African Centre of Meteorological Application for Development
Centre Africain pour les Applications de la Météorologie au Développement

Ten Day Climate Bulletin
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Dekad 01st to 10th Jun, 2010

HIGHLIGHT: Cumulative rainfall distribution indicated intense rainfall distribution over the equatorial belt had slightly moved northwards thus giving rains over southern parts of Sahel and few places of the rest of the Sahel especially over the west. The rest of the continent remained dry with light rains over eastern part of South Africa, Uganda and West Ethiopia. Wintry conditions over southern Africa gave the region the lowest mean minimum temperatures in the continent.

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 1025 hPa with W-E axis, weakened slightly by 1 hPa and shifted westwards compared to the previous dekad. Its mean position was about 32°N/41°W with an extended ridge over north Atlantic Ocean.

- **Saharan thermal low :** pressure at 1006 hPa filled up by 2 hpa and shifted northeast compared to the past dekad. Its mean position was observed about 17°N/15°E and its trough extended over south Algeria, east Mali, north Niger and central Chad.

- **St. Helena high:** pressure of 1026 hPa with SE-NW axis, weakened by 3 hPa and shifted northeast compared to the previous dekad. Its mean position was about 28°S/00°W, extending a ridge over south Atlantic Ocean.

- A thermal high pressure of 1024 hPa was located about 27°N/25°E with a link with St. Helena high, was observed over South Africa and Botswana with an extended ridge over east Southern Africa and East African countries.

- **Mascarene high:** pressure of 1028 hPa with SE-NW axis, maintained its intensity and shifted southeast compared to the past dekad. Its mean position was about 35°S/110°E with an extended ridge over Idian Ocean.

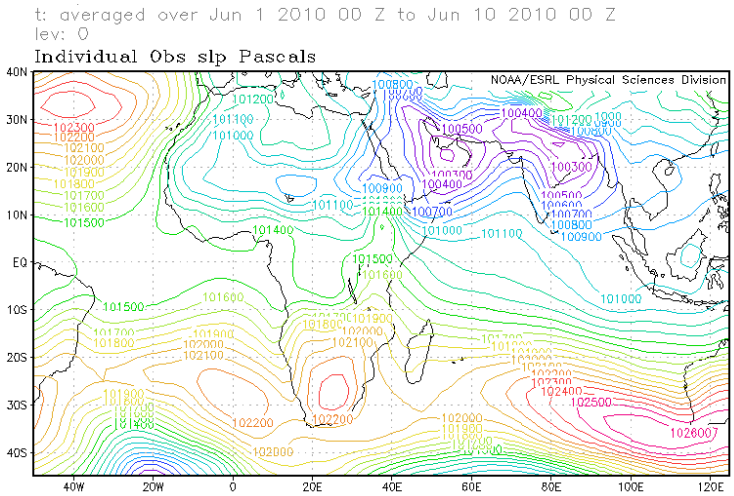

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

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

Between the third dekad of May (blue line) and the first dekad of June (black line), 2010, the ITD continued its migration northward generally throughout Sahel with.a maximum displacement of about 300-400km over east Niger ; there was a slight southward shift over north Senegal (Figure2)

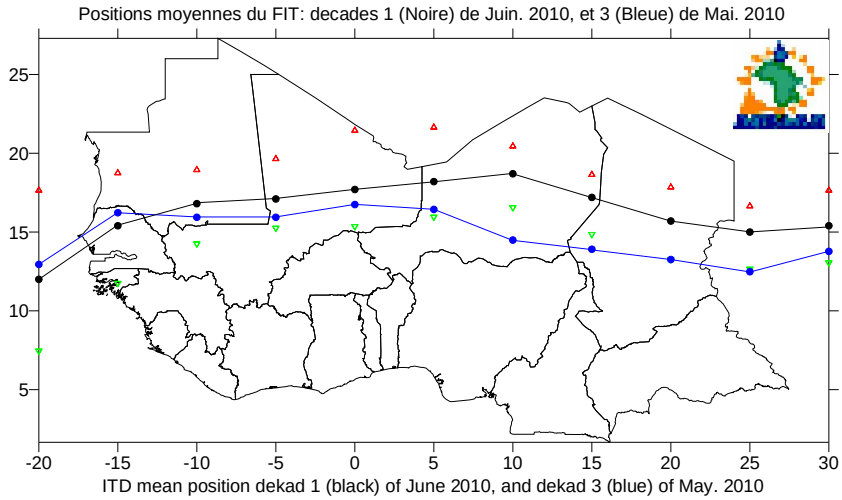

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

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

1.2.2 Thermal Index (TI)

In the first dekad of June, 2010, thermal index (TI) regime at 300hPa in (Figure 3) had the threshold value of 242°K forming a belt stretching through Africa at about 15°N-15°S. The TI maxima of 243°K over western part of Gulf of Guinea countries, southwestern and northeastern part of central Africa and most parts of GHA countries can be linked to occurrence of heavy rainfall with floods over the areas due to high relative humidity as shown in Figure 4.

