

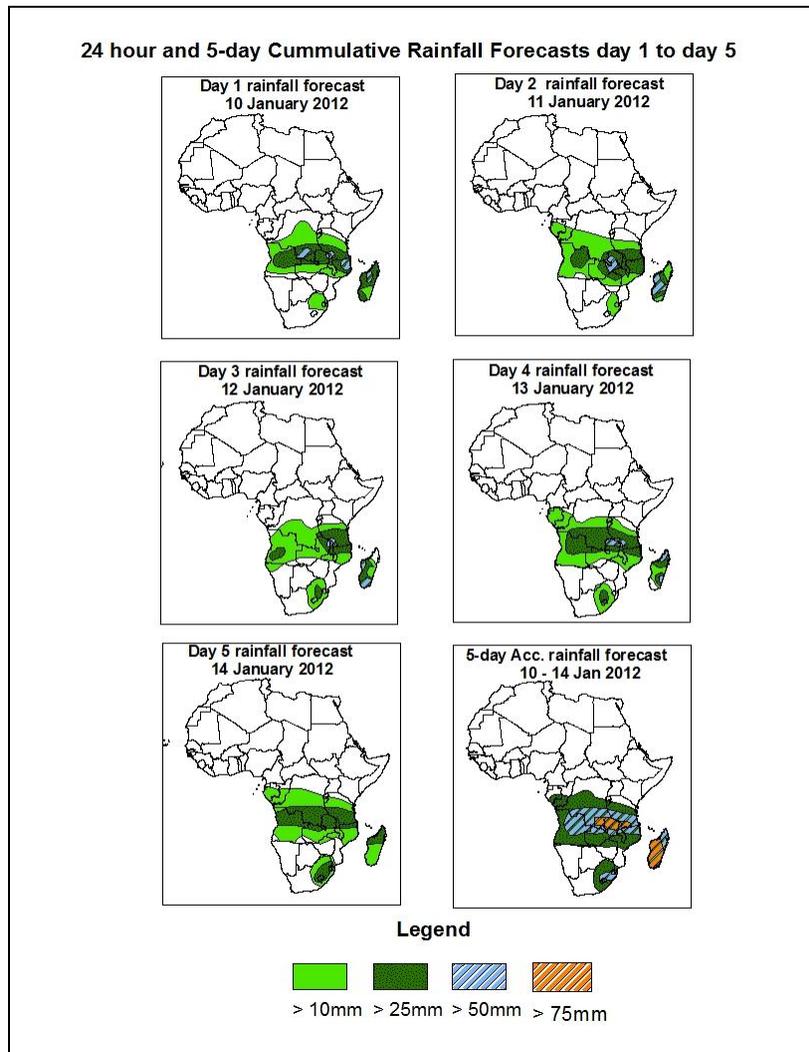


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid 06Z of 10 January – 06Z of 14 January 2012, (Issued at 17:30Z of 09 January 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, Namibia and Mozambique Channel are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over northern Angola, Zambia, southern Tanzania, southern DRC, Malawi and Madagascar.

## 1.2. Models Comparison and Discussion-Valid from 00Z of 09 January 2012

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 fill up, with its mean sea level pressure value increasing from 1007mb to 1008mb while shifting slightly to the west towards the end of the forecast period according to the **GFS** model. According to **ECMWF** model, it is expected to fill up from MSLP value of 1008mb to 1010mb while moving to the northwest towards the end of the forecast period. According to the **UKMET** model, it is expected to deepen, with its MSLP value decreasing from 1009mb to 1008mb through 24 to 72 hours and then it tends to fill up back to 1009 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 1006mb to 1005mb through 24 to 48 hours while shifting slightly to the south and then it tends to fill up, with its MSLP value increasing from 1005mb to 1007mb through 48 to 96 hours, this low pressure tends to deepen back to 1006mb towards end of the forecast period according **GFS** model. According to **ECMWF** model, the low pressure is expected to deepen, with its MSPL value decreasing from 1008mb to 1006mb while moving slightly to the south through 24 to 48 hours and then it tends to fill up to 1011mb towards end of the forecast period. This low pressure is expected to fill up, with its MSLP value increasing from 1006mb to 1008mb towards end of the forecast period according **UKMET** model. Another low pressure which is expected to form across Mozambique Channel and tends to fill up, with its mean sea level pressure value increasing from 1000mb to 1007mb while shifting to the east through 24 to 96 hours and then it tends to deepen, with its MSLP value decreasing from 1007mb to 1006mb towards end of the forecast period according **GFS** model. According to the **ECMWF** this low pressure is expected to fill up, with its MSLP value increasing from 1005mb to 1009mb while shifting slightly to the east towards end of forecast period. This low tends to fill up, with its MSPL value increasing from 1002mb to 1008mb towards end of forecast period according **UKMET** model. The fourth low over Sudan tends to deepen, with its MSLP value decreasing from 1008mb to 1007mb through 24 to 96 hours and then it tends to fill up to 1008mb towards end of the forecast period, according to **GFS** model. This low pressure is expected to appear by 120 hours with its MSLP of 1010mb according to **ECMWF** model. According the **UKMET** model, this low pressure tends to

