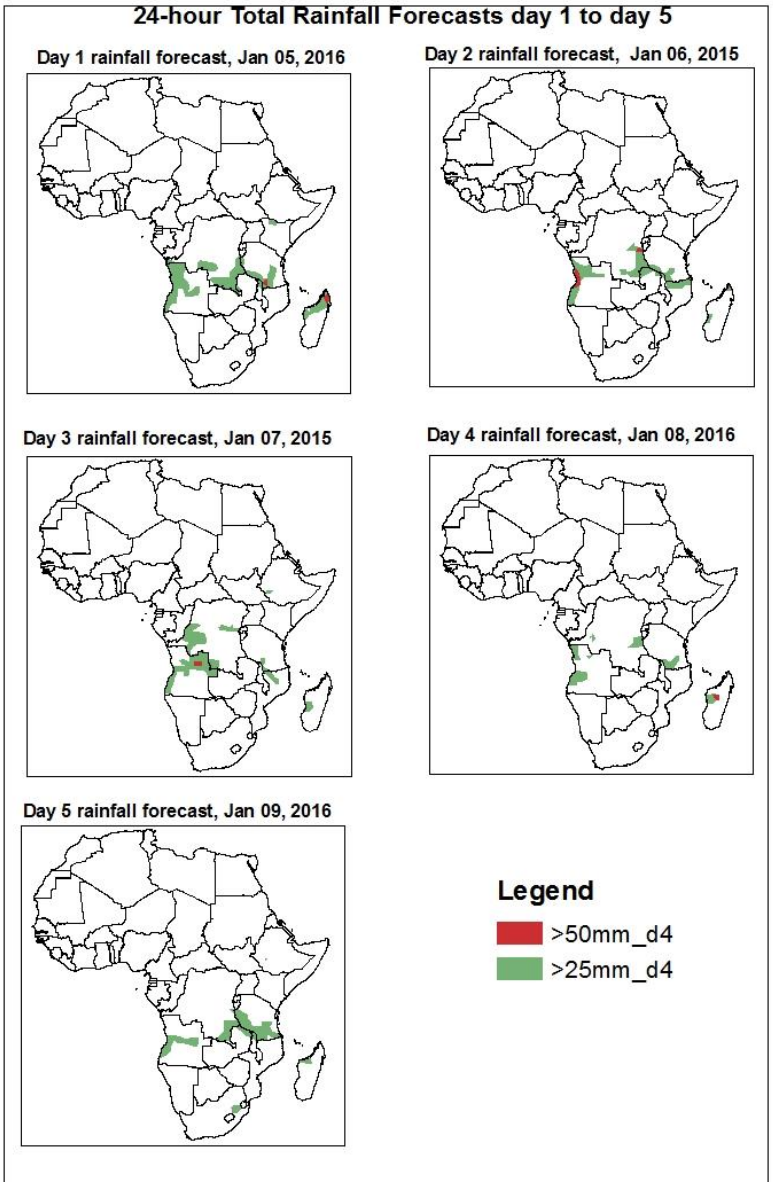
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

