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

Ten Day Climate Bulletin

N° 35 Year 2008

Dekad of 11 to 20 December, 2008

- **HIGHLIGHT:** The highest rainfall of about 300mm was estimated over eastern Mozambique and central Madagascar. The southern Africa countries are expected to experience the highest rainfall associated with floods.

1. GENERAL SITUATION :

1.1 SURFACE

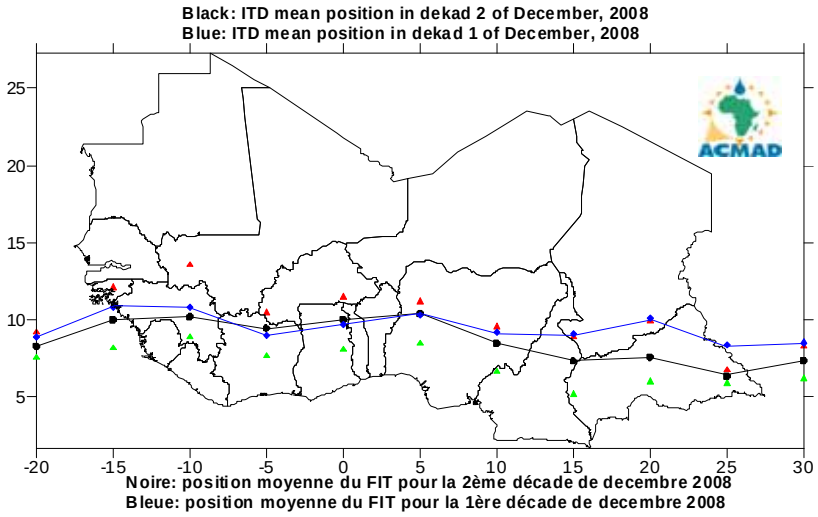
• **Azores high:** Pressure at 1035hPa strengthened by 3hPa compared to the last dekad and shifted southwest. Its mean position was observed at 40°N/25°W with a ridge over south Morocco, Mauritania and north Mali.

• **St. Helena high:** Pressure at 1023hPa weekend by 3hPa and shifted southeast at 34°S/12°W with an extended ridge over south Atlantic Ocean.

• **Mascarene high:** Pressure at 1025hPa strengthened slightly by 1hPa compared to the previous dekad and shifted northeast at 38°S/62°E with an extended ridge over Indian Ocean.

• **Saharan thermal low:** Pressure at 1008hPa maintained its intensity compared to the past dekad and shifted southeast at 10°N/07°E with an extended trough over southwest Niger, north Benin and Nigeria, and south Chad.

• **Inter-Tropical Discontinuity (ITD) :** Between the first and the second dekad of December, 2008, the ITD had southward displacement over the eastern and western parts over central Africa countries and Gulf of Guinea countries respectively. However, it had a slight displacement to the north over the central part. It's mean position was observed at 8.3°N over longitude 20°W; at 10.0°N and 10.2°N over west and central east Guinea respectively; at 9.4°N over northeast Côte d'Ivoire; at 10.0°N over extreme northeast Ghana; at 10.4°N and 8.5°N over west and east Nigeria respectively; at 7.3°N and 10.1°N over southwest Chad respectively; at 7.6°N and 6.3°N over north and northeast Central African Republic respectively and at 7.3°C over south Sudan.



