

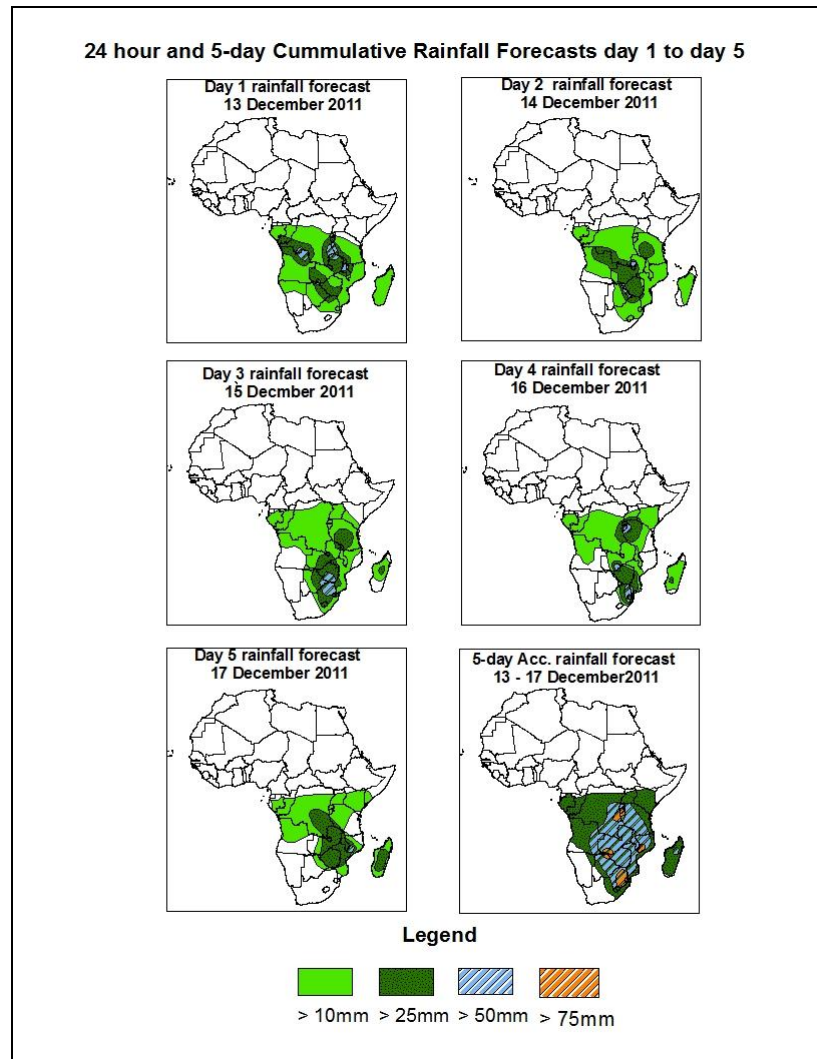


NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 13 December – 06Z of 17 December 2011, (Issued at 16:30Z of 12 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 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 Mozambique, Zambia, Zimbabwe, southern Tanzania, southeastern DRC and eastern South Africa.

1.2. Models Comparison and Discussion-Valid from 00Z of 12 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 1008mb towards end of the forecast period according to the **GFS** model. According to **ECMWF** model it is expected to fill up, with its MSLP value increasing from 1009mb to 1010mb from 48 hours towards the of the forecast period. According to the **UKMET** model, it is expected to fill up from MSLP value of 1005mb to 1008mb by 48 hours towards end of the forecast period. Another low is expected to form in the vicinity of Botswana and tends to fill up, with its MSLP value increasing from 1004mb to 1009mb towards end of the forecast period according **GFS** model. According to **ECMWF** model, the low pressure is expected to fill up, with its mean sea level pressure value increasing from 1008mb to 1011mb towards end of the forecast period. According to the **UKMET** model, this low pressure is expected to deepen, with its MSLP value decreasing from 1008mb to 1005mb and then it tends to fill up from MSLP value of 1005mb to 1012m until the end of the forecast period. Another low pressure which is expected to form across Mozambique Channel and tends to fill up, with its MSLP value increasing from 1006mb to 1008mb while shifting to the eastern areas to reach the western areas of Madagascar towards end then it tends to deepen, with its MSLP value decreasing from 1008mb to 1005mb through 72 to 96 hours and finally it is expected to fill up to 1007mb towards end of the forecast period according **GFS** model. According to the **ECMWF** this low pressure is expected to form by 72 hours and tends to fill up, with its MSLP value increasing from 1008 to 1009mb towards end of forecast period. It then tends to deepen, with its MSLP value decreasing from 1008mb to 1006 through 24 to 72hours towards 72 hours according **UKMET** model. The fourth low over the southern areas of Sudan is expected to fill up, with its MSLP value increasing from 1007mb to 1008mb through 24 to 96 hours and then it tends to deepen back from MSLP value of 1008mb to 1007mb towards end of the forecast period, according **GFS** model. According the **ECMWF** model this low is expected to fill up, with its MSLP value increasing from 1009mb to 1010mb through 24 to 72 hours and then it tends to deepen, with its mean sea level pressure value decreasing from 1010mb to 1009mb towards end of the forecast period. This low pressure is expected to fill up, with MSLP value increasing

