AFRICAN CENTRE OF METEOROLOGICAL APPLICATIONS FOR DEVELOPMENT
CENTRE AFRICAIN POUR LES APPLICATIONS DE LA METEOROLOGIE AU DEVELOPPEMENT

CLIMATE WATCH AFRICA BULLETIN

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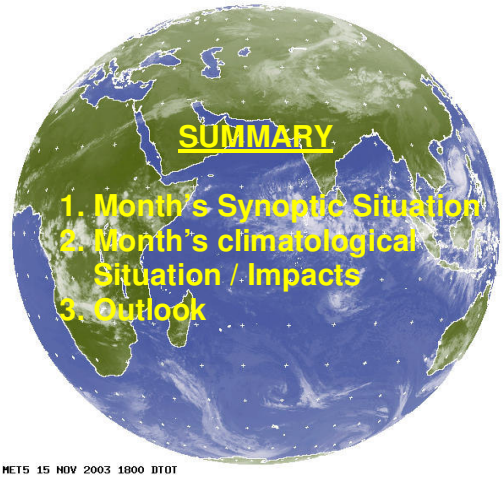
SEPTEMBER 2009



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HIGHLIGHTS: Rainfall increased over Northern Africa with a decrease over the Sahel and Gulf of Guinea countries, Central Africa and Greater Horn of Africa (GHA) countries. However, the Gulf of Guinea countries, Central Africa and parts of GHA countries will get rainfall increase in October.

1. SITUATION DURING THE MONTH OF SEPTEMBER, 2009

This section provides the strengths of the surface pressure systems; the 850hPa general circulation anomalies; middle and upper troposphere zonal winds; upper troposphere thermal regimes; sea surface temperature (SST) and El Nino/Southern Oscillation (ENSO).

1.1 Centres of Anticyclone

The Figure1 shows surface pressure systems as described below:

The Azores high pressure at 1022hPa weakened by 2hPa compared to the previous month and shifted northeast at about 45°N/20°W.

The St Helena high pressure at 1024hPa maintained its strength compared to the past month and shifted southeast at about 30°S/05°W extending a ridge over western Gulf of Guinea countries.

The Saharan thermal low of 1008hPa maintained its depths compared to the past month, but covered limited area in Sudan.

The Mascarene high pressure at 1026hPa weakened by 2hPa. Its mean position was at 35°S/65°E with an extended ridge over eastern Africa.

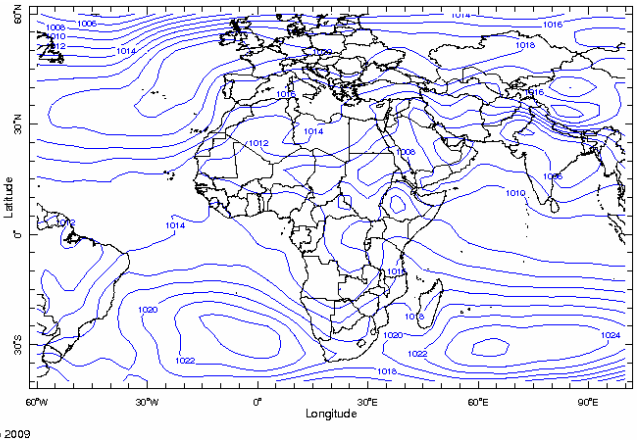

Figure 1 : Mean surface pressure during the Month of September, 2009

(Source : IRI/NOAA/NCEP)

1.2 Low level wind anomaly flow at 850hPa

The Figure 2 shows wind anomalies at 850hPa derived from reference period 1971-2000.

Strong westerly wind anomalies were observed from equatorial Atlantic ocean up to western part of Gulf of Guinea countries and over eastern Nigeria, north Cameroon, southern Chad Central African republic and southwest Sudan.

Over Democratic Republic of Congo and Congo strong continental north-easterly anomalies prevailed while over Ethiopia strong north-easterly winds anomalies from Indian Ocean were observed.

Over Central Morocco, Algeria, south Tunisia, west Libya and north Mauritania westerlies anomalies were observed turning to north-easterlies/easterlies over central Mali.

The average wind anomaly speed (shaded) was observed at about 08 m/s and above.

