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

Ten Day Climate Bulletin
N° 12
Dekad 21st to 30th April, 2010

HIGHLIGHT: The cumulative estimated high rainfall distribution was over central Africa and the Gulf of Guinea. The highest rainfall amount in the continent was recorded in Seychelles. The highest mean maximum temperature was recorded at Bilma in Niger while the lowest mean minimum temperature was recorded at Maseru in Lesotho.

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 1024 hPa with a SW-NE axis was located at about 30°N/25°W extending a ridge over North Atlantic Ocean.

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- **Saharan thermal low:** pressure at 1004 hPa centred at about 14°N/14°E, maintained its intensity and shifted northwest compared to the past dekad. Its trough extended over south Mali, north Burkina Faso, central Niger, north Nigeria and south Chad.

- **St. Helena high:** pressure of 1026 hPa with a SE-NW axis strengthened by 4 hPa and shifted southeast compared to the previous dekad. Its mean position was at about 35°S/02°W, extending a ridge over South Atlantic Ocean.

- **A high** of 1022 hPa located at about 30°S/28°E with a SSW-NNE axis extended a ridge over east South African and East African countries.

- **Mascarene high:** pressure of 1028 hPa with a W-E axis strengthened by 2 hPa and shifted southeast compared to the past dekad. Its mean position was about 32°S/81°E with an extended ridge over Indian Ocean.

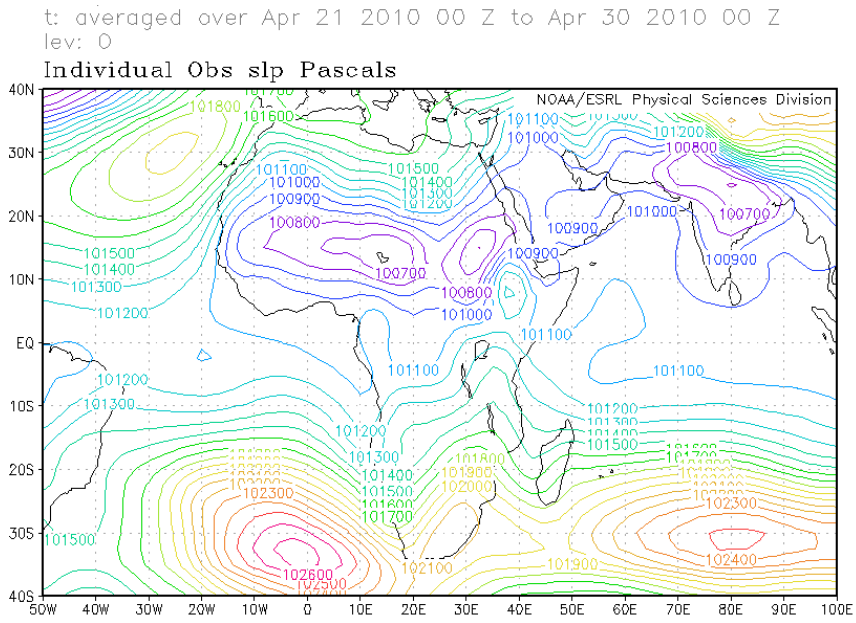


Figure 1: Mean Sea Level Pressure (Source: NOAA/NCEP/ESRL: PSD)

- **Inter-Tropical Discontinuity (ITD)**

Between the second dekad (blue line) and the third dekad of April (black line), 2010, the ITD continued to shift northward over south of the Sahel countries with a mean displacement of about 100km (Figure2)

