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 21 to 31 July, 2009

HIGHLIGHT: The heaviest rainfall amounts were observed over the northern parts of Gulf of Guinea countries, southern parts of the Sahel, northern central Africa countries and northern parts of GHA countries. The expected rainfall peak in August will be suppressed by evolution of El Nino.

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 1025hPa weakened by 2hPa and shifted northwest compared to the past dekad. Its mean position was located at about 36°N/52°W, extending a ridge over north Morocco and Algeria.

- **St. Helena high:** Pressure of 1033hPa strengthened by 1hPa and shifted southeast at 36°S/02°E with an extended ridge over Gulf of Guinea.

- **Mascarene high:** Pressure of 1033hPa strengthened by 2hPa compared to the past dekad and shifted southeast. Its mean position was located at 32°S/90°E with an extended ridge over Indian Ocean.

- **Saharan Thermal Low:** Pressure at 1006hPa maintained its intensity and shifted westward compared to the previous dekad. Its mean position was located at 22°N/05°W with an extended trough over north Mauritania, Mali, southwest Algeria, west Niger and north Chad.

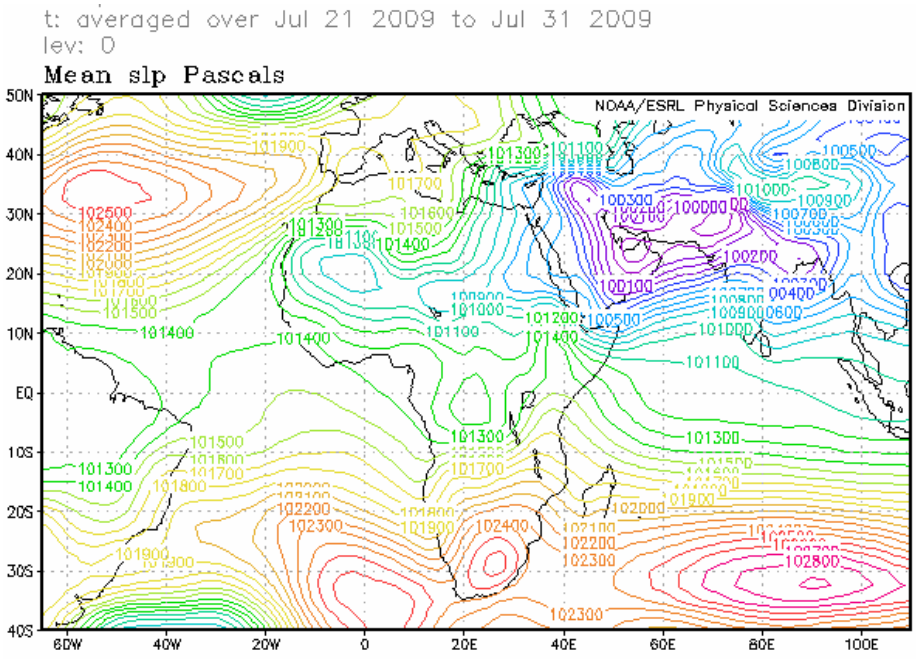

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

- **Inter -Tropical Discontinuity (ITD):** Between the second dekad (blue line) and the third dekad of July (black line), 2009, the ITD (Figure 2) shifted slightly northwards over Mauritania and southwards over centre Sahel especially over northern Mali where the displacement was about 200km and it was quasi stationary over eastern Niger, Chad and Sudan. Comparing the present ITD position to the second dekad of July 2008 (pink line), the second dekad of July (black line), 2009 there is slightly northward of 2008 ITD position over extreme west Sahel and about 200 km southward over the central Sahel and slightly northward over extreme east Sahel. The mean position of 2009 ITD was observed at 17.6°N over longitude 20°W; at 19.9°N and 21.0°N over west and central Mauritania respectively; at 20.5°N and 19.4°N over northwest and east Mali respectively; at 18.6°N and 18,7°N and 18,1°N over extreme northwest, central north and east Niger; at 17.6°N over central north Chad; at 17.5°N and 18.0°N over northwest and north Sudan respectively.

