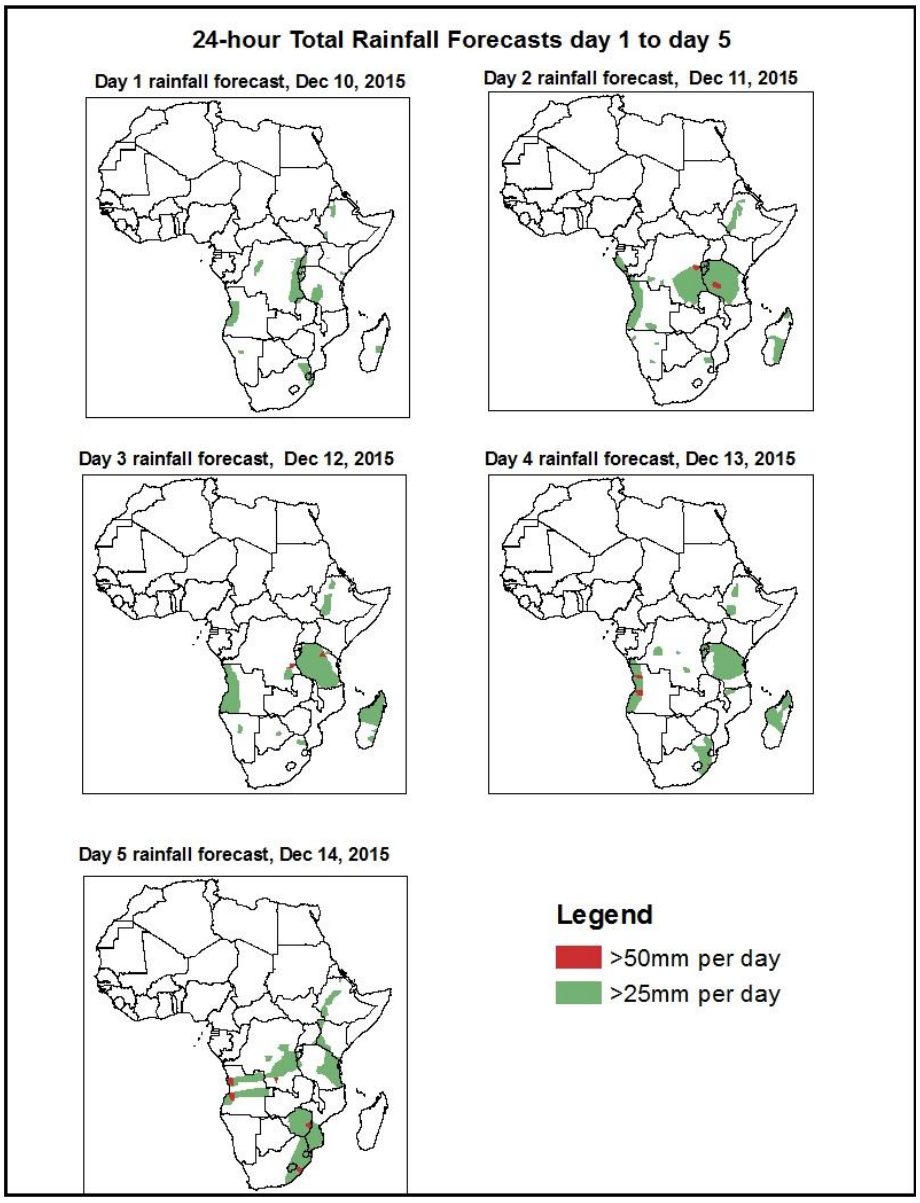
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

