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

Ten Day Climate Bulletin

N° 12 Year 2009

Dekad of 21 to 30 April, 2009

HIGHLIGHT: The high thermal index regime of 243°K resulted in heavy rainfall with floods over parts of Gulf of Guinea, central Africa and parts of GHA countries.

1. GENERAL SITUATION:

1.1 SURFACE

• **Azores high:** Pressure of 1031hPa strengthened by 3hPa and shift northward compared to the past dekad. Its mean position was located at about 37°N/27°W extending a ridge over north Morocco and Algeria.

• **St. Helena high:** Pressure of 1027hPa maintained its intensity and shifted southwest at 38°S/08°W with an extended ridge over South Atlantic Ocean.

• **Mascarene high:** Pressure of 1025hPa weakened slightly by 1hPa compared to the past dekad and shifted northeast. Its mean position was at 34°S/58°E with an extended ridge over Indian Ocean.

• **Saharan Thermal Low:** Pressure at 1005hPa maintained its depth compared to the previous dekad and shifted west at 15°N/08°E with an extended trough over south Mali, north Burkina Faso, Benin and Nigeria, south Niger and central Chad.

• **Inter -Tropical Discontinuity (ITD):** Between second and the third dekad of April, 2009, the ITD had an oscillation over southern part of the Sahel countries. It's mean position was observed at 9.4°N over longitude 20°W; at 11.5°N over south of Guinea Bissau; at 12.6°N and 13.0°N over extreme southwest and south Mali; at 14.5°N over northeast Burkina Faso; at 14.3°N over south Niger; at 13.1°N over north Nigeria; at 13.4°N and 13.0 over west and east Chad respectively; at 12.4°N and 13.1°N over west and central Sudan respectively.

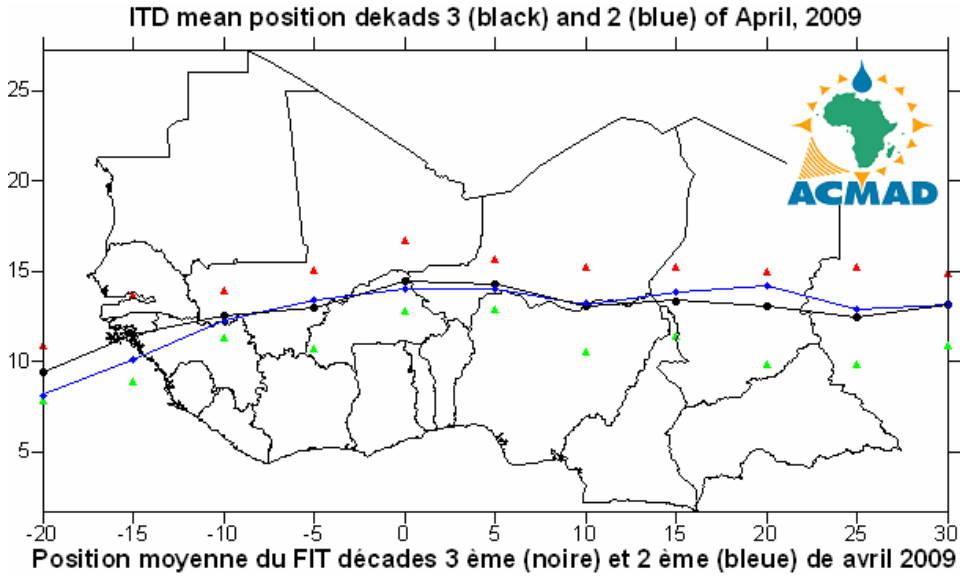

Figure 1 : The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

• **Monsoon:** Monsoon influx at 925hPa level was weak (1 to 5m/s) over south Cameroon and moderate (5.5 to 11.5m/s) over south Burkina Faso, Togo, south Benin, Nigeria and north Cameroon.

• **Thermal Index (TI):** In the third dekad of April, 2009, the thermal index (TI) regime at 300hPa, map shown below (figure 2), had TI regime value of 242°K over southern Sahel, Gulf of Guinea, central Africa and extreme northern parts of southern Africa countries resulting in heavy rainfall over some parts characterized by high relative humidity as observed in Figure3. The highest thermal index regime of 243°K characterized by heavy rainfall with floods was located over GHA, Central Africa and eastern part of Gulf of Guinea countries.

