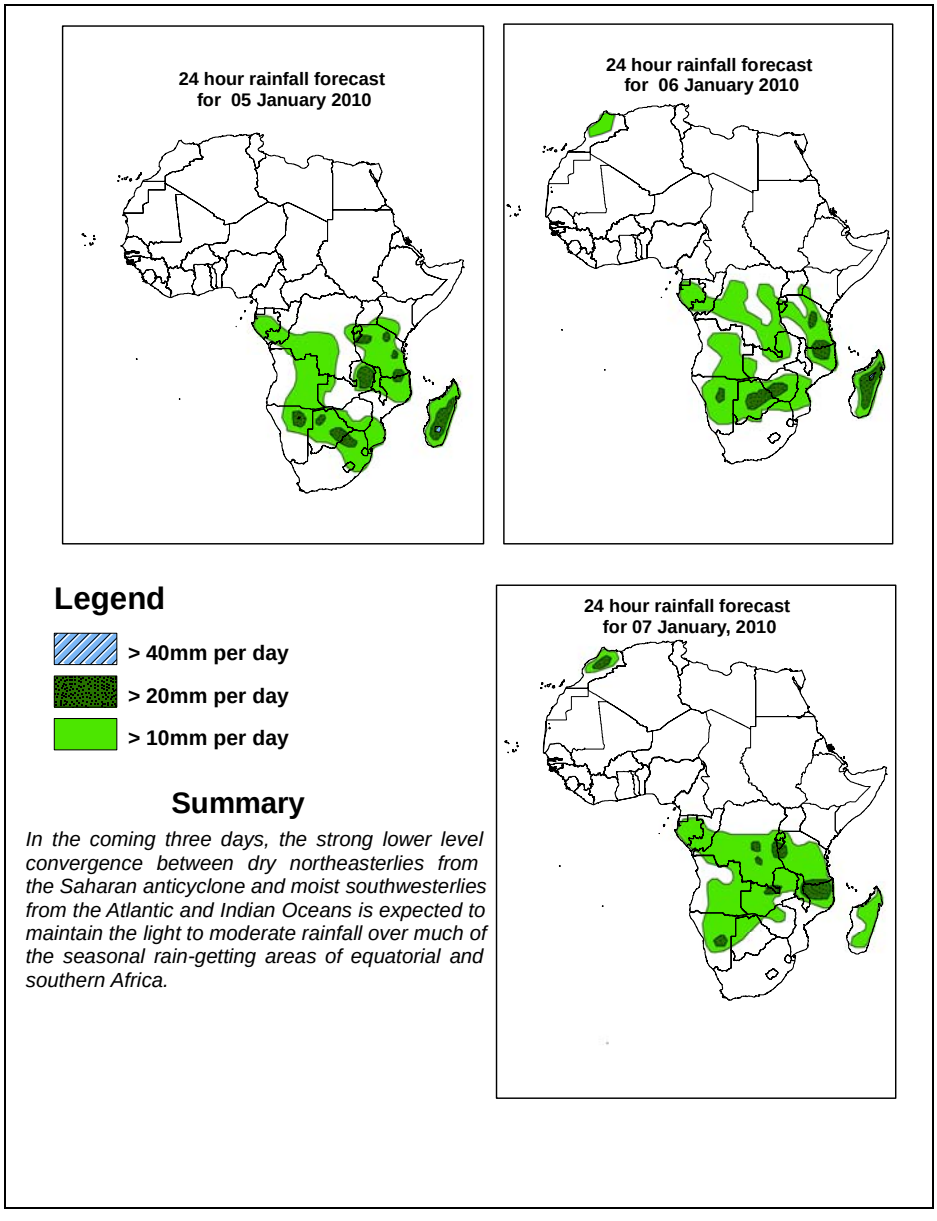
# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## *1.0. Rainfall Forecast: Valid, 06Z of 05 January –06Z of 07 January 2010, (Issued at 14:00EST of 04 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 05 January 2010

The ridge associated with the northern hemisphere sub-tropical high pressure system is expected to extend in the region between Libya and the Persian Gulf, attaining a maximum pressure value of 1023mb within the extent of the ridge through 24hrs. This system is expected to shift towards the east while strengthening through 48 to 72 hrs. The system is expected to align with the Siberian high, as a result of which its central pressure value becomes 1028 through 48hrs and 1032mb through 72 hrs over the periphery of the northern part of the Arabian Peninsula.