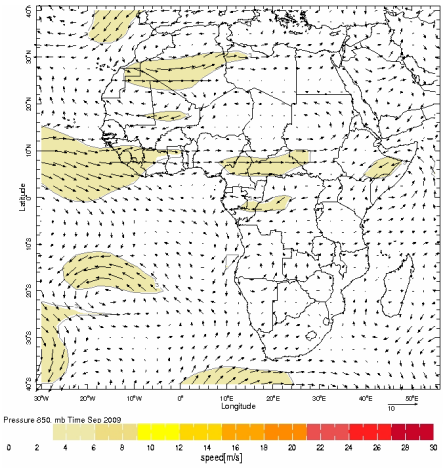

Figure 2 : August 2009, Wind Anomalies at 850hPa
(Source : IRI/NOAA/NCEP)

1.3 Mid and upper troposphere winds

At the 700hPa (Figure 3), a wind core associated with the African Easterly Jet (AEJ) compared to the previous month shift southward at about 15°N and weakened by 2m/s to about 10m/s stretching from south Mauritania

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up to north-eastern Nigeria.

The Figure 4 shows, the Tropical Easterly Jet (TEJ) at 150hPa core value of 26 m/s observed over south India/Indian Ocean at about 08°N weakened by 2m/s compared to the past month with an extended effect over northern GHA countries. A secondary core value of 14m/s was observed over western Gulf of Guinea countries.

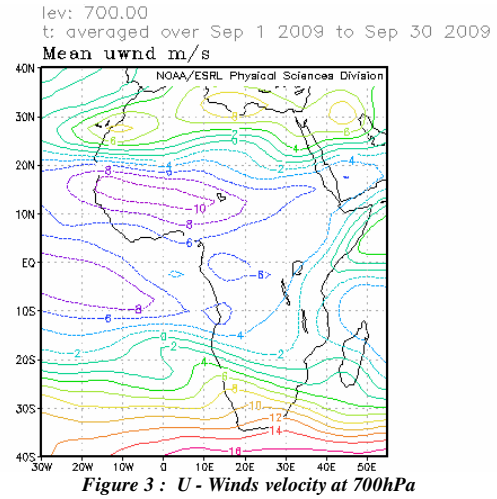

Figure 3 : U - Winds velocity at 700hPa
(Source : NOAA/NCEP)

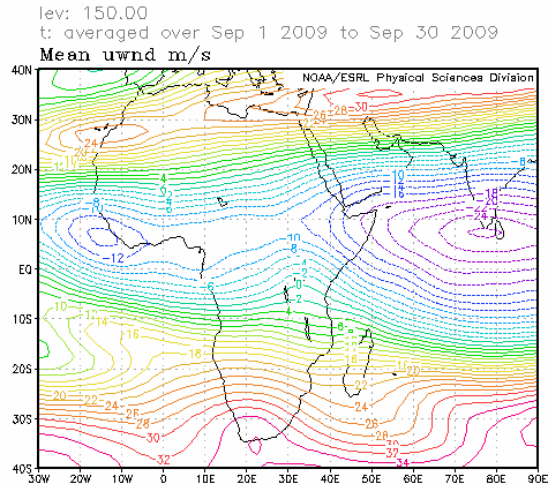

Figure 4 : U - Winds velocity at 150hPa
(Source : NOAA/NCEP)

1.4 Thermal index

In the month of September, 2009, the Thermal Index (TI) regime at 300hPa, Figure 5, had a near-threshold value of 242°K and above isotherms over Africa covering the Sahel, Gulf of Guinea countries, most parts of central Africa and GHA countries maintaining the high conditional instability associated with heaviest rainfall over Cameroon, Burkina Faso, the Gambia and Mali. The highest TI regime with epicenter of 246°K maintained the highest conditional instability was over north India resulting in heavy rainfall with floods. The low TI regime values less or equal to 241°K were associated with suppressed convection over the rest Africa.

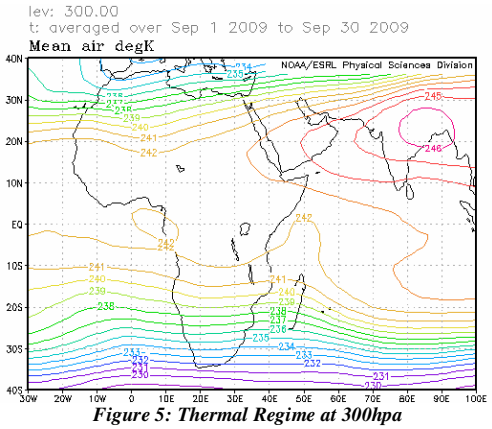

Figure 5: Thermal Regime at 300hpa
(Source : NOAA/NCEP)

1.5 Sea Surface Temperature (SST) and El Nino/Southern Oscillation (ENSO)

A neutral to major warming conditions prevailed in most of the central and east Pacific Ocean extending northward while in the south eastern part cooling conditions prevailed. Neutral to warming conditions were observed in most of the Atlantic Ocean except in the equatorial east, central-north and south western where some cooling conditions were observed. Neutral to warming condition were observed in most of the Indian Ocean except some cooling conditions observed in the southern sector. Over the Mozambique Channel neutral to warming conditions were observed.

