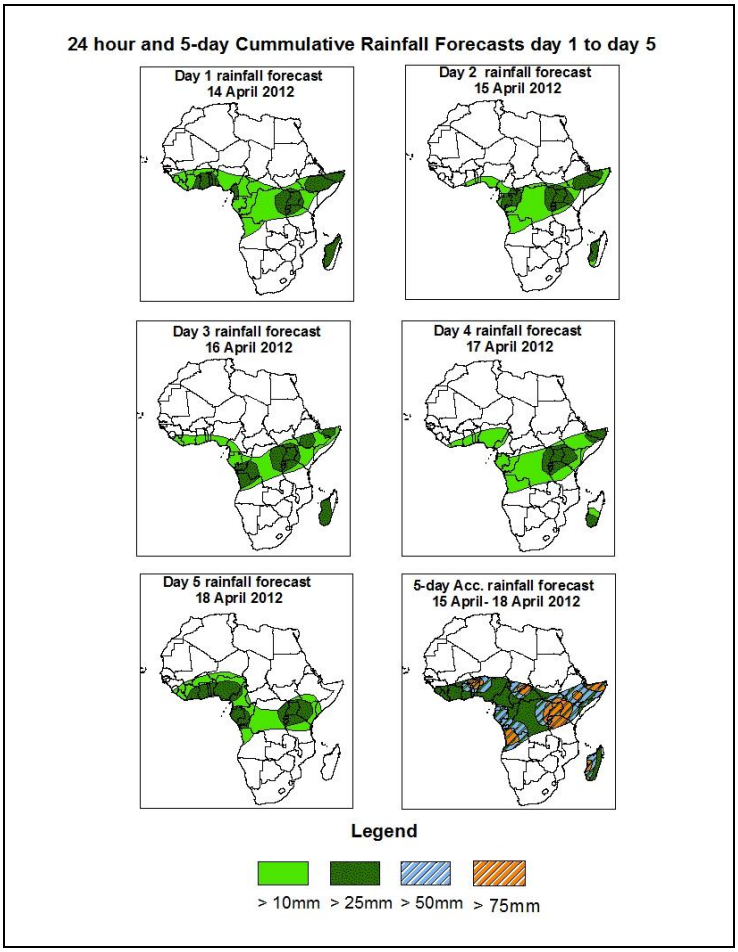
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 14 April – 06Z of 18 April 2012, (Issued at 11:00Z of 13 April 2012)

1.1. Twenty Four Hour Cumulative Rainfall Forecasts

The forecasts are expressed in terms of 75% probability of precipitation (POP) exceeded, based on the NCEP, UK Met Office and the ECMWF NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.

