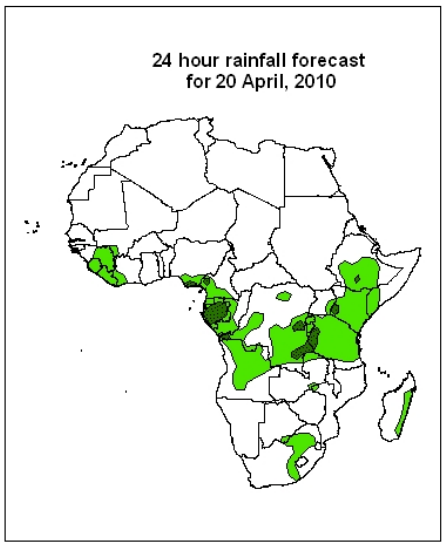
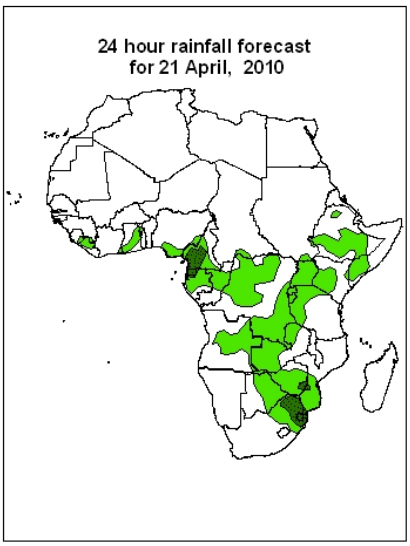
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 20 April –06Z of 22 April 2010, (Issued at 14:00EST of 19 April 2010)

1.1. Twenty Four Hour Cumulative Rainfall Forecasts

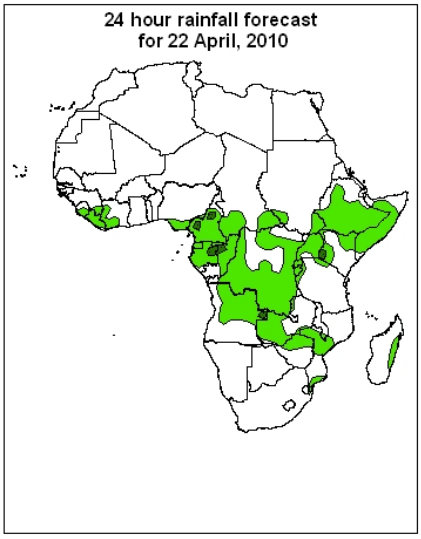
The forecasts are expressed in terms of probability of precipitation (POP) exceedence based on the NCEP, UK Met Office and the ECMWF NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.





Legend

- >40mm per day
- > 20mm per day
- > 10mm per day



Summary

The passage of a mid-latitude frontal system across eastern Mediterranean Sea is expected to continue enhancing interaction between the mid-latitude and tropical air masses across northeast Africa through 24 hours. In addition, the abundant moisture from the Arabian Sea and western Indian Ocean towards the Horn Africa and the strong lower level convergence in East Africa are expected to increase rainfall in the region. Hence, many places in Ethiopia and Kenya as well as parts of southern Somalia are expected to have light to moderate rainfall through 24 to 72 hours. The active lower level convergence in the Congo Air Boundary (CAB) region is also expected to maintain the moderate to heavy rainfall in the region while a feeble mid-latitude westerly trough that crosses South Africa is expected to increase rainfall in parts of South Africa.

1.2. Models Comparison and Discussion - Valid from 00Z of 19 April 2010

Mid latitude low pressure system located over northeast Atlantic Ocean is expected to fill up, while gradually becoming weak trough through 24 to 72 hours. Low pressure systems with central pressure values of 1009mb and 1011mb 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 value of 1008mb, located over the Gulf of Aden is expected to deepen slightly in 24 to 72 hours. A localized low pressure with central pressure value of 1005mb located over Red Sea is expected to fill up in 48 to 72 hours. On the other hand, a high pressure system with central pressure value of 1020mb located over Tunisia is expected to extend its ridge axis up to northern Algeria and Libya in 24 to 48 hours. This high pressure system is expected to move slightly southeast wards extending its ridge further to eastern Algeria and central Egypt, while weakening in 24 to 72 hours. The Mascarene high pressure system is expected to extend its ridge axis towards Namibia and South Africa, while gradually retreating back in 24 to 48 hours. A localized high pressure cell with central pressure value of 1024mb located over southern part of South Africa is expected to weaken in 48 to 72 hours. The equatorial trough is expected to maintain its position while slightly deepening from 1005mb to 1004mb over Guinea, 1004mb to 1002mb over Central Africa and 1004mb to 1003mb over southern Sudan through 24 to 72 hours.

