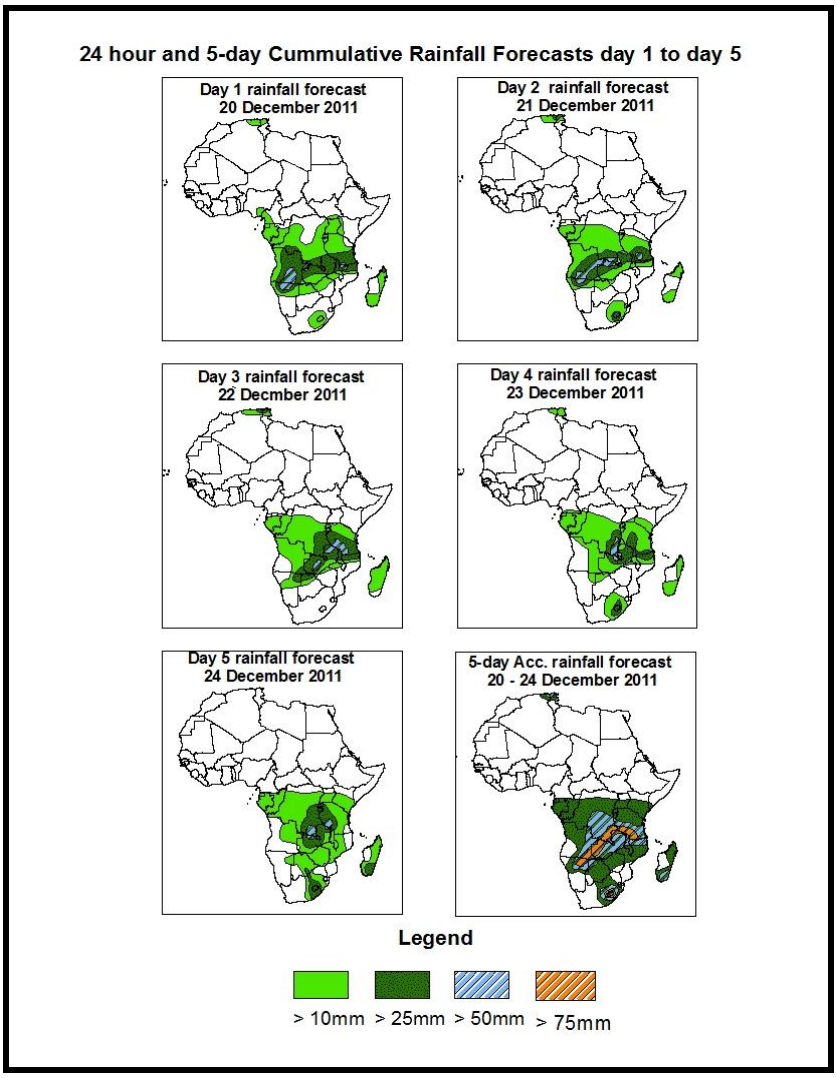
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 20 December – 06Z of 24 December 2011, (Issued at 16:30Z of 19 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 northern Tunisia, northeastern Algeria, parts of DRC, Angola, parts of Namibia, northern Botswana, Zimbabwe, Zambia, northern Malawi, southern Mozambique and parts of Madagascar.

1.2. Models Comparison and Discussion-Valid from 00Z of 19 December 2011

The GFS, ECMWF and UKMET models indicate series of lows and their associated troughs across central and the South African countries. **T**he low over DRC is expected to deepen, with its mean sea level pressure value decreasing from 1009mb to 1008mb towards end of the forecast period according to the **GFS** model. **A**ccording to **ECMWF** model it is expected to deepen, with its MSLP value decreasing from 1009mb to 1008mb through 24 to 48 hours and then it tends to fill up back to 1009mb towards end of the forecast period. **T**his low is expected to deepen, with its MSLP value decreasing from 1009mb to 1006mb through 24 to 48 hours and then it tends to fill up to 1008mb towards end of the forecast period according to the **UKMET** model. **A**nother low in the vicinity of Namibia is expected to deepen, with its MSLP value decreasing from 1009mb to 1005mb while moving towards the east to reach Botswana towards end of the forecast period according **GFS** model. **A**ccording to **ECMWF** model, this low is expected to deepen, with its mean sea level pressure value decreasing from 1010mb to 1007mb through 24 to 48 hours and then it tends to fill up, with its MSLP value increasing from 1007mb to 1010mb while reaching the southern parts of Botswana towards end of the forecast period. **A**ccording to the **UKMET** model, this low pressure is expected to deepen, with its MSLP value decreasing from 1010mb to 1006mb while moving slightly towards southeast towards end of the forecast period. **A**nother low pressure across Mozambique Channel is expected to deepen, with its MSLP value decreasing from 1009mb to 1008mb towards end of the forecast period according **GFS** model. **A**ccording to the **ECMWF** this low pressure is expected to appear by 72hours and it tends to fill up, with its MSLP value increasing from 1008mb to 1012mb towards end of forecast period. It then tends to maintain its MSLP value of 1008mb through 24 to 96 hours, according to the **UKMET** model. **T**he fourth low over southern Sudan is expected to deepen, with its MSLP value decreasing from 1008mb to 1007mb through 24 to 48 hours and then it tends to fill up back to 1008mb through 48 to 72hours, this low tends to deepen, with its MSLP value decreasing from 1008mb to 1007mb towards end of the forecast period, according **GFS** model. **A**ccording the **ECMWF** model this low is expected to maintain its MSLP value of 1009mb towards end of the forecast period. **T**his low pressure is expected to fill up, with its MSLP value increasing from 1007mb to 1008mb and then it tends to deepen back to 1006mb towards end of the forecast period according the **UKMET** model.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to deepen, with its MSLP value decreasing from 1025mb to 1023mb through 24 to 48 hours and then it tends to fill up to 1026mb towards end of the forecast period according to the **GFS** model. **A**ccording to **ECMWF** model this high pressure system tends to deepen, with its MSLP value decreasing from 1025 to 1023mb through 24 to 72 hours and then it tends to fill up back to 1026mb towards end of the forecast period. **T**his high pressure system tends to weaken, with its MSLP value decreasing from 1025 to 1024mb through 24 to 72 hours and then it tends to intensify, with its MSLP value increasing from 1024mb to 1026mb towards end of the forecast period according to the **UKMET** model. **T**he Mascarene high pressure system over southwest Indian Ocean is expected to weaken, with its MSLP value decreasing from 1024mb to 1020mb towards end of the forecast period according to **GFS** and **UKMET** models. **A**ccording to the **ECMWF** model, this high pressure system is expected to maintain its 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 intensify while shifting slightly to the west and reach DRC towards end of the forecast period. **L**ocalized wind convergences are also expected to dominate the flow over both southern Angola and Namibia and then it tends to intensify and to shift slightly to the southeast to reach Zambia towards end of the forecast period. **L**ower tropospheric anticyclone and its associated ridge are expected over South Africa and the neighboring areas tend to weaken while shifting slightly to the east through 48 to 72 hours. **A**nother lower tropospheric cyclone and its associated trough are expected to dominate the flow over Madagascar and then it tends to weaken by 48 hours while reaching eastern Mozambique areas towards 72 hours.