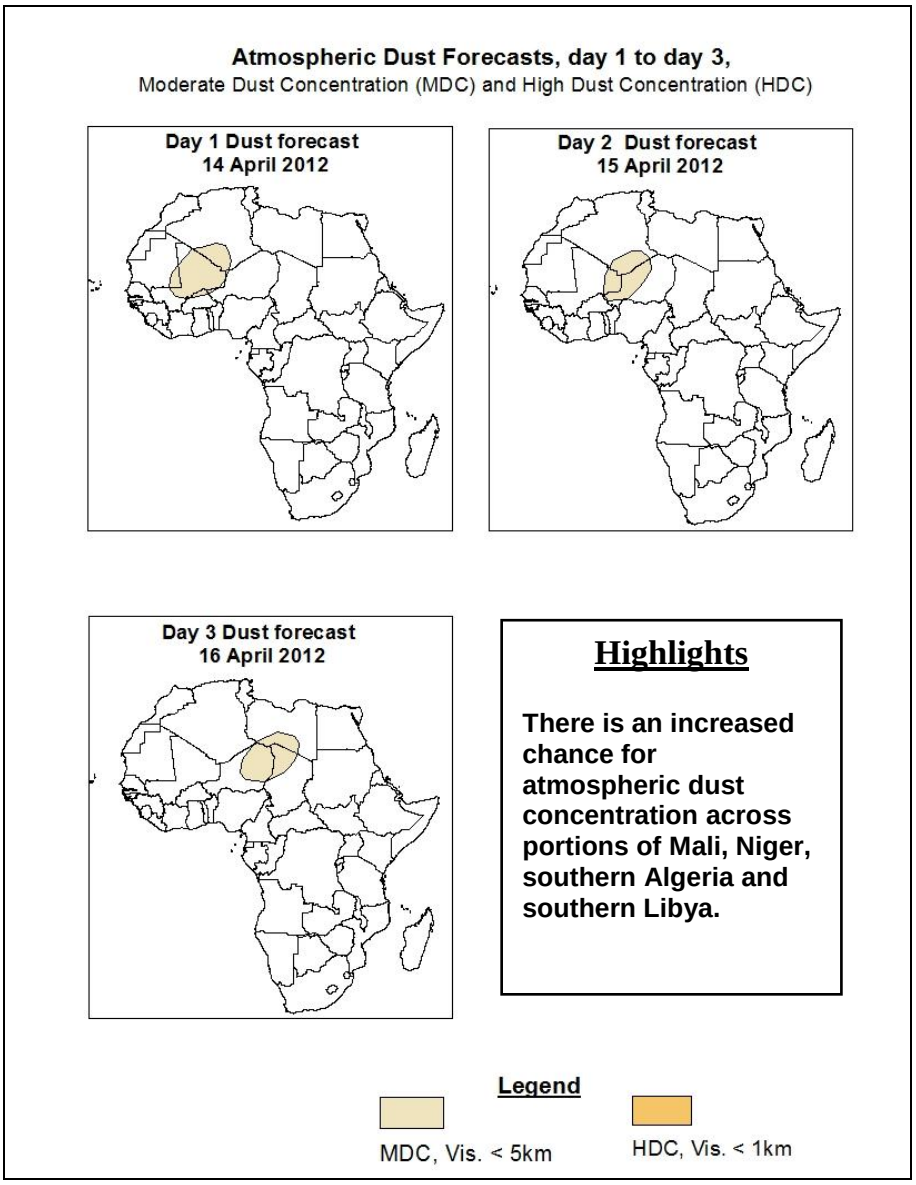


Summary

In the next five days, the West Africa monsoon flow with its convergence across the Gulf of Guinea, convergences associated with Congo Air Mass, localized wind convergences in Ethiopia and Somali, and the interactions between mid-latitude and tropical systems across Madagascar are expected to enhance rainfall across their respective regions. In general, there is an increased chance for moderate to heavy rainfall over portions of the Gulf of Guinea and central African regions, northern Angola, the Lake Victoria region, Ethiopia, parts of Somalia and Madagascar.

1.2. Atmospheric Dust Forecasts: Valid 14 – 16 April 2012

The NCEP/GFS, the UK Met Office, the ECMWF and the NCEP/WRF outputs are used to identify areas with high probability of dust concentration.



1.3. Model Discussion: Valid from 00Z of 12 April 2012

According to the GFS, ECMWF and UKMET models an east-west oriented trough and its associated heat lows are expected to prevail in the region between eastern Mali and Sudan.

A low across Niger and northern Nigeria is expected to have minimum central values of 1004mb during 24 and 74 hours, while maintaining minimum central pressure value of 1005mb during the rest of the forecast period. Another low over southern Chad tends to deepen during 48 and 120 hours to central pressure value of 100mb, while maintaining mean sea level pressure value of 1002mb during the rest of the forecast period. The low across Sudan and South Sudan Republic is expected to have central pressure values, which is expected to drop occasionally to central pressure value of 1001mb.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken from mslp values of about 1035 in 24 hours to 1020mb in 96 hours.

The Mascarene high pressure system over southwestern Indian Ocean is expected to shift eastwards, ahead of a mid-latitude frontal system propagating across South Africa during the rest of the forecast period. The high pressure system is expected to have maximum central pressure value as high as 1035mb during the forecast period.

At 925hpa level, zone of moderate and dry wind (>25kts) across portions Mali, Burkina Faso and western Niger is expected to weaken through 48 to 120 hours. Dry northerly winds are expected to prevail over northwestern and north-central African countries as a continental high pressure system builds over Algeria through 24 to 72 hours.

At the 850hpa level, a lower tropospheric wind convergence associated with the West African Monsoon is expected to remain active in the region between Cote d'Ivoire and southern Chad traversing, Burkina Faso, Ghana, Togo, Benin, Nigeria and Cameroon during the forecast period. Another zone of lower level convergence is expected to prevail over CAR, southern Sudan and portions of Ethiopia throughout the forecast period. The convergence associated with the meridonial arm of the ITCZ is expected to restore back to its normal position, to enhance rainfall over portions of East Africa and the Lake Victoria region during the forecast period.

At 500hpa level, a stationary mid-latitude trough that prevailed over northeastern Africa and neighboring areas is expected to propagate eastwards while weakening. Another mid-latitude frontal system is expected to propagate across northern Africa and the neighboring areas, reaching the longitudes of Libya by 120 hours. Eastwards propagating mid-latitude trough with a geo-potential value of 5840gpm along its northern extent is expected to dominate the flow over southern African countries as it propagates eastwards reaching the longitude of the Mozambique Channel 120 hours.

