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 of 01 to 10 July, 2008

HIGHLIGHT: The Greater Horn of Africa (GHA) countries experienced significant rainfall increase over the northern parts with the Sahel experiencing deep moisture influx associated with outbreak of heavy rains which are expected to intensify. The deepening Indian monsoon thermal low characterized by the highest thermal index (TI) of 248°K at 300hPa is the major source conditional instability spreading westward over the Sahel and northern parts of West Africa countries triggering heavy rainfall with floods.

1. GENERAL SITUATION :

1.1 SURFACE

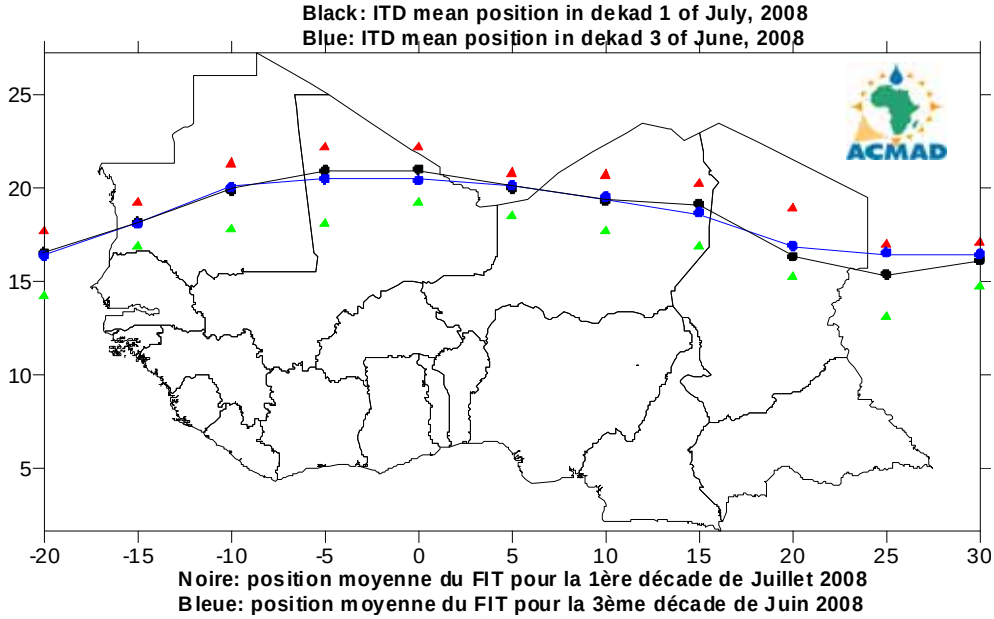
- **Azores high:** The Azores high pressure at 1026hPa weakened by 1hPa compared to the last dekad and shifted towards the southwest. Its mean position was observed at 35°N/27°W with a ridge extended over north Morocco and north Algeria.

- **Saharan thermal low:** The Saharan low of 1005hPa filled up by 1hPa and shifted towards the southeast. Its mean position was observed at 20°N/08°E with a trough extended over east Mauritania, north Mali, southwest Algeria, north Niger and central Chad.

- **St. Helena high :** The St. Helena high pressure at 1033hPa weakened by 3hPa and shift towards the northeast compared to the past dekad. Its mean position was observed at 38°S/09°W with an extended ridge over Atlantic Ocean.

- **Mascarene high:** The Mascarene high pressure at 1031hPa weakened by 1hPa and shifted towards the southwest. Its mean position was observed at about 40°S/56°E with an extended ridge over north Mozambique, north Tanzania and south Kenya.

- **Inter-Tropical Discontinuity (ITD) :** Between the third dekad of June and the first dekad of July 2008, the ITD migrated about 2 degree of latitude towards the north over the Sahel. It's mean position was observed at 16.6°N over longitude 20°W; at 18.2°N and 19.9°N over southwest and central Mauritania respectively; at 21.0°N over north Mali; at 20.0°N over extreme south Algeria; at 19.3°N and 19.2°N over north and extreme northeast Niger respectively; at 16.4°N over central north Chad; at 15.4°N and 16.2°N over northwest and central north Sudan respectively.