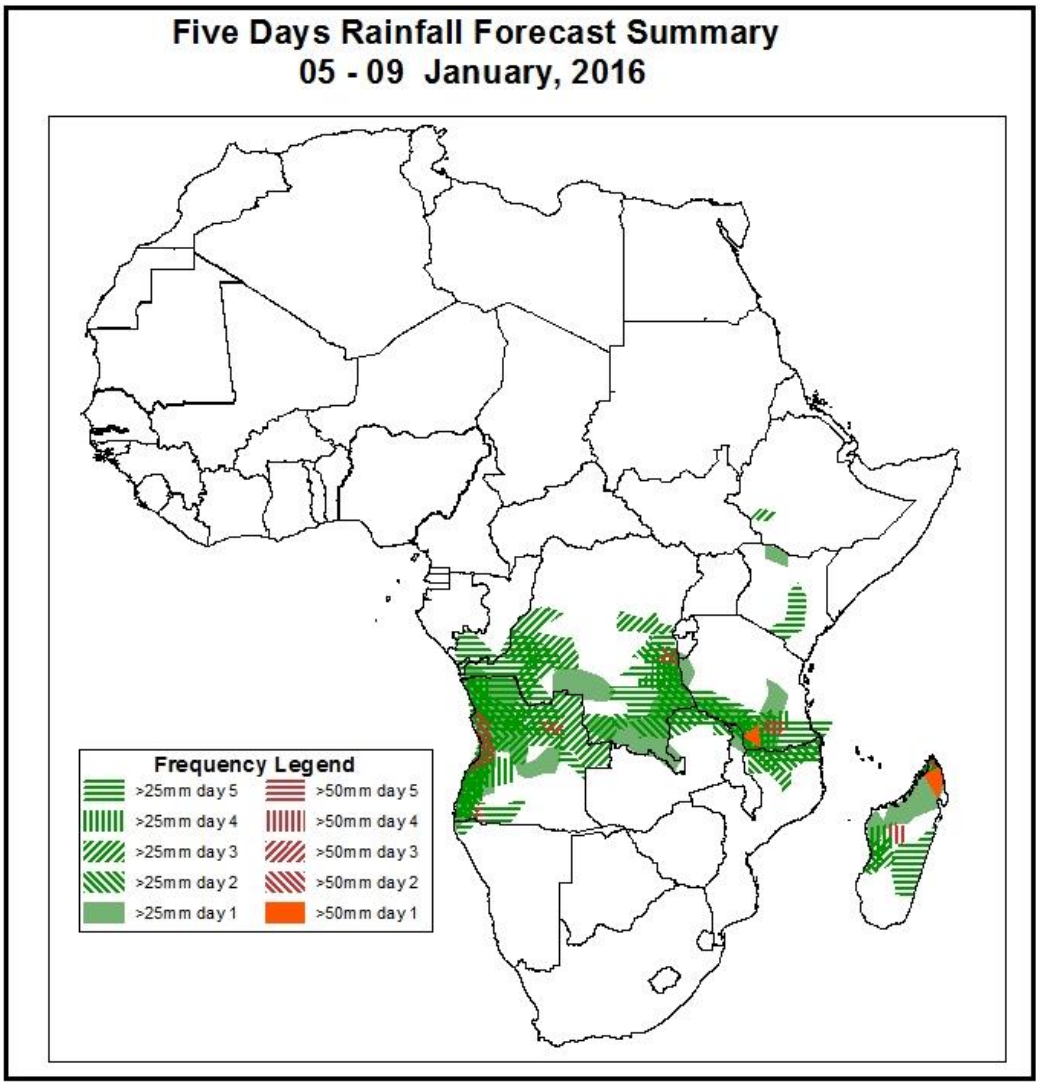
1. Rainfall and Dust Concentration Forecasts

Valid: 06Z of Jan 05 - 06Z of Jan 09, 2016. (Issued on January 04, 2016)

1.1. 24-hour Cumulative Rainfall Forecasts

The forecasts are expressed in terms of high probability of precipitation (POP), based on the NCEP/GFS, ECMWF and the NCEP Global Ensemble Forecasts System (GEFS) and expert assessment.