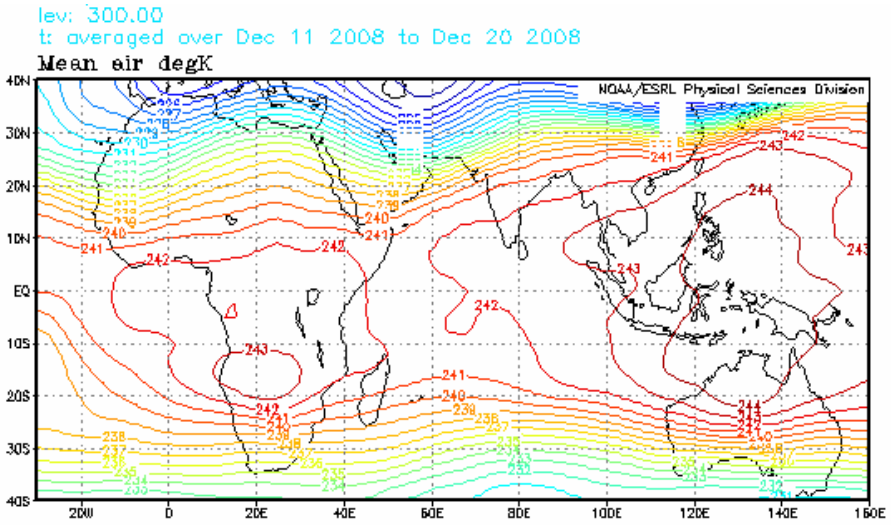
The red and green triangles represent the max. and min. displacements of the ITD respectively

Direction Générale ACMAD, BP 13184, 85 Avenue des Ministères, Niamey - Niger
Tél. (227) 20 73 49 92 , Fax : (227) 20 72 36 27 , E-mail : dgacmad@acmad.ne, Web : http://www.acmad.org

1.2 TROPOSPHERE

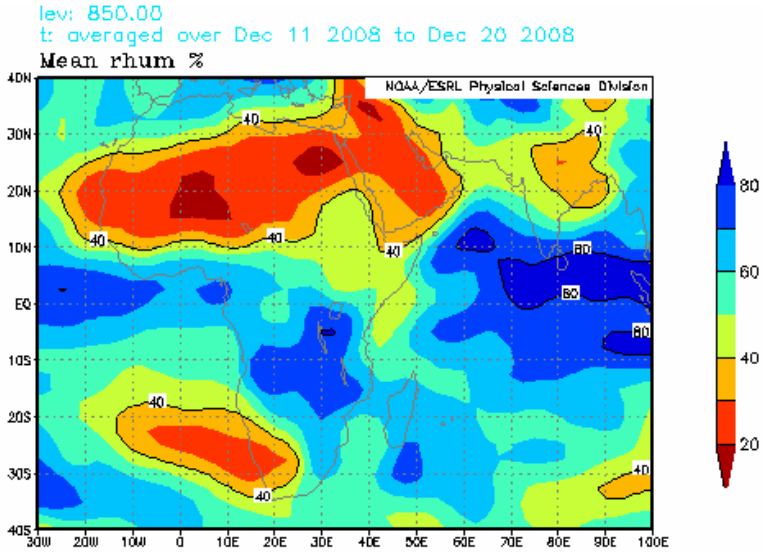
- **Monsoon :** Monsoon influx was weak (1 to 5 m/s) at 925hPa level over southeast Nigeria and south Cameroon.

- **Thermal Index (TI) :** In the second dekad of December, 2008, the thermal index (TI) regime at 300hPa, map shown below, had TI regime value of 242°K near threshold of 243°K over extreme southern part of Gulf of Guinea countries, central Africa countries, parts of GHA countries and north parts of Southern Africa countries associated with heavy rainfall over areas characterized by high relative humidity as observed below. The thermal index regime value of 243°K, associated with heavy rainfall with floods is located over southern part of central Africa, and western/central parts of south African countries.



(Data Source: NOAA/NCEP)

- **Relative Humidity (RH):** The 850hPa map below shows high RH (>70%) in the second dekad of December, 2008 over extreme part of Gulf of Guinea, extreme western part of Cameroon and Equatorial Guinea, parts of central Africa and western parts of GHA countries, associated with heavy rainfall over Angola, southern Tanzania, Zambia, Zimbabwe, Mozambique and Madagascar. The Sahara, the Sahel countries and the western part of south Africa countries experienced dry conditions characterized by the lowest RH (<40%).