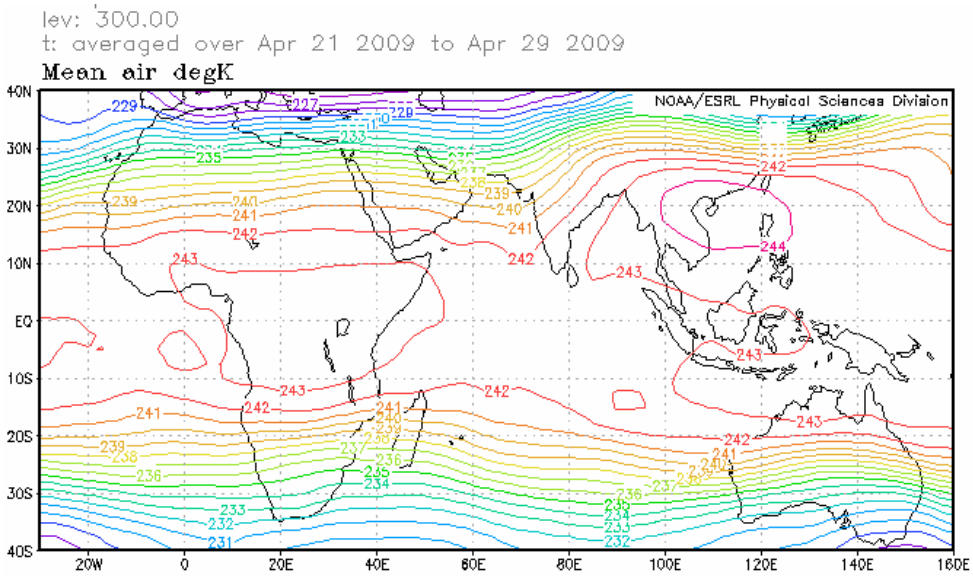

Figure 2: Air temperature at 300hPa, (Source: NOAA/NCEP/ESRL: PSD)

• **Relative Humidity (RH):** The 850hPa map below (Figure 3) shows high RH (>70%) in the third dekad of April, 2009 over Great Lakes countries, part of GHA countries and extreme southwestern part of Gulf of Guinea countries. The Sahara, most of the Sahel countries and extreme western part of Southern Africa countries experienced dry conditions characterized by the lowest RH (<40%).

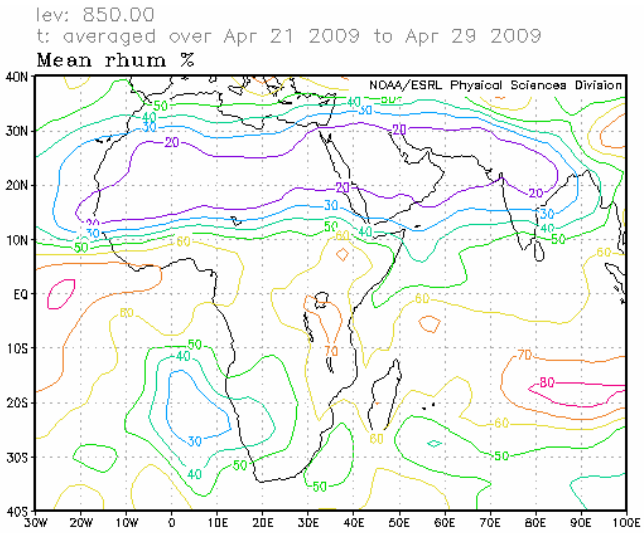

Figure 3: Relative Humidity at 850hPa, (Source: NOAA/NCEP/ESRL: PSD)

2. RAINFALL AND TEMPERATURE SITUATION

2.1 RAINFALL

The rainfall estimate based on Satellite and Rain Gauge on the map below (Figure 4) for the third dekad of April, 2009 shows rainfall distribution increase over southern Sahel, GHA and central Africa countries, while Gulf of Guinea and North African countries experienced rainfall distribution decrease. In summary:

- **North Africa countries:** experienced rainfall distribution and amounts decrease ranging from 10mm to 50mm over extreme north Morocco, Algeria and Tunisia.

- **The Sahel:** had slight increase in rainfall distribution recording amounts ranging from 10 to 75mm over the extreme southern part.

- **Gulf of Guinea countries:** experienced slight decrease in rainfall distribution recording amounts ranging from 10mm to 100mm with peaks ranging from 100mm to 150mm over Côte d'Ivoire/Ghana and Nigeria/Cameroon.

- **Central Africa countries:** had increased rainfall distribution recording amounts ranging from 10mm to 150mm, intensifying over eastern Democratic Republic of Congo, Angola and Gabon with peaks ranging from 150mm to 300mm.

