

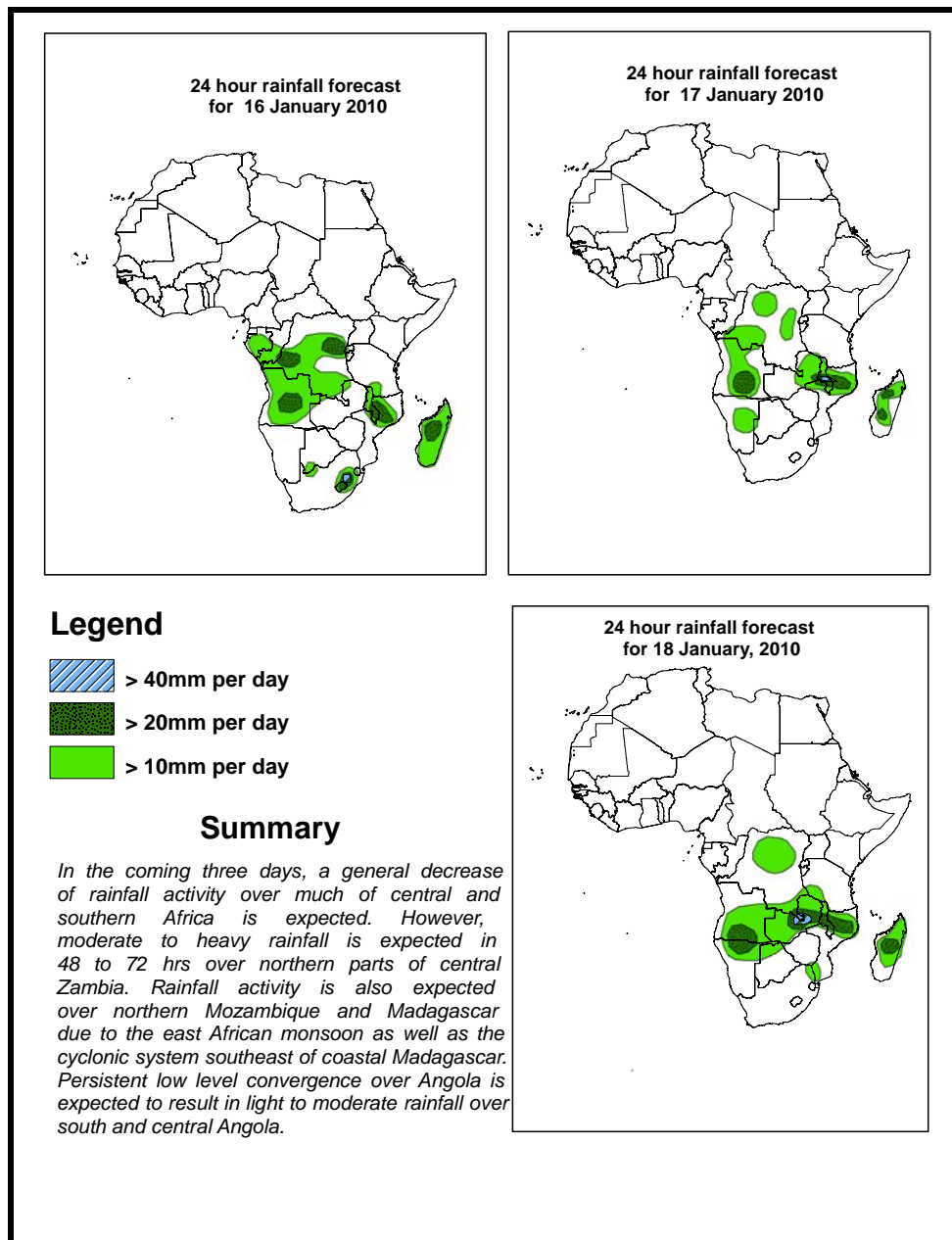


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid, 06Z of 16 January –06Z of 18 January 2010, (Issued at 14:00EST of 15 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 16 January 2010**

The Saharan high is expected to strengthen while maintaining its position over northwest Africa through 24 to 72 hrs. On the other hand, the Arabian high is expected to maintain its position and strength in 24 to 48 hrs and then move its centre over Iran while strengthening through 48 to 72 hrs. A mid latitude low pressure system is expected to move eastwards, over the Mediterranean Sea, with its trough extending southwards over Libya, through 24 to 48 hrs. This system is expected to merge with a low pressure system over southern Sudan, through 48 to 72hrs, forming a north south stretch of low pressure zone running from northeast Egypt to southern Sudan with an east west span of  $20^{\circ}$  on an axis of  $25^{\circ}$  E. A weak ridge will develop over southern Kenya through Tanzania, northern Zambia up to central Angola. This high pressure system is expected to split into two cells of weak high pressure one located over central Angola and the other on the border between Tanzania and Kenya. 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 move northwards through eastern south Africa and reaching northern Zimbabwe. The low pressure system over southeast of Madagascar will deepen through 24 to 72 while moving polar wards. All the models show similar forecasts with the only difference being that the ECMWF model seems to underestimate the strength of the tropical depression over southeast of Madagascar.