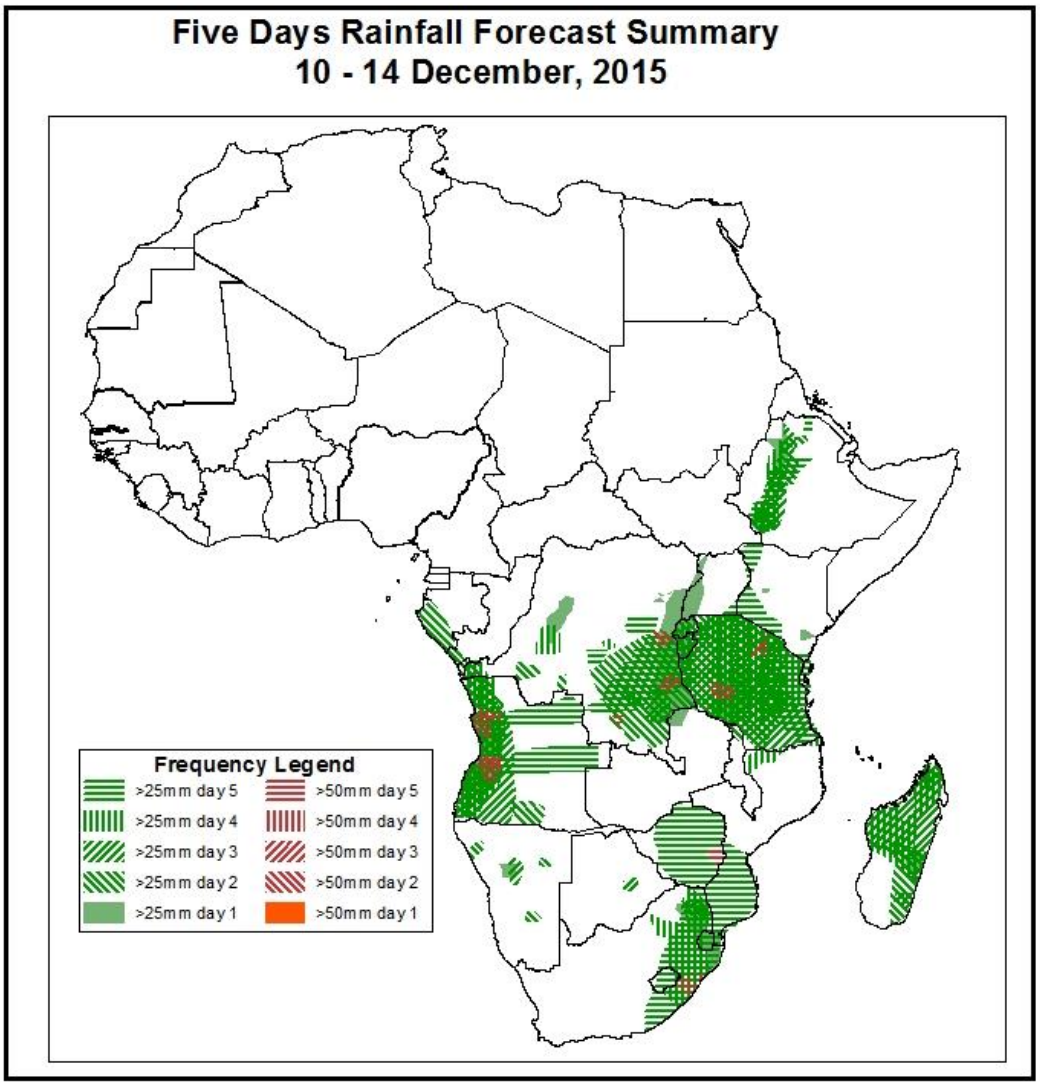
1. Rainfall and Dust Concentration Forecasts

Valid: 06Z of Dec 10 – 06Z of Dec 14, 2015. (Issued on December 09, 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.