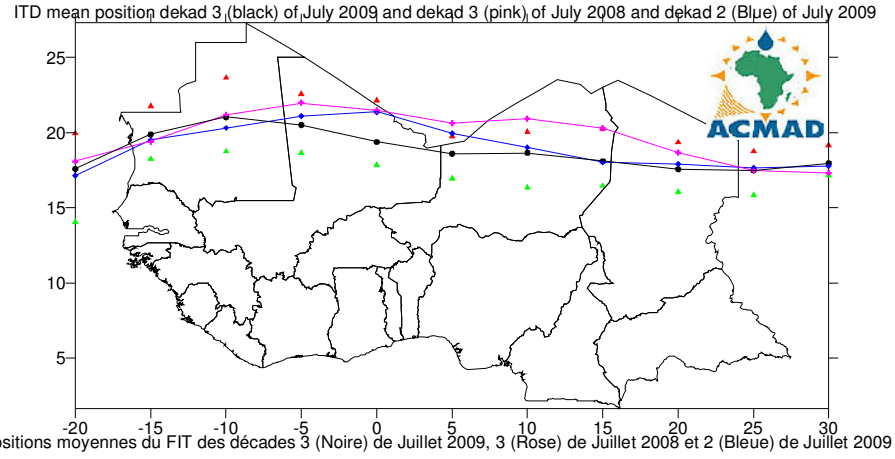

Figure 2 : The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

- **Monsoon:** Monsoon influx at 925hPa level was moderate (5.5 to 11.5m/s) over Gulf of Guinea countries, Burkina Faso, and southwest Niger.

- **African Easterly Jet (AEJ) and Tropical Easterly Jet (TEJ):** The mean speed of the AEJ (figure 3) at 700hPa level was about 16m/s during the dekad with an axis located at about 15°N, stretching from southern Mali, central Senegal up to southwest Cape Verde Island in north Atlantic Ocean (Figure 3).

- **Tropical Easterly Jet:** The core value of the TEJ at 150hPa level was 32m/s at about 10°N of latitude over India extending its axis over northern GHA countries, north-eastern part of Central Africa and eastern part of the Sahel countries (Figure 4).

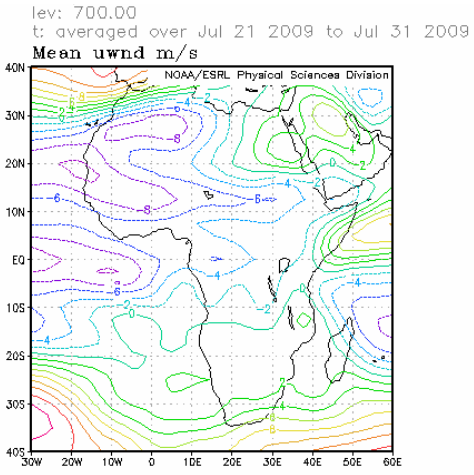

Figure 3: Position of AEJ
(Source: NOAA/NCEP/ESRL: PSD)

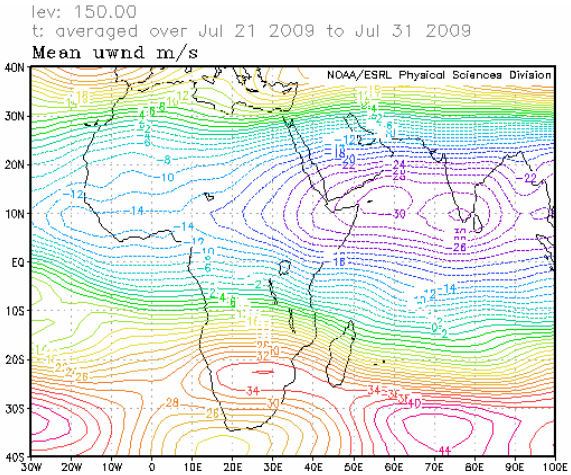

Figure 4: Position of the TEJ
(Source: NOAA/NCEP/ESRL: PSD)

