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

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Dekad of 01 to 10 May, 2009

HIGHLIGHT: The eastern part of Gulf of Guinea countries, Central Africa and parts of GHA countries with high relative humidity and highest thermal index regime (TI) of 243°K experienced heavy rainfall with floods. The areas with high relative humidity and TI threshold value of 243°K will get heavy rainfall with floods.

1. GENERAL SITUATION:

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

1.1 SURFACE

- **Azores high:** Pressure of 1030hPa weakened slightly by 1hPa and shifted northwest compared to the past dekad. Its mean position was located at about 41°N/22°W, extending a ridge over north Morocco, Algeria and Tunisia.

- **St. Helena high:** Pressure of 1025hPa weakened by 2hPa and shifted northeast at 37°S/07°E with an extended ridge over South of South Africa and Namibia.

- **Mascarene high:** Pressure of 1026hPa strengthened slightly by 1hPa compared to the past dekad and shifted southeast. Its mean position was at 38°S/59°E with an extended ridge over Indian Ocean.

- **Saharan Thermal Low:** Pressure at 1004hPa deepened slightly by 1hPa compared to the previous dekad and shifted northwest at 18°N/06°E with an extended trough over east Mali, north Burkina Faso, central Niger, north Nigeria and central Chad.

- **Inter -Tropical Discontinuity (ITD):** Between the third dekad of April and the first dekad of May, 2009, the ITD (Figure 1) had significant migration towards the north over the Sahel countries particularly over central and east Niger where the migration was about 4 degrees of latitude. Its mean position was observed at 11.5°N over longitude 20°W; at 13.8°N over central Senegal; at 13.8°N and 14.4°N over southwest and south Mali respectively; at 15.2°N over extreme north Burkina Faso; at 16.7°N and 16.9°N over west and central Niger respectively; at 16.2°N and 13.9°N over extreme west and east Chad respectively; at 12.6°N and 13.1°N over west and central Sudan respectively.

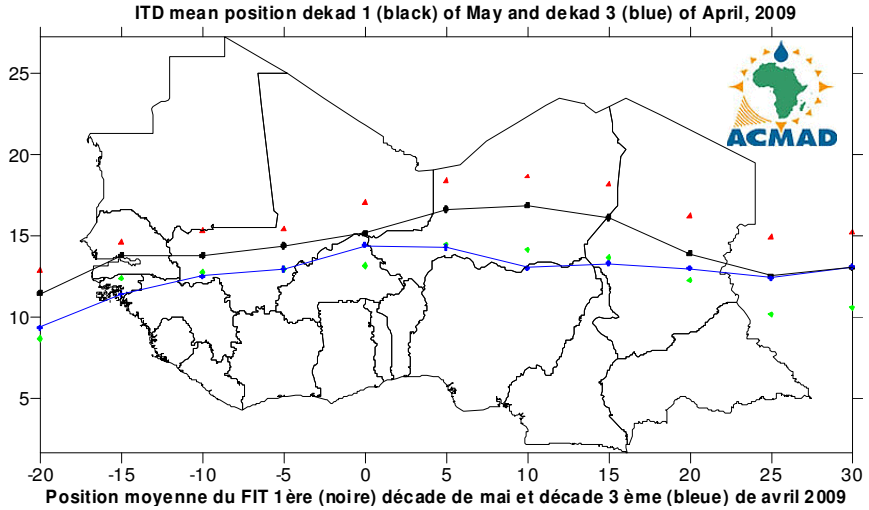

Figure 1 : The red and green triangles represent the max. and min. displacements of the ITD respectively

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 east Côte d'Ivoire, Ghana, Togo, south Burkina Faso, Benin, Nigeria and north Cameroon.

• **Thermal Index (TI):** In the first dekad of May, 2009, the thermal index (TI) regime at 300hPa in (figure 2), had TI regime value of 242°K extended about 12°N and 12°S covering southern Sahel, Gulf of Guinea, central Africa, southern part of GHA and extreme northern parts of southern Africa countries resulting in convective 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 parts of GHA, Central Africa and eastern part of Gulf of Guinea countries.

