

Ten Day Climate Bulletin

N° 17 Year 2009

Dekad of 11 to 20 June, 2009

HIGHLIGHT: The heaviest rainfall mounts were observed over southeast Côte d'Ivoire, southwest Ghana, south Benin and Central African Republic. The areas with high TI regime value of 242°K characterized by high relative humidity (>60%) will continue experience heavy rainfall.

1. GENERAL SITUATION

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

1.1 SURFACE

- **Azores high:** Pressure of 1028hPa strengthened significantly by 4hPa and shifted northwest compared to the past dekad. Its mean position was located at about 38°N/28°W, extending a ridge over north Morocco and Algeria.
- **St. Helena high:** Pressure of 1026hPa weakened by 1hPa and shifted southwest at 30°S/06°W with an extended ridge over South Atlantic Ocean.
- **Mascarene high:** Pressure of 1032hPa strengthened significantly by 4hPa compared to the past dekad and shifted southwest. Its mean position was located at 38°S/58°E with an extended ridge over Indian Ocean.
- **Saharan Thermal Low:** Pressure at 1006hPa filled up by 1hPa and shift east compared to the previous dekad. Its mean position was located at 16°N/18°E with an extended trough over east Mali, south Algeria, central Niger and Chad.

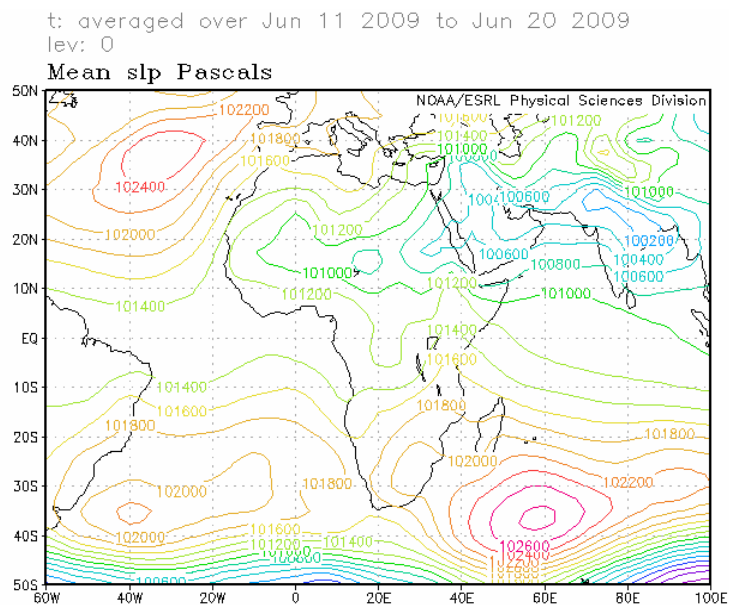


Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

- **Inter -Tropical Discontinuity (ITD):** Between the first dekad (blue line) and the second dekad of June (black line), 2009, the ITD (Figure 2) moved generally northwards over the Sahel with maximum displacement over Niger and Chad. Compare to the ITD position of the second dekad of June 2008 (pink line), the 2009 ITD was located slightly north over Senegal, Mauritania, south Chad and Sudan and maintained its position over Mali and Niger. Its mean position was observed at 13.5°N over longitude 20°W; at 16.6°N over extreme north Senegal; at 17.9°N over south Mauritania; 17.5°N and 18.2°N over west and east Mali respectively; at 17.2°N and 16.6°N over west and central Niger respectively; at 16.5°N and 14.6°N over west and east Chad respectively; at 13.6°N and 14.3°N over west and central Sudan respectively.