- **Thermal Index (TI):** In the third dekad of July, 2009, the thermal index (TI) regime at 300hPa in (figure 5), had TI regime value of 242°K and above covering extreme northern parts of Central Africa countries, Great Lakes countries and GHA countries with the threshold value of 243°K and above covering the Sahel triggered heavy rains over the areas characterized by high relative humidity(>60%) as observed in Figure 6. The highest thermal index regime of 249°K was located over northern Asia extending into north western Pacific Ocean associated with heavy rainfall with floods.

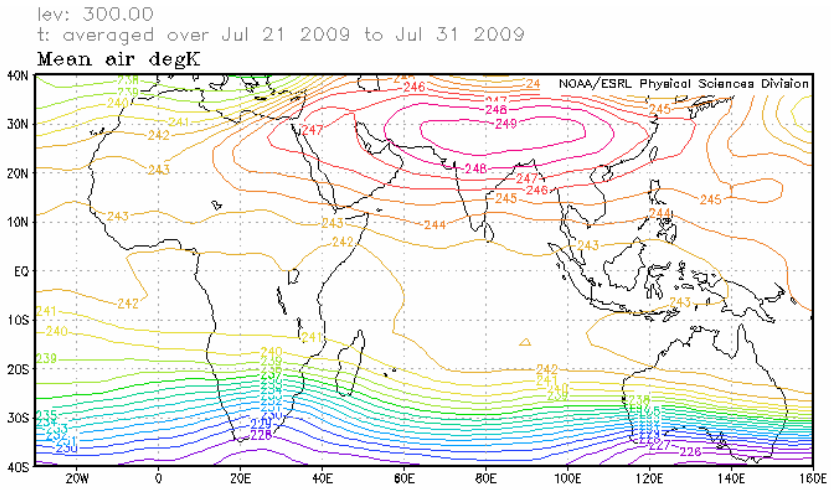

Figure 5: Thermal regimes at 300hPa (Source: NOAA/NCEP/ESRL: PSD)

- **Relative Humidity (RH):** The 850hPa (Figure 6) shows high RH (>70%) in the third dekad of July, 2009 over GHA, Gulf of Guinea countries and northwestern and extreme eastern parts of central Africa countries, southern part of the Sahel and Madagascar. The Sahara, parts the Sahel countries, most parts of Southern Africa countries and southern part of central Africa countries experienced dry conditions characterized by the lowest RH (<40%).

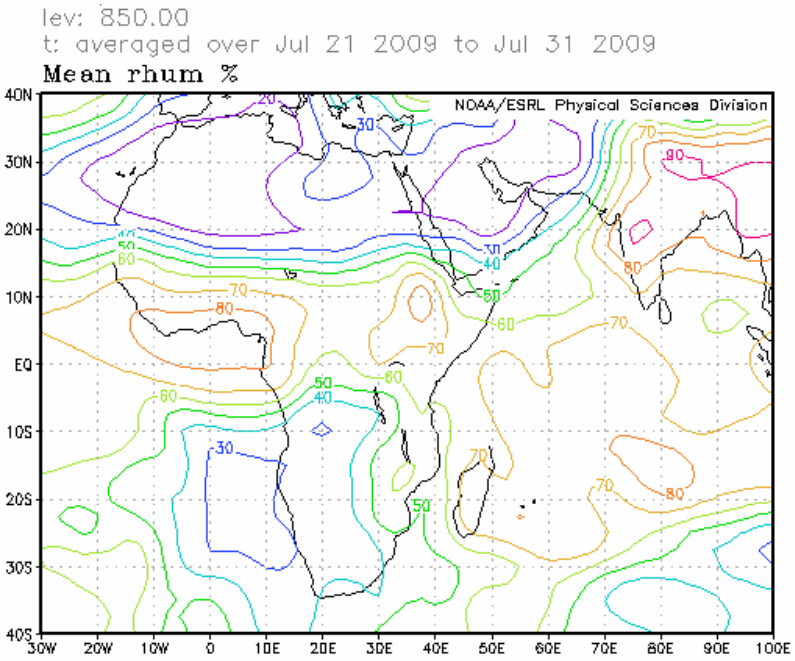

Figure 6: Relative Humidity at 850hPa (Source: NOAA/NCEP/ESRL: PSD)

