

Ten Day Climate Bulletin

N° 22

Dekad 01st to 10th August, 2010

HIGHLIGHT: During the first 10 days of the month there was rainfall increase over the western countries in the Gulf of Guinea, the Sahel and Central African Republic, Congo and Cameroun. Generally countries in North Africa and most of GHA region were dry, except northwest Ethiopia and northern parts of Eritrea. Southern African countries remained dry with low relative humidity.

GENERAL SITUATION

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

1.1 SURFACE

- **Azores high:** pressure of 1028 hPa maintained its intensity and shifted northwest compared to the previous dekad. Its mean position was about 44°N/24°W with an extended ridge over North Atlantic Ocean.
- **Saharan low:** pressure of 1004 hPa maintained its intensity and shifted northeast compared to the previous dekad. Its mean position was about 24°N/00°W, extending a trough over north Mauritania, north Mali, south Algeria, north Niger and north Chad.
- **St. Helena high:** pressure of 1031 hPa with SE-NW axis, weakened by 3 hPa and shifted southeast compared to the past dekad. Its mean position was about 35°S/04°E with an extended ridge over south Atlantic Ocean.
- **Mascarene high:** pressure of 1033 hPa with W-E axis, strengthened by 3 hPa and shifted eastward compared to the previous dekad. Its mean position was about 32°S/58°E with an extended ridge over east of Southern Africa and Eastern Africa countries.

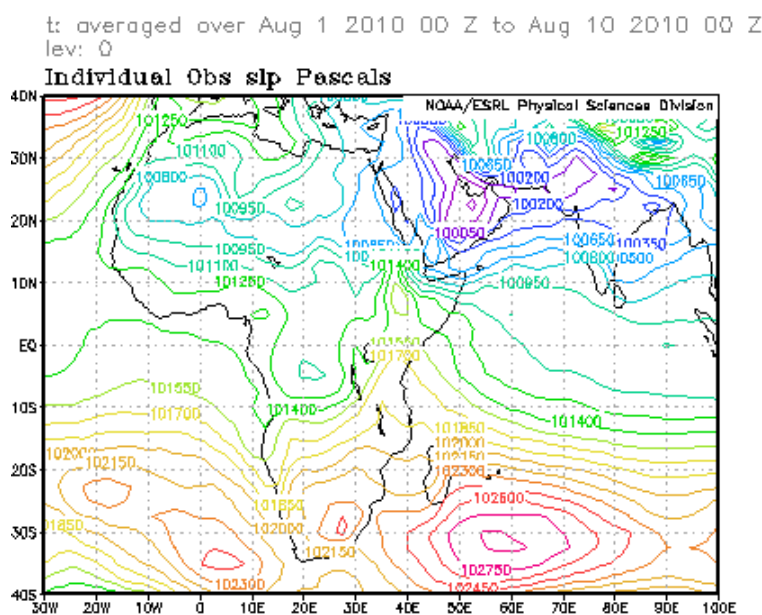


Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

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

Between the third dekade of July (blue line) and the first dekade of August (black line), 2010, the ITD was quasi stationary over Sahel (Figure2).

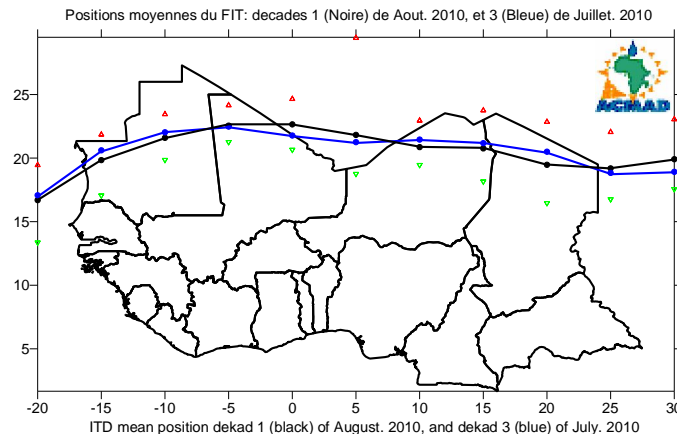


Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

Monsoon influx at 925hPa level was generally moderate (5.5 to 12.5 m/s) over south Senegal, Guinea Bissau, Sierra Leone, Guinea Conakry, Liberia, Côte d'Ivoire, east Mali, Burkina Faso, Ghana, Togo, Benin, Nigeria and south Niger during the dekade.

1.2.2 Thermal Index (TI)

In the first dekade of August, 2010, thermal index (TI) regime at 300hPa in (Figure 3) had threshold TI regime value of 243°K enclosing the Sahel countries and the northern Gulf of Guinea countries with the 242°K over most of GHA countries through south Angola into the Atlantic covering Central Africa and the Gulf of Guinea countries. High TI values ranging between 244°K and 246°K were observed over north Sudan and northeast Africa. The high TI regime with attendant high relative humidity (>60%), will trigger heavy rainfall which may result into flooding.

