

## Ten Day Climate Bulletin

N° 22 Year 2009

Dekad of 01 to 10 August, 2009

**HIGHLIGHT:** The heaviest rainfall amounts were observed over the northern parts eastern sector of the Gulf of Guinea countries, northern parts of central Africa countries and northern parts of GHA countries. Compounded by reduced moisture influx due to limited northward displacement of ITD expected rainfall peak in August will remain suppressed by the evolving El Niño.

### 1. GENERAL SITUATION

Subsection 1.1 provides the strengths of the surface pressure systems, the ITD displacement while the subsection 1.2 in the Troposphere gives a brief on monsoon, thermal index regimes and relative humidity.

#### 1.1 SURFACE

- **Azores high:** Pressure of 1026hPa strengthened slightly by 1hPa and shifted northeast compared to the past dekad. Its mean position was located at about 39°N/22°W, extending a ridge over north Morocco.
- **St. Helena high:** Pressure of 1028hPa weakened significantly by 5hPa and shifted northwest at 29°S/07°W with an extended ridge over Gulf of Guinea.
- **Mascarene high:** Pressure of 1036hPa strengthened by 3hPa compared to the past dekad and shifted southwest. Its mean position was located at 35°S/57°E with an extended ridge over Indian Ocean.
- **Saharan Thermal Low:** Pressure at 1006hPa maintained its intensity and shifted eastward compared to the previous dekad. Its mean position was located at 22°N/03°W with an extended trough over north Mauritania and Mali, southwest Algeria, and north-west Niger.

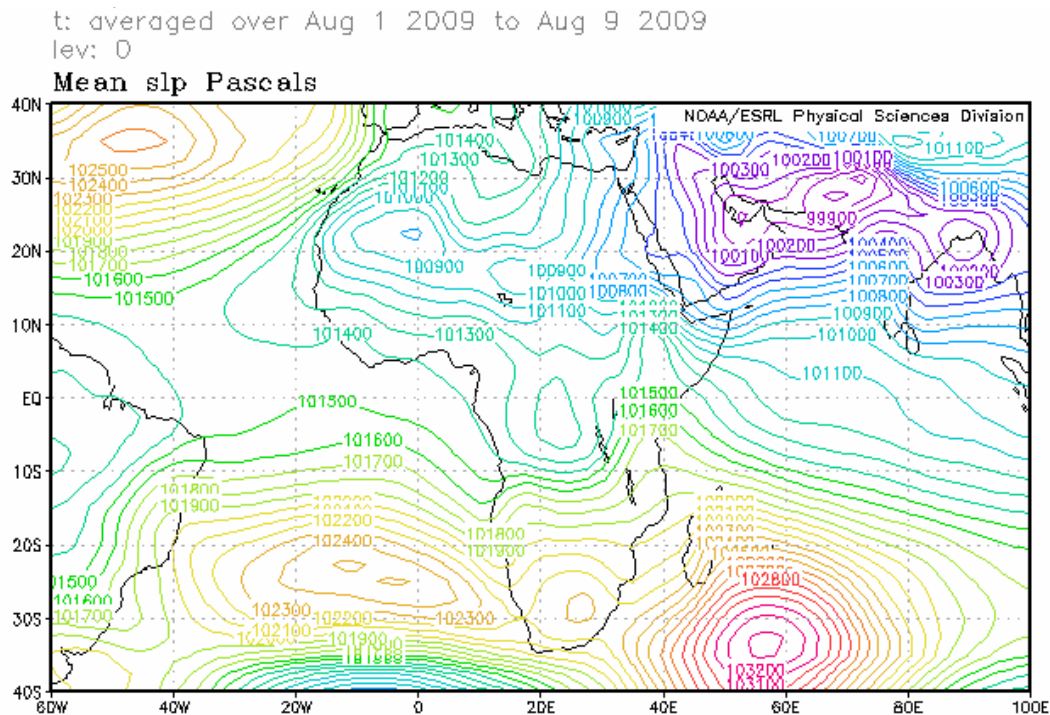


Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

- **Inter -Tropical Discontinuity (ITD):** Between the third dekad (blue line) of July and the first dekad (black line) of August, 2009, the ITD (Figure 2) shifted moved northwards to about 100Km over northeast Mali and northwest Niger; Elsewhere, over the Sahel, its had a quasi-stationary position. Comparing the present ITD position to the third dekad of July 2008 (pink line), the first dekad of August (black line), 2009 there is slightly southward of 2008 ITD position over Mali, Niger and Chad with a slight northward displacement over north Mauritania and Sudan.

