

Ten Day Climate Bulletin

N° 20

Dekad 11th to 20th July, 2010

HIGHLIGHT: Cumulated rainfall indicates increase over the Sahel and reduction over most countries in the Gulf of Guinea area, except countries neighbouring Senegal. There was, heavy rainfall reported over southern Chad while in GHA countries rainfall was reported over NW Ethiopia, central and southern Sudan, other areas remained dry or under low rainfall. Southern African countries continued being dry with very low level of rainfall in very few places.

GENERAL SITUATION

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

1.1 SURFACE

- **Azores high:** pressure of 1026 hPa with W-E axis, weakened slightly by 1 hPa and shifted northwest compared to the previous dekad. Its mean position was about 36°N/30°W with an extended ridge over north Atlantic Ocean.
- **Saharan low :** pressure of 1004 hPa with two cells located about 22°N/02°W and 15°N/18°E respectively, maintained its intensity compared to the past dekad. Its trough extended over north Mali, north Niger and north Chad.
- **St. Helena high:** pressure of 1032 hPa with SE-NW axis, strengthened by 2 hPa and shifted northeast compared to the previous dekad. Its mean position was about 28°S/05°W, extending a ridge over south Atlantic Ocean.
- **Mascarene high:** pressure of 1034 hPa with W-E axis, weakened by 2 hPa and shifted southwest compared to the past dekad. Its mean position was about 33°S/90°E with an extended ridge over east of Southern Africa and Eastern Africa countries.

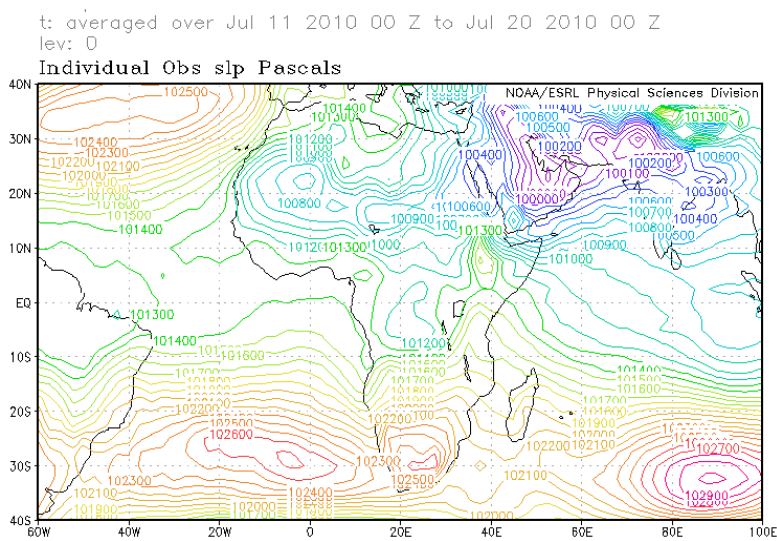


Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

- **Inter-Tropical Discontinuity (ITD)**

Between the first dekad (blue line) and the second dekad of July (black line), 2010, the ITD shifted northwards significantly over Sahel except over the central parts where it maintained a quasi stationary position (Figure2).

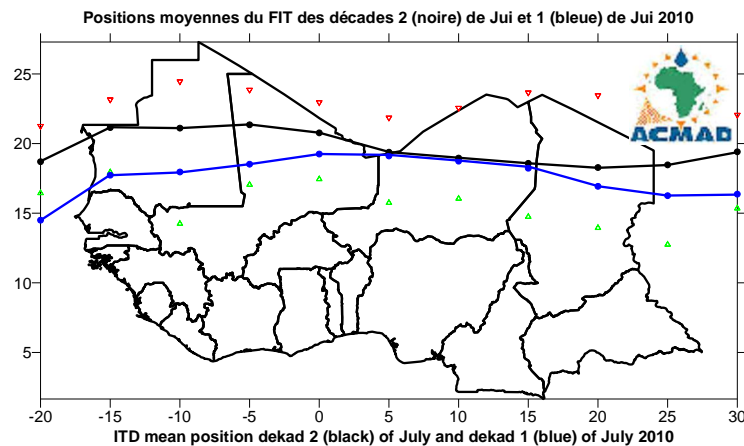


Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

Monsoon influx at 925hPa level was weak (1 to 5 m/s) over south Cameroun and moderate (5.5 to 12.5 m/s) over Liberia, Côte d'Ivoire, Burkina Faso, Ghana, Togo, south Benin, Nigeria, south Niger and south Chad during the dekad.