- **GHA countries:** experienced rainfall distribution increase recording amounts ranging from 10mm to 100mm with peaks ranging above 100mm to 300mm over Sudan, Tanzania and Ethiopia.

- **Southern Africa countries:** experienced significant rainfall decrease recording amounts ranging from 10mm to 100mm over south of South Africa with an isolated peak of above 300mm over Madagascar.

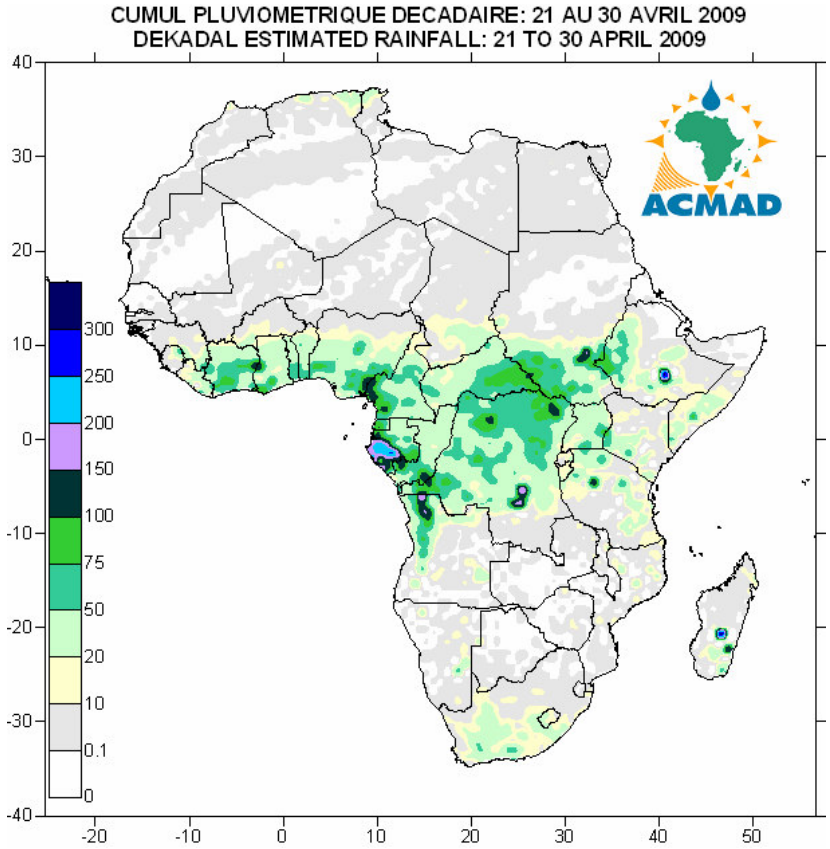

Figure 4: Estimated precipitations, (Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows heaviest rainfall recorded over Seychelles, Plaisance in Mauritius, Brazzaville in Congo, Cotonou in Benin and Douala in Cameroon. The lowest temperature of 8.3°C was recorded at Maseru in Lesotho while the highest temperature of 44.2°C was recorded at Khartoum in Sudan.

N°	STATIONS	Précipitations (mm)	Nombre de jours de pluie	Température maxi moyenne (°C)	Température mini moyenne (°C)
1	Abidjan	23	3	32,7	26,3
2	Accra	8	1	32,1	25,1
3	Agadez	0	0	42,4	29,1
4	Alger(Dar El Beida)	7	1	23,2	9,5
5	Antananarivo	0	0	24,0	13,2
6	Antsiranana	0	0	32,2	22,5
7	Bamako-Senou	2	1	39,9	26,0
8	Bangui	67	5	31,6	22,4
9	Banjul	0	0	35,0	18,9
10	Beira	32	2	28,2	20,4
11	Bilma	0	0	42,5	26,1
12	Bobo Dioulasso	9	2	38,0	26,1
13	Brazzaville	114	4	32,5	22,8
14	Cotonou	112	3	31,2	26,4
15	Dakar-Yoff	0	0	25,6	19,1
16	Dar-es-Salaam	68	4	28,9	22,8
17	Douala	108	6	31,5	24,3
18	Durban	14	3	24,9	15,5
19	Entebbe	4	2	26,3	20,7
20	Francistown	0	0	28,7	9,5
21	Harare	0	0	26,3	11,1
22	Johannesbourg	1	1	20,8	10,1
23	Khartoum	0	0	44,2	28,0
24	Kigali	94	3	25,6	16,5
25	Kigoma	35	2	29,2	19,9
26	Le Caire	0	0	28,7	16,8
27	Le Cap	4	2	19,8	12,6
28	Libreville	62	5	30,6	25,1
29	Lilongwe	0	0	26,1	14,1
30	Lomé	33	3	33,1	25,2
31	Lusaka	0	0	26,9	13,3
32	Manzini	1	1	-	12,8
33	Maputo	0	0	29,0	17,3
34	Maseru	29	3	-	8,3
35	Maun	0	0	31,0	13,4
36	Mbeya	0	0	23,5	12,2
37	Nairobi	52	3	24,8	15,7
38	Nampula	3	1	29,5	19,5
39	N'Djamena	7	1	41,0	27,3
40	Niamey-Aéroport	14	1	42,3	29,3
41	Nouakchott	0	0	38,7	22,0
42	Ouagadougou	0	0	40,0	28,1
43	Plaisance	136	4	28,5	22,6
44	Sal	0	0	25,0	20,0
46	Seychelles	154	7	31,7	26,0
47	Tamanrasset	0	0	32,1	18,2
48	Toalagnaro	17	2	27,1	19,1
49	Tombouctou	0	0	40,8	25,5
50	Tripoli	0	0	27,9	14,0
51	Tunis	16	2	22,1	13,7
52	Windhoek	12	1	26,1	12,1
53	Zinder	0	0	41,6	27,3