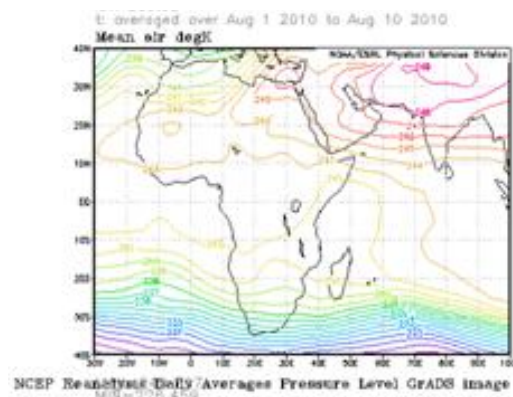


Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

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

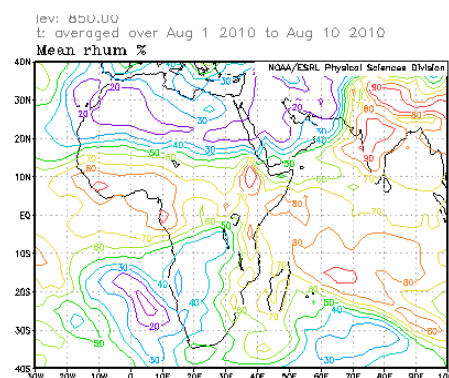


Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

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 and GHA countries. However, the Gulf of Guinea countries showed an increase in amounts but continued reduction in distribution while the Sahel and Central Africa showed slight decrease in rainfall distribution and amounts. Southern Africa remained cold and dry. In detail:

- **North Africa countries:** had continued being dry, with localized low rainfall of 20mm over southern Algeria and about 50mm over north Algeria.
- **The Sahel:** had both a slight decrease in spatial distribution and amounts in estimated rainfall, observing between 10mm to 100mm with the highest amounts of about 150mm over south Chad.
- **Gulf of Guinea countries:** continued to experience an increase in rainfall amounts ranging between 10mm to 100mm with maximum about 150mm over Coastal Guinea Conakry and about 200mm over coastal Cameroon.
- **Central Africa countries:** observed an increase in rainfall distribution and but decrease in amount; observing between 10mm to 100mm significantly over Central African Republic.
- **GHA countries:** experienced similar rainfall pattern as in the last dekad with rainfall over South Sudan and Northwest Ethiopia which rose to maximum amounts of about 150mm.
- **Southern Africa countries:** continues to experience reduction in rainfall.

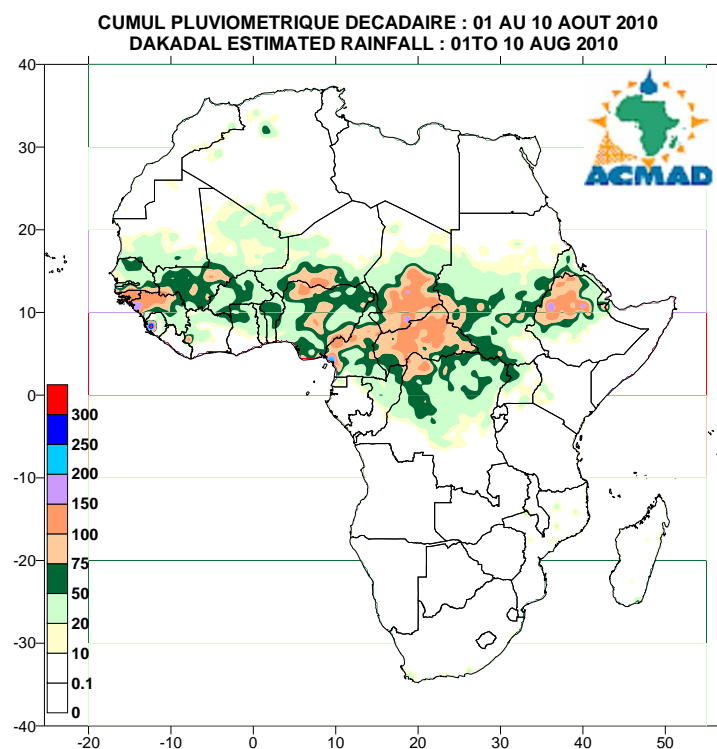


Figure 5 : Estimated precipitations, (Data Source: NOAA/NCE

2.2 OBSERVED DATA

The Table below shows that heavy rainfall amounts (>100mm) were observed at Douala in Cameroun over Gulf of Guinea countries (GGC), Zinder in Niger over Sahel countries (SC) and at Bangui in Central African Republic over Central African countries (CAC). The highest mean maximum temperature of 41.7°C was observed at Bilma in Niger while the lowest mean minimum temperature of 4.4°C was observed at Maseru in Lesotho.