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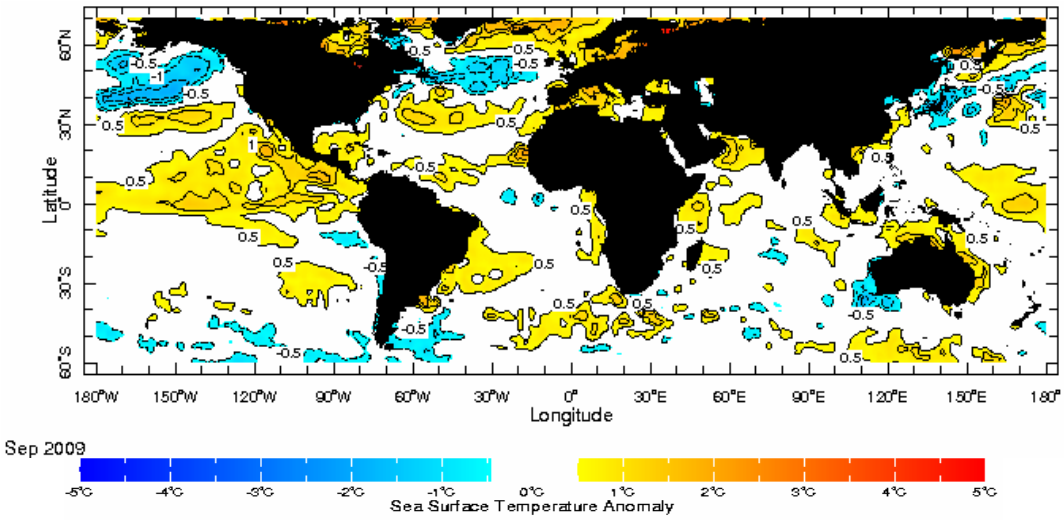

Figure 6: Sea Surface Temperature Anomalies (Source: IRI)

2. CLIMATOLOGICAL SITUATION AND IMPACTS DURING THE MONTH OF SEPTEMBER, 2009

The section provides the general climatological situation covering two major parameters, the rainfall and temperature.

2.1 Rainfall

Compared to the last month, the estimated rainfall for September 2009 in Figure 7, shows increase rainfall distribution and amounts over Northern Africa; decrease in amounts over the Sahel and gulf of Guinea countries; rainfall distribution increase with decreased amounts over Central Africa and Greater Horn of Africa (GHA) countries. In detail**:**

- **North Africa:** had spatial rainfall distribution and amounts increase ranging from 10mm to 100mm over extreme north-eastern Morocco and Algeria.

- **The Sahel**: had spatial rainfall distribution and amounts decrease ranging from 10mm to 250mm with maximum rainfall amounts ranging between 250mm to 500mm over central Burkina Faso, southern Mali and Senegal.

- **Gulf of Guinea**: countries observed decrease in rainfall amounts ranging from 10mm to 300mm with maximum amounts of about 400mm over Guinea Conakry/Guinea Bissau and west Cameroon/Nigeria.

- **Central Africa**: countries had increase in rainfall distribution with decrease in amounts ranging from 10mm to 300mm with peaks of about 400mm over Central Africa Republic.

- **GHA**: northern countries experienced spatial rainfall distribution increase with decrease in amounts ranging from 10mm to 250mm with peaks of about 250mm to 400mm over northwestern Ethiopia.

- **Southern Africa:** countries experienced some relief from the widespread light rainfall amounts ranging from 10 to 80mm.

Compared to the reference period 1979-2000, the September, 2009, rainfall anomalies, Figure 8 shows significant rainfall deficits over most of Gulf of Guinea countries, GHA countries, Central Africa countries, southeastern part of the Sahel, southeastern part of Madagascar and extreme southeastern South Africa. However, excessive rainfall was observed over western part of the Sahel, extreme northwestern part of Gulf of Guinea countries and extreme north Morocco and northwest Algeria.

