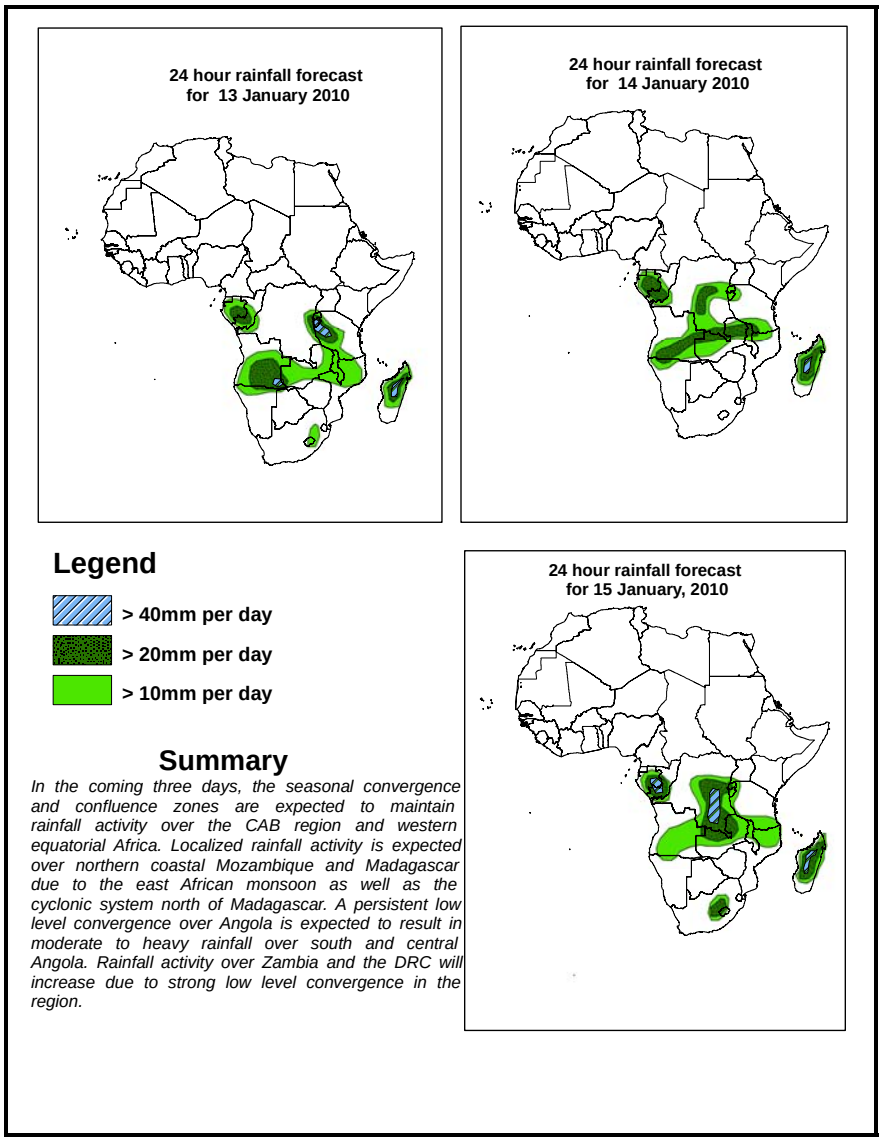
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 13 January –06Z of 15 January 2010, (Issued at 14:00EST of 12 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 13 January 2010

A zonally oriented subtropical ridge is expected to develop in the region between northeast Atlantic Ocean and Egypt through 24 to 48 hrs. With a mid-latitude low-pressure system moving from western to eastern Mediterranean Sea region, this ridge is expected to weaken through 48 to 72 hrs. On the other hand, the high pressure system centered over the Persian Gulf is expected to persist, with its ridge extending towards southern Kenya through the horn of Africa in 48 to 72 hrs. A low pressure system over northern Madagascar is expected to move to the west, while slightly deepening while a high pressure system over southeast of South Africa will persist through 24 to 48 hrs tending to slightly weaken through 48 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 Azores Anticyclone is expected to build up, with its ridge extending eastwards up to western Sudan. Ahead of it is a westerly trough from the mid latitudes extending southwards towards the20^0 N latitude over Egypt. A strong anticyclonic system over the Persian Gulf is expected to extend towards the Gulf of Eden. 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 48 hrs. The peripheral winds from the Azores anticyclone 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. This northeasterly flow, together with moist southwesterly flow from the Atlantic Ocean is expected to maintain a strong lower level convergence over western and central parts of equatorial Africa, resulting in rainfall activity in the regions through 24 to 48 hrs. The northeasterly flow is also expected to converge with a westerly moist winds coming from the Atlantic Ocean to maintain the convergence in the CAB region. In 48 to 72 hrs, the mid latitude cyclonic system tend to weaken the Azores and Arabian anticyclonic systems. The extent of the Azores and Arabian anticyclonic systems will be western Chad and the Arabian Peninsula respectively. This may lead to an interaction between the tropical and the mid latitude air mass. Convergence will significantly develop over northern Zambia and DRC, in 48 to 72 hrs, due to the moist southeasterly flow and the flow partially coming from the Atlantic Ocean. Much of the convergence over the western equatorial Africa will be due to the dry convergence and hence little rainfall activity.

