

## Ten Day Climate Bulletin N° 11 Dekad 11<sup>th</sup> to 20<sup>th</sup> April, 2010

**HIGHLIGHT:** The highest cumulative estimated rainfall was over eastern GHA countries. The highest mean maximum temperature of was recorded at N'Djamena in Chad while the lowest mean minimum temperature was recorded at Maseru in Lesotho.

### 1. GENERAL SITUATION

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

#### 1.1 SURFACE

- **A high pressure:** of 1024 hPa was located at about 42°N/83°W extending a ridge over North Atlantic Ocean (figure 1) and resulted in southward displacement of maritime ITD and semi continental ITD over 20°W and 15°W respectively (figure 2).
- **Saharan thermal low:** Pressure at 1004 hPa centred at about 13°N/18°E, deepened slightly by 1 hPa and shifted eastward compared to the past dekad. Its trough extended over south Mali, north Burkina Faso, central Niger, north Nigeria and Cameroon and south Chad.
- **St. Helena high:** Pressure of 1026 hPa with a E-W axis strengthened slightly by 1 hPa and shifted westward compared to the previous dekad. Its mean position was at about 33°S/29°W, extending a ridge over South Atlantic Ocean.
- **Mascarene high:** Pressure of 1026 hPa with a E-W axis maintained its intensity compared to the past dekad and shifted northwest. Its mean position was located at about 30°S/55°E with an extended ridge over east of Southern African countries.

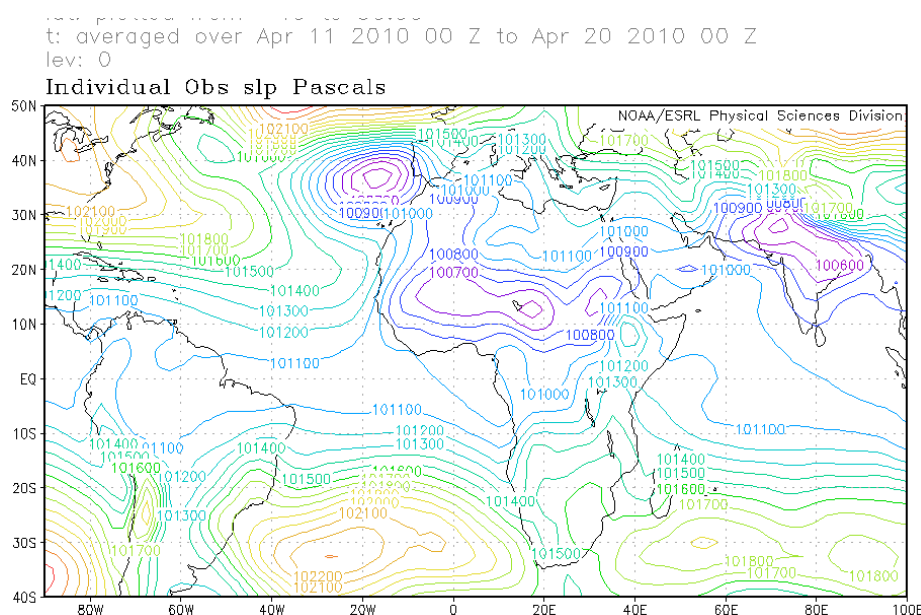


Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

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

Between the first dekad (blue line) and the second dekad of April (black line), 2010, the ITD shifted northward significantly over the Gulf of Guinea countries and over south of Sahel countries with a maximum displacement of about 300 km over Burkina Faso while over extreme west part of subregion including Senegal, Gambia and Guinea Bissau, the ITD shifted southward as a result of the ridge extended from a high located at about 42°N/83°W. (Figure2)

