Ten Day Climate Bulletin
N° 17
Dekad 11st to 20th Jun, 2010

HIGHLIGHT: Cumulative rainfall distribution indicated intense rainfall distribution over the coastal regions of the Gulf of Guinea countries with indications of a declining trend in rainfall amounts and spatial coverage over the central African countries. Some rains continued to be experienced over Uganda, South Sudan and western parts of Ethiopia in the GHA. The southern parts of the Sahelian countries experienced rainfall, while some parts of Northern African countries also reported rainfall. The Cape region in Southern Africa reported cases of rainfall while the rest of region remained dry.

1. GENERAL SITUATION

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

1.1 SURFACE

- **Azores high:** pressure of 1030 hPa with SW-NE axis, strengthened by 5 hPa and shifted northeast compared to the previous dekad. Its mean position was about 43°N/25°W with an extended ridge over north Atlantic Ocean.

- **Saharan thermal low :** pressure of 1006 hPa maintained its intensity and shifted southeast compared to the past dekad. Its mean position was about 15°N/16°E with an extended trough over south Mauritania, central Mali, Niger and Chad.

- **St. Helena high:** pressure of 1030 hPa with SE-NW axis, strengthened by 4 hPa and shifted southeast compared to the previous dekad. Its mean position was about 33°S/05°E, extending a ridge over south Atlantic Ocean.

- **A thermal high pressure** of 1028 hPa with SW-NE axis, strengthened by 46 hPa and shifted southwest compared to the past dekad. Its mean position was about 29°S/23°E with an extended ridge over east Southern Africa countries.

- **Mascarene high:** pressure of 1031 hPa with W-E axis, strengthened by 3 hPa and shiftrd northwest compared to the past dekad. Its mean position was about 31°S/70°E with an extended ridge over Idian Ocean.

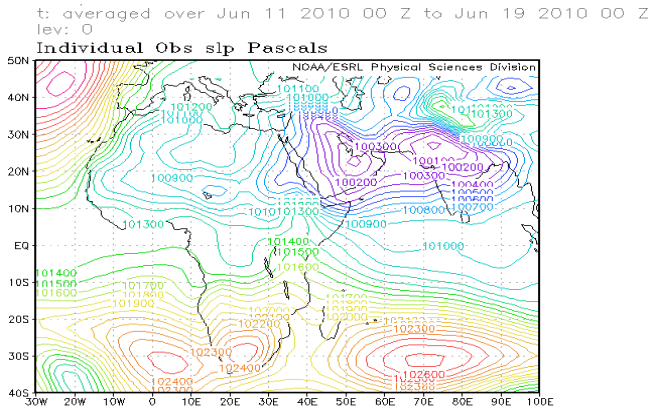

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

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

Between the first dekad (blue line) and the second dekad of June (black line), 2010, the ITD shifted slightly northward over west Sahel countries and also slightly southward over east parts (Figure2).