The mean position of the first dekad of August 2009 ITD was observed at 18.2°N over longitude 20°W; at 19.8°N and 20.9°N over west and central Mauritania respectively; at 20.9°N and 20.4°N over northwest and northeast Mali respectively; at 19.9°N over extreme south Algeria; at 19.4°N and 18.4°N over central north Chad; at 17.5°N and 17.8°N over northwest and north Sudan respectively.

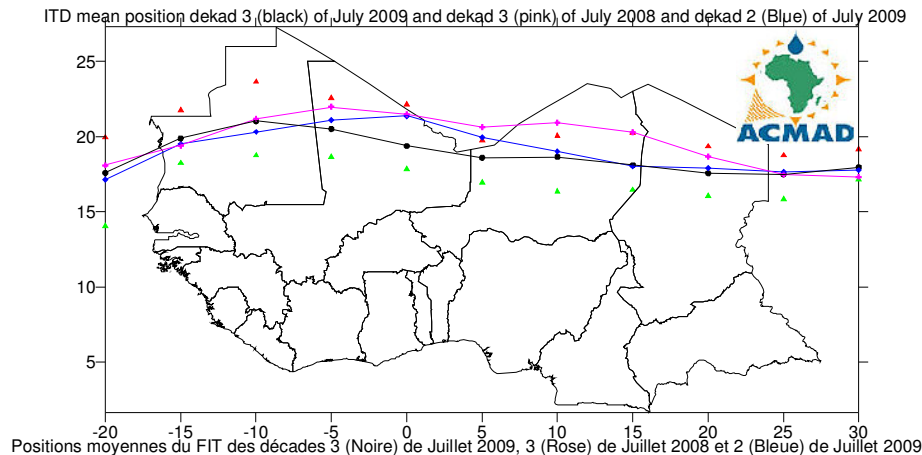


Figure 2 : The red and green triangles represent the max. and min. displacements of the ITD respectively

## 1.2 TROPOSPHERE

- **Monsoon:** Monsoon influx at 925hPa level was moderate (5.5 to 11.5m/s) over Gulf of Guinea countries, Burkina Faso, and central Niger.
- **African Easterly Jet (AEJ) and Tropical Easterly Jet (TEJ):** The mean speed of the AEJ (figure 3) at 700hPa level was about 17m/s during the dekad with an axis located at about 16°N, stretching from central Mali, south Mauritania up to northwest Cape Verde Island in north Atlantic Ocean (Figure 3).
- **Tropical Easterly Jet:** The core value of the TEJ at 150hPa level was 34m/s at about 11°N of latitude over India extending its axis over northern GHA countries, with secondary winds core of 16m/s at about 5°N over Gulf of Guinea countries (Figure 4).

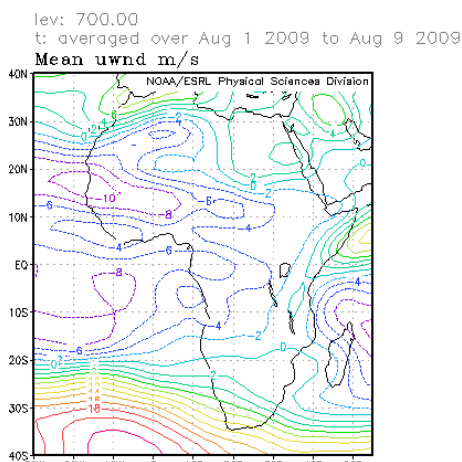


Figure 3: Position of AEJ  
(Source: NOAA/NCEP/ESRL: PSD)

