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

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Dekad 21th to 31th May, 2010

HIGHLIGHT: Cumulative rainfall distribution indicated rainfall realised over the equatorial belt and the southern parts of Sahel with the highest amounts reported over central Africa and Gulf of Guinea countries. Mean maximum temperatures were high in the northern areas of the Sahel. Lowest mean minimum temperatures continued being reported over southern Africa.

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 1026 hPa with SW-NE axis, weakened by 4 hPa and shifted southwest compared to the previous dekad. Its mean position was about 32°N/31°W with an extended a ridge over North Atlantic Ocean.

- **Saharan thermal low with two cells :** pressure at 1004 hPa maintained its intensity and shifted northeast compared to the past dekad. Its trough extended over central Mali, Niger and Chad.

- **St. Helena high:** pressure of 1029 hPa strengthened significantly by 6 hPa and shifted eastwards compared to the previous dekad. Its mean position was about 39°S/34°W, extending a ridge over South Atlantic Ocean.

- **Mascarene high:** pressure of 1028 hPa with SW-NE axis, weakened by 2 hPa and shifted northwest compared to the past dekad. Its mean position was about 34°S/68°E with an extended ridge over Idian Ocean.

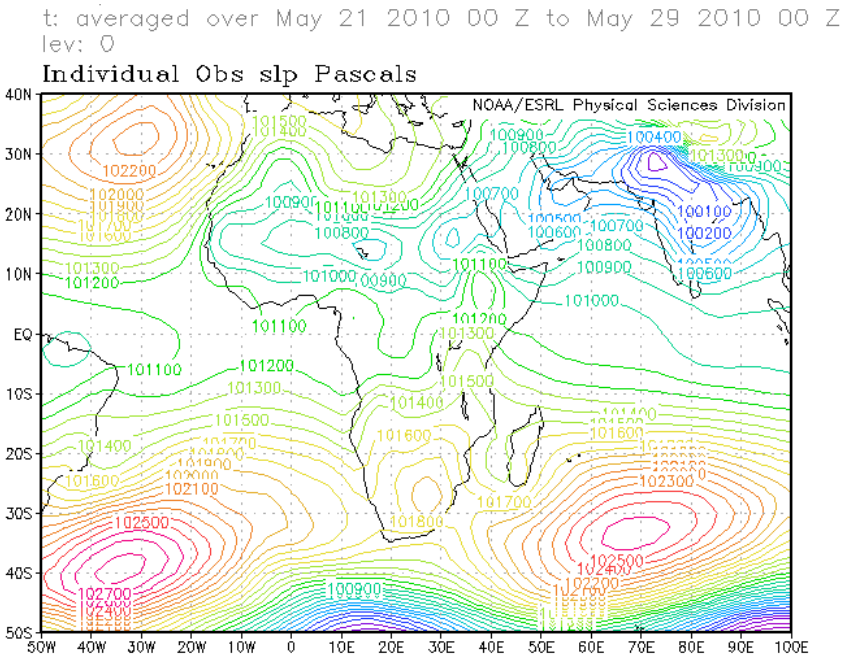

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

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

Between the second (blue line) and the third dekad of May (black line), 2010, the ITD shifted slightly northward throughout Sahel with.maximum displacement of about 200km over Senegal (Figure2)

