

Ten Day Climate Bulletin

N° 36 Year 2008

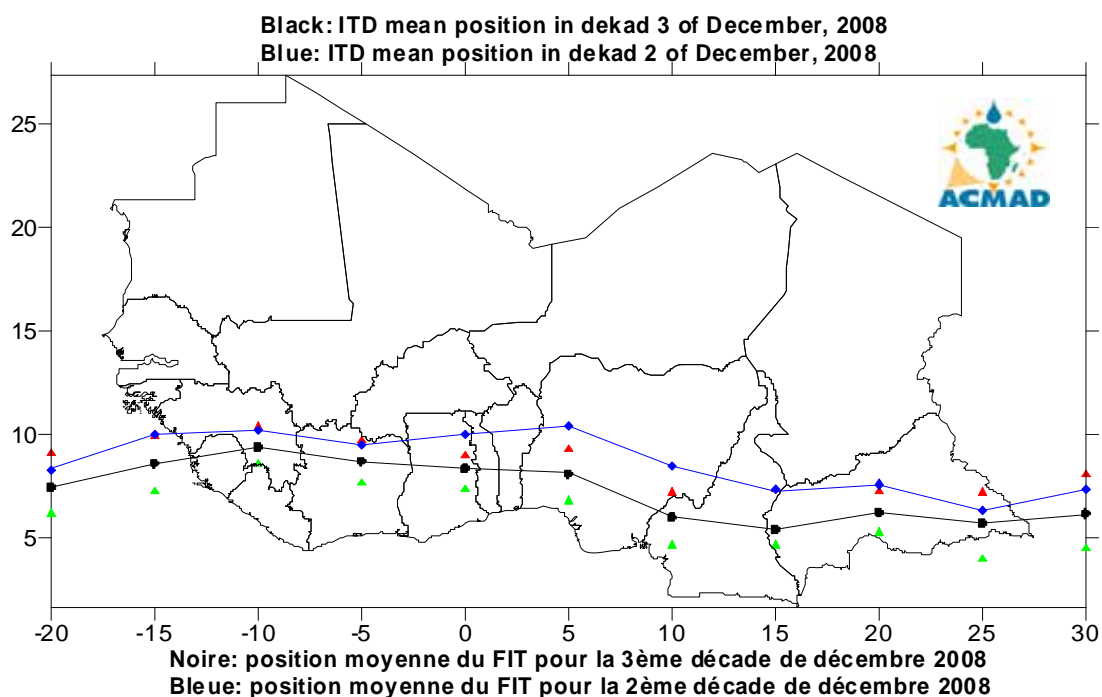
Dekad of 21 to 31 December, 2008

HIGHLIGHT: The highest rainfall of above 300mm was estimated over southern Mozambique. The eastern part of southern Africa countries are expected to continue experiencing the highest rainfall associated with floods.

1. GENERAL SITUATION :

1.1 SURFACE

- **Azores high:** disappeared during the third dekad of December 2008. Its mean position was occupied by a low pressure of 988hPa at 42.8°N/25.4°W on 31/12/2008.
- **St. Helena high:** Pressure at 1027hPa strengthened by 4hPa and shifted south at 40°S/12°W with an extended ridge over south Atlantic Ocean.
- **Mascarene high:** Pressure at 1022hPa weakened by 3hPa compared to the previous dekad and shifted northeast at 40°S/75°E with an extended ridge over Indian Ocean.
- **Saharan thermal low:** Pressure at 1009hPa fill up slightly by 1hPa compared to the past dekad and shifted southwest at 08°N/01°E with an extended trough over Togo, south Benin and Nigeria.
- **Inter-Tropical Discontinuity (ITD) :** Between the second and the third dekad of December, 2008, the ITD had significantly southward movement over Gulf of Guinea and central Africa countries. It's mean position was observed at 7.4°N and 8.6 over longitude 20°W and 15°W respectively; at 9.4°N over southeast Guinea; at 8.7°N over central north Côte d'Ivoire; at 8.3°N over extreme east Ghana; at 8.1°N over southwest Nigeria; at 6.0°N over west Cameroon; at 5.4°N, 6.2°N and 5.7°N over west, central and east Central African Republic respectively and at 6.2°N over south Sudan.