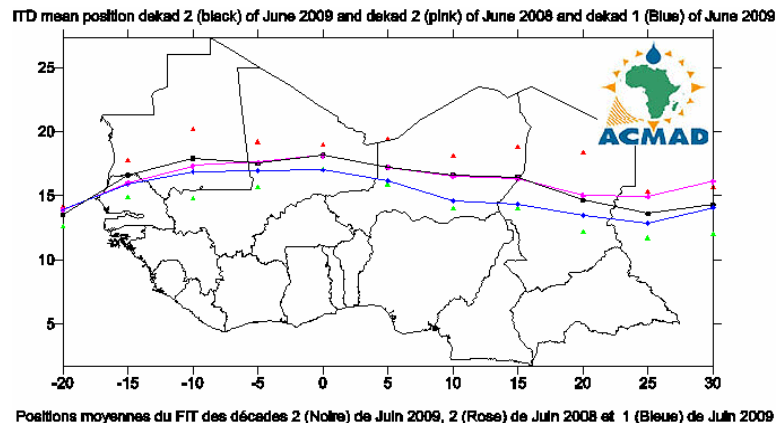


Figure 2 : The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

- **Monsoon:** Monsoon influx at 925hPa level was moderate (5.5 to 11.5m/s) over Guinea Conakry, Sierra Leone, Liberia, Côte d'Ivoire, Burkina Faso, Ghana, Togo, Benin and Nigeria
- **African Easterly Jet (AEJ):** AEJ at 700hPa level was not observed during this dekad.
- **Thermal Index (TI):** In the second dekad of June, 2009, the thermal index (TI) regime at 300hPa in (figure 3), had TI regime value of 242°K within tropical belt about 10°N and 10°S covering Gulf of Guinea, eastern part of central Africa, GHA and extreme northern part of Southern Africa countries resulting in heavy rainfall over areas characterized by high relative humidity as observed in Figure 3. The highest thermal index regime of 243°K and above characterized by heavy rainfall with floods was located over Bay of Bengal extending over northwest India and Asia.

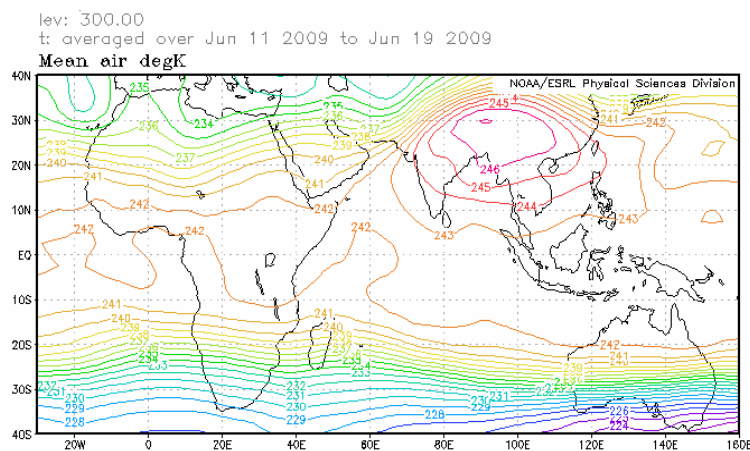


Figure 3: Air temperature at 300hPa (Source: NOAA/NCEP/ESRL: PSD)

- **Relative Humidity (RH):** The 850hPa (Figure 4) shows high RH (>70%) in the second dekade of June, 2009 over Ethiopia, Kenya, Tanzania in GHA and over the Gulf of Guinea and its countries. The Sahara, parts the Sahel countries, northern and extreme western parts of Southern Africa countries experienced dry conditions characterized by the lowest RH (<40%).

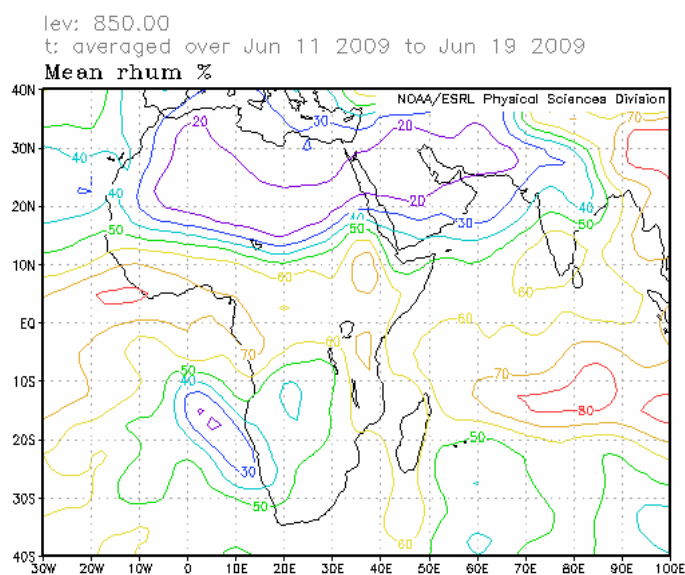


Figure 4: Relative Humidity at 850hPa (Source: NOAA/NCEP/ESRL: PSD)

