

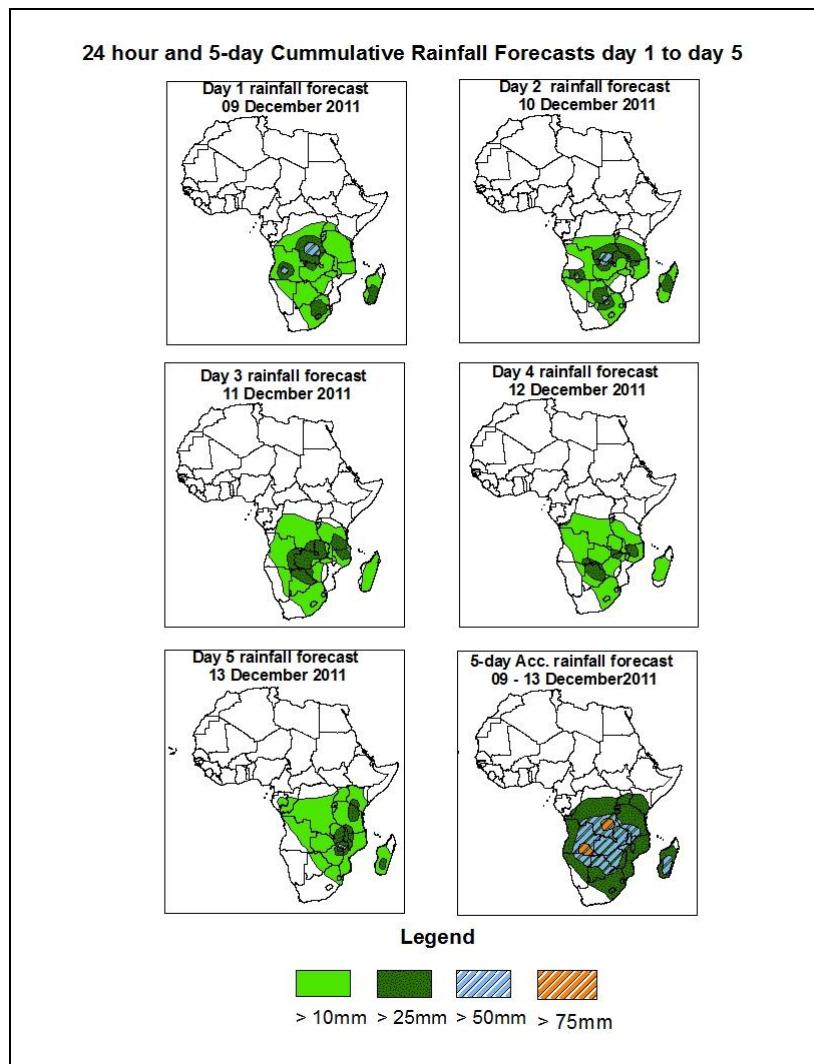


NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 09 December – 06Z of 13 December 2011, (Issued at 19:00Z of 08 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 wind convergences and cyclonic circulations in the vicinity of Angola, Namibia and Mozambique Channel are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over Angola, northern Namibia, Zambia, Zimbabwe, southern Tanzania and southern DRC.

1.2. Models Comparison and Discussion-Valid from 00Z of 08 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 fill up, with its mean sea level pressure value increasing from 1007mb to 1008mb through 24 to 72hours and tends to decrease to 1006mb towards the end of the forecast period while moving slightly southeastwards according to the **GFS** model. According to **ECMWF** model it is expected to maintain its MSLP value of 1008mb towards the end of the forecast period. According to the **UKMET** model, it is expected to deepen from MSLP value of 1008mb to 1006mb towards the 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 1005mb to 1004mb through 24 to 48 hours and tends to move towards southern Botswana and the adjoining areas of South Africa, then it tends to fill up to MSLP value of 1005mb through 48 to 72 hours and then tends to deepen back, with its mean sea level pressure value decreasing from 1005mb to 1003mb while covering both Botswana and South Africa areas 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 1007mb to 1008mb through 24 to 48 hours, and then it tends to maintain its MSPL value of 1008mb towards end of the forecast period. According the **UKMET** model, the low pressure is expected to deepen, with its MSPL value decrease from 1008mb to 1005mb and moving towards South Africa 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 1007mb to 1008mb through 24 to 48hours. It then tends to deepen, with its mean sea level pressure value decreasing from 1008mb to 1003mb towards end of the forecast period according **GFS** model. According to the **ECMWF** this low pressure is expected to form across Mozambique Chanel by 120hours with a MSLP value of 1008mb. It then tends to maintain its MSPL value of 1008mb towards end of forecast period while shifting to the eastern areas to reach the central Madagascar according **UKMET** model. The fourth low over Tanzania Republic tends to fill up, with its MSLP value increasing from 1008mb to 1009mb through 24 to 48hours, then it tends maintain MSLP value of 1009mb until 96hours and then it tends to deepen, with its MSLP value decreasing from 1009mb to 1008mb towards end of the forecast period while covering the much of Tanzania, according **GFS** model. According the **UKMET** model, this low

pressure tends to decrease from 1008mb to 1007mb through 24 to 72hours while reaching the coastal areas and then it tends to fill up to 1008mb until the end of the forecast period while moving towards northern Tanzania.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken, with its MSLP value decreasing from 1028mb to 1024mb through 24 to 96hours according to both **GFS** and **ECMWF** models, while shifting slightly to west, and then it's expected to fill up, with its MSLP value increasing from 1024mb to 1028mb towards end of the forecast period. According to **UKMET** model, it tends to weaken, with its MSLP value decreasing from 1028mb to 1024mb through 24 to 96hours and then it tends to fill up, with its MSLP value increasing from 1024mb to 1028mb towards end of the forecast period while shifting slightly to west. The Mascarene high pressure system over southwest Indian Ocean is expected to weaken, with its central pressure value decreasing from 1020mb to 1016mb while shifting to west towards the end of the forecast period according to both **GFS** model. According to **ECMWF** model it is expected to fill up, with its MSLP value increasing from 1016mb to 1020mb towards end of the forecast period while shifting slightly to west until the end of forecast period. This high pressure system is expected to fill up, with its MSLP value increasing from 1016mb to 1020mb towards end of the forecast period while moving slightly to east until the end of forecast period, according the **UKMET** model.