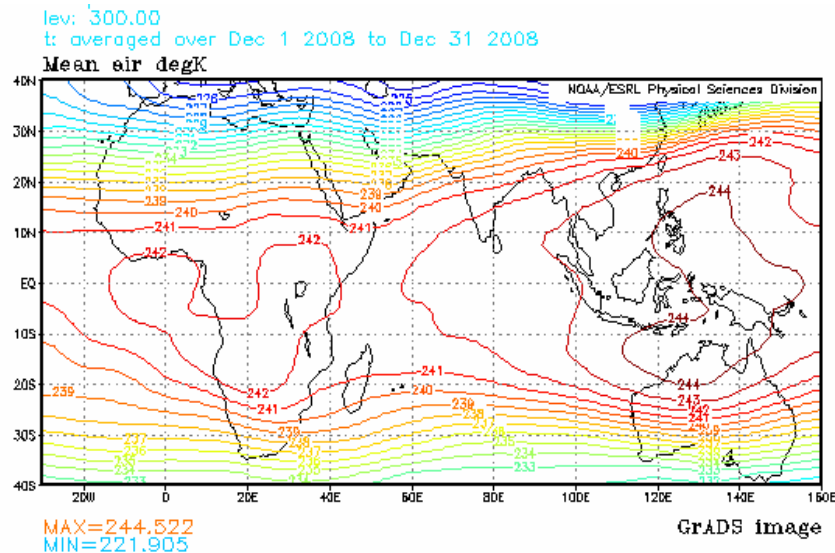
The red and green triangles represent the max. and min. displacements of the ITD respectively

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1.2 TROPOSPHERE

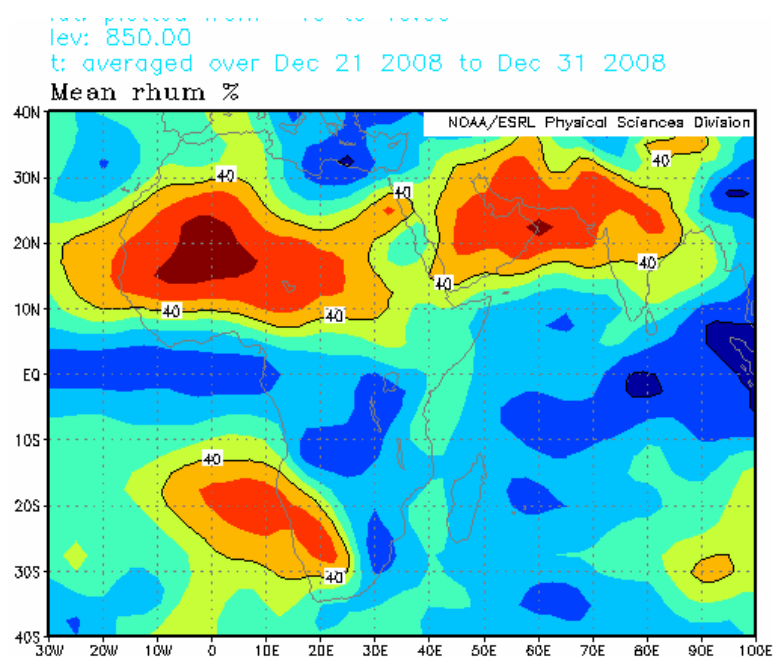
- **Monsoon:** Monsoon influx was weak (1 to 5 m/s) at 925hPa level over Sierra Leone, Liberia and south Cameroon.

- **Thermal Index (TI):** In the third 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 coastal strip of Gulf of Guinea countries, eastern and southern parts of 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 maximum value of 244°K, associated with heavy rainfall with floods is located over southern Japan, Indonesia and northern Australia. The situation is clearly manifesting suppressed rainfall over parts of GHA countries.



(Data Source: NOAA/NCEP)

- **Relative Humidity (RH):** The 850hPa map below shows high RH (>70%) in the third dekad of December, 2008 over Gulf of Guinea, extreme western part of Cameroon and Equatorial Guinea, Gabon, parts of central Africa and western parts of GHA countries. The Sahara, the Sahel countries and the western part of south Africa countries experienced dry conditions characterized by the lowest RH (<40%).



