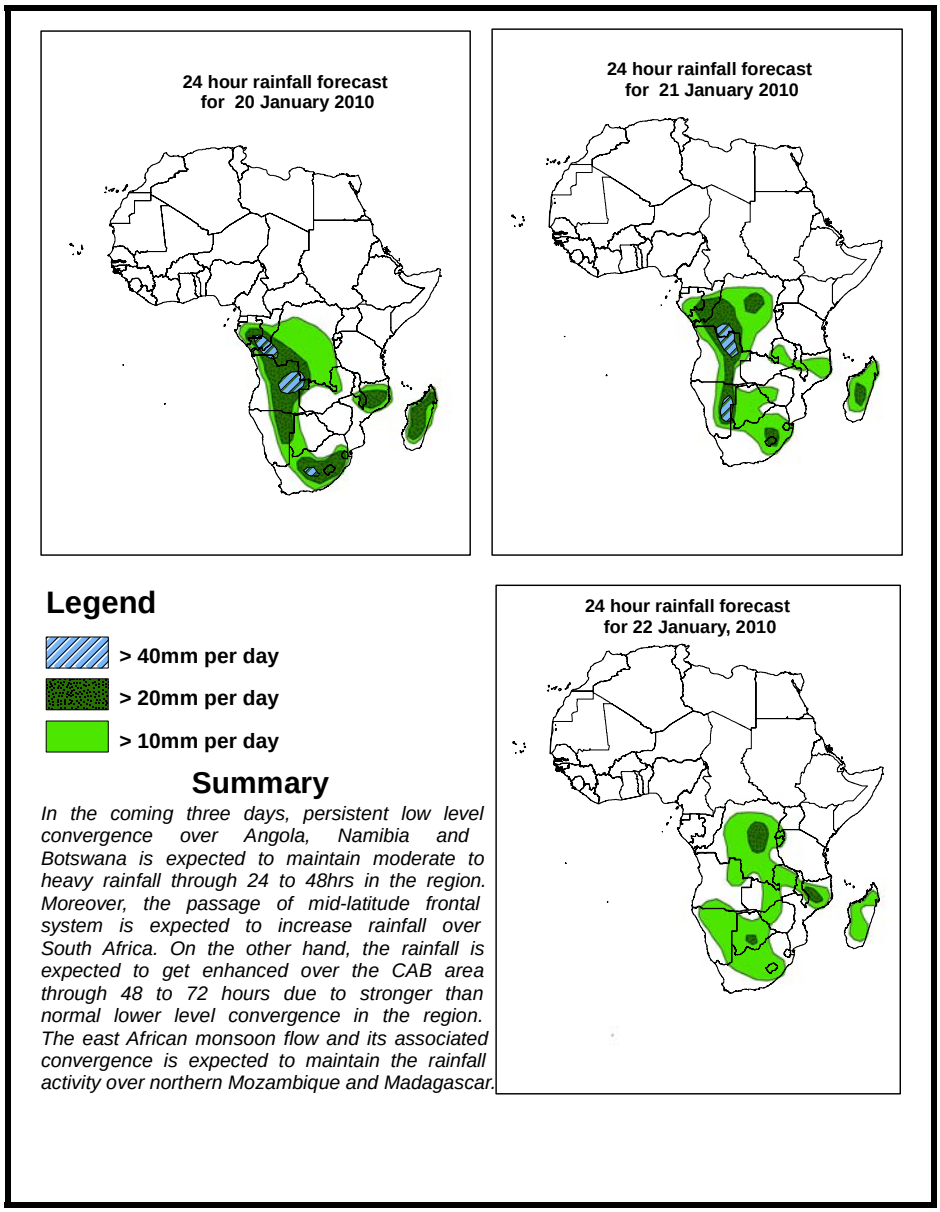
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 20 January –06Z of 22 January 2010, (Issued at 14:00EST of 19 January 2010)

1.1. Twenty Four Hour Cumulative Rainfall Forecasts

The forecasts are expressed in terms of probability of precipitation (POP) exceedence based on the NCEP, UK Met Office and the ECMWF NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.



1.2. Models Comparison and Discussion - Valid from 00Z of 20 January 2010

The Saharan high is expected to merge with the Arabian high reducing the influence of the mid latitude low pressure system on the tropics, through 24 to 72 hrs. A low pressure system over Europe is expected to deepen and move eastwards with its trough extending southwards up to northern Libya through 48 to 72 hrs. A low pressure system over Botswana and eastern Namibia is expected to persist through 24 to 72 hrs, while a ridge from the Mascarene high in the southern hemisphere will extend northwards through southeastern south Africa and reaching the border with Zimbabwe. All the models show similar forecasts with the ECMWF model underestimating the strength of some of the features.

