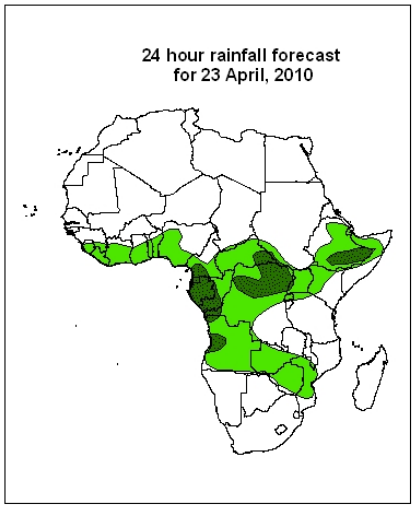
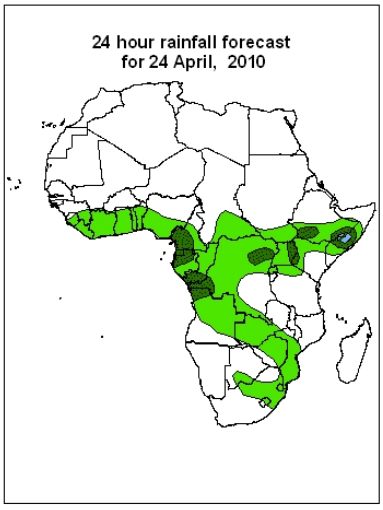
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 23 April –06Z of 25 April 2010, (Issued at 14:00EST of 22 April 2010)

1.1. Twenty Four Hour Cumulative Rainfall Forecasts

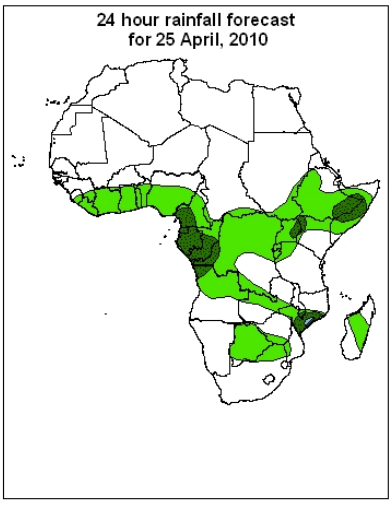
The forecasts are expressed in terms of probability of precipitation (POP) exceedence based on the NCEP, UK Met Office and the ECMWF NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.





Legend

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



Summary

The onshore winds from the Atlantic Ocean and their associated strong convergence in western parts of equatorial Africa are expected to continue increasing rainfall to 10mm per day and above in many places of Cameron, Gabon and their adjacent areas through 24 to 72 hours. Meanwhile, 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.

1.2. Models Comparison and Discussion - Valid from 00Z of 22 April 2010

A low pressure system with central pressure value of 1003mb located in the border between Libya and Egypt are expected to move eastwards while filling up in 24 to 48 hours. This low pressure system is expected to fill up further while moving eastwards in 48 to 72 hours. A low pressure system with central pressure value of 1008mb located over southwestern Algeria is expected to persist with slight change through 24 to 48 hours. The heat low, with central pressure values of 1004mb, over western Sudan is expected to maintain its position through 24 to 72 hours. Localized low pressure systems, with central pressure values of 1005mb 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 1019mb located in the border between Libya and Egypt is expected to move slightly eastwards while its ridge extending up to northern Sudan and Chad in 24 to 48 hours. A high pressure over Madagascar is expected to maintain its position in 24 to 48 hours. A strong high pressure system with central pressure value of 1031mb located over southern part of southern Africa is expected to move slightly northeastwards extending its ridge axis up to Zimbabwe through 48 to 72 hours. A low pressure system with central pressure value of 1008mb located off the coast of Somalia is expected to move slightly eastwards with slight change through 24 to 72 hours. Low pressures with central pressure values of 1011mb and 1012mb located over coast of Gabon and Angola respectively are expected to maintain their position through 24 to 72 hours. The equatorial trough is expected to maintain its position with slight change with central pressure values of 1004mb over Guinea, 1005mb over Central Africa and 1006mb over southern Sudan through 24 to 72 hours.

At 850mb level, a mid-latitude trough located between 10^0W to 0^0 is expected to persist in 24 to 48 hours. This trough is expected to propagate eastwards through 48 to 72 hours. Another 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 build up 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 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 30^0E and 45^0E longitudes, enhancing the lower level convergence in the Horn Africa through 24 to 72 hours. On the other hand, a southeast-northwest oriented trough between the Indian and Atlantic Oceans across southern parts of South Africa is expected to continue dominating the flow in the region through 24 to 72 hours.

