



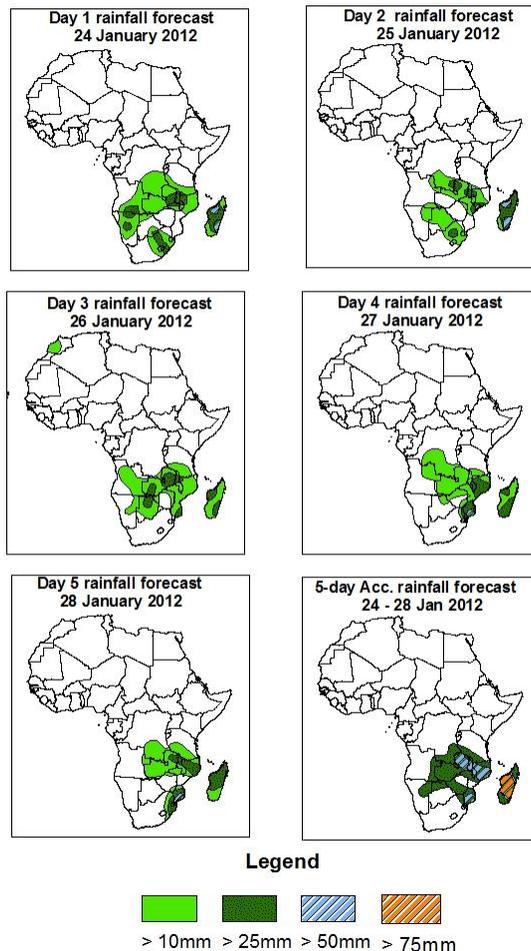
# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid 06Z of 24 January – 06Z of 28 January 2012, (Issued at 16:30Z of 23 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.

24 hour and 5-day Cumulative Rainfall Forecasts day 1 to day 5



### Summary

In the next five days, seasonal wind convergence in the CAB region, localized wind convergences and cyclonic circulations in the vicinity of Mozambique Channel are expected to enhance rainfall in its neighbors regions. Hence, there is an increased chance for heavy rainfall over Zambia, northern Mozambique, eastern South Africa and Madagascar.

## 1.2. Models Comparison and Discussion-Valid from 00Z of 23 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 deepen, with its mean sea level pressure value decreasing from 1008mb to 1005mb through 24 to 72 hours and then it tends to fill up to 1006mb while shifting slightly to the southwest through 72 to 96 hours and then it tends to deepen back to 1005mb towards end of the forecast period according to both **GFS** and **ECMWF** models. According to the **UKMET** model, it is expected to fill up, with its MSLP value increasing from 1007mb to 1008mb while shifting slightly to the east through 24 to 48 hours and then it tends to deepen back to 1005mb by 72 hours and to maintain its MSLP value of 1005mb towards 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 1004mb through 24 to 48 hours and then it tends to fill up back to 1006mb through 48 to 96 hours, then it tends to deepen back to 1005mb towards end of the forecast period according **GFS** model. According to **ECMWF** model, the low pressure is expected to fill up, with its MSPL value increasing from 1008mb to 1009mb while shifting slightly to the south through 24 to 96 hours and then it tends to deepen back to 1008mb towards end of the forecast period. This low pressure is expected to maintain its MSLP value of 1008mb while shifting to the west towards end of the forecast period according **UKMET** model. Another low pressure is expected to form across Mozambique Channel and tends to deepen, with its mean sea level pressure value decreasing from 980mb to 969mb through 24 to 72 hours and then it tends to fill up to 976mb towards end of the forecast period, according **GFS** model. According to the **ECMWF**, this low pressure is expected to deepen, with its MSLP value decreasing from 998mb to 993mb through 24 to 48 hours and then it tends to fill up to 996mb through 48 to 72 hours, this low tends to deepen back to 993 towards end of the forecast period. This low tends to deepen, with its MSPL value decreasing from 994mb to 988mb through 24 to 72 hours and then it tends to fill up back to 994mb towards end of forecast period, according **UKMET** model. The fourth low over Sudan tends to deepen, with its MSLP value decreasing from 1008mb to 1005mb while shifting slightly to the northwest through 24 to 72 hours and then it tends to fill up, with its MSLP value increasing from 1005mb to 1006mb through 48 to 96 hours, then it tends to deepen back to 1005mb towards end of the forecast period, according to **GFS** model. This low pressure is expected to maintain its MSLP

