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 01 to 10 October, 2009

HIGHLIGHT: Highest cumulative rainfall amounts were recorded at Seychelles and Douala in Cameroon while high temperatures were experienced in the Sahel with mean maximum temperature of 42.3°C recorded at Tombouctou in Mali.

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 1024hPa with an SW-NE axis weakened significantly by 4hPa and shifted southwest compared to the past dekad. Its mean position was located at about 28°N/17°W, extending a ridge over Morocco and north Algeria.

- **St. Helena high:** Pressure of 1031hPa with an NW-SE axis weakened slightly by 1hPa and shifted southwest at 38°S/06°E 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 northeast. Its mean position was located at 30°S/81°E with an extended ridge over Indian Ocean.

- **Saharan Thermal Low:** Pressure at 1008hPa filled up by 1hPa, but shifted west compared to the previous dekad. Its mean position was located at 16°N/02°E with an extended trough over central Mali, south Niger and central Chad.

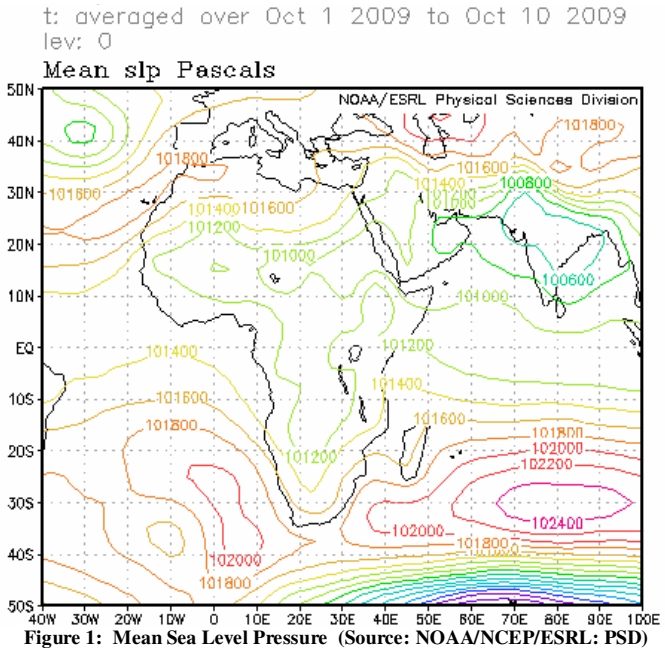

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

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- **Inter-Tropical Discontinuity (ITD):** Between the third dekad (blue) of September and the first dekad (black) of October, 2009 in (Figure 2) continued its southwards migration over the Sahel with significant migration of about 300Km over southwest Niger.

The current ITD position is generally south of that of the same dekad (pink) in 2008 over the Sahel.

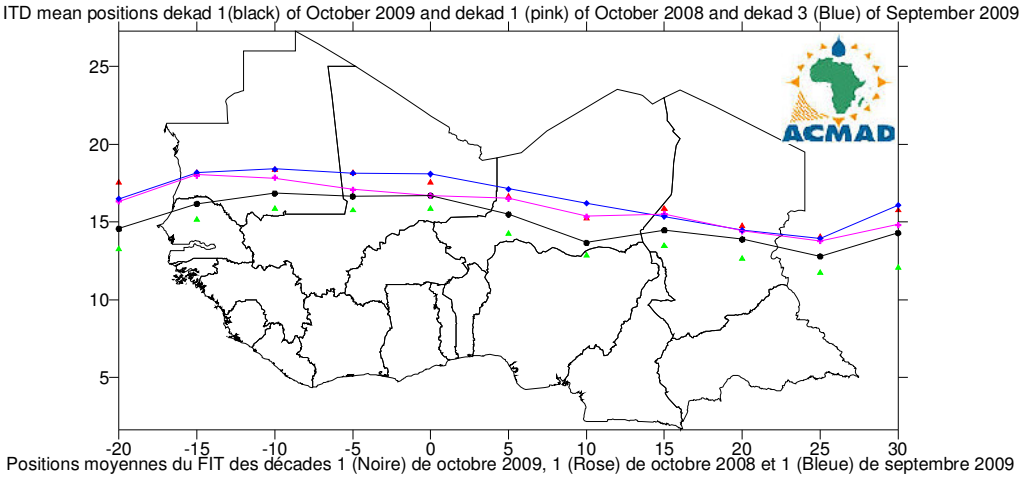

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

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

- **African Easterly Jet (AEJ):** The mean speed of the AEJ (figure 3) at 700hPa level was about 19m/s During the dekad with an axis located at about 12°N; stretching from Guinea Bissau, Senegal up to south of Cape Verde Island (Figure 3).