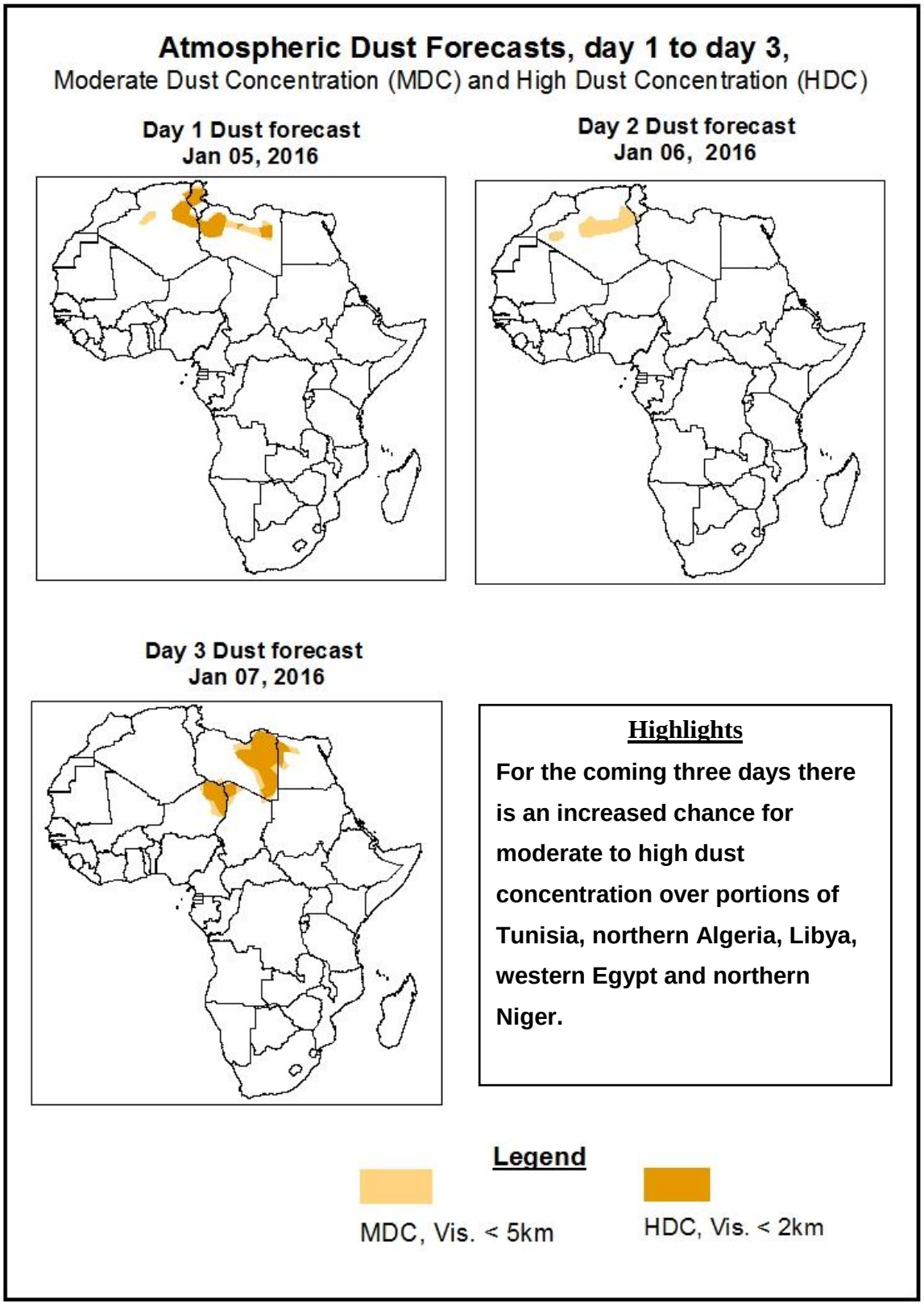


In the coming five days, there is an increased chance for two or more days of moderate to heavy rainfall over western Madagascar, western Angola, southern DRC and southern Tanzania, with high probability of heavy rainfall over parts of western Angola, northern Madagascar DRC and southern Tanzania.

1.2. Atmospheric Dust Concentration Forecasts

Valid: 12Z of Jan 05– 12Z of Jan 07, 2016

The forecasts are expressed in terms of high probability of dust concentration, based on the Navy Aerosol Analysis and Prediction System, NCEP/GFS lower-level wind forecasts and expert assessment.



1.3. Model Discussion, Valid: 05 -09 January, 2016

The Extension of Azores high pressure system over Sahara is expected to weaken in to 1023mb in 24 hours' time from its central value of 1025mb and intensify in to 1026mb in 48 hours' time and attain this central value for about 24 hours. This pressure system is also expected to intensify in to the relative maximum value of 1027mb in 96 hours' time and back weaken in to 1024mb in 120 hours' time. Following the intensification of this pressure system over the center of northern Africa, unlike the previous days anticyclonic activity is expected to dominate over the region and hence dust concentration that have been *prevailed* over Chad, Southern Algeria, Western Sahara, Mauritania, and Northern Nigeria is expected to be depressed but the there is an increased chance for moderate to high dust concentration over portions of Tunisia, northern Algeria, Libya, western Egypt and northern Niger.

The Siberian high pressure system is expected to weaken in to 1024mb and in to 1023mb in 24 and 48 hours' time respectively from its central value of 1029mb and intensify in to 1027mb and in to 1030mb in 72 and 96 hours' time respectively. By the end of the forecast period, this pressure system expected to weaken in to the relatively minimum value of 1022mb. As the spatial position of this high pressure system is expected to make a slight shift towards south, the dominant north east wind is expected to pick up moisture from northern Indian Ocean in to east African high lands, which inter leads to the formation of clouds and increased daily minimum temperature over the region.

The St Helena high pressure system over South East Atlantic Ocean is expected to weaken in to 1019mb in 24 hours' time from its central value of 1020mb and intensify in to 1034mb in 48 hours' time. This high pressure system is also expected to weaken into 1032mb, in to 1031mb and into 1029mb in 72, 96 and 120 hours' time respectively.
Even if, this high pressure system is expected to attain its relatively maximum value (in the middle of the forecast period), the low pressure system expected to intensify over the central Atlantic Ocean influence the amount of moisture supposed to incur in to the

south western Africa fro south western Atlantic Ocean, as a result of this the cumulative rainfall expected oved Angola, western Namibia and western DRC is expected to be below normal up to normal.