	STATIONS	Rainfall (mm)	Number of rainy days	Mean maximum temperature (°C)	Mean minimum temperature (°C)
NAC	Alger (Dar El Beida)	0	0	31,5	18,0
	Tunis	0	0	32,1	21,6
	Tripoli	0	0	33,0	21,2
	Le Caire	0	0	37,0	25,8
	Casablanca	0	0	29,1	22,8
	Tamanrasset	5	2	35,2	23,8
SC	Nouakchott	9	1	31,6	26,4
	Dakar-Yoff	17	3	31,2	26,5
	Tombouctou	14	5	36,8	26,6
	Banjul	38	2	30,7	24,2
	Bamako-Sénou	68	6	31,0	22,9
	Ouagadougou	65	4	31,7	23,8
	Bobo Dioulasso	50	6	30,1	22,1
	Bilma	1	1	41,7	26,8
	Agadez	2	2	37,0	26,0
	Niamey-Aéroport	17	2	33,9	25,5
	Zinder	136	4	33,0	23,5
	N'Djamena	34	4	32,5	23,9
GGC	Conakry	52	1	-	-
	Abidjan	0	0	29,9	23,3
	Accra	0	0	29,8	24,0
	Lomé	0	0	30,0	23,3
	Cotonou	1	1	28,3	24,8
	Douala	236	6	28,0	24,0
CAC	Libreville	0	0	26,9	22,6
	Bangui	102	4	30,2	22,1
	Brazzaville	0	0	27,5	20,5
GHAC	Khartoum	0	0	37,7	27,1
SAC	Nampula	0	0	26,7	17,2
	Lusaka	0	0	25,0	9,0
	Harare	0	0	22,0	9,5
	Bulawayo	0	0	23,2	9,0
	Maputo	0	0	26,9	13,3
	Beira	0	0	25,6	18,2
	Maun	0	0	27,3	11,1
	Ghanzi	0	0	24,8	6,4
	Francistown	0	0	25,4	8,0
	Seretse Kama Intl Airport	0	0	23,0	-
	Manzini	0	0	-	9,1
	Maseru	0	0	-	4,4
	Windhoek	0	0	25,3	10,0
	Johannesbourg	0	0	19,8	5,6
	Pretoria	0	0	22,9	6,2
	Port Elisabeth	17	2	22,0	10,8
	Durban	0	0	25,5	12,0
	Le Cap	58	3	19,0	8,6
IOC	Seychelles	18	6	28,7	24,5
	Antsiranana	1	1	29,2	19,7
	Antananarivo	0	0	19,2	9,5
	Toalagnaro	36	4	23,5	18,0
	Plaisance	19	9	24,7	18,8

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 (21st – 31st AUGUST, 2010)

3.1 RAINFALL

The ITD will start downward movement during the outlook period this will lead to indications of declined rainfall in the Sahel mainly in the northern parts. During the first week of the outlook period rainfall will continue being heavy over Gulf of Guinea countries which are further to the west. GHA will also experience reduced rainfall except over northern western Ethiopia and north Eritrea which will have continued rainfall activities but at a lower degree. North Africa countries will remain mainly dry during most the outlook period.

- **The Sahel:** will experience rainfall decrease both in intensity and spread with amounts ranging between 20mm and 50mm being reported. This amount is expected to remain high in some areas with amounts over 125mm over Chad – Sudan border.
- **Gulf of Guinea countries:** will experience reduction of rainfall amounts over most parts with most parts recording 10mm to 35mm except countries neighbouring Guinea Conakry and northern Nigeria where high rainfall above 125 mm is expected.
- **Central Africa countries:** during the period under consideration rainfall will show a decline in spread over most parts which will be recording between 30 to 80 mm, however over north Cameroun and South Chad rainfall may reach over 100mm. North east of Democratic Republic of Congo (DRC) will notice slight rainfall increase which may attain a peak of over 100 mm. Dry conditions are expected to be more pronounced in southern parts of the region.
- **GHA countries:** will have decreased rainfall of amounts ranging between 10 and 35mm over most parts, however central and northwest Ethiopia and the Kodorfan areas of Sudan will have an active situation with 80 to 100mm being reported.
- **Southern Africa countries:** will continue to experience dry conditions with some slight drizzle which may occur over highground areas. Slight increase to wet situation is expected to be realised over the Cape with 5 to 30 mm in the extreme south.