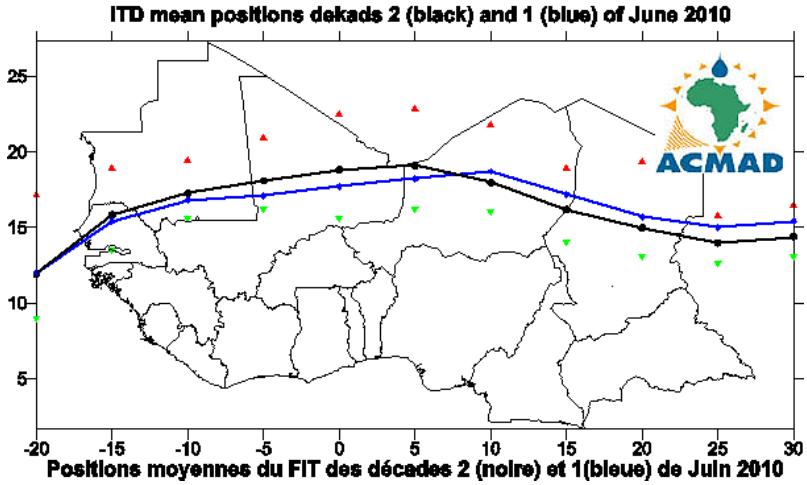

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

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

1.2.2 Thermal lndex (TI)

In the second dekad of June, 2010, thermal index (TI) regime at 300hPa in (Figure 3) had a near threshold value of 242°K forming a belt stretching through Africa at about 20°N-15°S. The TI regime value of 243°K stretched over eastern parts of the Sahel through parts of Central Africa and GHA countries. Similar value of 243°K was reported in the ocean off the coast of the western countries of the Gulf of Guinea. With the attendant high relative humidity can be linked to occurrence of heavy rainfall with floods over the areas as shown in Figure 4.

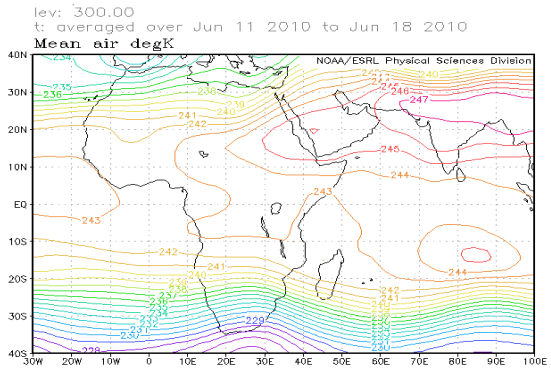

Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

The 850hPa (Figure 4) shows high RH (>70%) in the second dekad of June, 2010 over southern part Gulf of Guinea countries, extreme eastern part of central Africa, western part of GHA and extreme northeastern part of Southern Africa countries including northern part of Madagascar. However, most of northern part of Africa north of 15°N as well as western part of Southern Africa countries experienced the lowest RH (< 40%).

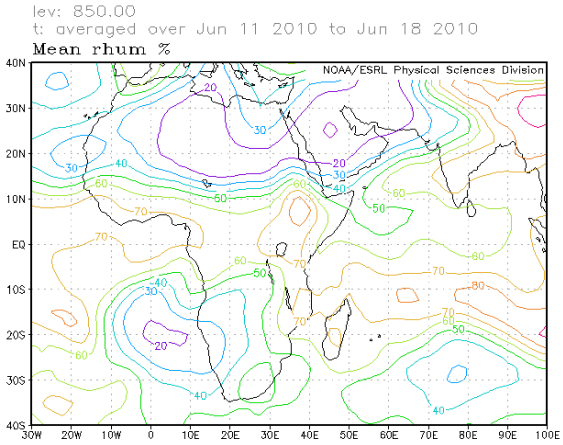

Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

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 increase in rainfall distribution and amounts over northern Africa, the Sahel, Gulf of Guinea and western parts of GHA countries while Central Africa and Southern Africa countries experience decrease in rainfall distribution and amounts. In detail:

- **North Africa countries:** had slight increase in rainfall distribution and amounts, observing 10mm to 50mm over northern Morocco, Algeria, Tunisia and Libya.
- **The Sahel:** had slight spatial increase in estimated rainfall distribution, observing between 10mm to 100mm with maximum ranging from 100mm to 150mm over south Mali and south Chad.
- **Gulf of Guinea countries:** experienced slight increase in rainfall amounts, observing between 10mm to 150mm intensifying to amounts ranging from 150mm to 250mm over coastal zones of Liberia, Côte d'Ivoire, Ghana, Benin, Togo and Nigeria.
- **Central Africa countries:** continue to observed slight decreased in both rainfall distribution and amounts in the southern parts; observing between 10mm to 75mm. High rainfall amounts ranging from 75mm to 150mm was reported over Central African Republic and Democratic republic of Congo.
- **GHA countries:** experienced maintainance in rainfall distribution and amount. The estimated amounts ranged from 10mm to 100mm intensifying to about 150mm over south Sudan and west Ethiopia.
- **Southern Africa countries:** continues to experience rainfall deficit. However, some localized amounts of rainfall ranging from 10 to 50mm were observed over the Cape in South Africa.

