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

Ten Day Climate Bulletin

N° 01 Year 2009

Dekad of 01 to 10 January, 2009

HIGHLIGHT : The highest rainfall of about 250mm was estimated over central Africa countries. The northern part of southern Africa countries including Madagascar are expected to continue experiencing the highest rainfall associated with floods.

1. GENERAL SITUATION :

1.1 SURFACE

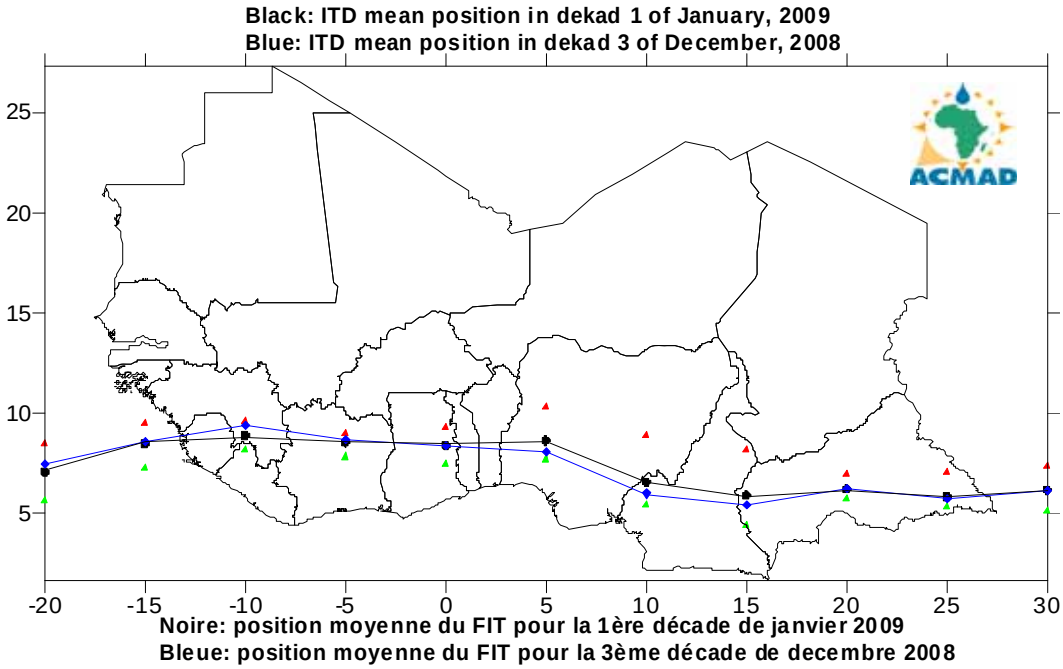
• **Azores high :** Pressure of 1026hPa with a mean position at 35°N/26°W had a ridge extending over south Morocco and Mauritania reducing prospects for good rainfall amounts.

• **St. Helena high:** Pressure at 1025hPa weakened by 2hPa and shifted southeast at 40°S/09°E with an extended ridge over south Atlantic Ocean.

• **Mascarene high:** shifted eastward at longitude 75°E over the Indian Ocean.

• **Saharan thermal low:** Pressure at 1010hPa filled up slightly by 1hPa compared to the past dekad and shifted northeast at 09°N/02°E with an extended trough over Togo, Benin, south Nigeria and Chad increasing prospects for good rainfall.

• **Inter-Tropical Discontinuity (ITD) :** Between the third dekad of December 2008 and the first dekad of January, 2009, the ITD had slight southward movement over western part of Gulf of Guinea countries, and moved towards the north over the eastern part. It's mean position was observed at 714°N and 8.5°N over longitude 20°W and 15°W respectively; at 8.9°N over extreme north Liberia; at 8.5°N over central north Côte d'Ivoire; at 8.4°N over central east Ghana; at 8.6°N over southwest Nigeria; at 6.6°N over extreme west Cameroon; at 5.9°N, 6.2°N and 5.8°N over west, central and east Central African Republic respectively and at 6.2°C over south Sudan.