At the 850hpa level, a lower tropospheric seasonal wind convergence is expected to remain active over parts of CAB region then it tends to intensify while extending towards Zambia towards end of the forecast period. Localized wind convergences are also expected to dominate the flow over both Angola and Namibia while the convergence line is expected to intensify and shift to the east by 96hours. Lower tropospheric anticyclone and its associated ridge are expected prevail over South Africa and the neighboring areas through 72 to 120hours.

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 5820gpm extending to the latitudes of southern Libya by 24hours. This northeast-southwest oriented trough is expected to move eastwards until reaching Egypt and the adjoining areas during the forecast period. Another mid-latitude

frontal system is expected to approach coastal Morocco through 24hours and it tends to propagate towards Algeria towards end of the forecast period while its southern extent reaching across Mauritania and Senegal. A mid latitude frontal system is also expected to propagate eastwards across the Southern African countries during the forecast period.

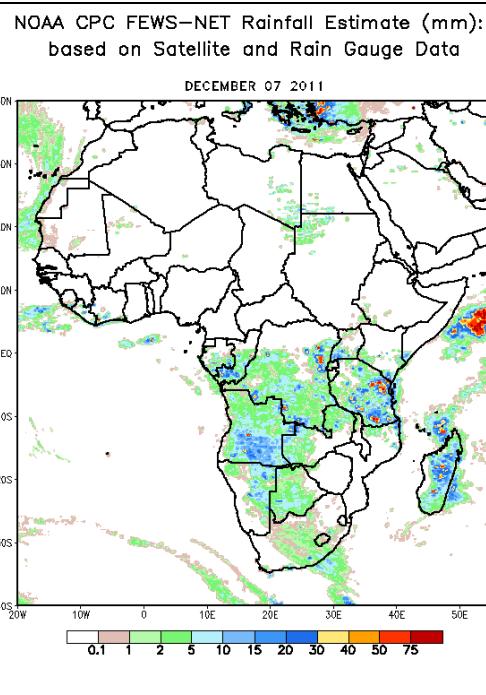
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow over northern Africa, during the forecast period. The intensity of the jet is expected to exceed 110kts in the region between Mali and the Persian Gulf while moving to the east by 24hours. The jet core tends to propagate towards in the region between Niger and Persian Gulf through 48 and 72 hours then it tends to propagate towards in the region between Chad and Persian Gulf through 72 to 96 hours then it tends to propagate towards in the region between Egypt and Persian Gulf until 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 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 90kts by 96hours then it tends to fill up to 110kts towards the end of the forecast period. The third Jet is expected to dominate the flow over the northwest Africa, during the forecast period. The intensify of the Jet is expected to exceed 110kts in the region between North Atlantic Ocean and Mauritania by 72 hours, the core of jet tends to shift further to the east in the region between North Atlantic Ocean and Mali by 96 hours then it tends to waken towards the end of forecast period.

In the next five days, seasonal wind convergence in the CAB region, localized wind convergences and cyclonic circulations in the vicinity of Angola, Namibia and Mozambique Channel are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over Angola, northern Namibia, Zambia, Zimbabwe, southern Tanzania and southern DRC.

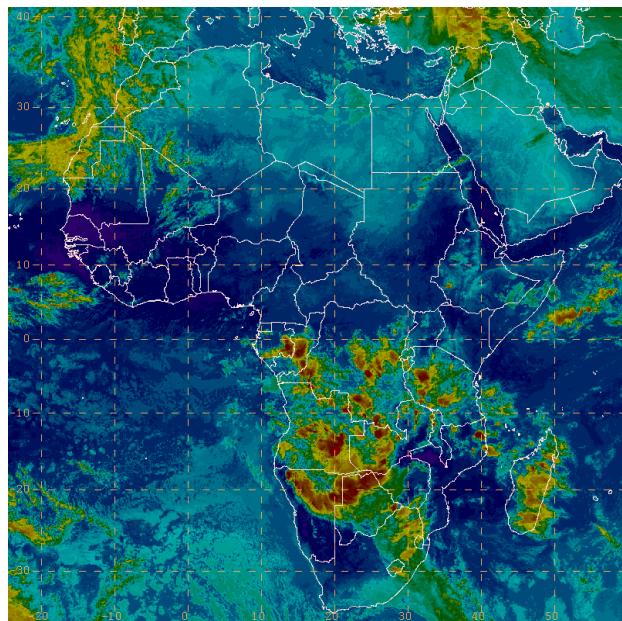
2.0. Previous and Current Day Weather Discussion over Africa (07 December – 08 December 2011)

2.1. Weather assessment for the previous day (07December 2011): During the previous day, moderate to locally heavy rainfall was observed over southern Angola, southern Congo, Tanzania and central Madagascar.

2.2. Weather assessment for the current day (08December2011): Intense clouds are observed over Congo, Angola, southern DRC, Namibia, Botswana, Zambia, eastern South Africa, Tanzania and Madagascar.



IR Satellite Image (valid 1900Z of 08December 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

Author(s): Lotfi Khammari (Tunsian Meteorological Authority) / CPC-African Desk),
lotfi.khammari@noaa.gov, and

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