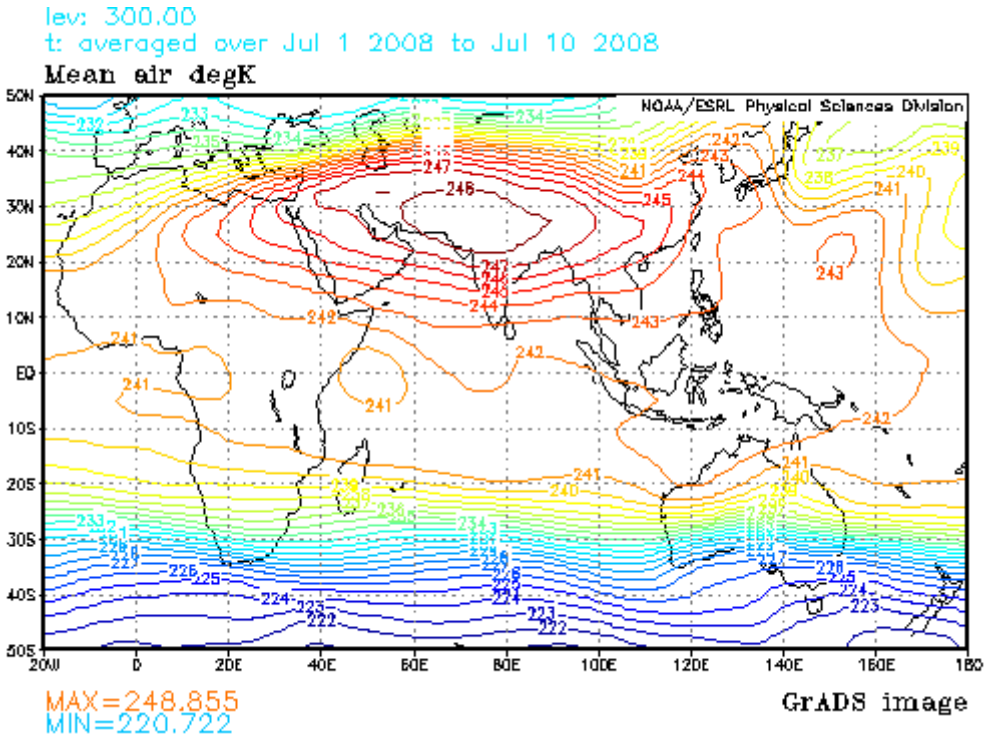
The triangles in red represent the maximum northward displacement of the ITD while the green triangles represent its minimum displacement.

1.2 TROPOSPHERE

- **Monsoon :** Monsoon influx was moderate (5.5 to 12.5 m/s) at 925hPa level over east Guinea, southeast Mali, Burkina Faso, Côte d'Ivoire, Ghana, Togo, Benin, south Niger, Nigeria, north Cameroon and south Chad.

- **African Easterly Jet at 700hPa :** The African Easterly Jet mean speed of about 20m/s at 700hPa strengthened by 3m/s compared to the past dekad. Its axis was located at about 13°N moved southwards by 2 degrees of latitude, stretching from southwest Mali, south Senegal up to 24°W in the north Atlantic Ocean.

- **Thermal Index (TI) :** In the first dekad of July, 2008, the thermal index (TI) regime at 300hPa, map shown below, had a near threshold TI regime value of 242°K over parts of West Africa and northern parts of GHA countries that maintained reasonable conditional instability triggering heavy rains. The high TI regime of 243°K and above over northeastern part of Africa extended from TI regime maximum of 248°K centered over Asia maintaining extremely high conditional instability accompanied by heavy rainfall with severe floods.