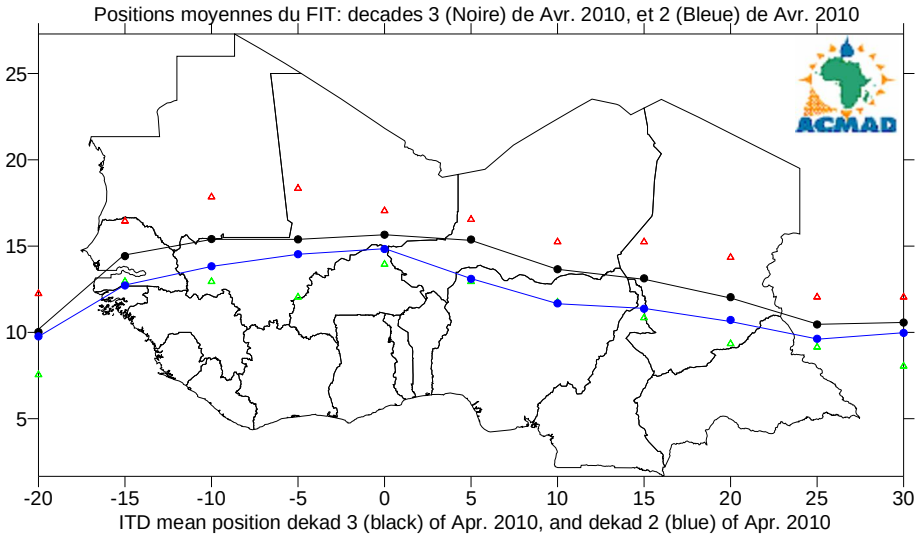


Figure 2: The red and green triangles represent the max. and min. displacements of the ITD respectively

1.2 TROPOSPHERE

1.2.1 Monsoon

Monsoon influx at 925hPa level was weak (1 to 5 m/s) over Sierra Leone, Liberia and southwest Cameroon and moderate (5.5 to 12.5 m/s) over east Guinea, Côte d'Ivoire, south Burkina Faso, Ghana, Togo, Benin and Nigeria during the dekad.

1.2.2 Thermal lndex (TI)

In the third dekad of April, 2010, the thermal index (TI) regime at 300hPa in (Figure 3), had the threshold value of 243°K forming belt extending about 11°N over Gulf of Guinea and the GHA countries and about 15°S over Central Africa and Southern Africa countries. The TI maxima of 244°K over southern part of Gulf of Guinea countries and most part of GHA countries extending to eastern part of Central Africa countries are linked to heavy rainfall with floods over areas with high relative humidity shown in Figure 4.

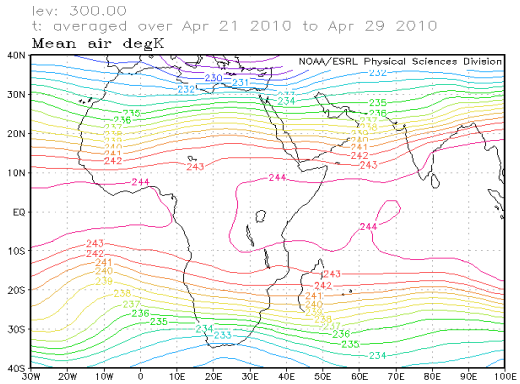


Figure 3: TI at 300hPa (Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH)

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

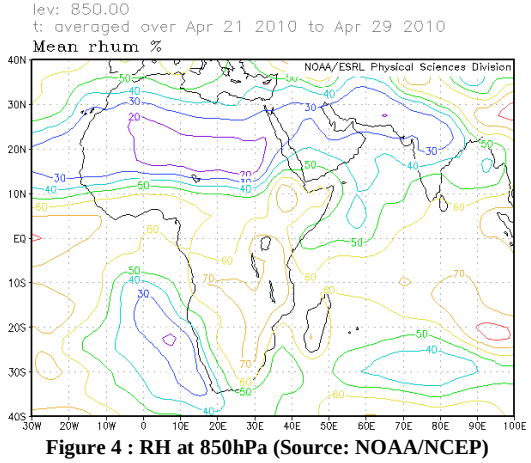


Figure 4 : RH at 850hPa (Source: NOAA/NCEP)

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 compared to that of the past dekad shows rainfall distribution increase over the Sahel, Gulf of Guinea, Central Africa,. GHA countries and Southern Africa countries have shown a decline except parts of Kenya, Uganda and Botswana. Northern Africa had insignificant change in rainfall distribution and amounts. In detail:

- **North Africa countries:** had insignificant change in rainfall distribution and amounts; observing amounts ranging from 10mm to 50mm with localized peaks of about 50 - 75mm over northern Morocco and Algeria.

- **The Sahel:** had observed amounts ranging from 10mm to 20mm, intensifying to about 50 - 75mm over southern Mali.

- **Gulf of Guinea countries:** experienced increase in rainfall distribution and amounts ranging from 10mm to 75mm intensifying from about 100mm to 150mm over south Côte d'Ivoire, Ghana, east Nigeria and Cameroon.

- **Central Africa countries:** had rainfall distribution and amounts increase; observing between 10mm to 100mm with maximum ranging from 150mm to above 200mm over Democratic Republic of Congo and a peak in Gabon of over 300mm.

- **GHA countries:** experienced rainfall ranging between 10mm to 100mm with localised peaks ranging from 200mm to about 300mm over east Tanzania while most parts of the country remained dry.

