

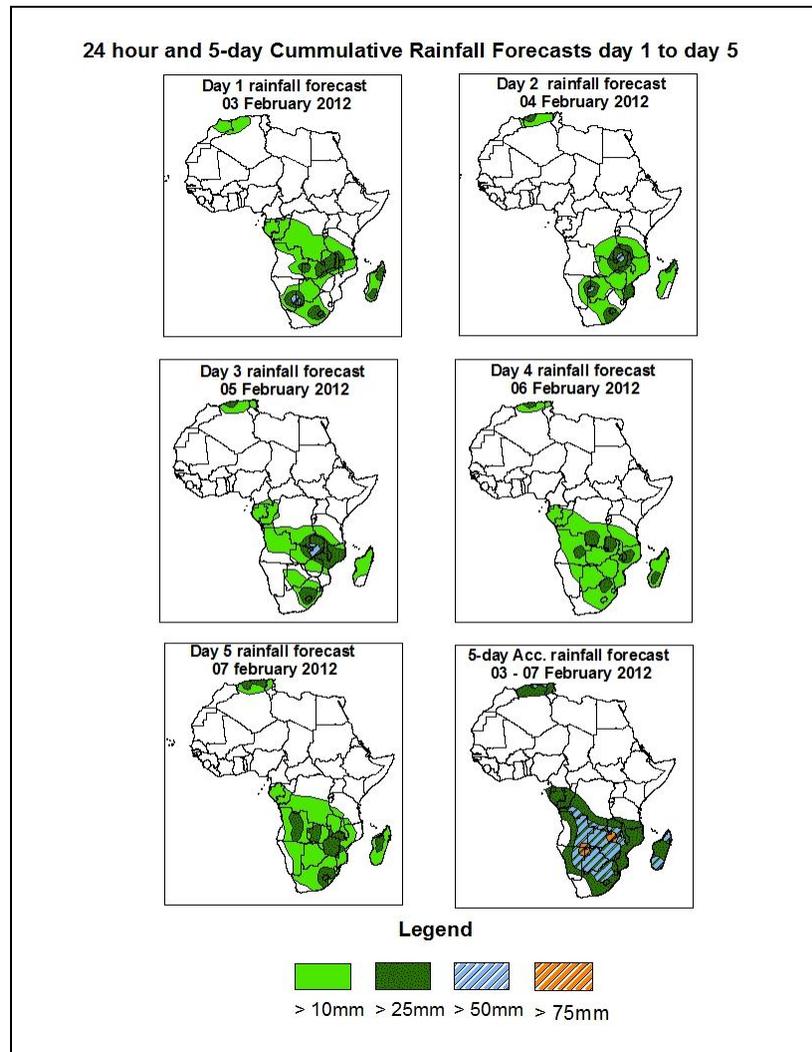


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid 06Z of 03 February – 06Z of 06 February 2012, (Issued at 16:30Z of 02 February 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, seasonal wind convergence in the CAB region, localized wind convergences and cyclonic circulations in the vicinity of Angola and Mozambique Channel are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over eastern Angola, eastern Namibia, Zambia, northern Zimbabwe, northern Botswana, southern DRC and parts of Madagascar.

## **1.2. Models Comparison and Discussion-Valid from 00Z of 02 February 2012**

The GFS, ECMWF and UKMET models indicate series of lows and their associated trough across central and the South African countries. The low over DRC is expected to deepen, with its mean sea level pressure value decreasing from 1010mb to 1003mb while shifting slightly to the southeast through 24 to 96 hours and then it tends to fill up, with its MSLP value increasing from 1003mb to 1004mb towards end of the forecast period according to the **GFS** model. According to **ECMWF** model it is expected to appear by 48 hours and to deepen from MSLP value of 1008mb to 1003mb while shifting slightly to the northwest towards end of the forecast period. According to the **UKMET** model, it is expected to maintain MSLP value of 1008mb through 24 to 48hours and then it tends to deepen from MSLP value of 1008mb to 1004mb while shifting to the east towards end of the forecast period. Another low is expected to form in the vicinity of Botswana and tends to fill up, with its MSLP value increasing from 1008mb to 1009mb through 24 to 48 hours while moving to the northeast and then it tends to deepen back to 1006mb while shifting slightly to the south towards end of the forecast period according **GFS** model. According to **ECMWF** model, the low pressure is expected to deepen from central pressure value of 1011mb to 1009mb while shifting to the southwest towards end of the forecast period. According the **UKMET** model too, the low pressure forms during 24 hours with a MSLP value of 1008mb and it is expected to fill up to 1009mb through 24 to 48hours while shifting to the south and then it tends to deepen back to 1007mb while shifting slightly to north until the end of the forecast period. Another low pressure which is expected to form across Mozambique Channel and tends to fill up, with its MSLP value increasing from 1009mb to 1010mb through 24 to 72 hours while shifting towards northeast, then it tends to deepen to 1008mb while moving to the east to reach coastal Madagascar areas towards end of the forecast period according **GFS** model. According to the **ECMWF** model, this low pressure is expected to form during 24hours with a value of 1012mb and tends to deepen to 1008mb while shifting to the south by 72 hours and then to the east during the rest of the forecast period. On the other hand **UKMET** model forecasts, tends to locate the low in across southeastern Mozambique with a MSLP value of 1010mb. The model tends to deepen its central pressure value from 1010mb to 1008mb through 24 to 96 hours and then and the low tends to fill up to 1012mb towards end of the forecast period. **The fourth** low over South Sudan Republic tends to deepen, with its MSLP value decreasing from 1007mb to 1003mb through 24 to 96 hours and then it tends to fill up

