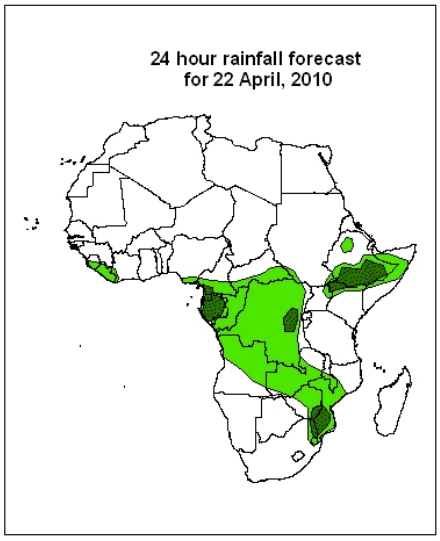
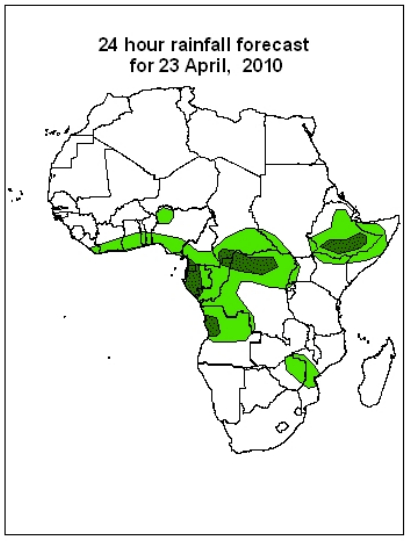
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 22 April –06Z of 24 April 2010, (Issued at 14:00EST of 21 April 2010)

1.1. Twenty Four Hour Cumulative Rainfall Forecasts

The forecasts are expressed in terms of probability of precipitation (POP) exceedence based on the NCEP, UK Met Office and the ECMWF NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.





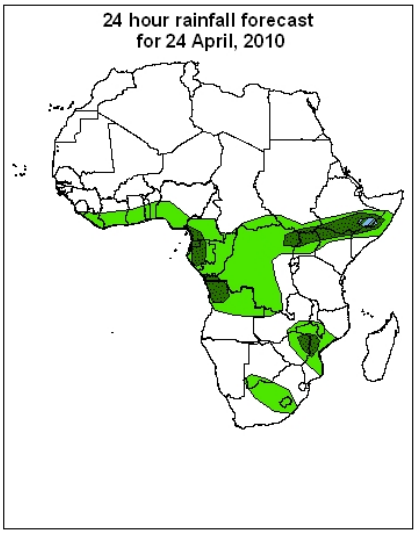
Legend

>40mm per day

> 20mm per day

Summary

The interaction between the mid-latitude and tropical systems is expected to continue enhancing rainfall in the Horn of Africa. Hence, many places in southern Ethiopia and the adjacent areas of Somalia and northern Kenya are expected to receive moderate to heavy rainfall through 24 to 72 hours. The active lower level convergence in the Congo Air Boundary (CAB) region is also expected to maintain the light to moderate in the region. The coastal areas of the Gulf of Guinea countries are also expected to receive light to moderate rainfall due to the onshore winds converging in the regions.



1.2. Models Comparison and Discussion - Valid from 00Z of 21 April 2010

Low pressure systems with central pressure values of 1008mb and 1009mb located over western and northern Algeria respectively are expected to move northeastwards while deepening through 24 to 48 hours. The lows are expected to move further to the east filling up through 48 to 72 hours. The heat low, with central pressure values of 1002mb, over western Sudan is expected to maintain its position through 24 to 72 hours. Localized low pressure systems, with central pressure values of 1004mb and 1006mb, in the Red Sea and the Gulf of Aden area, respectively, are expected to fill up while maintaining their position through 24 to 72 hours. On the other hand, a localized high pressure system with central pressure value of 1020mb located over central Mediterranean Sea is expected to move slightly eastwards with slight change in 24 to 48 hours. A localized high pressure cell with central pressure value of 1019mb located over southeastern part of South Africa is expected to persist extending its ridge up to Zimbabwe in 24 hours while another high pressure over Madagascar is expected to maintain its position in 48 to 72 hours. A strong high pressure system with central pressure value of 1032mb located over coast of southern Africa is expected to dominate the southern Africa regions extending its ridge axis up to Zimbabwe and Namibia through 48 to 72 hours. A low pressure system with central pressure value of 1008mb located off the coast of Somalia is expected to persist through 24 to 72 hours. The equatorial trough is expected to maintain its position with slight change with central pressure values of 1005mb over Guinea, 1004mb over Central Africa and 1003mb over southern Sudan through 24 to 72 hours.

At 850mb level, a mid-latitude trough located near the boarder between Morocco and Algeria is expected to propagate eastwards, while a trough close to northern Red Sea is expected to persist through 24 to 48 hours. The mid latitude systems located over northwestern Africa is expected to move further eastwards while retreating northwards in 72 hours. Meanwhile, the Saharan anticyclone is expected to strengthen slightly over northern Africa through 48 to 72 hours. The southeasterly winds from the periphery of the anticyclone in the Indian Ocean are expected to continue carrying moisture towards a strong lower level convergence in East Africa through 24 to 72 hours. A fast moving mid latitude frontal system located near 30^0E longitude, while extending its axis up to the southeastern part of South Africa, is expected to cross the southeastern part of South Africa in 24 to 48 hours.