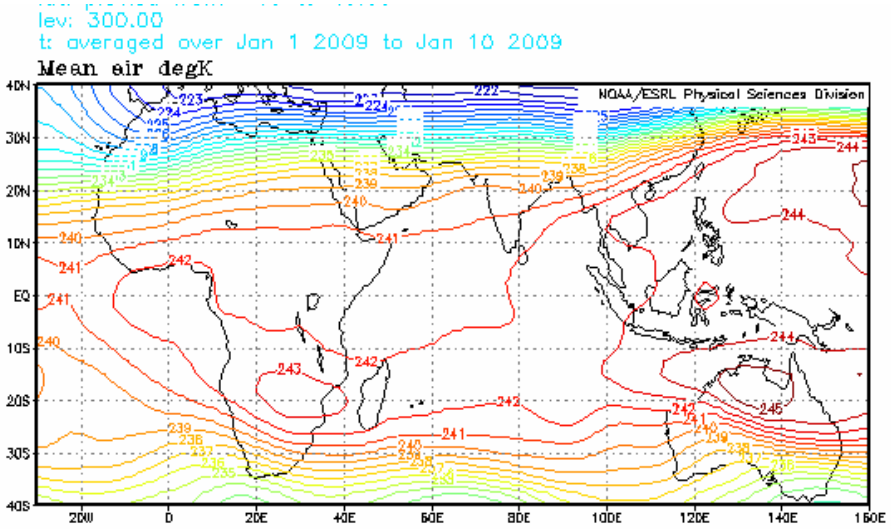
The red and green triangles represent the max. and min. displacements of the ITD respectively

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

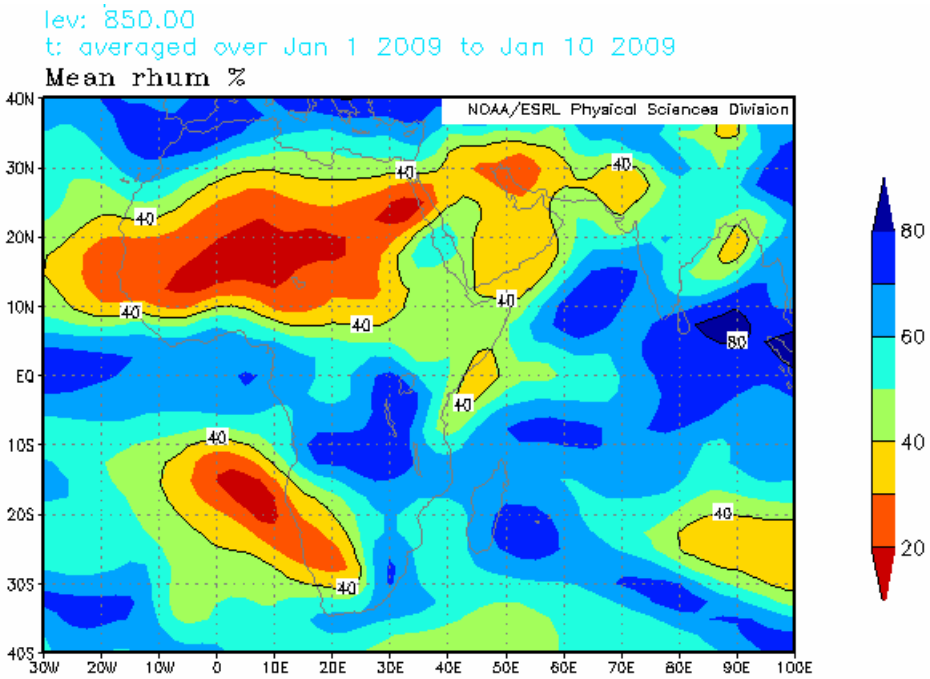
- **Monsoon:** Monsoon influx was weak (1 to 5 m/s) at 925hPa level over south Liberia and Cameroon.

- **Thermal Index (TI):** In the first dekad of January, 2009, the thermal index (TI) regime at 300hPa, map shown below, had TI regime value of 242°K over coastal strip of Gulf of Guinea countries, western and southern parts of central Africa countries, extreme southwest part of GHA countries and north parts of southern Africa countries associated with heavy rainfall that intensified into floods over areas covered TI regime threshold value of 243°K characterized by high relative humidity as observed below. The thermal index regime maximum value of 243°K and above, associated with heavy rainfall with floods is located over eastern Asia, Japan and northern Australia.



(Data Source: NOAA/NCEP)

- **Relative Humidity (RH):** The 850hPa map below shows high RH (>70%) in the first dekad of January, 2009 over Gulf of Guinea, parts of central Africa, western parts of GHA countries, and eastern part of southern Africa 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 first dekad of January, 2009 shows spatial rainfall increase over Northern Africa, Gulf of Guinea countries and southern Africa countries, while, central Africa and GHA countries experienced spatial rainfall decrease.

In summary:

- **North Africa countries :** experienced slight spatial rainfall increase recording amounts ranging from 10mm to 50mm over north Morocco, north Algeria and north Tunisia.