1.2.2 Thermal Index (TI)

In the second dekad of July, 2010, thermal index (TI) regime at 300hPa in (Figure 3) had near TI regime value of 242°K stretching over most of the Sahel countries, central part of central African countries and most of Gulf of Guinea countries. High TI values ranging between 243°K and 244°K were observed over eastern Sahel and northern part of GHA countries. With the attendant high relative humidity, this is expected give these areas rainfall which may be heavy to cause floods in some areas.

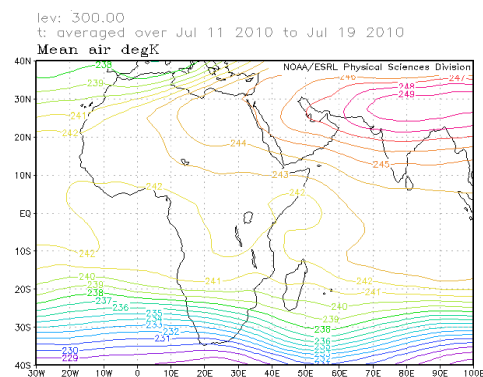


Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

The 850hPa (Figure 4) shows high RH (>70%) in the second dekad of July, 2010 over Gulf of Guinea countries and GHA. However, most of northern Africa north of 15°N as well as western part of South-West Africa countries experienced the lowest RH (< 40%).

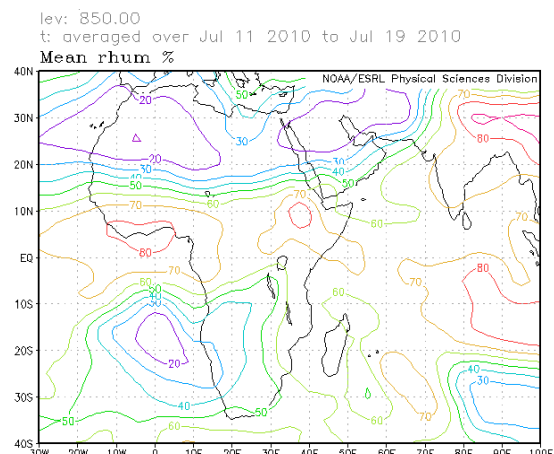


Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

2. RAINFALL AND TEMPERATURE SITUATION

Subsection 2.1 provides a summary on estimated rainfall amounts and distribution while subsection 2.2 provides a table showing stations' observed rainfall, number of rainy days, mean maximum and mean minimum temperatures.

2.1 RAINFALL

The rainfall estimate based on satellite and rain gauge observations in Figure 5, shows decrease in rainfall distribution and amounts over Northern Africa, Gulf of Guinea while the Sahel, Central Africa and GHA countries experienced increase in rainfall distribution and amounts. Southern Africa remained cold and dry. In detail:

- **North Africa countries:** had continues decrease in rainfall distribution and amounts, observing localized non significant amounts.
- **The Sahel:** had both spatial distribution and amounts increase in estimated rainfall distribution, observing between 10mm to 100mm with the highest amounts of about 150mm over south Senegal intensifying to about 250mm over south Chad.
- **Gulf of Guinea countries:** experienced decrease in rainfall amounts ranging between 10mm to 100mm with maximum about 150mm over Guinea Bissau and east Côte d'Ivoire.
- **Central Africa countries:** continue to observe slight increased in rainfall distribution; observing between 10mm to 75mm. High rainfall amounts ranging from 75mm to 250mm was observed over north Central African Republic.
- **GHA countries:** experienced significant increase in both rainfall distribution and amount. The estimated amounts ranged from 10mm to 150mm intensifying to about 250mm over northern Ethiopia and southern Sudan.
- **Southern Africa countries:** continues to experience rainfall deficit. However, some localized amounts of estimated rainfall ranging from 10 to 20mm were observed over southern part of South Africa.

