

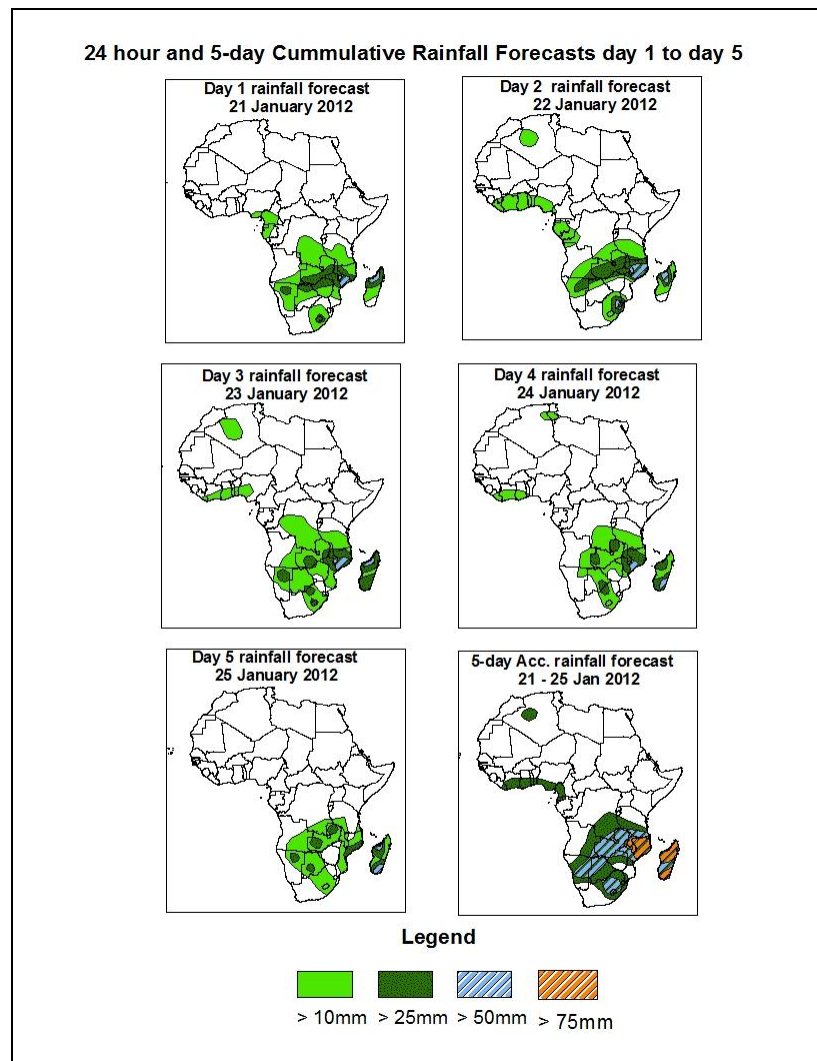


NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 21 January – 06Z of 25 January 2012, (Issued at 16:30Z of 20 January 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 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 Zambia, northern Zimbabwe, parts of Botswana, Malawi, Mozambique, eastern South Africa and Madagascar.

1.2. Models Comparison and Discussion-Valid from 00Z of 20 January 2012

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 1007mb to 1006mb through 24 to 48 hours and then it tends to fill up to 1007mb while shifting slightly to the southwest through 48 to 72 hours and then it tends to deepen back to 1005mb 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 1007mb to 1008mb through 24 to 72 hours and then it tends to deepen, with its MSLP value increasing from 1008mb to 1006mb towards end of the forecast period. According to the **UKMET** model, it is expected to fill up, with its MSLP value increasing from 1006mb to 1009mb while shifting slightly to the northwest towards 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 72 hours and then it tends to fill up back to 1006mb while shifting to the west through 72 to 96 hours, then it tends to deepen back to 1005mb towards end of the forecast period according **GFS** model. According to **ECMWF** model, the low pressure is expected to deepen, with its MSPL value decreasing from 1008mb to 1007mb through 24 to 72 hours and then it tends to fill up back to 1008mb towards end of the forecast period. This low pressure is expected to deepen, with its MSLP value decreasing from 1008mb to 1004mb while shifting to the west towards end of the forecast period according **UKMET** model. Another low pressure is expected to form across Mozambique Channel and tends to deepen, with its mean sea level pressure value decreasing from 991mb to 964mb while shifting to the west and reaching Mozambique towards end of the forecast period, according **GFS** model. According to the **ECMWF**, this low pressure is expected to deepen, with its MSLP value decreasing from 999mb to 987mb while shifting slightly to the west towards end of the forecast period. This low tends to deepen, with its MSPL value decreasing from 993mb to 987mb towards end of forecast period, according **UKMET** model. The fourth low over Sudan tends to deepen, with its MSLP value decreasing from 1007mb to 1006mb while shifting slightly to the southeast through 24 to 48 hours and then it tends to fill up, with its MSLP value increasing from 1006mb to 1007mb through 48 to 96 hours, then it tends to deepen back to 1005mb towards end of the forecast period, according to **GFS** model. This low pressure is expected to maintain its MSLP value of 1008mb towards

end of the forecast period according to **ECMWF** model. According the **UKMET** model, this low pressure tends to increase from 1005mb to 1006mb while shifting slightly to the southeast through 24 to 96 hours and then it tends to deepen back to 1005mb towards end of the forecast period.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to deepen, with its MSLP value decreasing from 1024mb to 1020mb while shifting slightly to the east towards end of the forecast period according to both **GFS** and **ECMWF** models. According to **UKMET** model, this high pressure tends to deepen, with its MSLP value decreasing from 1028mb to 1020mb while shifting slightly to the east towards end of the forecast period. The Mascarene high pressure system over southwest Indian Ocean is expected to deepen with its central pressure value decreasing from 1020mb to 1012mb through 24 to 72 hours and then it tends to fill up to 1020mb towards the end of the forecast period according to **GFS**, **ECMWF** and **UKMET** models