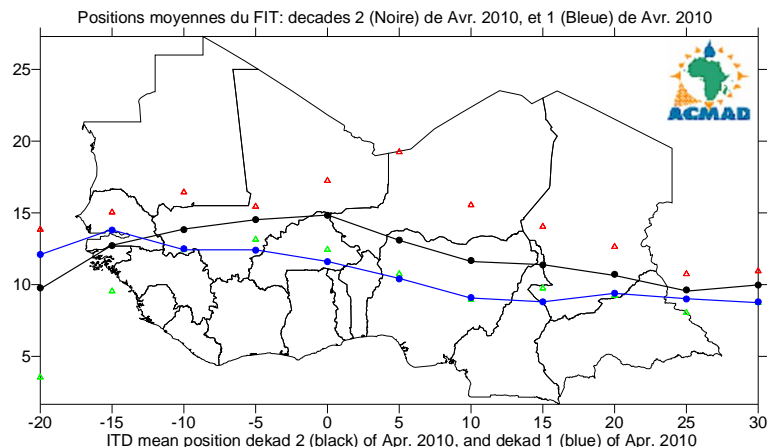


Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

## 1.2 TROPOSPHERE

### 1.2.1 Monsoon

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

### 1.2.2 Thermal Index (TI)

In the second dekade of April, 2010, the thermal index (TI) regime at 300hPa in (Figure 3), had the threshold value of 243°K forming belt extending about 10°N over Gulf of Guinea countries and about 8°N over Central Africa and the GHA countries while over the south it extended to about 12°S over west and 8°S over the eastern parts of southern Africa countries with maxima TI of 244°K over Atlantic Ocean linked to heavy rainfall with floods over areas with high relative humidity shown in Figure 4.

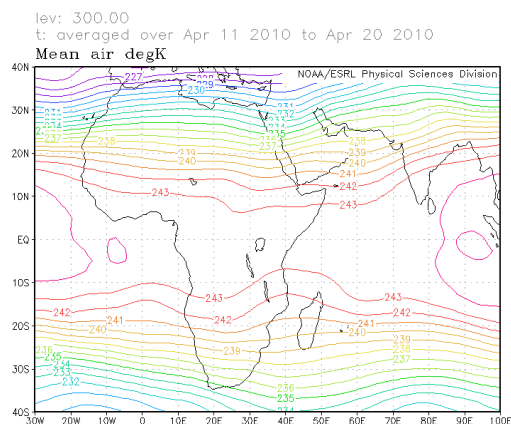


Figure 3: TI at 300hPa (Source: NOAA/NCEP)

### 1.2.3 Relative Humidity (RH)

The 850hPa (Figure 4) shows high RH (>70%) in the second dekade of April, 2010 over GHA countries and extreme southern part central Africa, countries. The Sahara, the Sahel and extreme northern part of Gulf of Guinea countries experienced the lowest RH (< 40%).

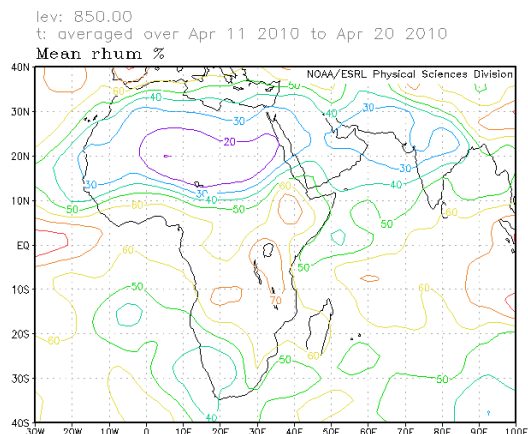


Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

## 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 in Figure 5 below compared to that of the past dekad shows rainfall distribution increase over Northern Africa, the Sahel, Gulf of Guinea and GHA countries while southern Africa countries had decrease in distribution and amounts. In detail:

- **North Africa countries:** had significant rainfall increases in distribution and amounts ranging from 10mm to 50mm with localized peaks of about 75mm over northern Morocco.
- **The Sahel:** major part remained under the influence of a weak Harmattan characterized by dry and dusty conditions. However, southern part had slight rainfall distribution increase with amounts ranging from 10mm to 50mm over south Mali and Burkina Faso.
- **Gulf of Guinea countries:** experienced increase in rainfall distribution and amounts ranging from 10mm to 100mm with peaks ranging from about 150mm to 200mm over eastern Nigeria/ Cameroon.
- **Central Africa countries:** had rainfall amounts ranging from 10mm to 150mm with maximum of about 200mm over north eastern Democratic Republic of Congo.
- **GHA countries:** experienced significant increase in rainfall distribution and amounts ranging between 10mm to 200mm with peaks ranging from 200mm to 300mm over southern Somalia.
- **Southern Africa countries:** most the countries experienced low amounts of rainfall ranging from 0 to 10mm. with other parts observing amounts ranging from 10mm to 50mm with maximum of about 100mm over south Mozambique and northern Madagascar..

