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

Ten Day Climate Bulletin
N° 01
Dekad 01st to 10th January, 2010

HIGHLIGHT: The highest cumulative rainfall was recorded over Douala in Cameroon while the highest estimated rainfall was observed over Equatorial Guinee. The highest mean maximum temperature was recorded at Ndelé in Central African Republic and the lowest mean minimum temperature was recorded at Bilma in Niger.

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 1022hPa had an W-E axis. Its centre was located at about 25°N/33°W extending a ridge over North Atlantic Ocean.

- **Saharan Thermal Low:** Pressure at 1010 hPa centred over north Cameroon/south Chad maintained its intensity compared to the previous dekad. It had an extended trough over north Ghana and south Nigeria.

- **St. Helena high:** Pressure of 1020 hPa with an NW-SE axis weakened by 3 hPa and shifted northeast compared to the past dekad. Its mean position was at 31°S/02°E.

- **Mascarene high:** Pressure of 1020 hPa with a W-E axis weakened by 3hPa compared to the previous dekad and shifted northeast. Its mean position was located at 30°S/95°E with an extended ridge over Indian Ocean.

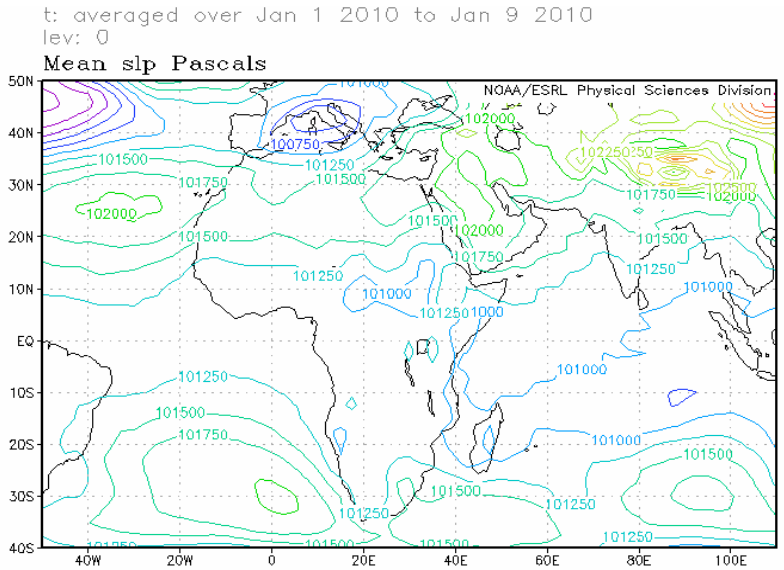

Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

- **Inter-Tropical Discontinuity (ITD):** Between the third dekad of December 2009 (blue line) and the first dekad (black) of January, 2010 in (Figure 2), the ITD had a slight southward mean displacement over the Gulf of Guinea countries (Figure2).

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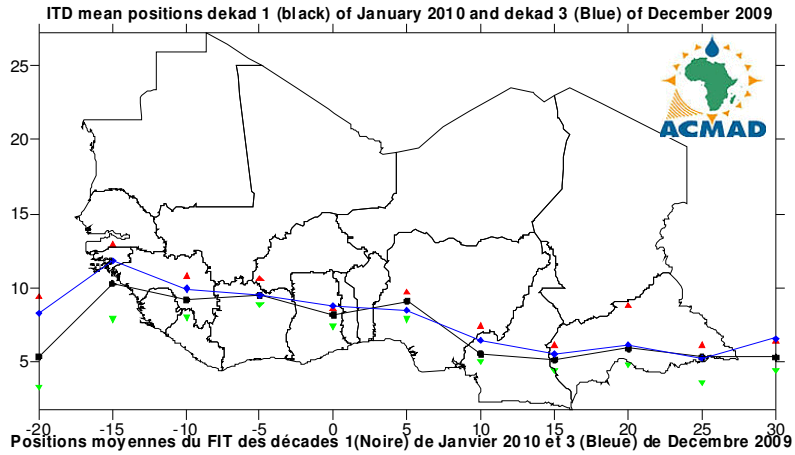

Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

Monsoon influx at 925hPa level was weak over Liberia and southwest Cameroon during the dekad.

1.2.2 Thermal Index (TI)

In the first dekad of January, 2010, the thermal index (TI) regime at 300hPa in (figure 3), had isotherm value of 242°K covering extreme eastern Sahel, southern part of Central Africa and most GHA countries and Southern Africa countries. The maximum threshold value of 243°K covered southern part of central Africa/northern part of Southern Africa countries and was associated with heavy rains and floods over the areas characterized by high relative humidity in Figure 4.

