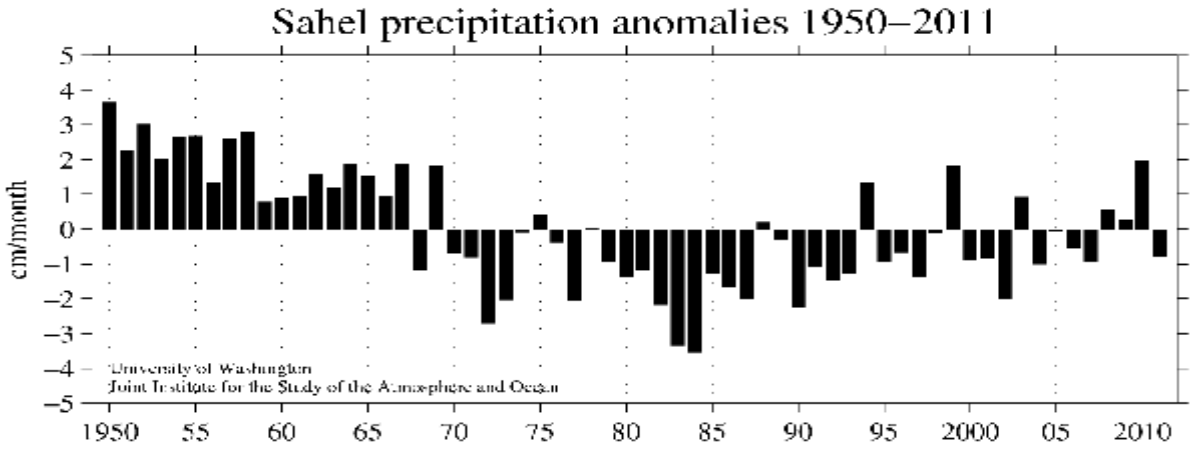
SEASONNAL FORECASTS ASSESSMENT REPORT



Significant precipitation deficits up to 20% and more were recorded over southern Mauritania and adjacent areas in Mali, southwestern Burkina Faso and western Niger. Severe drougth hit much of Ethiopia and Sudan. Shortages in food production and appeals for international food aid have been reported in some of these countries.



June through October averages over 20–10N, 20W–10E, 1950–2011 climatology.
NOAA NCDC Global Historical Climatology Network data

The year 2000 in the Sahel appears to be the most recent year similar to 2011.

December 26, 2011

ABSTRACT

In this report, we assess seasonal outlook forums products for West and Central Africa in 2011. The performance of two precipitation seasons (July-August-September and October-November-December 2011) over West and Central Africa are described.
In JAS 2011, sea surface temperatures outlooks anticipated quite well neutral conditions in the tropical Atlantic off the coast of West and Central Africa and warm waters over the Mediterranean Sea. However, the outlook supported a persistence of ENSO neutral conditions but a weak La Nina reemerged in the observations during summer of 2011.
In OND 2011, the outlook anticipated the observed persistence of a weak La Nina as well as neutral conditions in the tropical Atlantic off the coasts of West and Central Africa.
Much of Mauritania and adjacent areas in Mali, southwestern Burkina Faso, and Western part of Niger, south central Nigeria and northern Cameroon recorded below normal precipitation with late onset and/or irregular distribution of precipitation within the season in some locations. These areas are at risk of shortage in food production.
The JAS outlook anticipated the irregular distribution of precipitation during the season but failed to indicate below normal precipitation over much of Mauritania, parts of Burkina Faso, western Niger and northern Cameroon.

Over coastal West Africa, much of Guinea Conakry, Sierra Leone and Liberia, south central Nigeria recorded significant rainfall deficits. The outlook was favorable for normal to below normal precipitation over the coast. It failed to locate areas of significant deficits in Guinea-Conakry, Liberia, Sierra Leone and south Central Nigeria.
Areas with precipitation deficits in Guinea-Conakry, Nigeria and northern Cameroon are in the upper and lower Niger River basin. Recent records indicate normal to below normal water levels in some of these areas of the Niger River basin.

Well above normal precipitation observed in coastal areas of central Africa in October and November 2011 associated with long duration weak to moderate and/or short duration moderate to heavy rain events was well anticipated by the OND 2011 outlook. Future food production estimation and risk mapping efforts may consider upgrades of tools to make better use of climate outlook information.

A- SEASONAL FORECASTS PERFORMANCE FOR JULY-AUGUST-SEPTEMBER 2011 FOR WEST AFRICA, CHAD AND CAMEROON

In June 2011, a climate outlook forum was organized at ECOWAS headquarters in Abuja-Nigeria. It delivered the climate outlook product valid for July-August-September 2011 in the sub-region.

SSTs outlook and observations

The SST outlook anticipated:

- a persistence of ENSO neutral conditions;
- an evolution from warm to neutral conditions over tropical north Atlantic off the coasts of West Africa;
- a transition from warm to neutral conditions over eastern tropical south Atlantic with a persistence of a cold tongue over the equator;
- a persistence of warm waters over the eastern Mediterranean sea.

Figures 1 and 3 indicate that a weak La Nina re-emerged in August 2011 following the ENSO neutral conditions that started in June 2011 from a long La Nina period. July-August-September 2011 was characterized by a weak La Nina and not a neutral ENSO as predicted. However tropical Atlantic Ocean and the Mediterranean Sea, the predicted patterns actually materialized with neutral conditions in regions of interest in the tropical Atlantic and warm waters over the Mediterranean Sea.