At 850mb level, a fast moving Mid latitude trough is expected to propagate between central Mediterranean Sea and the Gulf of Persia, 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 30^0E longitude, while extending its axis up to the southeastern part of South Africa, is expected to cross 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 30^0E longitudes, enhancing the lower level convergence in the Horn Africa through 24 to 48 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 through 24 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 west of Mediterranean Sea to Tunisia and west of Algeria to northern Libya while in the southern hemisphere in the region between west of Namibia and Southern Indian Ocean near 40^0E. Meanwhile, wind

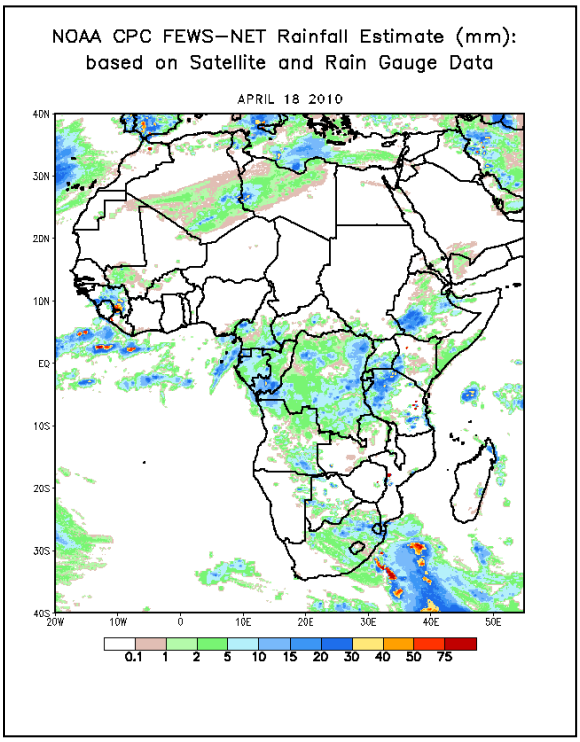
speeds exceed 90 knots across central Mediterranean Sea to in the northern hemisphere while across 40^0W to 45^0E in the southern hemisphere and Southern Atlantic Ocean across near 5^0W to near 30^0E through 24 to 72 hours. The speed of the jet wind is expected to weaken through 48 hours and will attain its strength through 48 to 72 hours in association with an east ward propagating the westerly wave.

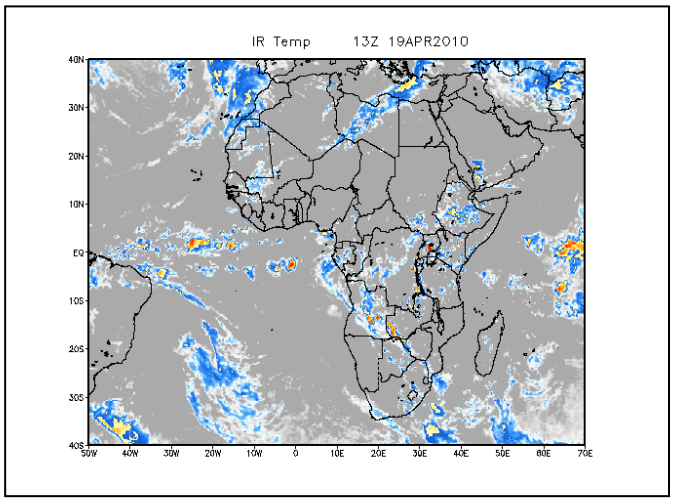
The passage of a mid-latitude frontal system across eastern Mediterranean Sea is expected to continue enhancing interaction between the mid-latitude and tropical air masses across northeast Africa through 24 hours. In addition, the abundant moisture from the Arabian Sea and western Indian Ocean towards the Horn Africa and the strong lower level convergence in East Africa are expected to increase rainfall in the region. Hence, many places in Ethiopia and Kenya as well as parts of southern Somalia are expected to have light to moderate rainfall through 24 to 72 hours. The active lower level convergence in the Congo Air Boundary (CAB) region is also expected to maintain the moderate to heavy rainfall in the region while a feeble mid-latitude westerly trough that crosses South Africa is expected to increase rainfall in parts of South Africa.

2.0. Previous and Current Day Weather Discussion over Africa (18 April 2010 – 19 April 2010)

2.1. Weather assessment for the previous day (18 April 2010): During the previous day, moderate to heavy rains was observed over southwestern part of Ethiopia, northwestern and southeastern parts of Tanzania, part of east DRC, Equatorial Guinea and southern part of Congo as well as few areas of eastern South Africa and southwestern part of Cameroon.

2.2. Weather assessment for the current day (19 April 2010): Isolated intense clouds are observed over southwestern and eastern Ethiopia, Uganda, Angola, southwestern part of Zambia, central part of South Africa as well as few places of southern Sudan, DRC, Kenya, Tanzania, Gabon and Botswana.





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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