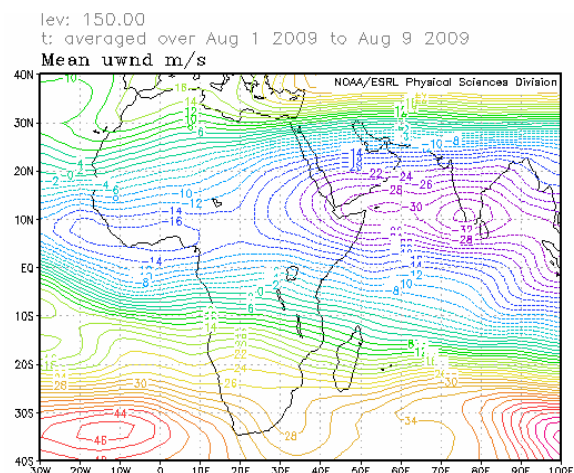


Figure 4: Position of the TEJ  
(Source: NOAA/NCEP/ESRL: PSD)

- **Thermal Index (TI):** In the first dekad of August, 2009, the thermal index (TI) regime at 300hPa in (figure 5), had TI regime value of 242°K and above covering extreme northern parts of Central Africa countries, Great Lakes countries and GHA countries with the threshold value of 243°K and above covering the Sahel triggered heavy rains over the areas characterized by high relative humidity(>60%) as observed in Figure 6. The highest thermal index regime of 250°K was located over northern Asia extending into north western Pacific Ocean and northeastern Africa associated with heavy rainfall with floods.

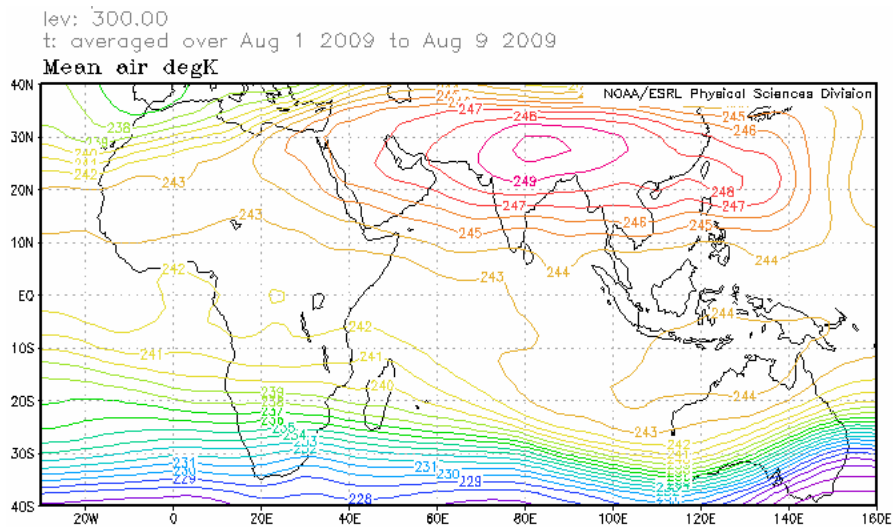


Figure 5: Thermal regimes at 300hPa (Source: NOAA/NCEP/ESRL: PSD)

- **Relative Humidity (RH):** The 850hPa (Figure 6) shows high RH (>70%) in the first dekad of August, 2009 over GHA, Gulf of Guinea countries, extreme southern part of the Sahel countries and northwestern part of Central Africa countries. The Sahara, most parts the Sahel, Southern Africa and southern part of Central Africa countries experienced dry conditions characterized by the lowest RH (<40%).