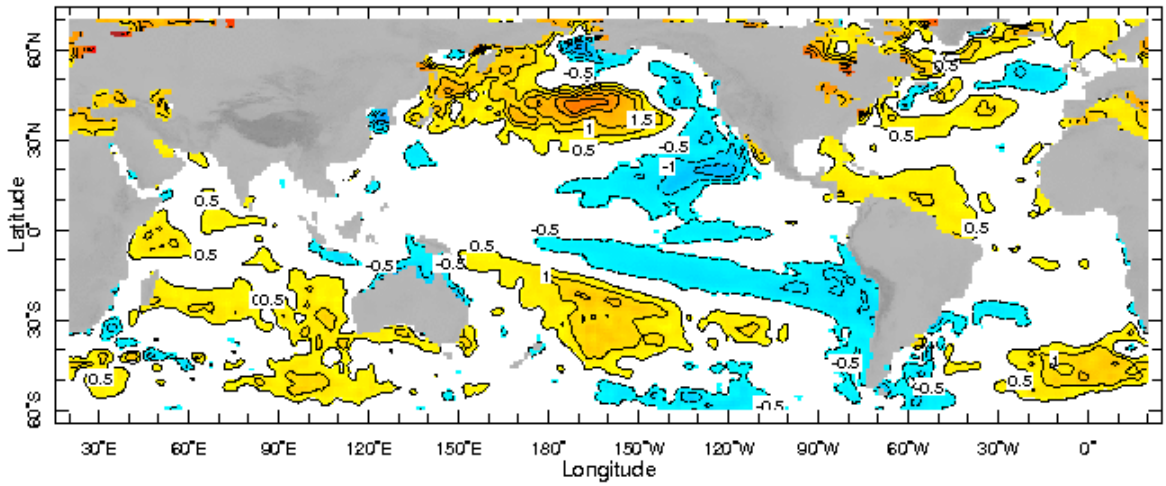


Figure 1: Observed SST anomaly for the global oceans in July-August-September 2011.
Dataset: Reynolds and Smith Version 2 monthly sea surface temperature anomaly (deg. C). Reference period: 1971-2000. Data Source: NCEP, Environmental Monitoring Center . NCEP is an acronym for the US National Centers for Environmental Prediction.

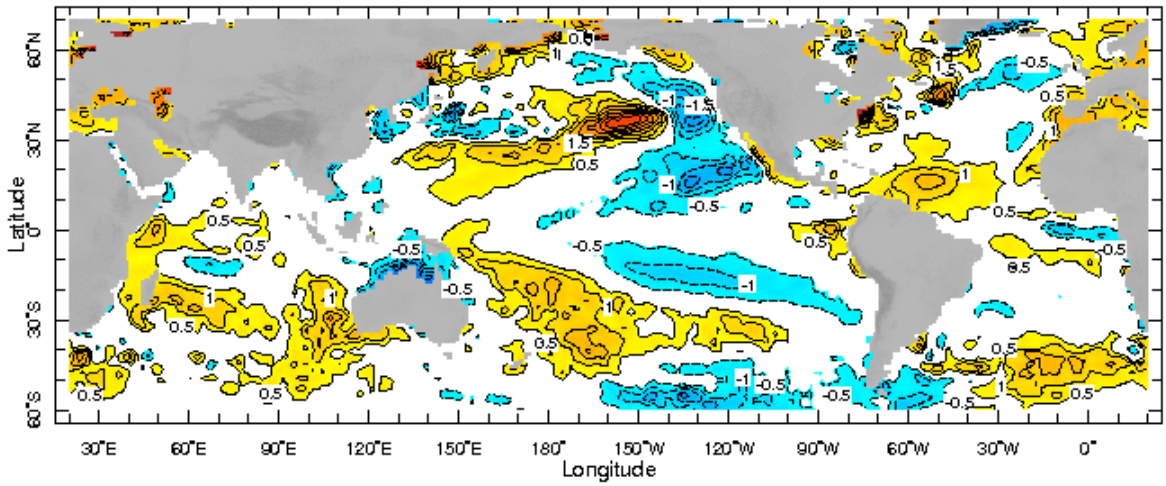


Figure 2: Observed SST anomaly for the global oceans in June 2011.

Dataset: Reynolds and Smith Version 2 monthly sea surface temperature anomaly (deg. C). Reference period: 1971-2000. Data Source: NCEP, Environmental Monitoring Center . NCEP is an acronym for the US National Centers for Environmental Prediction