- **Southern Africa countries:** Most parts remained dry except Botswana which observed rainfall distribution of amounts ranging from 10mm to 75mm with maxima of over 100mm.

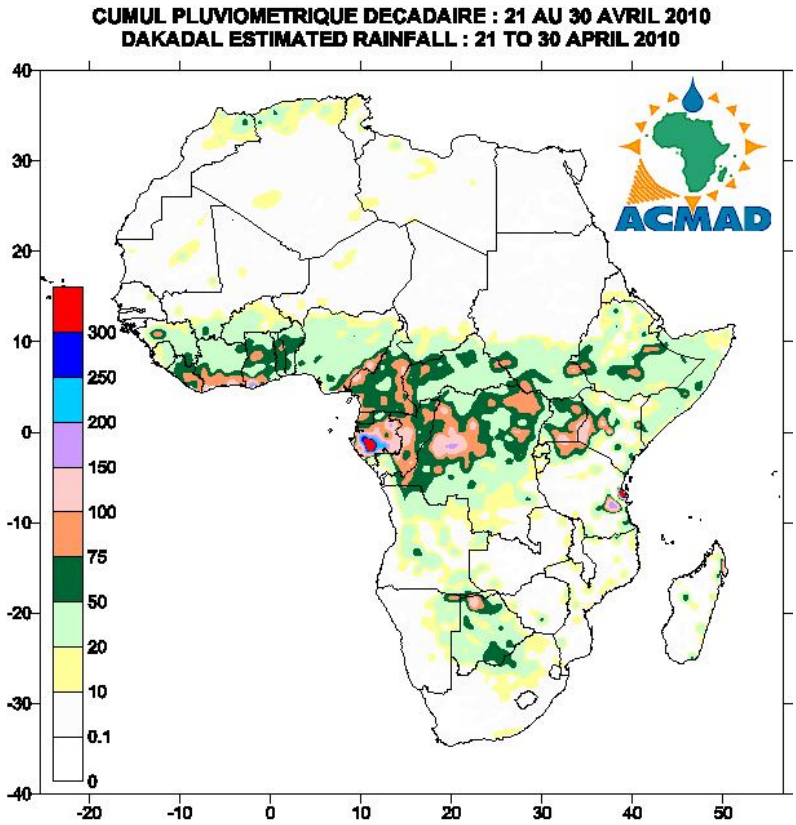


Figure 5 : Estimated precipitations, (Data Source: NOAA/NCEP)

2.2 OBSERVED DATA

The Table below shows that the heavy cumulative rainfall (>100mm) was observed at Seychelles, Brazzaville in Congo and Abidjan in Côte d'Ivoire. The highest mean maximum temperature of 43.0°C was recorded at Bilma in Niger while the lowest mean minimum temperature of 6.7°C was recorded at Maseru in Lesotho.

	STATIONS	Rainfall (mm)	Number of Rainy days	Mean maximum temperature (°C)	Mean minimum temperature (°C)
NAC	Casablanca	3	2	24,5	17,6
	Alger (Dar El Beida)	26	3	24,4	11,1
	Tamanrasset	0	0	33,7	20,0
	Tunis	7	3	23,2	14,4
	Tripoli	0	0	26,6	15,4
	Le Caire	0	0	28,3	18,0
SC	Sal	0	0	27,7	22,5
	Nouakchott	0	0	31,9	20,8
	Dakar-Yoff	0	0	27,1	21,8
	Banjul	0	0	34,5	22,7
	Bissau	0	0	35,3	24,2
	Tombouctou	4	1	41,7	28,9
	Bamako-Senou	0	0	39,0	27,5
	Ouagadougou	48	2	38,5	27,7
	Bobo Dioulasso	24	2	34,9	24,8
	Bilma	0	0	43,0	26,8
	Agadez	0	0	42,4	30,1
	Niamey-Aéroport	7	2	41,2	29,8
	Zinder	0	0	42,3	29,1
	N'Djamena	0	0	42,9	28,7
GGC	Conakry	0	0	32,6	25,8
	Monrovia	0	0	32,8	24,4
	Abidjan	124	5	33,1	26,2
	Accra	8	2	33,3	25,8
	Lomé	25	3	34,2	26,2
	Cotonou	17	3	32,2	27,0
	Douala	57	3	32,0	24,6
CAC	Bangui	0	0	33,8	22,7
	Libreville	42	3	29,5	24,0
	Brazzaville	127	4	32,4	23,4
	Kinshasa	0	0	31,9	22,9
GHAC	Khartoum	0	0	41,8	27,7
	Entebbe	0	0	26,7	21,9
	Nairobi	9	2	26,8	15,9
	Kigali	0	0	27,0	17,9
	Kigoma	25	1	-	19,8
	Dar-es-Salaam	22	3	31,8	23,3
	Mbeya	0	0	-	12,8
	Mtwara	34	2	31,6	23,3
SAC	Lilongwe	0	0	25,2	15,3
	Nampula	12	1	-	-
	Lusaka	0	0	27,0	16,2
	Harare	6	1	24,8	14,2
	Bulawayo	25	1	26,2	14,1
	Ghanzi	61	2	25,9	14,4
	Maun	29	2	-	-
	Francistown	14	1	24,7	15,1
	Seretse Khama- Aéro	26	1	23,4	-
	Windhoek	0	0	27,6	12,1
	Johannesbourg	44	7	17,4	9,6
	Pretoria	1	1	19,8	12,2
	Durban	1	1	26,3	16,4
	Le Cap	2	1	22,4	10,3
	Port Elisabeth	20	5	23,0	12,4
	Manzini	1	1	20,7	15,3
	Maseru	1	1	18,6	6,7
IOC	Seychelles	138	6	31,5	25,8
	Moroni	0	0	32,0	25,3
	Antsiranana	0	0	32,5	23,4
	Antananarivo	1	1	26,2	15,8
	Toalagnaro	66	5	27,8	21,7
	Plaisance	47	7	29,0	22,6