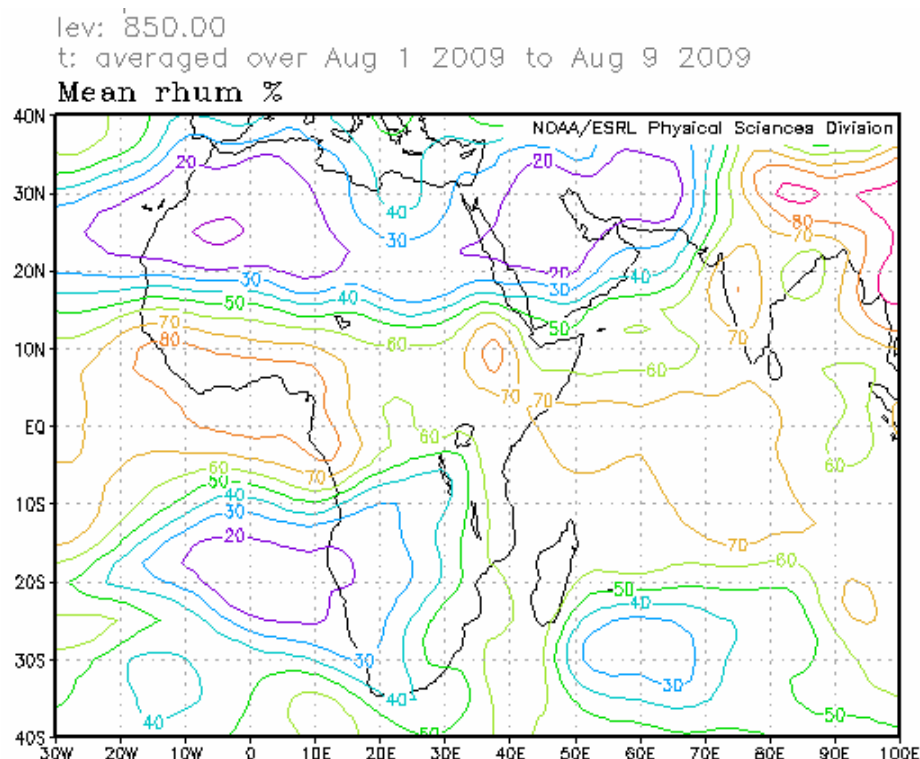


Figure 6: Relative Humidity at 850hPa (Source: NOAA/NCEP/ESRL: PSD )

## 2. RAINFALL AND TEMPERATURE SITUATION

Subsection 2.1 provides a summary on estimated rainfall amounts and distribution and the subsection 2.2 gives stations observed data on rainfall, mean maximum and mean minimum temperatures including number of rainy days.

### 2.1 RAINFALL

The rainfall estimate based on Satellite and Rain Gauge in Figure 7 below shows slight rainfall distribution increase over the Sahel, Gulf of Guinea and Central Africa countries while GHA observed slight decrease in rainfall distribution. Southern Africa and Northern Africa countries had non significant change in spatial rainfall distribution and amounts. In detail:

- **North Africa countries:** Non significant rainfall amounts were observed.
- **The Sahel:** had slight increase in rainfall distribution with amounts ranging from 10mm to 100mm with some peaks ranging between 100mm to 200mm over south-western Mali and south-western and south-eastern Senegal.
- **Gulf of Guinea countries:** experienced slight rainfall distribution increase over its southern part observing rainfall amounts ranging between 10mm to 150mm with maximum between 150mm to 300 over Cameroon, northern Côte d'Ivoire, Guinea Bissau intensifying to above 300mm over Guinea Conakry.
- **Central Africa countries:** had slight increase in rainfall distribution observing amounts ranging from 10mm to 150mm over Central Africa Republic and Democratic Republic of Congo.
- **GHA countries:** experienced slight decrease in rainfall distribution and amounts observing 10mm to 100mm of rainfall over northern part with heaviest amounts ranging from 100mm to 150mm over southern Sudan and north-western Ethiopia.
- **Southern Africa countries:** experienced localized rainfall with amounts ranging from 10mm to 100mm over eastern part of South Africa, Swaziland, southern Mozambique and eastern part of Madagascar.

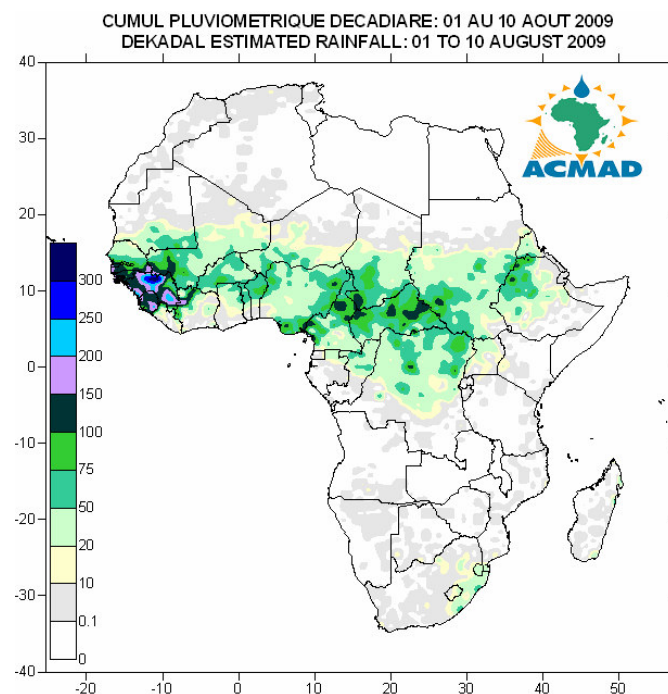


Figure 7: Estimated precipitations, (Data Source: NOAA/NCEP)