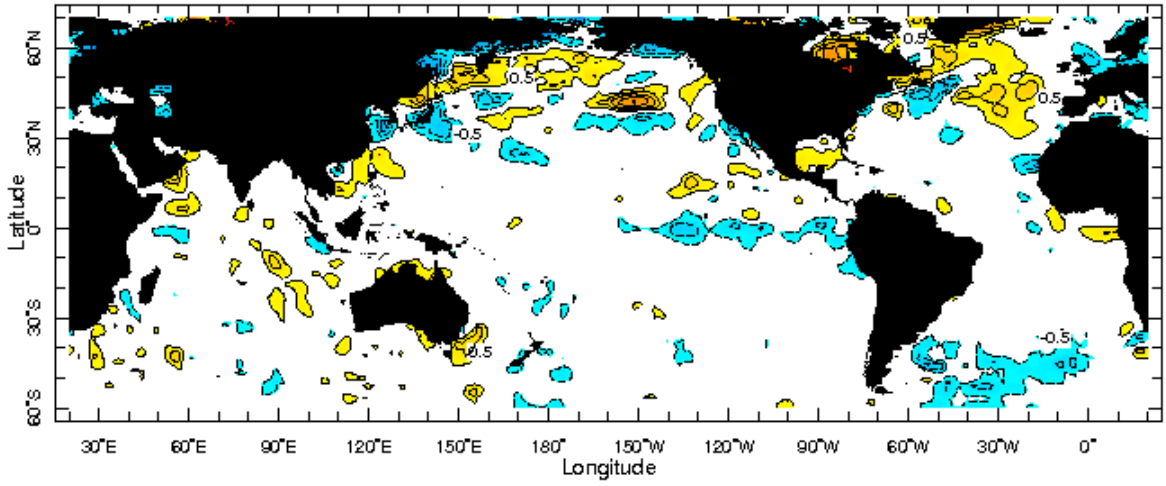


Figure 3: : Observed SST anomaly difference between August and July 2011: Note the re-emergence of a La Nina and the decay of the cold tongue over the equator.

Dataset: Reynolds and Smith Version 2 monthly sea surface temperature anomaly (deg. C). Reference period: 1971-2000. Data Source: NCEP, Environmental Monitoring Center . NCEP is an acronym for the US National Centers for Environmental Prediction

Precipitation outlook and observations

PRESAO-14 product predicted above normal precipitation (between 100 and 130% of normal) over Eastern Sahel from Eastern Niger to Chad, normal to above normal

precipitation (between 80% and 120% of normal) over western Sahel from western Niger to Senegal, and normal to below normal precipitation over the Gulf of Guinea with precipitation between 70% and 100% of normal (fig. 4).

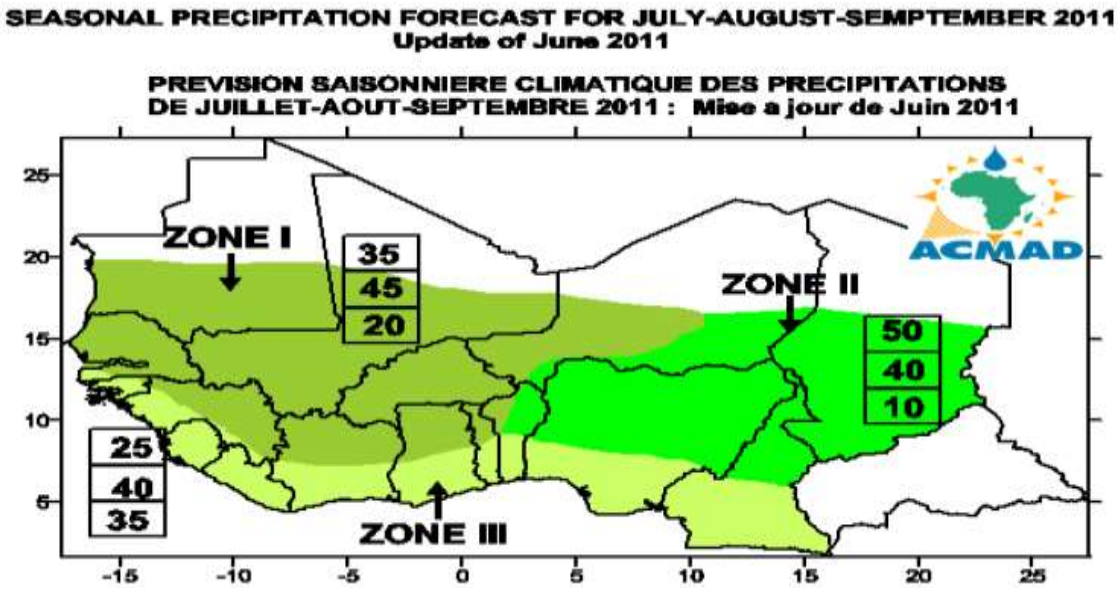


Figure 4: Precipitation outlook valid for July-August-September 2011 over West Africa, Chad and Cameroon.

Mauritania and border areas with Mali, southern Burkina Faso and much of northern Cameroon recorded normal to below normal precipitation. The outlook indicated normal to above normal precipitation over these areas which end up normal to below normal.

The outlook mentioned less regular distribution of summer 2011 precipitation compared to 2010. Late onset and irregular precipitation distribution were reported by some countries (e.g. Mauritania) with substantial impacts on food production. This situation prompted preparations and/or appeals for international assistance needed for the first half of 2012.

Westernmost part of Mali and adjacent areas in Senegal, northern Mali, Lake Chad area and southern Chad recorded the highest positive rainfall anomalies in the Sahel. Over coastal West Africa, Guinea-Conakry, Sierra Leone, Liberia, westernmost part of Ivory Coast and south central Nigeria exhibits the largest deficits. Compared to 2010, 2011 precipitation was less abundant over all countries of the Sahel (Fig. 5.1 and 5.2). The 2011 total precipitation amount for the Sahel is quite close to 2000 and 2001 (Fig. 6).

With substantial reduction in precipitation over the upper and lower Niger river basin in Guinea-Conakry, northern Cameroon and Nigeria, water levels in the Basin River are mostly normal to below normal.