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 7 below shows slight rainfall distribution increase over the Sahel, Central Africa, GHA and Southern Africa countries while Northern Africa countries experienced non significant change in spatial rainfall distribution and amounts. In detail:

- **North Africa countries:** Non significant rainfall amounts were observed.

- **The Sahel:** had increase rainfall distribution and amounts ranging from 10mm to 100mm with a peak of about 150mm over northern Senegal, western Mali,/Mauritania, Burkina Faso, southwest Niger and Southern Chad.

- **Gulf of Guinea countries:** experienced significant increase in rainfall amounts observed 10mm to 150mm intensifying to about 200mm over south-western Nigeria and Cameroon.

- **Central Africa countries:** had increase in rainfall distribution observing amounts ranging from 10mm to 100mm intensifying to about 200mm over Central Africa Republic.

- **GHA countries:** experienced slight increase in rainfall distribution with amounts ranging from 10mm to 150mm with heaviest amounts of about 200mm over northern Ethiopia and Eritrea.

- **Southern Africa countries:** experienced localized rainfall with amounts ranging from 10mm to 100mm with maximum rainfall above 100mm over Madagascar and Mozambique.

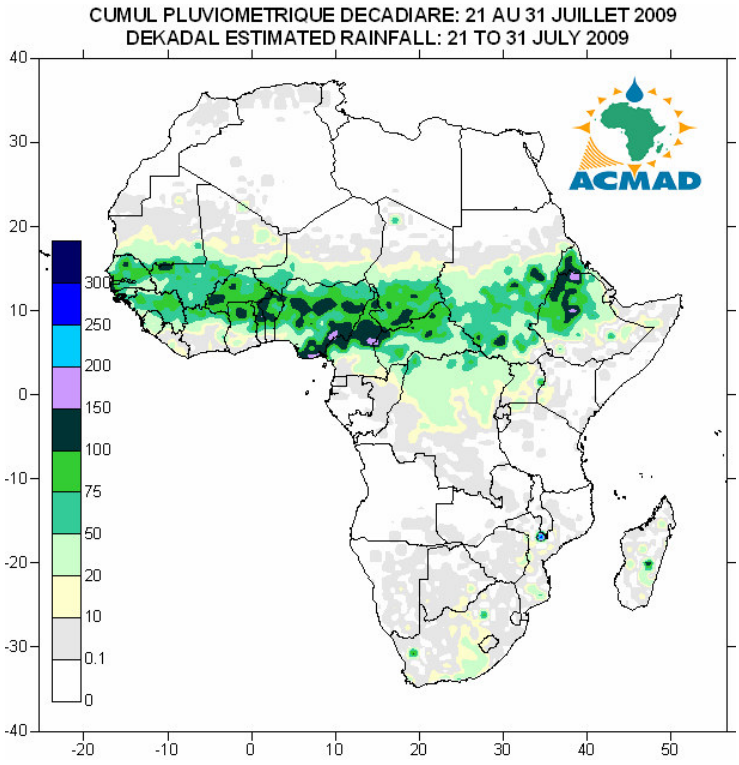

Figure 7: Estimated precipitations, (Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows heaviest cumulative rainfall recorded over Banjul in the Gambia. The lowest temperature of –1.0°C was recorded at Maseru in Lesotho while the highest temperature of 44.7°C was recorded at Djibouti in Djibouti.