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 5 below shows rainfall distribution and amounts increase over Northern Africa, The Sahel, Gulf of Guinea and GHA countries while Southern Africa countries experienced significant rainfall activities decrease. In detail:

- **North Africa countries:** experienced rainfall distribution and amounts increase recording quantities ranging from 10mm to 100mm over Morocco and west Algeria.
- **The Sahel:** had increase in rainfall distribution and amounts ranging from 10mm to 100mm with maximum amount of about 150mm over north Mauritania and south Chad.
- **Gulf of Guinea countries:** experienced increase in rainfall distribution and amounts ranging from 10mm to 100mm intensifying over the coastal zones with amount between 100mm to 150mm with heaviest rainfall amounts ranging from 150 mm to above 300mm over southeast Côte d'Ivoire/Ghana and south Benin/Nigeria..
- **Central Africa countries:** had rainfall amounts ranging from 10mm to 100mm with maximum amounts ranging between 100mm to 200mm over Central African Republic and northwest Democratic Republic of Congo.

- **GHA countries:** experienced increase in rainfall distribution and amounts recording quantity ranging from 10mm to 100mm with maximum of about 150mm over west Ethiopia.
- **Southern Africa countries:** experienced significant decrease in rainfall spatial distribution and amounts recording light amounts ranging from 10mm to 50mm over south Namibia, southwest Botswana, south Mozambique and over South Africa.

