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

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Dekad of 11 to 20 October, 2009

HIGHLIGHT: Highest rainfall amounts were recorded at Douala in Cameroon and Libreville in Gabon while high temperatures were experienced in the Sahel with mean maximum temperature of 40.6°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 1025hPa with an SW-NE axis intensified slightly by 1hPa and shifted northeast compared to the past dekad. Its mean position was located at about 50°N/00°W, extending a ridge over north Algeria.

- **St. Helena high:** Pressure of 1029hPa with an SE-NW axis weakened slightly by 2hPa and shifted northwest at 28°S/08°W with an extended ridge over South Atlantic Ocean.

- **Mascarene high:** Pressure of 1030hPa with a W-E axis maintained its intensity compared to the past dekad and shifted southeast. Its mean position was located at 32°S/95°E with an extended ridge over Indian Ocean.

- **Saharan Thermal Low:** Pressure at 1006hPa deepened by 2hPa and shifted southeast compared to the previous dekad. Its mean position was located at 14°N/16°E with an extended trough over east Mali, central Niger and south Chad.

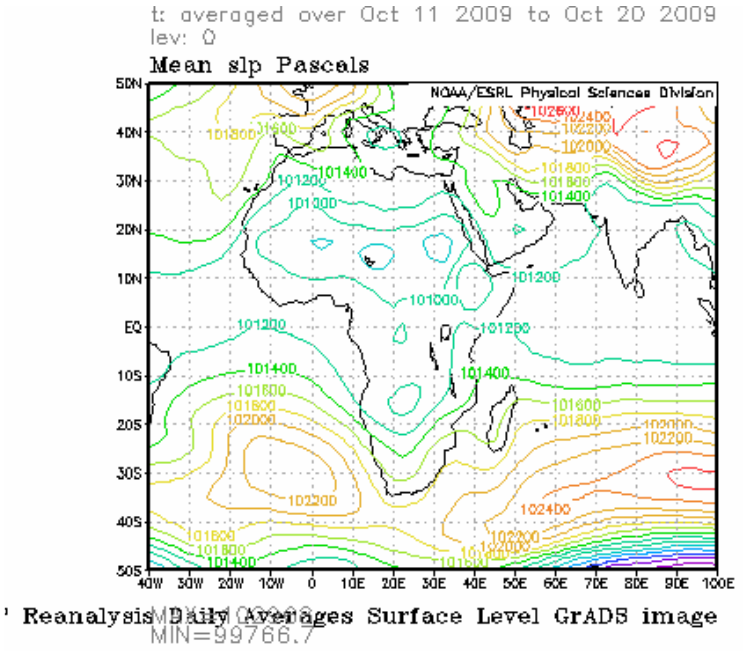

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

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- **Inter-Tropical Discontinuity (ITD):** Between the first dekad (blue) of October and second dekad (black) of October, 2009 in (Figure 2), the ITD continued its southwards migration over western of the Sahel while the eastern part covering Niger and western Chad shifted northward.

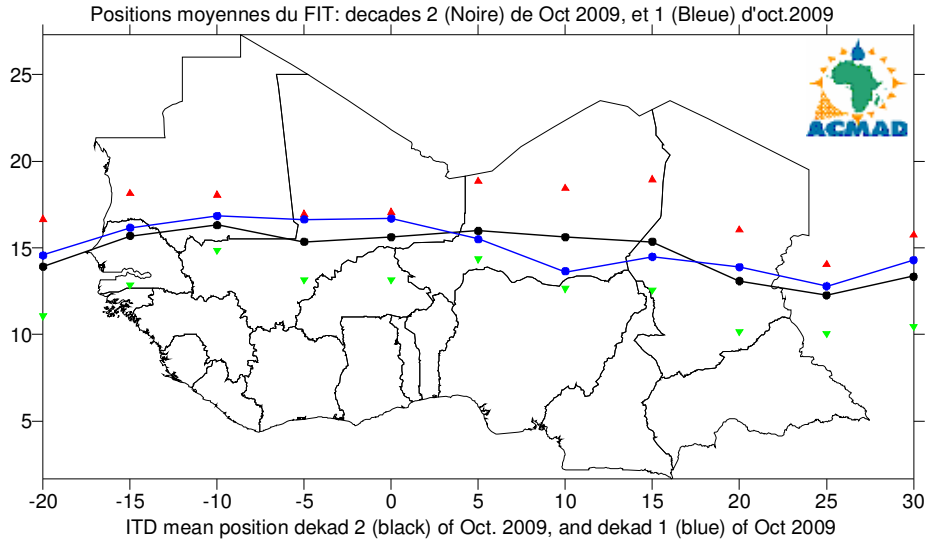

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

- **Monsoon:** Monsoon influx at 925hPa level was moderate (5.5 to 11.5m/s) over Côte d'Ivoire, Burkina Faso, Ghana, Togo, Benin, Nigeria and south Niger.