### 3. OUTLOOK FOR DEKAD (21<sup>th</sup> - 31<sup>st</sup> AUGUST, 2009)

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#### 3.1 RAINFALL

The ITD limited northward displacement had reduced moisture influx over northern central part of the Sahel undermines the prospects for rainfall over the sector. The western and eastern Sahel, northern part of Gulf of Guinea countries, central Africa and northern sector of GHA countries will have rainfall increase. However, rainfall decrease will continue over southern parts of GHA countries while dry conditions will prevail over southern Africa countries (Figure 8). In detail:

- **North Africa countries:** will experience mainly dry conditions with light rainfall patches, amounts ranging from 10mm to 20mm.
- **The Sahel:** will continue to experience increasing temperatures with slight rainfall increase over western and eastern parts southern sector of the Sahel recording amounts ranging from 10mm to 100mm with highest peaks of about 150mm. However, the rainfall will remain depressed due to evolving El Nino.
- **Gulf of Guinea countries:** will experience no significant rainfall increase recording amounts ranging from 10mm to 150mm with peaks of about 200mm.
- **Central Africa countries:** will have no significant rainfall increase over northern parts recording amounts ranging from 10mm to 150mm with peaks ranging of about 200mm.
- **GHA countries:** will have no significant rainfall increase over northern parts observing amounts ranging from 10mm to 150mm with peaks of about 200mm.
- **Southern Africa countries:** dry conditions will be expected to prevail over most of the countries with light rainfall patches ranging from 10mm to 20mm over eastern parts.

#### 3.2 TEMPERATURE

The forecast in Figure 9, shows that the mean surface temperature will continue to increase over northern part of Gulf of Guinea countries, the Sahel, northern parts of central Africa and northern parts of GHA countries. The highest forecast temperatures range from 25°C to 35°C in orange and red colours respectively with more than 60% of the Continent recording 20°C and above.

#### 3.3 SOIL MOISTURE

The outlook on soil moisture change, maps shown in Figure 10 include the initial soil moisture and the forecast changes over the next 7 days. The soil moisture change and precipitation relationship is discernable on the maps below. The areas forecast to have highest soil moisture change include Gulf of Guinea countries, southern parts of the Sahel, northern central Africa and northern GHA countries.

#### 3.4 IMPACTS

**Health:** The incidences of malaria and other climate related diseases are higher in areas with high temperatures during rainy periods. The temperatures in the range of 18°C to 32°C with high rainfall and relative humidity (>60%) favour the survival of the vector and development of the parasite in the vector resulting in high incidences of malaria even in low prevalence areas. The parts of Gulf of Guinea, the Sahel, northern parts of central Africa and northern GHA countries with high humidity/rainfall coupled with prevailing conducive temperatures will support the survival of parasite resulting in higher incidences of climate related diseases including malaria. The health authorities and Agencies need to continue the healthcare and humanitarian services to protect lives of the vulnerable communities.

**Agriculture and food security:** The integration of climate information and prediction products in agricultural production is of crucial importance. We often emphasize on the importance of well documented onset dates of seasonal rainfall as well as monitoring of the phenological stages of crops for crop yield assessments in our countries. It is imperative to carry out cost benefit analysis on determination and applications of appropriate planting dates in order to take full advantage of limited soil moisture availability in a shortened crop growing season. The drought-tolerant crops can be grown in zones where the prevailing soil moisture is the major climate constraint on crop yield. The crop



varieties that are higher yielding, more drought resistant, earlier maturing, disease and pest tolerant are recommended in these moisture constrained zones for communities' sustained food security and adaptation. There is also a need to invest in higher yielding crops during a good rainy season by taking advantage of seasonal climate consensus forecast, for example those issued by regional climate outlook fora (RCOF), the GHACOF, PRESAO, PRESAC, and SARCOF for Greater Horn of Africa (GHA), West Africa, central Africa, and southern Africa countries respectively. The prevailing protracted drought over parts of eastern African after the failure of long rains over much of the subregion is mainly due to the evolving El Niño while at the same time the countries in the subregion have to put in place mitigation strategies to cope with heavy rains with floods expected to hit the countries in November/December, 2009 at the peak of the phenomenon.

