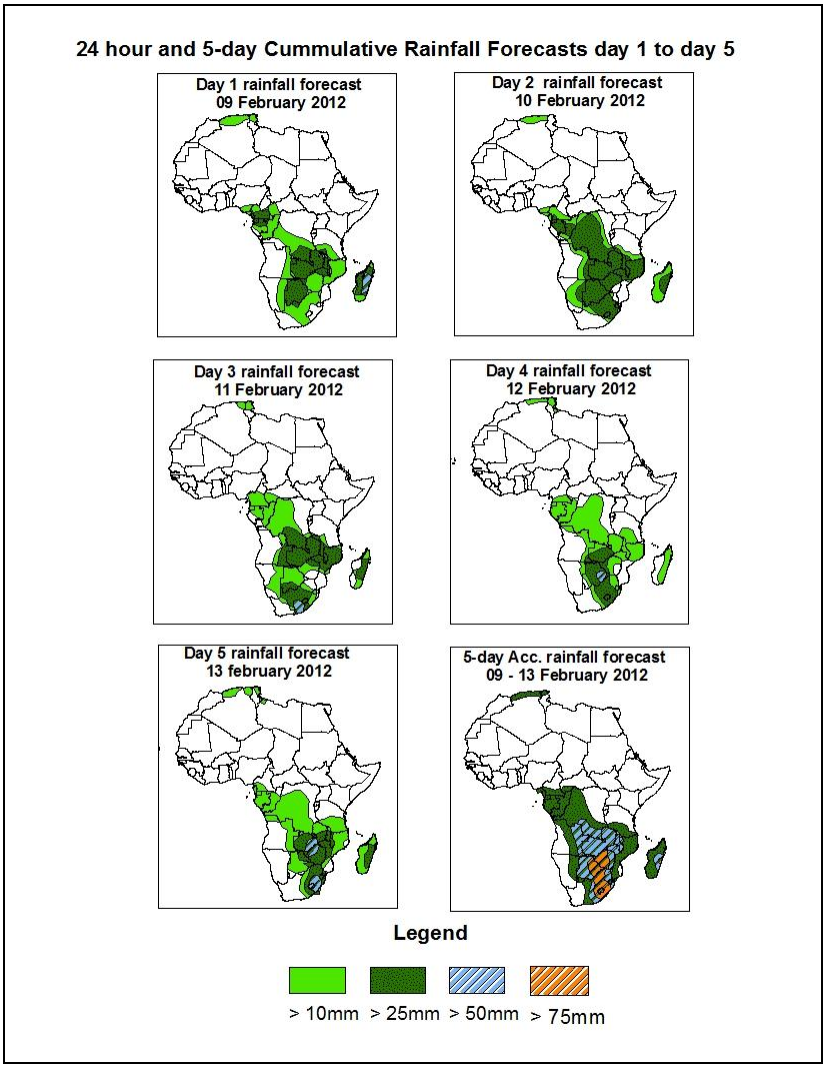
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 09 February – 06Z of 13 February 2012, (Issued at 18:30Z of 08 February 2012)

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

In the next five days, seasonal wind convergence in the Gulf of Guinea region, central and southern DRC, localized wind convergences and cyclonic circulations in the vicinity of southeastern Angola / eastern Namibia and Botswana, Zambia, Zimbabwe, Mozambique Channel and mid latitude trough over South Africa are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over the Gulf of Guinea and the surrounding regions, eastern Angola, eastern Namibia, Zambia, Zimbabwe, eastern South Africa, central and western DRC, Mozambique and eastern Madagascar.

