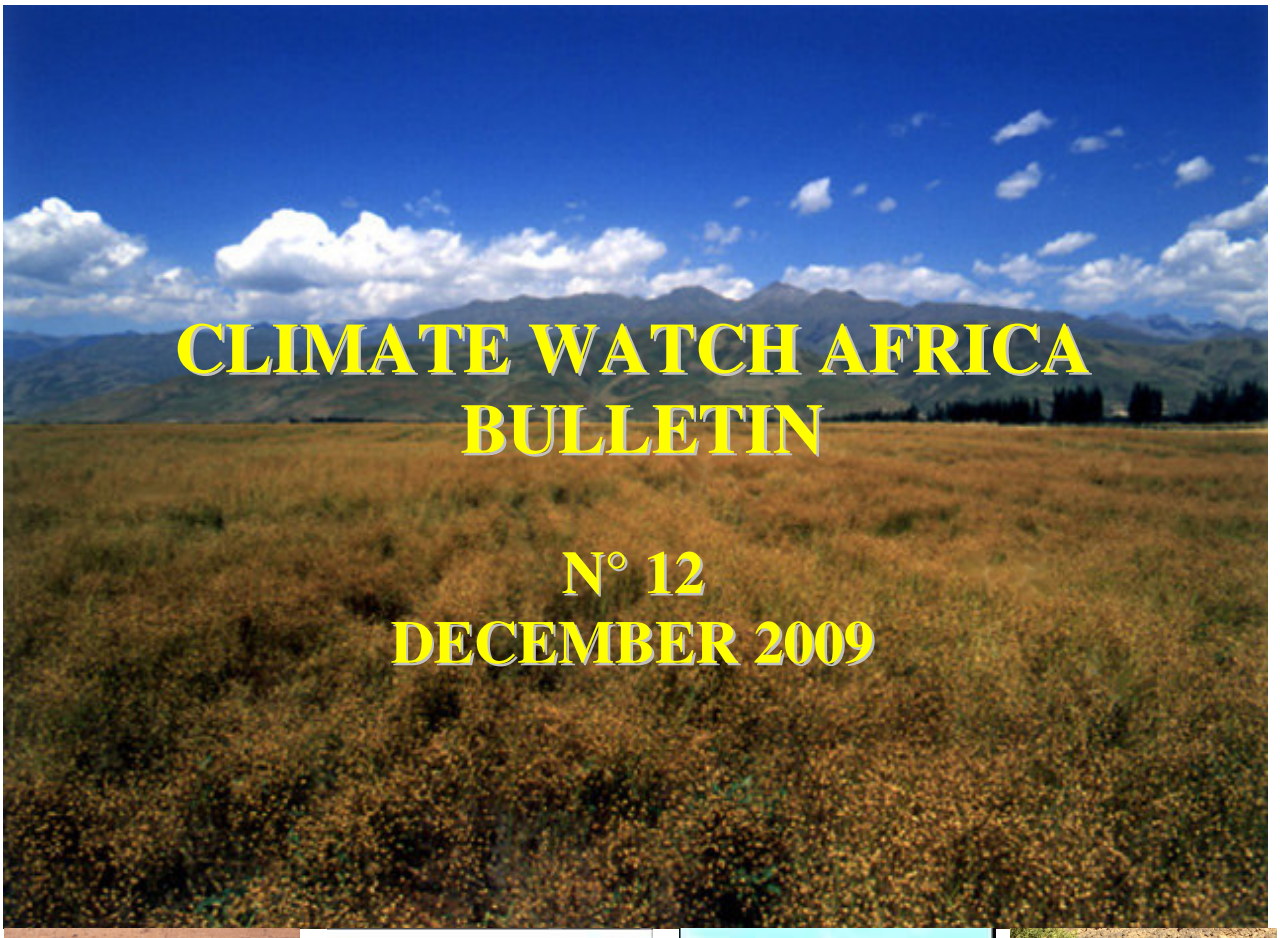
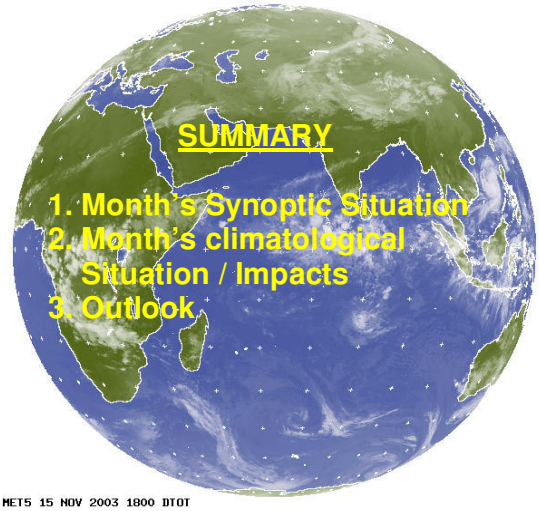