- **Tropical Easterly Jet (TEJ):** The core value of the TEJ at 150hPa level was 22m/s at about 10°N of latitude over southern India extending its axis over north-eastern GHA countries, with secondary core of 10m/s at about 5°N over off coast Liberia/Cote d'Ivoire (Figure 4).

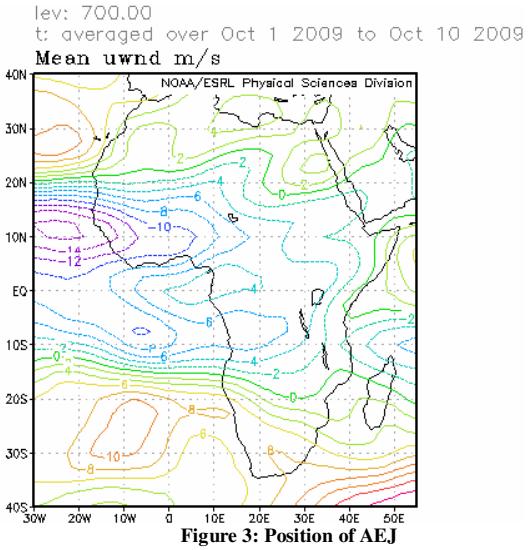

Figure 3: Position of AEJ
(Source: NOAA/NCEP/ESRL: PSD)

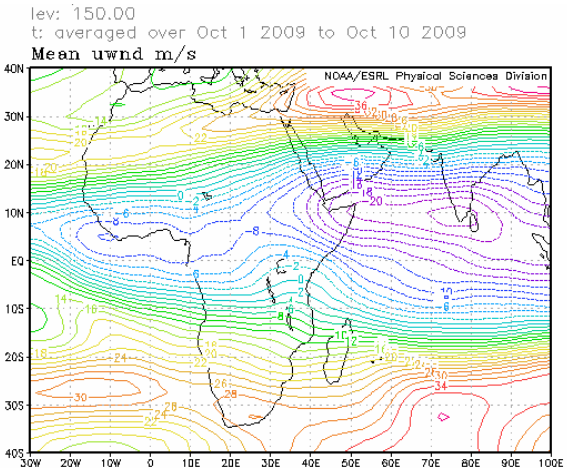

Figure 4: Position of the TEJ
(Source: NOAA/NCEP/ESRL: PSD)

- **Thermal Index (TI):** In first dekad of October, 2009, the thermal index (TI) regime at 300hPa in (figure 5), had TI regime value of 242°K covering the Sahel, Gulf of Guinea countries, Central Africa

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countries, GHA countries triggering moderate rainfall over the areas characterized by high relative humidity as observed in Figure 6. High TI regime of 243°K extended over north Central Africa countries and northern GHA countries with double maxima of 245°K over India and north western Pacific Ocean associated with heavy rainfall with floods over Asia.