- **African Easterly Jet (AEJ):** The mean speed of the AEJ (figure 3) at 700hPa level was above 10m/s with double maxima over Guinea Bissau, Senegal up to south of Cape Verde Island and south Atlantic (Figure 3).

- **Tropical Easterly Jet (TEJ):** The TEJ at 150hPa core over Africa was 10m/s at about 5°N of Equator off coast Liberia/Cote d'Ivoire (Figure 4).

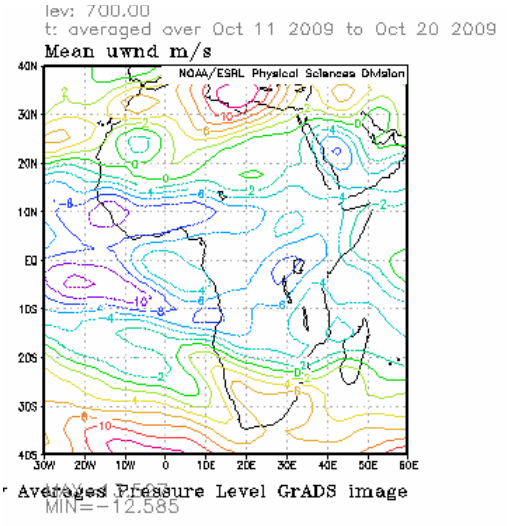

Figure 3: Position of AEJ
(Source: NOAA/NCEP/ESRL: PSD)

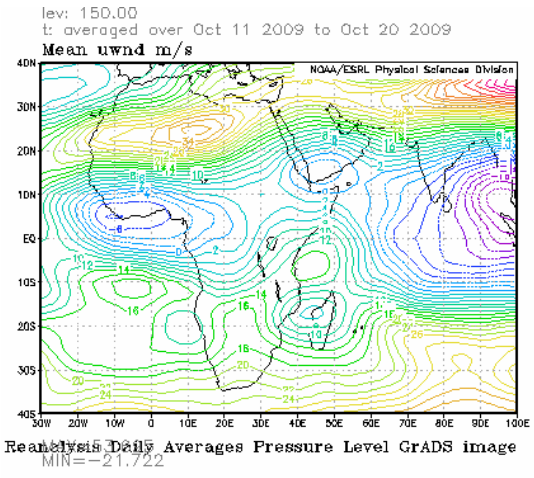

Figure 4: Position of the TEJ
(Source: NOAA/NCEP/ESRL: PSD)

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- **Thermal Index (TI):** In second dekad of October, 2009, the thermal index (TI) regime at 300hPa in (figure 5), had TI regime value of above 242°K covering the Sahel, Gulf of Guinea countries, Central Africa countries, GHA countries triggering moderate rainfall over the areas characterized by high relative humidity as observed in Figure 6. High TI regime of 242.5°K over Central Africa countries and western GHA countries were associated with heavy rainfall with floods with the worst over Asia.

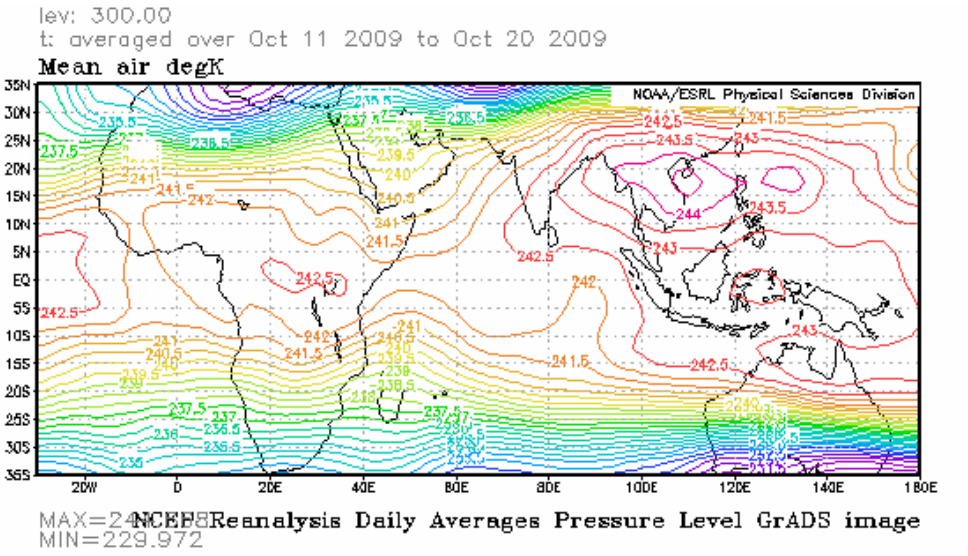

Figure 5: Thermal regimes at 300hPa (Source: NOAA/NCEP/ESRL: PSD)

