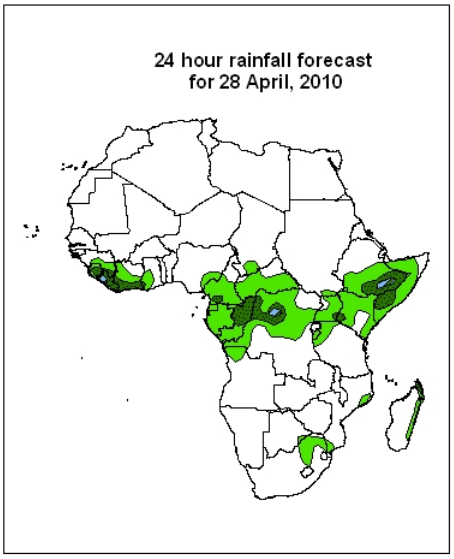
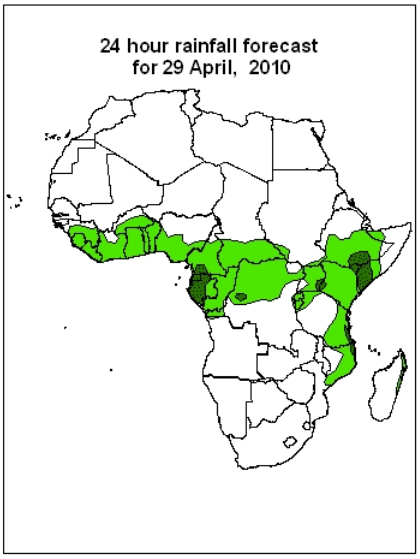
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 28 April –06Z of 30 April 2010, (Issued at 14:00EST of 27 April 2010)

1.1. Twenty Four Hour Cumulative Rainfall Forecasts

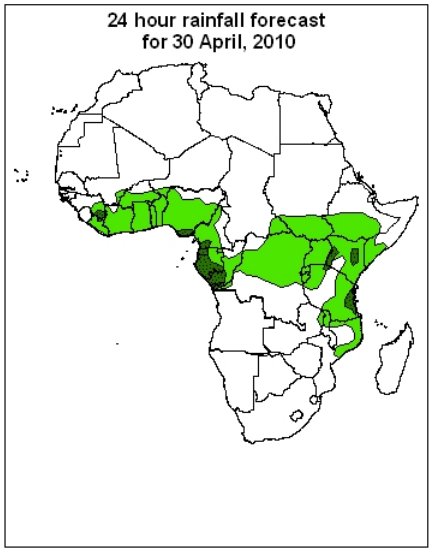
The forecasts are expressed in terms of probability of precipitation (POP) exceedence based on the NCEP, UK Met Office and the ECMWF NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.





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 daily rainfall to 10mm and above in many place of Sierra Leone, Liberia, Ivory Coast, Congo, Gabon, Equatorial Guinea, Guinea and northern half of DRC through 24 to 72 hours. Meanwhile, the abundant moisture from northern Indian Ocean and the persistence lower level convergence in the Horn of Africa is expected to continue enhancing rainfall in the region. Hence, many places in southern half of Ethiopia and the adjacent areas of Somalia, coastal areas of eastern part of Tanzania and central 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 27 April 2010

Localized low pressure systems, with central pressure values of 1007mb and 1011mb located in the Red Sea and Gulf of Aden respectively are is expected to maintain their position while deepening through 24 to 72 hours. On the other hand, high pressure system with central pressure value of 1023mb located over coast of northeastern Algeria is expected to develop in 24 hours while replaced by ridge in the next to 48 hours onwards. The ridge extended from this high pressure is expected to reach up to Libya. A high pressure with central pressure value of 1024mb located over east of South Africa is expected to maintain its position and strength while extending its ridge up to southern Mozambique and Zambia through 24 to 72 hours. High pressure systems with central pressure values of 1018mb and 1022mb located over central part of Angola and Zimbabwe respectively are expected to develop in 24 hours. The Mascarene high pressure system with central pressure value of 1029 located over southern Indian Ocean is expected to split in to two cells while weakening in 24 to 48 hours. A low pressure system with central pressure value of 1011mb located off the coast of Somalia is expected to maintain its position while slightly deepening through 24 to 72 hours. A localized low pressure system with central pressure value of 1010mb located over central parts DRC is expected to deepen while maintaining its position through 24 to 72 hours. Low pressures with central pressure values of 1011mb located along each coasts of Angola and Gabon are expected to maintain their position while slightly deepening through 24 to 72 hours. The equatorial trough is expected to maintain its position with central pressure values of 1006mb each located over Guinea and southern Sudan and 1005mb over Central Africa with slight change through 24 to 72 hours. Another localized low pressure with central pressure value of 1004mb located over western part of Sudan is expected to deepen while maintaining its position through 24 to 72 hours.

At 850mb level, the sub tropical anticyclonic circulation is expected to dominate the northern Africa regions through 24 to 72 hours, while a mid latitude trough located along 10^0E longitude is expected to create favorable condition for the eastern Africa regions. The northwesterly and southeasterly wind flows is expected to converge along equatorial regions in 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. Mid latitude

frontal system located near 15^0E longitude is expected to weaken in 24 hours, while shifting eastwards in the next 48 hours.