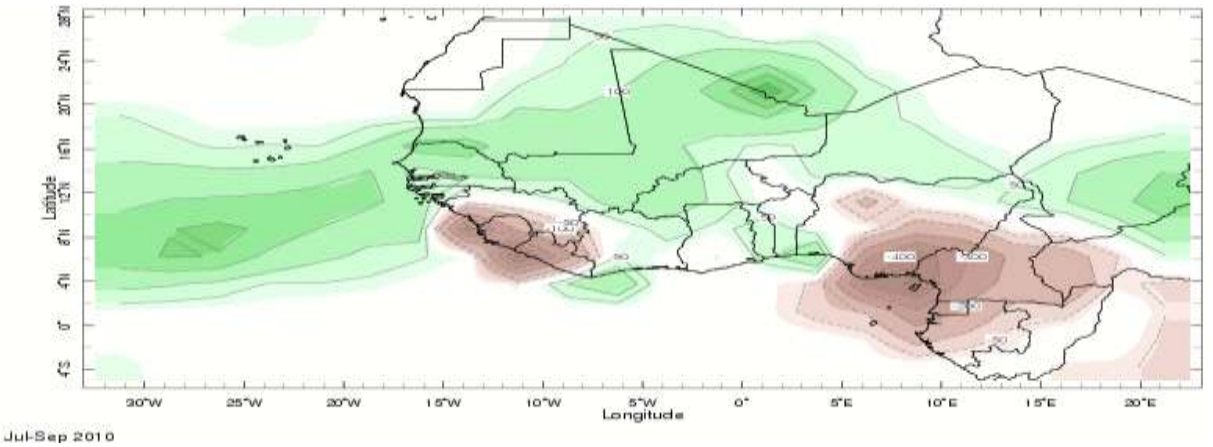


Figure 5.1: July-August-September 2010 Precipitation anomaly over West Africa.

Data source: NOAA/NCEP/CPC/CAMS/OPI monthly precipitation. Base period- 1979-2000. The precipitation anomalies shown are based on satellite precipitation estimates over ocean areas and available rain gauge data over land regions.

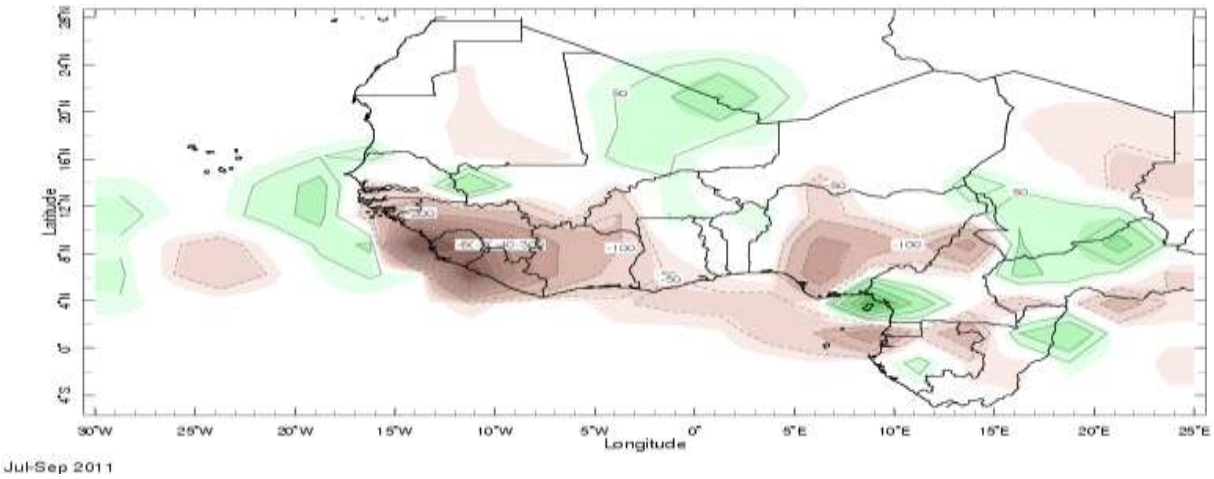


Figure 5.2: July-August-September 2011 Precipitation anomaly over West Africa. Data source: NOAA/NCEP/CPC/CAMSOPI monthly precipitation. Base period- 1979-2000. The precipitation anomalies shown are based on satellite precipitation estimates over ocean areas and available rain gauge data over land regions.

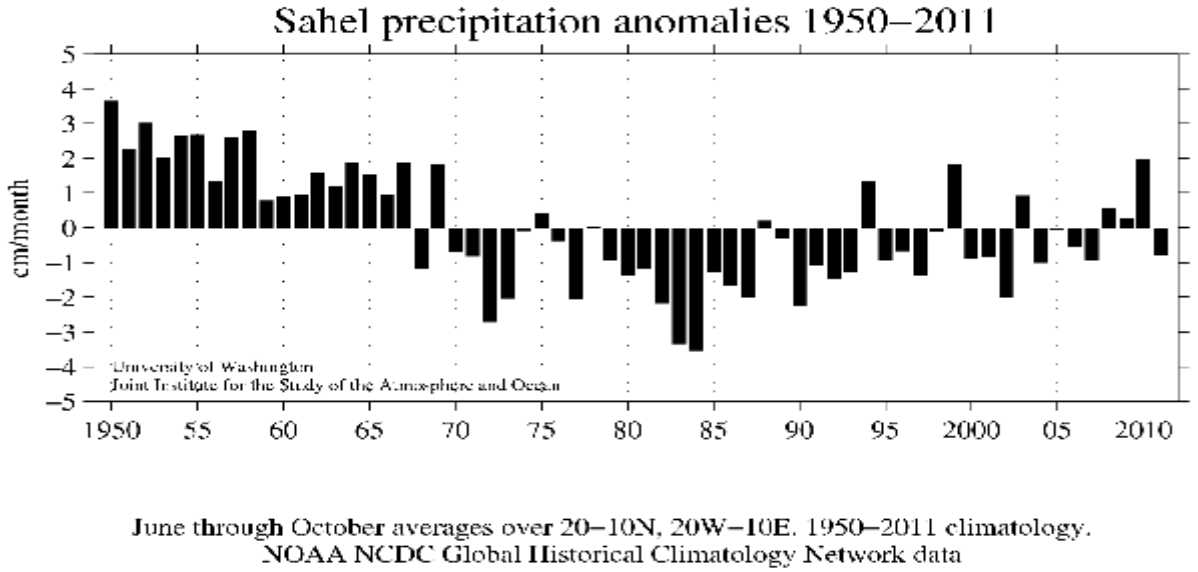


Figure 6: Sahel precipitation anomalies. 2000 is the most recent similar year.

