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

Ten Day Climate Bulletin

N° 30 Year 2009

Dekad of 01 to 10 November, 2009

HIGHLIGHT: Heaviest cumulative rainfall amounts were recorded over Mbeya in Tanzania and Lusaka in Zambia. However heavy rainfall with floods are expected over parts of central Africa and GHA countries:- Rwanda, Burundi, Uganda, south Sudan, south Ethiopia, Somalia, Kenya and northeast Tanzania.

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 1031hPa with an E-W axis strengthened significantly by 8hPa and shifted northwest compared to the previous dekad. Its mean position was located at about 38°N/28°W, extending a ridge over north pacific ocean.

- **St. Helena high:** Pressure of 1023 hPa with an E-W axis weakened significantly by 6hPa and shift northwest compared to the past dekad . Its mean position was at 25°S/18°W with an extended ridge over South Atlantic Ocean.

- **Mascarene high:** Pressure of 1025 hPa with a NW-SE axis weakened significantly by 5hPa compared to the previous dekad and shifted southwest. Its mean position was located at 38°S/47°E with an extended ridge over Indian Ocean.

- **Saharan Thermal Low:** Pressure at 1007 hPa maintained its intensity and shifted southeast compared to the previous dekad. Its mean position was located at 14°N/17°E with an extended trough over east Burkina Faso, south Niger, north Nigeria and south Chad.

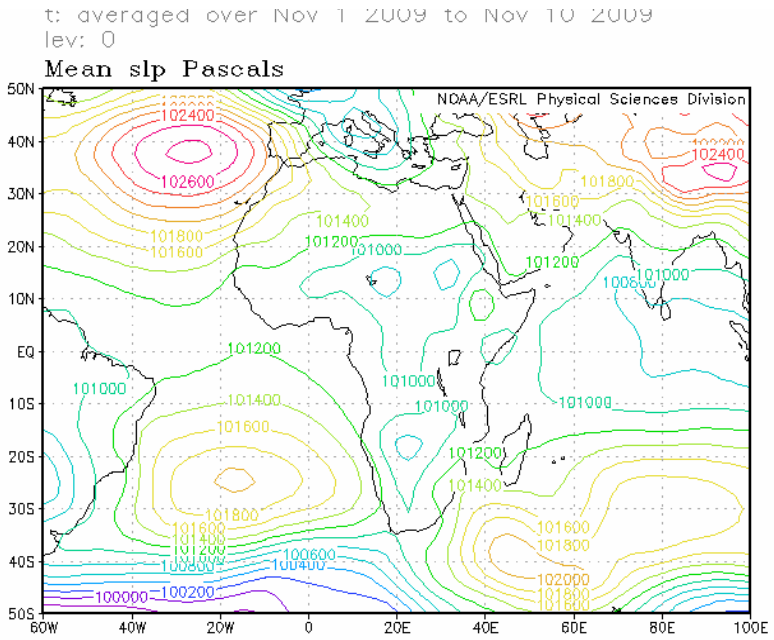

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

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- **Inter-Tropical Discontinuity (ITD):** Between the third dekad (blue) of October and first dekad (black) of November, 2009 in (Figure 2), the ITD moved significantly too the south with an average displacement of 400Km over central Sahel while the movement over the western and eastern part was weak.

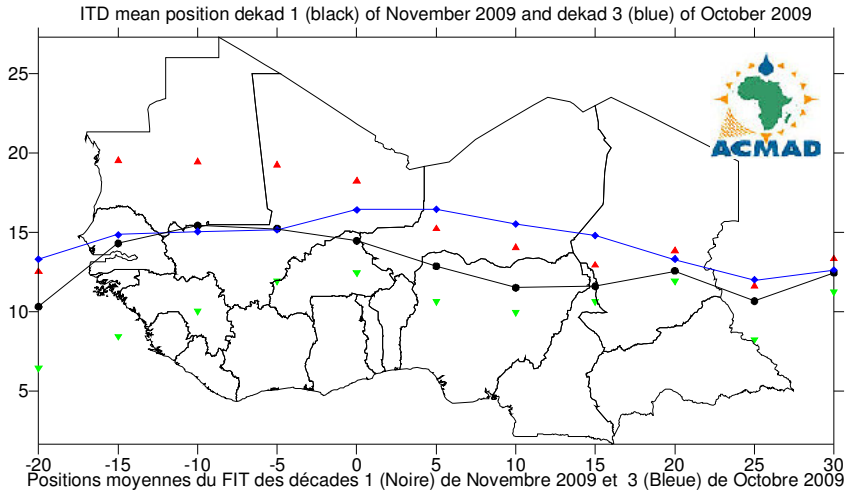

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

Monsoon influx at 925hPa level was generally weak (1 to 5.0 m/s) over Liberia and south Cameroon.