The persistent cyclonic circulation north of Madagascar and the east African monsoon flow will bring rainfall activity over Madagascar. Localized convergence is expected over south central Angola and South Africa due to the wind flow from the CAB region and the westerlies from the Atlantic Ocean.

At 500mb level, a northwest-southeast oriented ridge between Azores and Burkina Faso, and a northeast-southwest oriented ridge between the Persian Gulf and Chad exists with a westerly trough between the ridges penetrating southwards up to 18^0N and

its axis across Chad through 24 to 48hrs. Through 48 to 72 hrs, the Azores anticyclonic circulation is expected to strengthen while moving eastwards. The westerly wave will also be expanded at the expense of the weakening of the Arabian anticyclonic system

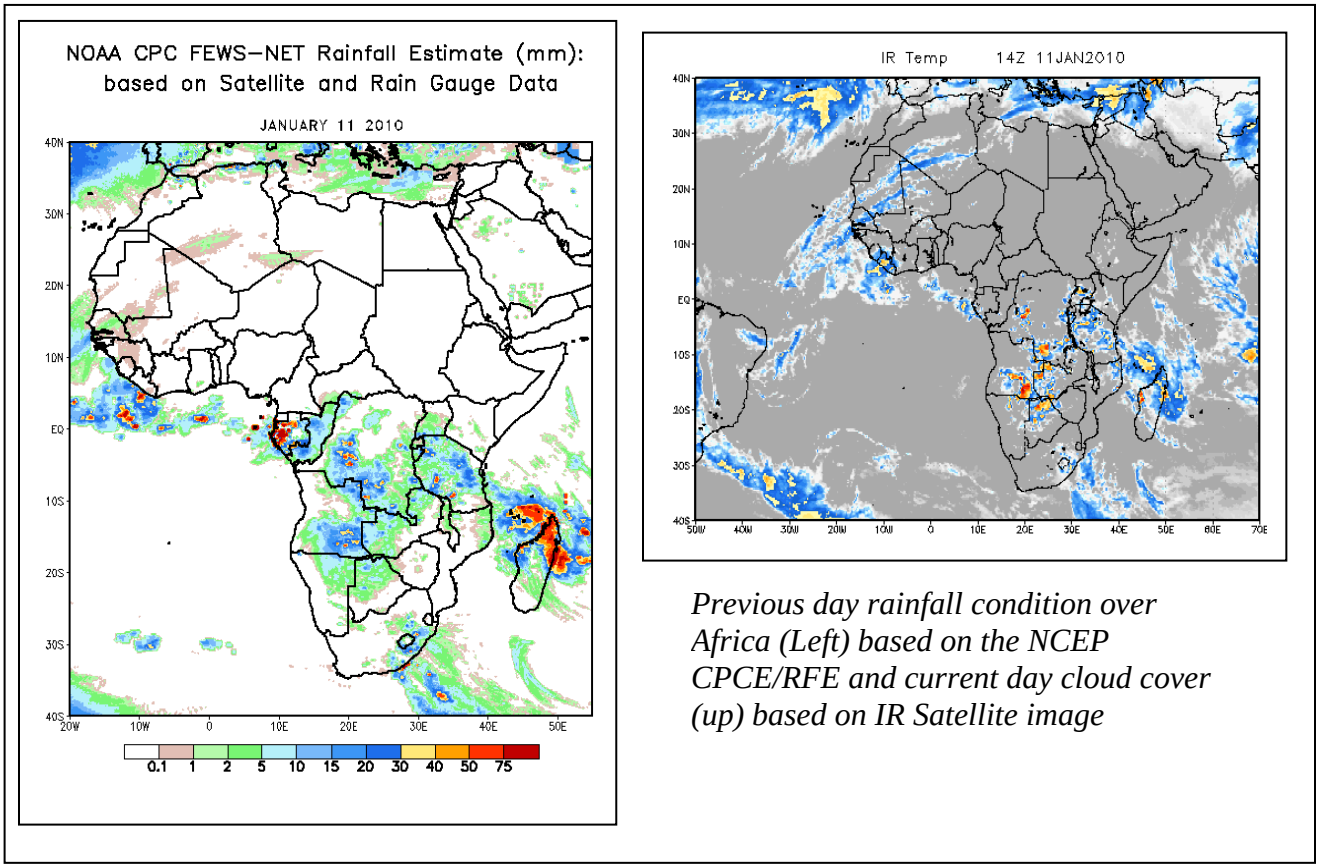
At 200mb, a weak wavy pattern is expected, through 24 to 48 hrs, with a zone of maximum wind extending from northern Mali to the north of the Persian, with maximum winds exceeding 130 knots over central and eastern zones. In 48 hrs, the weak wavy pattern will be moving eastwards while becoming zonal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

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

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

2.1. Weather assessment for the previous day (11 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 Tanzania, Angola, DRC and South Africa.

2.2. Weather assessment for the current day (12 January 2010): Clouds are observed over western 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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