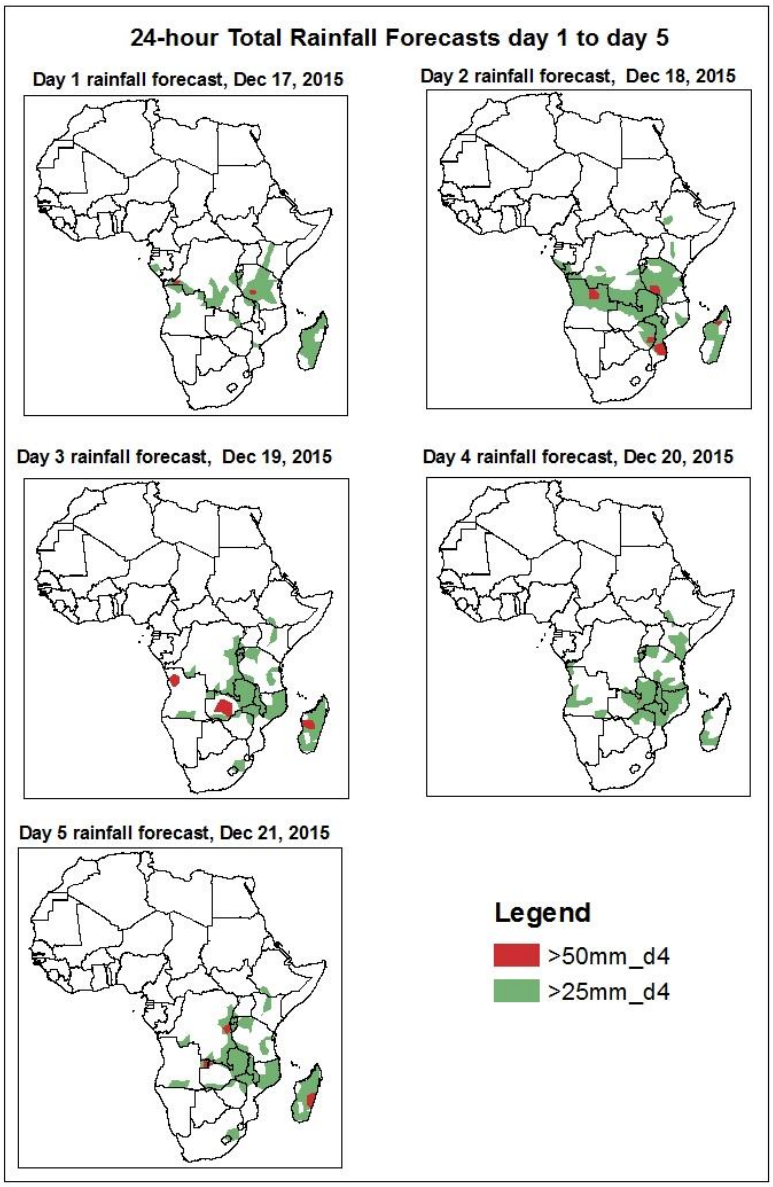
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