**African Ecosystems :** While noting that forests serve as water catchments areas, the destruction of forests has been blamed for the declining water levels in the African lakes and rivers. We have to rehabilitate our presently degraded rainfall catchments areas and forests ecosystems through enhanced national policies and environmental conservation strategies such as national tree planting, afforestation and soil conservation during rainy seasons to minimize soil loss due to heavy runoff. Enhanced national strategies for adaptation to Climate Change are of highest priority for States' enhanced economic growth and sustainable development. Invest in environmental conservation now for better tomorrow.

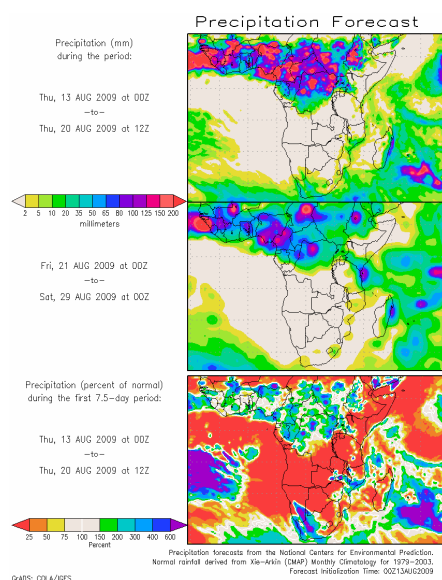


Figure 8: Precipitation forecast, Source : COLA

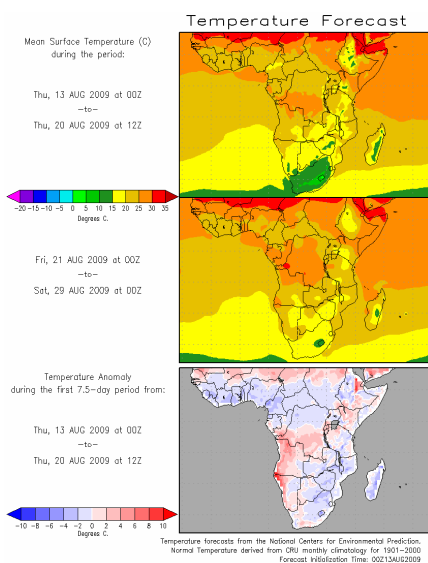


Figure 9 : Temperature forecast Source : COLA

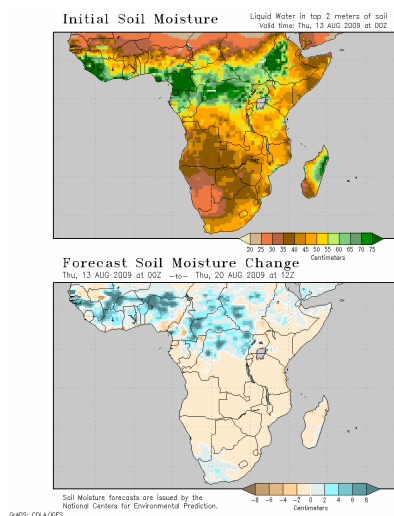


Figure 10 : Soil moisture forecast, Source: COLA

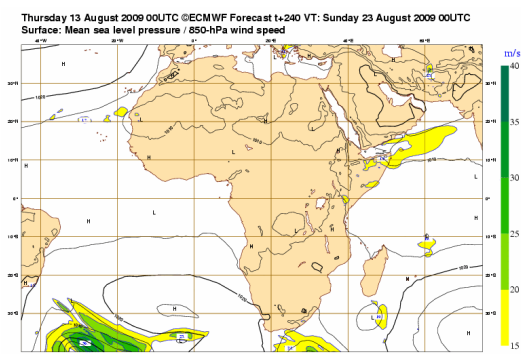


Figure 11 : Mean sea Level pressure forecast  
Source : ECMWF