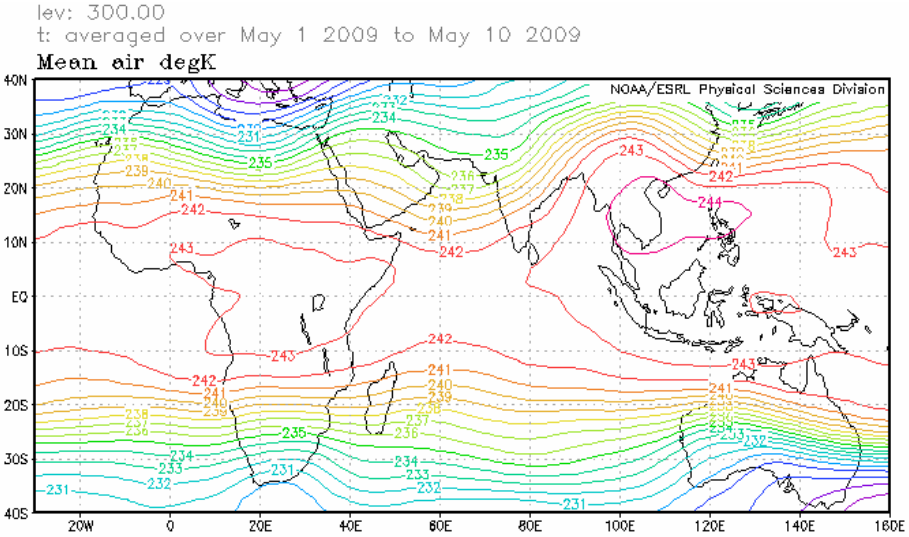

Figure 2: Air temperature at 300hPa, (Source: NOAA/NCEP/ESRL: PSD)

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

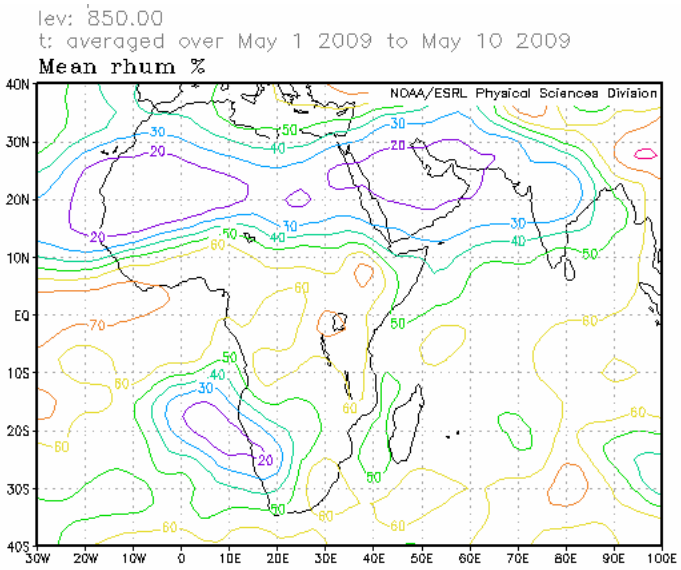

Figure 3: Relative Humidity at 850hPa, (Source: NOAA/NCEP/ESRL: PSD)

2. RAINFALL AND TEMPERATURE SITUATION

Subsection 2.1 provides a summary on estimated rainfall amounts and distribution and the subsection 2.2 gives stations observed data on rainfall, mean maximum and mean minimum temperatures including number of rainy days.

2.1 RAINFALL

The rainfall estimate based on Satellite and Rain Gauge in Figure 4 shows rainfall distribution increase over Gulf of Guinea, the Sahel and southern Africa countries with slight decrease over North African, central African and GHA countries. In summary:

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

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

- **Gulf of Guinea countries:** experienced significant increase in rainfall distribution and amounts ranging from 10mm to 150mm with peaks ranging from about 200mm to 250mm over Côte d'Ivoire and southeast Nigeria.