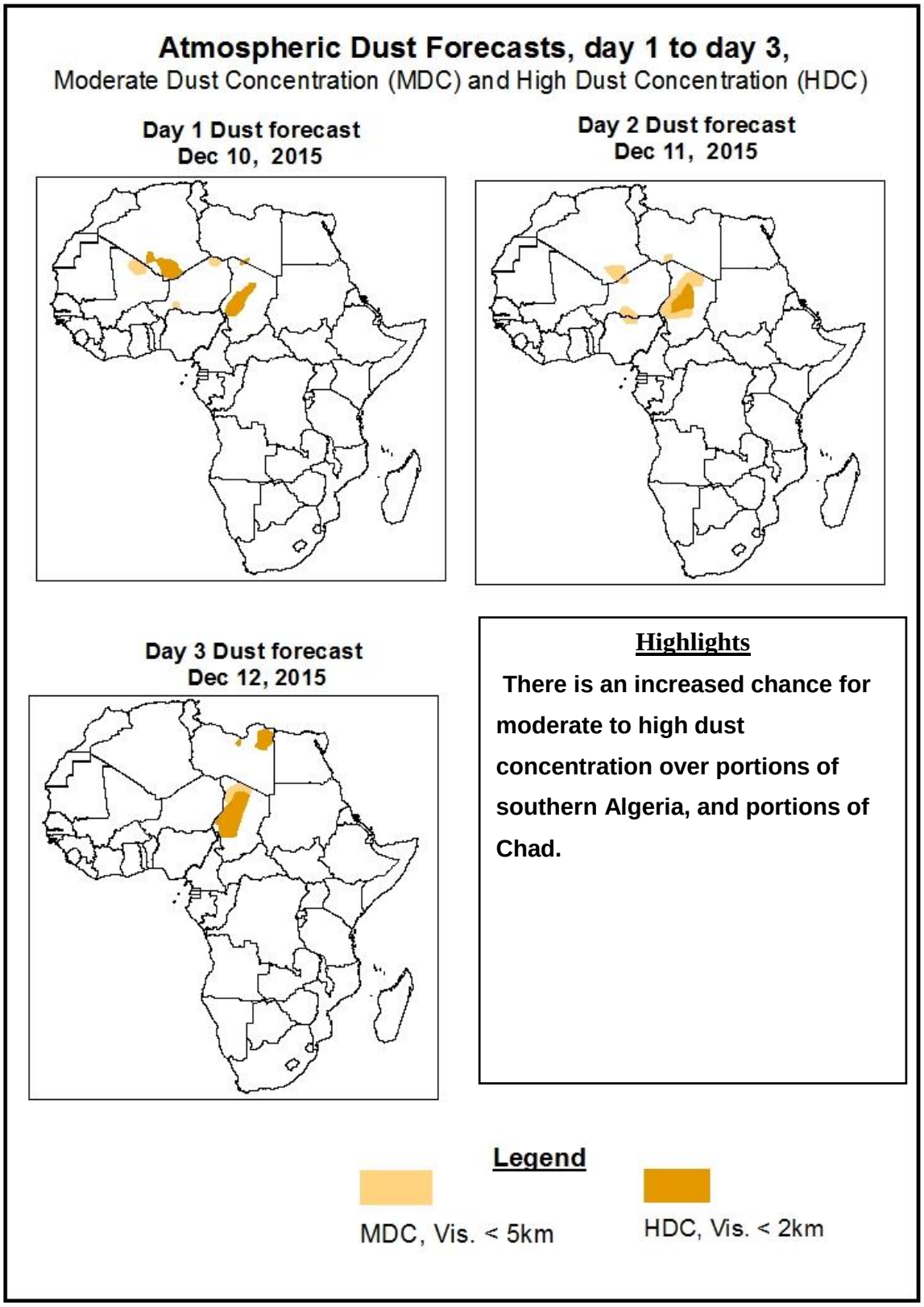


There is an increased chance for two or more days of moderate to heavy rainfall over western Angola, eastern DRC, Rwanda, Burundi, much of Tanzania, portions of western Ethiopia, eastern South Africa, Swaziland, and portions of Madagascar, with the heaviest rainfall amount expected over local areas in western Angola eastern DRC and Tanzania.

1.2. Atmospheric Dust Concentration Forecasts

Valid: 12Z of Dec 10– 12Z of Dec 12, 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: 10 – 14 December, 2015

The Azores high pressure system is expected to be weaken from its central value 1044mb to 1038mb by the next 24 hours. By continuous weakening, this High pressure system attains its minimum value 1025mb by the end of the forecast period.

The Libyan high pressure system which is an extension or a cut off High from Azores high pressure system is expected to maintain its position like the previous days.
This behavior exhibited by Libyan high pressure Systems is well expected cause of the seasonal change. Therefore, just like the previous days, high probability of widespread dust is still expected to still prevail over the dust source regions, affected regions in North Africa and Northern and Central parts of some countries in West Africa like Nigeria, Benin, Ghana, and Burkina Faso. Also Senegal, Guinea, Mauritania, Sudan, Niger, Chad and Northern Cameroun are expected to be effected. The dust raised will be propagated by relatively moderate to strong Northeasterly trade winds towards areas and zones along their trajectory. This development is a strong indication that active rainfall and weather activities are moving towards the southern hemisphere.