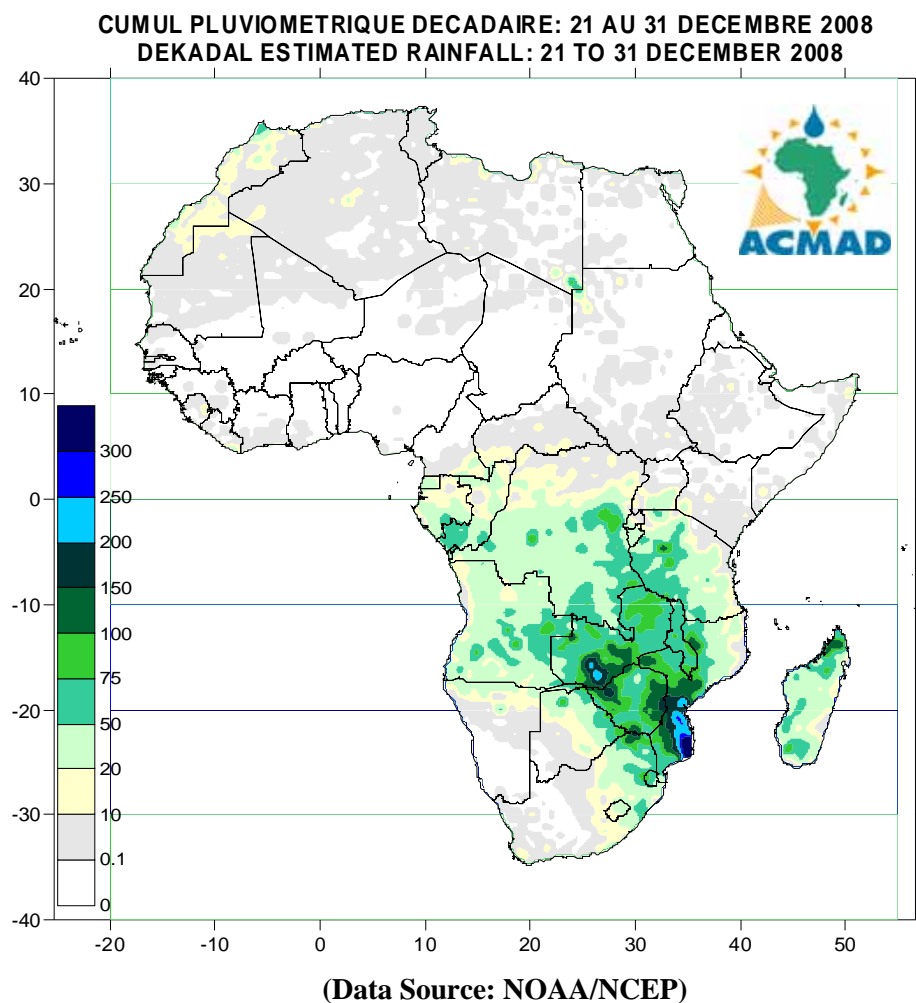
(Data Source: NOAA/NCEP)

2. RAINFALL AND TEMPERATURE SITUATION

2.1 RAINFALL

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

- **North Africa countries** : experienced spatial and intensity of rainfall decrease recording amounts ranging from 10 to 50mm with maximum rainfall amounts between 50 to 75mm over extreme north Morocco and southeast Libya.
- **The Sahel** : continued to experience generally dry and localized dusty conditions.
- **Gulf of Guinea countries** : had significant rainfall deficits recording amounts below 20mm over few places.
- **Central Africa countries** : had slight spatial rainfall decrease recording amounts ranging from 10 to 150mm.
- **GHA countries** : experienced spatial and intensity of rainfall increase recording amounts ranging from 10 to 100mm with localized peaks of about 150mm over north west Tanzania.
- **Southern Africa countries** : had spatial and intensity of rainfall increase recording amounts ranging from 10 to 200mm with heaviest amounts ranging from 200 to above 300mm over southern Mozambique and southern Zambia.



2.2 OBSERVED DATA

The Table below shows heaviest rainfall recorded over Manzini in Swaziland. The lowest temperature of 4.4°C was recorded at Alger (Dar-El-Bieida) in Algeria while the highest temperature of 36.0°C was recorded at Abuja in Nigeria.