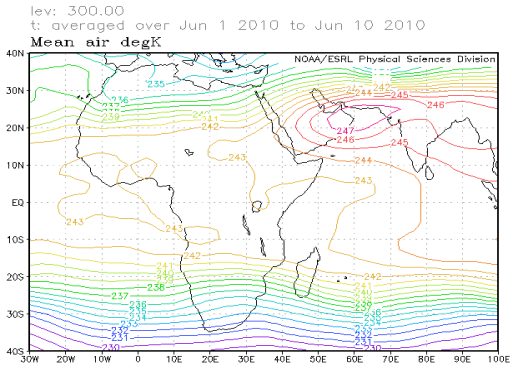

Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

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

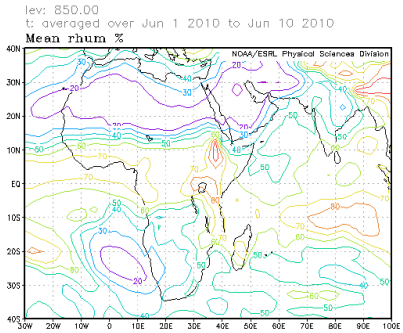

Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

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 decrease in rainfall distribution and amounts over most of African continent except over the Sahel, where some increases were observed. In detail:

- **North Africa countries:** had significant decrease in rainfall distribution and amounts, observing less to none rainfall amounts.

- **The Sahel:** had increased in estimated rainfall distribution and amounts, observing between 10mm to 100mm intensifying to about 150mm over south Mali, Burkina Faso and south Chad. However, the extreme northern part remained dry with no rainfall activities.

- **Gulf of Guinea countries:** experienced slight decrease in rainfall amounts, observing between 10mm to 150mm intensifying from about 200mm over coastal zones.

- **Central Africa countries:** had slight decreased in both rainfall distribution and amounts in the southern parts; observing between 10mm to 100mm. Higher rainfall was reported over the north with localised peaks about 150mm over Central African Republic, Democratic republic of Congo and Congo.

- **GHA countries:** experienced decrease in rainfall distribution and amount. The amounts observed ranged from 10mm to 100mm, mostly over Uganda and Kenya with peaks ranging from 100mm to 200mm over west Ethiopia.

- **Southern Africa countries:** had continues decrease in rainfall distribution and amounts; observing patches of rainfall ranging from 10 to 50mm with highest amounts of about 75mm in some places over southeast South Africa, south Mozambique and north Madagascar.

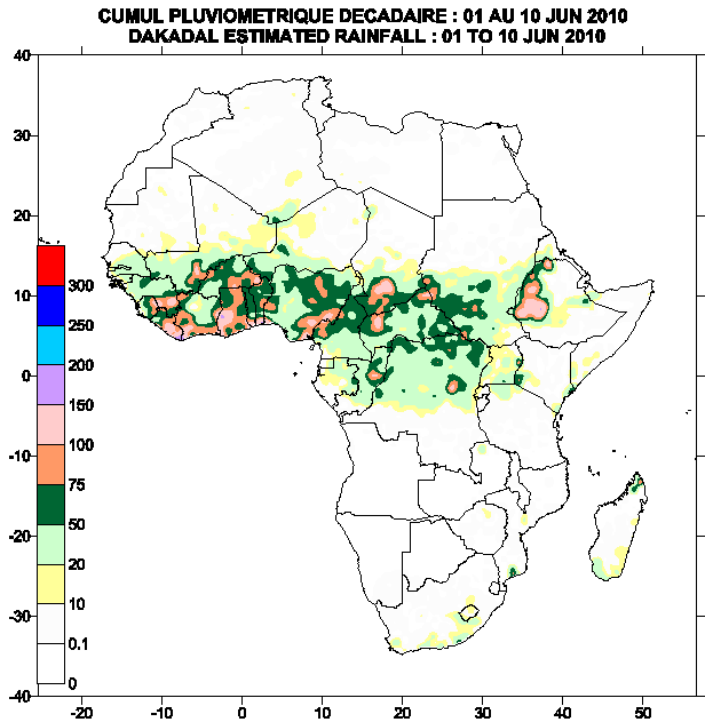

Figure 5 : Estimated precipitations, (Data Source: NOAA/NCEP

2.2 OBSERVED DATA

The Table below shows that high rainfall amounts observed over Gulf of Guinea (GGC) and Sahel (SC) countries. The highest mean maximum temperature of 44.7°C was recorded at Bilma in Niger while the lowest mean minimum temperature of 5.3°C was recorded at Pretoria in South Africa.