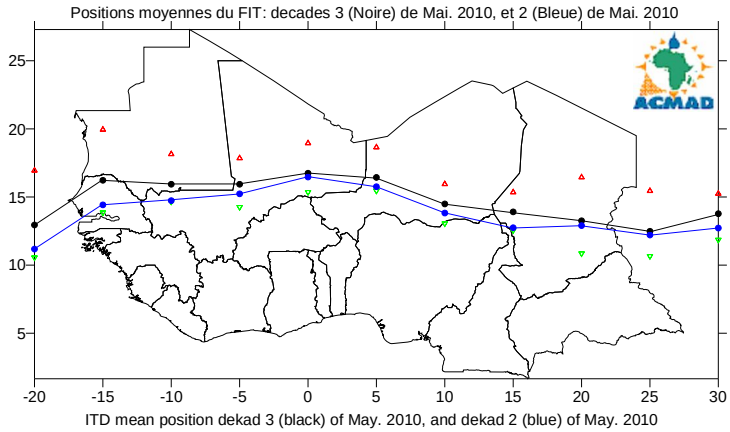

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

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

1.2.2 Thermal Index (TI)

In the 3rd dekad of May, 2010, thermal index (TI) regime at 300hPa in (Figure 3) had the threshold value of 243°K forming a belt stretching through the Sahel in the north and at about 15°S in the south. The TI maxima of 244°K over western part of Gulf of Guinea countries, eastern 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.

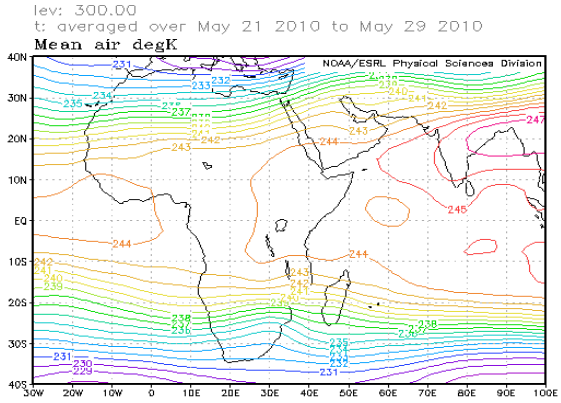

Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

The 850hPa (Figure 4) shows high RH (>70%) in the third dekad of May, 2010 over southern part Gulf of Guinea countries, western part of central Africa and parts of GHA countries. Most parts of the Sahel and north Africa above 12°N as well as western part of Southern Africa countries experienced the lowest RH (< 40%).

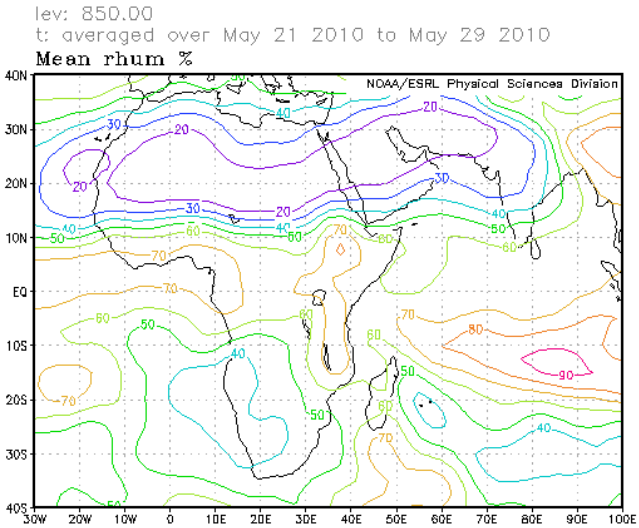

Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

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 southern Sahel, the Gulf of Guinea and Central Africa countries continued to experience high rainfall. In detail:

- **North Africa countries:** slight increase in estimated rainfall distribution and with amounts ranging between 10mm to 50mm over extreme north Algeria and Tunisia.

- **The Sahel:** had slight increased in estimated rainfall distribution and amounts over the southern part observing between 10mm to 75mm intensifying to about 100mm over southwest Mali, Burkina Faso and Chad. However, the northern part remained dry with no rainfall activities.

- **Gulf of Guinea countries:** experienced increase in rainfall distribution and amounts, observing between 10mm to 200mm intensifying from about 250mm over Liberia, Côte d'Ivoire, Ghana.

- **Central Africa countries:** had increased rainfall both in distribution and amounts; observing between 10mm to 150mm with localised peak above 200mm over Central African Republic.

- **GHA countries:** experienced slight rainfall distribution decrease. The amounts ranged from 10mm to 150mm with localized peaks of up to about 200mm over west Ethiopia.