At 850mb level, the Saharan Anticyclone is expected to strengthen while its center moving from 28^0 N and 6^0 W to 20^0 W and 33^0N through 24 to 48 hrs and then move to 10^0 W and 30^0 N through 48 to 72 hrs. Its peripheral winds are expected to dominate flow over western Africa through 24 to 72 hrs. The Arabian anticyclone is expected to be positioned over the Arabian Peninsula with its ridge extending up to Ethiopia through 24 to 72hrs. An anticyclonic circulation near the east coast of east Africa is expected to maintain it position while inducing an easterly flow over the east African coast, through 24 to 72 hrs. A northern hemisphere mid latitude cyclonic circulation moving east while slightly deepening, is expected, with its trough extending south up to central Arabian peninsula through 48 to 72 hrs. Easterly flow, from the east African monsoon, and westerly flow from the Atlantic Ocean is expected to converge over parts of east central and southern Africa, through 24 to 48 hrs. Especially, the seasonal convergence over the CAB region is expected to strengthen gradually through 48 to 72 hrs. Discontinuities over western equatorial Africa is partially due to the northeasterly peripheral flow from the Saharan anticyclone. Localized convergence over Angola is expected through 24 to 72 hrs. The northward shift of the Mascarene anticyclone, and the eastward extension of its ridge, is expected to induce a zonal westerly flow in the southern hemisphere mid latitudes through 24 to 72 hrs.

At 500mb level, a southwest northeast oriented trough reaching up to Lake Chad is expected to persist through 24 to 72 hrs. A feeble wavy flow in the westerlies is expected to dominate the flow over southern hemisphere sub tropical areas in 24 hrs. However, the system is expected to move eastwards while weakening with the flow expected to be mostly zonal through 48 to 72 hrs.

At 200mb, a mid latitude westerly wave is expected in 24 hrs, tending to a zonal flow in 48 to 72 hrs. Wind speeds exceeding 130 are expected over much of North Africa with the strongest winds reaching 150kts over Egypt and the north of the Arabian Peninsula through 24 to 72 hrs.

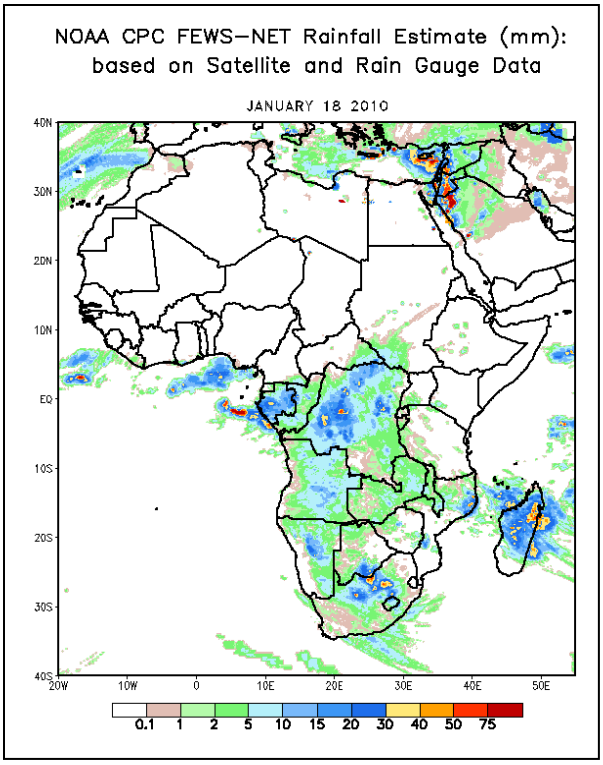
In the coming three days, persistent low level convergence over Angola, Namibia and Botswana is expected to maintain moderate to heavy rainfall through 24 to 48hrs in the

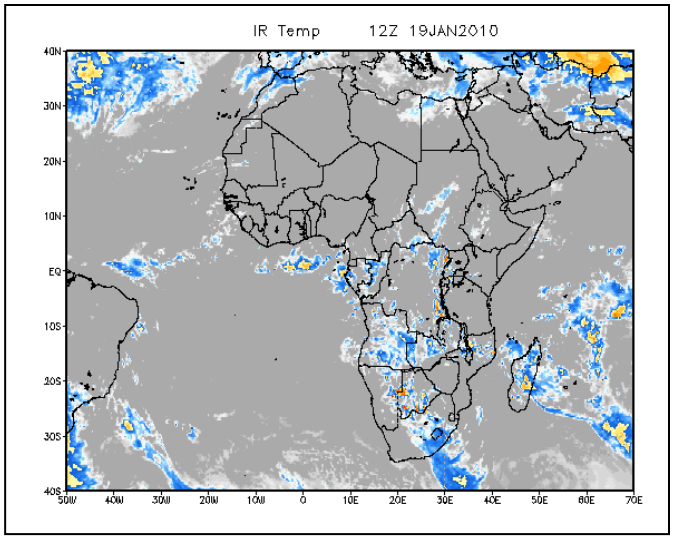
region. Moreover, the passage of mid-latitude frontal system is expected to increase rainfall over South Africa. On the other hand, the rainfall is expected to get enhanced over the CAB area through 48 to 72 hours due to stronger than normal lower level convergence in the region. The east African monsoon flow and its associated convergence is expected to maintain the rainfall activity over northern Mozambique and Madagascar.

2. 0. Previous and Current Day Weather Discussion over Africa (11 –12 January 2010)

2.1. Weather assessment for the previous day (18 January 2010): During the previous day, moderate to light rainfall events were observed over northern South Africa, Gabon, the DRC, Madagascar.

2.2. Weather assessment for the current day (19 January 2010): Clouds are observed over western Zambia, parts of Angola, Botswana, South Africa and Madagascar.





Previous day rainfall condition over Africa (Left) based on the NCEP CPCE/RFE and current day cloud cover (up) based on IR Satellite image

Author(s): *Edson Nkonde (Zambia Meteorological Department / CPC-African Desk)*
Anthony Twahirwa (Rwanda Meteorological Services / CPC-African Desk)