back to 1005mb until the end of the forecast period according **GFS** model. According to **ECMWF** model this low is expected to deepen, with its MSLP value decreasing from 1007 to 1006mb through 24 to 48 hours and then it tends to fill up back to 1008mb by 72 hours and then it tends to deepen to 1003mb towards end of the forecast period. According the **UKMET** model, the low pressure tends to decrease from 1006mb to 1002mb throughout the forecast period.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken, with its MSLP value decreasing from 1027mb to 1020mb throughout the forecast period according to **GFS** model. This high pressure system tends to weaken, with its MSLP value decreasing from 1027mb to 1019mb towards end of forecast period According to **ECMWF**. According to **UKMET** model, it is expected to weaken, with its MSLP value decreasing from 1027mb to 1022mb towards the end of the forecast period. The Mascarene high pressure system over southwest Indian Ocean is expected to weaken, with its central pressure value decreasing from 1019mb to 1016mb through 24 to 48hours and tends to intensify its value to 1020mb while shifting to the east towards the end of the forecast period according to **GFS** model. According to **ECMWF** model it is expected to weaken, with its central pressure system value decreasing from 1016mb to 1012mb towards end of the forecast period.

At the 850hpa level, a lower tropospheric seasonal wind convergence is expected to remain active over parts of CAB region during the forecast period. Localized wind convergences are also expected to dominate the flow over Angola while the convergence line moving to the south by 120 hours to reach northern Namibia and then South Africa. Another local cyclonic circulation is also expected in the northern Mozambique Channel tending to change its location and intensity during the forecast period and finally settling near costal Madagascar.

At 500hpa, eastward propagating trough in the westerly is expected to dominate the flow over Mediterranean Sea and northern Africa during the forecast period; with the low geopotential value of 5700gpm extending to the latitudes of Algeria by 24. The northeast-southwest oriented trough, associated with low is expected eastwards to reach Tunisia by 48 whit the low geopotential value of 5640gpm and then Libya by 96 whit the low geopotential value of 5700gpm towards end of the forecast period. A mid

latitude frontal system is also expected to propagate eastwards across the Southern African with the low geopotential value of 5820gpm through 24 to 48 hours.