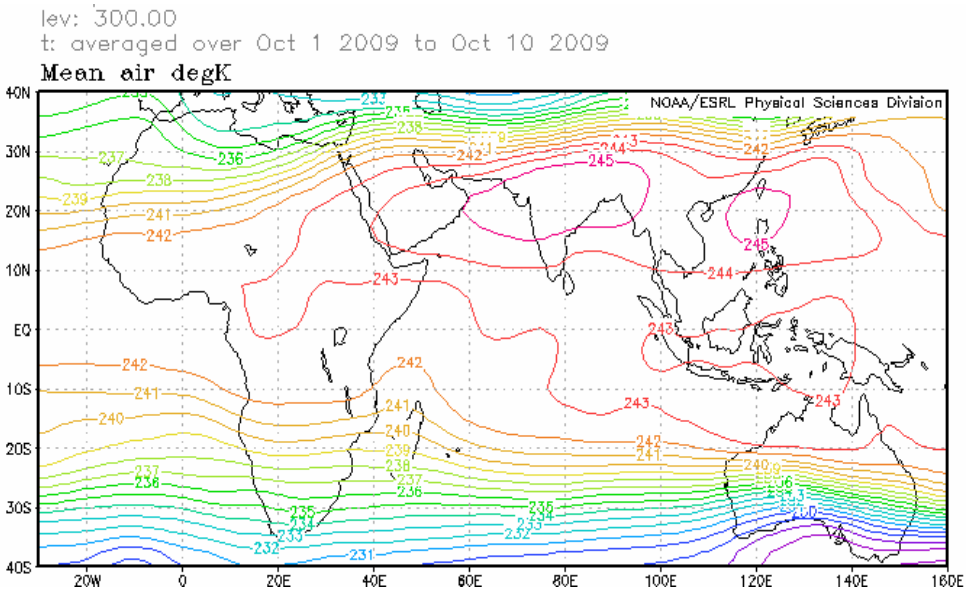

Figure 5: Thermal regimes at 300hPa (Source: NOAA/NCEP/ESRL: PSD)

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

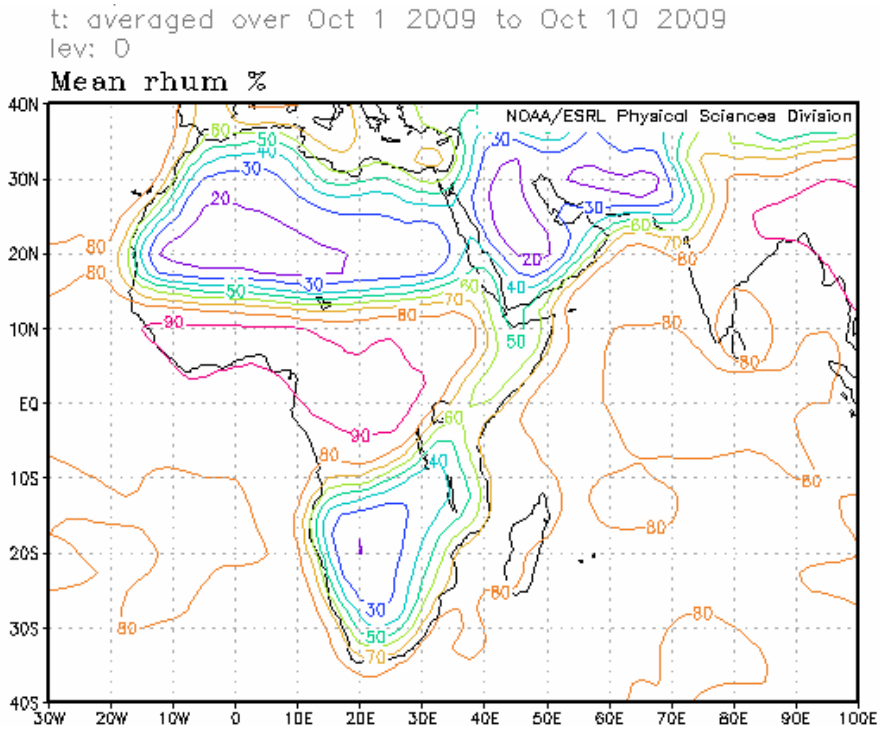

Figure 6: Relative Humidity at 850hPa (Source: NOAA/NCEP/ESRL: PSD)

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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 in distribution and amounts observing localized rainfall amounts ranging from 10mm to 50mm over extreme north-eastern Algeria and northern Tunisia

- **The Sahel:** had a decrease in rainfall distribution and amounts observing amounts ranging from 10mm to 75mm over its southern part.

- **Gulf of Guinea countries:** experienced rainfall distribution and amounts decrease observations ranging from 10mm to 100mm with maximum of about 150mm over eastern Nigeria/Cameroon.

- **Central Africa countries:** observed rainfall distribution increase, but with decreased amounts ranging from 10mm to 100mm with peaks of about 150mm over eastern Central African republic, central Congo and central and eastern 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 with heaviest amounts ranging from 100mm to 200mm over eastern Namibia/Botswana.