At 500mb level, consistent with the lower tropospheric flow, a mid tropospheric westerly trough is expected to move between 20^0E and 40^0E longitudes, enhancing the lower level convergence in the Horn Africa through 24 to 72 hours. On the other hand, a trough in the westerlies is expected to propagate towards the western coastal areas of southern Africa across southeast Atlantic Ocean 24 to 72 hours.

At 200mb, the northern hemisphere mid-latitude westerlies are expected to assume wavy pattern, with trough axes dominating the flow off the coast of West Africa and near the Horn of Africa. Whereas, in the southern hemisphere, the flow over the subtropical

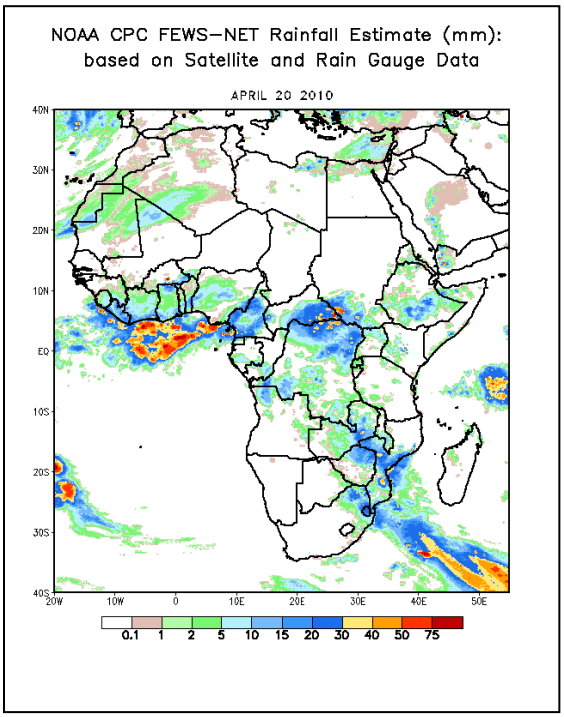
regions is expected to attain a zonal orientation in the western parts of the sub-tropical regions, while it tends to remain wavy in the eastern regions in 24 hours. In the northern hemisphere, the maximum wind speed associated with this flow is expected to exceed 130 knots in the region between 25^0E to 30^0E longitude in the southern hemisphere while 110 knots across coast of Libya to west of Egypt in the northern hemisphere and between 5^0E to 10^0E and 10^0E to 45^0E longitude in the southern hemisphere. Similarly a wind speed expected to exceed 90 knots across northern Libya to central Egypt in the northern hemisphere and between 5^0W to 40^0E and 0^0 to 50^0E longitude in the southern hemisphere through 24 to 72 hours. The speed of the jet wind is expected to weaken through 48 hours and will attain its strength through 48 to 72 hours in association with an east ward propagating the westerly wave.

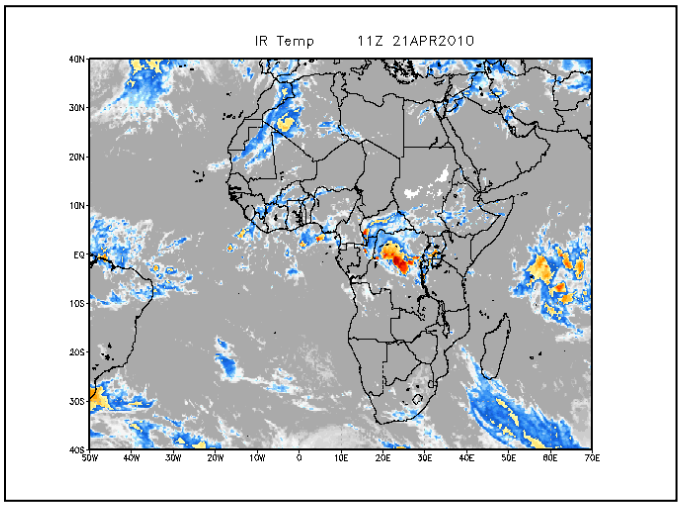
The interaction between the mid-latitude and tropical systems is expected to continue enhancing rainfall in the Horn of Africa. Hence, many places in southern Ethiopia and the adjacent areas of Somalia and northern Kenya are expected to receive moderate to heavy rainfall through 24 to 72 hours. The active lower level convergence in the Congo Air Boundary (CAB) region is also expected to maintain the light to moderate in the region. The coastal areas of the Gulf of Guinea countries are also expected to receive light to moderate rainfall due to the onshore winds converging in the regions.

2.0. Previous and Current Day Weather Discussion over Africa (20 April 2010 – 21 April 2010)

2.1. Weather assessment for the previous day (20 April 2010): During the previous day, moderate to heavy rains was observed over parts of Cameroon, southeastern part of Central African Republic, northern parts of DRC, southern part of Ethiopia, southwestern part of Sudan, northeastern Zimbabwe, central Mozambique and northeastern part of South Africa as well as coastal areas of Ivory Coast, Ghana and Nigeria.

2.2. Weather assessment for the current day (21 April 2010): Isolated intense clouds are observed over central part of DRC, part of Central African Republic, and adjacent areas, eastern part of Guinea and adjacent areas, Uganda, Rwanda and Burundi as well as few places of southwestern Ethiopia and southern parts of Sudan and South Africa.





Previous day rainfall condition over Africa (Left) based on the NCEP CPCE/RFE and current day cloud cover (up) based on IR Satellite image

Author(s): *Solomon Yohannes (National Meteorological Agency of Ethiopia / CPC-African Desk)*
