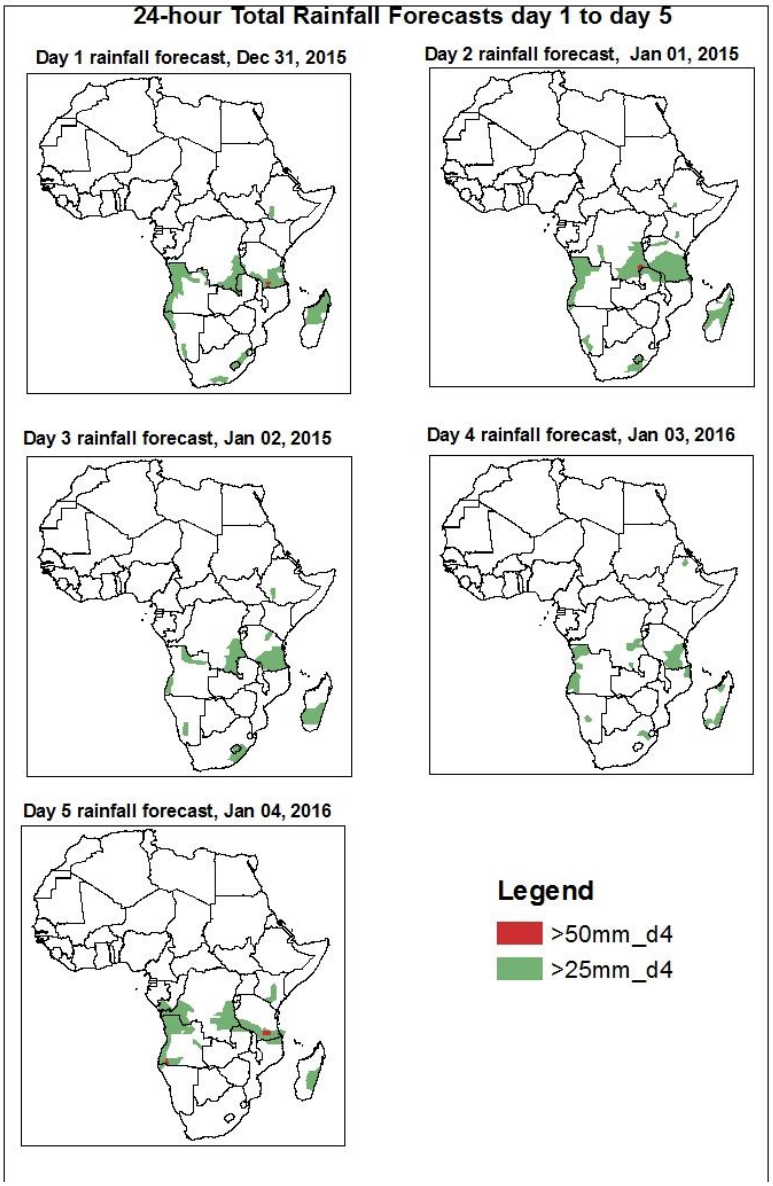
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