(Data Source: NOAA/NCEP)

2. RAINFALL AND TEMPERATURE SITUATION

2.1 RAINFALL

The rainfall estimate based on Satellite and Rain Gauge on the map below for the second dekad of December, 2008 shows spatial rainfall decrease over Central Africa, GHA and Gulf of Guinea countries while northern African countries and southern Africa countries experienced intensity of rainfall increase.
In summary:

- **North Africa countries :** experienced intensity of rainfall increase recording amounts ranging from 10 to 100mm with maximum rainfall amounts between 100 to 200mm over extreme north Morocco and Algeria.

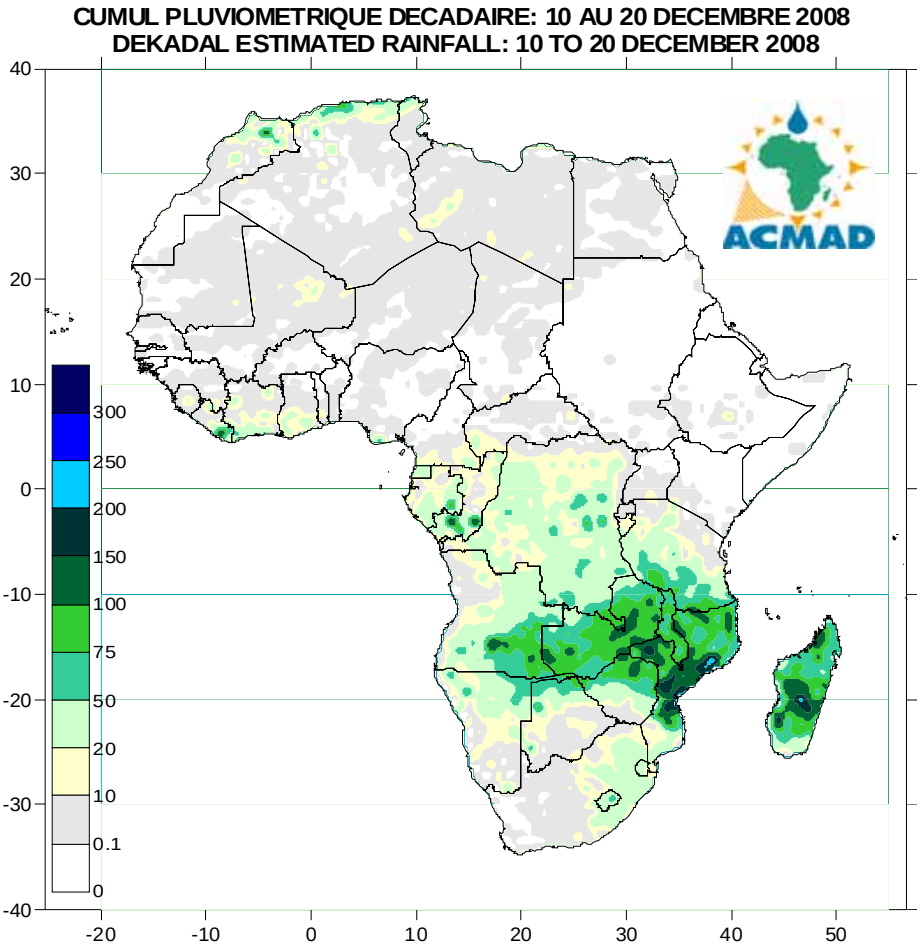
- **The Sahel :** continued to experience generally dry and localized dusty conditions.

- **Gulf of Guinea countries :** had spatial rainfall decrease recording amounts ranging from 10 to 100mm with maximum rainfall amounts ranging from 100 to 200mm over Eastern Liberia and western Côte d'Ivoire.

- **Central Africa countries :** had spatial and intensity of rainfall decrease recording amounts ranging from 10 to 100mm with a major peaks ranging from 150 to 200mm over Congo.

- **GHA countries :** experienced rainfall decrease recording amounts ranging from 10 to 100mm with localized peaks of above 150mm over southern Tanzania.

