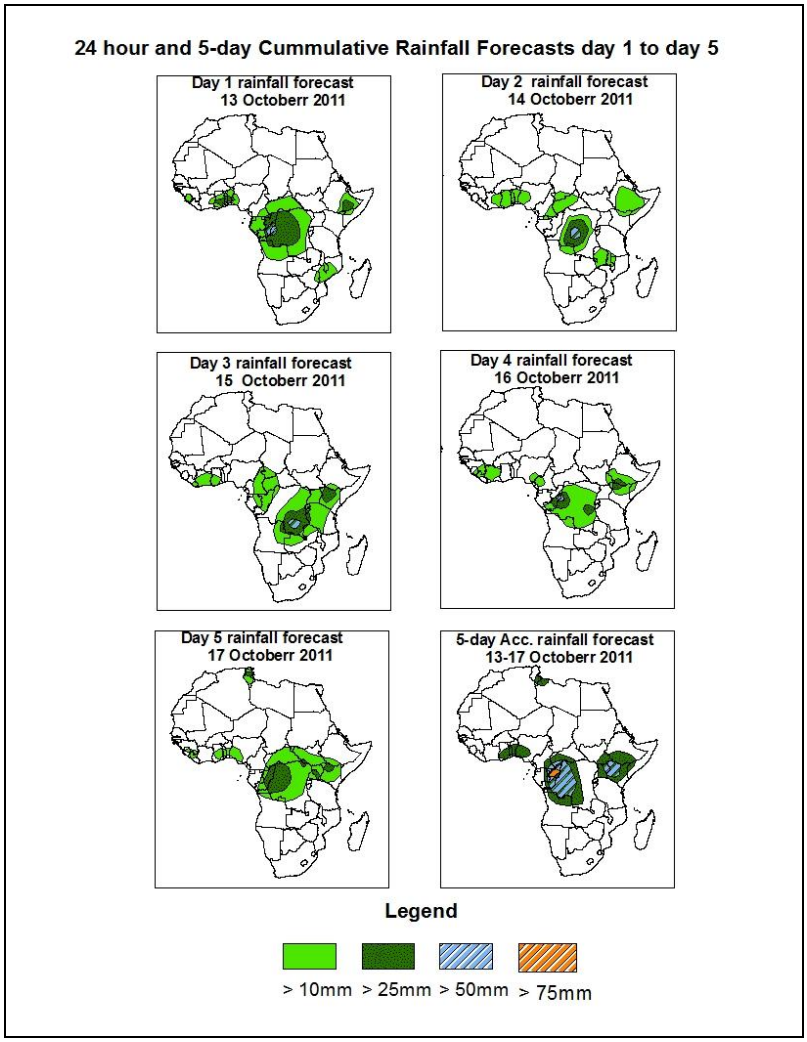
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 13 October – 06Z of 17 October 2011, (Issued at 18:00Z of 12 October 2011)

1.1. Twenty Four Hour Cumulative Rainfall Forecasts

The forecasts are expressed in terms of high 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, localized wind convergences and cyclonic circulations over central and eastern African countries are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over eastern Cameroon, northern Congo Brazzaville, western CAR, eastern Gabon, western DRC, southern Ethiopia and Kenya.

1.2. Models Comparison and Discussion-Valid from 00Z of 13 October 2011

According to the GFS, ECMWF and UKMET models, the monsoon trough with its associated heat lows across the Sahel region is expected to maintain its east-west orientation during the forecast period. The models also indicate series of heat lows and their associated trough across central African countries, extending partly to the South African countries. The heat low along its western end (near Mali, Mauritania and Burkina Faso) is expected to deepen, with MSLP values changing from 1007mb to 1005mb, according to the GFS model during the forecast period. This low is expected to fill up with MSLP values increasing from 1008mb to 1009mb, according to the ECMWF model through 24 to 96 hours and it tends to deepen to MSLP value of 1008mb towards end of forecast period. In contrast, this same low is expected to deepen, with MSLP value changing from 1007mb to 1004mb according to the UKMET model by 96 hours and it is expected to fill up to MSLP value of 1005mb by 120 hours. The heat low over central Africa region is expected to deepen, with its central value pressure decreasing from 1006mb to 1004mb, according to the GFS model during the forecast period. This same low tends to fill up from 1007mb to 1008mb, according to the ECMWF model and deepen from 1007mb to 1004mb, according to the UKMET model through 24 to 96 hours. On the other hand, the heat low over the Arabian Peninsula is expected to deepen with its MSLP value decreasing from 1009mb to 1007mb, according to the UKMET model through 96 to 120 hours. A localized high pressure over Ethiopia tends to maintain a MSLP value of 1016mb through 24 to 96 hours according to GFS model and then tends to weaken by 120 hours. This same high pressure tends to weaken by 24 hours to MSLP value of 1012mb according to ECMWF model.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken, with its MSLP value decreasing from 1028mb to 1020mb during the forecast period according to GFS model. According to ECMWF model, it tends to weaken, with its MSLP value decreasing from 1028mb to 1020mb through 24 to 72 hours and tends to intensify to MSLP value of 1024 by 96 hours and it tends to weaken again towards end of the forecast period. This same high pressure system tends to weaken to MSLP values of 1020mb towards end of the forecast period according to UKMET model. The Mascarene high pressure system over southwest Indian Ocean is expected to intensify, with its MSLP value increasing from 1024mb to 1028mb according to both ECMWF and UKMET models through 24 to 96 hours and tends to weaken again towards end of

forecast period. According to GFS model, the same high pressure system tends to weaken to MSLP value of 1020mb by 120hours.