- **Southern Africa countries:** observed patches of rainfall. The estimated rainfall amounts ranging from 10mm to 50mm.

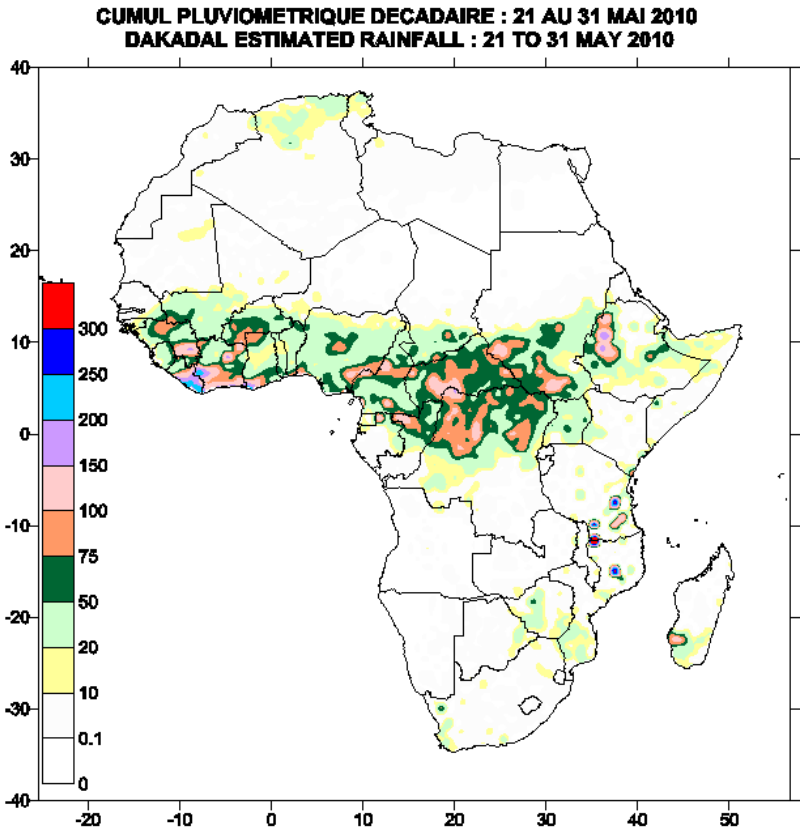

Figure 5 : Estimated precipitations, (Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows that high rainfall amounts observed over Gulf of Guinea (GGC). The highest mean maximum temperature of 44.3°C was recorded at Bilma in Niger while the lowest mean minimum temperature of 7.9°C was recorded at Johannesburg in South Africa.