- **Southern Africa countries :** had significant rainfall intensity increase recording amounts ranging from 10 to 200mm intensifying to about 250mm over eastern Mozambique and central Madagascar.



(Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows heaviest rainfall of 226mm recorded over Seychelles. The lowest temperature of 6.4°C was recorded at Alger (Dar-El-Bieida) in Algeria while the highest temperature of 37.6°C was recorded at N'Djamena in Chad.

N°	STATIONS	Précipitations (mm)	Nombre de jours de pluie	Température maxi moyenne (°C)	Température mini moyenne (°C)
1	Abidjan	1	1	33,1	25,6
2	Abuja	0	0	35,7	21,5
3	Accra	0	0	32,3	25,5
4	Agadez	0	0	33,4	17,6
5	Alger(Dar El-Beida)	65	5	14,3	6,4
6	Antananarivo	0	0	27,4	17,3
7	Bamako-Senou	0	0	33,3	17,2
8	Bangui	0	0	33,4	21,6
9	Banjul	0	0	32,6	18,4
10	Bilma	0	0	31,2	12,7
11	Bissau	0	0	31,6	-
12	Bobo Dioulasso	0	0	34,1	20,8
13	Brazzaville	17	3	30,7	22,8
14	Casablanca	16	5	16,5	9,1
15	Conakry	0	0	31,3	-
16	Cotonou	0	0	31,7	27,0
17	Dakar-Yoff	0	0	25,5	21,0
18	Dar-es-Salaam	4	2	30,9	-
19	Douala	0	0	31,9	24,6
20	Entebbe	0	0	-	18,8
21	Francistown	3	1	33,4	19,4
22	Harare	58	3	26,2	16,7
23	Johannesbourg	23	3	26,5	14,2
24	Khartoum	0	0	34,5	21,5
25	Kigoma	19	1	-	-
26	Kinshasa	0	0	31,0	23,5
27	Le Caire	0	0	22,7	12,7
28	Le Cap	1	1	23,7	17,3
29	Libreville	70	4	29,5	24,4
30	Lomé	46	4	27,4	-
31	Lusaka	6	1	29,1	18,5
32	Manzini	27	5	-	19,0
33	Maputo	14	1	31,9	22,4
34	Maseru	30	4	-	15,7
35	Maun	27	5	30,1	20,5
36	Mbeya	40	3	-	-
37	Monrovia	0	0	30,6	24,1
38	Nairobi	0	0	27,1	14,7
39	Nampula	55	4	31,1	22,1
40	N'Djamena	0	0	37,6	18,5
41	Niamey-Aéroport	0	0	36,8	19,9
42	Nouakchott	0	0	27,0	14,1
43	Ouagadougou	0	0	36,3	20,2
44	Plaisance	16	8	30,0	22,9
45	Sal	0	0	24,4	20,0
46	Seretse Khama Airport	22	3	31,9	18,2
47	Seychelles	226	7	29,8	24,3
48	Tamanrasset	0	0	22,9	7,7
49	Tombouctou	0	0	29,0	15,5
50	Tripoli	14	1	17,1	7,2
51	Tunis	26	6	15,4	8,9
52	Windhoek	22	3	27,6	16,0
53	Zinder	0	0	34,6	17,4

NOTE: **0** means no rain;
- means no temperature data available Data Source **:** ACMAD / GTS

3.OUTLOOK FOR DEKAD (01st – 10th JANUARY, 2009)

3.1 RAINFALL

The ITD will maintain southward displacement reducing the on-the-land moisture depth resulting in decreased rainfall over Gulf of Guinea countries. However, rainfall will intensify over north Africa countries, southern part of central Africa countries and northern part of south Africa countries including southern Tanzania. In summary:

- **North Africa countries :** expected to experience increase in rainfall with amounts ranging from 10mm to 100mm with peaks of about 150mm.

- **The Sahel :** will continue to experience dry condition with localized dusty episodes.