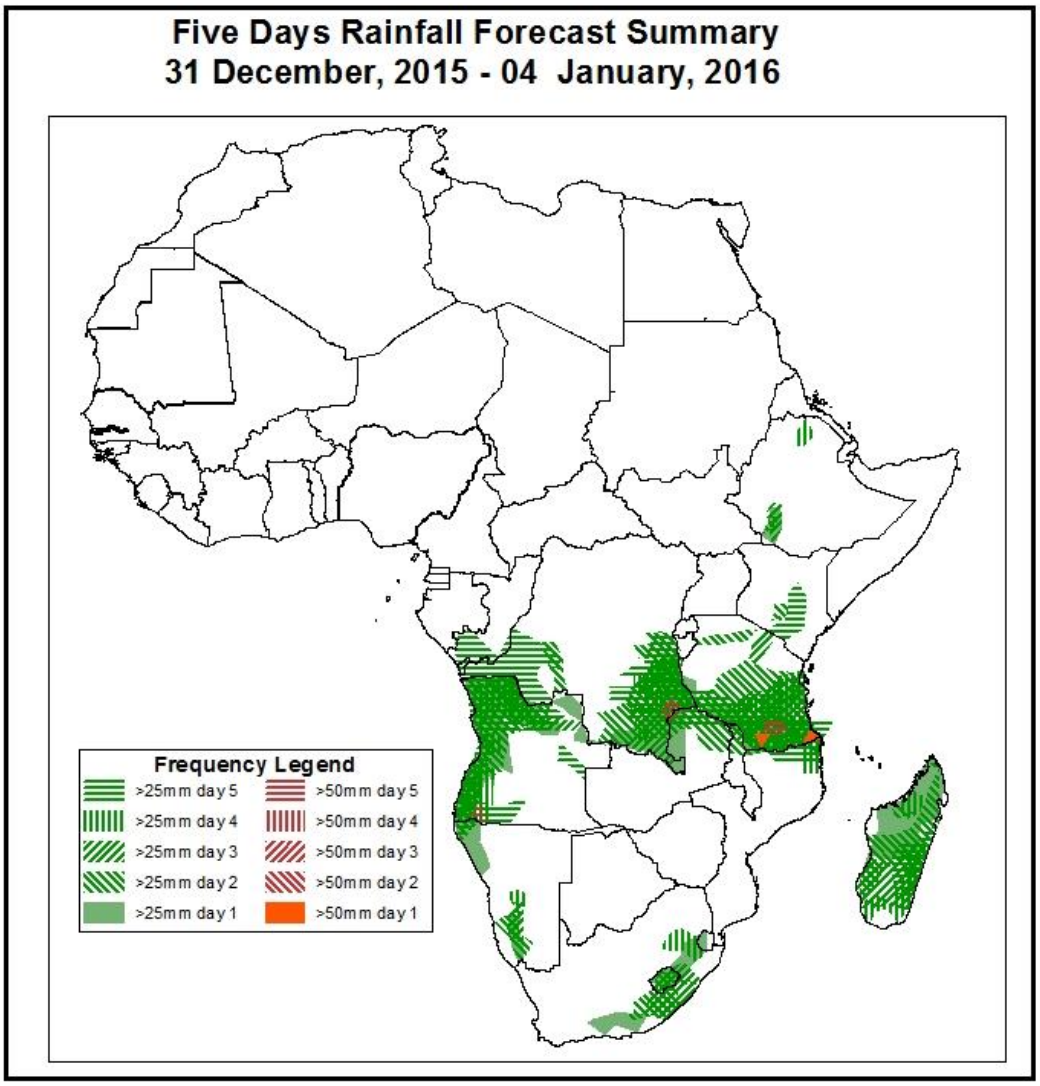
1. Rainfall and Dust Concentration Forecasts

Valid: 06Z of Dec 31, 2015 – 06Z of Jan 04, 2016. (Issued on December 30, 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 central Madagascar, western Angola, southern DRC, Lesotho and southern Tanzania, with high probability of heavy rainfall over parts of south eastern DRC and southern Tanzania.

1.2. Atmospheric Dust Concentration Forecasts

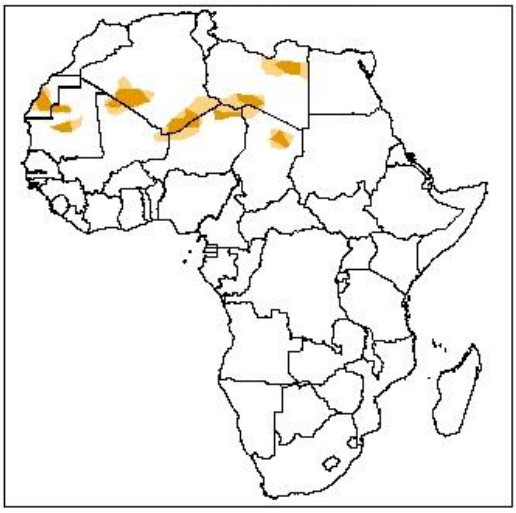
Valid: 12Z of Dec 31– 12Z of Jan 02, 2016

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.