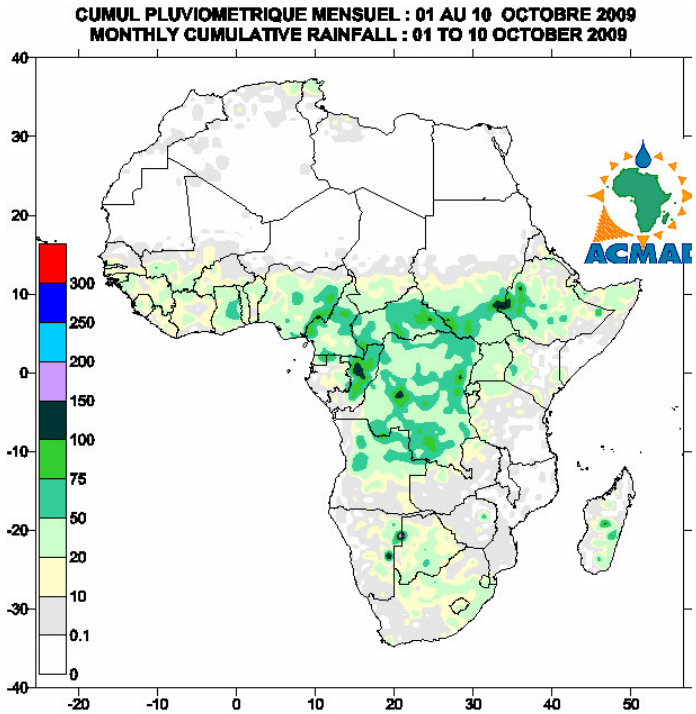

Figure 7: Estimated precipitations, (Data Source: NOAA/NCEP)

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2.2 OBSERVED DATA

The Table below shows heaviest cumulative rainfall recorded over Seychelles and Douala in Cameroon. The lowest temperature of 9.9°C was recorded at Maseru in Lesotho while the highest temperature of 42.3°C was recorded at Tombouctou in Mali.

N°	STATIONS	Precipitations (mm)	Number of rainy days	Temperature Max mean (°C)	Temperature Min mean (°C)
1	Abidjan	1	1	29,7	23,3
2	Abuja	7	2	30,7	22,2
3	Accra	1	1	31,0	23,7
4	Addis Abéba	13	1	22,2	11,9
5	Agadez	0	0	40,5	25,8
6	Alger(Dar El Beida)	14	2	29,8	16,6
7	Antananarivo	98	5	26,4	15,3
8	Antsiranana	0	0	31,1	21,2
9	Bamako-Senou	2	1	34,3	22,6
10	Bangui	2	2	31,2	21,7
11	Banjul	0	0	33,4	24,4
12	Beira	19	1	29,6	22,4
13	Bilma	0	0	40,3	18,7
14	Bobo Dioulasso	5	2	33,9	22,2
15	Brazzaville	1	1	31,9	22,8
16	Casablanca	0	0	25,4	18,8
17	Cotonou	19	2	29,7	25,3
18	Dakar-Yoff	0	0	32,1	27,4
19	Dar-es-Salaam	6	1	32,0	20,8
20	Douala	104	6	29,9	23,4
21	Durban	36	5	23,9	17,7
22	Entebbe	0	0	25,7	18,7
23	Francistown	15	3	32,0	15,6
24	Johannesbourg	11	2	24,7	12,3
25	Khartoum	0	0	39,6	27,0
26	Kigali	6	1	28,0	16,9
27	Kigoma	6	2	29,8	19,8
28	Le Caire	0	0	31,0	21,6
29	Le Cap	4	1	18,3	11,1
30	Libreville	4	1	29,8	24,1
31	Lomé	1	1	31,3	24,7
32	Lusaka	0	0	33,8	20,0
33	Manzini	5	2	-	16,4
34	Maputo	17	3	28,1	19,9
35	Maseru	16	3	-	9,9
36	Maun	0	0	33,8	18,5
37	Mbeya	0	0	28,3	12,5
38	Nairobi	0	0	27,9	14,8
39	Nampula	0	0	33,2	19,0
40	Ndele (RCA)	33	5	30,9	19,1
41	N'Djamena	8	2	38,5	24,7
42	Niamey-Aéroport	0	0	39,6	27,2
43	Nouakchott	0	0	40,1	27,8
44	Ouagadougou	0	0	36,6	25,9
45	Plaisance	17	5	26,6	19,7
46	Sal	0	0	31,0	25,5
47	Seretse Khama Intl Aéro	27	2	28,5	15,3
48	Seychelles	109	5	30,8	26,0
49	Tamanrasset	0	0	33,7	19,6
50	Toalagnaro	33	6	26,3	20,4
51	Tombouctou	2	1	42,3	24,6
52	Tripoli	3	1	30,5	18,1
53	Tunis	34	3	28,1	19,2
54	Windhoek	3	1	30,2	13,3
55	Zinder	0	0	39,8	23,4

Data Source: ACMAD / GTS

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

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3. OUTLOOK FOR DEKAD (21st - 31th OCTOBER, 2009)

3.1 RAINFALL

The continued southward displacement ITD will be associated with the start of dry conditions characterized by high temperature and dusts over the Sahel countries. The convective rainfall activities will intensify over Gulf of Guinea countries, central Africa and GHA countries. Rainfall deficits will continue over extreme southern parts of GHA countries and southern Africa countries. However, the eastern part of South Africa will have rainfall over eastern parts. 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 characterized by dry conditions over northern sector with outbreak of sporadic convective rainfall activities over southern parts characterized by high relative humidity.