value of 1008mb towards end of the forecast period according to **ECMWF** model. According the **UKMET** model, this low pressure tends to decrease from 1007mb to 1004mb while shifting slightly to the southwest through 24 to 72 hours and then it tends to fill up back to 1008mb towards end of the forecast period.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to deepen, with its MSLP value decreasing from 1024mb to 1022mb while shifting slightly to the east through 24 to 72 hours and then it tends to fill up to 1023mb towards end of the forecast period according to both **GFS** and **UKMET** models. According to **ECMWF** model, this high pressure tends to deepen, with its MSLP value decreasing from 1023mb to 1020mb while shifting slightly to the east through 24 to 96 hours and then it tends to fill up back to 1022 towards end of the forecast period. The Mascarene high pressure system over southwest Indian Ocean is expected to deepen with its central pressure value decreasing from 1020mb to 1016mb towards the end of the forecast period according to **GFS**, **ECMWF** and **UKMET** models

At the 850hpa level, a lower tropospheric seasonal wind convergence is expected to remain active over the CAB region aligning itself with a convergence across southern Africa. The convergence tends to intensify while shifting slightly to the south and reach Mozambique by 48 hours then to the west reaching DRC towards end of the forecast period. Localized wind convergences are also expected to dominate the flow over Angola and Namibia then it tends to intensify and to shift to the east to reach Mozambique and the neighboring areas towards end of the forecast period. Lower tropospheric anticyclone and its associated ridge are expected over South Africa and the neighboring areas and tend to weaken and shift slightly to the south towards end of the forecast period. Another lower tropospheric cyclone and its associated trough are expected to dominate the flow over Mozambique Channel and it tends to shifting to the east and reach coastal Madagascar towards end of the 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 southwestern Mali and by 24hours. This northeast-southwest oriented trough is expected to move southwards

until reaching Algeria and the adjoining areas with the low geopotential value of 5820gpm through 48 to 96 hours and then 5760gpm towards end of the forecast period. A mid latitude frontal system is also expected to propagate eastwards across the Southern African countries with the low geopotential value of 5820gpm through 24 to 48 hours and then 5760gpm towards end of the forecast period. Another trough is expected to prevail over Mozambique Channel with the low geopotential value of 5700gpm and tends to intensify with the low geopotential value of 5580gpm through 48 to 96 hours and then 5640gpm towards end of the forecast period.