B- SEASONAL FORECASTS PERFORMANCE FOR OCTOBER-NOVEMBER-DECEMBER 2011 IN CENTRAL AFRICA

In September 2011, regional climate outlook forum for central Africa delivered the October-November-December 2011 outlook for Central Africa.

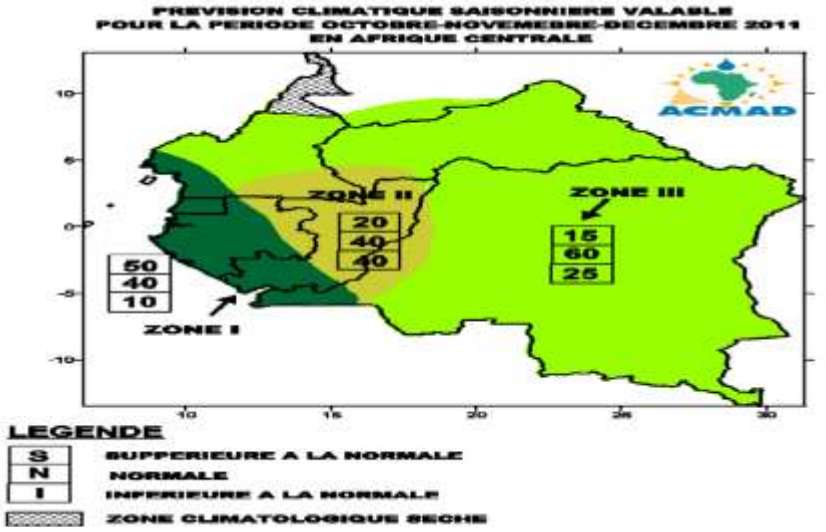
Precipitation outlook and observations

Figure 7a indicates above normal precipitation over islands and coastal areas of central Africa, below normal precipitation over central and northern Congo-Brazzaville and neighboring areas in Gabon, Cameroon and Central Africa, normal precipitation over much of DRC, Central Africa and Cameroon.
Observations of precipitation anomalies for October (Fig.7b) and November (Fig.7c) 2011 are quite close to the outlook in coastal as well as continental Central Africa.

SSTs outlook and observations

The reemergence of a weak La Nina observed in August 2011 was expected to persist from October to December 2011. This predicted persistence signal was effectively observed (fig 8 and 9).
The observed neutral conditions over Tropical north and south Atlantic off the coast of West and central Africa respectively were well anticipated by the outlook. However, between October and November 2011, a slight cooling was observed in the tropical south-east Atlantic (figure 10). This trend is not favorable for precipitation well above normal in December.

(a)



(b) (c)

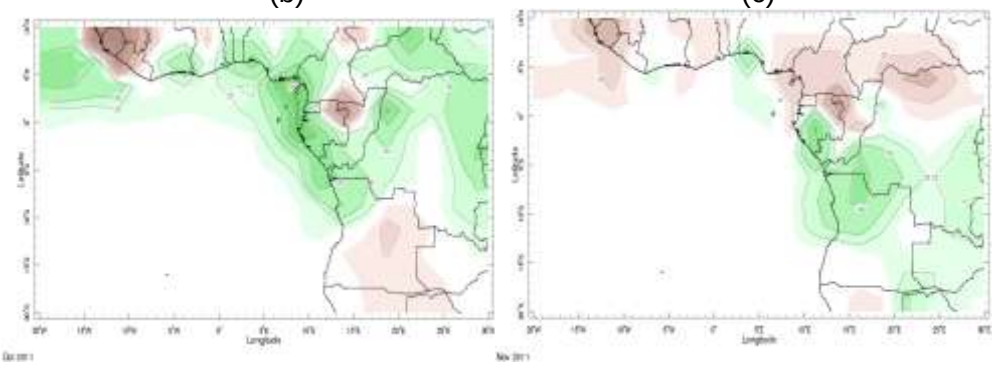


Figure 7:(a)-Precipitation outlook for October-November-December 2011. Precipitation anomalies for October (b) and November 2011 (c).

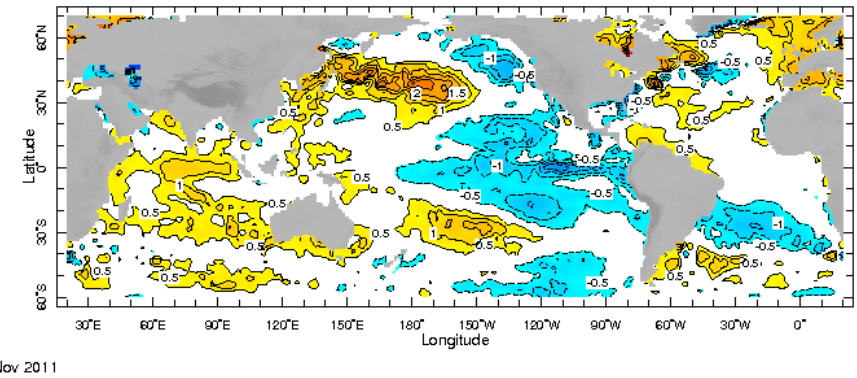


Figure 8: Observed SST anomaly for the global oceans in November 2011.