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

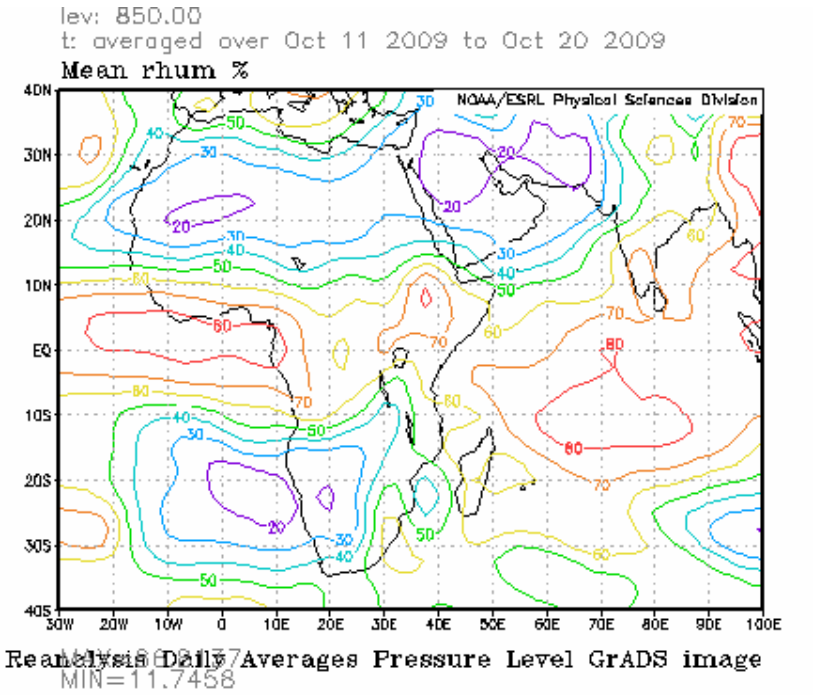

Figure 6: Relative Humidity at 850hPa (Source: NOAA/NCEP/ESRL: PSD)

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2. RAINFALL AND TEMPERATURE SITUATION

Subsection 2.1 provides a summary on estimated rainfall amounts and distribution while subsection 2.2 provides a Table showing stations' observed rainfall, number of rainy days, mean maximum and mean minimum temperatures.

2.1 RAINFALL

The rainfall estimate based on Satellite and Rain Gauge in Figure 7 below shows rainfall decrease over the Sahel, Gulf of Guinea countries and southern Africa countries, while the Central Africa, Northern Africa and GHA countries had decrease in rainfall distribution. In detail:

- **North Africa countries:** had rainfall decrease amounts ranging from 10mm to 50mm over northern Morocco and northern Tunisia
- **The Sahel:** had an in rainfall increase amounts ranging from 10mm to 75mm over its southern part covering Senegal, western Mali, entire Burkina Faso, south western Niger and south Chad.
- **Gulf of Guinea countries:** continued to receive rainfall amounts ranging from 10mm to 100mm with maximum of about 150mm over northwest Guinea, coast and eastern Nigeria/Cameroon.
- **Central Africa countries:** observed moderate rainfall amounts ranging from 10mm to 100mm with peaks of about 150mm over Gabon northern Congo, central Democratic Republic of Congo.
- **GHA countries:** experienced significant increase in rainfall distribution over north and eastern parts amounts ranging from 10mm to 100mm with peaks of about 150mm over eastern Ethiopia, northern and central Kenya and most of Somalia.
- **Southern Africa countries:** continued to get rainfall with amounts ranging from 0mm to 50mm with maximum of about 100mm over central and eastern South Africa and Lesotho.