At 500mb level, consistent with the lower tropospheric flow, a back hanged mid tropospheric westerly trough located near 0^0 longitude is expected to move eastwards reach up between 10^0E and 20^0E longitude while extending up to near 20^0N latitude through 24 to 72 hours. This mid tropospheric trough is expected to get its ideal position along 20^0N latitude in the next 72 hours. On the other hand, a westerly wind flows in the southern hemisphere are expected to move slightly eastwards while remain being zonal across southern Africa regions through 48 to 72 hours.

At 200mb, the persistent wavy pattern in the subtropical areas of the northern hemisphere is expected to move eastwards following one another across the western Africa regions 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 move easterly while crossing southern part of South Africa through 24 to 48 hours, while system is tending to weaken through 48 to 72hours. In the northern hemisphere, the maximum wind speed associated with this flow is expected to exceed 130 knots across central part of Libya to east Mediterranean Sea and northeast of Libya to west of Persian Gulf and exceed 110 knots across west of Libya to west of Arabian Peninsula and central Libya to west of Asia, while exceed 90 knots across east of Algeria to east of Arabian Peninsula and central Libya to west Asia. The speed of the jet wind is expected to weaken in 48 to 72 hours in association with an east ward propagating the westerly wave.

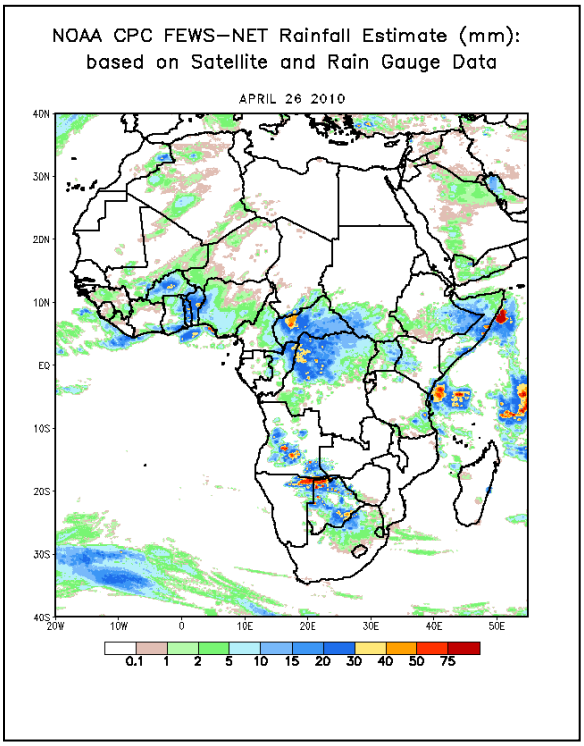
The onshore winds from the Atlantic Ocean and their associated strong convergence in western parts of equatorial Africa are expected to continue increasing daily rainfall to 10mm and above in many place of Sierra Leone, Liberia, Ivory Coast, Congo, Gabon, Equatorial Guinea, Guinea and northern half of DRC through 24 to 72 hours. Meanwhile, the abundant moisture from northern Indian Ocean and the persistence lower level convergence in the Horn of Africa is expected to continue enhancing rainfall in the region. Hence, many places in southern half of Ethiopia and the adjacent areas of Somalia, coastal areas of eastern part of Tanzania and central Kenya are expected to receive moderate to heavy rainfall through 24 to 72 hours. The active lower level

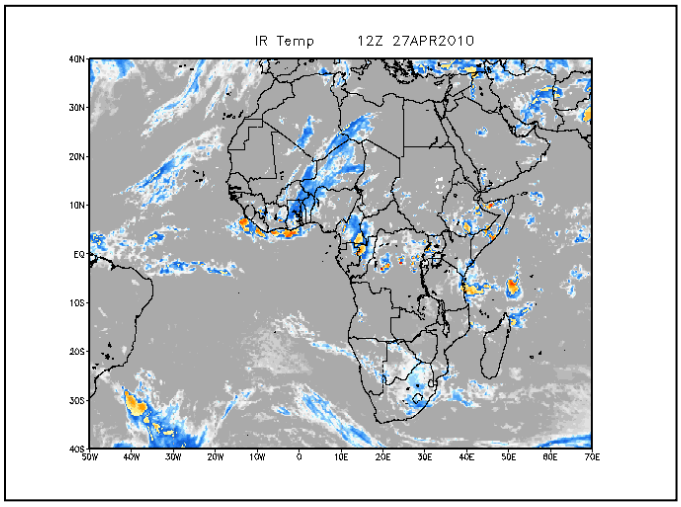
convergence in the Congo Air Boundary (CAB) region is also expected to maintain the light to moderate in the region.

2.0. Previous and Current Day Weather Discussion over Africa (26 April 2010 – 27 April 2010)

2.1. Weather assessment for the previous day (26 April 2010): During the previous day, moderate to heavy rains was observed over Burkina Faso, Togo, Benin, Central African Republic, northwestern DRC and adjacent areas of Congo and Sudan, some places of Angola, northeastern part of Namibia, Botswana and adjacent areas of South Africa, southeastern and eastern parts of Ethiopia and east and southeast of Somalia.

2.2. Weather assessment for the current day (27 April 2010): Isolated intense clouds are observed over Cameroon, southeast of Gabon adjacent areas of Congo, west part of Central African Republic, northern half of DRC, Uganda, southern half including eastern Ethiopia, northern and southeastern parts of Somalia, eastern coast of Tanzania, central and northern part of South Africa, west of Burkina Faso, northern half of Ghana, Togo and Benin and Niger.





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)*