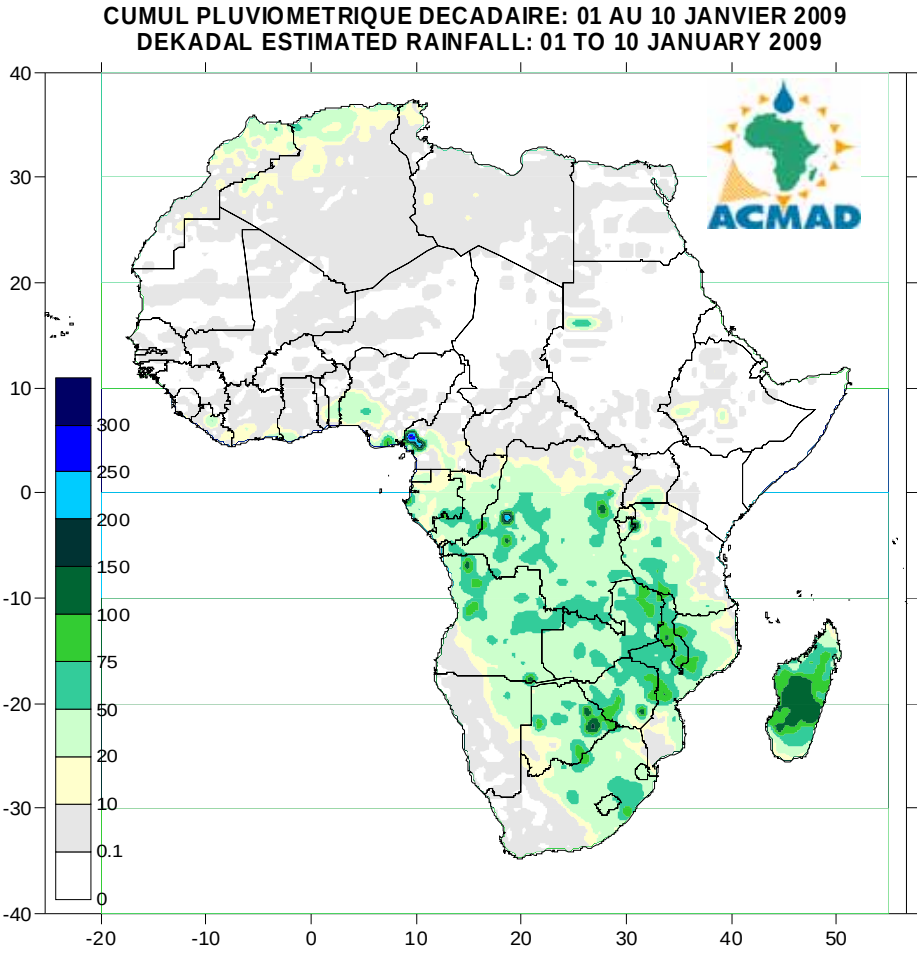
- **The Sahel :** continued to experience generally dry and localized dusty conditions.

- **Gulf of Guinea countries :** had slight spatial and intensity of rainfall increase recording amounts ranging from 10mm to 100mm with heaviest rainfall amounts of above 200mm over west Cameroon/southeast Nigeria.

- **Central Africa countries :** had slight intensity of rainfall increase recording amounts ranging from 10mm to 200mm with localized peak of about 250mm over Democratic Republic of Congo.

- **GHA countries :** experienced spatial rainfall decrease recording amounts ranging from 10mm to 150mm intensifying to about 200mm over Burundi.

- **Southern Africa countries :** had slight spatial rainfall increase recording amounts ranging from 10mm to 150mm with heaviest amounts of above 200mm over Botswana, Zimbabwe, Mozambique and Madagascar ..



(Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows heaviest rainfall recorded over Seychelles. The lowest temperature of 7.3°C was recorded at Alger (Dar-El-Bieida) in Algeria while the highest temperature of 34.3°C was recorded at Maun in Botswana.