At 200mb, winds with strong wind speed, associated with a stationary Sub-Tropical Westerly Jet are expected to dominate the flow from northeastern Atlantic Ocean across North Africa to eastern Egypt during the forecast period through 24 to 72 hours. The intensity of the jet is expected to exceed 120kts while moving to the east with its core values increasing to more than 140kts towards end of the forecast period.

In the next five days, the West Africa monsoon flow with its convergence across the Gulf of Guinea, convergences associated with Congo Air Mass, localized wind convergences in Ethiopia and Somali, and the interactions between mid-latitude and tropical systems across Madagascar are expected to enhance rainfall across their respective regions. In general, there is an increased chance for moderate to heavy rainfall over portions of the Gulf of Guinea and central African regions, northern Angola, the Lake Victoria region, Ethiopia, parts of Somalia and Madagascar.

There is an increased chance for atmospheric dust concentration across portions of Mali, Niger, southern Algeria and southern Libya.

2.0. Previous and Current Day Weather Discussion over Africa

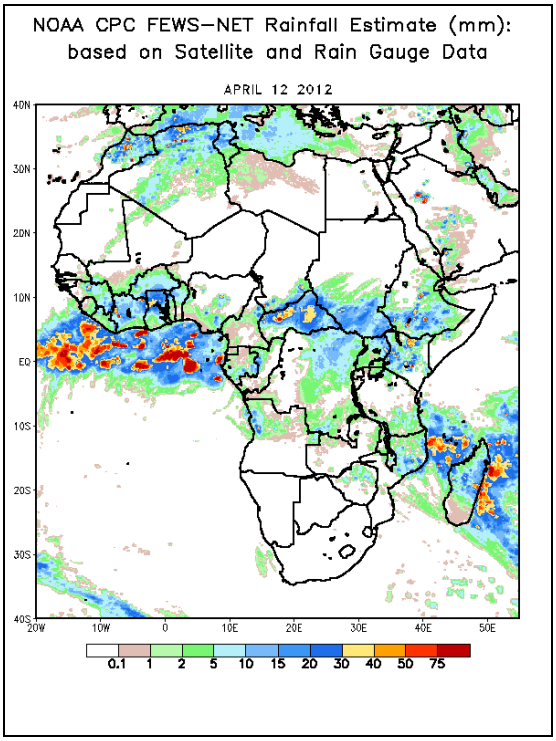
(12 April – 13 April 2012)

2.1. Weather assessment for the previous day (12 April 2012)

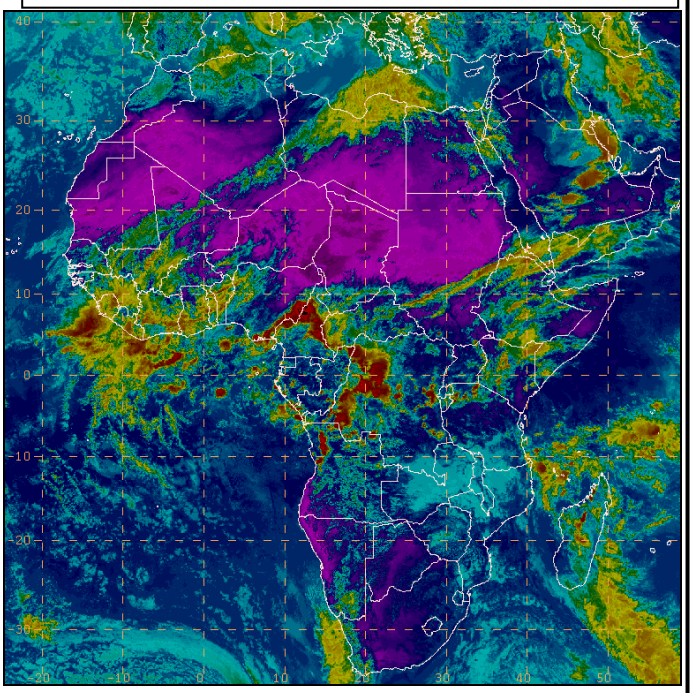
During the previous day, moderate to locally heavy rainfall was observed across portions of Guinea, Cote D'Ivoire, Ghana, CAR, northern DRC, South Sudan Republic, Ethiopia, Kenya, portions of Uganda, northern Mozambique and Madagascar.

2.2. Weather assessment for the current day (13 April 2012)

Intense clouds are observed across Gulf of Guinea and central African regions, Ethiopia, Kenya and northern Tanzania.



IR Satellite Image (valid 1422Z of 13 April 2012)



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

Author: Ezekiel Njoroge, (Kenyan Meteorological Department / CPC-African Desk); ezekiel.njoroge@noaa.gov