3.1 TEMPERATURE

The forecast in Figure 7 shows temperature in the Gulf of Guinea will be cooler at 20°C – 25°C. Over the Sahel 25°C - 30°C be realised in the south while in the north it will be between 30°C and 35°C. Central Africa is expected to record temperatures between 25°C - 30°C in the central areas of DRC except over Cameroun where between 20°C and 25°C will be realised. GHA countries will start warming with central Kenya and Tanzania recording temperatures of 15°C - 20°C. These temperatures are expected to become cooler over Ethiopian highlands which will be between 10 -15°C. Southern Africa will remain cold with temperatures between 10 and 20°C with the Cape being the coldest where temperatures will range between 10°C and 15°C. Further to the north of the southern Africa region temperature will warm to 20-25°C.

3.2 SOIL MOISTURE

The outlook on soil moisture changes, Fig.8 indicate that there has been ample moisture over the Sahel and Gulf of Guinea countries which is expected to continue being available as result of the past rains. Continued increase in moisture is expected to over the northern parts of Central Africa region, with reduction over southern parts of Gulf of Guinea countries. Moisture increase is expected over Chad and other countries in the northern parts of Central Africa including Central Africa Republic and Cameroun, while in the south due to increased temperature depletion is expected to occur. In GHA as a consequence of warming temperatures, soil moisture is expected to show reduction except over central and northern parts of Ethiopia where replenishment is expected from the on going rainfall. Low soil moisture conditions are expected to continue over most of other parts of southern Africa.

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, Sahel and central African 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 out break of malaria are low in southern tip of South African and highlands of Ethiopia due to the low temperatures. Whereas temperatures have been relatively low over GHA countries, the current warming which is expected to continue may lead to outbreaks, thus there is need for close monitoring of the situation.

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 from the available soil moisture while livestock pasture will be readily available. The rains are expected to continue recharging livestock and wildlife drinking water points both in the south and some parts of northern Sahel.

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. Riverine areas are expected to receive occasional flooding which may lead to destruction of some existing ecosystems.

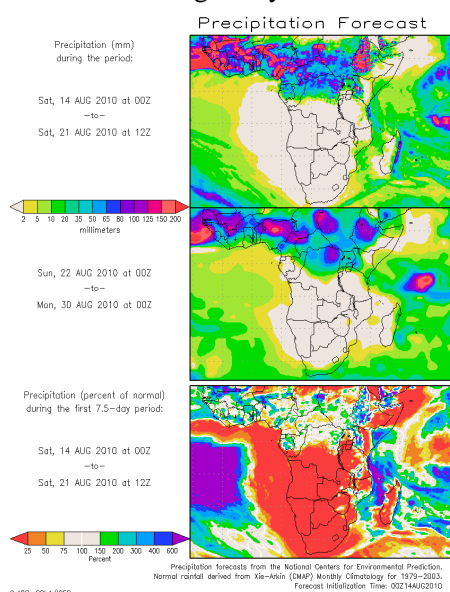


Figure 6 : Precipitation forecast, Source : COLA

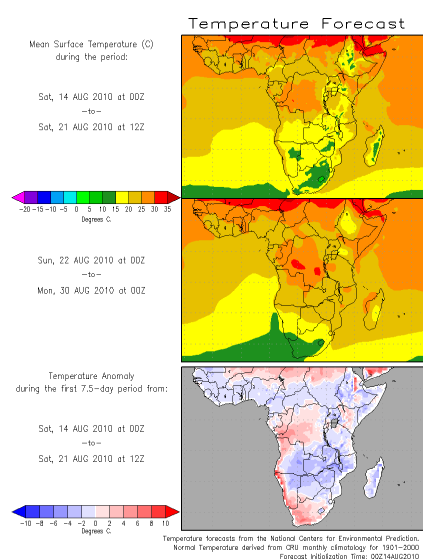


Figure 7 : Temperature forecast Source : COLA

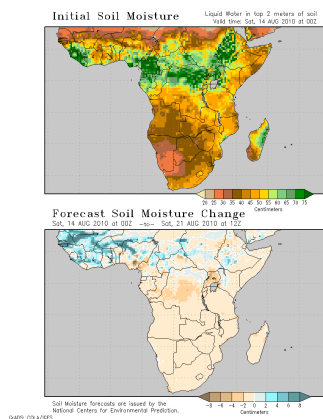
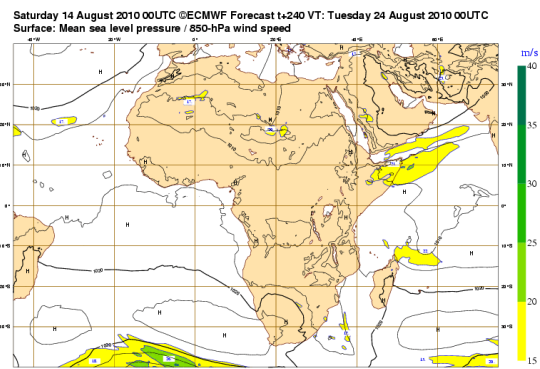


Figure 8 : Soil moisture forecast, Source: COLA



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