

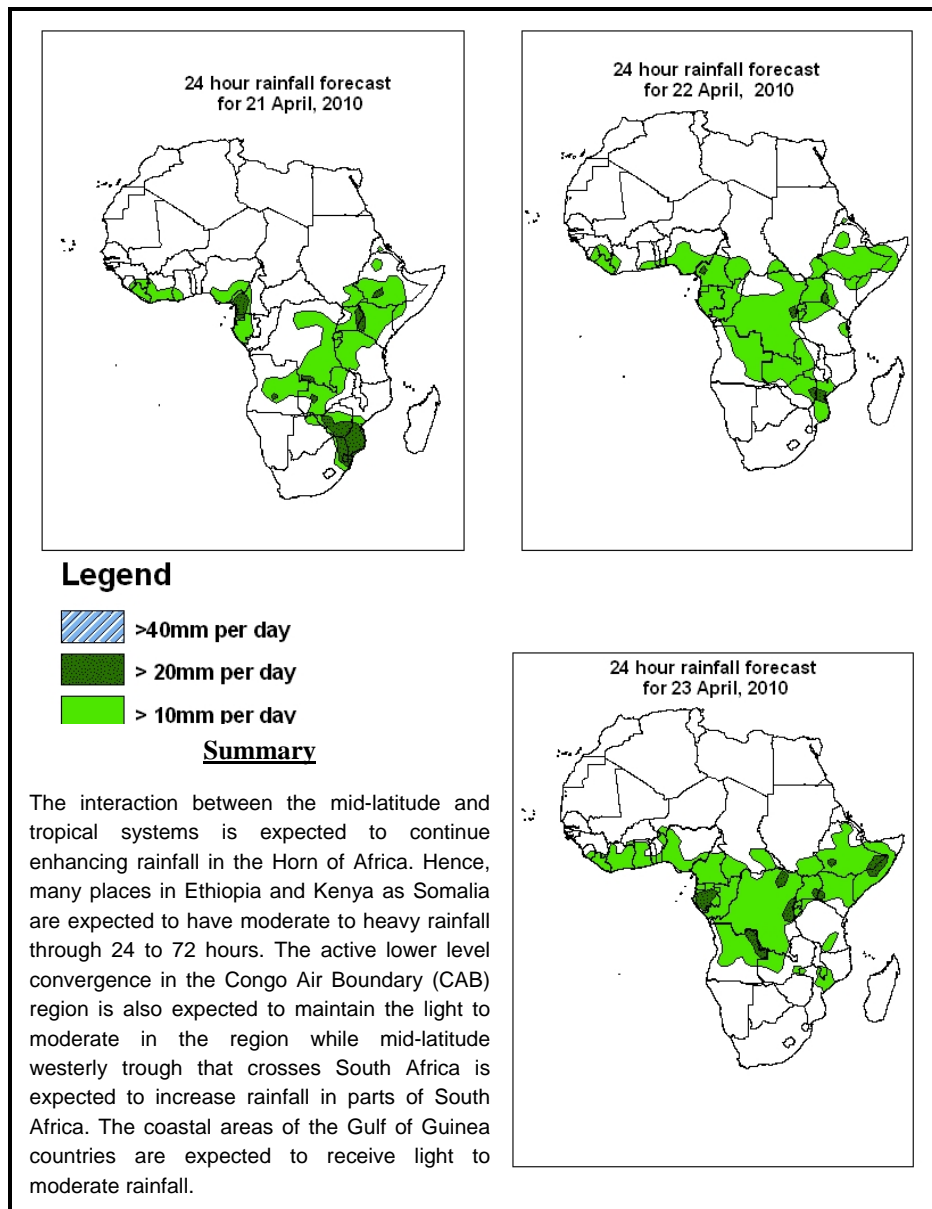


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid, 06Z of 21 April –06Z of 23 April 2010, (Issued at 14:00EST of 20 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.



## **1.2. Models Comparison and Discussion - Valid from 00Z of 20 April 2010**

Mid latitude low pressure system located over northeast Atlantic Ocean is expected to move eastwards while filling up in 24 to 48 hours. Low pressure systems with central pressure values of 1009mb and 1003mb located over west of Algeria and western Sudan, respectively are expected to persist while slightly deepened in 24 to 48 hours. The low located over western Algeria is expected to move eastwards with further deepening while over western Sudan is expected to maintain its position with slight change in the next 72 hours. The low pressure systems with central pressure values of 1009mb and 1010mb located off the coasts of Gabon and Angola respectively are expected to maintain their position through 24 to 72 hours. Another low pressure system with central pressure values of 1005mb and 1007mb, located over Red Sea and the Gulf of Aden respectively are expected to persist with a slight change through 24 to 72 hours. On the other hand, a high pressure system with central pressure value of 1019mb located over western Mediterranean Sea is expected to move eastwards with slight change in 24 to 48 hours. This localized high pressure system is expected to move further eastwards with a slight change in 48 to 72 hours. A localized high pressure cell with central pressure value of 1024mb located over southeastern part of South Africa is expected to move slightly northwards while weakening in 24 to 48 hours. The equatorial trough is expected to maintain its position with slight change with central pressure values of 1005mb over Guinea, 1002mb over Central Africa and 1004mb over southern Sudan through 24 to 72 hours.