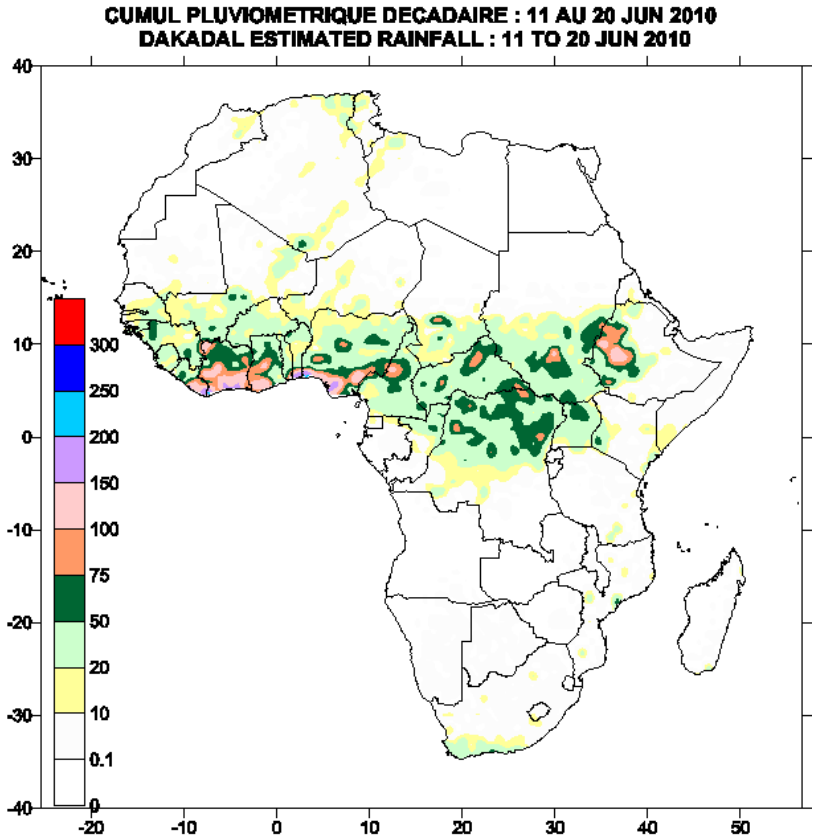

Figure 5 : Estimated precipitations, (Data Source: NOAA/NCE

2.2 OBSERVED DATA

The Table below shows that heavy rainfall amounts observed over Gulf of Guinea countries (GGC). The highest mean maximum temperature of 44.6°C was recorded at Bilma in Niger while the lowest mean minimum temperature of 1.9°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	22,7	18,7
	Alger (Dar El Beida)	4	4	26,3	16,1
	Tamanrasset	12	1	36,2	24,5
	Tunis	3	3	30,2	20,2
	Tripoli	0	0	39,4	25,2
	Le Caire	0	0	36,7	24,5
SC	Nouakchott	0	0	34,5	24,1
	Dakar-Yoff	0	0	30,3	25,0
	Tombouctou	0	0	41,8	30,0
	Bamako-Sénou	16	1	34,1	24,4
	Ouagadougou	21	3	35,2	26,0
	Bobo Dioulasso	17	4	32,2	23,6
	Bilma	2	1	44,6	24,4
	Agadez	5	1	41,8	29,7
	Niamey-Aéroport	22	3	39,3	27,7
	Zinder	28	3	38,8	26,8
	N'Djamena	13	2	40,5	27,1
GGC	Abidjan	180	7	30,5	25,3
	Accra	81	6	29,4	24,7
	Conakry	0	0	30,8	-
	Lomé	151	7	30,4	25,3
	Cotonou	332	6	30,0	26,4
CAC	Libreville	0	0	27,7	24,0
	Brazzaville	0	0	27,7	20,8
GHAC	Khartoum	0	0	42,0	29,8
	Nairobi	0	0	23,0	12,7
	Kigoma	0	0	-	17,6
	Dodoma	0	0	-	15,5
	Dar-es-Salaam	0	0	-	21,4
	Mtwara	3	1	-	20,5
SAC	Nampula	2	2	26,3	18,6
	Lusaka	0	0	24,4	9,2
	Beira	5	2	27,8	17,5
	Harare	0	0	20,7	8,3
	Bulawayo	0	0	23,8	7,5
	Ghanzi	0	0	22,0	3,5
	Francistown	0	0	22,9	5,2
	Seretse Kama Intl Airport	0	0	18,0	5,1
	Windhoek	0	0	21,2	4,7
	Johannesbourg	0	0	13,8	1,9
	Pretoria	0	0	16,9	4,3
	Le Cap	34	4	17,0	6,7
	Port Elisabeth	36	3	18,6	6,5
	Maseru	8	1	-	-
	Manzini	0	0	-	8,4
	Maputo	0	0	25,6	13,8
IOC	Seychelles	20	3	30,4	25,8
	Antsiranana	17	4	29,5	21,9
	Antananarivo	0	0	22,0	11,2
	Toalagnaro	29	3	26,1	18,1
	Plaisance	17	8	26,8	20,9