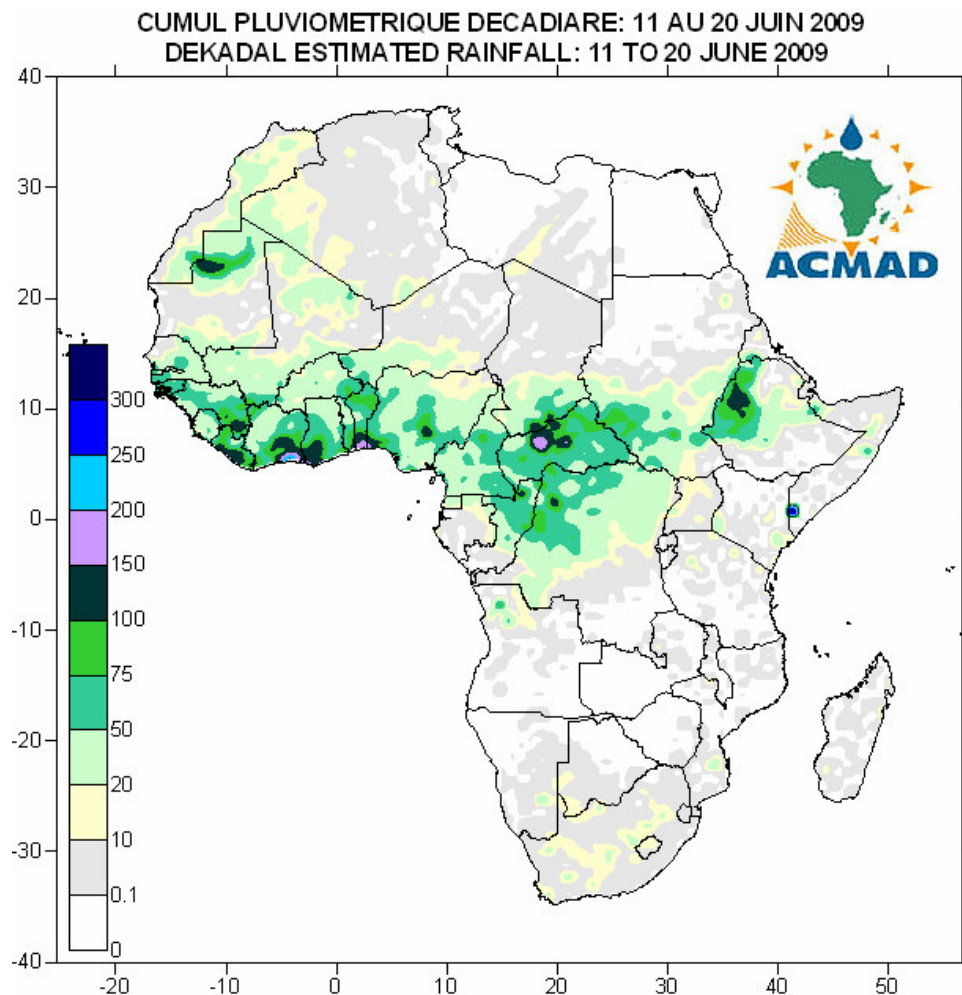


Figure 5: Estimated precipitations, (Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows heaviest rainfall recorded over Cotonou in Benin, Abidjan in Côte d'Ivoire, Douala in Cameroon and Accra in Ghana. The lowest temperature of 6.3°C was recorded at Mbeya in Tanzania while the highest temperature of 43.1°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	360	9	29,7	25,0
2	Abuja	1	1	30,9	21,5
3	Accra	115	6	29,5	23,6
4	Addis-Abéba	3	2	-	12,7
5	Agadez	0	0	42,0	29,2
6	Alger(Dar El Beida)	0	0	33,4	19,0
7	Antananarivo	0	0	21,9	11,4
8	Antsiranana	0	0	30,7	21,0
9	Bamako-Senou	23	4	34,7	24,4
10	Bangui	91	4	30,7	21,6
11	Banjul	28	2	32,6	23,7
12	Beira	0	0	28,7	18,7
13	Bilma	0	0	41,2	27,1
14	Bobo Dioulasso	41	3	32,2	23,1
15	Brazzaville	0	0	29,0	21,4
16	Casablanca	1	1	31,5	22,0
17	Conakry	17	1	29,8	-
18	Cotonou	402	8	29,7	24,5
19	Dakar-Yoff	0	0	28,2	23,1
20	Dar-es-Salaam	16	3	30,8	21,4
21	Douala	146	5	30,2	23,3
22	Durban	0	0	24,8	14,6
23	Entebbe	0	0	26,1	19,0
24	Francistown	0	0	25,5	8,5
25	Harare	0	0	21,3	10,1
26	Johannesbourg	5	3	17,0	7,6
27	Khartoum	0	0	43,1	29,7
28	Kigali	0	0	26,5	15,1
29	Kigoma	0	0	30,6	16,6
30	Le Caire	0	0	35,6	24,3
31	Le Cap	19	3	18,7	12,2
32	Libreville	3	1	28,6	24,2
33	Lomé	53	3	30,5	24,3
34	Lusaka	0	0	25,7	9,8
35	Manzini	5	2	-	12,9
36	Maputo	11	1	27,1	16,6
37	Maseru	6	3	-	6,6
38	Maun	0	0	27,0	12,8
39	Mbeya	0	0	23,1	6,3
40	Nairobi	6	1	24,2	13,6
41	Nampula	0	0	28,8	18,0
42	N'Djamena	10	2	39,8	26,2
43	Niamey-Aéroport	37	4	37,4	26,4
44	Nouakchott	0	0	34,2	22,7
45	Ouagadougou	43	3	34,8	25,0
46	Plaisance	61	6	25,8	19,7
47	Sal	0	0	26,8	21,0
48	Seretse Khama Intl Aéro	0	0	22,5	10,0
49	Seychelles	3	2	31,0	26,0
50	Tamanrasset	2	1	35,1	22,6
51	Toalagnaro	8	1	25,5	19,4
52	Tombouctou	3	2	41,3	27,1
53	Tripoli	0	0	32,6	19,3
54	Tunis	0	0	33,5	19,2
55	Windhoek	1	1	23,3	9,1
56	Zinder	31	3	38,1	25,9
57	Ndele (RCA)	88	7	31,3	20,5

NOTE: 0 means no rain;

- means no temperature data available

Data Source: ACMAD / GTS

3. OUTLOOK FOR DEKAD (01st – 10th JULY, 2009)

3.1 RAINFALL

The ITD will move northwards maintaining moisture influx and rainfall increase over Gulf of Guinea countries, parts of the Sahel, northern parts of central Africa and northern sector of GHA countries. There will be rainfall decrease over southern parts of GHA countries with significant decrease over southern Africa countries (Figure 6). In summary:

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

3.2 TEMPERATURE

The forecast in Figure 7, shows that the mean surface temperature will increase over northern part of Gulf of Guinea countries, the Sahel, northern parts of central Africa and northern parts of GHA countries. The highest forecast temperatures range from 25°C to 35°C in orange and red colours respectively with more than 60% of the Continent recording 20°C and above.

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 highest soil moisture change include parts of Gulf of Guinea countries, parts of the south Sahel, northern parts of central and northern GHA 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 and relative high 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 parts of Gulf of Guinea, the Sahel, northern parts of central Africa and northern GHA countries with high humidity/rainfall coupled and 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 (GHA), West Africa, central Africa, and southern Africa countries respectively.