Data Source: ACMAD / GTS

NOTE: **0** means no rain;

- means no temperature data available

NAC= Northern Africa Countries ; **SC**=Sahel Countries; **GGC**=Gulf of Guinea Countries; **CAC**=Central Africa Countries; **GHAC**=Greater Horn of Africa Countries; **SAC**=Southern Africa Countries; **IOC**=Indian Ocean Countries.

3. OUTLOOK FOR DEKAD (11th – 20th MAY, 2010)

3.1 RAINFALL

The ITD will be expected to move northward with rainfall increase in the southern Sahel countries intensifying over the Gulf of Guinea, central Africa and north GHA countries. In detail**:**

- **North Africa countries:** will continue to experience rainfall amounts ranging from 10mm to 50mm with localized peaks of above 75mm.

- **The Sahel:** will experience rainfall increase amounts ranging from 10mm to 75mm with peaks of about 100mm over southern Sahel.

- **Gulf of Guinea countries:** will experience rainfall increase amounts ranging from 25mm to 150mm with peaks ranging from about 200mm and above.

- **Central Africa countries:** will experience rainfall increase with amounts ranging from 20mm to 200mm with peaks ranging from about 250mm to 300mm resulting in flooding.

- **GHA countries:** will have rainfall increase in the nothern parts with amounts ranging from 25mm to 200mm intensifying over some parts with amounts ranging from about 250mm to 300mm resulting in flooding in some areas.

- **Southern Africa countries:** will continue to experience rainfall decrease with amounts ranging from 0mm to 50mm with some isolated peaks of about 100mm in south western parts.

3.2 TEMPERATURE

The forecast in Figure 7, shows temperture in the Gulf of Guinea will be 25 – 30°C, the Sahel, northern central Africa above 30°C, GHA countries will realise a cooler period of 15 - 25°C except its eastern parts. The lowest temperatures ranging from 5- 25°C will cover most of Southern Africa.

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 significant soil moisture change increase include Gulf of Guinea countries, central Africa countries and northern countries of GHA while significant soil moisture change deficits will dominate and most of southern Africa countries and Madagascar.

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 Gulf of Guinea, central Africa, and GHA countries with high humidity/rainfall coupled with prevailing conducive temperatures will support survival of parasite resulting in higher incidences of malaria including other climate related diseases. Chances in the southern are low due to current low temperatures. The health authorities and Agencies need to continue the healthcare and humanitarian services to protect lives.

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 suitable planting dates, seasonal rainfall onset, rainfall amounts and length of the season including 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 and suitable seed variety 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 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) countries, West Africa countries/Chad/Cameroon, central Africa and southern Africa countries respectively. The GHACOF25 has issued the seasonal

climate consensus forecast for March-April-May, (MAM), 2010 for GHA countries available at ICPAC website.