At the 850hpa level, a cyclonic circulation is expected to dominate the flow over Liberia coast by 24 hours and another cyclonic circulation is expected to form over Chad through 48 to 72 hours. A localized cyclonic circulation is expected to dominate the flow across coastal Benin, while another cyclonic circulation is expected to prevail over Mali by 48 hours. Strong wind convergences are expected to prevail over DRC, Congo Brazzaville and Angola during the forecast period. Localized wind convergence is also expected to prevail over Sudan through 48 hours to 120 hours. A trough in the westerly, associated with mid-latitude frontal system, is expected to dominate the flow over Algeria through 72 to 96 hours.

At 500hpa, eastward propagating trough in the westerly is expected to dominate the flow over Mediterranean Sea and coastal North Africa during the forecast period. A mid latitude frontal system is expected to propagate eastwards across the South African tip during the forecast period.

At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow over southern Africa, while intensifying gradually during the forecast period. The northern Hemisphere sub-tropical westerly jet is also expected to intensify across Algeria, Egypt and Libya during the second half of the forecast period.

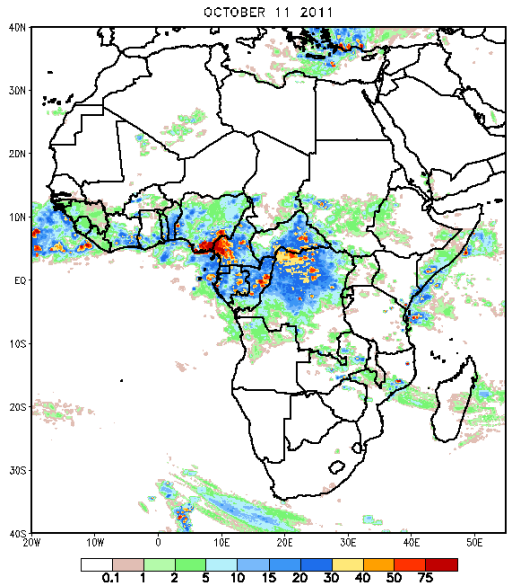
In the next five days, localized wind convergences and cyclonic circulations over central and eastern African countries are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over eastern Cameroon, northern Congo Brazzaville, western CAR, eastern Gabon, western DRC, southern Ethiopia and Kenya.

2.0. Previous and Current Day Weather Discussion over Africa (11 October - 12 October 2011)

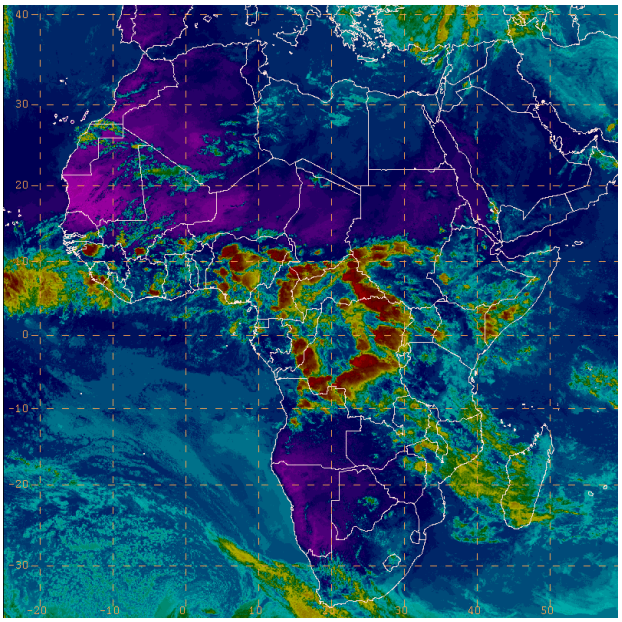
2.1. Weather assessment for the previous day (11 October 2011): During the previous day, moderate to locally heavy rainfall was observed over southern Benin, portions of Nigeria, western Cameroon, parts of CAR, Gabon, Congo Brazzaville, and northern DRC.

2.2. Weather assessment for the current day (12 October 2011): Intense clouds are observed over portions of the Gulf of Guinea, much of central African countries and parts of the Horn of Africa.

NOAA CPC FEWS–NET Rainfall Estimate (mm): based on Satellite and Rain Gauge Data



IR Satellite Image (valid 1622Z of 12 October 2011



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(s): Amira Ibrahim (Egyptian Meteorological Authority) / CPC-African Desk), Amira.ibrahim@noaa.gov,
Sadibou Ba (Agence Nationale de la Meteorologie du Senegal) / CPC-African Desk), sadibou.ba@noaa.gov and
Aminata Makalou (Direction Nationale de la Meteorologie du Mali-ASECNA) / CPC-African Desk), aminata.makalou@noaa.gov