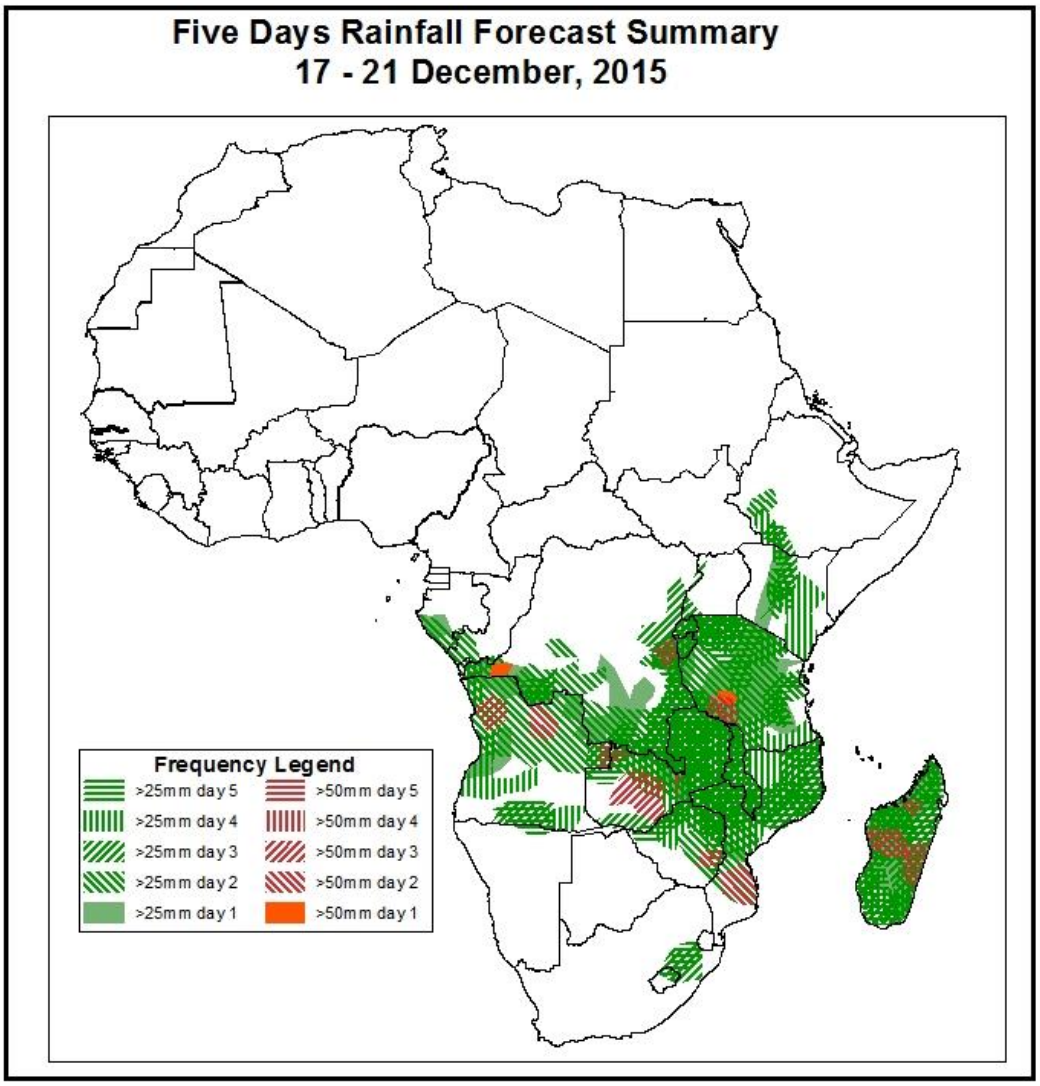
1. Rainfall and Dust Concentration Forecasts

Valid: 06Z of Dec 17 – 06Z of Dec 21, 2015. (Issued on December 16, 2015)

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.