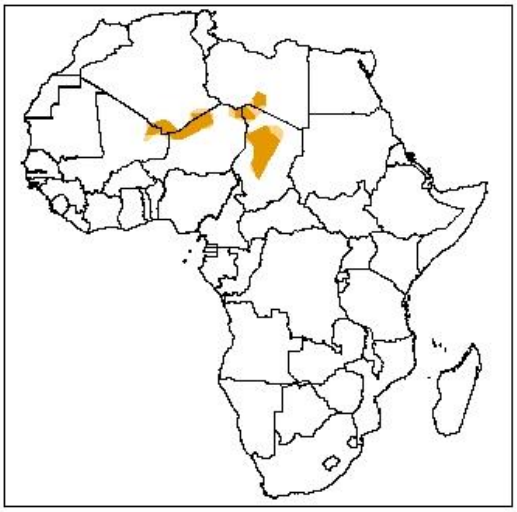
Atmospheric Dust Forecasts, day 1 to day 3,

Moderate Dust Concentration (MDC) and High Dust Concentration (HDC)

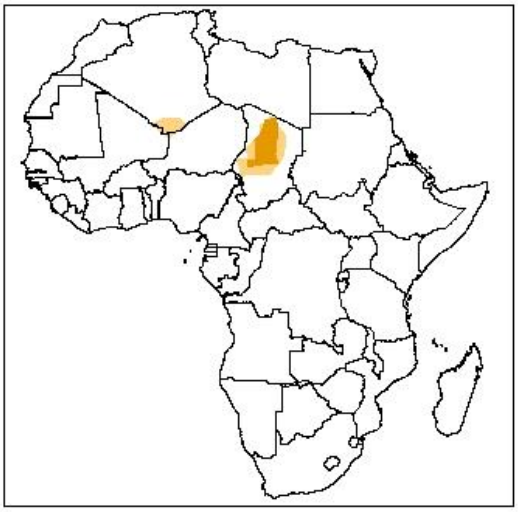
Day 1 Dust forecast
Dec 31, 2015



Day 2 Dust forecast
Jan 01, 2016



Day 3 Dust forecast
Jan 02, 2016



Highlights

For the coming three days there is an increased chance for moderate to high dust concentration over portions of Mauritania, western Sahara, Chad, southern Algeria, and northern Niger.

Legend

MDC, Vis. < 5km

HDC, Vis. < 2km

1.3. Model Discussion, Valid: 31 December, 2015 - 04 January, 2016

The Extension of Azores high pressure system over Sahara is expected to weaken in to 1028mb in 24 hours' time from its central value of 1031mb and intensify in to 1029mb in 48 hours' time. This pressure system by attaining its central value for about 24 hours, starts weakening in to 1025mb and into 1022mb in 96 and 120 hours' time respectively. The continuous weakening of this high pressure system is expected to l decrease the dust concentration that have been *prevailed* over Chad, Southern Algeria, Western Sahara, Mauritania, Southern Niger, and Northern Nigeria.

The Siberian high pressure system is expected to weaken in to 1025mb and in to 1024mb in 24 and 48 hours' time respectively from its central value of 1030mb and intensify in to 1026mb and in to 1028mb in 72 and 96 hours' time respectively. This pressure system is also expected to attain its central value for about 24 hours and weaken in to the relative minimum value of 1022mb by the end of the forecast period. In general , this pressure system is expected to weaken from 1030mb in to 1022mb in five days' time, as a result of this weakening, the daily minimum temperature over east Africa is expected to make slight increase from the previous days. The spatial position of this high pressure system is expected to make significant shift toward north eastern direction.

The St Helena high pressure system over South East Atlantic Ocean is expected to intensify in to 1023mb from its central value of 1021mb and weaken in to 1020mb and in to 1019mb in 48 and 72 hours' time respectively. This pressure system is also expected to attain its central value for about 24 hours and weaken again into 1018mb in 96 hours' time. By the end of the forecast period, this system is expected to attain the relative minimum value of 1018mb.Duto the continuous weakening of this system, cumulative rainfall over south western Africa, is expected to decrease slightly from the normally expected amount.