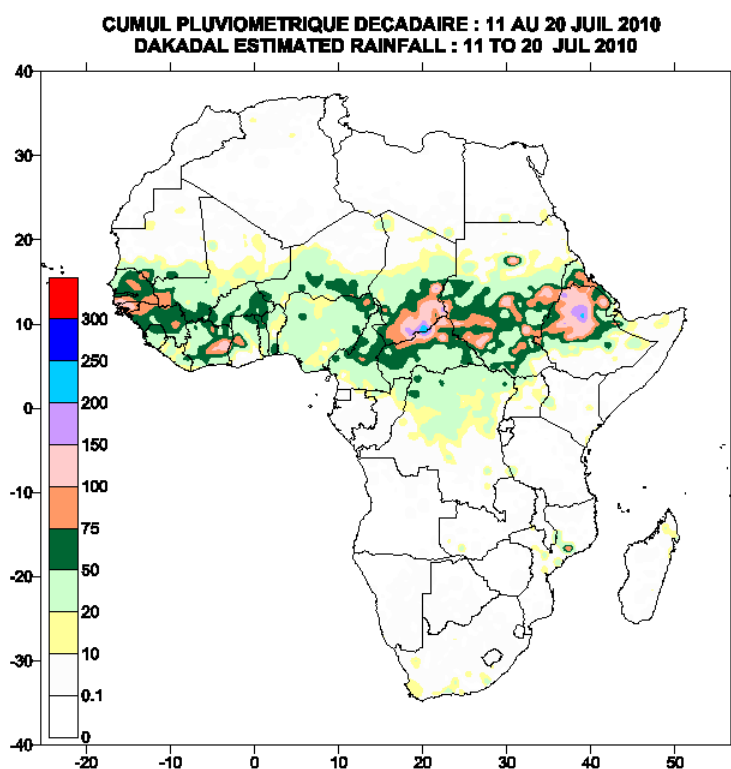


Figure 5 : Estimated precipitations, (Data Source: NOAA/NCE

2.2 OBSERVED DATA

The Table below shows that heavy rainfall amounts (>100mm) were observed at Cotonou in Benin over Gulf of Guinea countries (GGC) and at Banjul in the Gambia over west Sahel countries (SC). The highest mean maximum temperature of 42.8°C was recorded at Bilma in Niger while the lowest mean minimum temperature of 1.5°C was recorded at Johannesburg in South Africa.