CLIMATE WATCH AFRICA BULLETIN

N° 12
DECEMBER 2009



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HIGHLIGHTS: The estimated rainfall for December, 2009 had significant increase in distribution over Northern Africa, GHA and Southern Africa countries while substantial decrease was observed over Gulf of Guinea countries

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1. SYNOPTIC SITUATION DURING THE MONTH OF DECEMBER, 2009

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

1.1 Centres of Surface Pressure Systems

The Figure 1 shows surface pressure systems as described below:

The Azores high pressure merge with a high pressure of 1018hP located over northwest Atlantic ocean at about 28°N/65°W.

The Libyan High pressure of 1018 hPa centred at about 27°N/15°E extended a ridge over south Algeria and north Libya.

The St Helena high pressure at 1018hPa maintained its intensity compared to the past month and shifted southeast at about 30°S/05°W.

The Saharan thermal low at 1010hPa maintained its intensity compared to the previous month and had limited area coverage over south Chad/Central African Republic and south Sudan.

The Mascarene high pressure at 1022hPa strengthened slightly by 2hPa and shifted southeast. Its mean position was at 33°S/90°E with an extended ridge over eastern part of Southern Africa.

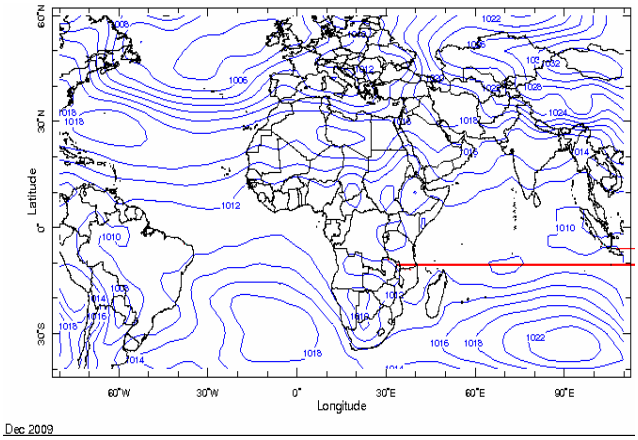

Figure 1 : Mean surface pressure during the Month of December, 2009

(Source : IRI/NOAA/NCEP)

1.2 The 850hPa wind anomaly

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

Strong westerly wind anomalies from northern Atlantic ocean were observed over northern Africa stretching from northern Mauritania to western Egypt.

From east equatorial Atlantic ocean up to eastern Gulf of Guinea strong southwesterlies anomaly prevailed while over Sudan, southwesterly winds veered to westerlies over north Ethiopia, Eritrea and Djibouti.

Over south Atlantic ocean strong easterlies veered to southerly and westerly winds anomalies.