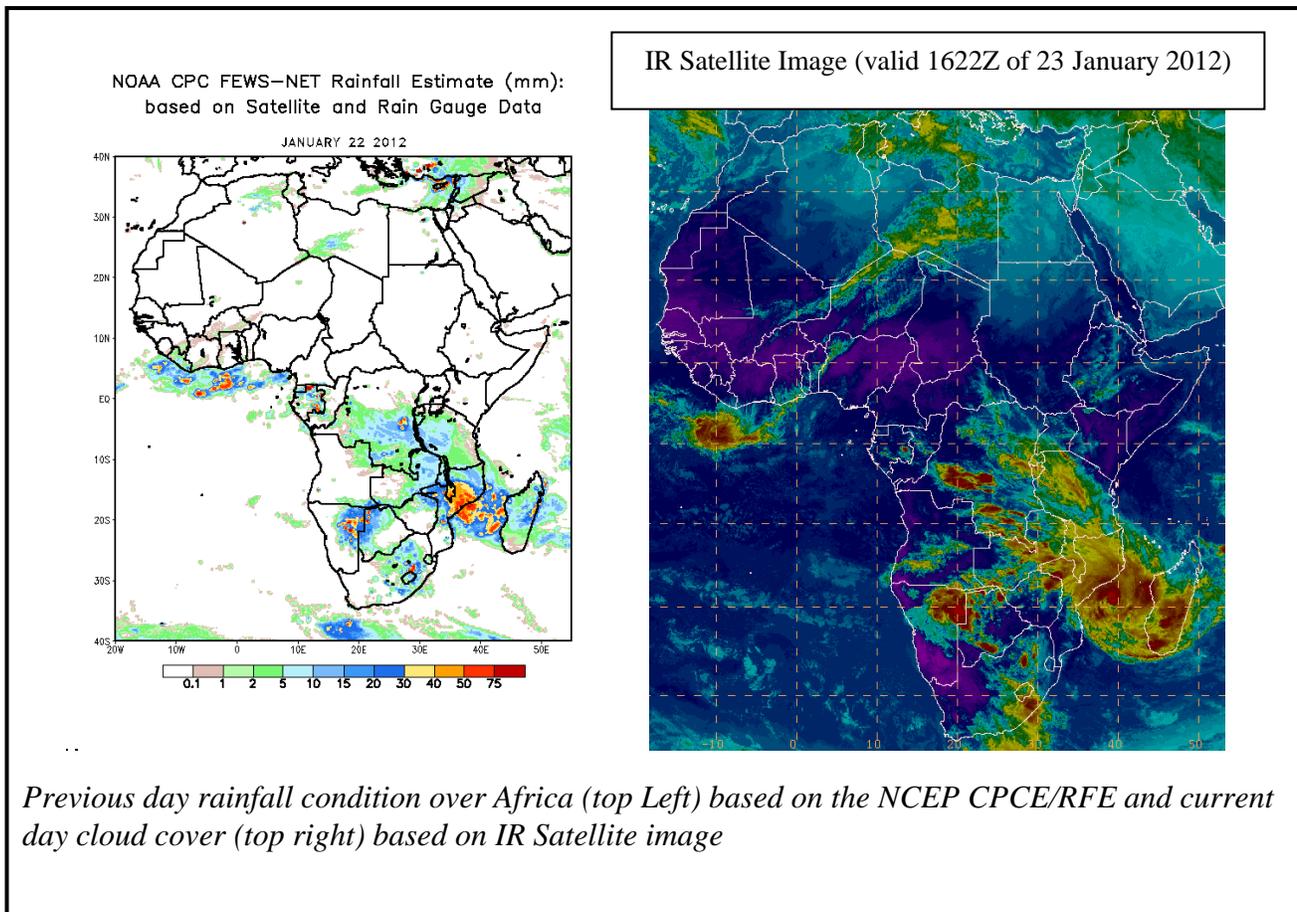
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow over northern Africa, during the forecast period. The intensity of the jet is expected to exceed 150kts in the region between Atlantic Ocean and the Persian Gulf across Mauritania, southern Algeria, southern Libya and Egypt while moving to the east towards end of the forecast period. The Sub-tropical Westerly Jet in the Southern Hemisphere is expected to dominate the flow over the South Africa. 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 Mozambique Channel are expected to enhance rainfall in its neighbors regions. Hence, there is an increased chance for heavy rainfall over Zambia, northern Mozambique, eastern South Africa and Madagascar.

## 2.0. Previous and Current Day Weather Discussion over Africa (22 January – 23 January 2012)

**2.1. Weather assessment for the previous day (22 January 2012):** During the previous day, moderate to locally heavy rainfall was observed over eastern Namibia, parts of DRC, parts of Congo, southern Malawi, northern Mozambique and parts of Madagascar.

**2.2. Weather assessment for the current day (23 January 2012):** Intense clouds are observed over DRC, Zambia, Namibia, Malawi, Tanzania, Botswana, northern Zimbabwe, southern South Africa, Mozambique and Madagascar.



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

**Author(s):** Amira Ibrahim (Egyptian Meteorological Authority) / CPC-African Desk), [Amira.ibrahim@noaa.gov](mailto:Amira.ibrahim@noaa.gov)