	STATIONS	Rainfall (mm)	Number of rainy days	Mean maximum température (°C)	Mean minimum temperature (°C)
NAC	Casablanca	0	0	23,7	17,7
	Alger (Dar El Beida)	1	1	26,4	12,4
	Tamanrasset	0	0	34,4	21,2
	Tunis	34	4	27,1	16,9
	Tripoli	9	3	29,4	17,9
	Le Caire	0	0	32,1	20,4
SC	Sal	0	0	27,3	22,0
	Nouakchott	0	0	34,6	22,9
	Dakar-Yoff	0	0	27,9	22,6
	Banjul	0	0	34,8	23,4
	Bissau	0	0	33,7	24,8
	Tombouctou	3	1	42,0	31,0
	Bamako-Senou	15	2	36,6	25,9
	Ouagadougou	51	4	37,1	26,6
	Bobo Dioulasso	66	4	32,5	25,3
	Bilma	0	0	44,3	25,7
	Agadez	0	0	43,5	30,1
	Niamey-Aéroport	3	2	39,7	28,7
	Zinder	1	1	41,9	29,4
	N'Djamena	2	1	41,9	29,3
GGC	Monrovia	0	0	30,9	24,6
	Abidjan	48	7	32,0	26,1
	Accra	58	6	31,9	25,4
	Lomé	94	4	32,2	26,1
	Cotonou	84	4	31,2	26,2
	Abuja	0	0	30,6	24,1
	Douala	0	0	31,3	24,7
CAC	Bangui	0	0	33,0	23,1
	Libreville	6	2	28,7	23,2
	Brazzaville	1	1	31,5	22,8
	Kinshasa	0	0	31,0	23,4
GHC	Khartoum	0	0	43,3	31,0
	Addis -Abéba	0	0	25,5	13,7
	Nairobi	2	1	25,1	13,9
	Entebbe	0	0	26,0	20,0
	Kigali	0	0	27,9	17,5
	Dar-es-Salaam	14	1	30,1	22,4
	Mtwara	19	3	29,7	-
SAC	Nampula	3	1	29,4	19,7
	Lusaka	0	0	26,6	11,5
	Beira	98	3	26,4	18,7
	Harare	0	0	22,7	11,8
	Bulawayo	2	2	24,4	11,0
	Ghanzi	1	1	24,1	9,2
	Francistown	11	3	24,5	9,7
	Windhoek	0	0	24,3	9,4
	Johannesbourg	0	0	19,5	7,9
	Pretoria	0	0	21,7	8,0
	Durban	0	0	26,4	13,8
	Le Cap	21	2	17,4	8,9
	Port Elisabeth	7	3	18,8	12,3
	Manzini	0	0	25,3	10,5
	Maputo	2	1	27,0	17,4
IOC	Moroni	0	0	31,9	24,2
	Seychelles	4	4	31,6	26,6
	Antsiranana	6	4	30,4	22,8
	Antananarivo	0	0	25,8	13,3
	Toalagnaro	2	2	27,1	21,4
	Plaisance	43	10	28,0	22,4

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 expected to move northward with rainfall increase in the southern Sahel countries intensifying over the Gulf of Guinea, central Africa and north GHA countries. In detail**:**

- **North Africa countries:** will experience rainfall amounts ranging from 10mm to 50mm with localized peaks of about 75mm.
- **The Sahel:** will experience rainfall increase especially in the south with amounts ranging from 30mm to 40mm and peaks of over 100mm over especially in southern Sahel.
- **Gulf of Guinea countries:** will experience rainfall increase amounts ranging from 50mm to 150mm with peaks which may reach 200mm in the coastal belt.
- **Central Africa countries:** during the period under consideration rainfall will show a slight decline being over 30mm in most areas and maximum amounts of over 125mm in the Democratic Republic of Congo and Cameroon.
- **GHA countries:** will have rainfall decrease in all parts, except the southern coastal area boundarying Kenya and Tanzania realize rainfall of over 100mm in some parts.
- **Southern Africa countries:** will continue to experience dry conditions with rainfall inrease which will be of 20 to 50 mm in parts to the eastern parts.

3.2 TEMPERATURE

The forecast in Figure 7, shows temperture in the Gulf of Guinea and central Africa will be 20 – 25°C, the Sahel, northern central Africa above 30°- 35°. GHA countries will realise a cooler period of 15 - 25°C, highland will be 10°C -15°C parts. The lowest temperatures ranging from 5- 20°C will cover most of Southern Africa.

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 drying up of soil moisture conditions over the GHA region. 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 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.

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.