1.2. Models Comparison and Discussion-Valid from 00Z of 07 February2012

The GFS, ECMWF and UKMET models indicate series of lows and their associated trough 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 1005mb to 1003mb towards the end of forecast period according to the **GFS** model. According to **ECMWF** model it is expected to remain stationary at 1008mb throughout the forecast period. **A**ccording to the **UKMET** model, it is expected to fill, with its MSLP value increasing from 1006mb to 1007mb through 48 to 72 hours while shifting eastwards through 24 to 48 hours and then shifting back through 48 to 72 hours. **A**nother low is expected to form in the vicinity of Botswana and tends to deepen, with its MSLP value decreasing from 1007mb to 1003mb while moving to the south through 24 to 48 hours. It will then move northwards and tends to deepen further with central pressures decreasing from 1003mb to 1002mb through 48 to 72 hours. It will then shift southwards becoming extra tropical trough towards end of the forecast period according **GFS** model. **A**ccording to **ECMWF** model, this low pressure is expected to shift southwards in the next 24 hours becoming extra tropical trough. This trough will shift southwards and fill up through 48 to 72 hours. **A**ccording the **UKMET** model, the low pressure is expected to deepen, with its MSLP value decreasing from 1008mb to 1005mb while shifting to the southeast through 24 to 48 hours. It will shift further to the south becoming extra tropical trough through 48 to 72 hours. **A**nother low pressure is expected to form in the vicinity of Mozambique Channel and will tends to fill up, with its MSLP value increasing from 1009mb to 1007mb through 24 to 48 hours. It will then deepen further with its central pressures decreasing to 1002mb while shifting to the east towards the end of the forecast period according **GFS** model. **A**ccording to the **ECMWF** model, this low pressure with central pressures of 1008mb is expected to shift to the south through 24 to 48 hours becoming extra tropical trough. This trough will progressively shift southwards and fill up through 48 to 96 hours. On the other hand **UKMET** model forecasts, tends to locate the low in across southern Mozambique with a MSLP value of 1007mb. Within the next 24 hours the low is expected deepen to central pressures of 1006mb and shift southwards, becoming extra tropical trough within the next 72 hours. Another low will form over central Mozambique within 72 to 96 hours with central pressures of 1003mb and tends to fill up with its central pressures decreasing to 1006mb towards the end of the forecast period. **The fourth** low over South Sudan Republic tends to remain constant, with its MSLP value ranging between 1002mb and 1004mb throughout the forecast period according **GFS**

model. **A**ccording to **ECMWF** model this low is expected to be stationary but will slightly deepen from central pressures of 1004mb to 1003mb towards the end of the forecast period. **A**ccording to **UKMET** model, the low pressure tends to remain stationary with its central pressures remaining constant at 1002mb throughout the forecast period.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to strengthen, with its MSLP value increasing from 1023mb to 1028mb towards end forecast period. It will however progressively shift southeastwards according to **GFS** model. This high pressure system tends to remain constant with its MSLP value of 1024mb throughout the forecast period, according to **ECMWF**. According to **UKMET** model, it is expected to strengthen, with its MSLP value increasing from 1024mb to 1028mb and shift southwards towards the end of the forecast period. The Mascarene high pressure system over southwest Indian Ocean is expected to weaken, with its central pressure value decreasing from 1016mb to 1012mb while shifting southeast throughout the end of the forecast period according to **GFS** model. According to **ECMWF** model it is expected to weaken, with its central pressure system value decreasing from 1016mb to 1012mb towards end of the forecast period. **T**his high pressure system is expected to weaken from 1016mb to 1012mb towards end of forecast period. However, it will be progressively shifting southeastwards throughout the forecast period according to **UKMET** model.

At the 850hpa level, a lower tropospheric seasonal wind convergence is expected to be active over Gulf of Guinea region extending eastwards to Central Africa republic and northern DRC during the forecast period. Localized winds convergences are also expected to dominate the flow over Namibia/Angola within the next 24 hours. They will progressively shift eastwards reaching eastern Botswana after 72 hours. By the end of the forecast period these convergences will be located over eastern South Africa. However another cyclonic circulation will form northern Namibia / southern Angola border in the next 96 hours and progress eastwards reaching western Botswana by the end of the forecast period. Another local cyclonic circulation is also expected in the northern Mozambique Channel which will then weaken and disappear through 24 to 48 hours. Anticyclonic circulation is expected to dominate over southeastern DRC for the next 48 hours. It will then shift westwards and by the end of the forecast period it will be sitting over central DRC.

At 500hpa, zonal flow is expected to dominate over North Africa. A mid latitude trough is also expected to propagate southeastwards across the Southern African with the low geopotential value of 5760gpm through 72 to 96 hours.