The Mascarene high pressure system over Southwest Indian Ocean is expected to weaken in to 1020mb in 24 hours' time from its central value 1024mb and attain this value for about 24 hours. This high pressure system is also expected to intensify in to 1021mb in 72 hours' time and weaken in to 1020mb in 96, hours' time. By the end of the forecast period, this system is expected to weaken in to the relative minimum value of 1019mb. In general, this pressure system is expected to weaken from 1024mb in to 1019mb in five days period, this significant weakening decrease the amount of moisture supposed to incur from south western Indian Ocean in to south eastern Africa.

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925mb and 850mb level: easterly wing of north easterly wind is expected to be dominant over northern Africa for about 48 hours and star weakening up to the end of the forecast period. Following this system (depression of the high pressure system) the dust concentration that has been *prevailed* on previous days over Western Sahara and Mauritania will attain for about 24 hours and decrease up to the end of the forecast period.

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. This shifting intensifies the weather producing systems over south western Africa. Strong low level cyclonic activity, observed over Madagascar area is also expected to enhance the seasonal moist north westerly wind (coming from Indian Ocean) to produce rain over Madagascar 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 central Madagascar, western Angola, southern DRC, Lesotho and southern Tanzania, with high probability of heavy rainfall over parts of south eastern DRC and southern Tanzania.

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2.0. Previous and Current Day Weather over Africa

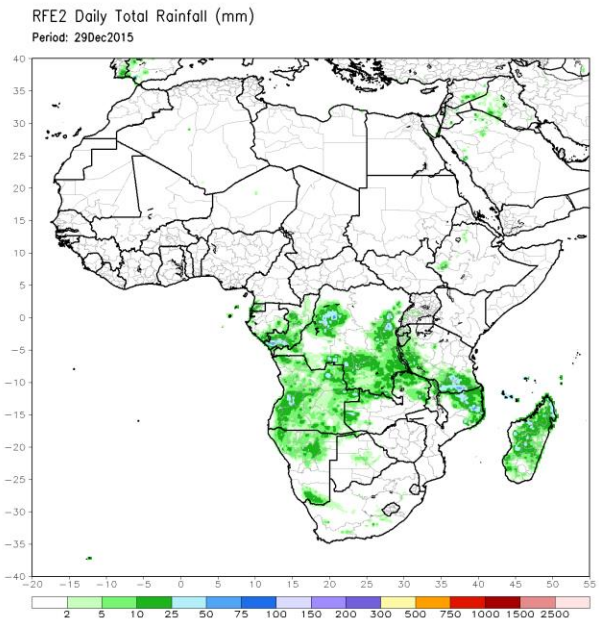
2.1. Weather assessment for the previous day (December 29, 2015)

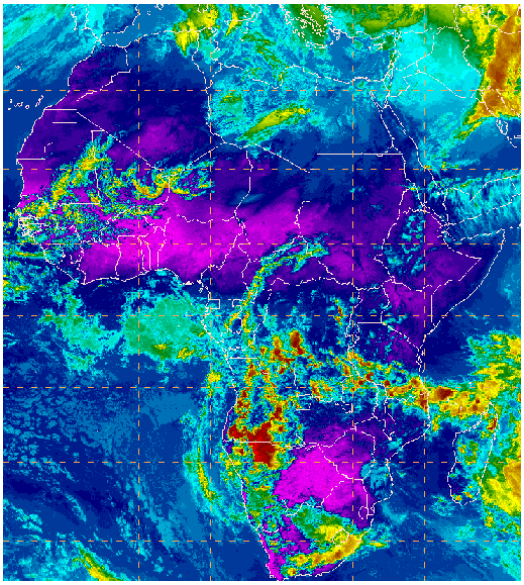
Moderate to heavy rainfall was observed over local areas in most parts of DRC, Northern Madagascar, North eastern Mozambique, western Congo, western Angola, Southern Tanzania and Northern Namibia.

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

Intense convective clouds are observed across many places over most parts of Angola, Northern Madagascar, Lesotho, South western DRC and Northern Namibia.

IR Satellite Image (valid 1830z of December 30, 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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