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

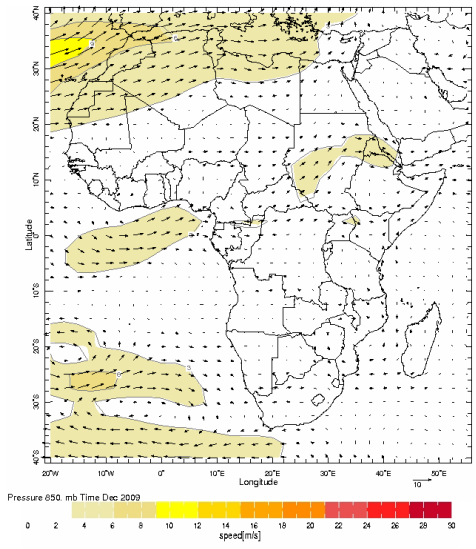

Figure 2 :December 2009, Wind Anomalies at 850hPa
(Source : IRI/NOAA/NCEP)

1.3 Thermal index

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In the month of December, 2009, the Thermal Index (TI) regime at 300hPa, Figure 3, had isotherm value of 242°K over extreme eastern part of Gulf of Guinea countries, central Africa, GHA and northern part of Southern African countries with the highest near-threshold value of 242.5°K over southeastern part of GHA countries and western central Africa. These are linked to the floods over areas characterized by high relative humidity as shown in Figure 4. The low TI regime values less or equal to 241°K were associated with suppressed convection over the rest Africa.

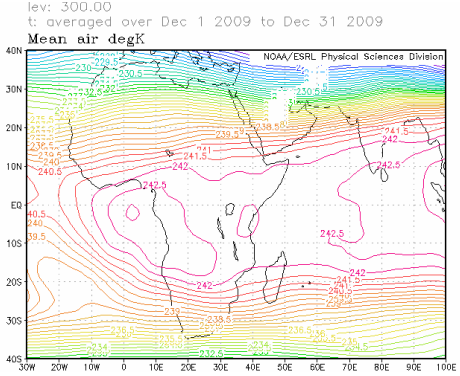

Figure 3: Thermal Regime at 300hpa (Source: NOAA/NCEP)

1.4 Relative Humidity at 850hPa

The 850hPa (Figure 4) shows high RH (>60%) in December, 2009 over southern part of Gulf of Guinea countries, Central Africa, western part of GHA countries and eastern part of Southern Africa countries. The Sahara, most of the Sahel and western southern Africa countries experienced dry conditions characterized by the lowest RH (40%).

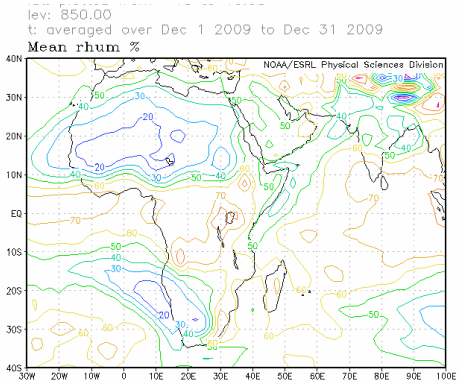

Figure 4:RH at 850 hPa (Source : NOAA/NCEP)

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

A warming conditions persisted in most of the Pacific Ocean except in the south-western, south-eastern and north-eastern parts where some cooling conditions were observed. Neutral to warming conditions were observed in most of the Atlantic Ocean except in the central-north, south central where some cooling conditions were observed. Neutral to warming conditions were observed in most of the Indian Ocean except the cooling conditions observed in its southwestern part. Over the Mozambique Channel neutral to warming were observed.

