

## Ten Day Climate Bulletin

N° 15 Year 2009

Dekad of 21 to 31 May, 2009

**HIGHLIGHT:** The part of GHA countries with thermal index (TI) regime of 243°K and characterized by the highest relative humidity experienced heavy rainfall with floods. The areas with high relative humidity (>70%) and TI value of 242°K and above will 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 under Troposphere gives a brief on monsoon, thermal index regimes and relative humidity.

#### 1.1 SURFACE

- **Azores high:** Pressure of 1029hPa strengthened by 3hPa and shifted northeast compared to the past dekad. Its mean position was located at about 41°N/22°W, extending a ridge over north Morocco and Algeria.
- **St. Helena high:** Pressure of 1026hPa weakened by 1hPa and shifted northwest at 32°S/15°E with an extended ridge over South Atlantic Ocean.
- **Mascarene high:** Pressure of 1031hPa strengthened by 3hPa compared to the past dekad and shifted east. Its mean position was at 37°S/57°E with an extended ridge over Indian Ocean.
- **Saharan Thermal Low:** Pressure at 1005hPa deepened slightly by 1hPa compared to the previous dekad and shifted southwest at 15°N/04°E with an extended trough over southeast Mauritania, central Mali, north Burkina Faso, central Niger and south Chad.
- **Inter -Tropical Discontinuity (ITD):** Between the second and third dekad of May, 2009, the ITD (Figure 1) had moved slightly northwards over western Sahel. However, it remained quasi-stationary over east Mali and central Niger. Its mean position was observed at 13.1°N over longitude 20°W; at 15.1°N over north Senegal; at 16.0°N over south Mauritania; 16.6°N and 16.7°N over central-west and central-east Mali respectively; at 15.1°N and 13.5°N over central-west and south-east Niger respectively; at 13.4°N and 12.3°N over central west and central east Chad respectively; at 11.8°N and 12.3°N over west and central Sudan respectively.

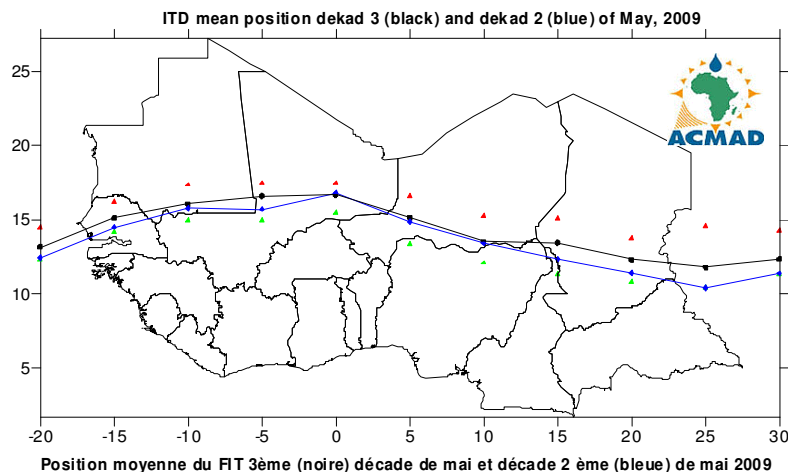


Figure 1 : The red and green triangles represent the max. and min. displacements of the ITD respectively

## 1.2 TROPOSPHERE

- **Monsoon:** Monsoon influx at 925hPa level moderate (5.5 to 11.5m/s) over Sierra Leone, Guinea Conakry, Liberia, Côte d'Ivoire, Togo, Benin and Nigeria.
- **African Eastern Jet (AEJ):** The intensity of AEJ at 700hPa level was about 19m/s. The jet axis was located at about 07°N, stretching south Côte d'Ivoire and Liberia up to 24°W in the Atlantic Ocean
- **Thermal Index (TI):** In the third dekad of May, 2009, the thermal index (TI) regime at 300hPa in (figure 2), had TI regime value of 242°K covering Gulf of Guinea, central Africa and GHA 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 northern part of GHA countries, central and eastern Indian Ocean and Asia.