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 the drying wetlands. We have to rehabilitate our presently degraded rainfall catchment areas and natural 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 and the achievement of the United Nations millennium development goals (MDGs) for sustainable development. The countries have to invest in environmental conservation now for better tomorrow**.**

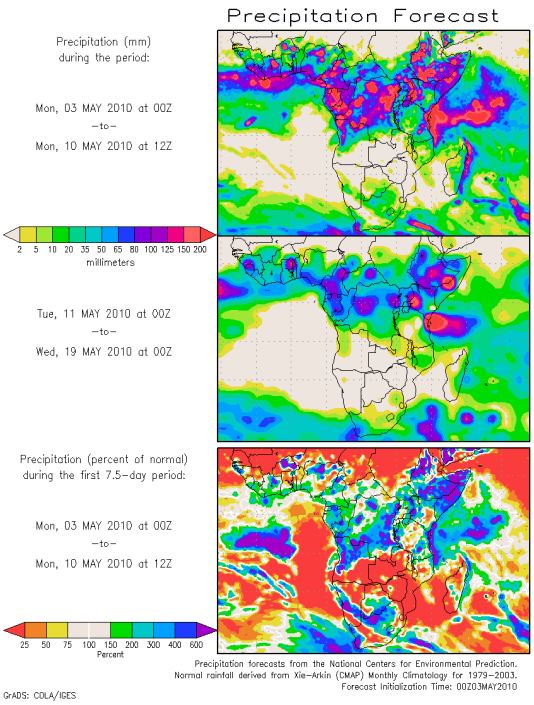
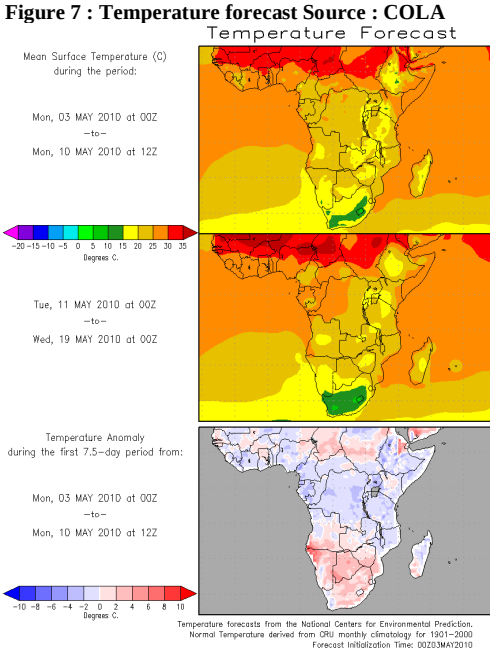


Figure 6 : Precipitation forecast, Source : COLA

Figure 7 : Temperature forecast Source : COLA



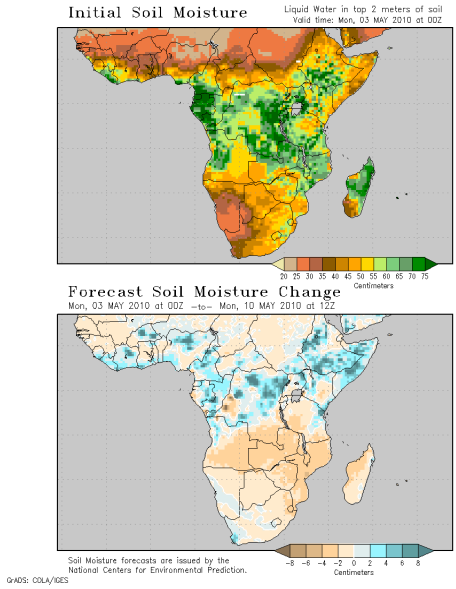


Figure 8 : Soil moisture forecast, Source: COLA

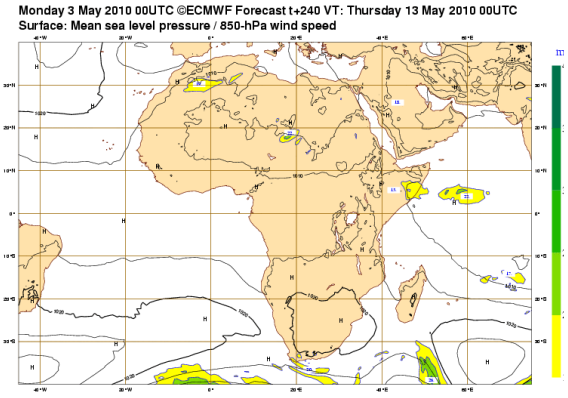


Figure 9 : Mean Sea Level pressure forecast Source: ECMWF