N°	STATIONS	Précipitations (mm)	Number of rainy days	Temperature max mean (°C)	Temperature min mean (°C)
1	Abidjan	0	0	33,9	27,1
2	Abuja	0	0	36,0	17,8
3	Accra	0	0	32,6	25,5
4	Agadez	0	0	28,0	13,2
5	Alger(Dar El Beida)	3	1	17,9	4,4
6	Antananarivo	0	0	28,4	17,3
7	Bamako-Senou	0	0	35,1	17,6
8	Bangui	0	0	33,2	19,9
9	Banjul	0	0	32,7	19,6
10	Bilma	0	0	27,2	6,9
11	Bissau	0	0	32,5	-
12	Bobo Dioulasso	0	0	34,1	21,0
13	Brazzaville	98	4	30,6	22,6
14	Casablanca	4	2	19,0	10,3
15	Conakry	0	0	31,9	-
16	Cotonou	0	0	32,4	24,9
17	Dakar-Yoff	0	0	26,7	20,7
18	Dar-es-Salaam	1	1	32,8	25,6
19	Douala	0	0	32,9	24,7
20	Entebbe	0	0	27,3	19,4
21	Francistown	45	6	28,5	19,5
22	Harare	61	3	26,2	17,3
23	Johannesbourg	23	2	27,1	16,3
24	Khartoum	0	0	32,0	18,6
25	Kigoma	37	3	28,0	19,9
26	Kinshasa	0	0	30,5	22,8
27	Le Caire	0	0	18,6	12,1
28	Le Cap	0	0	20,9	14,9
29	Libreville	13	3	30,7	24,9
30	Lilongwe	6	1	-	-
31	Lomé	0	0	33,4	25,2
32	Lusaka	42	5	27,4	18,9
33	Manzini	123	2	-	19,4
34	Maputo	85	7	31,0	23,1
35	Maseru	36	5	27,9	13,9
36	Maun	12	3	33,2	21,0
37	Mbeya	47	5	24,2	14,4
38	Monrovia	0	0	31,6	24,4
39	Nairobi	0	0	28,4	13,7
40	Nampula	0	0	33,5	23,0
41	N'Djamena	0	0	31,9	14,6
42	Niamey-Aéroport	0	0	32,5	17,6
43	Nouakchott	0	0	31,5	20,0
44	Ouagadougou	0	0	34,1	18,5
45	Plaisance	41	4	30,4	23,9
46	Sal	0	0	24,6	20,9
47	Seretse Khama Airport	0	0	33,8	20,6
48	Seychelles	59	6	30,3	24,7
49	Tamanrasset	0	0	21,9	5,7
50	Tombouctou	0	0	31,9	15,6
51	Tripoli	2	1	18,4	8,1
52	Tunis	0	0	16,8	7,6
53	Windhoek	0	0	32,7	15,3
54	Zinder	0	0	28,1	15,5

NOTE: 0 means no rain;

- means no temperature data available

Data Source : ACMAD / GTS

3.OUTLOOK FOR DEKAD (11th – 20th JANUARY, 2009)

3.1 RAINFALL

The ITD will maintain southward displacement reducing the on-the-land moisture depth resulting in severe rainfall deficits 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 some increase in rainfall with amounts ranging from 10mm to 75mm with peaks of about 100mm.
- **The Sahel** : will continue to experience dry condition with localized dusty episodes.
- **Gulf of Guinea countries** : will continue to experience severe deficits recording rainfall amounts below 20mm with isolate peaks of about 50mm over the coastal zone.
- **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 150mm over southern parts.
- **GHA countries** : will record rainfall decrease with amounts ranging from 10mm to 75mm with isolated peaks of about 100mm over southern Tanzania.
- **Southern Africa countries** : will experience slight increase in spatial and intensity of rainfall recording amounts ranging from 10mm to 200mm with peaks of about 300mm over eastern Angola, Zambia, Malawi, Zimbabwe, Mozambique and Madagascar. However, isolated rainfall peaks of above 300mm are expected over Mozambique.

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, Zimbabwe, Mozambique and Madagascar.

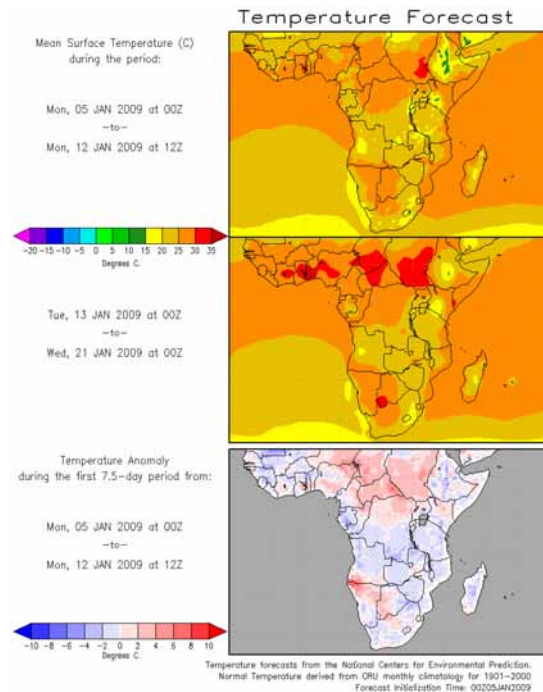
3.4 IMPACTS

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 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, Zimbabwe, eastern South Africa, Mozambique and Madagascar are expected to get heavy rainfall associated with floods and increased risk on 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.