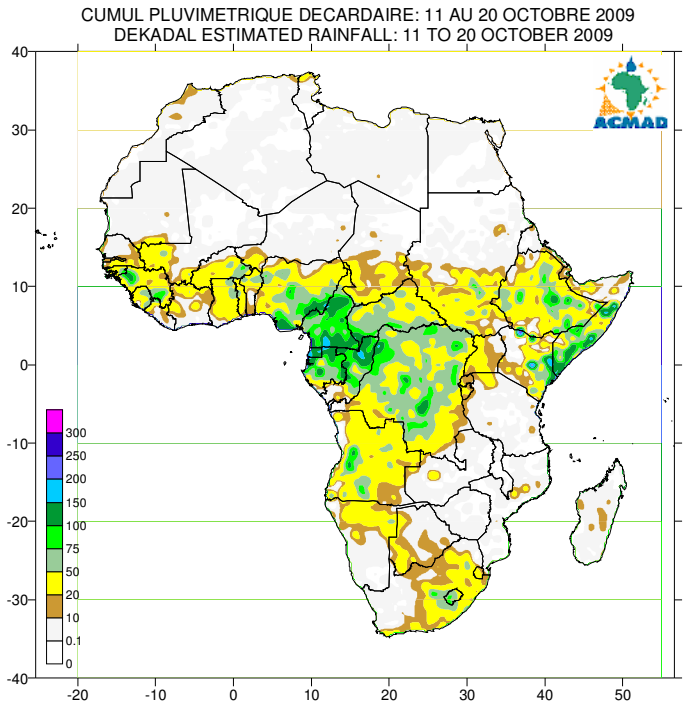

Figure 7: Estimated precipitations, (Data Source: NOAA/NCEP)

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2.2 OBSERVED DATA

The Table below shows heaviest cumulative rainfall recorded over Douala in Cameroon and Libreville in Gabon while high temperatures were experienced in the Sahel with mean maximum temperature of 40.6°C 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	30,5	23,9
2	Abuja	24	2	29,4	21,7
3	Accra	0	0	30,6	24,0
4	Addis Abéba	0	0	22,1	10,7
5	Agadez	0	0	39,2	24,1
6	Alger(Dar El Beida)	5	1	23,9	11,0
7	Antananarivo	8	1	26,3	13,4
8	Antsiranana	0	0	31,3	21,2
9	Bamako-Senou	5	3	35,1	21,8
10	Bangui	56	4	30,4	21,6
11	Banjul	14	2	31,9	23,7
12	Beira	0	0	30,3	22,9
13	Bilma	0	0	40,6	20,5
14	Bobo Dioulasso	28	4	33,3	21,8
15	Brazzaville	34	6	31,9	23,4
16	Casablanca	11	1	-	-
17	Cotonou	0	0	29,8	25,3
18	Dakar-Yoff	33	2	31,1	25,9
19	Dar-es-Salaam	0	0	33,0	22,0
20	Douala	128	6	29,5	23,6
21	Durban	29	6	23,4	17,3
22	Entebbe	11	1	-	18,5
23	Francistown	0	0	32,8	19,1
24	Johannesbourg	59	4	25,1	13,1
25	Khartoum	0	0	39,8	29,2
26	Kigoma	3	1	30,8	20,5
27	Le Caire	0	0	34,0	22,6
28	Le Cap	4	3	19,0	12,5
29	Libreville	159	6	28,1	22,9
30	Lomé	1	1	31,2	24,4
31	Lusaka	0	0	32,9	16,9
32	Manzini	20	2	-	16,0
33	Maputo	1	1	28,5	19,6
34	Maseru	37	3	-	10,1
35	Maun	0	0	35,6	21,6
36	Mbeya	0	0	27,6	14,3
37	Nairobi	35	3	25,5	13,7
38	Nampula	6	1	33,9	19,0
39	Ndele (RCA)	28	4	32,1	18,5
40	N'Djamena	4	1	38,5	23,0
41	Niamey-Aéroport	35	1	38,4	26,2
42	Nouakchott	0	0	32,1	23,9
43	Ouagadougou	24	2	36,2	24,5
44	Plaisance	8	6	26,6	20,4
45	Sal	0	0	29,6	24,6
46	Seretse Khama Intl Aéro	0	0	28,7	16,9
47	Seychelles	57	7	30,7	25,2
48	Tamanrasset	0	0	30,3	18,0
49	Toalagnaro	7	4	27,6	21,0
50	Tombouctou	0	0	40,2	22,3
51	Tripoli	4	2	28,8	15,4
52	Tunis	15	7	22,6	14,9
53	Windhoek	0	0	28,6	15,4
54	Zinder	0	0	38,1	23,6

Data Source: ACMAD / GTS

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

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3. OUTLOOK FOR DEKAD (01st - 10th NOVEMBER, 2009)

3.1 RAINFALL

The continued southward displacement ITD will be associated with the continued dry conditions characterized by high temperature and dust over the Sahel countries. The convective rainfall activities will decrease slightly over Gulf of Guinea countries, but intensify over central Africa and GHA countries. Rainfall deficits will continue over southern Africa countries, but the eastern part of South Africa will get substantial rainfall. In detail**:**

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

- **The Sahel:** will continue to experience dry conditions characterized by high temperatures and dust over northern part of the Sahel while some limited parts in the south will record some rainfall amounts ranging from10mm to 100mm.