N°	STATIONS	Précipitations (mm)	Number of rainy days	Température max mean (°C)	Température min mean (°C)
1	Abidjan	10	3	28,4	23,3
2	Abuja	17	2	29,1	22,8
3	Accra	0	0	27,5	24,4
4	Addis-Abéba	22	2	-	12,8
5	Agadez	2	1	39,3	27,0
6	Alger(Dar El Beida)	4	1	35,5	22,8
7	Antananarivo	0	0	22,2	12,3
8	Antsiranana	10	1	29,7	19,5
9	Bamako-Senou	27	3	32,3	22,4
10	Bangui	17	5	30,8	21,5
11	Banjul	162	6	31,8	23,9
12	Beira	25	3	23,4	15,6
13	Bilma	0	0	-	26,6
14	Bobo Dioulasso	95	6	31,3	22,2
15	Brazzaville	0	0	28,7	19,9
16	Casablanca	0	0	28,7	21,5
17	Conakry	62	1	28,1	-
18	Cotonou	0	0	28,4	25,2
19	Dakar-Yoff	35	3	31,0	26,4
20	Dar-es-Salaam	0	0	30,1	19,3
21	Djibouti	0	0	44,7	-
22	Douala	94	7	28,6	23,8
23	Durban	0	0	22,3	11,0
24	Entebbe	0	0	27,1	19,1
25	Francistown	0	0	20,6	3,4
26	Johannesbourg	0	0	14,6	3,1
27	Khartoum	0	0	37,7	26,4
28	Kigali	0	0	27,9	15,4
29	Kigoma	0	0	28,8	16,5
30	Le Caire	0	0	36,5	24,0
31	Le Cap	6	3	19,0	9,4
32	Libreville	0	0	28,4	21,8
33	Lomé	1	1	28,6	24,3
34	Lusaka	0	0	22,0	6,8
35	Manzini	0	0	-	7,3
36	Maputo	0	0	25,4	11,2
37	Maseru	0	0	-	-1,0
38	Maun	0	0	23,3	6,4
39	Mbeya	0	0	23,4	7,1
40	Nairobi	0	0	22,6	11,3
41	Nampula	4	1	25,8	14,9
42	Ndele (RCA)	40	5	-	20,3
43	N'Djamena	54	4	33,9	24,1
44	Niamey-Aéroport	100	4	34,5	25,3
45	Nouakchott	21	1	30,7	26,5
46	Ouagadougou	43	5	33,2	25,2
47	Plaisance	46	7	25,2	20,3
48	Sal	0	0	30,1	24,2
49	Seretse Khama Intl Aéro	0	0	19,0	2,3
50	Seychelles	84	7	29,2	25,0
51	Tamanrasset	0	0	35,6	22,7
52	Toalagnaro	8	3	23,4	16,5
53	Tombouctou	0	0	39,4	27,8
54	Tripoli	0	0	35,2	20,2
55	Tunis	4	1	36,7	22,4
56	Windhoek	0	0	20,1	5,1
57	Zinder	27	5	34,4	23,9

NOTE: **0** means no rain;

- means no temperature data available

Data Source: ACMAD / GTS

3. OUTLOOK FOR DEKAD (11th - 20th AUGUST, 2009)

3.1 RAINFALL

The ITD will maintain quasi-stationary position with no major impact on moisture influx and rainfall over West Africa, 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 8). In detail**:**

- **North Africa countries:** will experience rainfall increase, amounts ranging from 10mm to 75mm.

- **The Sahel:** will continue to experience increasing temperatures with slight rainfall increase recording amounts ranging from 10mm to 100mm with highest amounts about 150mm over southern parts of the Sahel countries. However, the rainfall will remain depressed due to evolving El Nino.

- **Gulf of Guinea countries:** will experience no significant rainfall increase recording amounts ranging from 10mm to 150mm with peaks ranging from about 200mm to 250mm.

- **Central Africa countries:** will have no significant rainfall increase over northern parts recording amounts ranging from 10mm to 150mm with peaks ranging from about 200mm to 250mm.