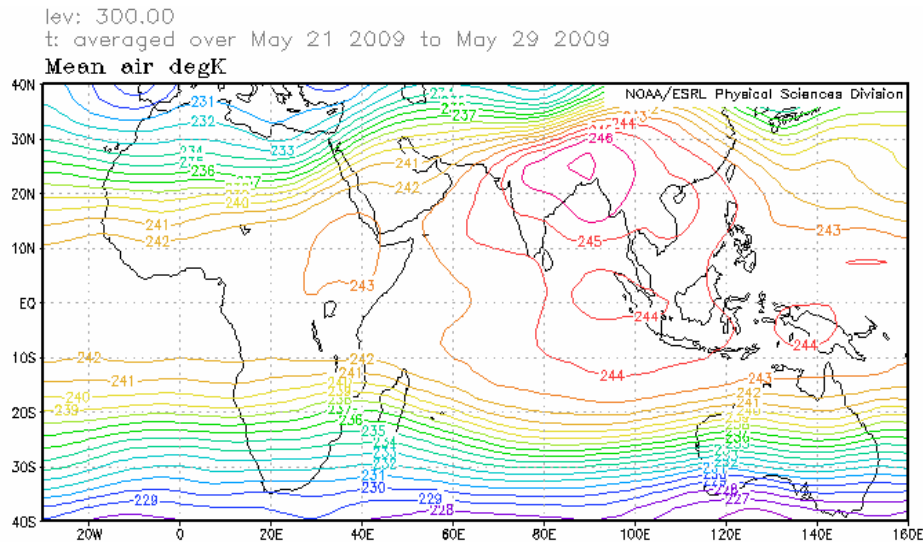


Figure 2: Air temperature at 300hPa (Source: NOAA/NCEP/ESRL: PSD)

- **Relative Humidity (RH):** The 850hPa (Figure 3) shows high RH (>70%) in the third dekad of May, 2009 over GHA countries, Ethiopia/Sudan and over the Gulf of Guinea. The Sahara, most part the Sahel countries and western part of Southern Africa countries experienced dry conditions characterized by the lowest RH (<40%).

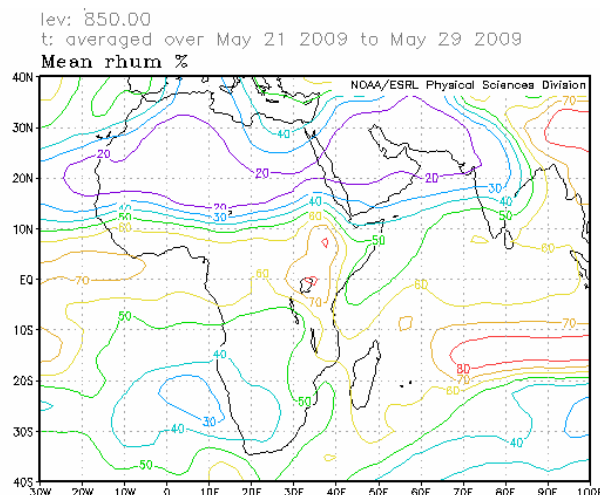


Figure 3: Relative Humidity at 850hPa (Source: NOAA/NCEP/ESRL: PSD )

## 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 below shows rainfall distribution and amounts decrease over North, South, Central Africa and GHA countries while the Sahel countries experienced rainfall increase in distribution and amounts. In detail:

- **North Africa countries:** experienced localised light rainfall recording ranging from 10mm to 50mm over Morocco and Algeria. However, some heaviest amounts ranging from 50mm to 150 mm were observed over western Algeria.
- **The Sahel:** had slight increase in rainfall distribution and amounts ranging from 10mm to 100mm over its southern part with maximum rainfall amounts ranging from 100mm to 150mm over south Mauritania/Mali, Guinea Conakry.
- **Gulf of Guinea countries:** experienced decrease in rainfall distribution and amounts ranging from 10mm to 100mm with maximum ranging from 100mm to 150mm over south Côte d'Ivoire and Sierra Leone.
- **Central Africa countries:** had decrease in rainfall distribution recording amounts ranging from 10mm to 100mm with heaviest amounts ranging from 100mm to 150mm over south Congo, central Democratic Republic of Congo and southeast Central African Republic.
- **GHA countries:** experienced significant decrease in rainfall distribution recording amounts ranging from 10mm to 100mm with localized peak of about 200mm over southwest Sudan.
- **Southern Africa countries:** experienced non significant amounts of rainfall except over the Cape and extreme southeast Mozambique where some amounts ranging from 10 to 50mm were observed.

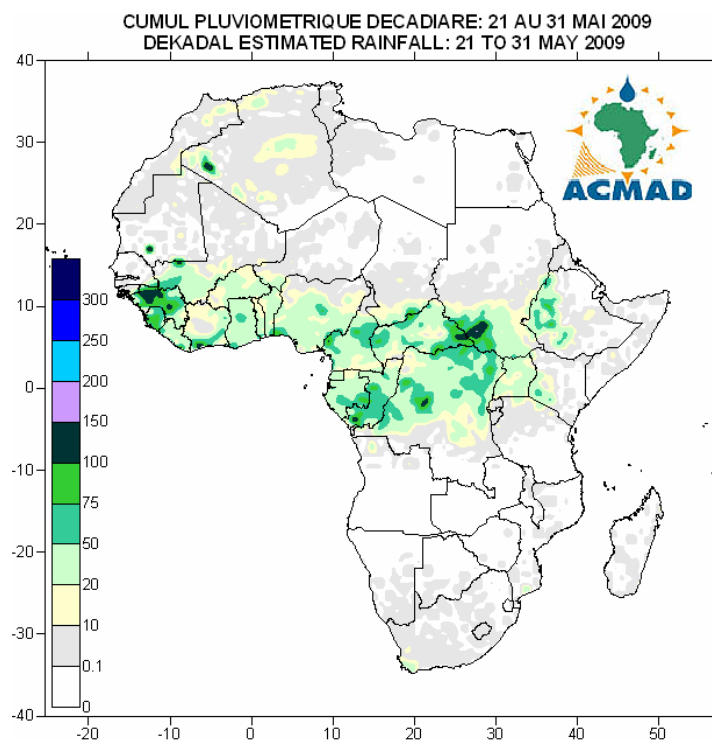


Figure 4: Estimated precipitations, (Data Source: NOAA/NCEP)

## 2.2 OBSERVED DATA

The Table below shows heaviest rainfall recorded over Toalagnaro in Madagascar. The lowest temperature of 5.2°C was recorded at Maseru in Lesotho while the highest temperature of 44.2°C was recorded at Tombouctou in Mali

