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

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Dekad of 21 to 30 September, 2009

HIGHLIGHT: Heaviest rainfall amounts were recorded over Douala and Ndele in Cameroon and Central Africa Republic respectively. High temperatures were experienced in the Sahel after cessation of JAS rainfall by 29 September, 2009 with mean maximum temperature of 42.9°C recorded at Bilma in Niger.

1. GENERAL SITUATION

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

1.1 SURFACE

- **Azores high:** Pressure of 1028hPa with an SW-NE axis strengthened slightly by 1hPa and shifted northeast compared to the past dekad. Its mean position was located at about 48°N/14°W, extending a ridge over south Morocco and north Algeria.

- **St. Helena high:** Pressure of 1032hPa with an NW-SE axis strengthened by 1hPa and shifted southeast at 37°S/08°E with an extended ridge over south Atlantic Ocean.

- **Mascarene high:** Pressure of 1030hPa with an W-E axis strengthened slightly by 1hPa compared to the past dekad and shifted southwest. Its mean position was located at 33°S/55°E with an extended ridge over Indian Ocean.

- **Saharan Thermal Low:** Pressure at 1007hPa maintained its intensity but shifted west compared to the previous dekad. Its mean position was located at 15°N/15°E with an extended trough over south Mauritania, central Mali, Niger and Chad.

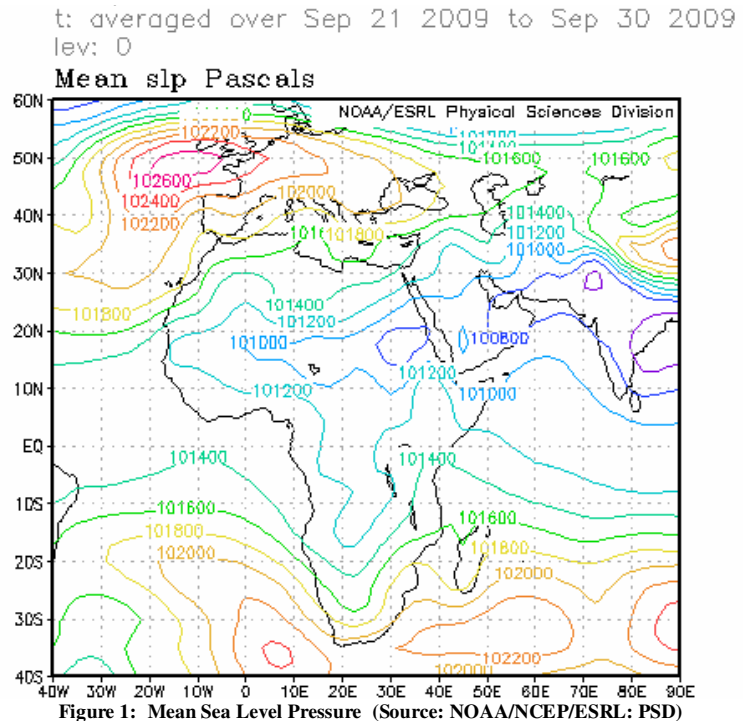

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

- **Inter-Tropical Discontinuity (ITD):** Between the second dekad (blue) and third dekad (black) of September, 2009, the ITD (Figure 2) continued its southwards migration over Mauritania, Niger and Chad and maintained a quasi-stationary position over west Mali and Sudan. The actual ITD position during third dekad of September 2009 was generally south of the same dekad in 2008 (pink line) over the Sahel.

