

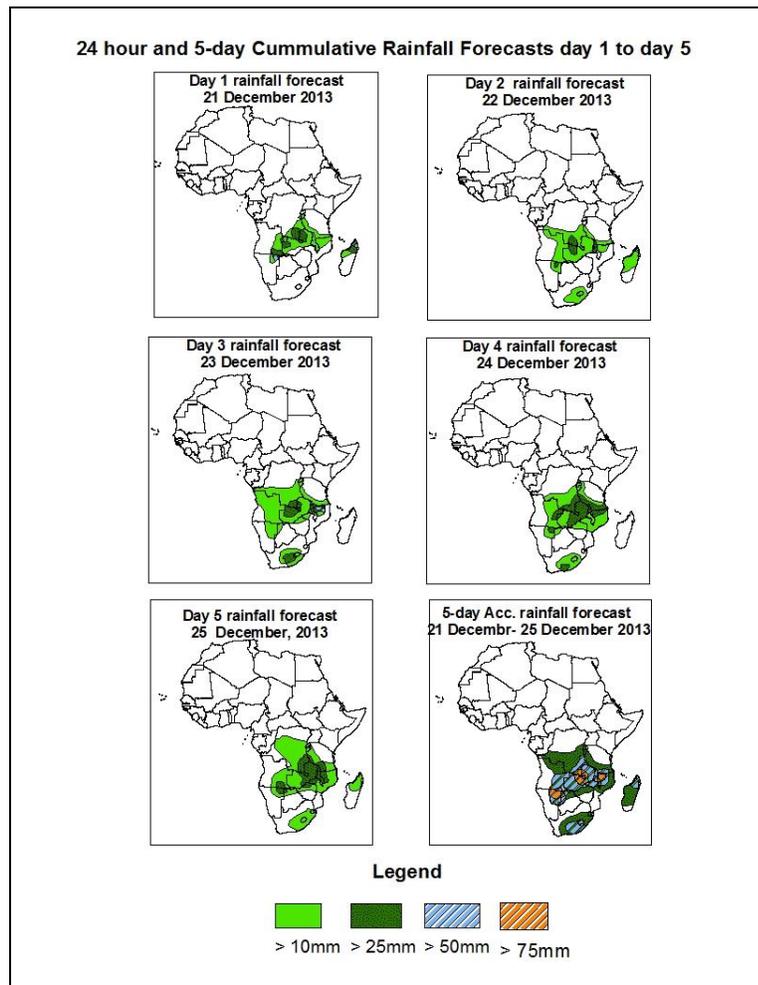


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid 06Z of 21 December – 06Z of 25 December, 2013. (Issued at 1800Z of 20 December 2013)

### 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

Therefore, Mascarene anticyclone is expected to maintain a moderate central pressure value but propagate eastward. This will result in the rain belt slightly shifting southward increasing rainfall in the southern parts of Mozambique, Zimbabwe and South Africa. The St Helena Anticyclone is expected to move westwards and hence some rains expected over areas of South Africa, Northern Botswana and Eastern Namibia. The movement of the northern hemisphere frontal system will result to slight northward shift of the rains benefiting areas of north Uganda, Tanzania, DRC and western Kenya. Due to the relaxed nature of the all the anticyclones, the rains are expected to be diffuse in and mainly moderate. Areas of Ivory Coast, Ghana, Togo, Benin and Guinea are expected to receive some rainfall due to the strong extra-tropical- Tropical interactions during the initial period of the forecast.

## 1.2. Atmospheric Dust Forecasts: Valid 21 December- 23 December 2013

### Atmospheric Dust Forecasts, day 1 to day 3, Moderate Dust Concentration (MDC) and High Dust Concentration (HDC)

**Day 1 Dust forecast  
21 December 2013**



**Day 2 Dust forecast  
22 December 2013**



**Day 3 Dust forecast  
23 December 2013**



#### Highlights

There is an increased chance for moderate to high dust over Niger and Chad.

#### Legend



MDC, Vis. < 5km



HDC, Vis. < 1km

## 1.2. Model Discussion: Valid from 00Z of 20 December 2013

*Model comparison (Valid from 00Z: 20 December 2013) shows all the two models are in general agreement in terms of depicting positions of the northern and southern hemisphere sub-tropical highs, while they showed slight differences in depicting their intensity.*

According to both the GFS model and the UKMET model, St. Helena High Pressure System over southeast Atlantic Ocean is expected to be moderate with its central pressure value at between 1022 hpa and 1019 hpa during the forecast period. The system is however quite west of the east Atlantic coast and therefore areas of South Africa, Northern Botswana and Eastern Namibia are expected to receive some rains

According to both the GFS model and the UKMET model, the Mascarene high pressure system over southwestern Indian Ocean is expected to maintain its central pressure at between 1019hpa and 1023. The system is expected to propagate eastward relaxing its influence over the West Indian coast. This will result in rain belt shifting southward increasing rainfall in the southern parts of Mozambique, Zimbabwe and South Africa.