- **Central Africa countries:** had slight decrease in rainfall distribution and amounts ranging from 10mm to 150mm, intensifying over south central Africa Republic and northwest Democratic Republic of Congo with peaks ranging from 150mm to 200mm.

- **GHA countries:** experienced rainfall distribution and amounts decrease recording amounts ranging from 10mm to 100mm with peaks of about 150mm south Ethiopia, northwest Kenya and northern Tanzania .

- **Southern Africa countries:** experienced rainfall distribution increase recording amounts ranging from 10mm to 100mm intensifying in amounts over southeast Zambia and western Mozambique with peaks ranging from about 150mm to 250mm.

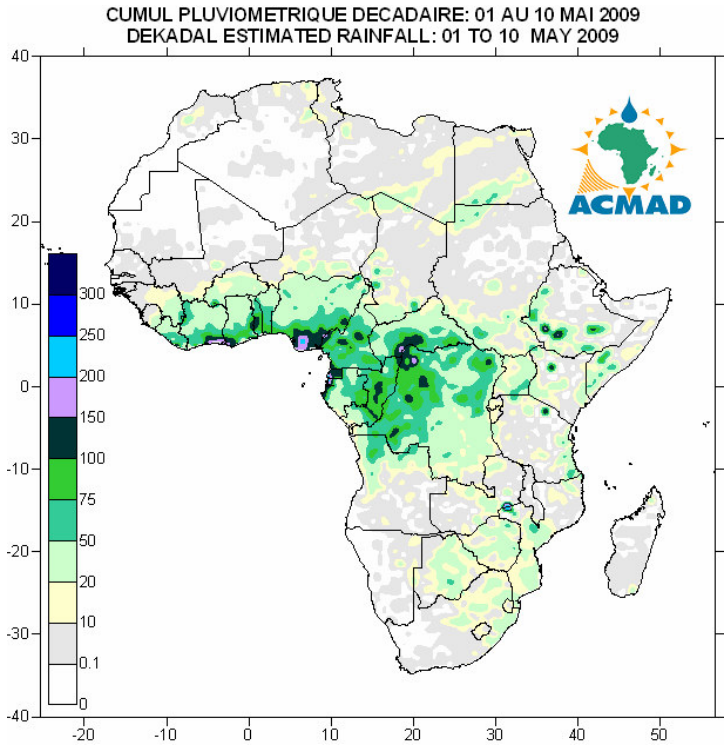

Figure 4: Estimated precipitations, (Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows heaviest rainfall recorded over Libreville in Gabon and Lomé in Togo. The lowest temperature of 8.3°C was recorded at Maseru in Lesotho while the highest temperature of 42.2°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	87	3	31,7	25,6
2	Accra	47	7	30,8	24,5
3	Agadez	7	2	40,3	26,3
4	Alger(Dar El Beida)	12	3	24,9	10,3
5	Antananarivo	0	0	25,9	13,2
6	Antsiranana	0	0	32,0	22,2
7	Bamako-Senou	0	0	39,8	26,2
8	Bangui	64	5	31,5	21,9
9	Banjul	0	0	33,6	19,9
10	Beira	41	1	28,7	21,0
11	Bilma	1	1	41,3	24,8
12	Bissau	0	0	32,7	-
13	Bobo Dioulasso	32	3	36,5	25,9
14	Brazzaville	90	5	31,5	22,9
15	Cotonou	93	8	30,1	25,6
16	Dakar-Yoff	0	0	25,6	19,3
17	Dar-es-Salaam	9	3	30,6	23,6
18	Douala	20	3	31,5	23,8
19	Durban	21	4	24,2	16,5
20	Entebbe	44	3	26,7	19,6
21	Francistown	13	1	28,0	13,1
22	Harare	13	1	26,2	12,6
23	Johannesbourg	29	5	19,6	9,2
24	Khartoum	0	0	42,2	29,3
25	Kigali	20	2	26,7	16,2
26	Kigoma	10	2	29,1	19,9
27	Kinshasa	0	0	31,3	22,8
28	Le Caire	0	0	29,0	19,0
29	Le Cap	3	1	19,9	12,8
30	Libreville	154	7	29,7	23,7
31	Lilongwe	1	1	26,2	15,1
32	Lomé	99	6	32,0	24,5
33	Lusaka	21	3	27,7	14,4
34	Manzini	29	4	26,6	15,8
35	Maputo	37	1	30,2	20,6
36	Maseru	14	2	19,8	8,3
37	Maun	21	3	30,2	16,2
38	Mbeya	11	1	24,4	12,3
39	Nairobi	18	5	24,7	15,6