N°	STATIONS	Précipitations (mm)	Nombre de jours de pluie	Température maxi moyenne (°C)	Température mini moyenne (°C)
1	Abidjan	9	2	33,0	26,4
2	Abuja	0	0	32,9	23,0
3	Accra	0	0	32,8	25,6
4	Addis Abéba	4	1	-	12,1
5	Agadez	0	0	42,0	26,6
6	Alger(Dar El Beida)	7	2	28,6	16,5
7	Antananarivo	0	0	24,2	11,9
8	Antsiranana	6	1	32,0	20,2
9	Bamako-Senou	10	2	38,5	25,9
10	Bangui	35	5	32,4	21,8
11	Banjul	0	0	30,4	21,1
12	Beira	0	0	26,6	19,1
13	Bilma	0	0	42,3	22,4
14	Bissau	0	0	34,4	-
15	Bobo Dioulasso	0	0	36,6	24,6
16	Brazzaville	36	4	31,5	23,2
17	Casablanca	0	0	23,1	16,8
18	Conakry	91	1	31,7	25,6
19	Cotonou	58	3	31,5	25,8
20	Dakar-Yoff	0	0	26,5	21,1
21	Dar-es-Salaam	0	0	30,7	20,5
22	Douala	30	5	32,0	23,5
23	Durban	0	0	24,3	13,9
24	Entebbe	44	2	-	-
25	Francistown	0	0	27,1	6,0
26	Harare	0	0	23,3	8,0
27	Johannesbourg	0	0	19,3	8,2
28	Khartoum	0	0	42,5	28,6
29	Kigali	0	0	26,4	16,9
30	Kigoma	0	0	28,9	18,9
31	Le Caire	0	0	31,8	21,2
32	Le Cap	27	5	19,0	13,3
33	Libreville	42	6	30,6	24,2
34	Lilongwe	0	0	24,4	9,7
35	Lomé	71	4	33,1	25,7
36	Lusaka	0	0	24,7	10,2
37	Manzini	0	0	24,6	12,3
38	Maputo	0	0	28,3	15,7
39	Maseru	0	0	17,5	5,2
40	Maun	0	0	28,3	11,0
41	Mbeya	0	0	23,5	8,1
42	Nairobi	49	3	23,7	14,3
43	Nampula	0	0	27,0	17,5
44	N'Djamena	0	0	42,0	27,5
45	Niamey-Aéroport	19	3	41,5	28,7
46	Nouakchott	0	0	36,0	21,9
47	Ouagadougou	18	3	38,1	27,4
48	Plaisance	41	6	27,4	21,1
49	Sal	0	0	25,1	20,1
50	Setse Khama Intl Aéro	0	0	24,8	5,5
51	Seychelles	19	2	31,1	26,4
52	Tamanrasset	0	0	35,2	21,6
53	Toalagnaro	115	3	25,8	19,5
54	Tombouctou	5	1	44,1	28,7
55	Tripoli	0	0	33,2	18,4
56	Tunis	3	2	30,8	17,7
57	Windhoek	0	0	24,2	10,1
58	Zinder	1	2	41,7	25,5

NOTE: 0 means no rain;

- means no temperature data available

Data Source: ACMAD / GTS

### 3.OUTLOOK FOR DEKAD (11<sup>th</sup> – 20<sup>th</sup> JUNE, 2009)

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#### 3.1 RAINFALL

The ITD will move northwards maintaining moisture influx and rainfall increase over Gulf of Guinea countries, southern part of the Sahel, northern parts of central Africa and northern GHA countries. There will be rainfall decrease over southern parts of GHA countries with significant decrease over southern Africa countries (Figure 5). 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 over southern parts of the Sahel countries.
- **Gulf of Guinea countries:** will experience rainfall increase recording amounts ranging from 10mm to 150mm with isolated 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 200mm.
- **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 6, 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 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 change include Gulf of Guinea countries, southern part of the Sahel, northern parts of central Africa, northern GHA countries and the Cape region of South Africa.

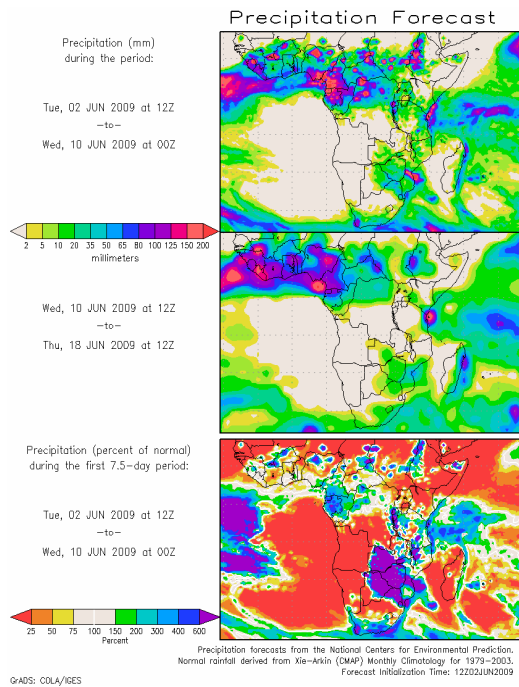
#### 3.4 IMPACTS

**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, the Sahel, central Africa, 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.