At 850mb level, the Saharan Anticyclone over the northwest Africa is expected to strengthen, while maintaining its position through 24 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 slightly strengthening and slightly moving northeast through 24 to 72hrs. An anticyclonic circulation near the east coast of Tanzania is expected to maintain its position while inducing an easterly flow over the east African coast, through 24 to 48. This system is expected to shift eastwards beyond  $70^{\circ}$  W allowing the east African monsoon to follow a northeasterly flow, through 48 to 72 hrs. The trough from the northern hemisphere mid latitude cyclonic circulation is expected to shift eastwards with the southern extent moving from central to northern Sudan, through 24 to 72 hrs. Easterly flow, from the east African monsoon, and westerly flow from the Atlantic Ocean is expected to converge over the CAB region and much of equatorial Africa through 24 to 72 hrs. Discontinuities over western equatorial Africa is partially due to the northeasterly peripheral flow from the Saharan anticyclone. The convergence over the DRC and equatorial Africa is expected to persist through 24 to 72 hrs. Localized convergence over Angola, Namibia, Botswana and South Africa is also expected through 24 to 72 hrs. The eastward movement of the Mascarene anticyclone will give a way to the cyclonic circulation over southeast Madagascar to strengthen and move polar wards, through 24 to 72 hrs.

At 500mb level, a feeble trough in the westerlies is expected to dominate the flow over northern Africa in 24 hrs. However, the system is expected to move eastwards while deepening with its trough changing orientation from north-south to northeast-southwest and extending south reaching 8° N over Nigeria, through 24 to 72 hrs. The center of the cyclonic circulation will be located over the central Mediterranean Sea through 24 to 72hrs.

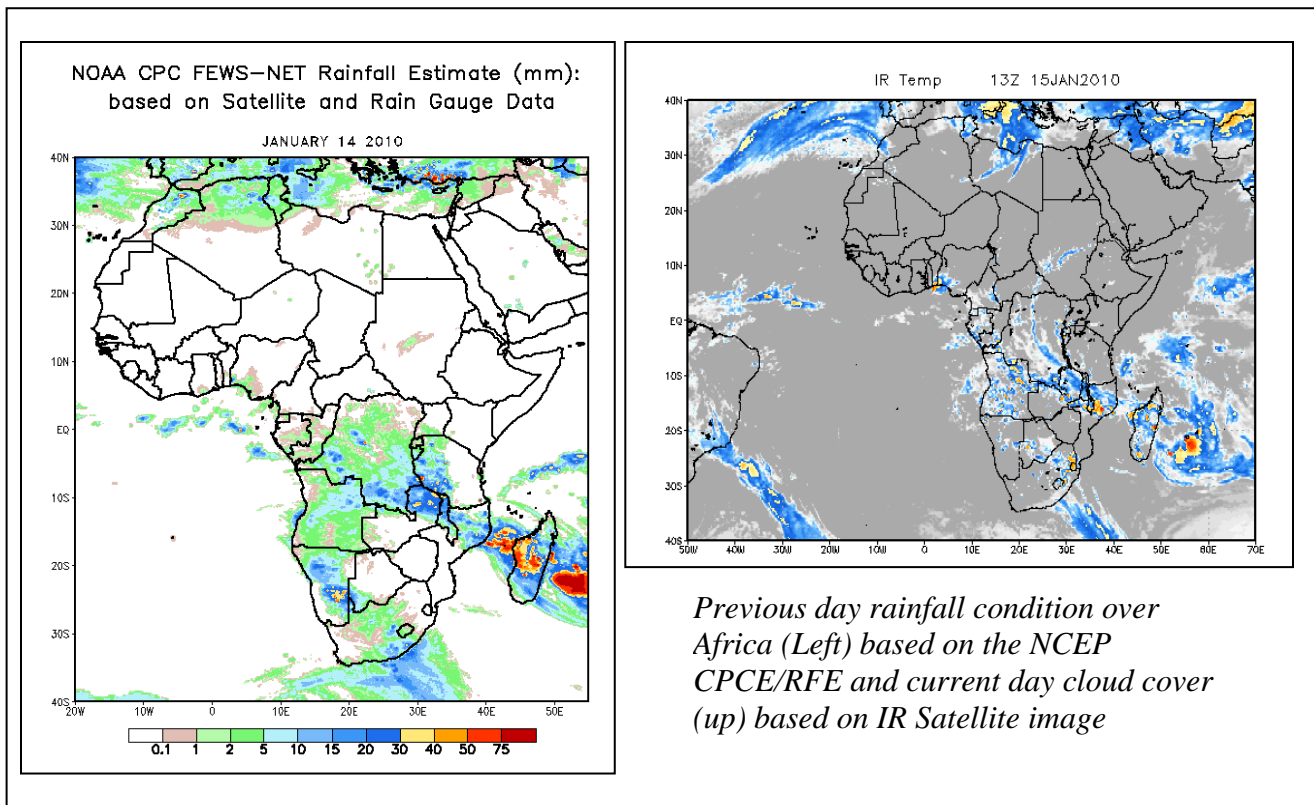
At 200mb, a mid latitude westerly wave is expected in 24 to 72 hrs. Jets with southeast-northwest and southwest-northeast orientation with speed exceeding 130 are expected over Libya, through 24 to 72 hrs.

In the coming three days, moderate to heavy rainfall is expected in 48 to 72 hrs over northern parts of central Zambia. Rainfall activity is also expected over northern Mozambique and Madagascar due to the east African monsoon as well as the cyclonic system southeast of coastal Madagascar. Persistent low level convergence over Angola is expected to result in light to moderate 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 (14 January 2010):** During the previous day, moderate to light rainfall events were observed over northern Zambia, northern Malawi and moderate to heavy rainfall was observed over central Madagascar.

**2.2. Weather assessment for the current day (15 January 2010):** Clouds are observed over northern Zambia, parts of Angola, Botswana, South Africa and Madagascar. Intense clouds are also observed over northern Mozambique



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