1.2.2 Thermal Index (TI)

In first dekad of October, 2009, the thermal index (TI) regime at 300hPa in (figure 3), had TI regime value of 242°K covering southeastern Sahel, Gulf of Guinea countries, Central Africa and GHA countries. The highest threshold value of 243°K covering most parts of GHA countries was characterized by heavy rains resulting in floods over areas with high relative humidity as observed in Figure 4.

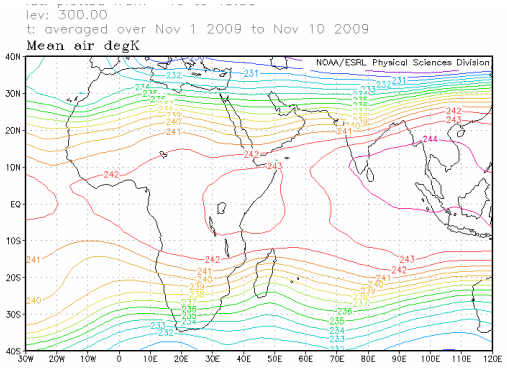

Figure 3: TI at 300hPa
(Source: NOAA/NCEP/ESRL: PSD)

1.2.3 Relative Humidity (RH)

The 850hPa (Figure 4) shows high RH (>70%) in the first dekad of November, 2009 over southern part of Gulf of Guinea countries and parts of GHA countries. The Sahara, most parts of the Sahel and southern Africa countries experienced dry conditions characterized by the lowest RH (40%).

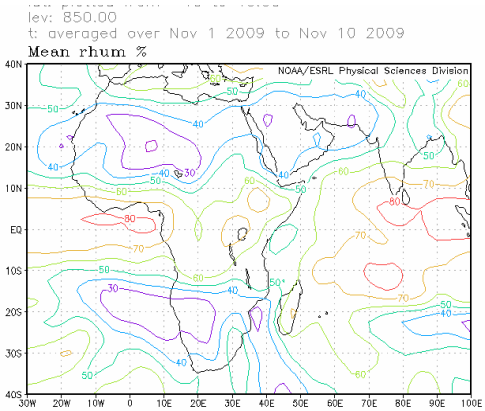

Figure 4 : RH at 850hPa
(Source: NOAA/NCEP/ESRL: PSD)

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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 5 below shows rainfall distribution decrease over the north Africa, Gulf of Guinea, the Sahel and GHA countries while rainfall distribution and amount increased over Central Africa countries. In detail:

- **North Africa countries:** had rainfall decrease, with amounts ranging from 10mm to 50mm over extreme northern Algeria and Tunisia.
- **The Sahel:** had significant decrease in rainfall distribution and amounts observing estimated rainfall from 10mm to 20mm over central Mali and south Senegal.
- **Gulf of Guinea countries:** continued had rainfall distribution decrease with amounts ranging from 10mm to 100mm with maximum of about 150mm over south Ghana and southern Nigeria.
- **Central Africa countries:** observed rainfall distribution increase with amounts ranging from 10mm to 150mm with peaks of about 200mm and above over Gabon and Democratic Republic of Congo.
- **GHA countries:** experienced slight decrease in rainfall distribution with estimated rainfall amounts ranging from 10mm to 200mm with isolated peaks of about 400mm and above over southeast Kenya.
- **Southern Africa countries:** continued to get rainfall with amounts ranging from 10mm to 75mm with a peak of about 150mm over Madagascar