NOTE: **0** means no rain;
- means no temperature data available Data Source: ACMAD / GTS

3.OUTLOOK FOR DEKAD (11th – 20th MAY, 2009)

3.1 RAINFALL

The ITD will maintain northward displacement leading to an increase in moisture influx and rainfall over Gulf of Guinea countries and southern part of the Sahel countries. The rainfall will also increase over central Africa, parts of GHA with significant decrease over southern Africa countries (Figure 5). In summary**:**

- **North Africa countries:** expected to experience rainfall decrease with amounts ranging from 10mm to 50mm.
- **The Sahel:** will continue to experience increasing temperatures with rainfall increase recording amounts ranging from 10mm to 100mm over parts of the Sahel countries.
- **Gulf of Guinea countries:** will experience rainfall increase recording amounts ranging from 10mm to 200mm with isolated peaks ranging from about 250mm to 300mm.
- **Central Africa countries:** will experience rainfall increase recording amounts ranging from 10mm to 200mm with peaks ranging from about 250mm to 300mm.
- **GHA countries:** will record rainfall increase with amounts ranging from 10mm to 150mm with peaks ranging from about 200mm to 300mm.
- **Southern Africa countries:** will experience significant rainfall decrease recording amounts ranging from 10mm to 75mm with isolated peaks of about 100mm.

3.2 TEMPERATURE

The forecast map below (Figure 6) shows that the mean surface temperature will increase over northern part of Gulf of Guinea countries, the Sahel, central Africa and GHA countries. The highest forecast temperatures range from 25°C to 35°C in orange and red colours respectively with more than 75% of the Continent recording 20°C and above.

3.3 SOIL MOISTURE

The outlook on soil moisture change, map shown below (Figure 7) includes 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 highest soil moisture increase include parts of Gulf of Guinea, central Africa and parts of the Sahel countries.

3.4 IMPACTS

Health: The incidences of malaria and other climate related diseases are higher in areas with high temperatures during rainy periods. The temperatures in the range of 18°C to 32°C with high rainfall (high humidity) 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 parts of Gulf of Guinea, parts of the Sahel, central Africa, and parts of GHA countries and Madagascar with high humidity/rainfall coupled with the prevailing conducive temperatures supporting the survival of parasite will experience higher incidences of climate related diseases including malaria. The health authorities and Agencies need to continue the health care and humanitarian services to protect lives of the vulnerable communities.

Agriculture and food security: The applications of climate information in agricultural production are of crucial importance. We often emphasize on the importance of well documented onset dates of seasonal rainfall as well as monitoring of the phenological stages of crops for crop yield assessments in our countries. It is imperative to carry out cost benefit analysis on determination and applications of appropriate planting dates 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 forecast, for example those issued by regional climate outlook fora (RCOF), the GHACOF, PRESAO, PRESAC, and SARCOF for Greater Horn of Africa, West Africa, central Africa, and southern Africa countries respectively.

African Natural Ecosystems: Call for rehabilitation of our presently degraded rainfall catchments areas within Africa's natural ecosystems through enhanced national conservation programmes such as national tree planting, afforestation and soil conservation during rainy seasons to minimize soil loss due to heavy runoff. Enhanced national strategies for adaptation to Climate Change are of high priority.