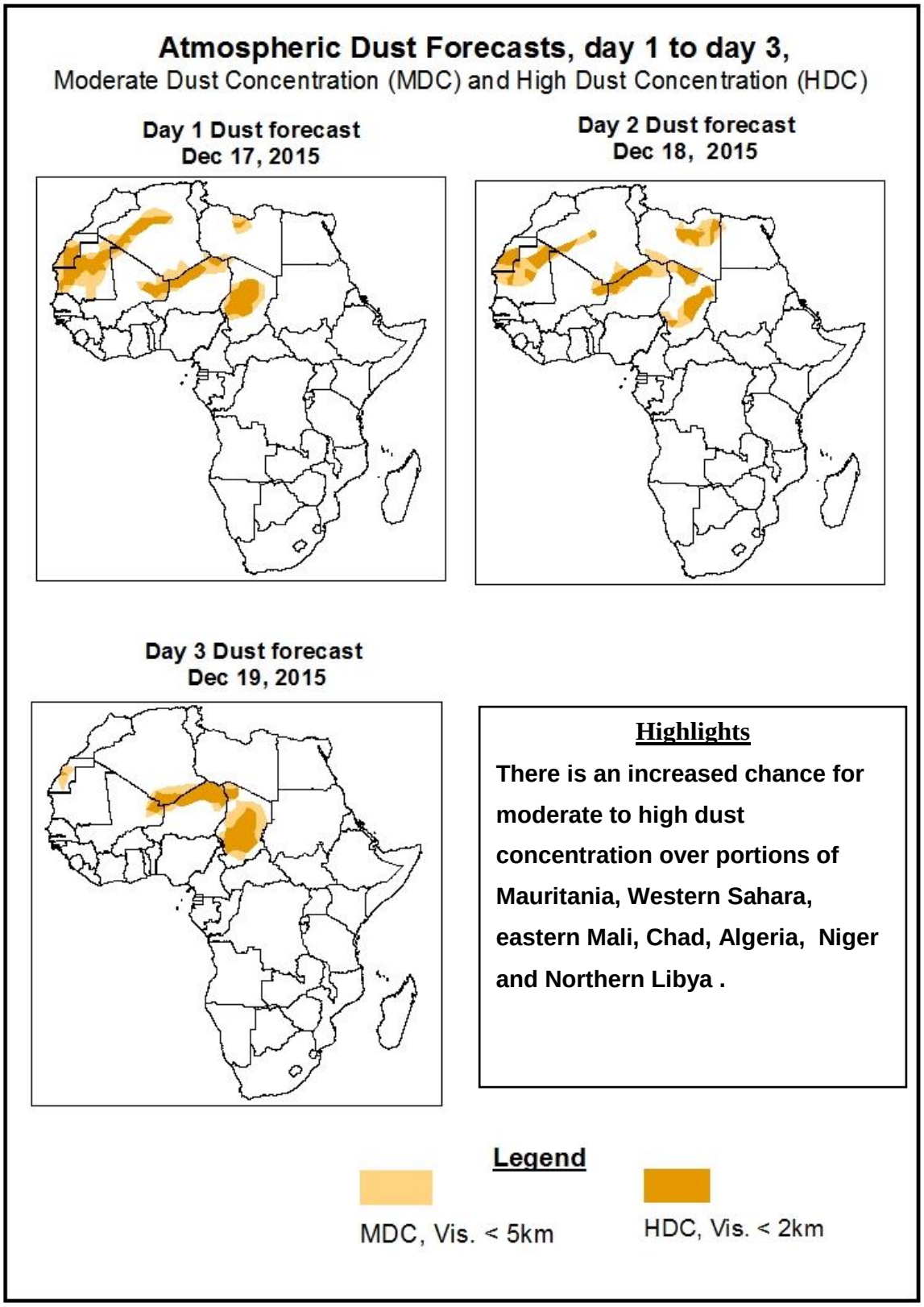


In the coming five days, there is an increased chance for two or more days of moderate to heavy rainfall over parts of western Kenya, Most parts of Tanzania, Mozambique, Malawi, Zimbabwe, Zambia, Southern DRC, Gabon ,western Angola and most parts of Madagascar, with heavier rainfall events expected over Madagascar, western Zambia, Zimbabwe, Northern Mozambique, Southern Tanzania, and Zambia.

1.2. Atmospheric Dust Concentration Forecasts

Valid: 12Z of Dec 17– 12Z of Dec 19, 2015

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: 17 – 21 December, 2015

The Extension of Azores high pressure system over Sahara is expected to weaken in to 1031mb and in to 1030mb in 24 and 48 hours' time respectively from its central value of 1033mb. This high pressure system is also expected to intensify into 1031mb in 72 hours' time and attains this value up to the end of the forecast period. During the forecast period, the spatial position of this pressure system is expected to make slight shift in to the east.

The Siberian high pressure system is expected to intensify from its central value 1030mb in to 1032mb in 24 hours' time and to attain this central value for about 24 hours. This system is also expected to intensify in to a central value of 1033mb in 72 hours' time and to be weaken in to 1030mb in 96 hours' time. By the end of the forecast period, this pressure system is expected to intensify in to a relatively maximum value of 1035mb.In terms of central spatial position, like the extension of the Azores high pressure system, this system is also expected to shift slightly to west ward.

The St Helena high pressure system over Southeast Atlantic Ocean is expected to weaken in to 1020mb and in to 1019mb in 24 and 48 hours' time respectively from its central value of 1022mb. This high pressure system is also expected to intensify into 1026mb in 72 hours' time and to stare weakening into 1024mb and in to 1022mb in 96 and 120 hours' time respectively from the initial time. During the forecast period, unlike the above two systems, the spatial position of this system is expected to make east to west fluctuation.

The Mascarene high pressure system over Southwest Indian Ocean is expected to weaken in to 1020mb in 24 hours' time, from its central value of 1022mb. This system is also expected to intensify in to 1022mb and into 1023mb in in 48 and 72 hours respectively. This system will attain relatively maximum value of 1023mb in 96 hours' time and expected to attain this value up to the end of the forecast period. During the forecast period, the spatial position of this pressure system is expected to make slight shift in to the east.