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 southwest and reach Malawi and then Mozambique towards end of the forecast period. Localized wind convergences are also expected to dominate the flow over Angola and Namibia then it tends to intensify and to shift to the east to reach Mozambique and the neighboring areas towards end of the forecast period. Lower tropospheric anticyclone and its associated ridge are expected over South Africa and the neighboring areas and tend to weaken and shift slightly to the west 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 to shifting to the east and reach coastal Mozambique 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 5700gpm extending to the latitudes of southwestern Algeria and northern Mali by 24hours. This northeast-southwest oriented trough is expected to move southwards until reaching Tunisia and the adjoining areas with the low

geopotential value of 5760gpm 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 5820mb during the forecast period. Another trough is expected to prevail over Mozambique Channel with the low geopotential value of 5760gpm and tends to intensify with the low geopotential value of 5520gpm towards end of the forecast period.

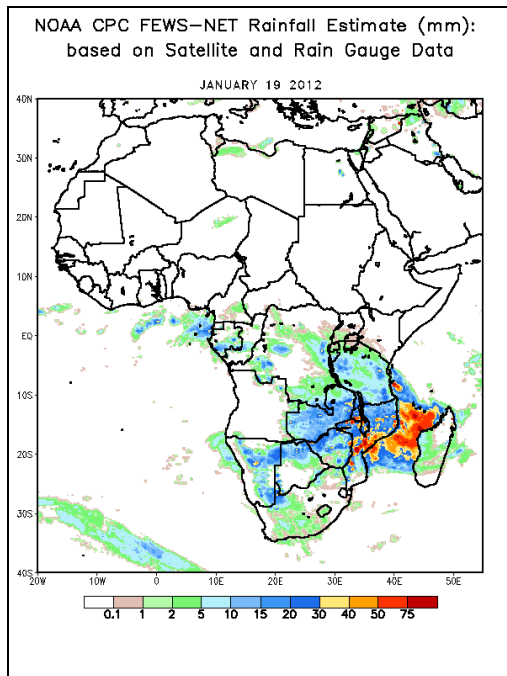
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow over northern Africa, during the forecast period. The intensity of the jet is expected to exceed 150kts in the region between Atlantic Ocean and the Persian Gulf across Mauritania, southern Algeria, southern Libya and Egypt while moving to the east 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, by 48 hours. The intensity of the jet is expected to exceed 110kts in the region between southeastern Atlantic Ocean and Indian Ocean across South Africa.

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 Zambia, northern Zimbabwe, parts of Botswana, Malawi, Mozambique, eastern South Africa and Madagascar.

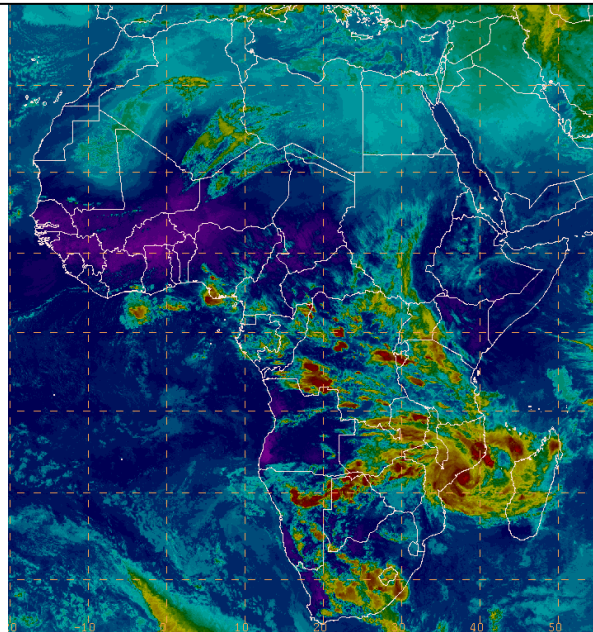
2.0. Previous and Current Day Weather Discussion over Africa (19 January – 20 January 2012)

2.1. Weather assessment for the previous day (19 January 2012): During the previous day, moderate to locally heavy rainfall was observed over Zimbabwe, parts of Zambia, northern Namibia, parts of Tanzania, Malawi and Mozambique.

2.2. Weather assessment for the current day (20 January 2012): Intense clouds are observed over DRC, Zambia, Namibia, Malawi, Tanzania, Burundi, Botswana, Zimbabwe, southern South Africa, Mozambique and Madagascar.



IR Satellite Image (valid 1622Z of 20 January 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): Lotfi Khammari (Tunisian Meteorological Authority) / CPC-African Desk),
lotfi.khammari@noaa.gov, and

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