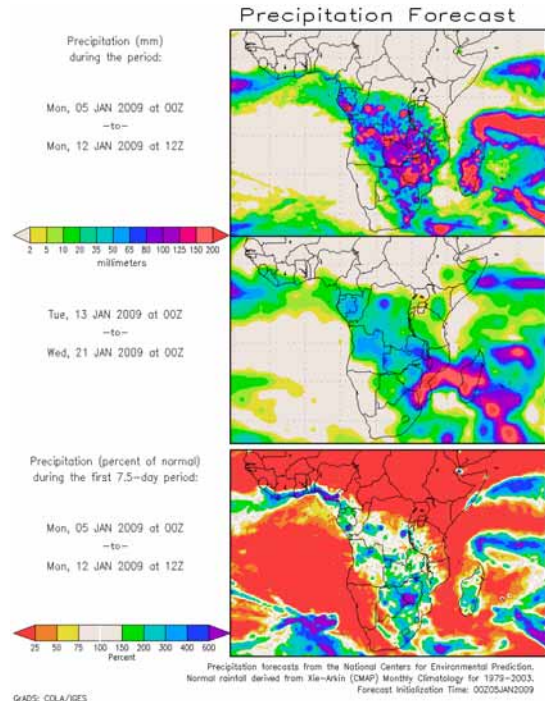
- **Agriculture and food security:** The applications of climate information in agricultural production are of crucial importance. We often emphasize on the importance of well documented onset and cessation dates of seasonal rainfall as well as monitoring of the phenological stages of crops for crop 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 seasonal climate consensus forecast, for example issued by regional climate outlook forum (RCOF) such as the PRESAO, PRESAC, GHACOF or SARCOF for West Africa, central Africa, Greater Horn of Africa and southern Africa countries respectively.

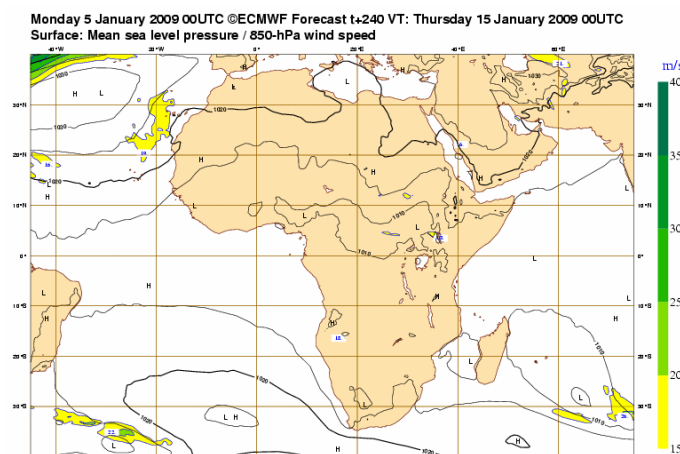
• **African Natural Ecosystems** : There is a need to invest in the rehabilitation of our presently degraded rainfall catchments areas within our natural ecosystems through enhanced national conservation strategies such as national tree planting, afforestation and soil conservation programmes during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



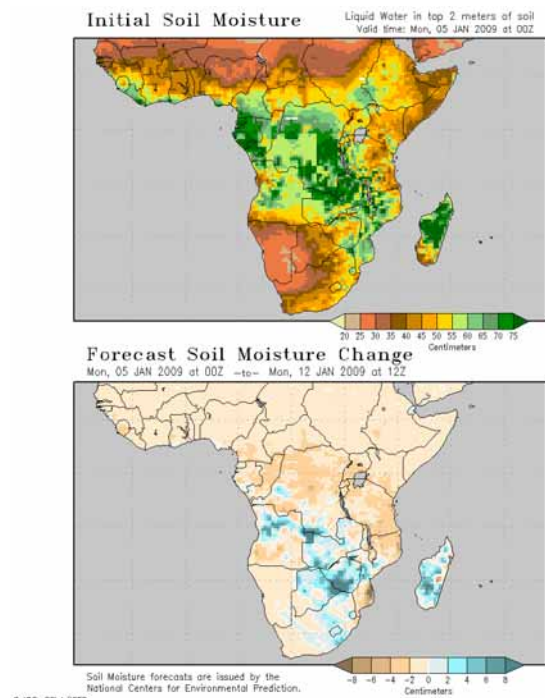
Source : COLA



Source : COLA



Source: ECMWF



Source: COLA