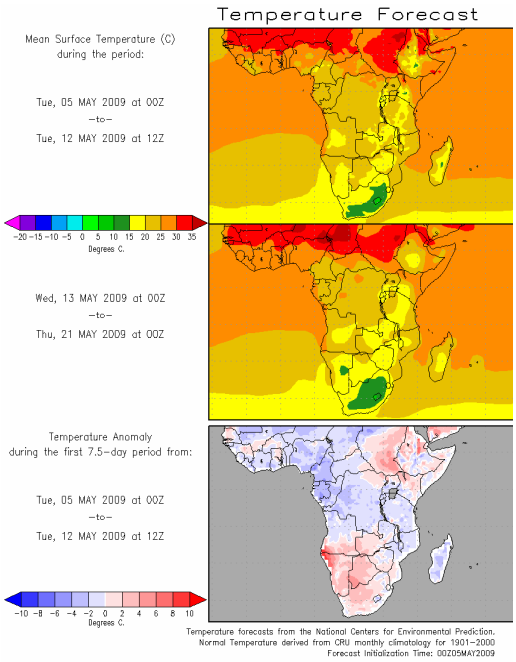

Figure 5: Precipitation forecast, Source : COLA

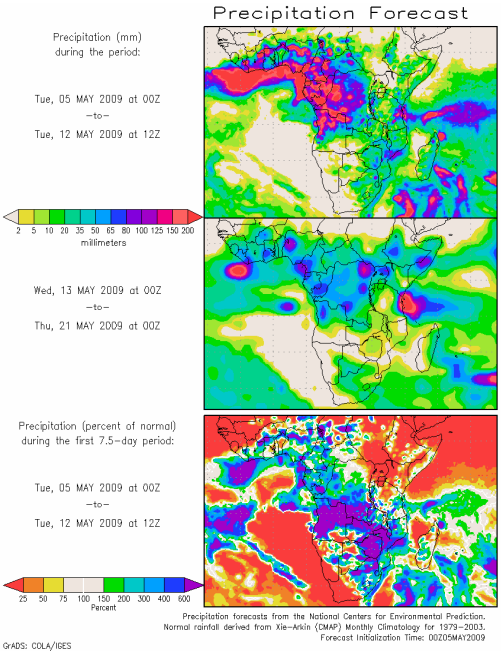

Figure 6 : Temperature forecast Source : COLA

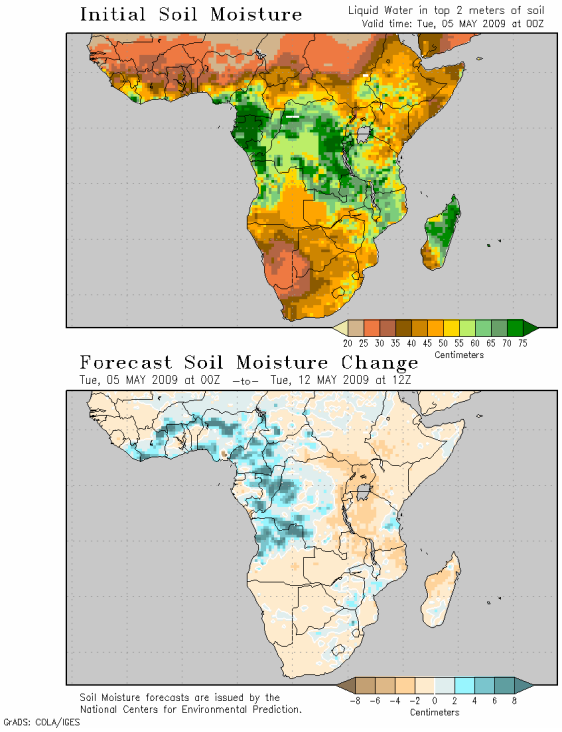

Figure 7 : Soil moisture forecast, Source: COLA

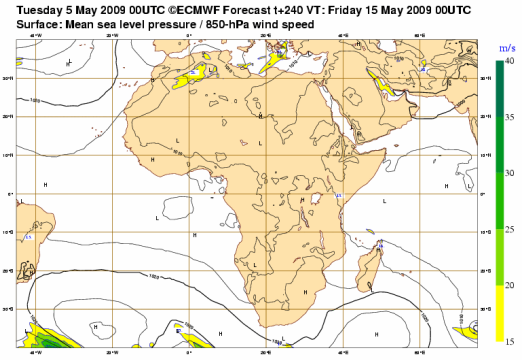

Figure 8 : Mean sea Level pressure forecast

Source : ECMWF