- **Gulf of Guinea countries :** will continue to experience significant decrease recording rainfall amounts ranging from 10mm to 75mm with coastal zone recording isolated peaks of about 100mm .

- **Central Africa countries :** Democratic Republic of Congo, Gabon, Congo, Angola and Equatorial Guinea will experience rainfall decrease recording amounts ranging from 10mm to 100mm with peaks of about 200mm over southern parts.

- **GHA countries :** will record rainfall decrease with amounts ranging from 10mm to 50mm with isolated localized peaks of about 100mm.

- **Southern Africa countries :** will experience significant increase in spatial and intensity of rainfall recording amounts ranging from 10mm to 250mm with peaks of about 300mm over Angola, Zambia, Malawi, Zimbabwe, Mozambique and Madagascar.

3.2 TEMPERATURE

The forecast map below shows that the majority of countries in Africa will record the highest temperatures while northern Africa and parts of GHA countries will record the lowest temperatures. The highest forecast temperatures on the map below range from 25°C to 35°C in orange and red colours respectively with more than 75% of the continent expected to record 20°C and above.

3.3 SOIL MOISTURE

The outlook on soil moisture change, map shown below includes 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 increase are south of Equator where the highest soil moisture increase is expected in parts of Angola, Zambia, Malawi, Zimbabwe, South Africa, Mozambique and Madagascar.

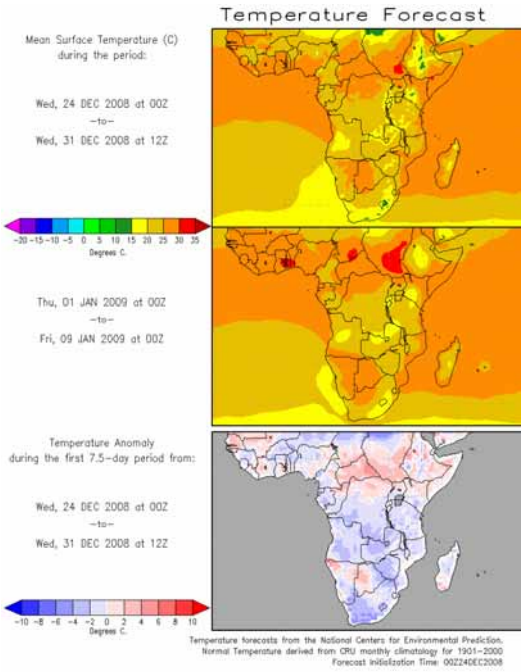
3.4 IMPACTS

Health: The incidences of malaria and other climate related diseases are higher in areas with high temperatures during rainy periods. The temperatures in the range of 18°C to 32°C with high rainfall (high humidity) 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 countries, central Africa countries, GHA countries and southern Africa countries with high humidity/rainfall and the prevailing conducive temperatures support the survival of parasite resulting in higher incidences of vector borne diseases including malaria. The southern Africa countries namely Angola, Zambia, Malawi, Zimbabwe, South Africa, Mozambique and Madagascar are expected to get heavy rainfall associated with floods and increased outbreak of water borne diseases such as cholera. The health authorities need to continue the health care services to protect lives of the vulnerable communities.