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 5700gpm extending to the latitudes of Mauritania. **T**his trough is expected to move eastwards and tends to reach northern Mali by 48 hours with the low geopotential value of 5700gpm then it tends to reach northern Chad towards end of the forecast period with the low geopotential value of 5760gpm.

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 130kts in the region between north Niger and Russia. The jet core tends to propagate towards in the region between Mali and Turkey through 48 to 72 hours with its maximum wind speed exceeding 150kts and then it tends to propagate towards in the region between Mauritania and Persian Gulf 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, during the forecast period. The intensity of the jet is expected to exceed 90kts in the region between southwestern Atlantic Ocean 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 110kts towards end of the forecast period.

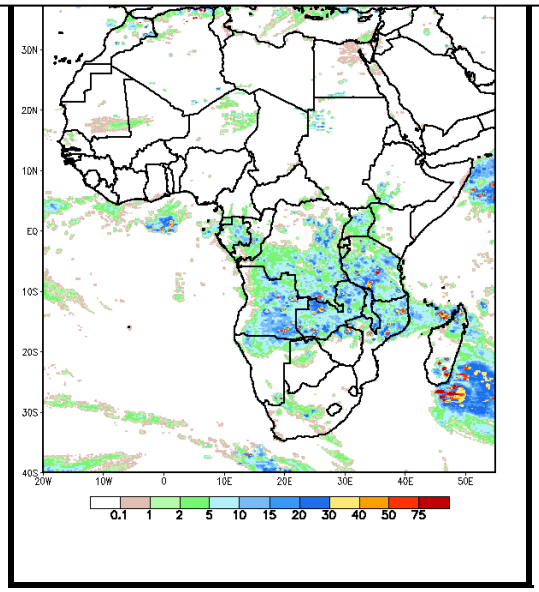
In the next five days, seasonal wind convergence in the CAB region, localized convergences and the interaction between eastward propagating mid-latitude and tropical systems across southern and southeastern Africa are expected to enhance rainfall in their respective regions. Hence, there is an increased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

2.0. Previous and Current Day Weather Discussion over Africa (18 December – 19 December 2011)

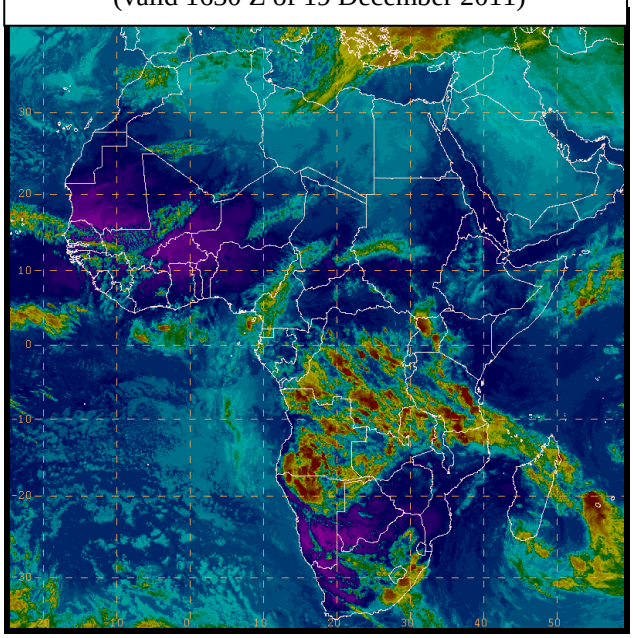
2.1. Weather assessment for the previous day (18 December 2011): During the previous day, moderate to locally heavy rainfall was observed over eastern Gabon, southern Congo, parts of DRC, Tanzania, Zambia, Zimbabwe, Angola, Malawi, northern Botswana, northern Zimbabwe, Mozambique and parts of Madagascar.

2.2. Weather assessment for the current day (19 December 2011): Intense clouds are observed over Congo, DRC, Angola, northern Namibia, Uganda, Tanzania, Zambia, , Malawi, northern Botswana, northern Mozambique, southern South Africa and Madagascar.

NOAA CPC FEWS-NET Rainfall Estimate (mm):
based on Satellite and Rain Gauge Data
DECEMBER 18 2011



IR Satellite Image
(valid 1630 Z of 19 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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