African Ecosystems: Call for rehabilitation of our presently degraded rainfall catchments areas and forests ecosystems 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 highest priority for States' sustainable development.

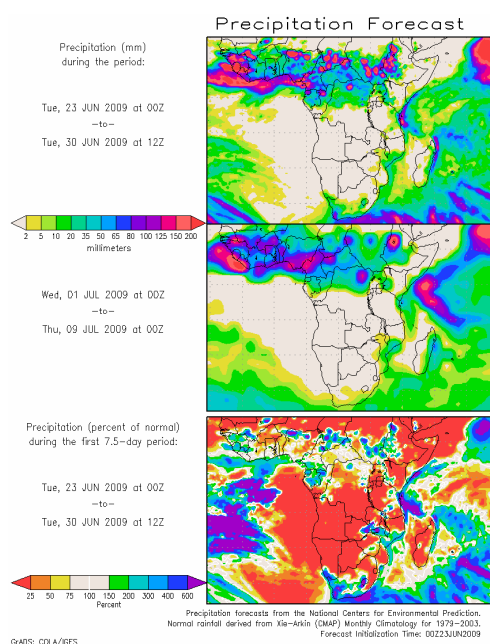


Figure 6: Precipitation forecast, Source : COLA

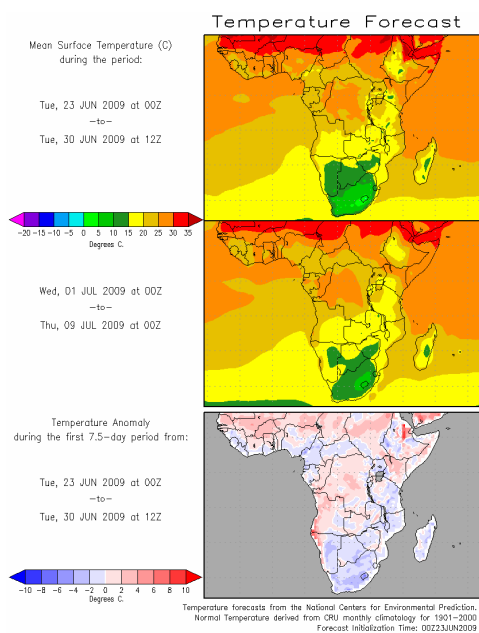


Figure 7 : Temperature forecast Source : COLA

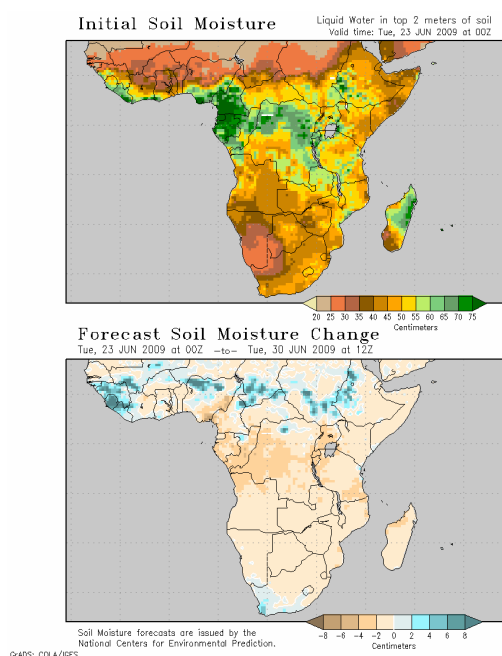
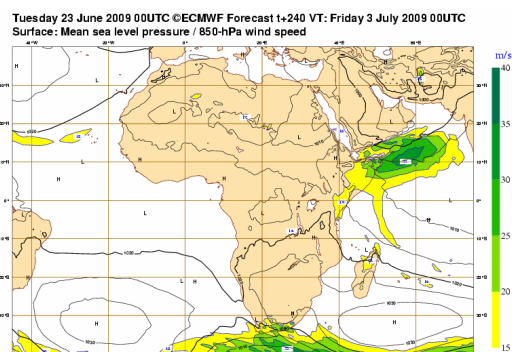


Figure 8 : Soil moisture forecast, Source: COLA



**Figure 9 : Mean sea Level pressure forecast
Source : ECMWF**