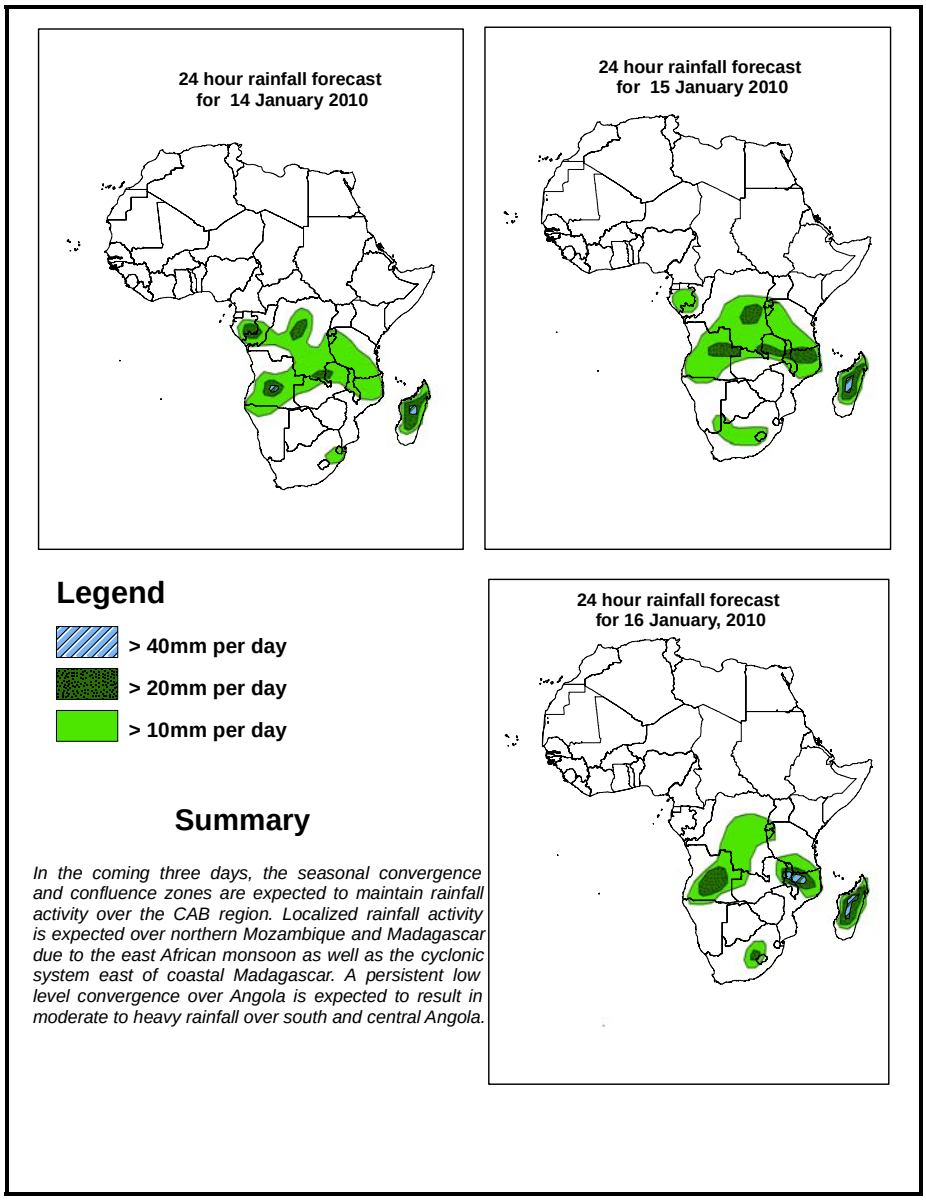
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 14 January –06Z of 16 January 2010, (Issued at 14:00EST of 13 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 14 January 2010

The extent of the Azores high and the Arabian high is expected to cut-off interaction between the mid latitude and the tropical low pressure systems 24 to 48hrs. The Arabian high will slightly weaken and shift southwards, through 48 to 72 hrs, reducing its westward extent and allowing the mid latitude low pressure system moving eastwards to further block the merging between the Azores high and the Arabian high. This may lead to increased interaction of the air masses from the mid latitude and the tropics. The flow in mid latitude expected to attain a zonal orientation over its eastern zone. Through 24 to 72 hrs, the high pressure system over southeast South Africa will significantly weaken and eventually disappear while the low pressure system over eastern coastal Madagascar will deepen through 24 to 72 hrs. All the models show most of the significant features although the ECMWF model seems to underestimate the strengths of the features.

At 850mb level, the Anticyclonic system over the extreme northwest Africa is expected to build up, forcing the mid latitude cyclonic system, along the 10^0 W longitude, northwards through 24 to 72hrs. Through 48 to 72 hrs, a westerly trough from the mid latitudes is expected to extend southwards towards the 22^0 N over Libya. An anticyclonic system over the Persian Gulf is expected to extend towards the Gulf of Eden, the Arabian Sea and the horn of Africa through 24 to 72 hrs. The Anticyclonic system over the extreme northwest Africa is expected to move eastwards becoming the Saharan anticyclone in 48 to 72 hrs.

The anticyclones over northeast Atlantic Ocean and the Persian Gulf will act to prevent the interaction of the mid latitude cyclonic system and the tropics through 24 to 72 hrs. The peripheral winds from the Anticyclonic system over the extreme northwest Africa and the Arabian anticyclone are expected to dominate the northeasterly flow of much of northwest Africa and equatorial Africa, and the east coast of east Africa including Madagascar, respectively ,through 24 to 72 hrs, converging with the westerly flow from the Atlantic ocean.