40	Nampula	0	0	31,5	20,1
41	N'Djamena	15	1	37,8	26,2
42	Niamey-Aéroport	0	0	39,5	28,9
43	Nouakchott	0	0	35,1	21,1
44	Ouagadougou	14	1	38,0	27,1
45	Plaisance	12	2	28,4	20,8
46	Sal	0	0	25,6	20,0
47	Seychelles	47	5	31,9	25,8
48	Tamanrasset	0	0	31,4	16,1
49	Toalagnaro	13	1	28,8	20,4
50	Tombouctou	0	0	41,8	22,9
51	Tripoli	5	1	24,9	12,8
52	Tunis	4	2	23,4	14,2
53	Windhoek	0	0	25,9	10,3
54	Zinder	24	2	37,8	25,7

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

3.OUTLOOK FOR DEKAD (21st – 31st MAY, 2009)

3.1 RAINFALL

The ITD will move northwards maintaining moisture influx and rainfall increase over Gulf of Guinea countries and southern part of the Sahel countries. There will be slight rainfall decrease 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 slight rainfall decrease recording amounts ranging from 10mm to 150mm with isolated peaks ranging from about 200mm to 250mm.
- **Central Africa countries:** will experience slight rainfall decrease recording amounts ranging from 10mm to 150mm with peaks ranging from about 200mm to 250mm.
- **GHA countries:** will record rainfall decrease with amounts ranging from 10mm to 100mm with peaks ranging from about 150mm to 250mm.
- **Southern Africa countries:** will experience significant rainfall decrease recording amounts ranging from 10mm to 50mm with isolated peaks of about 100mm.

3.2 TEMPERATURE

The forecast in Figure 6, shows that the mean surface temperature will increase over northern part of Gulf of Guinea countries, the Sahel and northern parts of central Africa 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, maps shown in Figure 7 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 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 will support the survival of parasite resulting in 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 integration of climate information and prediction products in agricultural production is 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 and forests through enhanced national policies and 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.