N°	STATIONS	Précipitations (mm)	Nombre de jours de pluie	Température maxi moyenne (°C)	Température mini moyenne (°C)
1	Abidjan	13	4	32,9	25,8
2	Abuja	0	0	34,2	18,0
3	Accra	0	0	32,4	25,3
4	Addis Abéba	0	0	23,7	-
5	Agadez	0	0	29,4	13,6
6	Alger(Dar El Beida)	63	9	15,2	7,3
7	Antananarivo	0	0	29,0	18,6
8	Bamako-Senou	0	0	32,3	18,9
9	Bangui	3	1	34,1	19,1
10	Banjul	0	0	32,5	18,2
11	Beira	2	1	32,0	22,8
12	Bilma	0	0	29,8	7,9
13	Bissau	0	0	32,4	-
14	Bobo Dioulasso	0	0	32,6	19,6
15	Brazzaville	93	6	30,6	22,1
16	Bulawayo	3	2	-	17,6
17	Casablanca	11	2	16,1	10,5
18	Conakry	0	0	32,2	-
19	Cotonou	0	0	31,9	26,0
20	Dakar-Yoff	0	0	27,3	20,1
21	Dar-es-Salaam	0	0	32,9	25,1
22	Douala	1	1	32,2	24,9
23	Durban	41	6	27,3	21,6
24	Francistown	21	1	31,8	19,5
25	Harare	1	1	26,9	17,0
26	Johannesbourg	15	3	27,4	15,9
27	Khartoum	0	0	30,8	17,8
28	Kigoma	2	1	27,9	18,9
29	Kinshasa	0	0	31,6	-
30	Le Caire	0	0	19,4	10,1
31	Le Cap	0	0	23,5	16,9
32	Libreville	25	5	29,8	24,0
33	Lilongwe	44	3	-	17,3
34	Lomé	0	0	33,3	26,1
35	Lusaka	3	2	28,2	19,2
36	Manzini	38	2	-	20,7
37	Maputo	0	0	33,4	24,4
38	Maseru	28	3	30,3	14,1
39	Maun	0	0	34,3	21,9
40	Mbeya	78	5	24,4	13,2
41	Monrovia	0	0	31,3	24,6
42	Nairobi	0	0	28,4	12,6
43	Nampula	55	1	33,2	23,0
44	N'Djamena	0	0	33,6	15,9
45	Niamey-Aéroport	0	0	33,7	17,2
46	Nouakchott	0	0	29,1	16,8
47	Ouagadougou	0	0	33,5	18,2
48	Plaisance	86	7	31,4	23,8
49	Sal	0	0	24,5	19,9
50	Seretse Khama Airport	0	0	32,4	20,6
51	Seychelles	115	4	29,5	26,0
52	Tamanrasset	0	0	21,0	8,3
53	Tombouctou	0	0	29,9	14,8
54	Tripoli	4	1	19,5	7,8
55	Tunis	15	3	16,4	9,0
56	Windhoek	0	0	33,7	16,1
57	Zinder	0	0	31,5	15,1

NOTE: **0** means no rain;

- means no temperature data available Data Source **:** ACMAD / GTS

3.OUTLOOK FOR DEKAD (21st – 31st JANUARY, 2009)

3.1 RAINFALL

The ITD will maintain a quasi stationary position and rainfall deficits are expected over Gulf of Guinea countries and the Sahel. However, rainfall will increase 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 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 ranging from 10mm to 100mm over the coastal zone.

- **Central Africa countries :** Democratic Republic of Congo, Gabon, Congo, Angola, southern Cameroon and Equatorial Guinea will experience rainfall increase recording amounts ranging from 10mm to 200mm with peaks of about 250mm over southern eastern parts.

- **GHA countries :** will record rainfall increase with amounts ranging from 10mm to 100mm with isolated peaks of about 150mm over western/southern Tanzania.

- **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 eastern Angola, Zambia, Malawi, Zimbabwe, Mozambique and Madagascar. However, isolated rainfall peaks of above 300mm are expected over some places.

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.

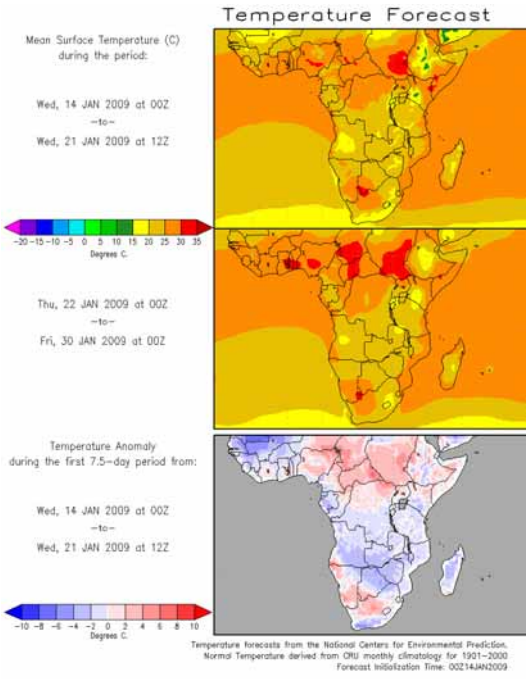
3.4 IMPACTS

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 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, 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.