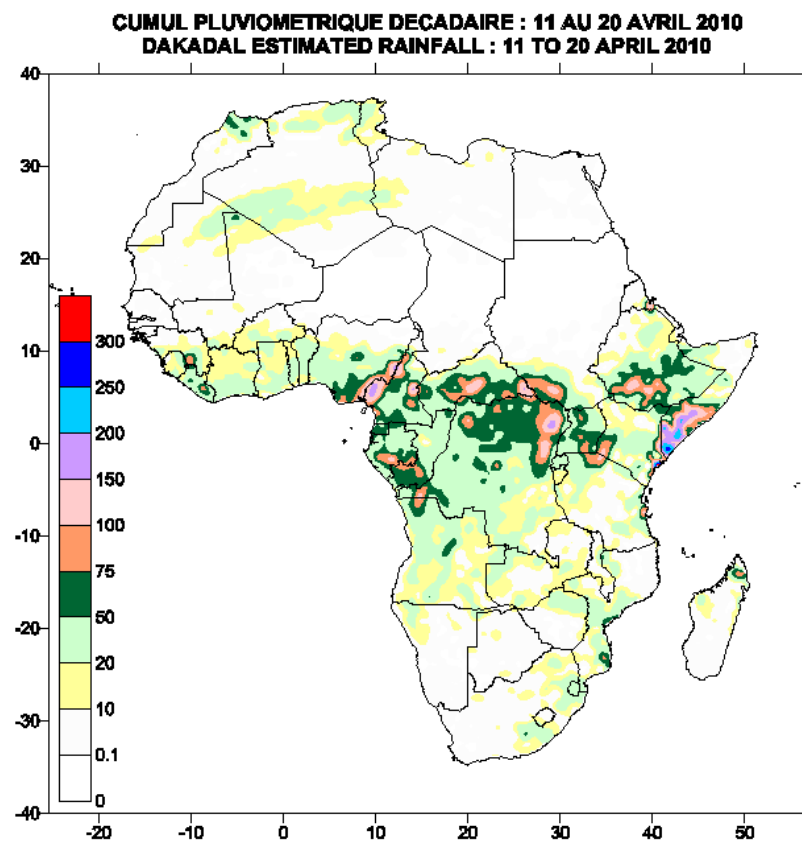


Figure 5 : Estimated precipitations, (Data Source: NOAA/NCEP)

## 2.2 OBSERVED DATA

The Table below shows that the heavy cumulative rainfall (>100mm) was observed at Plaisance in Mauritius and Seychelles. The highest mean maximum temperature of 45.1°C was recorded at N'Djamena in Chad while the lowest mean minimum temperature of 11.0°C was recorded at Maseru in Lesotho.

N°	STATIONS	Précipitations (mm)	Number of rainy days	Température Max mean (°C)	Température Min mean (°C)
1	Abidjan	13	3	34,1	27,5
2	Abuja	0	0	38,0	27,0
3	Accra	0	0	34,4	27,2
4	Addis Abéba	0	0	24,2	13,6
5	Agadez	0	0	42,9	26,5
6	Alger (Dar El Beida)	4	4	21,1	11,7
7	Antananarivo	0	0	27,3	15,5
8	Antsiranana	0	0	32,1	22,8
9	Bamako-Senou	0	0	39,9	27,1
10	Banjul	0	0	32,6	21,2
11	Beira	56	2	30,1	-
12	Bilma	0	0	43,1	21,9
13	Bobo Dioulasso	9	1	38,5	26,0
14	Brazzaville	27	4	33,8	23,3
15	Bujumbura	27	10	30,4	20,6
16	Bulawayo	0	0	27,9	14,2
17	Casablanca	18	3	22,2	14,7
18	Conakry	27	2	32,2	-
19	Cotonou	29	3	33,3	28,4
20	Dakar-Yoff	0	0	26,0	20,7
21	Dar-es-Salaam	23	3	32,0	23,2
22	Douala	58	2	34,1	25,9
23	Durban	0	0	27,1	18,6
24	Entebbe	82	1	26,8	20,3
25	Francistown	0	0	27,6	15,2
26	Ghanzi	0	0	28,6	14,9
27	Harare	12	1	25,9	15,1
28	Johannesbourg	15	2	23,6	13,2
29	Khartoum	0	0	40,7	25,3
30	Kigali	6	1	25,8	17,0
31	Kigoma	13	1	29,9	20,9
32	Kinshasa	0	0	33,8	22,7
33	Le Caire	0	0	30,3	17,8
34	Le Cap	4	2	22,2	15,0
35	Libreville	14	2	31,0	24,2
36	Lomé	9	1	34,0	27,1
37	Lusaka	0	0	27,6	15,9
38	Manzini	33	2	26,7	17,1
39	Maputo	0	0	29,3	21,0
40	Maseru	2	1	-	11,0
41	Mbeya	0	0	25,4	13,6
42	Mtwara	24	4	31,5	22,8
43	Nairobi	23	3	26,2	15,6
44	Nampula	4	1	-	-
45	N'Djamena	0	0	45,1	27,2
46	Niamey-Aéroport	0	0	43,9	30,7
47	Nouakchott	0	0	29,8	19,8
48	Ouagadougou	0	0	40,5	28,9
49	Plaisance	123	5	28,8	22,2
50	Port Elisabeth	3	1	24,5	14,9
51	Pretoria	12	2	25,7	14,8
52	Seretse Khama- Aéro	0	0	27,2	15,2
53	Seychelles	105	5	31,9	26,4
54	Tamanrasset	0	0	33,4	19,4
55	Toalagnaro	11	3	29,1	22,0
56	Tombouctou	0	0	42,6	31,4
57	Tripoli	5	2	29,1	16,2
58	Tunis	15	4	22,0	14,5
59	Windhoek	0	0	27,4	13,7
60	Zinder	0	0	43,2	27,4
61					