| | STATIONS | Rainfall (mm) | Number of rainy days | Mean maximum temperature (°C) | Mean minimum temperature (°C) |
|-------------|---------------------------|---------------|----------------------|--------------------------------|-------------------------------|
| NAC | Casablanca | 0 | 0 | 25,9 | 21,5 |
| | Alger (Dar El Beida) | 0 | 0 | 31,8 | 20,5 |
| | Tamanrasset | 0 | 0 | 37,0 | 23,7 |
| | Tunis | 0 | 0 | 34,7 | 23,2 |
| | Tripoli | 0 | 0 | 37,5 | 23,3 |
| | Le Caire | 0 | 0 | 35,1 | 24,2 |
| SC | Nouakchott | 0 | 0 | 32,7 | 25,5 |
| | Dakar-Yoff | 30 | 3 | 31,5 | 26,6 |
| | Tombouctou | 9 | 2 | 39,7 | 29,1 |
| | Banjul | 108 | 6 | 30,9 | 23,3 |
| | Bamako-Sénou | 41 | 6 | 31,9 | 22,6 |
| | Ouagadougou | 33 | 2 | 32,6 | 24,3 |
| | Bobo Dioulasso | 33 | 2 | 30,6 | 21,8 |
| | Bilma | 0 | 0 | 42,8 | 27,1 |
| | Agadez | 46 | 3 | 40,4 | 27,9 |
| | Niamey-Aéroport | 58 | 3 | 34,4 | 25,6 |
| | Zinder | 21 | 4 | 35,6 | 26,2 |
| | N'Djamena | 26 | 3 | 33,4 | 25,0 |
| GGC | Abidjan | 19 | 6 | 29,9 | 24,1 |
| | Accra | 3 | 2 | - | 24,1 |
| | Conakry | 51 | 4 | 29,4 | - |
| | Lomé | 44 | 2 | 29,6 | 24,3 |
| | Cotonou | 115 | 3 | 28,8 | 24,5 |
| | Abuja | 7 | 1 | - | 22,7 |
| CAC | Libreville | 0 | 0 | 26,7 | 22,1 |
| | Douala | 9 | 1 | - | - |
| | Bangui | 14 | 1 | - | - |
| | Brazzaville | 0 | 0 | 28,5 | 19,7 |
| GHAC | Khartoum | 2 | 1 | 38,0 | 27,3 |
| | Nairobi | 0 | 0 | 23,6 | - |
| | Kigoma | 0 | 0 | 30,9 | 16,6 |
| | Dar-es-Salaam | 5 | 1 | - | - |
| | Mtwara | 0 | 0 | - | 20,1 |
| SAC | Nampula | 0 | 0 | - | 16,7 |
| | Lusaka | 0 | 0 | 25,0 | 8,5 |
| | Maputo | 1 | 1 | 26,0 | 12,9 |
| | Harare | 0 | 0 | 20,4 | 9,2 |
| | Bulawayo | 0 | 0 | 23,4 | 6,3 |
| | Ghanzi | 0 | 0 | 20,5 | 2,3 |
| | Francistown | 0 | 0 | 22,9 | 4,4 |
| | Seretse Kama Intl Airport | 0 | 0 | 18,9 | 2,5 |
| | Windhoek | 0 | 0 | 22,2 | 5,0 |
| | Johannesbourg | 0 | 0 | 15,0 | 1,5 |
| | Pretoria | 0 | 0 | 17,1 | 3,3 |
| | Le Cap | 16 | 3 | 16,4 | 5,5 |
| | Port Elisabeth | 14 | 1 | 20,1 | 7,0 |
| | Durban | 0 | 0 | 23,2 | 9,8 |
| IOC | Maun | 0 | 0 | 24,2 | 6,6 |
| | Seychelles | 27 | 7 | 29,2 | 24,6 |
| | Antsiranana | 1 | 1 | 29,5 | 20,3 |
| | Antananarivo | 0 | 0 | 22,4 | 10,2 |
| | Toalagnaro | 0 | 0 | 25,2 | 18,4 |
| | Plaisance | 23 | 8 | 25,8 | 19,9 |

Data Source: ACMAD / GTS

NOTE: 0 means no rain;
- means no temperature data available

NAC= Northern Africa Countries ; **SC**=Sahel Countries; **GGC**=Gulf of Guinea Countries; **CAC**=Central Africa Countries; **GHAC**=Greater Horn of Africa Countries; **SAC**=Southern Africa Countries; **IOC**=Indian Ocean Countries.

3. OUTLOOK FOR DEKAD (01st – 10th AUGUST, 2010)

3.1 RAINFALL

The ITD will continue its move northward movement causing rainfall increase in the Sahelian countries. Reduction of rainfall amounts is expected in the Gulf of Guinea, central Africa except the northern areas. GHA countries will experience increased rainfall in south Sudan and N.W Ethiopia. In detail:

- **North Africa countries:** will remain mainly dry during most parts of period, but with localized rainfall amounts ranging from 10mm to 20mm in the south and parts of northwestern,
- **The Sahel:** will experience rainfall increase both in intensity and spread with amounts ranging between 65mm and 100mm being reported. This amount is expected to rise in some areas where amounts between 125mm and 150mm will be realised over south Burkina Faso and South west Niger.
- **Gulf of Guinea countries:** will experience reduction of rainfall compared to the last period with most parts recording 10mm to 35mm except the coastal belt of countries neighbouring Guinea where high rainfall of 125 to 150mm is expected.
- **Central Africa countries:** during the period under consideration rainfall will show a decline except southern Chad and Democratic Republic of Congo where 125mm to 150mm will be realised. Dry conditions are expected to be more pronounced in southern parts of the region.
- **GHA countries:** will have rainfall decrease in the southern and eastern sectors, however South and central Sudan together with northwest Ethiopia are expected to receive increased rainfall of 100mm to 125mm.
- **Southern Africa countries:** will continue to experience dry conditions especially over the western sector while those areas which are in the eastern coastal belt are expected to experience some rainfall in the range of 20-35mm.

3.1 TEMPERATURE

The forecast in Figure 7 shows temperature in the Gulf of Guinea will be 20°C – 25°C, the Sahel 25°C - 30°C in the south while in the north it will be between 30°C and 35°C. Central Africa is expected to record temperatures between 20°C - 25°C except the central parts of Democratic Republic of Congo which will record between 25°C and 30°C. GHA countries will be cool over the central Kenya and Tanzania as well as in Ethiopia with temperatures of 15°C - 20°C. The highland areas will have temperatures between 10 °C and 15°C while areas to the east will be hot with temperatures of 35°C - 35°C. Temperatures ranging from 15°C - 20°C will be realised in the most areas of southern Africa, with some places reporting sub 10°C mainly in the Cape area.

3.2 SOIL MOISTURE

The outlook on soil moisture changes, Fig.8 indicate that moisture will continue to increase over the Sahel, with reduction over Gulf of Guinea, southern parts of Central Africa. In GHA as a consequence of continued rainfall soil moisture is expected to increase in southern and central Sudan as well as in Northern Ethiopia and Eritrea. Low soil moisture is expected to continue over most of other parts of southern Africa except area in the eastern coast.

3.4 IMPACTS

Health: The incidences of malaria and other climate related diseases are higher in areas with high temperatures during rainy period. 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 Gulf of Guinea, Southern Sahel, central Africa, and parts of GHA countries with high humidity of over 60%, sufficient rainfall and conducive temperatures will support survival of malaria and it is therefore advised that plans be put in place to combat likely outbreaks. Chances of outbreak of malaria are low in southern African countries due to the low temperatures and the East African highlands of Tanzania, Kenya and Ethiopia.

Agriculture and food security: The integration of climate prediction products and information into agricultural production and food security is of crucial importance. We emphasize on the importance of suitable planting dates, seasonal rainfall onset, rainfall amounts and length of the season including monitoring of the phenological stages of crops for crop yield assessments in the countries. It is imperative to carry out cost benefit analysis on applications of appropriate planting dates and suitable seed variety 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. In the Sahel with the continued good performance of rainfall so far crops are expected to continue benefiting, while sprouting of pasture will be greatly help livestock. The rains are also expected to recharge animal water drinking points.

African Ecosystems: While noting that forests serve as rainfall catchment areas, the destruction of forests has been blamed for the declining water levels in the African lakes, rivers and the drying wetlands. The current rains are expected to provide sufficient moisture for rejuvenation of the earlier dormant shrubs else as vegetation in the riverine areas. We have to rehabilitate our presently degraded rainfall catchment areas and natural ecosystems through enhanced national policies and environmental reclamation strategies. Good practices in ecosystems rehabilitation and management include national tree planting during rainy season and soil conservation to minimize soil loss during rainy seasons due to heavy runoff. Farmers in the Sahelian region which now is under rainfall may take this opportunity to plant trees as seedlings survival rate is high due to the prevailing soil moisture conditions.