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 JULY, 2010)

3.1 RAINFALL

The ITD will be continue its move northward movement with rainfall increase in the southern Sahel countries intensifying over the Gulf of Guinea, north central Africa and north GHA countries. In detail**:**

- **North Africa countries:** will remain mainly dry during most parts of period but with localised rainfall amounts ranging from 10mm to 20 in the south and parts of northwestern coast.

- **The Sahel:** will experience rainfall increase both in intensity and spread especially in the south with amounts ranging from 30mm to 60mm and but some areas may realise peaks of over 120mm.

- **Gulf of Guinea countries:** will continue experiencing rainfall amounts ranging from 50mm to 150mm. More intense rainfall will be experienced along the coastal belt of Sierra Leone , Liberia and Guinea where it may reach over 150mm.

- **Central Africa countries:** during the period under consideration rainfall will show a decline in the southern parts with some areas being dry. This dry condition is expectd to change as we move northwards where rainfall of ranging between 80- 120mm will be realised over Central African Republic and Cameroon.

- **GHA countries:** will have rainfall decrease in all parts, except over West Kenya, Uganda, South Sudan and the western highland areas of Ethiopia. In these areas the amounts expected will range between 20mm to 60mm increasing to over 125mm in Ethiopia.

- **Southern Africa countries:** will continue to experience dry conditions in the western parts, however countries in the east including South Africa East, Swaziland, Zimbabwe and Mozambique will receive 10 -50mm. High rainfall is expected over the eastern coast of Madagascar where amounts higher than 125mm may be recorded during the period

3.1 TEMPERATURE

The forecast in Figure 7, shows temperture in the Gulf of Guinea and central Africa will be 20 – 25°C, the Sahel will have hotness of above 30°C in the south while in the north it will be over 35°C. Central Africa will record temperatures between 20°- 25° with parts of Central Democratic Republic of Congo having 25 -30°C. GHA countries will realise a cooler period of 15 - 20°C over southern Tanzania, Western highlands of Kenya and Ethipia. The lowest temperatures ranging from 5- 10°C will cover parts of Southern Africa around Lesotho.

3.2 SOIL MOISTURE

The outlook on soil moisture changes, Figure 8, indicate that moisture will increase over the Sahel and Gulf of Guinea with indication of depletion over southern parts of Central Africa and maintainance in the north. Soil moisture depletion will also be experienced over the GHA region except in the northwestern areas of Ethiopia where an increase is expected as a consequence of continued rainfall. General depletion of soil moisture is expected to continue over the Southern Africa region except over the the eastern parts where some limited recharge may take place.

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 GHA countries with high humidity of over 60% and rainfall which coupled with prevailing conducive temperatures will support survival of malaria and other climate related diseases parasites. Chances of out break of malaria are low in southern African countries and the East African highlnds due to current low temperatures. The health authorities and Agencies need to continue the healthcare and humanitarian services to protect lives.

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. There is also a need to invest in higher yielding crops during rain season by taking advantage of seasonal climate consensus forecasts, which indicate chances of high rainfall expectations over most parts of the Sahel. The farming community are advised that preparation for the planting season should be put underway, in order to take advantage of the early rains.