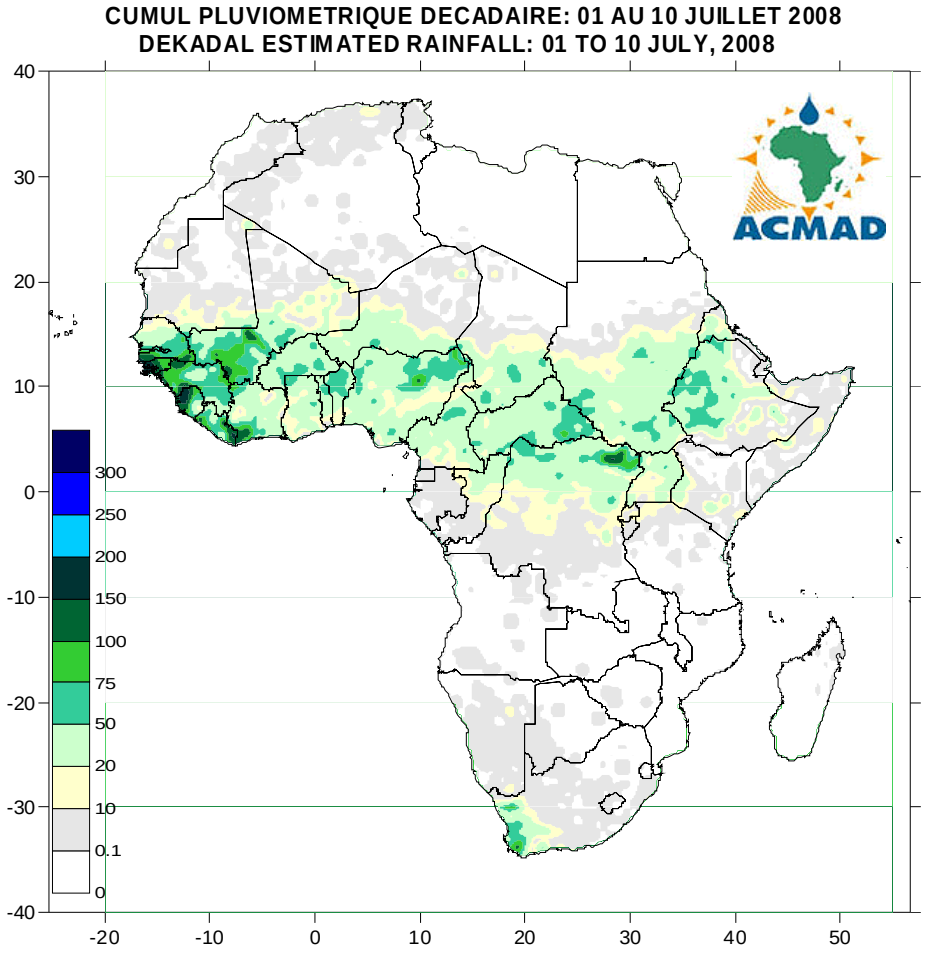
(Data Source: NOAA/NCEP)

2. RAINFALL AND TEMPERATURE SITUATION

2.1 RAINFALL

The rainfall estimate based on Satellite and Rain Gauge on the map below for the first dekad of July, 2008 shows increased spatial rainfall activities over the Sahel countries and GHA countries; spatial rainfall decrease over central Africa countries: spatial and intensity rainfall increase over west of South Africa while north Africa countries recorded no significant rainfall amounts. In summary:

- **North Africa countries :** No significant rainfall amount was recorded over northern Africa
- **Gulf of Guinea countries:** Recorded amounts of rainfall ranging from 20mm to 100mm with peaks of about 150mm over southwest Côte d'Ivoire, Liberia and Sierra Leone.
- **The Sahel :** Spatial rainfall activities increase recording amounts ranging from 10mm to 100mm with peaks of about 150mm over southern Mali and southern Senegal.
- **Central Africa countries :** The central Africa countries experienced spatial rainfall activities decrease recording amounts ranging from 10mm to 100mm with a maximum of 150mm over northeast Democratic Republic of Congo.
- **GHA countries:** The countries experienced slight spatial rainfall increase recording rainfall amounts ranging from 10mm to 100mm over western Ethiopia and southern Sudan.
- **Southern Africa countries:** Experienced spatial and intensity rainfall increase recording rainfall amounts ranging from 10mm to 75 mm over south western part of South Africa.



(Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows heavy rainfall recorded over Douala in Cameroon. The lowest temperatures of 0.7°C was recorded at Maseru in Lesotho with the highest temperatures of 44.1°C recorded at Bilma in Niger.

N°	STATIONS	Précipitations (mm)	Nombre de jours de pluie	Température maxi moyenne (°C)	Température mini moyenne (°C)
1	Abidjan	7	3	30,0	24,8
2	Accra	3	1	30,0	23,6
3	Addis Abéba	18	1	-	-
4	Agadez	4	2	39,5	27,1
5	Alger(Dar El-Beida)	0	0	32,6	20,3
6	Antananarivo	0	0	21,8	10,1
7	Antsiranana	0	0	29,2	18,3
8	Bamako-Senou	73	3	31,1	22,8
9	Bangui	65	2	30,8	21,1
10	Banjul	58	4	31,0	22,6
11	Bilma	0	0	44,1	27,5
12	Bobo Dioulasso	48	4	30,2	22,1
13	Brazzaville	0	0	28,1	17,7
14	Bujumbura	1	1	-	17,5
15	Casablanca	0	0	25,4	19,8
16	Cotonou	1	1	29,3	25,2
17	Dakar-Yoff	11	3	31,0	26,2
18	Dar-es-Salaam	0	0	29,7	18,1
19	Douala	124	6	29,2	22,8
20	Entebbe	20	3	26,5	17,6
21	Francistown	0	0	26,3	3,4
22	Harare	0	0	24,5	7,8
23	Johannesbourg	0	0	17,0	5,8
24	Khartoum	0	0	41,8	27,3
25	Kigali	4	1	27,4	15,3
26	Kigoma	0	0	-	15,8
27	Kinshasa	0	0	28,7	17,9
28	Le Caire	0	0	35,6	24,4
29	Le Cap	45	6	13,4	8,7
30	Libreville	0	0	27,4	23,5
31	Lomé	0	0	30,1	24,4
32	Luanda	0	0	23,0	-
33	Lusaka	0	0	26,8	8,3
34	Manzini	0	0	-	11,2
35	Maputo	0	0	30,2	14,2
36	Maseru	0	0	14,0	0,7
37	Maun	0	0	26,0	7,1
38	Mbeya	0	0	24,1	3,7
39	Nairobi	0	0	24,1	11,9
40	Nampula	0	0	28,9	15,5
41	N'Djamena	83	3	36,0	24,6
42	Niamey-Aéroport	27	4	33,2	24,0
43	Nouakchott	0	0	30,5	25,9
44	Ouagadougou	67	4	31,9	23,8
45	Plaisance	5	4	24,6	17,6
46	Sal	0	0	27,3	22,6
47	Seychelles	9	6	28,5	24,9
48	Tamanrasset	0	0	36,3	24,5
49	Toalagnaro	0	0	26,0	16,1
50	Tombouctou	8	1	39,9	24,5
51	Tripoli	0	0	39,3	22,7
52	Tunis	0	0	34,9	23,1
53	Windhoek	0	0	19,6	3,0
54	Zinder	45	3	35,2	24,8

NOTE: **0** means no rain;

- means no temperature data available Data Source **:** ACMAD / GTS

3. OUTLOOK FOR DEKAD (21st – 31st July, 2008)

3.1 RAINFALL

The ITD is expected to continue shifting northwards. The temperatures will continue to rise while moisture is expected to increase tremendously over several parts of the Sahel countries. The high TI regime will spread over West Africa particularly over the Sahel and northern parts of Gulf of Guinea countries with a maximum TI regime located over north India that will maintain high conditional instability associated with heavy rainfall and floods over parts of West Africa countries, northern parts of central Africa and northern /western parts of GHA countries. The southern Africa countries will record light rainfall. In summary:

- **North Africa countries:** The countries will record light rainfall of 10mm to 20mm.

- **The Sahel countries:** The Sahel countries will experience rising temperatures with increased moisture associated with moderate to heavy rainfall ranging from 50mm to 150mm with peaks of about 200mm.