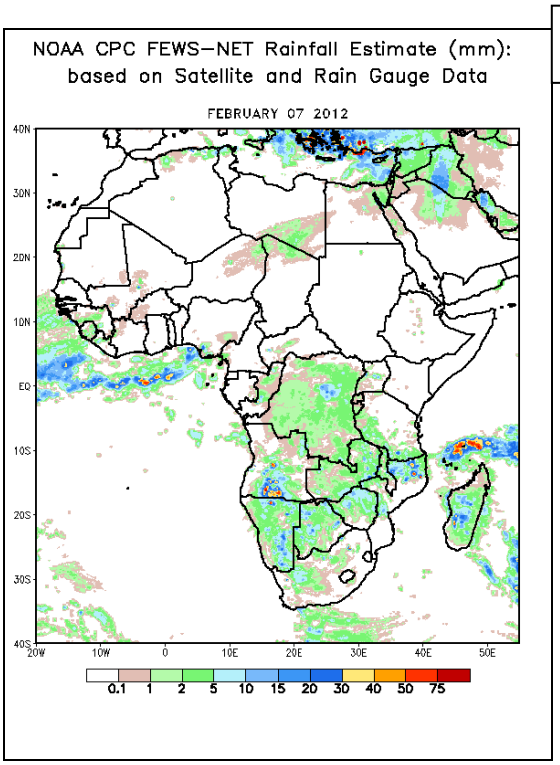
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow across northern Africa, during the forecast period. The intensity of the jet is expected to exceed 130kts in the region between Atlantic Ocean and the Persian Gulf while moving to the east with its core values occasionally increasing to more than 150kts.

In the next five days, seasonal wind convergence in the Gulf of Guinea region, central and southern DRC, localized wind convergences and cyclonic circulations in the vicinity of southeastern Angola / eastern Namibia and Botswana, Zambia, Zimbabwe, Mozambique Channel and mid latitude trough over South Africa are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over the Gulf of Guinea and the surrounding regions, eastern Angola, eastern Namibia, Zambia, Zimbabwe, eastern South Africa, central and western DRC, Mozambique and eastern Madagascar.

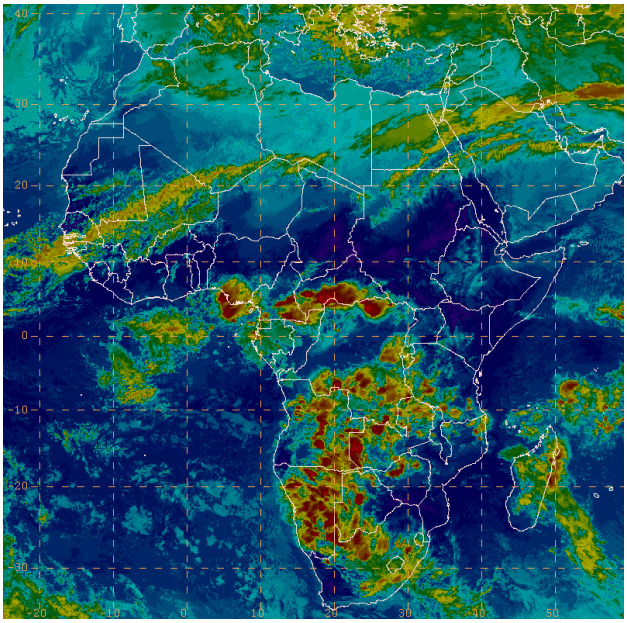
2.0. Previous and Current Day Weather Discussion over Africa (07 February – 08 February 2011)

2.1. Weather assessment for the previous day (07February 2012): During the previous day, moderate to locally heavy rainfall was observed over southern Angola and northern Mozambique.

2.2. Weather assessment for the current day (08 February 2012): Intense clouds are observed from southern Nigeria to Central Africa Republic, Namibia, Central and eastern Angola, southern and eastern DRC, Botswana, northern Zimbabwe, western Zambia and eastern Madagascar.



IR Satellite Image (valid 1800Z of 08 February 2012)



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): Ezekiel Njoroge (Kenyan Meteorological Department) / CPC-African Desk), ezekiel.njoroge@noaa.gov , and

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