In the Northern hemisphere, both the Arabian ridge and the Azores anticyclones are expected to remain active. However, with the expected eastward movement of the northern hemisphere frontal system, the anticyclones are anticipated to relax as the forecast period progress. This will therefore result in slight northward shift of the rain belt benefiting further north Parts of Uganda, Tanzania, DRC and western Kenya.

At 500hpa level, troughs associated with mid-latitude frontal system extending over Ivory Coast, Ghana, Togo, Benin and Guinea deep during the initial 48 hours of the forecast period. These interactions are expected to result to rains over these areas during the initial period of the forecast

At 200hpa level, the sub-tropical Westerly Jet mainly (with wind speed >70kts and <150 kts), extending between Mauritania, Morocco, and Egypt, and across, Mali, Niger, Chad, Algeria, Libya and Northern Sudan persist during the forecast period. The jet also

extends to Parts of Senegal, Gambia, Guinea, Togo, Ghana, Ivory Coast, Burkina Faso and Benin during the second half of the forecast period. In the south, the sub-tropical westerly Jet (with 70 to 90kts wind speed) is expected to be mainly over South Africa, Lesotho, Swaziland and the western Indian Ocean.

Therefore, Mascarene anticyclone is expected to maintain a moderate central pressure value but propagate eastward relaxing its influence on the weather on the south Western Indian Ocean. This will result in the rain belt slightly shifting southward increasing rainfall in the southern parts of Mozambique, Zimbabwe and South Africa. The St Helena Anticyclone is expected to move westwards relaxing its influence effect on the Atlantic east coast and hence some rains expected over areas of South Africa, Northern Botswana and Eastern Namibia. The expected eastward movement of the northern hemisphere frontal system will slightly weaken the Northern Hemisphere anticyclones resulting to a slight northward shift of the rain belt benefiting areas of north Uganda, Tanzania, DRC and western Kenya. However due to the relaxed nature of the all the anticyclones the rains are expected to be diffuse and mainly moderate. Areas of Ivory Coast, Ghana, Togo, Benin and Guinea are expected to receive some rainfall due to the strong extra-tropical- Tropical interactions during the initial period of the forecast.

## 2.0. Previous and Current Day Weather Discussion over Africa

(19 December 2013 – 20 December 2013)

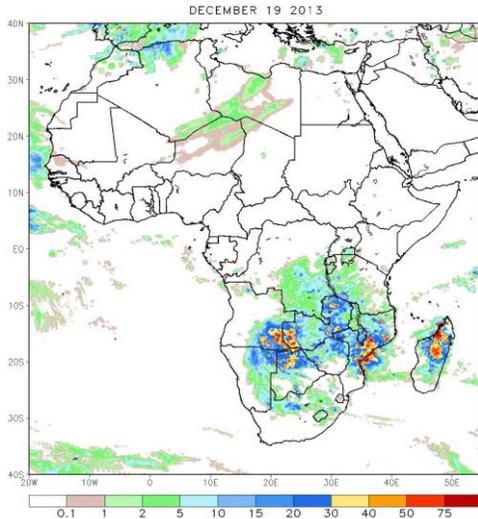
### 2.1. Weather assessment for the previous day (19 December 2013)

During the previous day, moderate to locally heavy rainfall was observed over Tanzania, Southern DRC, Zambia, Mozambique, Botswana, North-East Namibia, Zimbabwe, Angola, some parts South Africa, and Madagascar.

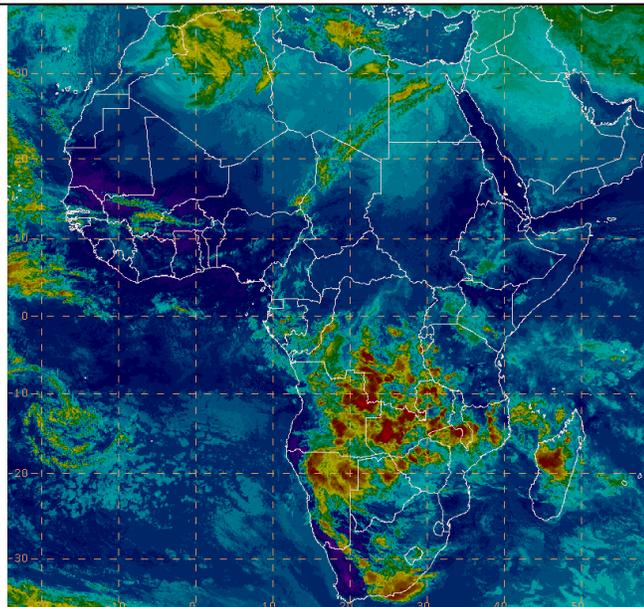
### 2.2. Weather assessment for the current day (20 December 2013)

Intense clouds were observed over Zimbabwe, Tanzania, Central and Southern DRC, Malawi, Mozambique, Angola, Botswana, South Africa, Namibia, Zambia and Madagascar.

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



IR Satellite Image (valid 1722 Z of 20 December 2013)



*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: Samuel N Muchiri**, (Kenya Meteorological Services / CPC-African Desk); Samuel.muchiri@noaa.gov