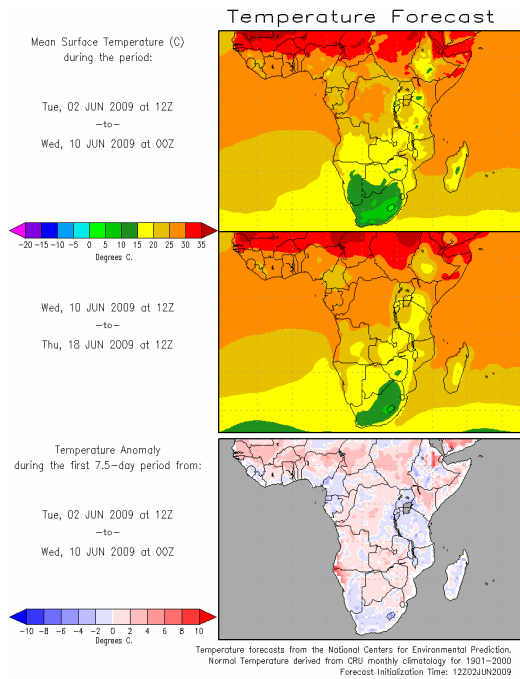
**Agriculture and food security:** The integration of climate information and prediction products in agricultural production is of crucial importance. We often emphasize on the importance of well documented onset dates of seasonal rainfall as well as monitoring of the phenological stages of crops for 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, PRESAC, 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 through enhanced national policies and conservation programmes such as national tree planting,

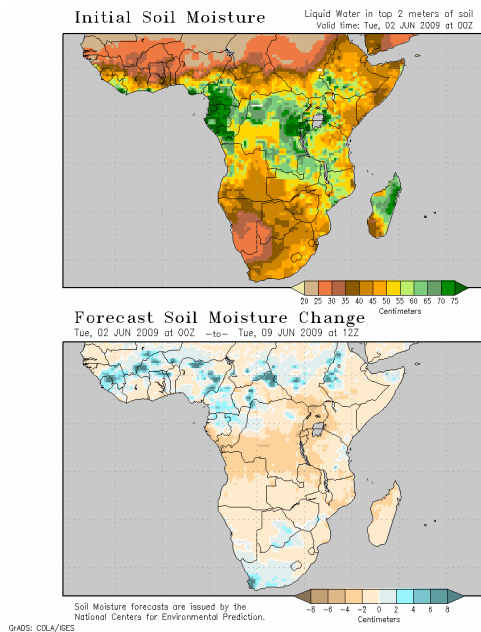
afforestation and soil conservation during rainy seasons to minimize soil loss due to heavy runoff. Enhanced national strategies for adaptation to Climate Change are of highest priority for States' sustainable development.



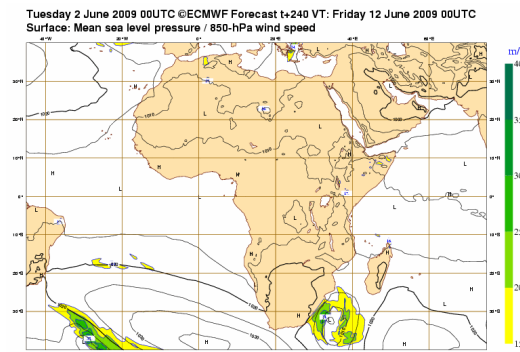
**Figure 5: Precipitation forecast, Source : COLA**



**Figure 6 : Temperature forecast Source : COLA**



**Figure 7 : Soil moisture forecast, Source: COLA**



**Figure 8 : Mean sea Level pressure forecast**  
**Source : ECMWF**