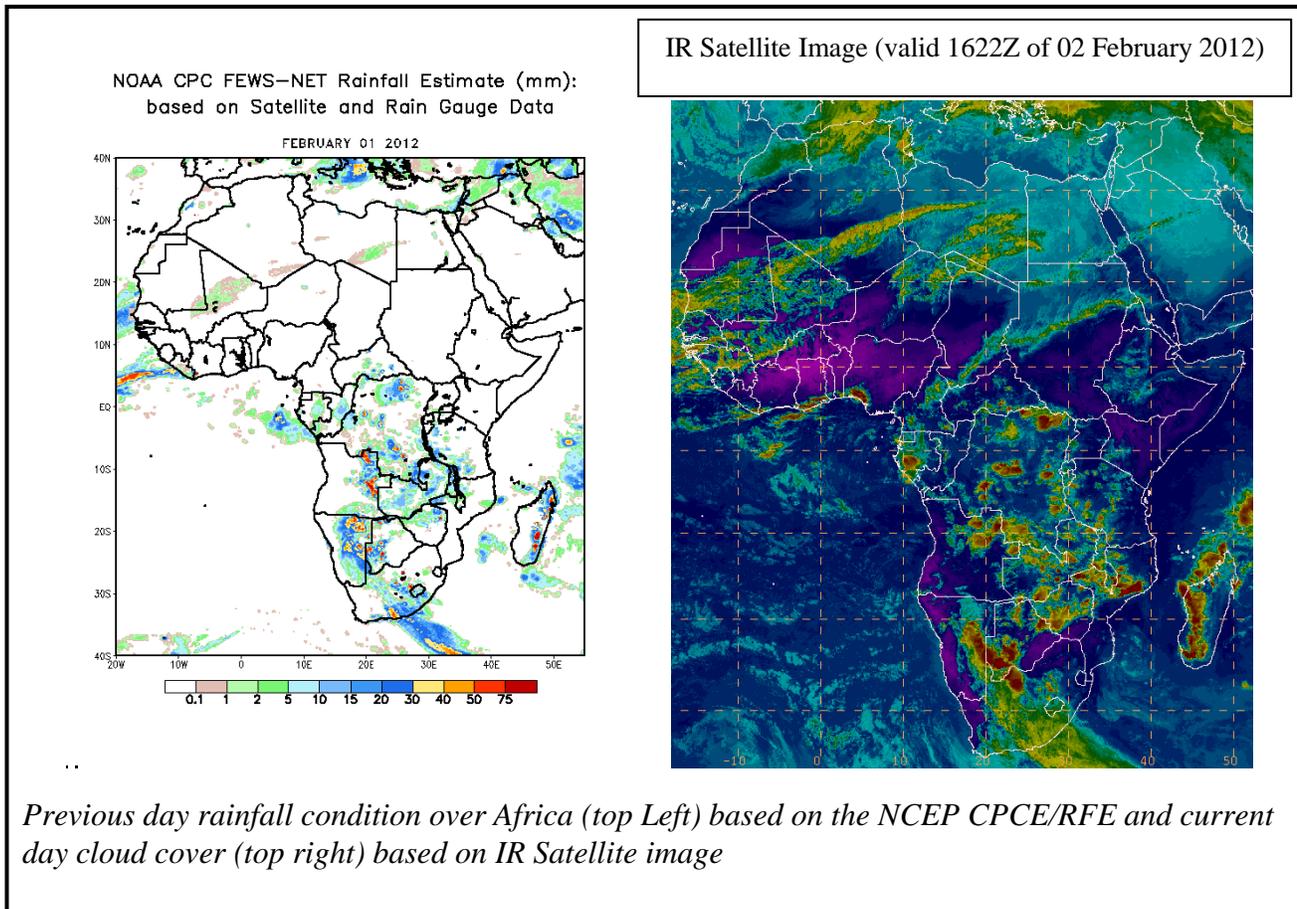
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow over northern Africa, during the forecast period. The intensity of the jet is expected to exceed 150kts in the region between Atlantic Ocean and the Persian Gulf while moving to the east by 24hours. The jet core tends to propagate towards in the region between Mauritania and Persian Gulf through 72 and 96 hours, with the maximum wind values decreasing to 130kts. The Sub-tropical Westerly Jet in the Southern Hemisphere is expected to dominate the flow over the South Africa through 24 to 72 hours. The intensity of the jet is expected to exceed 90kts in the region between southeastern Atlantic Ocean and Indian Ocean across South Africa.

In the next five days, seasonal wind convergence in the CAB region, localized wind convergences and cyclonic circulations in the vicinity of Angola and Mozambique Channel are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over eastern Angola, eastern Namibia, Zambia, northern Zimbabwe, northern Botswana, southern DRC and parts of Madagascar.

## 2.0. Previous and Current Day Weather Discussion over Africa (01 February – 02 February 2011)

**2.1. Weather assessment for the previous day (01 February 2012):** During the previous day, moderate to locally heavy rainfall was observed over portions of DRC, northern Namibia, eastern Angola, southwest Botswana, parts Zambia, parts of South Africa and eastern Madagascar.

**2.2. Weather assessment for the current day (02 February 2012):** Intense clouds are observed over Zambia, western Tanzania, parts of DRC, parts of Botswana, Namibia, Gabon, Zimbabwe, northern Mozambique, parts of South Africa and eastern Madagascar.



**Author(s): Ezekiel Njoroge (Kenyan Meteorological Department) / CPC-African Desk),**  
[ezekiel.njoroge@noaa.gov](mailto:ezekiel.njoroge@noaa.gov)

**Author(s): Lotfi Khammari (Tunisian Meteorological Authority) / CPC-African Desk),**  
[lotfi.khammari@noaa.gov](mailto:lotfi.khammari@noaa.gov), and