- **GHA countries:** will record slight rainfall increase over northern parts with amounts ranging from 10mm to 150mm with peaks of about 200mm to about 250mm.

- **Southern Africa countries:** expected to have slight rainfall increase with amounts ranging from 10mm to 100mm.

3.2 TEMPERATURE

The forecast in Figure 9, 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 10 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 parts of the Sahel, northern central Africa 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 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 with 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 healthcare 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 : While noting that forests serve as water catchments areas, the destruction of forests has been blamed for the declining water levels in the African lakes and rivers. We have to rehabilitate our presently degraded rainfall catchments areas and forests ecosystems through enhanced national policies and conservation strategies 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' enhanced economic growth and sustainable development. Invest in environmental conservation for better tomorrow.

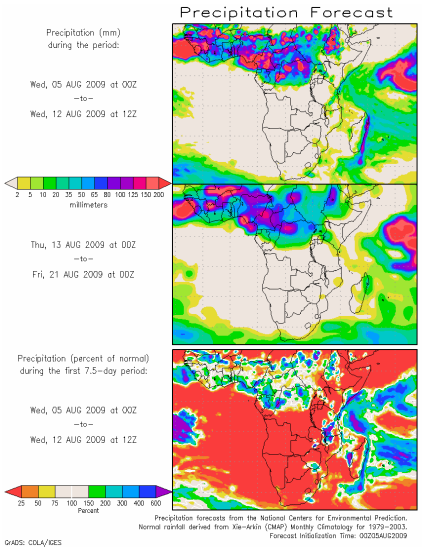

Figure 8: Precipitation forecast, Source : COLA

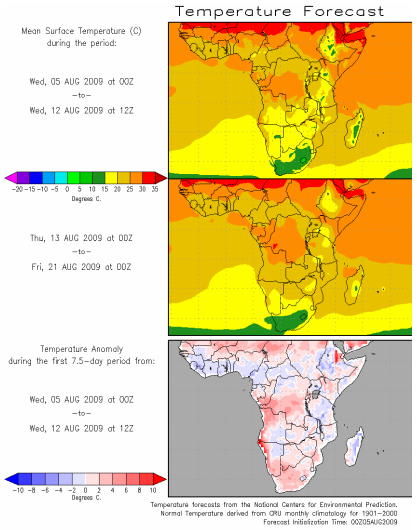

Figure 9 : Temperature forecast Source : COLA

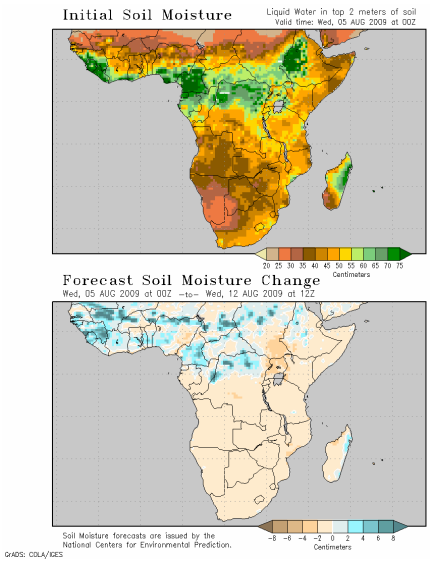

Figure 10 : Soil moisture forecast, Source: COLA

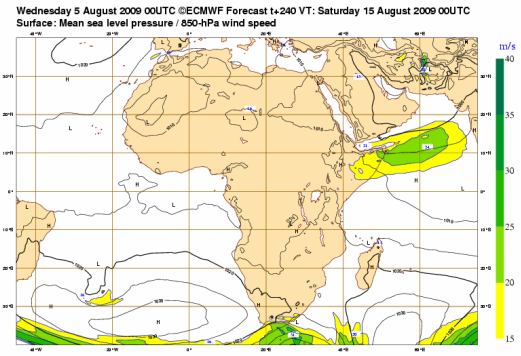

Figure 11 : Mean sea Level pressure forecast

Source : ECMWF