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. 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 is expected to receive enhanced rainfall are advised to employ strategic measures to avert soil erosion and retain water in their fields through micro water conservation practices.

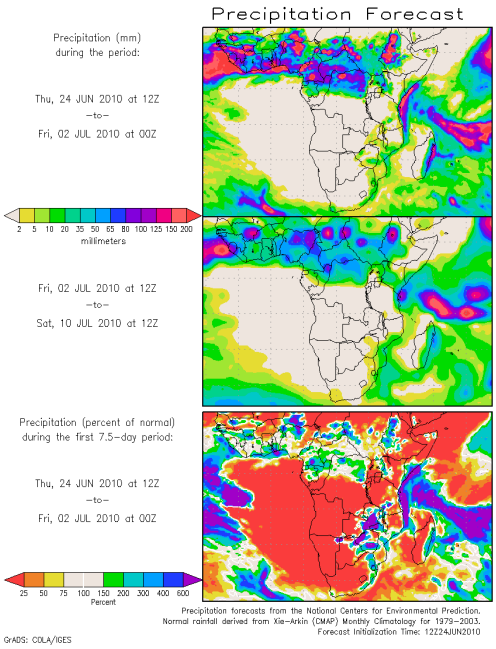

Figure 6 : Precipitation forecast, Source : COLA

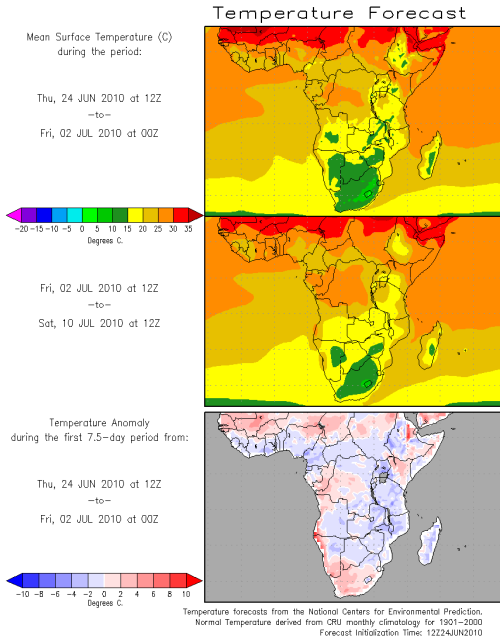

Figure 7 : Temperature forecast Source : COLA

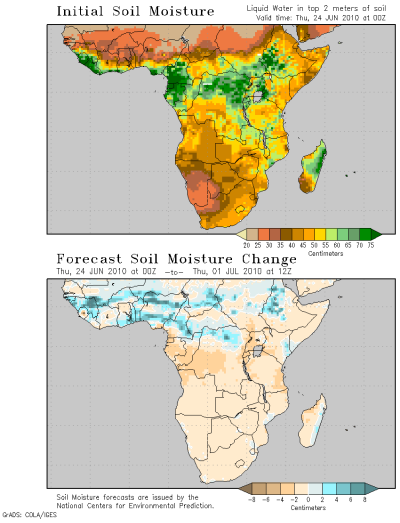

Figure 8 : Soil moisture forecast, Source: COLA

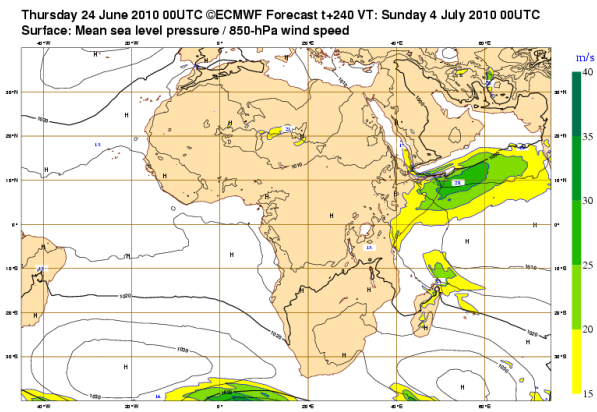

Figure 9: Mean Sea Level pressure forecast Source: ECMWF