At 850mb level, the Mid latitude trough located along  $10^{\circ}\text{W}$  and  $40^{\circ}\text{E}$  longitude are expected to propagate, while giving way to the eastward expanding Saharan anticyclone in 24 to 72 hours. As a result of this, dry northeasterly winds are expected to dominate the flow over northern Africa through 24 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  $30^{\circ}\text{E}$  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  $20^{\circ}\text{E}$  and  $40^{\circ}\text{E}$  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, in the northern hemisphere the mid-latitude westerlies are expected to remain zonal in 24 hours while gradually becoming wavy in 48 to 72 hours. 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 through 24 to 72 hours. In the northern hemisphere, the maximum wind speed associated with this flow is expected to exceed 110 knots across

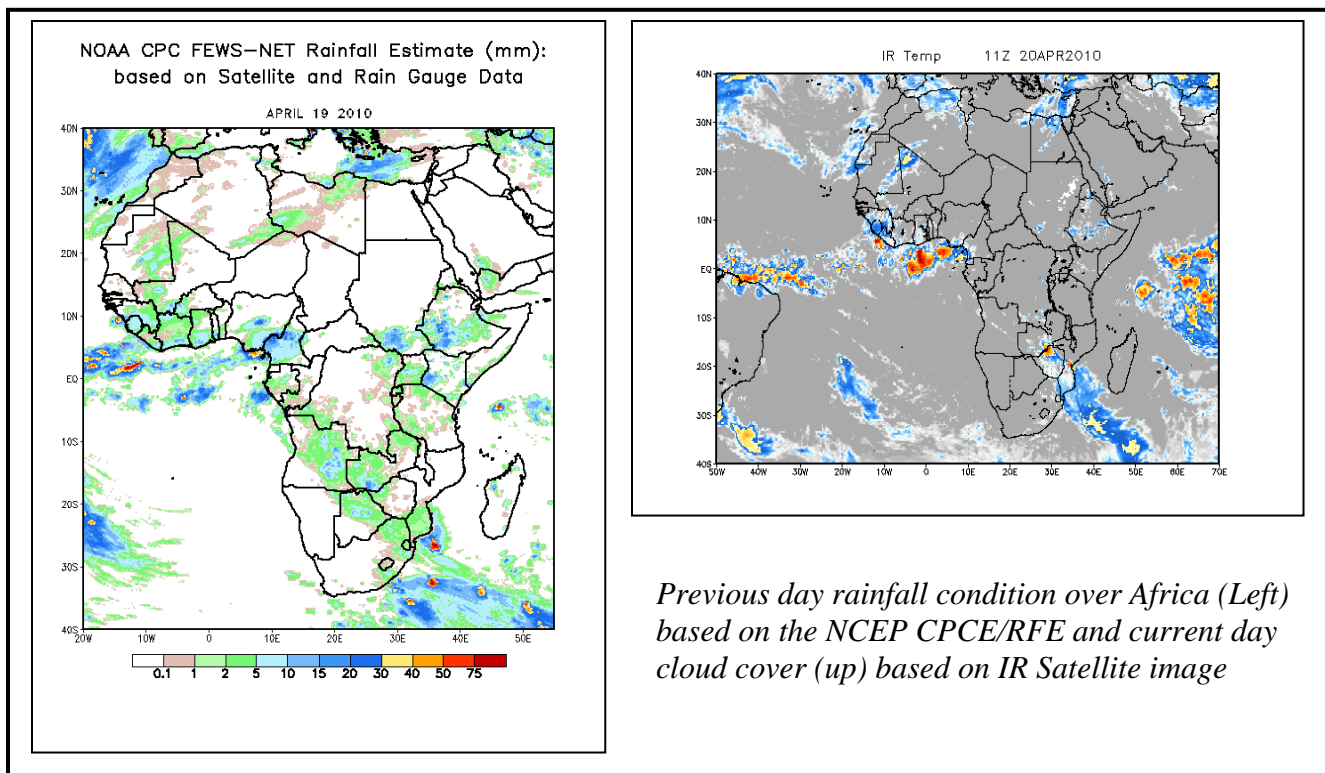
western Algeria to central Libya and central Mediterranean Sea to western Egypt while exceed 90 knots across eastern Morocco to central Libya. In the southern hemisphere the wind speed exceed 130 knots in the region between near  $35^{\circ}\text{E}$  to near  $42^{\circ}\text{E}$  longitude and wind speed exceed 110 knots across near  $32^{\circ}\text{E}$  to  $50^{\circ}\text{E}$  and around South Africa between near  $28^{\circ}\text{E}$  to  $33^{\circ}\text{E}$  longitude while, wind speeds exceed 90 knots across near  $30^{\circ}\text{E}$  to  $50^{\circ}\text{E}$  and  $5^{\circ}\text{W}$  to  $42^{\circ}\text{E}$  longitude 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 Ethiopia and Kenya as Somalia are expected to have 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 while mid-latitude westerly trough that crosses South Africa is expected to increase rainfall in parts of South Africa. The coastal areas of the Gulf of Guinea countries are expected to receive light to moderate rainfall.

## **2.0. Previous and Current Day Weather Discussion over Africa (19 April 2010 – 20 April 2010)**

**2.1. Weather assessment for the previous day (19 April 2010):** During the previous day, moderate to heavy rains was observed over southwestern part of Ethiopia, western part of Kenya, part of western and southwestern Cameroon, southern Sudan, central Nigeria and southern Zambia.

**2.2. Weather assessment for the current day (20 April 2010):** Isolated intense clouds are observed over northern half of Zimbabwe and adjacent areas of Zambia, central part of Mozambique, Sera Leone, and coastal areas of Liberia, Cameroon, Equatorial Guinea and Nigeria.



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

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