Dataset: Reynolds and Smith Version 2 monthly sea surface temperature anomaly (deg. C). Reference period: 1971-2000. Data Source: NCEP, Environmental Monitoring Center . NCEP is an acronym for the US National Centers for Environmental Prediction

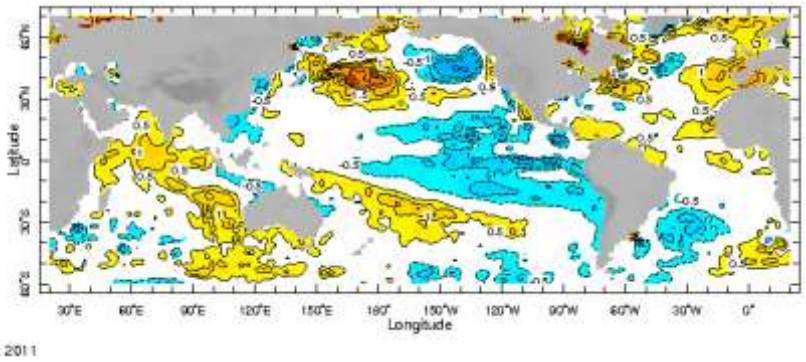


Figure 9: Observed SST anomaly for the global oceans in October 2011.

Dataset: Reynolds and Smith Version 2 monthly sea surface temperature anomaly (deg. C). Reference period: 1971-2000. Data Source: NCEP, Environmental Monitoring Center . NCEP is an acronym for the US National Centers for Environmental Prediction

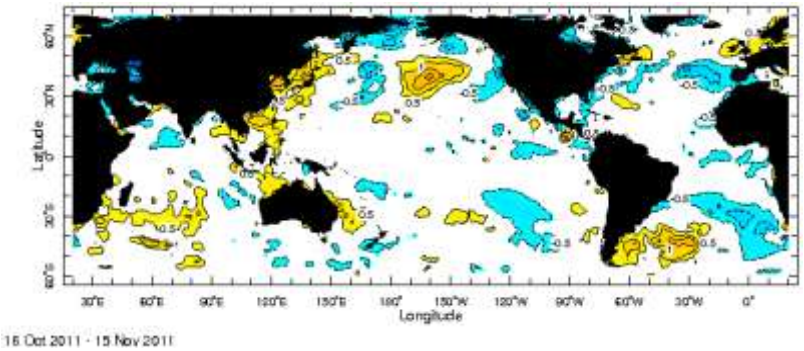


Figure 10: Sea surface temperature change from October to November 2011. A substantial cooling trend is observed over much of tropical south Atlantic.

C- SUB SEASONAL DISTRIBUTION OF PRECIPITATION

Observed precipitation distribution for pilot capital cities in the Sahel are presented to highlight precipitation distribution within the season which added to accumulated total seasonal precipitation deficits exacerbates impacts on crop yield and food production. Preliminary reports from the region indicated about 25% deficit in food production for the Sahel in 2011.

Niamey

Figure 11 shows that total precipitation deficit of about 30% was observed for 2011 in Niamey. This deficit was significant enough to cause substantial reduction in food production. Moreover, after the first rains during the first dekad of July 2011, a dry spell of about two weeks prevented a normal evolution of sowing activities and plant development. Significant rains felt from late July to mid August 2011 providing moisture relief to soil and plants. Unfortunately, little rains felt in September with negative effects on crop maturation. In Niamey and most of Western Niger, a combination of total precipitation deficits and disruptions in rain events distribution and quantity during the season were very much favorable for significant deficits in crop yield and food production. Distribution and total precipitation for 2010 were quite good making it a reference year in terms of favorable climate conditions for food production in this location.