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

Data Source: ACMAD / GTS

### 3.OUTLOOK FOR DEKAD (01<sup>st</sup> – 10<sup>th</sup> MAY, 2010)

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#### 3.1 RAINFALL

The ITD will be expected to move significantly northward with rainfall increase in the southern Sahel countries intensifying over the Gulf of Guinea, central Africa and GHA countries. In detail:

- **North Africa countries:** will experience an increase amounts ranging from 10mm to 75mm with localized peaks of above 100mm.
- **The Sahel:** will experience rainfall increase amounts ranging from 10mm to 75mm with peaks of about 100mm over southern Sahel.
- **Gulf of Guinea countries:** will experience rainfall increase amounts ranging from 10mm to 150mm with peaks ranging from about 200mm and above.
- **Central Africa countries:** will experience rainfall increase with amounts ranging from 20mm to 200mm with peaks ranging from about 250mm to 400mm resulting in flooding.
- **GHA countries:** will have rainfall increase with amounts ranging from 10mm to 200mm intensifying over some parts with amounts ranging from about 250mm to 300mm resulting in flooding.
- **Southern Africa countries:** will continue to experience rainfall decrease with amounts ranging from 0mm to 50mm with some isolated peaks of about 100mm.

#### 3.2 TEMPERATURE

The forecast in Figure 7, shows high temperature in parts of Gulf of Guinea, the Sahel, northern central Africa and parts of GHA countries. The high temperatures ranging from 20°C to 35°C will cover more than 75% of the Continent.

#### 3.3 SOIL MOISTURE

The outlook on soil moisture change, maps shown in Figure 8 include the initial soil moisture and the forecast changes over the next 7 days. The soil moisture change and precipitation relationship is discernable on the maps below. The areas forecast to have significant soil moisture change increase include Gulf of Guinea countries, central Africa countries and GHA countries while significant soil moisture change deficits will dominate southern parts of central Africa and parts of southern Africa countries.

#### 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, central Africa, and GHA countries with high humidity/rainfall coupled with prevailing conducive temperatures will support the survival of parasite resulting in higher incidences of malaria including other climate related diseases. The health authorities and Agencies need to continue the healthcare and humanitarian services to protect lives of the vulnerable communities.

**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, for example those issued by regional climate outlook forums (RCOFs), the GHACOF, PRESAO, PRESAC,



and SARCOF for Greater Horn of Africa (GHA) countries, West Africa countries/Chad/Cameroon, central Africa and southern Africa countries respectively. The GHACOF25 has issued the seasonal climate consensus forecast for March-April-May, (MAM), 2010 for GHA countries available at ICPAC website.

**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. Enhanced national strategies and policies for adaptation to Climate Change are of highest priority for States' enhanced economic growth and the achievement of the United Nations millennium development goals (MDGs) for sustainable development. The countries have to invest in environmental conservation now for better tomorrow.