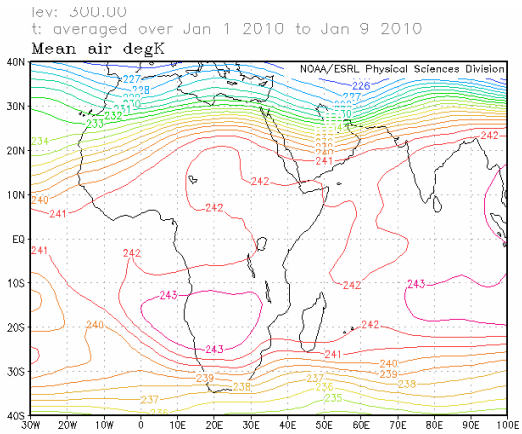

Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

The 850hPa (Figure 4) shows high RH (>70%) in the first dekad of January, 2010 over western, extreme eastern and southern part of central Africa, parts of GHA countries and eastern part of Southern Africa. The Sahara, the Sahel, northern part of Gulf of Guinea countries and western part of southern Africa countries experienced dry conditions characterized by the lowest RH (40%).

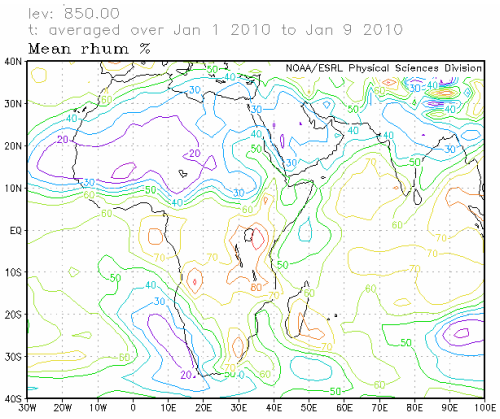

Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

2. RAINFALL AND TEMPERATURE SITUATION

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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 compared to that of the past dekad shows slight rainfall amounts decrease over Northern Africa and GHA countries while over Central Africa and Southern Africa there was increase in rainfall amounts. Over the rest of the continent there is no significant change in rainfall distribution and amount. In detail:

- **North Africa countries:** had decrease in rainfall amounts ranging between 10mm and 100mm over Northern Morocco with localized peaks ranging from about 150mm over extreme North Algeria.
- **The Sahel:** continued to experience dry and dusty conditions under the influence of the Harmattan.
- **Gulf of Guinea countries:** There is no significant change in rainfall distribution and amounts compared to the previous dekad. Estimated rainfall amounts ranging from 10mm to 50mm over southern Cote d'Ivoire and Liberia were observed.
- **Central Africa countries:** observed increase in rainfall amounts observing between 10mm to 250mm with heaviest rainfall amounts above 300mm over Equatorial Guinea.
- **GHA countries:** experienced significant decrease in rainfall amounts with observed amounts ranging from 10mm to 100mm intensifying to about 150mm over Tanzania and Great Lakes countries.
- **Southern Africa countries:** had rainfall distribution and amounts increase recording amounts ranging from 10mm to 100mm intensifying over Namibia and northern Madagascar to about 300mm.

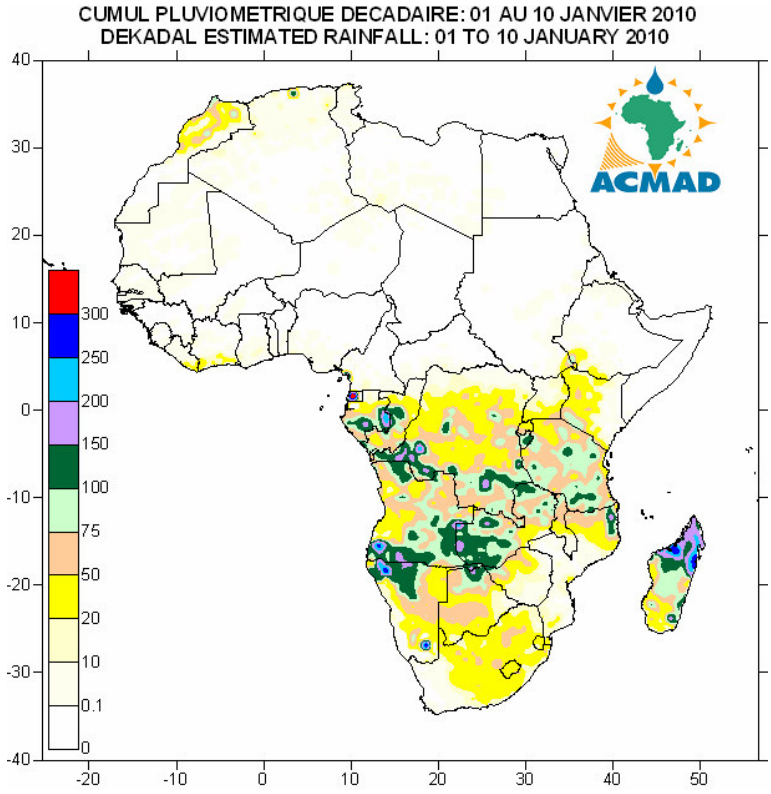

Figure 5 : Estimated precipitations, (Data Source: NOAA/NCEP)