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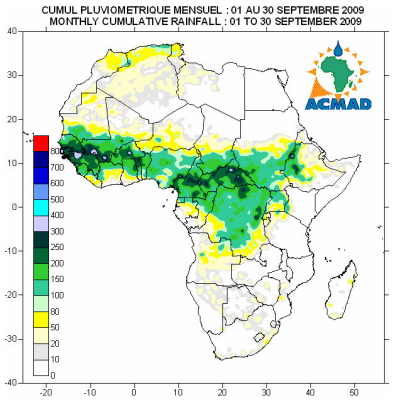

Figure 7: Monthly cumulative rainfall (Data Source: NOAA/NCEP)

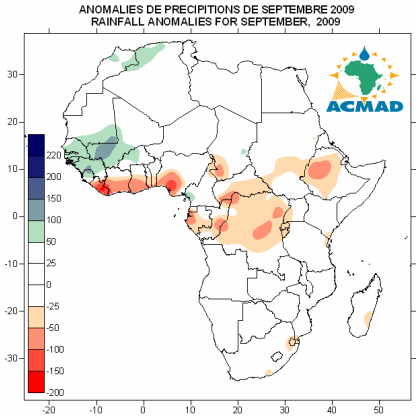

Figure 8: Monthly Precipitations Anomalies (Data Source: NOAA/NCEP)

2.2 Surface Temperature Anomalies

In September 2009, the temperature anomalies (Figure 9) compared to 1971-2000 base period, in most of African countries were generally normal (1°C to –1°C). However, positive temperature anomalies (>1.5°C) were observed over Niger, northern Nigeria, northern Namibia, east Botswana south Zimbabwe, northeastern South Africa and northern Madagascar. The highest temperature anomalies with epicenter of highest temperature anomalies (>2.5°C) was over Southern Morocco and northwestern Mauritania .

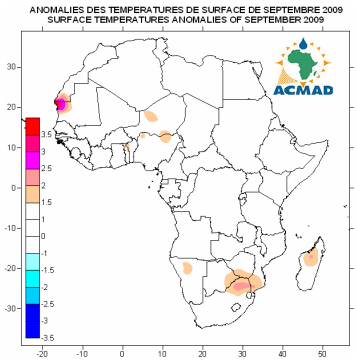

Figure 9 : Monthly Temperatures Anomalies (Data Source: NOAA/NCEP)

3. OUTLOOK

The subsections provide the expected SSTs and ENSO characteristics and evolution of events based on Figures 10 and 11 respectively with rainfall outlook in October.

3.1 Forecast Sea Surface Temperature (SST)

The figure 10 shows the forecast Sea Surface Temperature Anomalies from October, 2009 SST for the period –October-November-December 2009.

Pacific Ocean: Neutral to warming conditions will continue over central and eastern Pacific ocean while cooling will prevail above 30°N and 30°S.

Atlantic Ocean: A neutral to warming condition is expected over most of Atlantic Ocean except the north-eastern part of the ocean.

Indian Ocean: Neutral to warming conditions are expected over most of the Indian Ocean while a cooling condition will prevailed south-western coast of Australia.

Over Mozambique Channel, neutral to warming condition are expected.

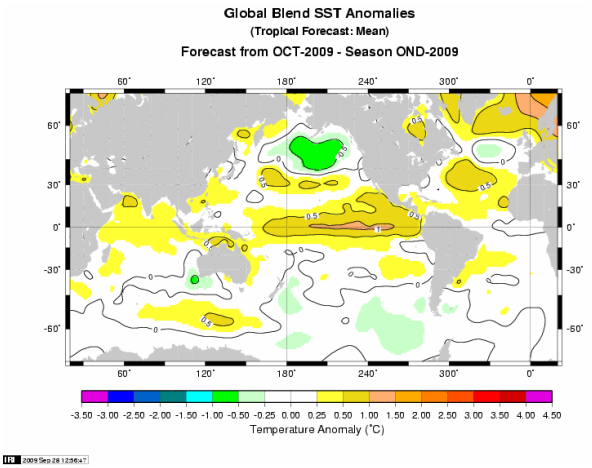

Figure 10 : Forecast Sea Surface Temperatures Anomalies (source IRI)

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3.2 El Ni Niño/La Niña

The set of dynamical and statistical model forecasts of ENSO over Nino 3.4 domain (5°N – 5°S, 120°W – 170°W) shown on Figure 11 that, current forecasts and observations indicate a probability of about 85% for maintaining weak to moderate El Nino conditions through the end of the year.