At 850mb level, two anticyclonic cells are expected to develop over Libya and southern parts of the Arabian Peninsula through 24 hrs. Accordingly, a trough in the easterly is expected to develop across 35oE longitude between these two anticyclone systems. The two anticyclonic cells and the weakness zone between them are expected to shift east ward through 48 to 72 hrs. Especially, the anticyclone over Libya is expected to shift toward the northern parts of the Arabian Peninsula while intensifying. As a result of this, the zone of northeasterly flow is also expected to shift eastwards covering much of the northeast African countries. This dry northeasterly flow, together with moist southwesterly flow from the Atlantic Ocean is expected to maintain the strong lower level convergence over western and central parts of equatorial Africa, resulting in moderate to heavy rainfall in the coming three days in the regions. Moreover, part of this dry northeasterly flow is also expected to converge with a moist flow that comes from the Indian Ocean to maintain the convergence in the CAB region in the coming three days. On the other hand, the GFS model indicates westward moving lower level cyclonic circulation over southwestern Indian Ocean. This cyclonic circulation is expected to cross northern Madagascar through 72 hrs. However, the ECMWF and UK Met Office models tend to underestimate the intensity of this system.

At 500mb level, unlike the previous week, the mid-tropospheric flow over much of the sub-tropical areas is expected to remain more or less zonal in the coming two days. However, the flow is expected to get disturbed over northwest Africa with a mid latitude trough approaching the region through 72 hrs. This wavy pattern is expected to put the northeastern parts of Africa under the influence of high in the geopotential field through 72hrs.

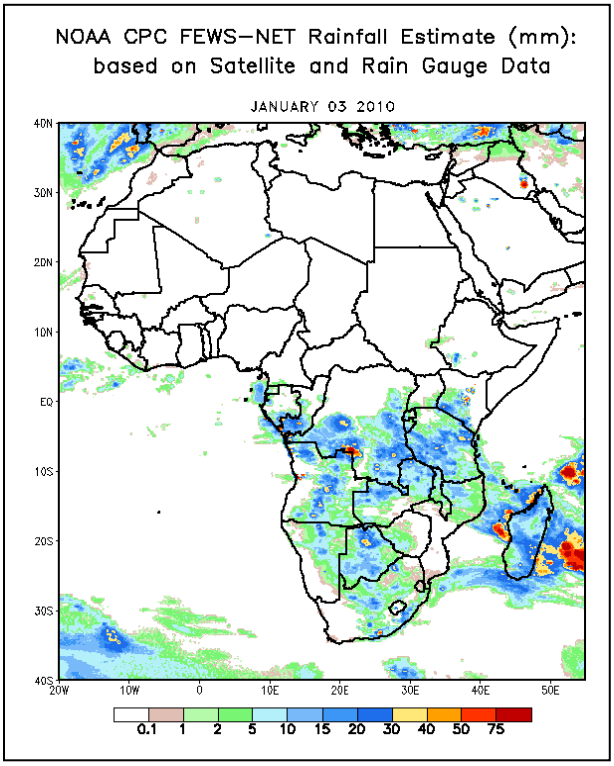
At 200mb, consistent with the mid-tropospheric flow, the upper tropospheric flow over sub-tropical areas of the northern hemisphere is expected to remain zonal through 24 to 72 hrs. The zone of maximum wind is expected to expand gradually over the sub-tropical regions, while strengthening through 24 to 72 hrs. In general, the maximum wind speed values are expected to increase from values about 90kts to over 130kts through 24 to 72 hrs.

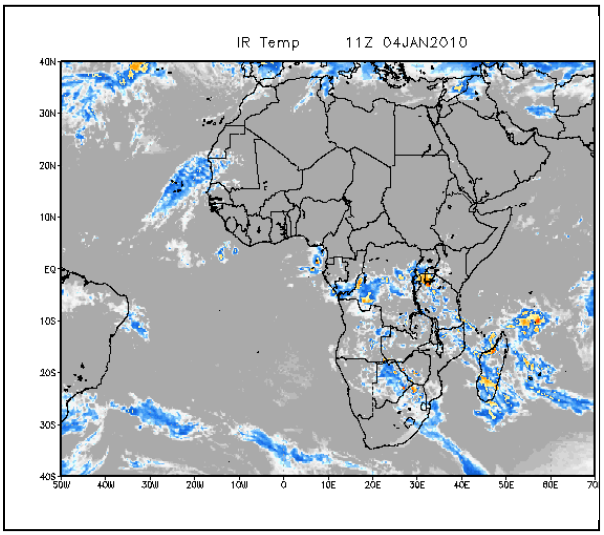
In general, the strong lower level convergence between dry northeasterlies from the Saharan anticyclone and moist southwesterlies from the Atlantic and Indian Oceans is expected to maintain the light to moderate rainfall over much of the seasonal rain-getting areas of equatorial and southern Africa.

## *2. 0. Previous and Current Day Weather Discussion over Africa (03 –04 January 2010)*

**2.1. Weather assessment for the previous day (03 January 2010):** During the previous day, light to moderate rainfall events were observed over south-west Kenya, Tanzania, parts of Congo and Congo DR, Madagascar, parts of Angola, Botswana and parts of Northern Zambia.

**2.2. Weather assessment for the current day (04 January 2010):** Clouds are observed in Congo, Congo DR, northern Botswana, Madagascar and the great lakes region.




*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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