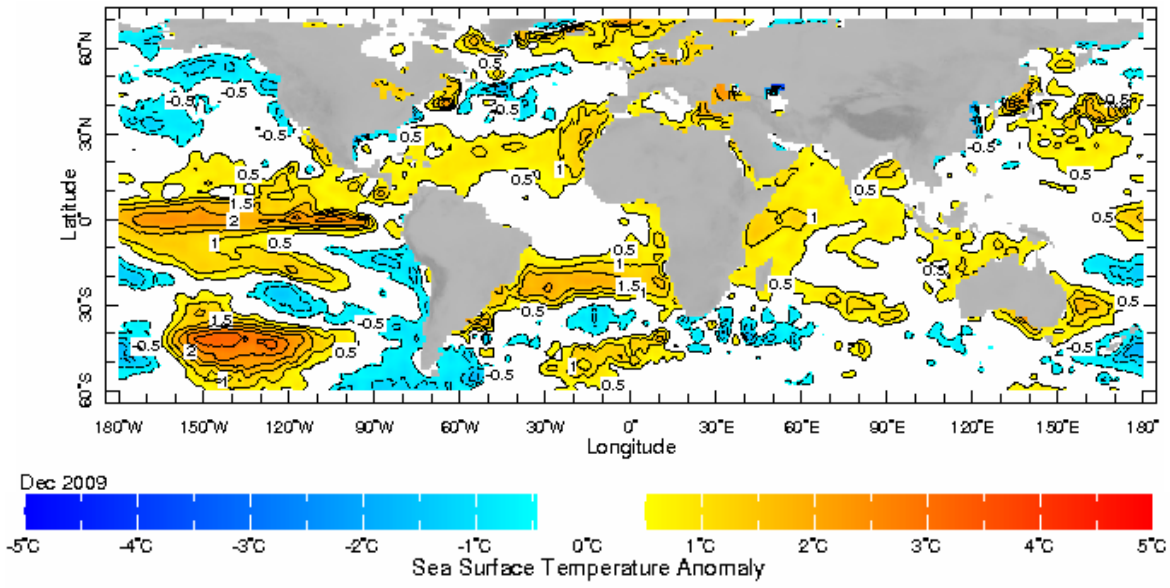

Figure 6: Sea Surface Temperature Anomalies (Source: IRI)

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2. CLIMATOLOGICAL SITUATION AND IMPACTS DURING THE MONTH OF DECEMBER

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

2.1 Rainfall

The estimated rainfall for December, 2009 in Figure 6, shows increase rainfall in distribution over Northern Africa, GHA and Southern Africa countries while decreases were observed over Gulf of Guinea countries. In detail**:**

- **North Africa:** had rainfall increase in distribution and amounts ranging from 10mm to 150mm with heaviest amounts of about 400 mm over extreme north Morocco.

- **The Sahel**: remained dry is under the influence of Harmattan characterized by dusty conditions.

- **Gulf of Guinea**: countries had significant decrease in rainfall distribution and amounts observing some localized rainfall amounts ranging from 10mm to 150mm over south Côte d'Ivoire, Ghana and Liberia.

- **Central Africa**: countries had rainfall increase with amounts ranging from 10mm to 400mm with maxima ranging from 400 to 500mm over Democratic Republic of Congo, Congo, Angola intensifying to above 800mm over Gabon and Equatorial Guinea.

- **GHA**: countries experienced slight rainfall distribution increase with amounts ranging from 10mm to 200mm with localized peaks between 200mm and 400mm.

- **Southern Africa:** countries had slight rainfall distribution increase observing amounts ranging between 10 to 200mm intensifying to about 400mm over northern part of Southern Africa countries.

Compared to the reference period 1979-2000, the December, 2009, rainfall anomalies, Figure 7 shows rainfall deficits over extreme northern part of North Africa, central part of Central Africa countries and over most of southern Africa countries and southern part of GHA countries, while excessive rainfall was observed over north Morocco, parts of the GHA countries, extreme eastern part of Gulf of Guinea countries and western part of central Africa countries.