from 1007mb to 1008mb through 24 to 96hours then it tends to deepen back 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 1028mb to 1020mb according to **GFS**, **ECMWF** and **UKMET** models towards end of the forecast period. The Mascarene high pressure system over southwest Indian Ocean is expected to intensify, with its MSLP value increasing from 1020mb to 1024mb then it tends to weaken back to 1020mb towards end of the forecast period according to both **GFS** and **UKMET** models. According to **ECMWF** model it is expected to weaken, with its MSLP value increasing from 1020mb to 1016mb 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 align itself with a convergence across Zambia. The convergence across Zambia, Zimbabwe and neighboring areas is expected to move towards the Mozambique Channel, while interacting with eastward propagating frontal system across southern Africa during 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 east through 48 to 72hours and then it tends to intensify while extending towards Angola and Zambia 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 central Algeria. This northeast-southwest oriented trough is expected to move eastwards and tends to reach Libya and the adjoining areas by 48hours then to northern Sudan through 72 to 96 hours. Another mid-latitude frontal system is expected to approach coastal Mauritania through 24hours and it tends to propagate towards southern Libya 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 5760gpm through 24 to 96 hours.

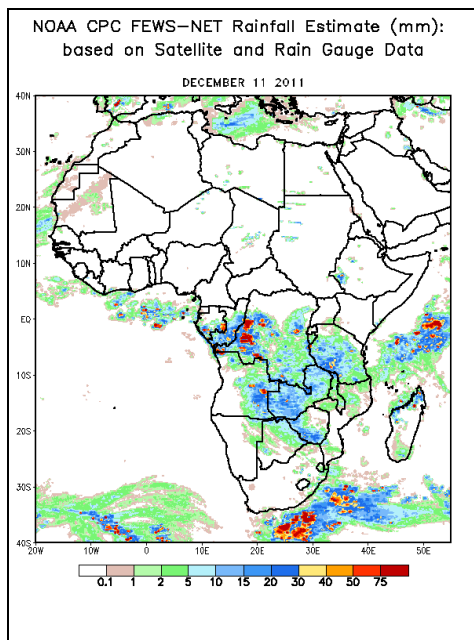
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow over northern Africa, during the forecast period. The intensity of the jet is expected to exceed 90kts in the region between northeastern Atlantic Ocean and Greece while moving to the east by 48hours and then it tends to intensify further to wind speed values of over 110kts. The jet core tends to propagate towards in the region between Algeria and Persian Gulf through 48 and 96 hours while weakening back to 90kts and then it tends to propagate towards in the region between southern Libya and Persian Gulf 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 southeast Atlantic and western Indian Ocean across southern 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 130kts by 48hours then it tends to weaken to 90kts through 48h to 96 hours. The third Jet is expected to dominate the flow over the northwest Africa, during the forecast period. The intensity of the Jet is expected to exceed 110kts in the region between Sudan and Persian Gulf by 24 hours.

In the next five days, seasonal wind convergence in the CAB region 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 Mozambique, Zambia, Zimbabwe, southern Tanzania, southeastern DRC and eastern South Africa.

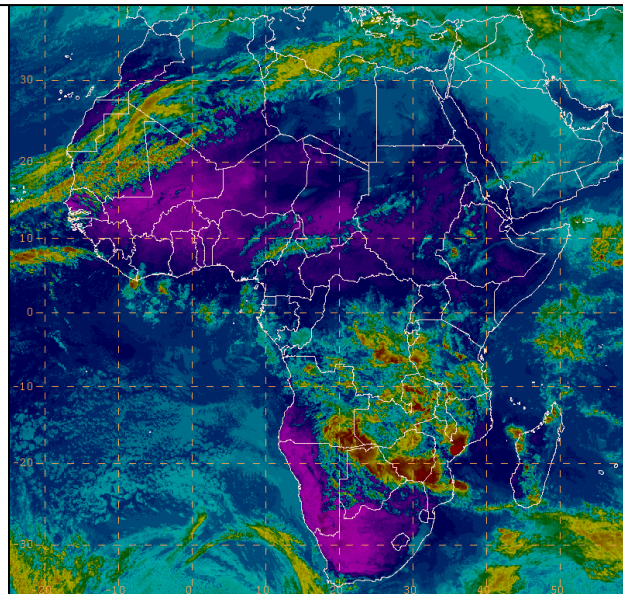
2.0. Previous and Current Day Weather Discussion over Africa (11 December – 12 December 2011)

2.1. Weather assessment for the previous day (11 December 2011): During the previous day, moderate to locally heavy rainfall was observed over southern Gabon, southern Congo, western DRC, eastern Angola, western Zambia, parts of Tanzania and Zimbabwe.

2.2. Weather assessment for the current day (12 December 2011): Intense clouds are observed over Angola, southern DRC, eastern Namibia, Botswana, Zambia, Zimbabwe, Tanzania, northern Mozambique and Madagascar.



IR Satellite Image (valid 1652Z of 09December 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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