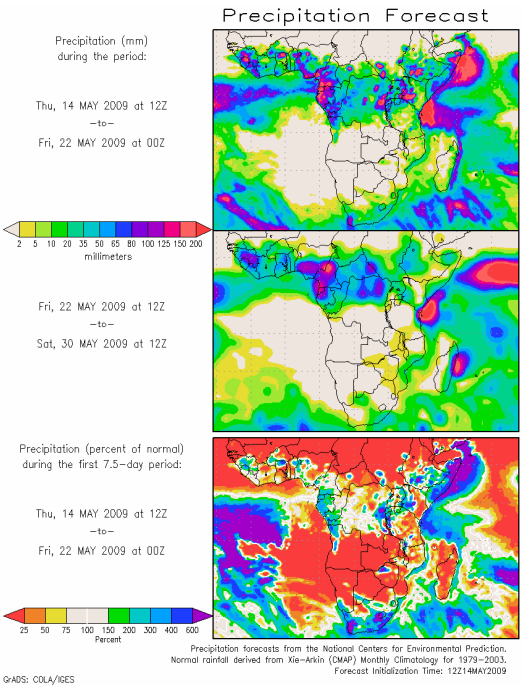

Figure 5: Precipitation forecast, Source : COLA

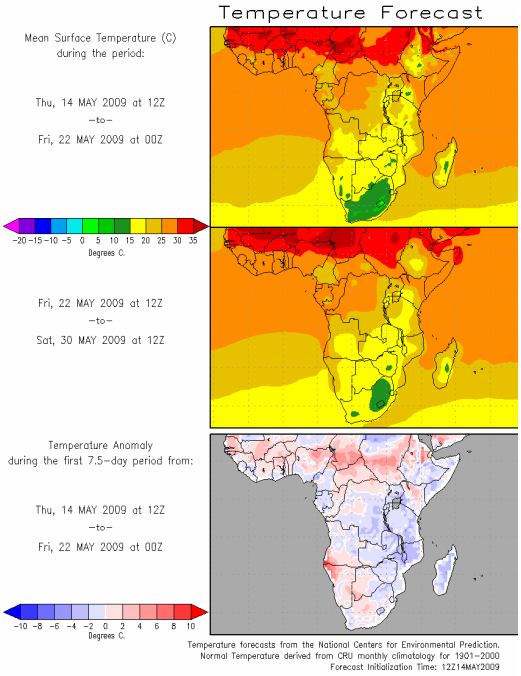

Figure 6 : Temperature forecast Source : COLA

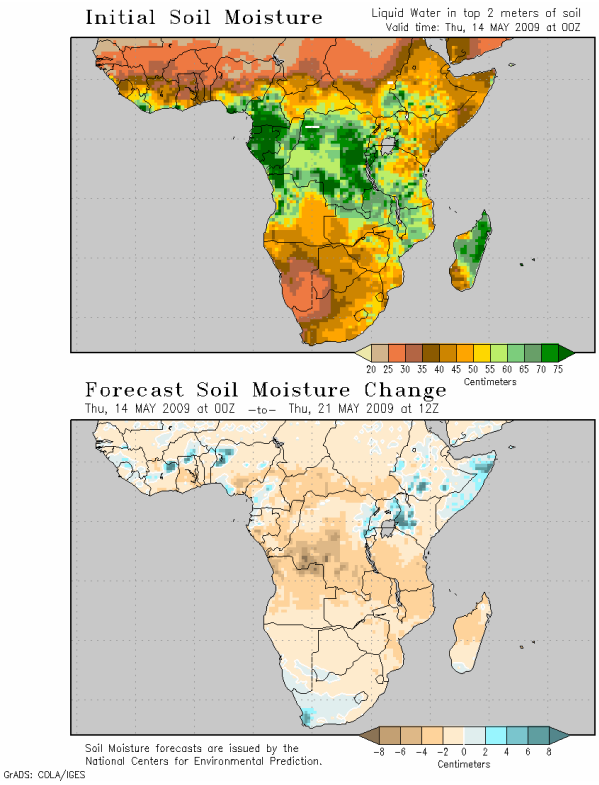

Figure 7 : Soil moisture forecast, Source: COLA

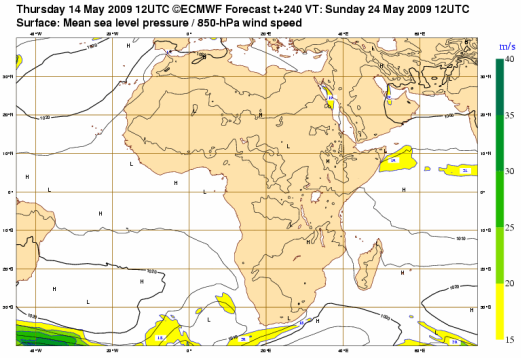

Figure 8 : Mean sea Level pressure forecast

Source : ECMWF