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2.2 OBSERVED DATA

The Table below shows heaviest cumulative rainfall recorded over Douala in Cameroon, Antsiranana in Madagascar, Maun in Botswana and Lusaka in Zambia. The highest mean maximum temperature of 36,6°C in Ndelé en Central African Republic while the lowest mean minimum temperature of 5.1°C was recorded at Bilma in Niger.

N°	STATIONS	Précipitations (mm)	Nombre de jours de pluie	Température maxi moyenne (°C)	Température mini moyenne (°C)
1	Abidjan	46	1	32,7	26,3
2	Abuja	0	0	34,6	17,3
3	Accra	0	0	33,0	26,0
4	Agadez	0	0	30,1	13,6
5	Alger (Dar El Beida)	2	4	16,7	8,2
6	Antananarivo	50	7	28,0	18,4
7	Antsiranana	143	7	31,5	23,1
8	Bamako-Senou	0	0	34,7	14,5
9	Bangui	0	0	34,2	18,6
10	Banjul	0	0	33,9	16,9
11	Beira	30	3	31,8	24,8
12	Bilma	0	0	30,7	5,1
13	Bobo Dioulasso	0	0	34,2	20,3
14	Brazzaville	79	2	31,8	22,9
15	Casablanca	65	4	17,4	11,1
16	Cotonou	0	0	31,8	26,3
17	Dakar-Yoff	0	0	26,4	19,6
18	Dar-es-Salaam	7	3	32,1	24,8
19	Dodoma	54	5	27,5	18,8
20	Douala	206	1	33,3	24,1
21	Durban	10	7	27,1	21,6
22	Francistown	0	0	32,6	18,9
23	Ghanzi	13	4	32,1	19,8
24	Harare	14	4	-	16,7
25	Johannesbourg	96	8	23,9	15,3
26	Khartoum	0	0	32,4	19,2
27	Kigoma	18	2	28,8	20,3
28	Kimberly	53	5	29,2	17,4
29	Kufra (Libye)	0	0	25,0	8,9
30	Le Caire	0	0	23,7	12,9
31	Le Cap	0	0	22,8	16,8
32	Libreville	99	8	29,9	24,2
33	Lomé	6	2	33,4	26,2
34	Lusaka	117	4	28,6	17,4
35	Manzini	28	1	-	18,1
36	Maputo	32	1	30,7	23,1
37	Maseru	27	4	-	-
38	Maun	126	5	32,0	20,6
39	Mbeya	26	4	32,0	20,6
40	Nairobi	64	5	26,1	15,7
41	Nampula	45	4	33,0	22,5
42	Ndele (RCA)	0	0	36,6	13,3
43	N'Djamena	0	0	34,7	14,0
44	Niamey-Aéroport	0	0	34,4	15,7
45	Nouakchott	0	0	32,7	18,7
46	Ouagadougou	0	0	34,5	15,8
47	Plaisance	94	8	29,9	23,5
48	Port Elisabeth	6	2	26,5	17,9
49	Pretoria	46	5	27,0	18,4
50	Seretse Khama- Aéro	6	2	28,3	-
51	Seychelles	28	1	30,4	26,0
52	Tamanrasset	0	0	24,3	5,4
53	Timimoun	0	0	21,7	6,8
54	Toalagnaro	80	6	29,2	23,6
55	Tombouctou	0	0	32,9	14,0
56	Tripoli	0	0	23,2	9,4
57	Tunis	7	3	18,4	10,0
58	Windhoek	52	7	28,8	16,9
59	Zinder	0	0	31,0	13,6

NOTE: **0** means no rain;
- means no temperature data avail able

Data Source: ACMAD / GTS

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3. OUTLOOK FOR DEKAD (21st – 31st JANUARY, 2010)

3.1 RAINFALL

The ITD will be expected to have slight southward displacement and intensified harmattan. Dry and dusty conditions will persist over the Sahel, Gulf of Guinea and northern central Africa countries with rainfall intensification over southern parts of central Africa, southern parts of GHA, northern and eastern parts of southern Africa countries. In detail**:**

- **North Africa countries:** will experience some increase in rainfall amounts ranging from 10mm to 150mm with maxima peaks of 200mm and above.

- **The Sahel:** will continue to experience dry and dusty conditions under the influence of harmattan.