The Mascarene high pressure system over Southwest Indian Ocean is expected to attain its central value of 1021mb for about 24 hours and weaken in to 1019mb in 48 hours' time. This high pressure system is also expected to intensify in to 1022mb and attain its central value 24 hours in 72 hours and start to weaken in to 1021mb in 120 hours' time. Like the St Helena high pressure system, even if this system is intensified in the middle of the forecast period, the formation of low pressure system over central Indian decrease will decrease the amount of moisture supposed to incur from south western Indian Ocean in to south eastern Africa and Madagascar.

.

925mb and 850mb level: The low level anticyclonic activity supposed to develop over northern Africa enhances the dust concentration over Tunisia and northern Libya. The low pressure systems observed over Africa are expected to create interactive weather by interacting with sub-tropical systems.

In general The North-South oriented meridional component of ITCZ that have been diagonally oriented by crossing Gabon, Congo, DRC Zambia, Malawi, Mozambique and Madagascar, is expected to make a slight west ward shift and vertically cross western DRC, Angola and Northern Namibia. Along with this shifting, low pressure system is also expected to be developed over central Atlantic Ocean and northern Indian Ocean. Hence for the coming five days normal up to below normal rainfall is expected over south western and south eastern Africa..

In the coming five days, there is an increased chance for two or more days of moderate to heavy rainfall over western Madagascar, western Angola, southern DRC and southern Tanzania, with high probability of heavy rainfall over parts of western Angola, northern Madagascar DRC and southern Tanzania.

.

2.0. Previous and Current Day Weather over Africa

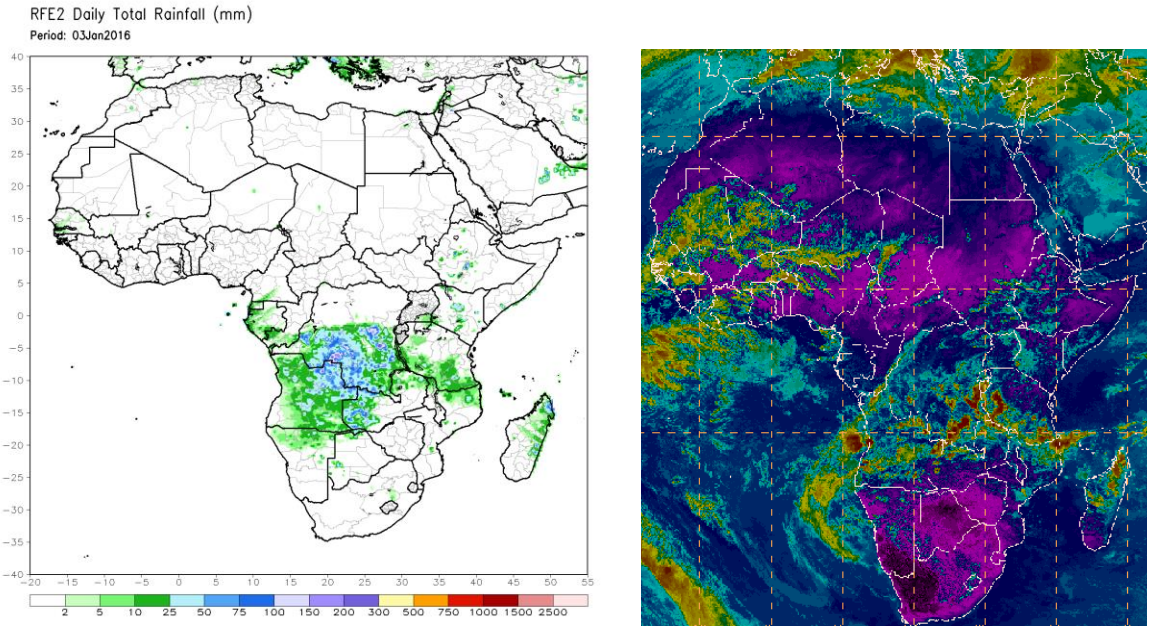
2.1. Weather assessment for the previous day (January 03, 2016)

Moderate to heavy rainfall was observed over local areas in northern Madagascar, western Angola and southern half of DRC.

2.2. Weather assessment for the current day (January 04 30, 2015)

Intense convective clouds are observed across many places over northern Madagascar, western Angola, southern Tanzania and southern DRC.

IR Satellite Image (valid 1830z January 04, 2016)



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

Author: Zerihun Hailemariam (Ethiopian National Meteorological Agency) / CPC-African Desk); zerihun.tessema@noaa.gov