

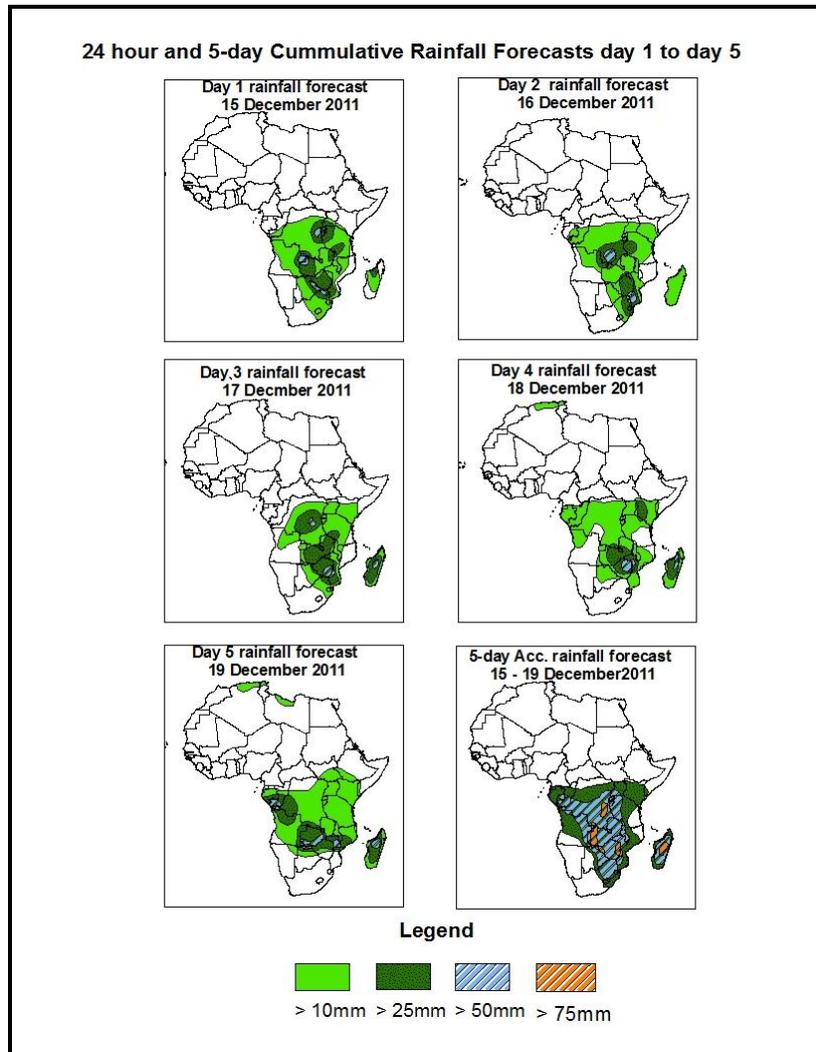


NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 15 December – 06Z of 19 December 2011, (Issued at 17:00Z of 14 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 convergences and the interaction between eastward propagating mid-latitude and tropical systems across southern and southeastern Africa are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over Zambia, western Zimbabwe, parts of Tanzania, southeastern DRC, northern Botswana and Madagascar.

1.2. Models Comparison and Discussion-Valid from 00Z of 14 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 1009mb to 1006mb while moving slightly towards southeast through 24 to 96 hours and then it tends to fill up slightly to MSLP value of 1007mb towards end of the forecast period according to the **GFS** model. According to **ECMWF** model it is expected to deepen, with its MSLP value decreasing from 1010mb to 1009mb while shifting towards the east towards end of the forecast period. According to the **UKMET** model, this low is expected to deepen from MSLP value of 1008mb to 1007mb through 24 to 96 hours. Another low in the vicinity of Botswana is expected to maintain its MSLP value of 1007mb while moving towards the east to reach western Zimbabwe towards end of the forecast period according **GFS** model. According to **ECMWF** model, this low is expected to fill up, with its mean sea level pressure value increasing from 1011mb to 1012mb while reaching the eastern parts of both Angola and Namibia through 48 to the end of the forecast period. According to the **UKMET** model, this low pressure is expected to fill up, with its MSLP value increasing from 1007mb to 109mb through 24 to 72 hours. Another low pressure across Mozambique Channel is expected to fill up, with its MSLP value increasing from 1006mb to 1008mb through 24 to 48 hours and then it tends to deepen, with its MSLP value decreasing from 1008mb to 1006mb. This low is expected to fill up with its mean sea level pressure value increasing from 1006mb to 1007mb while shifting to coastal Mozambique through 72 to 96 hours and then it tends to deepen back to 1006mb by 120 hours according **GFS** model. According to the **ECMWF** this low pressure is expected to appear by 48 hours and tends to deepen, with its MSLP value decreasing from 1010 to 1008mb while shifting to the eastern areas to reach the coastal areas of Mozambique towards end of forecast period. It then tends to fill up, with its MSLP value decreasing from 1007mb to 1008 towards end of forecast period according **UKMET** model. The fourth low over southern Sudan is expected to deepen, with its MSLP value increasing from 1008mb to 1006mb towards end of the forecast period, according **GFS** model. According the **ECMWF** model this low is expected to form by 48 hours and it tends to deepen, with its MSLP value increasing from 1010mb to 1009mb towards end of the forecast period. This low pressure is expected to deepen, with its

MSLP value decreasing from 1008 to 1007mb towards end of the forecast period according the **UKMET** model.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken, with its MSLP value decreasing from 1022mb to 1020mb through 24 to 72 hours and then it tends to intensify to 1025mb towards end of the forecast period according **GFS** model. According to **ECMWF** model this high pressure system tends to intensify, with its MSLP value increasing from 1020 to 1024mb while shifting to east towards end of the forecast period. This high pressure system tends intensify, with its MSLP value increasing from 1021 to 1025mb towards end of the forecast period according **UKMET** model. The Mascarene high pressure system over southwest Indian Ocean is expected to weaken, with its MSLP value decreasing from 1024mb to 1020mb through towards end of the forecast period according **GFS** and **UKMET** models. According **ECMWF** model, this high pressure system tends to weaken, with its MSLP value decreasing from 1020 to 1016mb through 24 to 72 hours and then it tends to intensify to MSLP value of 1020mb towards end of the forecast period.