- **Gulf of Guinea countries:** will continue to experience rainfall deficits recording amounts ranging from 10mm to 50mm with localized peaks of about 75 mm over coastal zone.

- **Central Africa countries:** will experience significant rainfall decrease over northern parts with amounts ranging from 10mm to 75mm intensifying over southern parts with amounts ranging from about 100mm to 200mm.

- **GHA countries:** will have rainfall decrease over northern sector intensifying over parts south of Equator amounts ranging from 10mm to 150mm.

- **Southern Africa countries:** will get rainfall increase over northern and eastern parts recording amounts ranging from 10mm to 150mm with peaks of about 200mm to 300mm.

3.2 TEMPERATURE

The forecast in Figure 7, shows high temperature in the Gulf of Guinea, central Africa, GHA and parts of southern Africa countries. The high 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 increase include central Africa and southern Africa countries while most of GHA countries will experience soil moisture decrease.

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, GHA and 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 prevailing Harmattan dust will resulting in increased cases of meningitis over the Sahel and Gulf of Guinea countries and parts of central Africa 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 emphasize on the importance of seasonal rainfall performance, onset and cessation dates and suitable planting dates as well as monitoring of the phenological stages of crops for crop yield assessments in the 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 forums (RCOFs), the GHACOF, PRESAO, PRESAC, and SARCOF for Greater Horn of Africa (GHA), West Africa countries/Chad/Cameroon, central Africa, and southern Africa countries respectively.

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, rivers and drying wetlands. 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 and management 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 to 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**.**

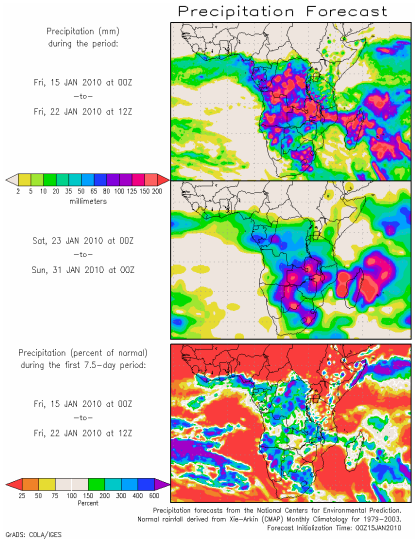

Figure 6 : Precipitation forecast, Source : COLA

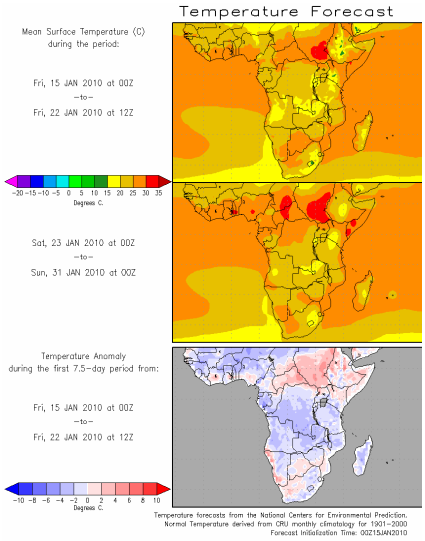

Figure 7 : Temperature forecast Source : COLA

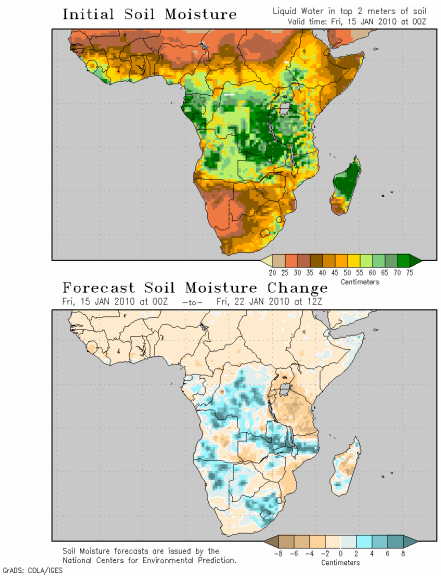

Figure 8 : Soil moisture forecast, Source: COLA

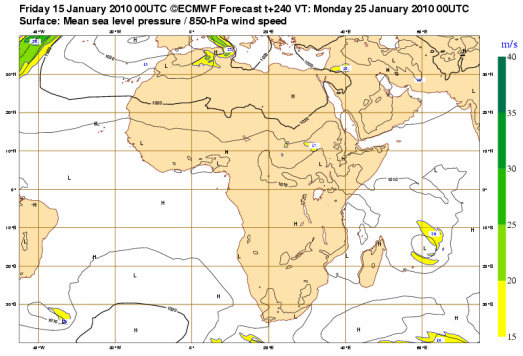

Figure 9 : Mean Sea Level pressure forecast
Source : ECMWF

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