	STATIONS	Rainfall (mm)	Number of rainy days	Mean maximum temperature (°C)	Mean minimum temperature (°C)
NAC	Casablanca	0	0	24,7	19,1
	Alger (Dar El Beida)	0	0	29,5	15,3
	Tamanrasset	0	0	35,2	24,0
	Tunis	0	0	29,2	19,5
	Tripoli	0	0	34,6	19,4
	Le Caire	0	0	34,7	22,8
SC	Sal	0	0	28,1	22,2
	Nouakchott	0	0	28,7	21,7
	Dakar-Yoff	0	0	28,5	23,5
	Banjul	0	0	33,8	24,8
	Tombouctou	0	0	42,0	29,3
	Bamako-Sénou	3	1	35,7	26,1
	Ouagadougou	56	2	34,0	25,3
	Bobo Dioulasso	51	4	32,1	22,8
	Bilma	0	0	44,7	29,9
	Agadez	1	1	41,9	30,1
	Niamey-Aéroport	21	3	37,1	27,1
	Zinder	5	4	38,1	26,7
	N'Djamena	18	1	39,0	27,2
GGC	Monrovia	0	0	30,3	23,4
	Abidjan	80	7	30,8	24,9
	Abuja	0	0	29,5	23,7
	Accra	126	3	30,7	24,7
	Conakry	0	0	30,1	24,2
	Lomé	213	10	30,8	24,9
	Cotonou	230	6	29,8	25,0
	Douala	0	0	29,7	23,2
CAC	Bangui	2	1	30,8	22,2
	Libreville	3	1	28,0	23,3
	Brazzaville	0	0	30,4	21,0
	Kinshasa	0	0	30,7	21,7
GHAC	Khartoum	0	0	42,9	30,2
	Addis-Abéba	0	0	24,1	11,7
	Nairobi	29	4	22,9	13,7
	Entebbe	0	0	26,3	18,6
	Kigali	0	0	27,1	17,3
	Kigoma	1	1	29,0	-
	Dar-es-Salaam	0	0	30,5	21,6
SAC	Nampula	0	0	27,2	17,0
	Lusaka	0	0	24,3	13,1
	Beira	34	2	26,7	17,3
	Harare	0	0	20,7	7,7
	Bulawayo	0	0	23,5	7,4
	Ghanzi	0	0	24,6	5,5
	Francistown	0	0	24,0	5,4
	Luanda	0	0	27,9	21,8
	Windhoek	0	0	24,6	8,4
	Johannesbourg	0	0	17,9	6,3
	Pretoria	0	0	20,9	5,3
	Durban	2	2	25,1	12,4
	Le Cap	25	6	19,6	10,3
	Port Elisabeth	1	1	21,5	10,9
	Manzini	0	0	23,9	10,5
	Maputo	0	0	27,5	15,5
IOC	Moroni	0	0	31,2	22,6
	Seychelles	12	6	31,3	26,5
	Antsiranana	37	1	30,5	22,3
	Antananarivo	0	0	22,5	13,1
	Toalagnaro	31	3	25,8	17,1
	Plaisance	4	3	27,7	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 (11th – 20th JUNE, 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.

- **The Sahel:** will experience rainfall increase especially in the south with amounts ranging from 30mm to 40mm and but some areas may realise peaks of over 100mm over especially in south.

- **Gulf of Guinea countries:** will continue experiencing rainfall amounts ranging from 50mm to 150mm with peaks which may reach 150mm in the coastal belt of Sierra Leone and Liberia.

- **Central Africa countries:** during the period under consideration rainfall will show a slight decline being over 30mm in most areas in the south and with the highest amounts of about 80-100mm in Cameroon.

- **GHA countries:** will have rainfall decrease in all parts, except the southern coastal area boundarying Kenya and Tanzania and northwest Ethiopia which are likely to receive rainfall of over 100mm. West Kenya and most Uganda will receive rains of about 30-60mm.

- **Southern Africa countries:** will continue to experience dry conditions with rainfall increase which will be of 20 to 50 mm in parts of the eastern parts.

3.2 TEMPERATURE

The forecast in Figure 7, shows temperture in the Gulf of Guinea and central Africa will be 25 – 30°C, the Sahel will have hotness of temperatures above 30°C in the south while in the north it will be over 35°C, northern central Africa above 30°- 35°. GHA countries will realise a cooler period of 15 - 25°C, highlands will be 10°C -15°C parts. The lowest temperatures ranging from 5- 20°C will cover most of Southern Africa with some areas reporting sub-zero.

3.3 SOIL MOISTURE

The outlook on soil moisture changes, Figure 8, indicate that moisture will increases over the southern Sahel, Gulf of Guinea and Central Africa regions as a consequence of the expected rains. There are expected maintainance soil moisture status over the GHA region except the northwestern areas of Ethiopia were 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 cape region.