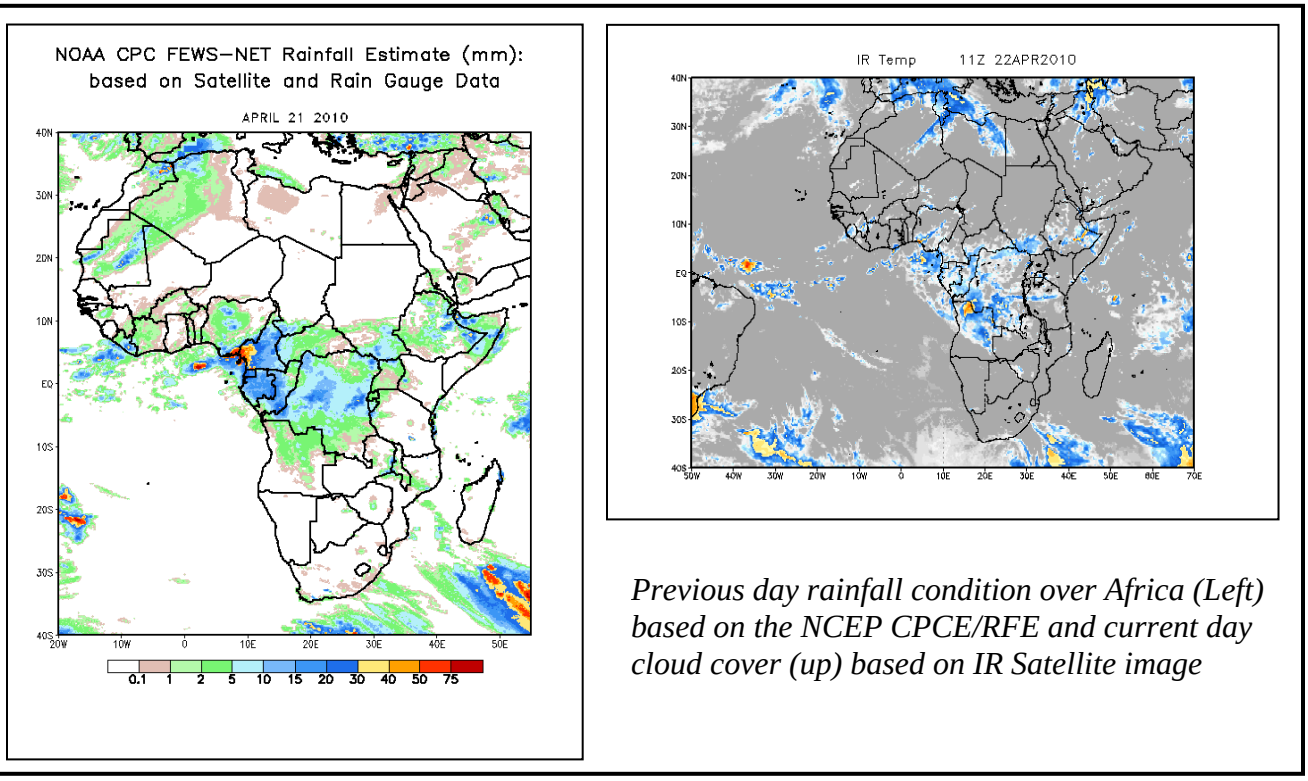
At 200mb, the northern hemisphere mid-latitude westerlies are expected to assume wavy pattern, with trough axes dominating the flow off the coast of West Africa and near the Horn of Africa. Whereas, in the southern hemisphere, the flow over the subtropical regions is expected to attain a zonal orientation in the eastern parts of the sub-tropical regions, while it tends to remain wavy in the western and central regions in 24 hours. In the northern hemisphere, the maximum wind speed associated with this flow is expected to exceed 110 knots in the region between 30^0E and 35^0E longitude while exceed 90 knots across east of Algeria to western Egypt. Whereas, in the southern hemisphere the wind speed expected to exceed 150 knots in the region between 50^0E and 60^0E, while exceed 130 knots in the region between 20^0E to 50^0E longitude. Similarly a wind speed expected to exceed 110 knots in the region between 5^0E to 55^0E and 15^0E to 60^0E, while exceed 90 knots in the region between 0^0E to 60^0E 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 onshore winds from the Atlantic Ocean and their associated strong convergence in western parts of equatorial Africa are expected to continue increasing rainfall to 10mm per day and above in many places of Cameron, Gabon and their adjacent areas through 24 to 72 hours. Meanwhile, 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.

2.0. Previous and Current Day Weather Discussion over Africa (21 April 2010 – 22 April 2010)

2.1. Weather assessment for the previous day (21 April 2010): During the previous day, moderate to heavy rains was observed over Cameroon, Gabon, Equatorial Guinea, central parts of Congo and DRC and eastern and southeastern parts of Ethiopia as well as few places of central Nigeria and southern Sudan.

2.2. Weather assessment for the current day (22 April 2010): Isolated intense clouds are observed over Sera Leone, northern and eastern parts of Angola, Congo, southern and western parts of DRC, southern Sudan, southern, southwestern and southeastern parts of Ethiopia and northwestern part of Tanzania.



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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