- **Gulf of Guinea countries:** Guinea, Guinea Bissau, Sierra Leone, Liberia, Cote-d'Ivoire, Ghana, Togo, Benin, Nigeria and Cameroon will record rainfall amounts ranging from 20mm to 150mm with peaks of about 200mm over northern parts.

- **Central Africa countries:** Gabon, Central Africa Republic, north Democratic Republic of Congo, Congo and north Angola will experience moderate to heavy rainfall recording amounts ranging from 50mm to 150mm with peaks of about 200mm confined to the northern parts.

- **GHA countries:** The GHA countries are expected to experience rainfall increase over northern and western parts recording amounts ranging from 10mm to 100mm with peaks of about 150mm.

- **Southern Africa countries:** The countries will experience rainfall deficits recording light rainfall of 10mm to 20mm with a few parts getting moderate rainfall ranging from 50mm to 75mm.

3.2 TEMPERATURE

The forecast map below shows that the countries north of Equator will record the highest temperatures while Southern and eastern Africa countries will record the lowest temperatures. The highest forecast temperatures on the map below range from 25°C to 35°C in orange and red colours respectively with more than half of the Continent expected to record 20°C and above.

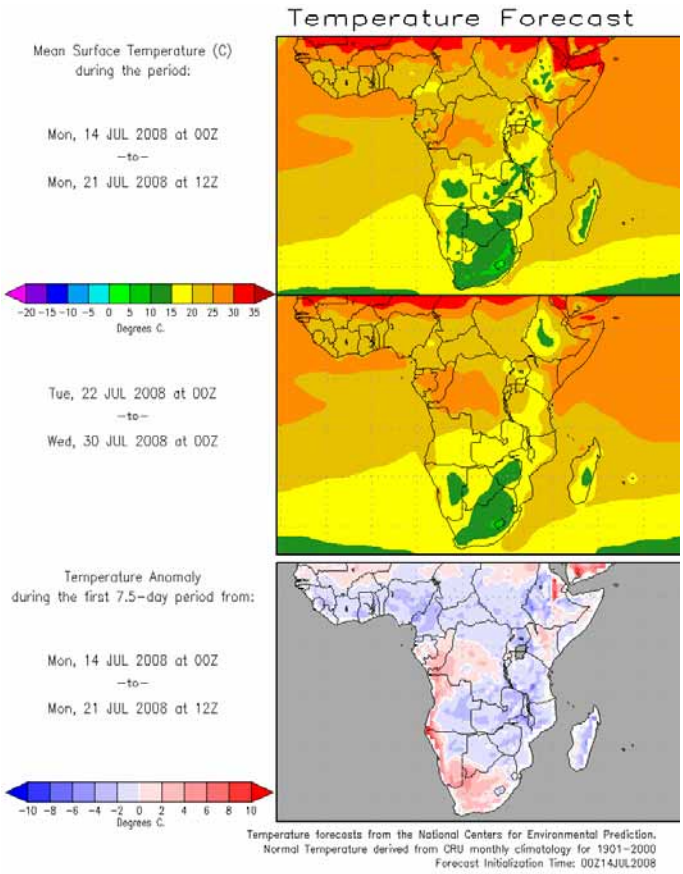
3.3 SOIL MOISTURE

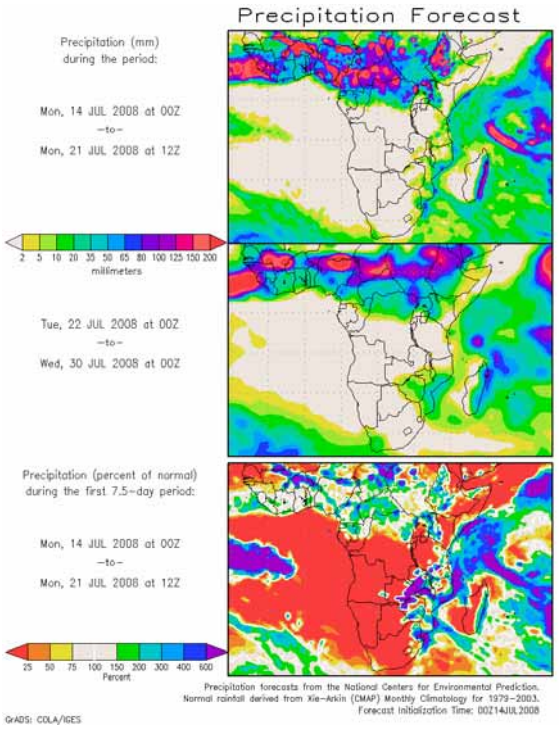
The outlook on soil moisture change, map shown below includes the initial soil moisture and the forecast soil moisture changes over the next 7 days. The soil moisture change and precipitation relationship is clearly manifested on the maps below. The areas forecast to have highest soil moisture increase are confined within the West Africa, parts of central Africa and northern parts of GHA countries.