- **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 several parts observing amounts ranging from 10mm to 150mm with peaks of about 200mm and above with continued deficits in southern sector.

- **Southern Africa countries:** Rainfall ranging from 02mm to 80mm over some parts will be expected to bring some relief 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 Sahel, Gulf of Guinea countries, central Africa, 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 central Africa countries and northern parts of GHA countries and central 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 prevailing protracted drought associated with the evolving El Niño over parts of eastern Africa countries has come to an end and the countries should be prepared to cope with heavy rains with floods expected to intensify by 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.

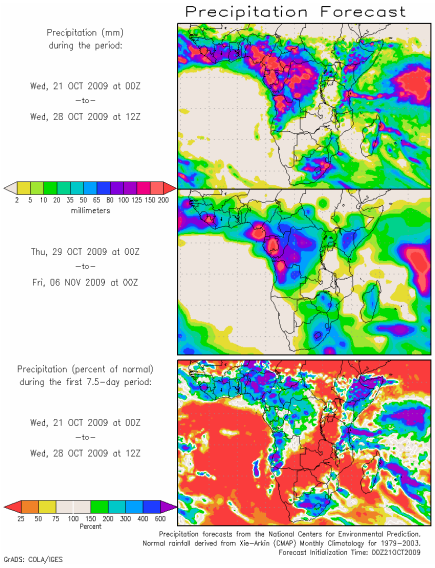

Figure 8: Precipitation forecast, Source : COLA

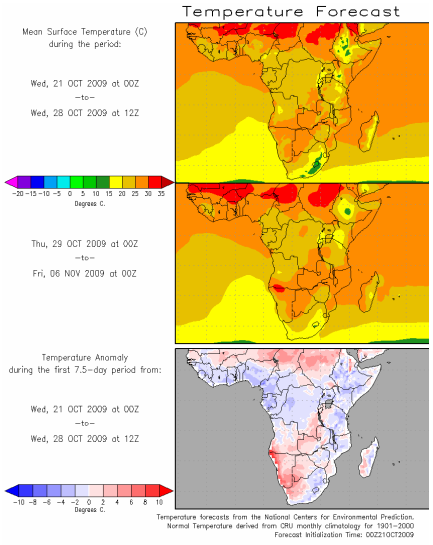

Figure 9 : Temperature forecast Source : COLA

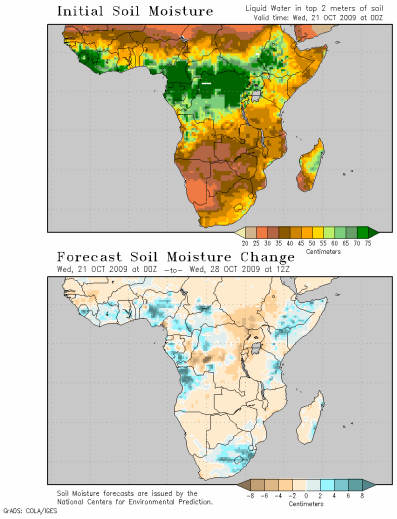

Figure 10 : Soil moisture forecast, Source: COLA

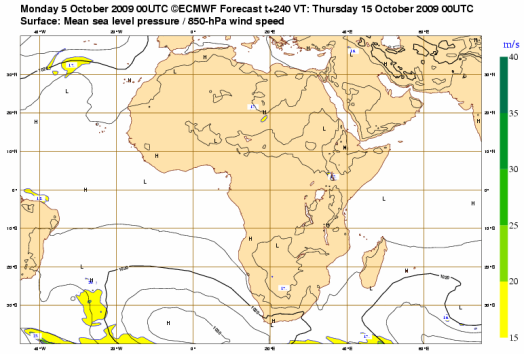

Figure 11 : Mean Sea Level pressure forecast Source : ECMWF

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