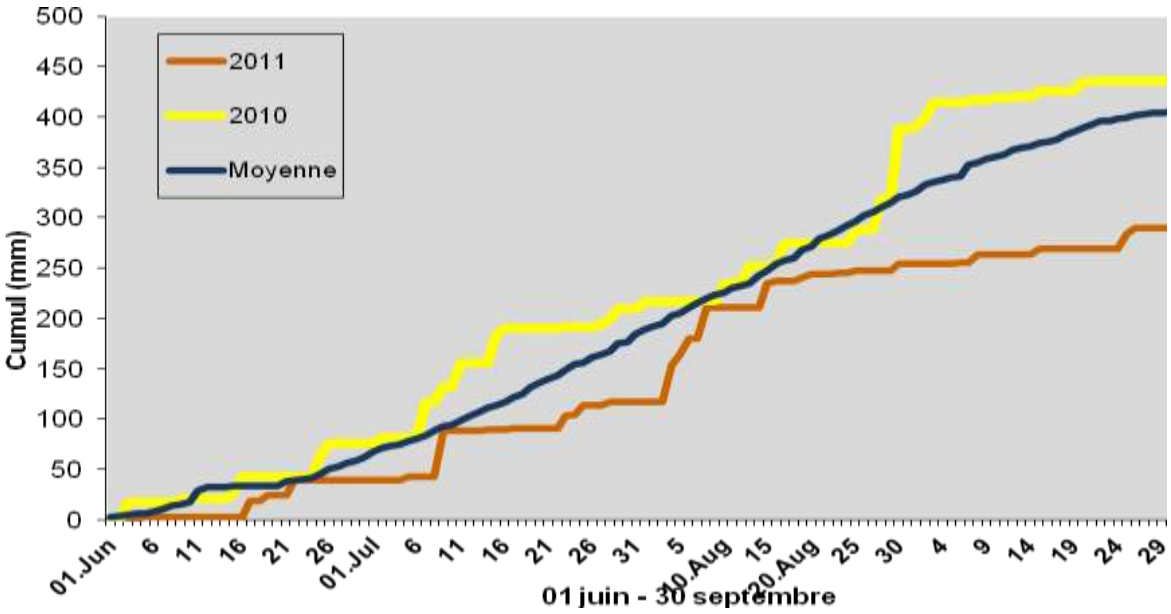


Figure 11: Accumulated precipitation distribution in Niamey with normal year (blue), last year 2010 (yellow) and current year 2011(orange).

Bamako

Compared to 2010 and the normal, Bamako had a quite good accumulated total and intra - seasonal distribution of precipitation in 2011. This interesting climate condition was quite favorable for normal to above normal food production in Bamako region.

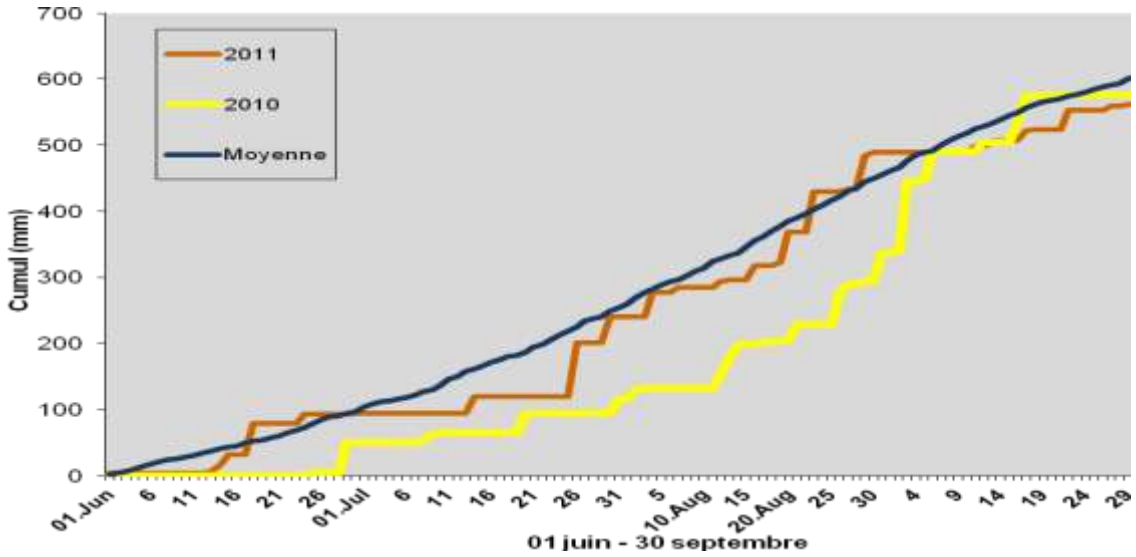


Figure 12: Idem as Figure 11 but for Bamako.

Ouagadougou – Burkina Faso

Compared to the normal, Ouagadougou recorded a precipitation deficit of 10% (figure 13). Intra-seasonal precipitation distribution in 2011 was quite close to normal. Over Ouagadougou area, total amount and distribution of precipitation within the season were not conducive to reduction in crop yield and/or shortage in food production.

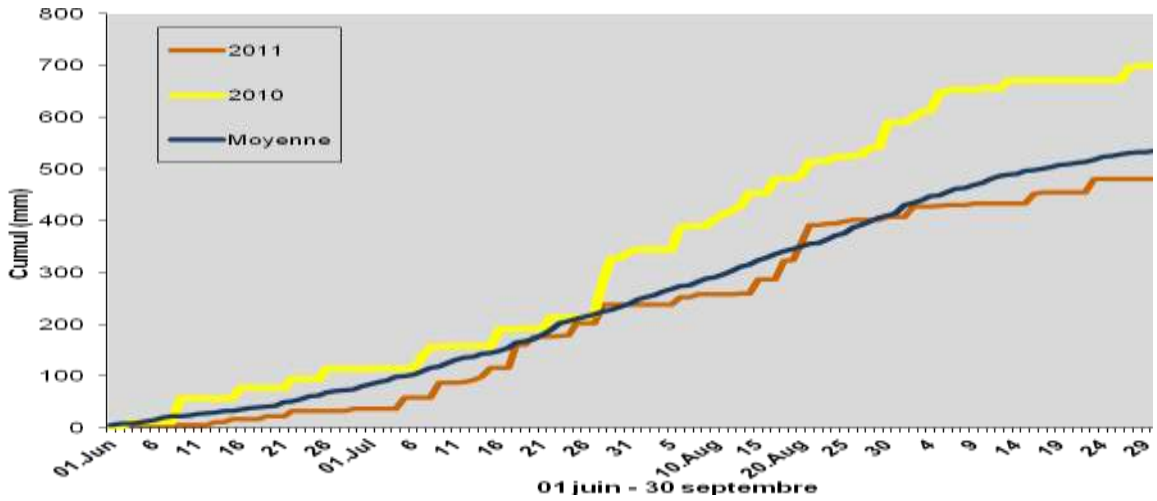


Figure 13: Idem as Figure 11 but for Ouagadougou.