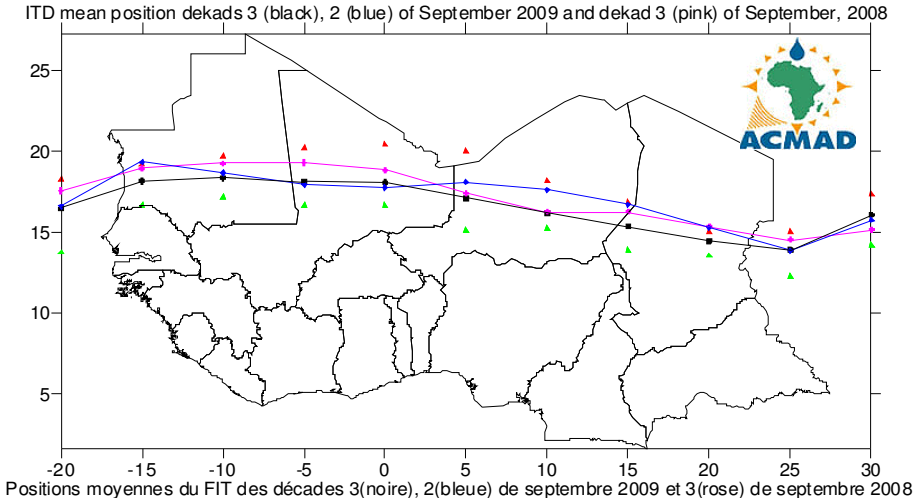

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

- **Monsoon:** Monsoon influx at 925hPa level was moderate (5.5 to 11.5m/s) over Liberia, Burkina Faso, north Ghana and Benin, Nigeria, south Niger and Chad.

- **African Easterly Jet (AEJ):** The mean speed of the AEJ (figure 3) at 700hPa level was about 20m/s during the dekad with an axis located at about 13°N, stretching from southwest Niger, north Burkina Faso, south Mali and Senegal (Figure 3).

- **Tropical Easterly Jet (TEJ):** The core value of the TEJ at 150hPa level was 26m/s at about 08°N of latitude over off coast India extending its axis over north-eastern GHA countries, with secondary core of 12m/s at about 5°N over Gulf of Guinea and its countries (Figure 4).

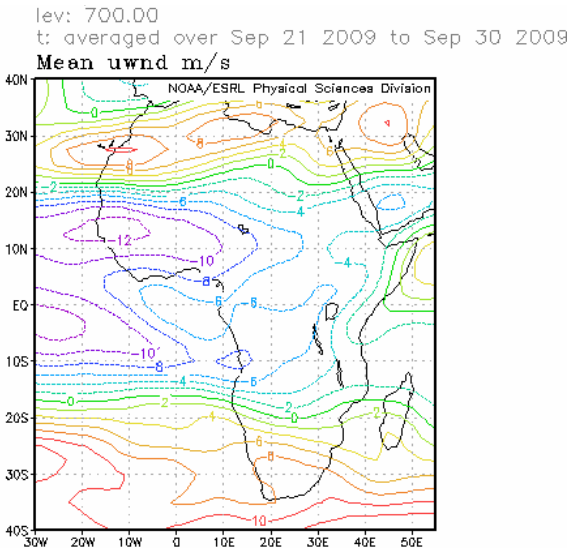

Figure 3: Position of AEJ
(Source: NOAA/NCEP/ESRL: PSD)

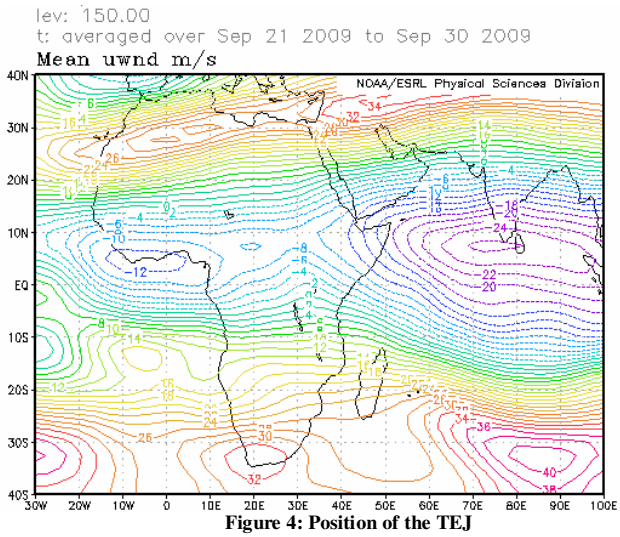

Figure 4: Position of the TEJ
(Source: NOAA/NCEP/ESRL: PSD)

- **Thermal Index (TI):** In the third dekad of September, 2009, the thermal index (TI) regime at 300hPa in (figure 5), had TI regime value of 242°K covering northern part of Central Africa countries, GHA

countries and the Sahel extending south to about 10°S triggering moderate rainfall over the areas characterized by high relative humidity as observed in Figure 6. The high TI regime of 243°K extended into extreme northeastern Africa, north and eastern Indian Ocean, northern Australia with higher values over north western Pacific attaining the highest TI regime of 246°K over northeastern Asia, associated with heavy rainfall with floods.