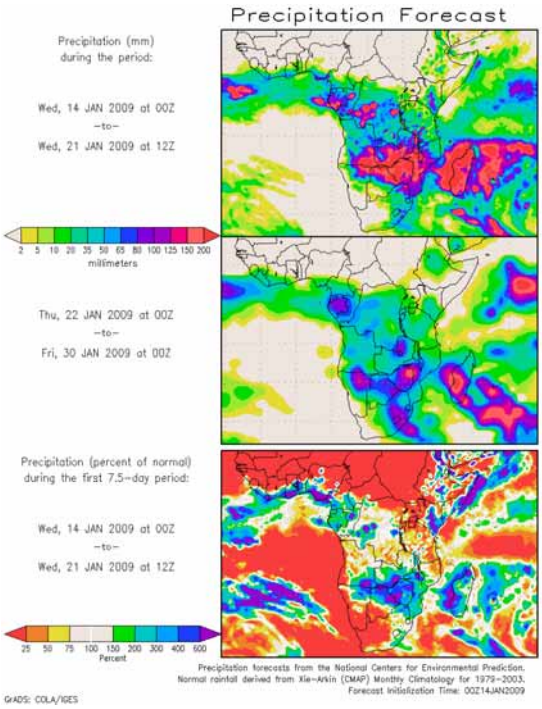
- **Agriculture and food security :** The applications of climate information in agricultural production are of crucial importance. We often emphasize on the importance of well documented onset and cessation dates of seasonal rainfall as well as monitoring of the phenological stages of crops for crop 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.

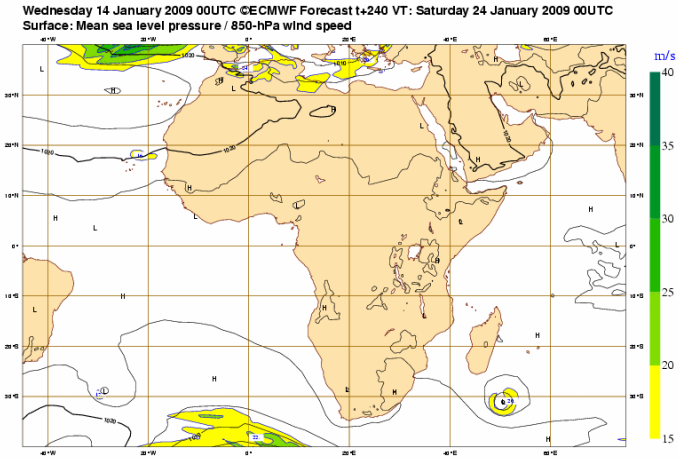
• **African Natural Ecosystems :** There is a need to invest in the rehabilitation of our presently degraded rainfall catchments areas within our natural ecosystems through enhanced national conservation strategies such as national tree planting, afforestation and soil conservation programmes during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



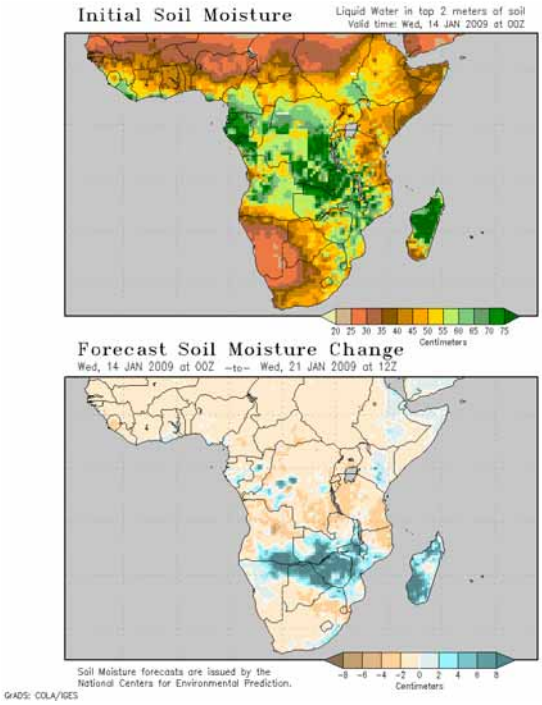
Source : COLA



Source : COLA



Source: ECMWF



Source: COLA