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 a good rainy season by taking advantage of seasonal climate consensus forecasts,

especially in the West African states where the recently released seasonal outlook forecast issued during the recent PRESAO forum has indicated high chances of sufficient rainfall for crop growth and development during the July, August and September season. Current indications are that in the southern parts of the Sahel moisture increase is evident and in this regard therefore 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.

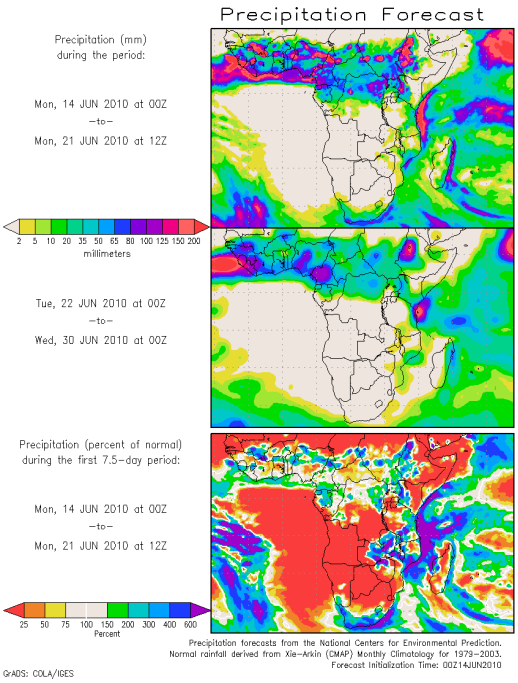

Figure 6 : Precipitation forecast, Source : COLA

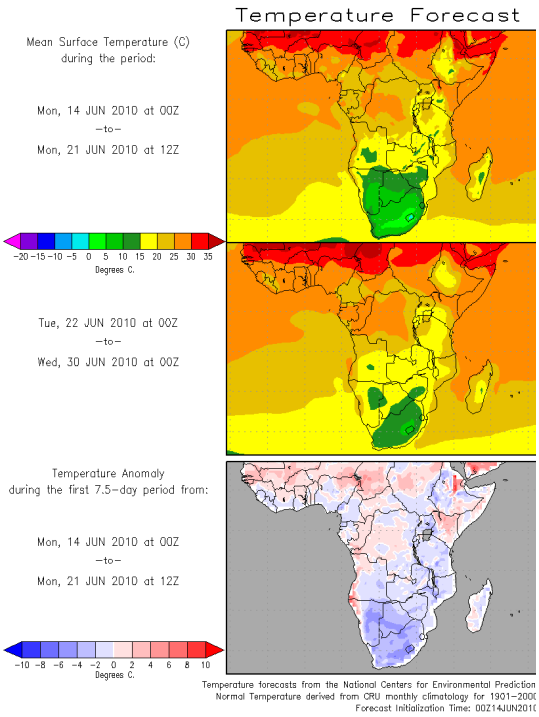

Figure 7 : Temperature forecast Source : COLA

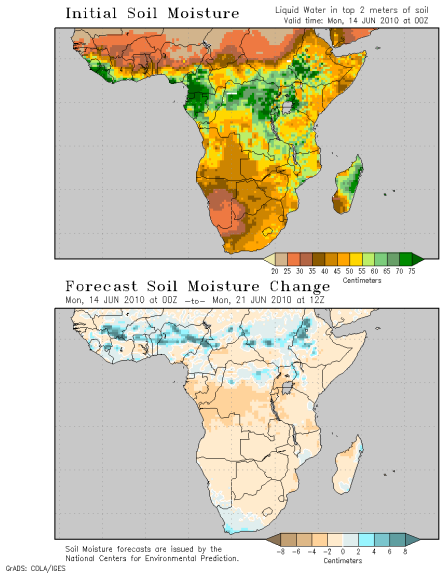

Figure 8 : Soil moisture forecast, Source: COLA

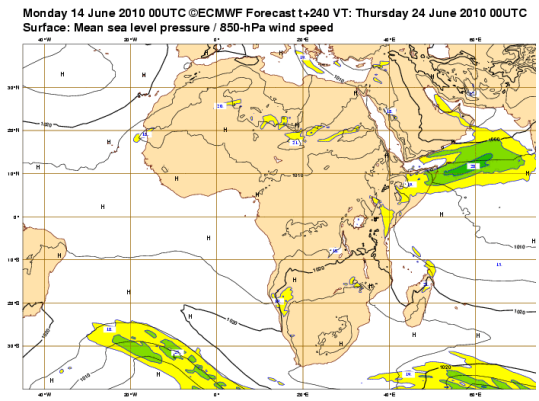

Figure 9: Mean Sea Level pressure forecast
Source: ECMWF