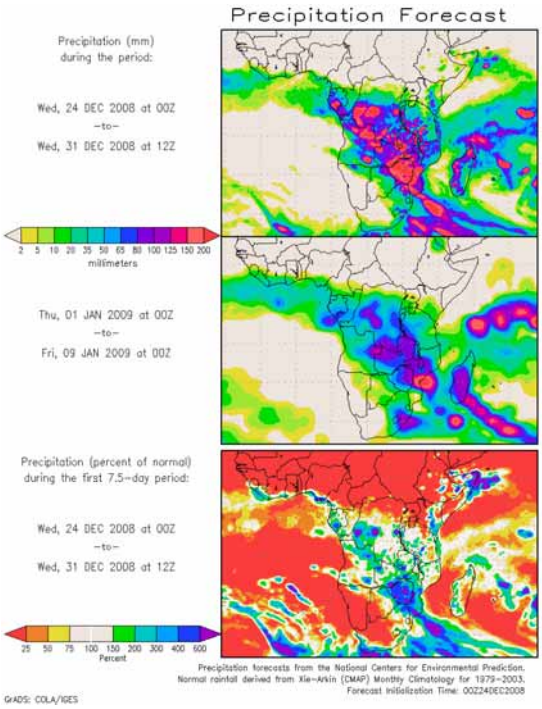
- **Agriculture and food security:** The applications of climate information in agricultural production are of crucial importance. We often emphasize on the importance of well documented onset and cessation dates of seasonal rainfall as well as monitoring of the phenological stages of crops for crop yield assessments in our countries. However, it is also important to carry out cost benefit analysis on determination and applications of appropriate planting dates in order to take full advantage of limited soil moisture availability in a shortened crop growing seasons. The drought-tolerant crops can be grown in zones where the prevailing soil moisture is the major climate constraint on 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 consensus forecast, for example issued by regional climate outlook forum (RCOF) such as the PRESAO, PRESAC, GHACOF or SARCOF.

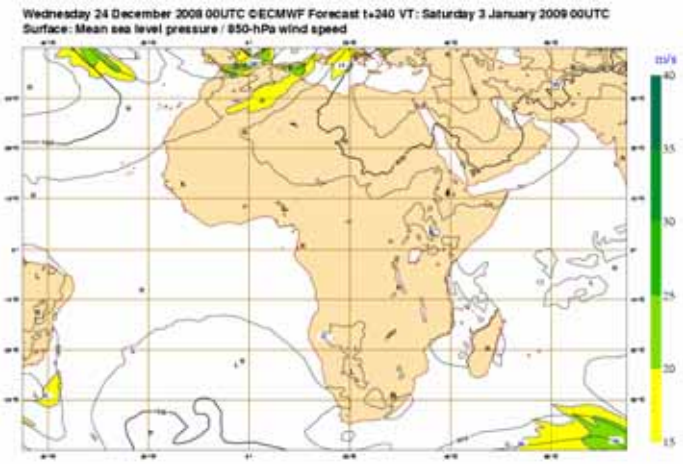
• **African Natural Ecosystems :** There is a need to invest in the rehabilitation of our presently degraded rainfall catchments areas within our natural ecosystems through enhanced national conservation strategies such as national tree planting, afforestation and soil conservation programmes during rainy seasons to minimize soil loss due to heavy runoff.



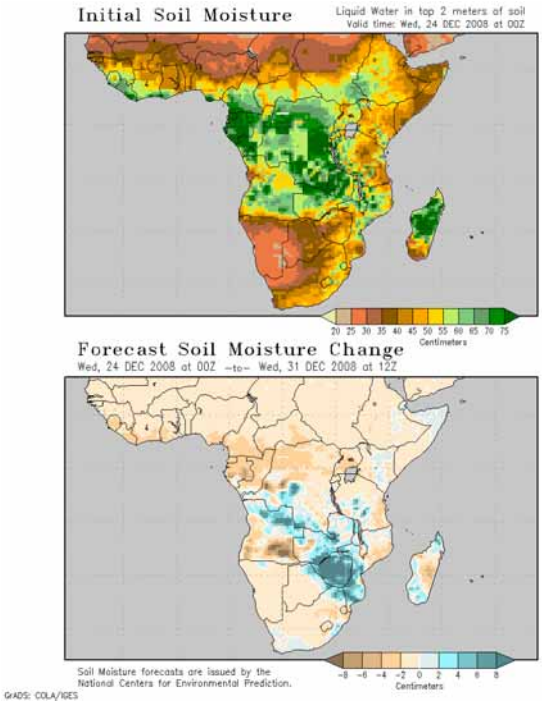
Source : COLA



Source : COLA



Source: ECMWF



Source: COLA