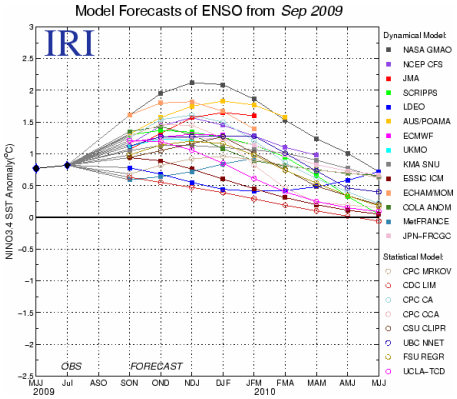

Figure 11 : Multi-model ENSO Forecast

(source IRI)

3.3 Rainfall

The prevailing wind and conditional instability manifested at 300hPa by the TI will maintain convective rainfall activities over southern parts of the Sahel intensifying into heavy rainfall over Gulf of Guinea countries, central Africa countries, western, northern and parts in the central sector of GHA countries. In detail

- **North Africa countries:** will experience rainfall increase, amounts ranging from 10mm to 100mm with peaks of about 150mm.

- **The Sahel:** will continue to experience high temperatures, characterized by dry conditions over northern sector with outbreak of sporadic convective rainfall activities over southern parts characterized by high relative humidity.

- **Gulf of Guinea countries:** will experience rainfall increase recording amounts ranging from 10mm to 250mm with peaks ranging from about 300mm to 500mm.

- **Central Africa countries:** will have rainfall increase recording amounts ranging from 10mm to 250mm with peaks of about 300mm to 500mm.

- **GHA countries:** will record rainfall increase over western, central and northern parts with amounts ranging from 10mm to 250mm with peaks of about 300mm to about 500mm.

- **Southern Africa countries:** expected to continue experiencing rainfall deficits recording amounts ranging from 10 to 80mm with localized rainfall peaks of about 100mm.

3.4 Result of PRESAO12:seasonal rainfall forecast for July-August-September 2009

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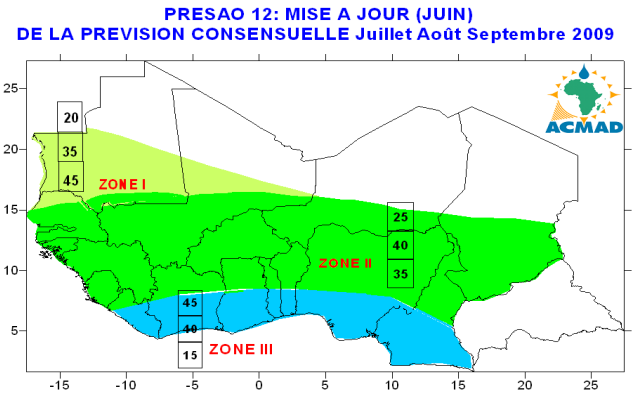
i) Over zone III which covers the southern part of Gulf of Guinea countries (from Cote d'Ivoire to Cameroon), a high probability of rainfall higher than normal (Probability of 0,45)

ii) Over the zone II, which corresponds to the Central Sahel and including Sierra Leone, Guinea Conakry, Guinea Bissau, southern Senegal, the Gambia, southern Mali, Burkina Faso, Niger, Chad, North Gulf of Guinea, the probability of rain near normal (p = 0.40) with a tendency to below normal (p = 0.35) is forecast.

iii) Finally over zone I, which includes the south-west of Mauritania, northern Senegal, probability of rainfall below normal (p = 0.45) is forecast.



ADVICE:

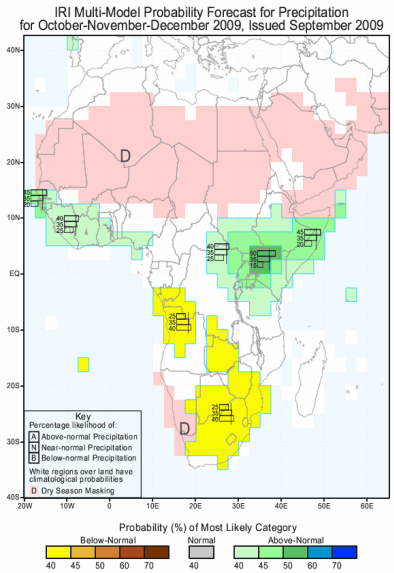
THE POTENTIAL OF ADVERSE IMPACTS IN THE REGIONS ARE CLEAR FROM THE FORECAST PROBABILITIES. ORGANISATIONS PROVIDING EARLY WARNING AND INTERVENTION SERVICES NEED, MORE THAN EVER, TO MAINTAIN CLOSE AND PERMANENT COORDINATION.

3.5 Seasonal Rainfall forecast for October- November-December 2009

The IRI seasonal rainfall forecast issued in September for the period of October-November-December 2009 show:

- excessive rainfall over Gulf of Guinea, North-eastern part of Central Africa countries, and GHA countries.
- Below normal rainfall is expected over southern part of Central Africa and southern Africa countries.

The rainfall forecasts at regional, sub-regional levels have to be harmonized with national forecasts for effective decision making.



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