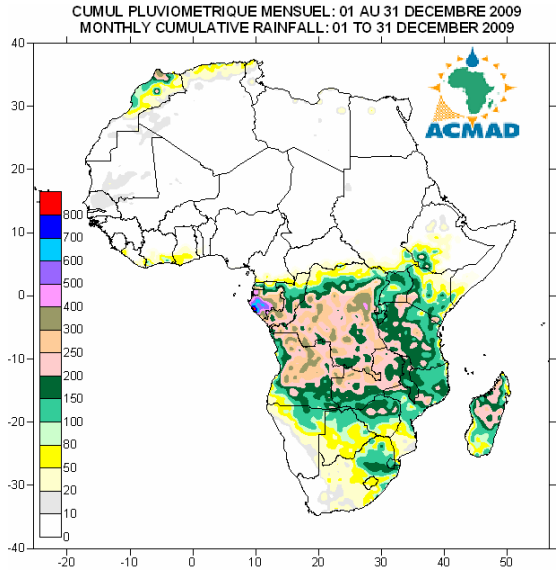

Figure6: Monthly cumulative rainfall (Data Source: NOAA/NCEP)

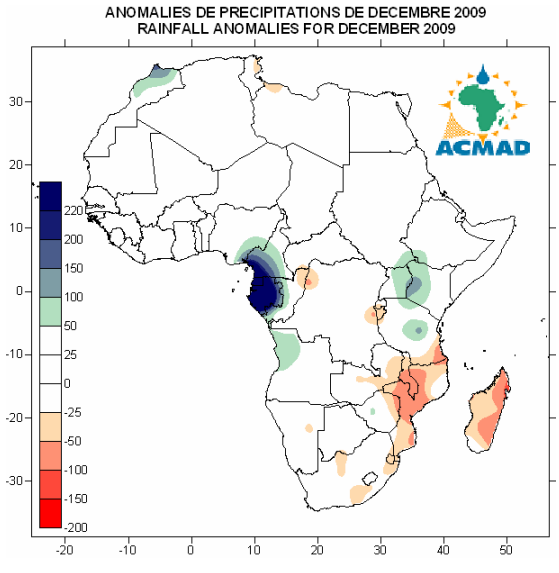

Figure7: Monthly Precipitations Anomalies (Data Source: NOAA/NCEP)

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2.2 Surface Temperature Anomalies

In December, 2009, the temperature anomalies (Figure 8) compared to 1971-2000 base period, in most of African countries were generally positive anomalies (>1.5°C) with the highest anomalies epicenter (>3°C) over north Morocco, west Libya and north Niger.

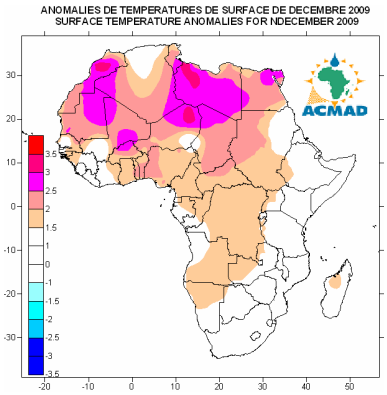

Figure 8 : Monthly Temperatures Anomalies (Data Source: NOAA/NCEP)

3. OUTLOOK

The subsections provide the expected SSTs and ENSO characteristics and evolution of events based on Figures 9 and 10 respectively with rainfall outlook in January.

3.1 Forecast Sea Surface Temperature (SST)

The figure 9 shows the forecast Sea Surface Temperature Anomalies from December, 2009 SST for the period of December-January-February 2010.

- **Pacific Ocean:** warming conditions will continue over equatorial, south central and nortwestern Pacific Ocean while cooling will persist in the south-western, south-eastern and northeastern parts.
- **Atlantic Ocean:** A warming condition will persist over most of Atlantic Ocean except the north-western and extreme south western and northwestern parts of the ocean.
- **Indian Ocean:** warming conditions are expected to persist over most of the Indian Ocean and the Mozambique Channel.