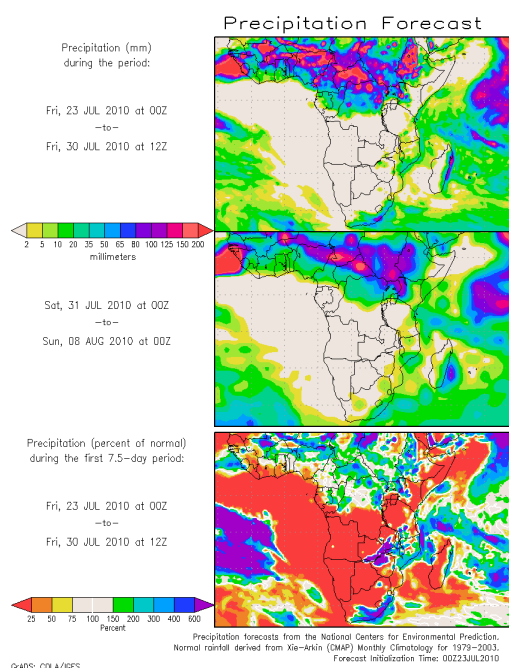


Figure 6 : Precipitation forecast, Source : COLA

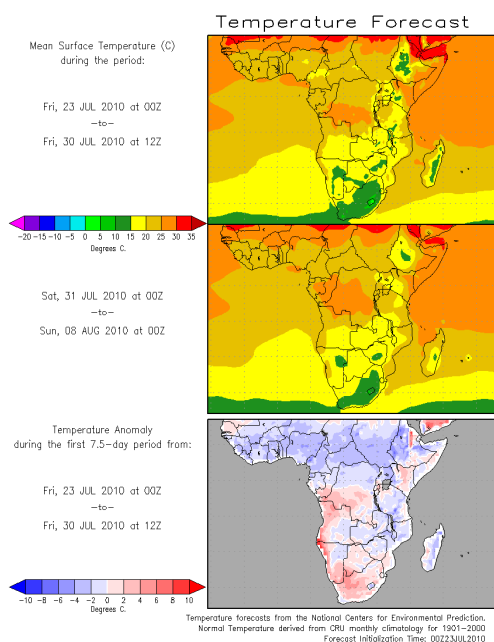


Figure 7 : Temperature forecast Source : COLA

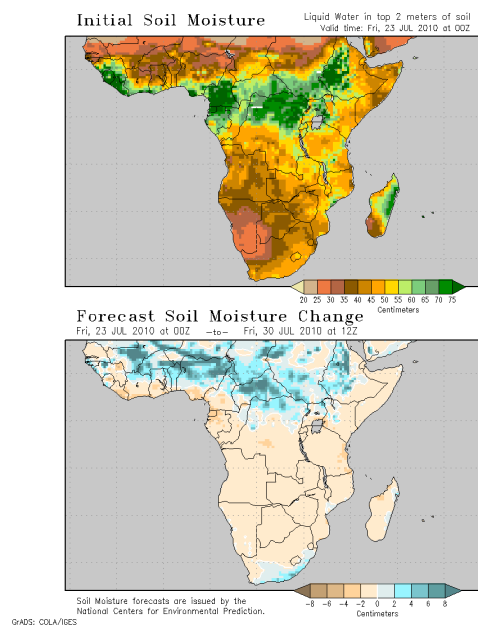
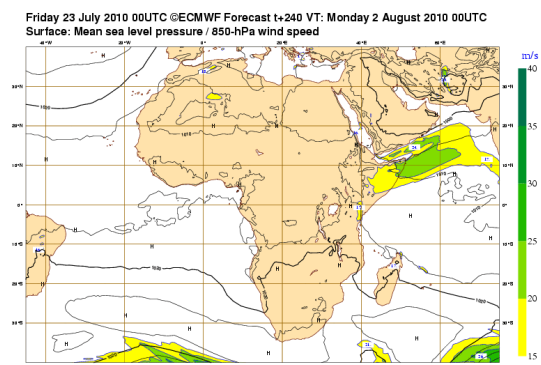


Figure 8 : Soil moisture forecast, Source: COLA



**Figure 9: Mean Sea Level pressure forecast
Source: ECMWF**