increase from 1007mb to 1008mb through 24 to 96hours and then it tends to deepen back to 1007mb until the end of the forecast period.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken, with its MSLP value decreasing from 1024mb to 1020mb through 24 to 96 hours and then it tends to fill up back to 1026mb while shifting to the east towards end of the forecast period according to **GFS** model. According to **ECMWF** model this high is expected to weaken, with its MSLP value decreasing from 1024mb to 1020mb towards end of the forecast period. According to **UKMET** model, it tends to weaken, with its MSLP value decreasing from 1024mb to 1020mb through 24 to 96 hours and then it tends to fill up back, with its MSLP value increasing from 1020mb to 1025mb 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 1019mb through 24 to 48 hours and then it tends to fill up, with its MSLP value increasing from 1019mb to 1028mb towards the end of the forecast period according to **GFS** model. According to both **ECMWF** and **UKMET** models it is expected to fill up, with its MSLP value increasing from 1016mb to 1020mb 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 then it tends to intensify while extending towards Zambia and Malawi towards end of the forecast period. Localized wind convergences are also expected to dominate the flow over both Angola and Namibia while the convergence line is expected to intensify and shift to the east. Lower tropospheric anticyclone and its associated ridge are expected prevail over South Africa and the neighboring areas. Another lower tropospheric cyclone and its associated trough are expected to intensify and dominate the flow over Madagascar and tends to shifting to the east towards and of forecast period.

At 500hpa, eastward propagating trough in the mid-latitude westerly flow is expected to prevail over Mediterranean Sea and northern Africa during the forecast period; with the low geopotential value of 5760gpm extending to the latitudes of Chad by 24hours. This northeast-southwest oriented trough is expected to move eastwards until reaching Sudan and the adjoining areas with the low geopotential value of 5820gpm by 72 hours. A mid latitude frontal system is also expected to propagate eastwards across the Southern African countries with the low geopotential value of 5820mb through 72 to 120 hours.

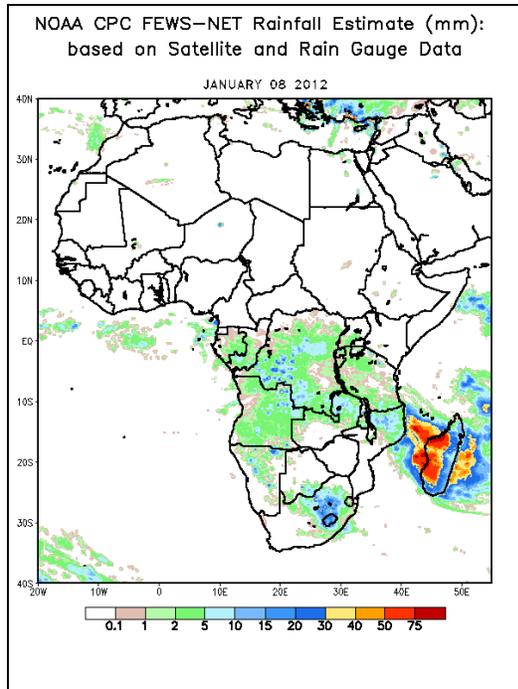
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow over northern Africa, during the forecast period. The intensity of the jet is expected to exceed 110kts in the region between Atlantic Ocean and the Persian Gulf across Mauritania, southern Algeria, while moving to the east by 24hours. The jet core tends to propagate towards the east with its maximum wind speed exceeding 150kts towards end of the forecast period. The Sub-tropical Westerly Jet in the Southern Hemisphere is expected to appear by 72 hours and 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 southeastern Atlantic Ocean and Indian Ocean across 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 90kts towards 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 northern Angola, Zambia, southern Tanzania, southern DRC, Malawi and Madagascar.

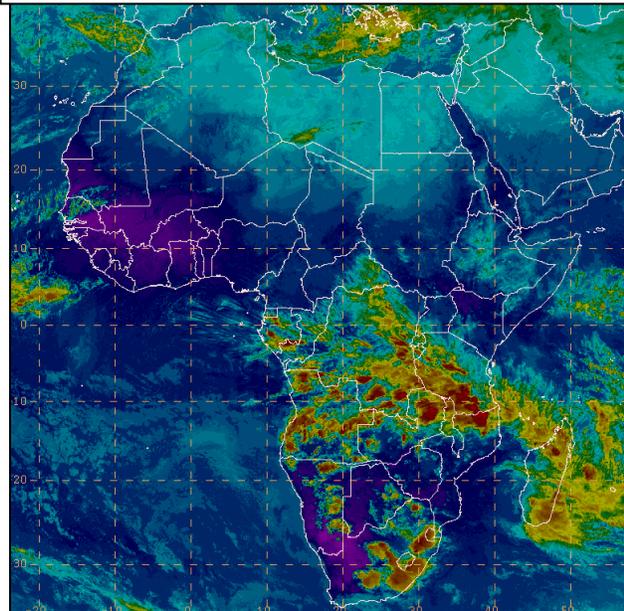
## 2.0. Previous and Current Day Weather Discussion over Africa (08 January – 09 January 2012)

**2.1. Weather assessment for the previous day (08 January 2012):** During the previous day, moderate to locally heavy rainfall was observed over eastern South Africa and Madagascar.

**2.2. Weather assessment for the current day (09 January 2012):** Intense clouds are observed over DRC, Zambia, eastern South Africa, Tanzania, Malawi, Angola, northern Mozambique and Madagascar.



IR Satellite Image (valid 1722Z of 09 January 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*

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