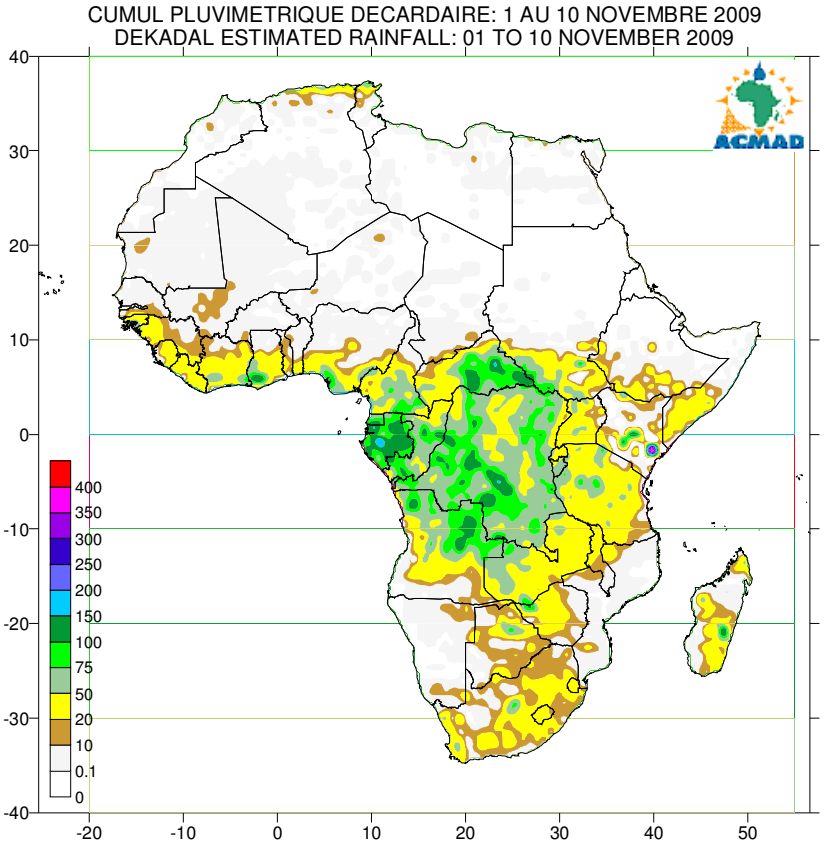

Figure 5 : Estimated precipitations, (Data Source: NOAA/NCEP)

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2.2 OBSERVED DATA

The Table below shows heaviest cumulative rainfall recorded over Mbeya in Tanzania and Lusaka in Zambia, The highest temperatures of 40.0°C were recorded over Khartoum in Sudan while the lowest temperature of 6.7°C was recorded over Addis Ababa in Ethiopia.

N°	STATIONS	Précipitations (mm)	Nombre de jours de pluie	Température maxi moyenne (°C)	Température mini moyenne (°C)
1	Abidjan	7	2	33,0	25,6
2	Abuja	4	1	33,2	-
3	Accra	0	0	31,8	24,9
4	Addis Abéba	0	0	-	6,7
5	Agadez	0	0	37,3	21,2
6	Alger(Dar El Beida)	33	6	21,6	12,3
7	Antananarivo	15	2	27,9	15,4
8	Antsiranana	1	1	33,9	21,8
9	Bamako-Senou	16	1	33,3	19,1
10	Bangui	3	2	32,0	-
11	Banjul	0	0	33,8	20,6
12	Beira	23	1	29,2	20,9
13	Bilma	0	0	37,2	15,7
14	Bobo Dioulasso	2	1	33,1	20,9
15	Brazzaville	39	3	31,8	22,5
16	Casablanca	2	1	22,0	16,3
17	Cotonou	61	2	31,0	25,9
18	Dakar-Yoff	0	0	30,6	24,7
19	Dar-es-Salaam	0	0	32,5	24,0
20	Douala	29	3	30,7	23,6
21	Durban	1	1	25,2	19,2
22	Entebbe	0	0	24,4	18,8
23	Francistown	16	3	34,1	17,2
24	Johannesbourg	46	5	23,8	12,6
25	Khartoum	0	0	40,0	27,0
26	Kigali	0	0	27,4	16,7
27	Kigoma	27	3	29,9	20,8
28	Le Caire	0	0	26,6	17,2
29	Le Cap	50	4	21,9	13,2
30	Libreville	87	3	29,3	23,4
31	Lomé	0	0	32,3	25,2
32	Lusaka	107	2	31,8	17,6
33	Manzini	38	4	-	16,5
34	Maputo	1	1	29,0	20,4
35	Maseru	17	3	-	12,3
36	Maun	7	1	34,9	20,1
37	Mbeya	108	3	26,7	-
38	Nairobi	19	3	25,5	15,2
39	Nampula	0	0	35,2	20,2
40	Ndele (RCA)	3	1	32,8	18,3
41	N'Djamena	0	0	39,9	22,4
42	Niamey-Aéroport	0	0	38,7	23,8
43	Nouakchott	0	0	35,6	22,9
44	Ouagadougou	0	0	36,6	23,0
45	Plaisance	61	4	28,3	21,6
46	Sal	0	0	29,2	23,6
47	Seretse Khama- Aéro	11	2	31,1	16,5
48	Seychelles	22	4	30,6	26,0
49	Tamanrasset	0	0	27,4	12,3
50	Toalagnaro	37	4	25,6	19,5
51	Tombouctou	0	0	34,7	19,2
52	Tripoli	0	0	24,7	12,7
53	Tunis	38	6	21,5	13,7
54	Windhoek	0	0	30,7	12,4
55	Zinder	0	0	37,5	21,0

Source of data : ACMAD/GTS

NOTE : 0 signifie : pas de précipitations
- signifie : données manquantes ou incomplètes.

