

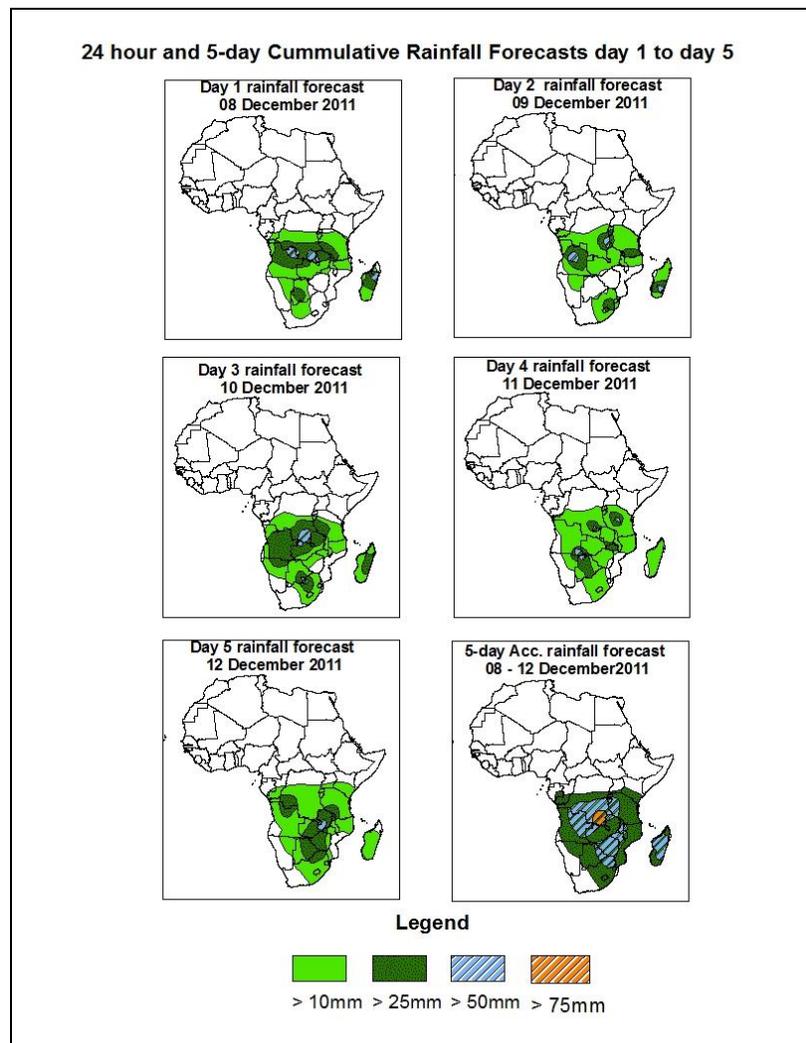


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid 06Z of 08 December – 06Z of 12 December 2011, (Issued at 17:30Z of 07 December 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, seasonal wind convergence in the CAB region, localized wind convergences and cyclonic circulations in the vicinity of Angola, Namibia and Mozambique Channel are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over Angola, Namibia, Zambia, Zimbabwe, Tanzania and southern DRC.

## **1.2. Models Comparison and Discussion-Valid from 00Z of 07 December 2011**

The GFS, ECMWF and UKMET models indicate series of lows and their associated troughs across central and the South African countries. The low over DRC is expected to deepen, with its mean sea level pressure value decreasing from 1008mb to 1006mb through 24 to 72hours while moving to the east and tends to fill up to 1007mb towards the end of the forecast period according to the **GFS** model. According to **ECMWF** model it is expected to deepen from MSLP value of 1009mb to 1008mb through 24 to 48hours and tends to maintain its MSLP value of 1008mb towards end of the forecast period. According to the **UKMET** model, it is expected to maintain its MSLP value of 1008mb towards the end of the forecast period. Another low is expected to form in the vicinity of Botswana and tends to deepen, with its MSLP value decreasing from 1005mb to 1004mb through 24 to 48 hours and tends to move towards southern Botswana and the adjoining areas of Namibia, then it tends to fill up to MSLP value of 1005mb towards end of the forecast period according **GFS** model. According to **ECMWF** model, the low pressure is expected to deepen, with its mean sea level pressure value decreasing from 1009mb to 1008mb through 24 to 48 hours while shifting towards Zimbabwe, and then it tends to maintain its MSPL value of 1008mb while covering both Botswana and Zimbabwe areas towards end of the forecast period. According the **UKMET** model, the low pressure is expected to deepen, with its MSPL value decrease from 1007mb to 1005mb through 24 to 72hours then it tends to fill up to 1006mb through 72 to 96 hours and finally it tends to deepen, with its MSLP value decreasing from 1006mb to 1005mb and moving towards northern Botswana 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 1007mb to 1008mb through 24 to 72hours while shifting towards north and then to the east, while deepening, with its MSPL value decreases from 1008mb to 1007mb. It then tends to move to the southern areas of Mozambique Channel towards end of the forecast period according **GFS** model. According to both the **ECMWF** and **UKMET** models, this low pressure tends to maintain its MSPL value of 1008mb towards end of forecast period while shifting to the northern areas to reach the central Madagascar. **The fourth** low over Tanzania Republic tends to deepen, with its MSLP value decreasing from 1009mb to 1006mb through 24 to 96hours, then it tends maintain MSLP value of 1006mb until the end of the forecast period while reaching the coastal areas of Tanzania, according **GFS** model. According