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 shift slightly to the east and reach Zimbabwe and Zambia towards end of the forecast period. Localized wind convergences are also expected to dominate the flow over both southern Angola and Namibia, while the convergence line is expected to shift to the west through 48 to 72hours and then it tends to deepen while extending towards coastal areas of both Angola and Namibia 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 reach the Madagascar areas across coastal Madagascar.

At 500hpa, eastward propagating trough in the mid-latitude westerly flow is expected to prevail over North Atlantic Ocean and northeastern Africa during the forecast period; with the low geopotential value of 5820gpm extending to the latitudes of north Mauritania. This trough is expected to move eastwards and tends to reach southern Algeria by 48 hours then it tends to reach northern Mali with the low geopotential value of 5760gpm towards end of the forecast period. Another mid-latitude frontal system is

expected to prevail over Mediterranean Sea and northern Africa with the low geopotential value of 5820gpm and it tends to propagate towards southern Libya then southern Sudan with the low geopotential value of 5820gpm through 24 to 72hours. A mid latitude frontal system is also expected to propagate eastwards across the Southern African countries with the low geopotential value of 5760gpm through 24 to 48 hours and then it tends to weaken, with its geopotential value increasing from 5760 to 5820gpm through 48 to 72hours .

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 90kts in the region between northeastern Atlantic Ocean and Persian Gulf while moving to the east while intensifying to 110kts by 72hours. The jet core tends to propagate towards in the region between Niger and Persian Gulf across southern Libya towards 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 South Africa and western Indian Ocean. 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 by 48hours then it tends to fill up back to 130kts by 96 hours. The third core of the subtropical Westerly Jet is expected to dominate the flow over the northwest Africa, by 120 hours. The intensity of this core is expected to exceed 110kts in the region between Spain and Greece across Algeria, Tunisia and Libya areas.

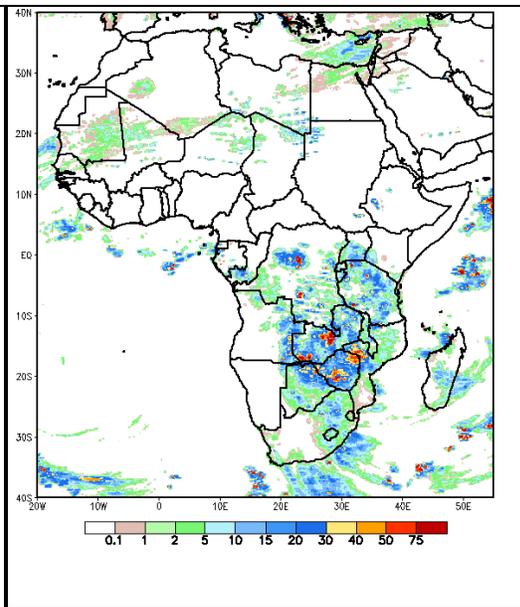
In the next five days, seasonal wind convergence in the CAB region, localized convergences and the interaction between eastward propagating mid-latitude and tropical systems across southern and southeastern Africa are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over Zambia, western Zimbabwe, parts of Tanzania, southeastern DRC, northern Botswana and Madagascar.

2.0. Previous and Current Day Weather Discussion over Africa (13 December – 14 December 2011)

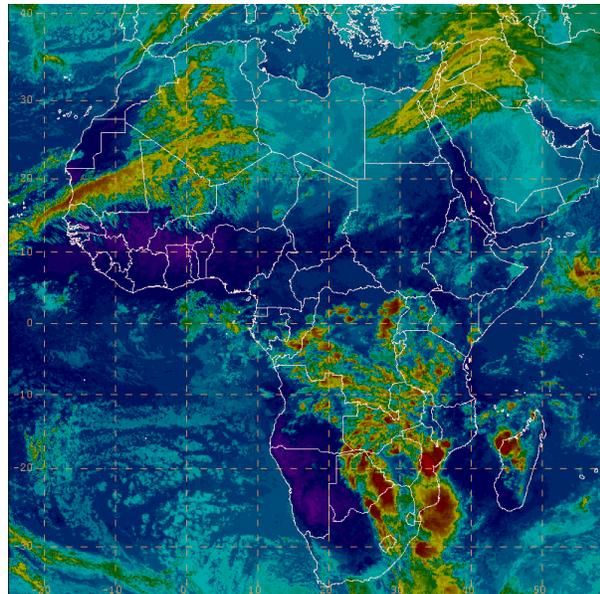
2.1. Weather assessment for the previous day (13 December 2011): During the previous day, moderate to locally heavy rainfall was observed over central and southern DRC, southern Uganda, Tanzania, Zambia, Zimbabwe, northern Botswana and central Mozambique.

2.2. Weather assessment for the current day (14 December 2011): Intense clouds are observed over DRC northern Angola, portions of Uganda, Tanzania, Zambia, eastern Botswana, Zimbabwe, Mozambique, eastern South Africa and portions of Madagascar.

NOAA CPC FEWS-NET Rainfall Estimate (mm):
based on Satellite and Rain Gauge Data
DECEMBER 13 2011



IR Satellite Image
(valid 1622Z of 14 December 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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