Southwesterly winds from the Atlantic Ocean and the northeasterlies from the Arabian anticyclone and the east African monsoon are expected to converge over the great lake region and equatorial Africa, through 24 to 72 hrs.

Cyclonic activity over the Atlantic Ocean near the coast of Angola may influence the southeasterly flow from the Mascarene anticyclone to change direction into southwesterlies converging over equatorial Africa, Angola and the great lakes region. The east African monsoon is expected to dominate the flow over much of east Africa, great lakes region, Madagascar and Mozambique, partially contributing to the convergence over parts of the great lakes region and Mozambique.

Through 24 to 72 hrs, the cyclonic system positioned over Madagascar is expected to shift southeastwards over the eastern coastal Madagascar due to the strengthening of the ridge from the St. Helena anticyclonic system, extending northwestwards.

The cyclonic activity over coastal Angola is expected to build up in 24 to 48 hrs and then diminish through 48 to 72 hrs.

At 500mb level, a northwest-southeast oriented ridge between Mauritania and Burkina Faso is expected. Another ridge with east-west orientation between Ethiopia and the Arabian Sea is expected. A trough is also expected extending from the mid Mediterranean Sea to southern Niger with a southwest-northeast orientation, through 24 to 48 hrs. Through 48 to 72 hrs, the Arabian anticyclone is expected to move southwards allowing the mid latitude cyclonic circulation to move southwards attaining a zonal flow over the eastern part of the wave.

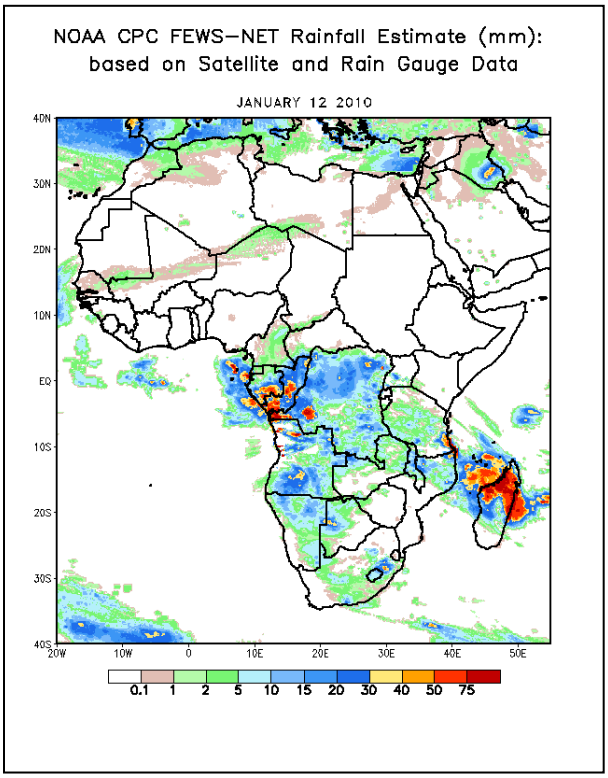
At 200mb, a weak wavy pattern is expected, through 24 to 48 hrs, with a zone of maximum wind extending from northern Mali to the north of the Persian, with maximum winds exceeding 130 knots over central and eastern zones. In 48 hrs, the weak wavy pattern will be moving eastwards while becoming zonal with speeds exceeding 150knots. In 72 hrs, the flow is mostly zonal with speeds exceeding 130 knots. An upper air level convergence exists over South Africa which may suppress rainfall activity over that region, through 24 to 48 hrs.

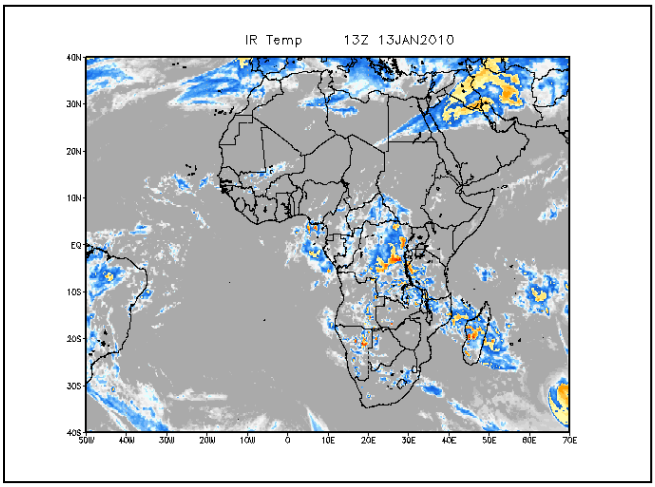
In the coming three days, the seasonal convergence and confluence zones are expected to maintain rainfall activity over the CAB region. Localized rainfall activity is expected over northern Mozambique and Madagascar due to the east African monsoon as well as the cyclonic system east of coastal Madagascar. A persistent low level convergence over Angola is expected to result in moderate to heavy rainfall over south and central Angola.

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

2.1. Weather assessment for the previous day (12 January 2010): During the previous day, moderate to intense rainfall events were observed over Gabon and northern Madagascar. Some rainfall activities were also reported over parts of Angola, DRC and South Africa and Mozambique.

2.2. Weather assessment for the current day (13 January 2010): Clouds are observed over northern Zambia, Tanzania, Great lakes region southern parts of DRC, south east Angola, northern Botswana north east Mozambique 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

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