to **ECMWF** model this low tends to deepen, with its MSLP value decreasing from 1012mb to 1008mb through 24 to 48hours, and then it tends to maintain MSLP value of 1008mb until the end of the forecast period while reaching the coastal areas. According the **UKMET** model, the low pressure tends to decrease from 1008mb to 1007mb through 24 to 72hours while reaching the coastal areas and then it tends to fill up to 1008mb until the end of the forecast period while moving towards northern Tanzania.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken, with its MSLP value decreasing from 1032mb to 1024mb through 24 to 120hours according to **GFS** models, while moving slightly to south. According to **ECMWF** this high pressure is expected to weaken, with its MSLP value decreasing from 1028mb to 1024mb through 24 to 72 hours while moving to southeast then it tends to maintain its MSPL value of 1024mb until the end of forecast period. According to **UKMET** model, it tends to weaken, with its MSLP value decreasing from 1032mb to 1024mb through 24 to 96hours and then it tends to maintain the MSLP value of 1024mb towards 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 1020mb to 1016mb through 24 to 48hours and tends to maintain its value of 1016mb while moving to east towards the end of the forecast period according to both **GFS** and **ECMWF** models. According to **UKMET** it is expected to maintain its central MSLP value of 1020mb until the end of 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 both Angola and Namibia while the convergence line shifting to the southwest up to 48hours and then towards the north through 72 to 96hours. Another local cyclonic circulation is also expected in the Mozambique Channel tending to change its location and intensity during the forecast period and finally settling near costal Tanzania. Lower tropospheric anticyclone and its associated ridge are expected to dominate the flow over South Africa and the nearest areas.

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 5820gpm extending to the latitudes southern Libya by 24. This northeast-southwest oriented trough is expected to move eastwards during the forecast period. Another mid-latitude frontal system is expected to approach coastal Morocco through 72hours and it tends to propagate towards Algeria towards end of the forecast period. A mid latitude frontal system is also expected to propagate eastwards across the Southern African countries during the forecast period.

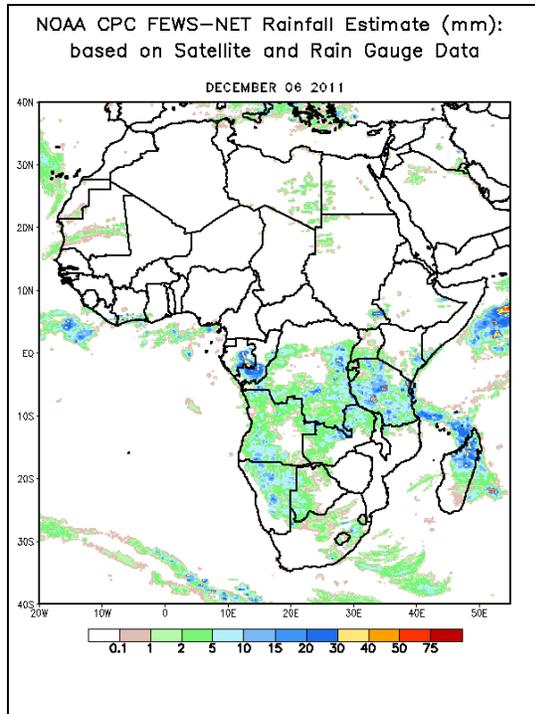
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow over northern Africa, during the forecast period. The intensity of the jet is expected to exceed 110kts in the region between north Niger and the Persian Gulf while moving to the east by 24hours. The jet core tends to propagate towards in the region between east Mali and Persian Gulf through 48 and 72 hours then it tends to propagate towards in the region between Chad and Persian Gulf until the end of forecast period. The Sub-tropical Westerly Jet in the Southern Hemisphere is expected to dominate the flow over the South Africa, during the forecast period. The intensity of the jet is expected to exceed 110kts in the region between southeast Atlantic and south Africa, the core of the jet tends to shift further to the east in the region between coastal south Africa and Indian ocean with its maximum wind speed exceeding 130kts by 72hours then it tends to weaken towards the end of the forecast period.

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

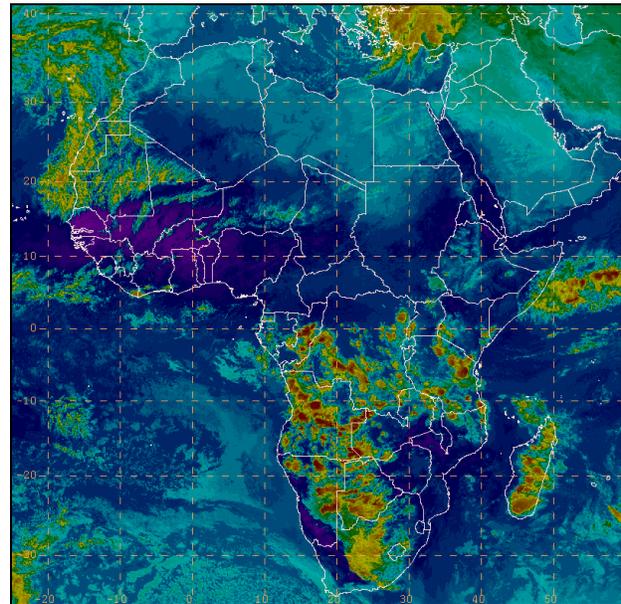
## 2.0. Previous and Current Day Weather Discussion over Africa (06 December – 07December 2011)

**2.1. Weather assessment for the previous day (06December 2011):** During the previous day, moderate to locally heavy rainfall was observed over portions of southern Congo, eastern Gabon, central Tanzania and northern Madagascar.

**2.2. Weather assessment for the current day (07December2011):** Intense clouds are observed over Congo, southern DRC, Angola, portions of Namibia, Botswana, South Africa, northern Zambia, Tanzania and Madagascar.



IR Satellite Image (valid 1652Z of 07December 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*

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