3.4 IMPACTS

- **Health:** The incidences of malaria and other diseases are higher in areas with high temperatures during periods of heavy rainfall. The temperatures in the range of 20°C to 28°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 Gulf of Guinea countries, the Sahel countries, central Africa countries and parts of GHA countries with high humidity/rainfall and the prevailing high temperatures, the survival of parasite will be high resulting in higher incidences of vector borne diseases such as malaria epidemic among others. The health authorities need to continue the health care services to protect lives of the vulnerable community in the countries.

- **Agriculture and food security:** While we consider the importance of well documented onsets and cessations dates of seasonal rainfall and the monitoring phenological stages of crops in our countries it is equally important to carry out cost benefit analysis on determination and applications of appropriate planting dates in order to take 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 climate constraint on 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. However, there is a need to invest in higher yielding crops during a good rainfall season for example forecasts provided by regional climate outlook forum (COF) such as the PRESAO, GHACOF, SARCOF and National Meteorological Services.





Source : COLA

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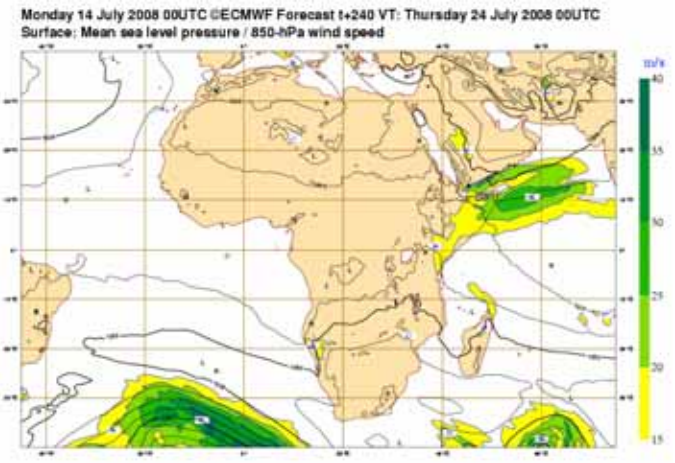
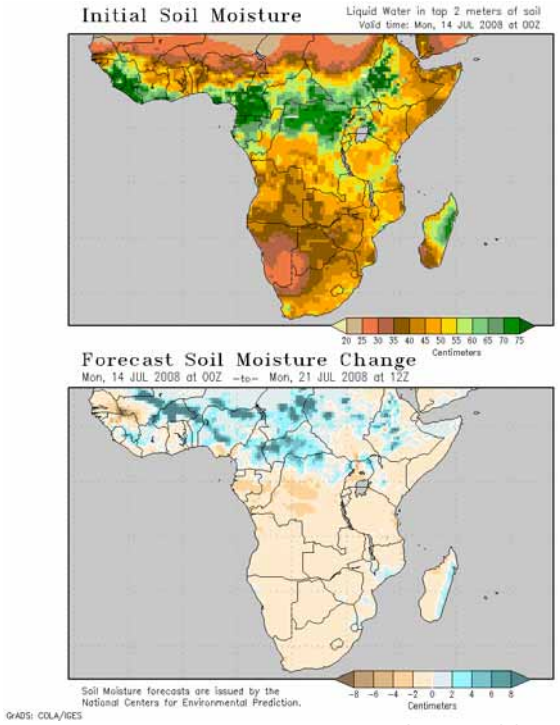


Source : ECMWF



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