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3. OUTLOOK FOR DEKAD (21st - 30th NOVEMBER, 2009)

3.1 RAINFALL

The ITD will be expected to move significantly southward due to the intensification of Azores High resulting in strengthened harmattan associated with dusty and dry conditions with low temperatures over the Sahel countries. The convective rainfall activities will decrease significantly over Gulf of Guinea countries, but intensify over central Africa and GHA countries. Rainfall deficits will continue over northern and western parts of southern Africa countries with the eastern parts getting light rainfall amounts. In detail**:**

- **North Africa countries:** will experience significant decrease in rainfall amounts ranging from 10mm to 75mm.
- **The Sahel:** will experience dry conditions characterized by low temperatures and dust episodes associated with harmattan.
- **Gulf of Guinea countries:** will experience rainfall decrease recording amounts ranging from 10mm to 75mm with isolated peaks of 100mm and above.
- **Central Africa countries:** will have rainfall increase recording amounts ranging from 10mm to 150mm with widespread peaks ranging from about 200mm and above.
- **GHA countries:** will have rainfall increase over western parts observing amounts ranging from 20mm to 200mm with maxima peaks of 250mm to 300mm and above resulting in floods.
- **Southern Africa countries: will get r**ainfall amounts ranging from 10mm to 75mm with peaks of about 100mm and above over eastern parts.

3.2 TEMPERATURE

The forecast in Figure 7, shows general decrease in temperature in the Sahel and parts of GHA countries with an increase in the southern Africa 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 8 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 southern parts of central Africa countries and southern Africa countries.

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 parts of Gulf of Guinea, central Africa, parts of GHA including 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 Harmattan episodes are expected resulting in reported cases of meningitis over the Sahel countries parts of Gulf of Guinea countries. 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

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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/Chad/Cameroon, central Africa, and southern Africa countries respectively. The eastern Africa is experiencing heavy rains with floods and intensification is expected in November/December, 2009 at the peak of the El Niño. Rain harvesting is recommended particularly in the Arid and Semi-Arid Lands (ASLS) to alleviate high water demand after cessation of seasonal rainfall.

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 during rainy season 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.

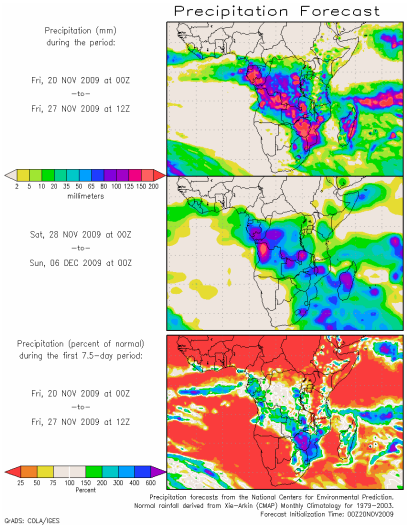

Figure 6 : Precipitation forecast, Source : COLA

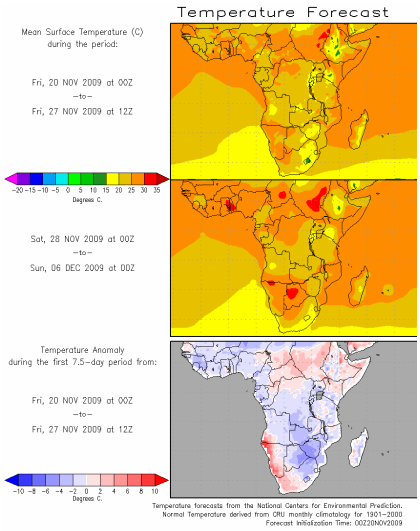

Figure 7 : Temperature forecast Source : COLA

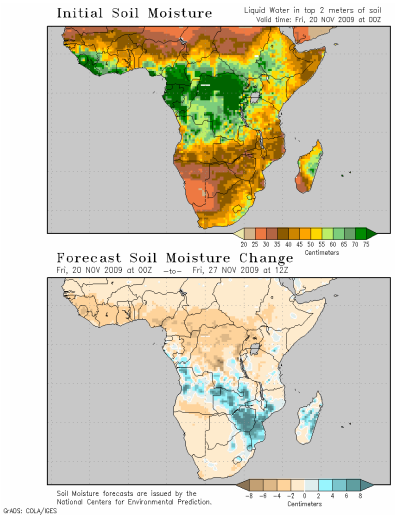

Figure 8 : Soil moisture forecast, Source: COLA

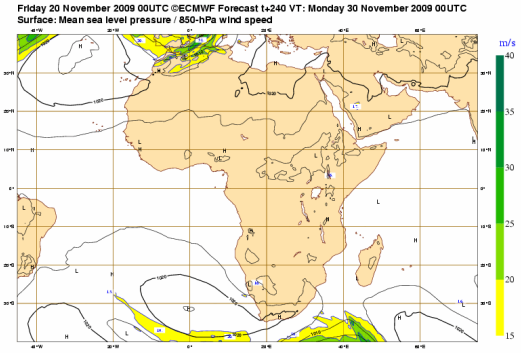

Figure 9 : Mean Sea Level pressure forecast
Source : ECMWF

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