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At 925mb level, The previous days dominant North easterly trade, winds over North Africa, is expected to make slight change to be more northerly, but over the rest of Africa dominant North easterly trade winds continue to bring high probability of dust to prevail over Western Sahara and Mauritania and Northern Mali. Like the previous days ,moist North easterly winds from Indian Ocean are expected to prevail over the coastal area of south eastern Africa leading rainfall activities over the region.

At 850mb level, strong low-level wind convergence is expected over the seasonal north-south oriented (meridional component of the ITCZ), which is currently located between Southern Ethiopia and South Africa. This convergence is expected to bring enhance rainfall in the region, with an increased chance for heavy rainfall over Tanzania, Mozambique, Malawi, Zambia, Madagascar, Northern Kenya, Southern CRD and Coastal areas of Gabon & Congo . Lower-level wind convergence over eastern Africa is also expected to bring enhance rainfall over western Kenya and South western Ethiopia.

At 500mb level, westerly winds associated mid-latitude frontal systems is expected to expand southwards into Northeastern Africa, down to the latitudes of northern Ethiopia during the forecast period. This condition may lead to increase in cloudiness over Ethiopia with chances of isolated to scattered rainfall across the highland areas.

In the coming five days, there is an increased chance for two or more days of moderate to heavy rainfall over parts of western Kenya, Most parts of Tanzania, Mozambique, Malawi, Zimbabwe, Zambia, Southern DRC, Gabon ,western Angola and most parts of Madagascar, with heavier rainfall events expected over Madagascar, western Zambia, Zimbabwe, Northern Mozambique, Southern Tanzania, and Zambia.

2.0. Previous and Current Day Weather over Africa

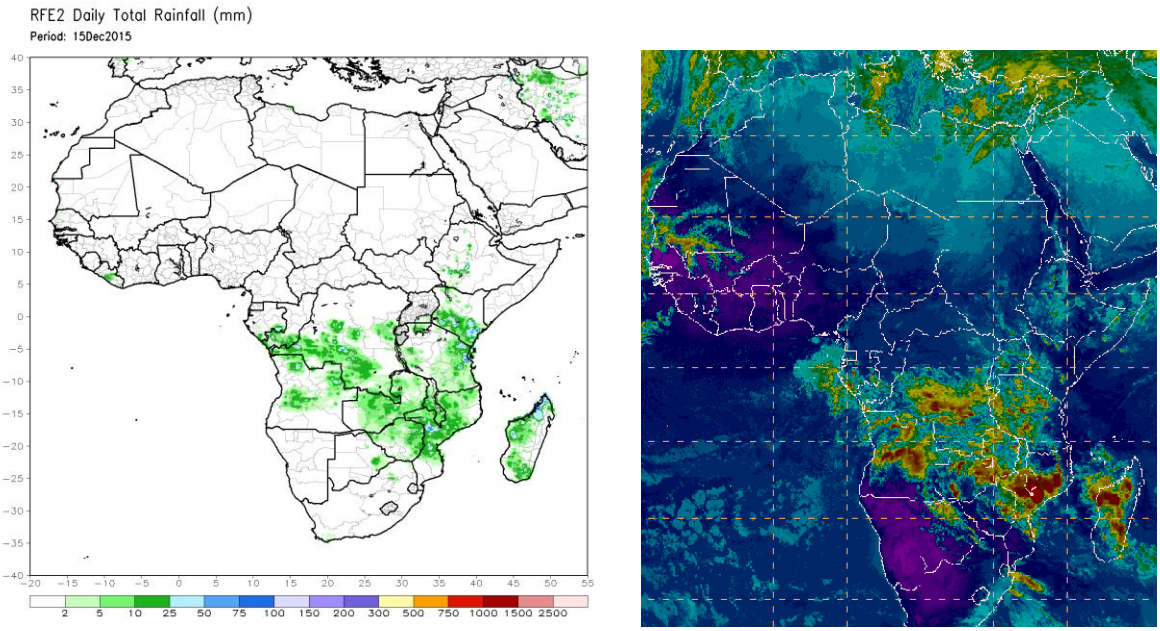
2.1. Weather assessment for the previous day (December 15, 2015)

Moderate to heavy rainfall was observed over local areas in central Angola, Southern Kenya, Northern Madagascar, central Mozambique, western DRC and NE Tanzania.

2.2. Weather assessment for the current day (December 16, 2015)

Intense convective clouds are observed across many places over central Angola, Northern Mozambique, central DRC ,Northern Madagascar, and parts of Zambia and Zimbabwe.

IR Satellite Image (valid 1830z of December 16, 2015)



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

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