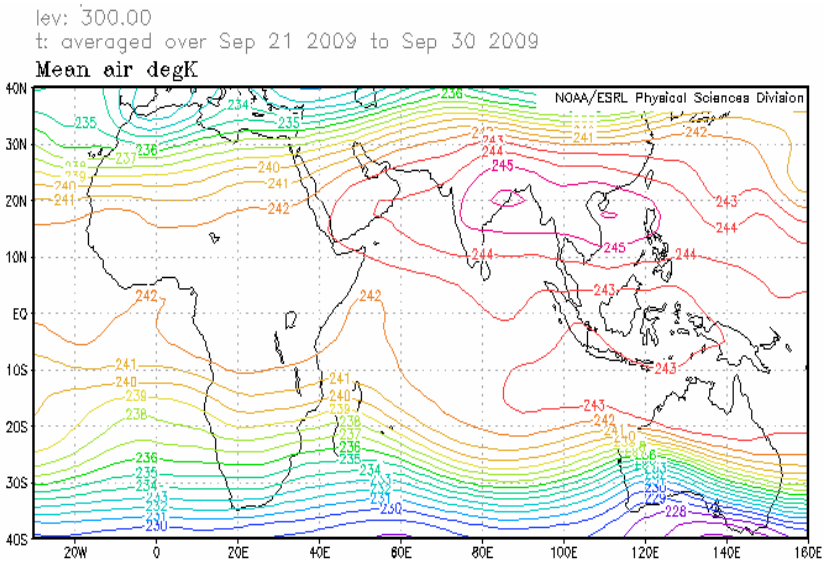

Figure 5: Thermal regimes at 300hPa (Source: NOAA/NCEP/ESRL: PSD)

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

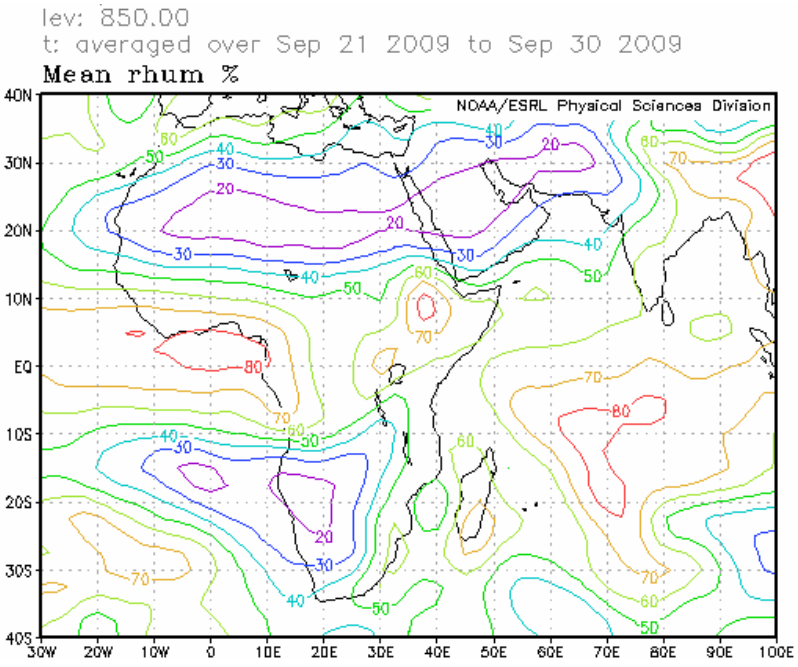

Figure 6: Relative Humidity at 850hPa (Source: NOAA/NCEP/ESRL: PSD)

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 rainfall distribution increase over Northern Africa, GHA, Central Africa and Southern Africa countries, while the Sahel and Gulf of Guinea countries had slight decrease in rainfall distribution. In detail:

- **North Africa countries:** rainfall distribution and amounts increase observing 10mm to 100mm with maximum amounts ranging between 100mm to 150mm over extreme north Algeria.
- **The Sahel:** had a decrease in rainfall distribution and amounts observing amounts ranging from 10mm to 100mm.
- **Gulf of Guinea countries:** experienced slight rainfall distribution and amounts decrease ranging from 10mm to 100mm.
- **Central Africa countries:** observed significant rainfall distribution increase, but with amounts decrease ranging from 10mm to 100mm with peaks between 100 to 150mm over Angola and Democratic Republic of Congo.
- **GHA countries:** experienced slight increase in rainfall distribution observing amounts ranging from 10mm to 100mm with peaks of about 150mm over Ethiopia and Sudan.
- **Southern Africa countries:** Experienced increase in rainfall distribution and amounts ranging from 10mm to 100mm.

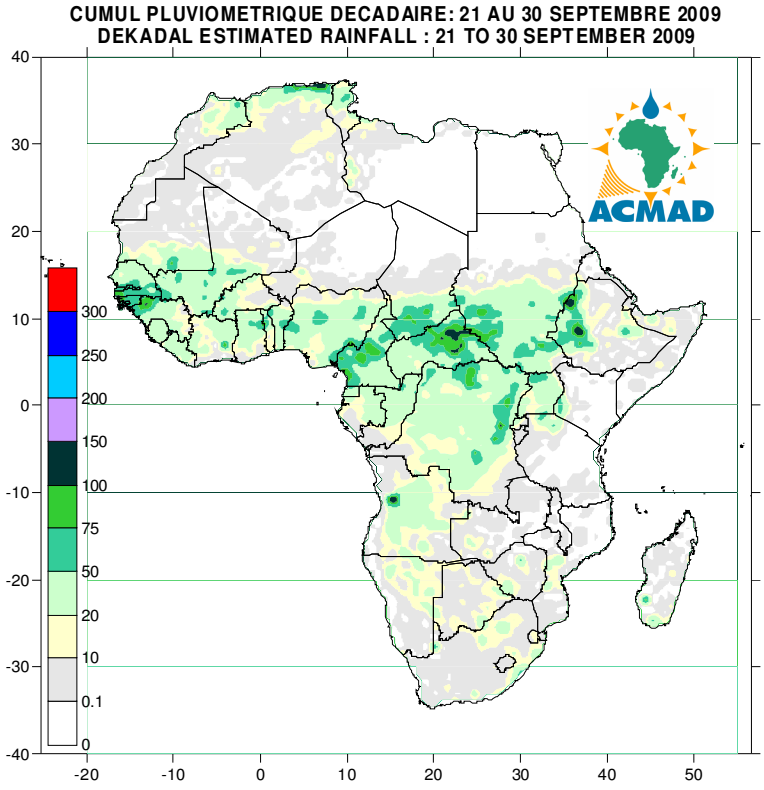

Figure 7: Estimated precipitations, (Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows heaviest cumulative rainfall recorded over Douala in Cameroon. The lowest temperature of 10.0°C was recorded at Maseru in Lesotho while the highest temperature of 42.9°C was recorded at Bilma in Niger.