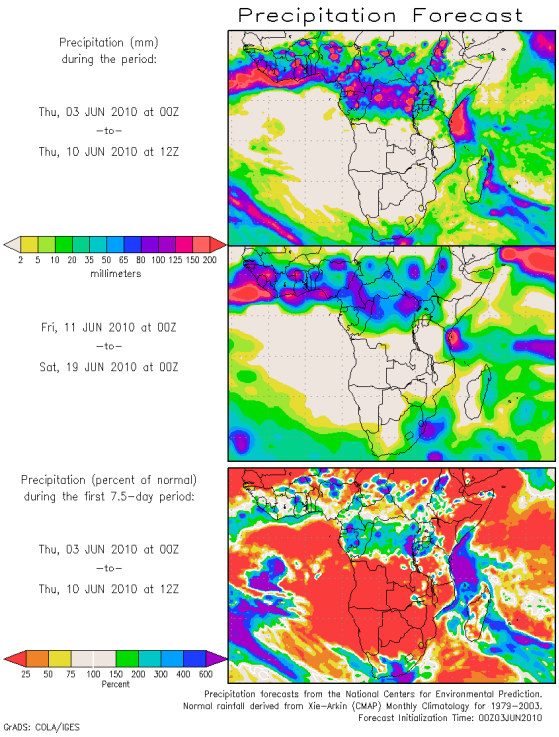

Figure 6 : Precipitation forecast, Source : COLA

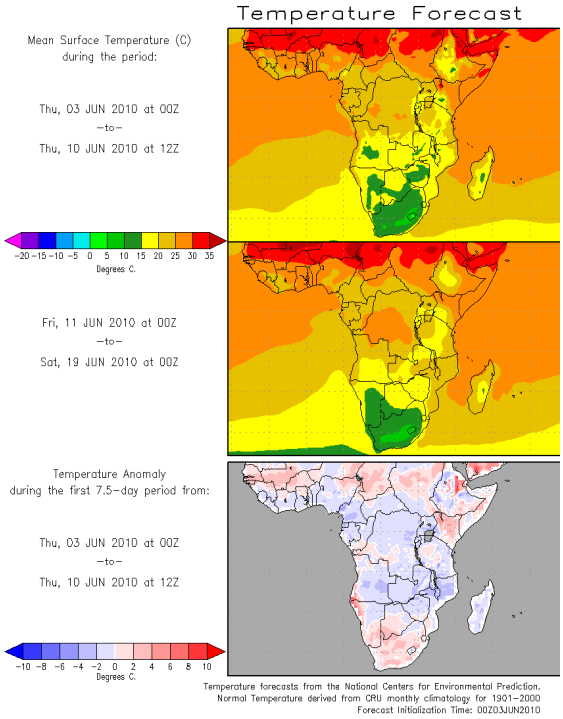

Figure 7 : Temperature forecast Source : COLA

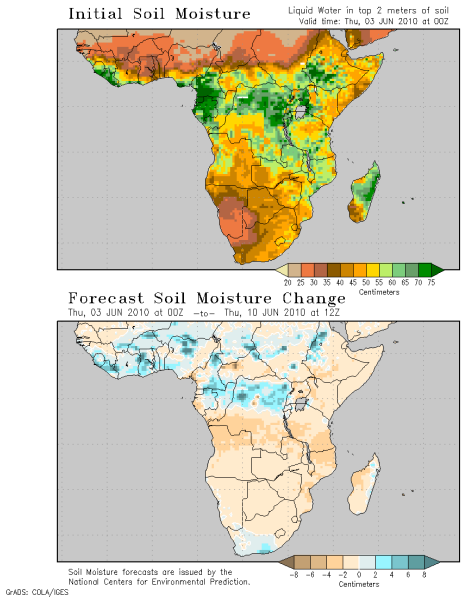

Figure 8 : Soil moisture forecast, Source: COLA

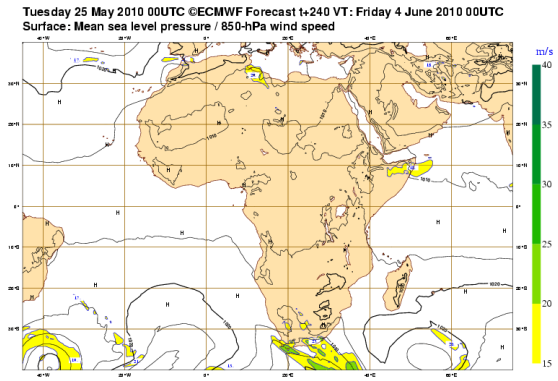

Figure 9 : Mean Sea Level pressure forecast
Source: ECMWF