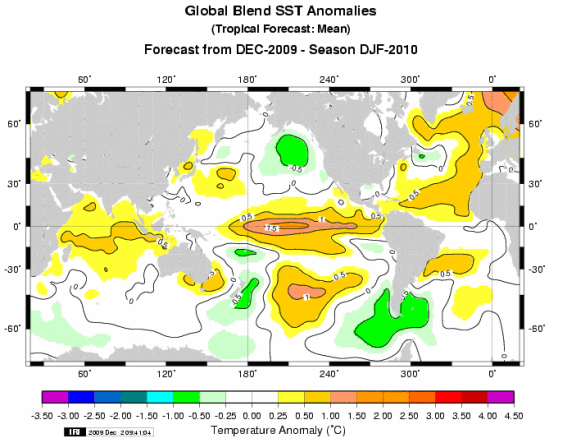

Figure9 : Forecast Sea Surface Temperatures Anomalies (source IRI)

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 10.
The majority of models indicate moderate strength. At the time of preparing this, the SST observations in the NINO3.4 region indicate moderate(+) El Nino conditions, with an area-averaged weekly anomaly of 1.8 C.. Current forecasts and observations indicate a probability of about 98% for maintaining El Nino conditions during the Dec-Feb period, and still at least 90% for the Feb-Apr period..

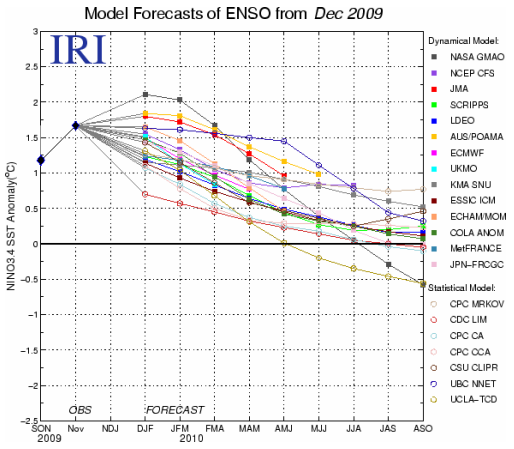

Figure 10 : Multi-model ENSO Forecast (source IRI)

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3.3 Rainfall

The prevailing high relative humidity coupled with high conditional instability manifested by TI regimes at 300hPa will maintain heavy rainfall over central Africa countries, parts of GHA countries, northern and eastern parts of southern Africa countries. In detail:

- **North Africa countries:** will experience slight rainfall increase with amounts ranging from 10mm to 150mm with peaks of above 200mm.

- **The Sahel:** will be under the influence of Harmattan characterized by decrease of temperature associated with dry and dust conditions.

- **Gulf of Guinea countries:** will experience rainfall decrease recording amounts ranging from 10mm to 80mm with peaks of about 100mm.

- **Central Africa countries:** will have slight rainfall decrease recording amounts ranging from 10mm to 250mm intensifying over some areas to about 300mm to 500mm.

- **GHA countries:** will record rainfall decrease over northern, central and eastern parts amounts ranging from 10mm to 150mm intensifying over southern parts with amounts ranging from about 200mm to 300mm.

- **Southern Africa countries:** will experience rainfall increase with amounts ranging from 10 to 250mm intensifying with peaks ranging from 300mm to 400mm and above over northern and eastern parts.

3.4 IRI seasonal Rainfall outlook issued in November 2009 for December-January-February 2010

The IRI seasonal rainfall forecast issued in November 2009 for the period of December-January-February 2010 is conformed with GHACOF24 and shows:

- excessive rainfall over southern parts of GHA countries.
- Below normal rainfall is expected over south central part of Gulf of Guinea countries, western part of Central Africa countries and most of Southern Africa countries.

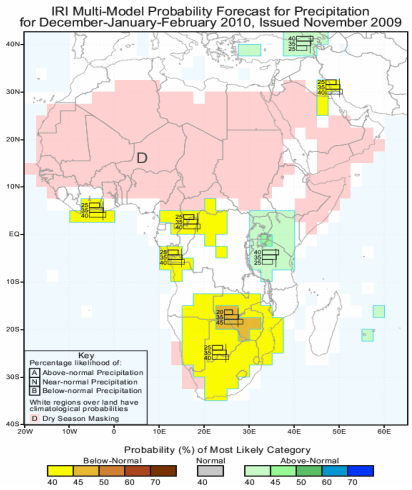

Figure 12: IRI forecast

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