N°	STATIONS	Precipitations (mm)	Number of rainy days	Temperature max mean (°C)	Temperature Min mean (°C)
1	Abidjan	1	1	29,5	23,3
2	Abuja	40	3	-	21,7
3	Accra	4	1	30,2	23,7
4	Agadez	0	0	41,7	27,6
5	Alger(Dar El Beida)	49	5	24,8	16,8
6	Antananarivo	1	1	26,3	13,9
7	Antsiranana	2	1	30,9	20,4
8	Bamako-Senou	28	2	32,9	22,7
9	Bangui	9	3	32,6	21,6
10	Banjul	30	2	31,7	23,4
11	Beira	9	1	28,9	21,2
12	Bilma	0	0	42,9	23,5
13	Bobo Dioulasso	42	4	32,8	21,8
14	Brazzaville	3	1	31,8	22,2
15	Casablanca	0	0	24,6	18,3
16	Conakry	31	3	29,4	-
17	Cotonou	0	0	29,5	24,5
18	Dakar-Yoff	38	2	31,2	26,5
19	Dar-es-Salaam	0	0	31,8	19,7
20	Douala	99	4	31,0	23,1
21	Durban	42	5	22,8	15,6
22	Entebbe	0	0	-	19,0
23	Francistown	30	4	28,5	15,4
24	Johannesbourg	19	2	23,3	12,1
25	Khartoum	0	0	41,7	29,3
26	Kigali	0	0	27,5	16,6
27	Kigoma	0	0	32,0	19,0
28	Le Caire	0	0	32,2	22,3
29	Le Cap	15	1	17,9	11,1
30	Libreville	11	3	29,1	23,4
31	Lomé	14	2	30,1	24,1
32	Lusaka	0	0	32,0	16,9
33	Manzini	8	3	-	15,1
34	Maputo	0	0	28,4	18,3
35	Maseru	4	2	-	10,0
36	Maun	1	1	31,7	17,4
37	Mbeya	0	0	27,6	11,0
38	Nairobi	0	0	28,0	14,0
39	Nampula	0	0	-	19,1
40	Ndele (RCA)	60	5	31,0	19,1
41	N'Djamena	0	0	37,7	24,2
42	Niamey-Aéroport	2	1	37,3	26,3
43	Nouakchott	0	0	37,5	28,0
44	Ouagadougou	0	0	35,5	24,7
45	Plaisance	12	3	25,6	18,7
46	Sal	0	0	30,3	-
47	Seretse Khama Intl Aéro	13	2	27,8	13,9
48	Seychelles	36	4	30,2	25,2
49	Tamanrasset	1	1	34,6	21,3
50	Toalagnaro	62	4	24,3	19,7
51	Tombouctou	6	1	40,8	26,6
52	Tripoli	9	2	31,6	20,8
53	Tunis	14	4	27,4	20,6
54	Windhoek	3	2	30,2	14,9
55	Zinder	2	1	39,2	25,8

Data Source: ACMAD / GTS

NOTE : 0 mean : no precipitations
- mean : missed data ou incomplètes.

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

3.1 RAINFALL

The ITD continued southward displacement associated with significant reduction of moisture influx marked the cessation of JAS seasonal rainfall over the Sahel. The convective rainfall activities will intensifying over Gulf of Guinea countries, central Africa, the northern and western extending into central parts of GHA countries. Rainfall deficits will continue over extreme southern parts of GHA countries with some relief from dry conditions prevailing over most of southern Africa countries due to persistent low relative humidity. In detail**:**

- **North Africa countries:** will experience slight rainfall increase with amounts ranging from 10mm to 100mm.

- **The Sahel:** will continue to experience high temperatures marking the onset of acute dry conditions after cessation of the JAS rainfall season over the Sahel.

- **Gulf of Guinea countries:** will experience rainfall increase recording amounts ranging from 10mm to 150mm with peaks of about 200mm and above.

- **Central Africa countries:** will have rainfall increase recording amounts ranging from 10mm to 150mm with peaks ranging from about 200mm and above.

- **GHA countries:** will have rainfall increase over northern, western and central parts observing amounts ranging from 10mm to 150mm with peaks of about 200mm and above.

- **Southern Africa countries:** prevailing dry conditions will be expected to have brief relief over limited parts that will record rainfall ranging from 02mm to 80mm over most of south intensifying over eastern parts with peaks of about 100mm.

3.2 TEMPERATURE

The forecast in Figure 9, shows that high temperature will be experienced in the Gulf of Guinea countries, the Sahel, northern parts of central Africa and parts of GHA countries. The highest forecast temperatures ranging from 20°C to 35°C will cover more than 70% of the Continent.

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 high soil moisture change include few parts in the Sahel, with highest in central Africa countries, western and northern parts of GHA countries and central and eastern parts of Southern Africa.

3.4 IMPACTS

Health: The incidences of malaria and other climate related diseases are higher in areas with high temperatures during rainy period. 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 Gulf of Guinea, few parts in extreme southern parts of the Sahel, central Africa, parts of GHA and limited parts of southern Africa countries with high humidity/rainfall coupled with prevailing conducive temperatures will support the survival of parasite resulting in higher incidences of malaria including other climate related diseases. 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 prediction products and information in agricultural production and food security is of crucial importance. We have emphasized on the importance of skilful prediction of seasonal rainfall onset dates and suitable planting dates 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 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 forecasts, 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. The prevailing protracted drought over parts of eastern African associated with the evolving El Niño comes to an end and the States hopefully have to put in place mitigation strategies to cope with heavy rains with floods expected to hit the countries in November/December, 2009 at the peak of the El Niño.