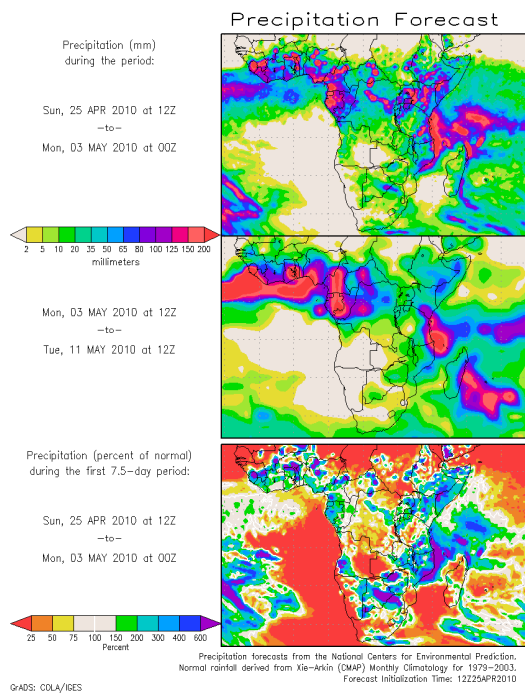


Figure 6 : Precipitation forecast, Source : COLA

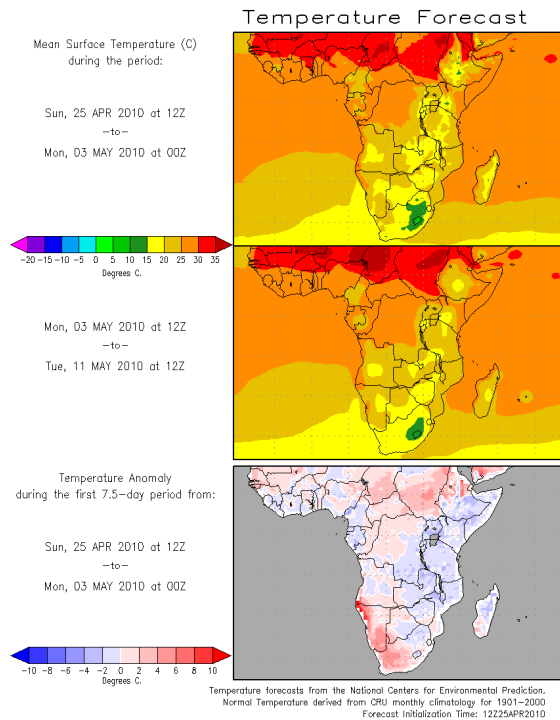


Figure 7 : Temperature forecast Source : COLA

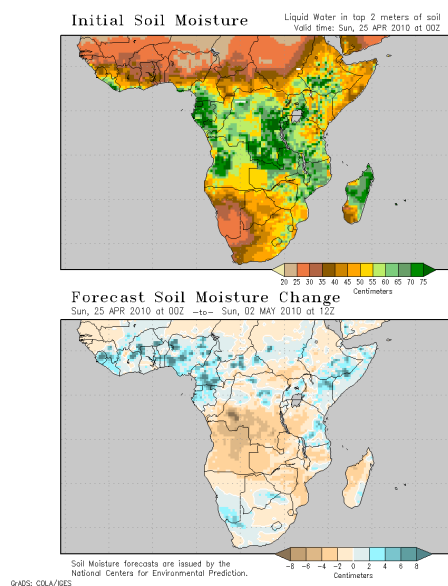


Figure 8 : Soil moisture forecast, Source: COLA

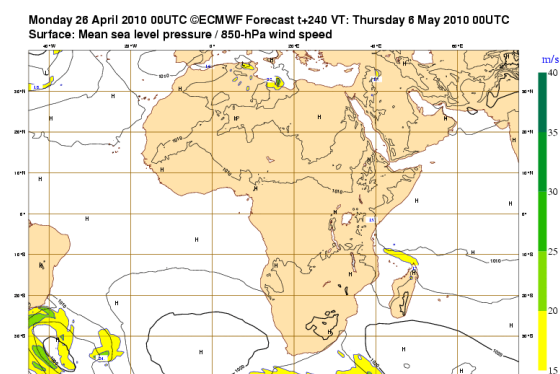


Figure 9 : Mean Sea Level pressure forecast Source: ECMWF