Ndjamena – Chad

Figure 14 indicates that precipitation in Ndjamena was far above normal. Excess precipitation of 40% was recorded making 2011 a quite wet year. The accumulated total precipitation for 2011 was close to 2010. However, distribution of precipitation was less regular in 2011 compared to 2010 with a dry spell of moderate impact from the second half of July to August 10, 2011.

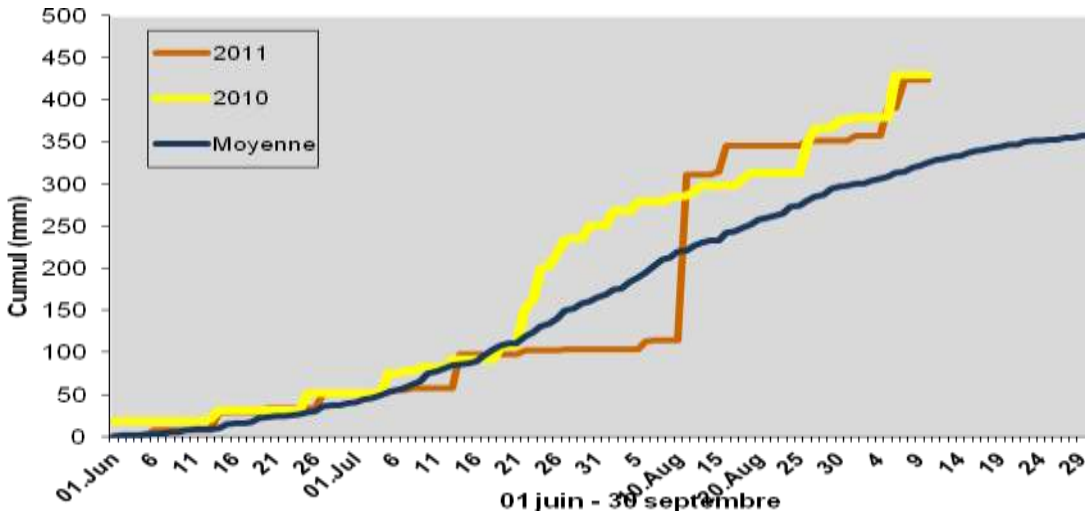


Figure 14: Idem as Figure 11 but Ndjamena.

Vegetation Condition

When Vegetation index remain low for more than five dekads, it indicates a serious problem including anomalies on the start/end of the season, crop development and maturation as well as crop yield. Southern Mauritania and adjacent areas in Mali, Western Niger are locations that recorded significant precipitation deficits and a bad vegetation condition (Figure 15). They are expected to be characterized by substantial climate related reduction in crop yield and poor harvest.

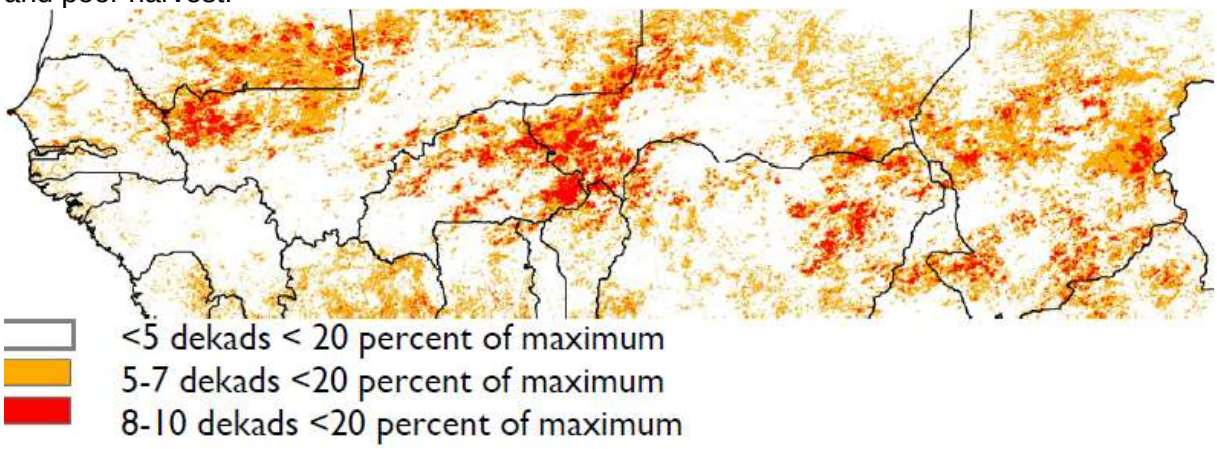


Figure 15: Number of dekads from June 1 to September 10, 2011 during which vegetation Condition index was less than 20% of the maximum.

A- CONCLUSION

SSTs outlooks for JAS 2011 were characterized by the reemergence of a weak La Nina unanticipated by the outlook. Over other oceanic areas of interest, the outlooks materialized.
The below normal precipitation in Mauritania, southwest Burkina Faso and parts of northern Cameroon was not anticipated by the outlook. However, the irregular distribution of precipitation which occurred in some of these areas was well indicated in the outlook even though not considered in risk mapping and food production estimation.
For the Sahel region as a whole, the year 2000 appears to be the most recent year similar to 2011.

For OND 2011, neutral conditions in the Atlantic and the persistence of the weak La Nina were anticipated. The predicted and observed above normal precipitation over the Atlantic coast of central African countries in October and November 2011 was consistent with the SST patterns. Bad vegetation conditions, deficits on total seasonal precipitation and irregular distribution of precipitation within the season were reported in southern Mauritania and neighboring areas in Mali, Western Niger. These areas have been reported to be significantly deficient in food production.