African Ecosystems: While noting that forests serve as rainfall catchment 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 catchment areas and forests ecosystems through enhanced national policies and environmental reclamation strategies. Good practices in ecosystems rehabilitation include national tree planting, afforestation and soil conservation to minimize soil loss during rainy seasons due to heavy runoff. Enhanced national strategies and policies for adaptation to Climate Change are of highest priority for States' enhanced economic growth for sustainable development and the achievement of the United Nations millennium development goals (MDGs). The countries have to invest in environmental conservation now for better tomorrow.

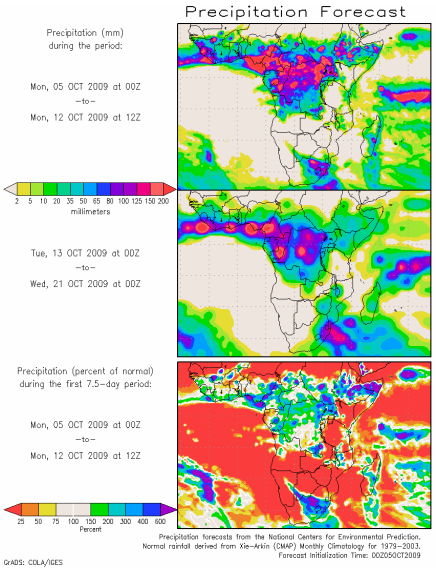

Figure 8: Precipitation forecast, Source : COLA

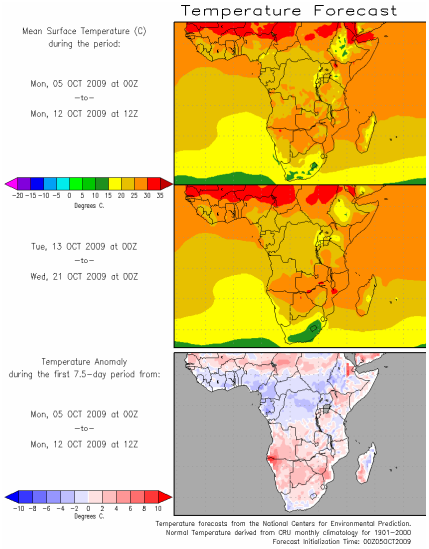

Figure 9 : Temperature forecast Source : COLA

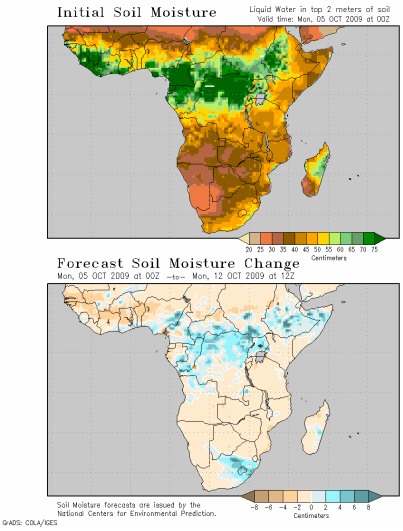

Figure 10 : Soil moisture forecast, Source: COLA

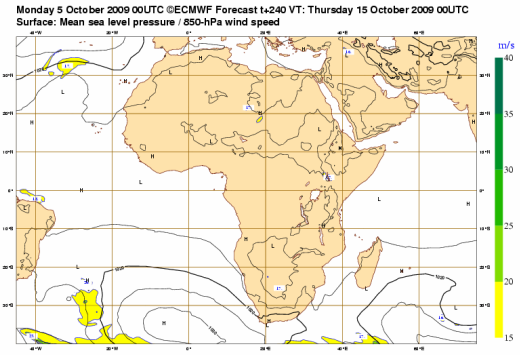

Figure 11 : Mean Sea Level pressure forecast Source : ECMWF