- **Gulf of Guinea countries:** will experience rainfall decrease recording amounts ranging from 10mm to 100mm with peaks of about 150mm.

- **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 heavy rainfall over several parts observing amounts ranging from 20mm to 250mm with maxima peaks of 300mm and above resulting in floods.

- **Southern Africa countries:** Rainfall ranging from 5mm to 80mm over eastern parts with peaks of about 100mm and above over eastern South Africa.

3.2 TEMPERATURE

The forecast in Figure 9, shows that high temperature will be experienced in the Sahel, southern 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 Gulf of Guinea countries, central Africa countries, eastern parts of GHA countries and eastern parts 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 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 into 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

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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/Chad/Cameroon, central Africa, and southern Africa countries respectively. The eastern Africa countries drought ended and now the countries have to prepared on how to cope with heavy rains and floods expected to intensify by November/December, 2009 at the peak of the El Niño. Rain harvesting is recommended particularly in the Arid and Semi-Arid Lands (ASLS).

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.

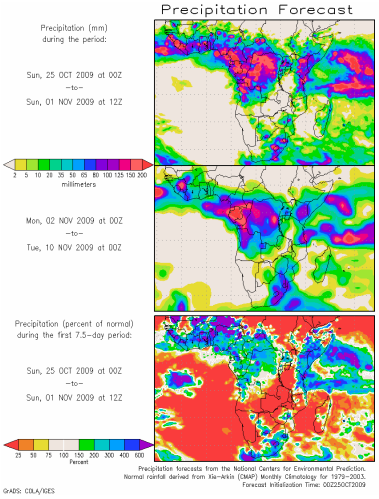

Figure 8: Precipitation forecast, Source : COLA

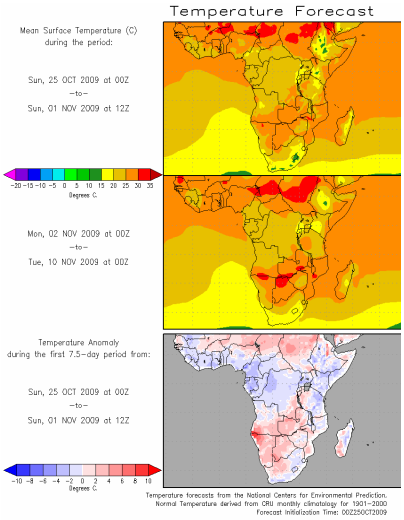

Figure 9 : Temperature forecast Source : COLA

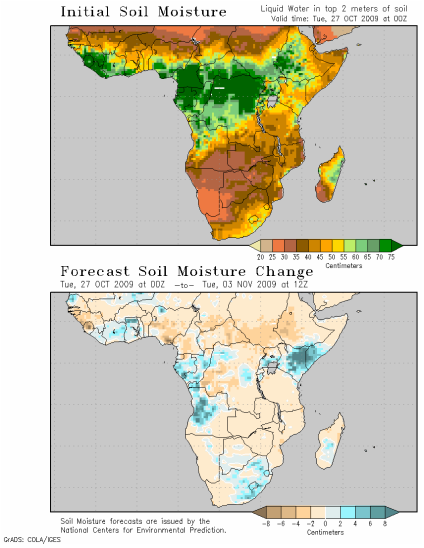

Figure 10 : Soil moisture forecast, Source: COLA

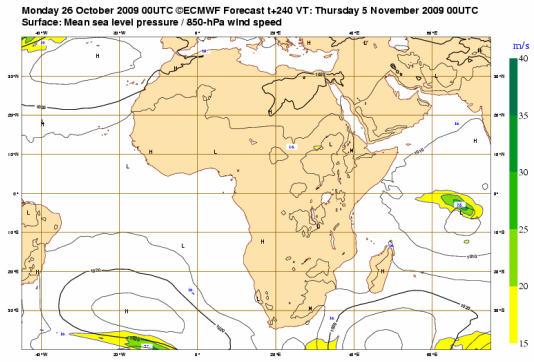

Figure 11 : Mean Sea Level pressure forecast Source : ECMWF

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