The Arabian high pressure system is expected to intensify in the next 96 hours from 1035 mb to 1043 mb. This High pressure system will weaken by 2 mb by the end the forecast period.
Arabian high pressure system was observed to have moved closer to Africa thereby establishing some cut off high over Egypt, Sudan and the Indian Ocean

The St Helena high pressure system at the beginning of the forecast period had a central pressure value of 1020 mb. This high pressure system is expected to persist as it is for 24 hours and intensify by 1mb for the next 24 hours; this High pressure system will keep its central value 1021mb for about three days and weaken to 1020mb by the end of the forecast period.
St Helena high pressure system was also observed not to make significant change in terms position and magnitude.

The Mascarene high pressure system is expected to keep its central value of 1022mb for the next 24 hours and weaken from its central value of 1022 to 1021 mb by the next 24 hours and keep this new central value for three consecutive days and weaken to 1020mb by the end of the forecast period.

At 925 mb streamlines; as expected, maritime winds from the Atlantic Ocean were still observed streaming into southern parts of some countries in West Africa namely Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Benin Republic, and Southern part of Nigeria within the forecast period. Maritime winds were also observed streaming into Southern Cameroun, Equatorial Guinea, Gabon and into the inlands of central Africa like, Angola, CAR and DRC. Maritime wind flow patterns from the Indian Ocean were also observed streaming into the inlands of Kenya, Uganda, Tanzania, Malawi, Zambia, thereby instituting the Congo boundary convergence. Indian Ocean monsoon, just like the previous days, was also observed over Mozambique, Malawi, Botswana, Swaziland and Lesotho in Southern Africa. Whereas The Northeasterly continental wind flow pattern was observed over Senegal, Guinea, Burkina Faso, Mali, Chad, Niger, Northern and central Nigeria, Northern Cameroun, Central African Republic and Sudan.

At 850 mb streamlines; continental flows, predominant North easterly trade winds were still observed over most parts of West Africa namely Senegal, Gambia, Mauritania, Sierra Leone, Liberia, Burkina Faso, Ghana, Togo, Niger, Chad, Nigeria, CAR and Cameroun. Maritime winds were also still observed converging over DRC, Angola, Namibia and Zambia. Also maritime wind flows were also observed over Congo, Angola, in Central Africa and Kenya. Burundi, Rwanda, Uganda, Ethiopia and Somalia in East Africa. Maritime winds from the Indian Ocean and Atlantic Ocean were observed streaming into Southern Africa.

At 700 mb streamlines; a high pressure system was still observed over South Africa throughout the forecast period thereby inducing an anticyclonic flow over Namibia, Botswana, Zimbabwe, Mozambique, Swaziland and South Africa. This feature has persisted for a couple of days. Another high pressure system was still observed over Mauritania and Northern chad, establishing an anticyclonic flow patterns over Mauritania, Senegal, Guinea, Sierra Leone, Ghana, Benin, Burkina Faso, chad, Niger, Nigeria, Sudan, and Central African Republic, just like the previous days. Maritime winds were observed at this level streaming into East Africa, DRC, Angola and parts of

Namibia. The easterly jets are still expected to propagate westwards from Sudan toward the gulf of Guinea during the forecast period. Strong maritime winds flow pattern were also observed streaming into East and central Africa from the Indian Ocean.

At 200 mb streamlines; Divergent flow patterns were observed over most of West Africa namely Ivory Coast, Ghana, Togo, Benin, and Nigeria. Divergent flow patterns were also observed over central and Eastern Africa especially Namibia, Angola, Zambia and Africa. Over South Africa Divergent flow patterns were current observed but is expected to be replaced by zonal flow patterns within the next 48 hours. The jets associated with this flow pattern had moderate to strong wind speeds.

For the next five days rainfall is expected to extent and spread over West and south east covering almost the whole parts of Tanzania and Zimbabwe up to South Africa. Over Western Angola rainfall is expected to continue for five consecutive days with heavy fall (more than 50mm/day) in some parts. As the ITCZ is getting its south most extreme, dry and cold air from Siberia will penetrating north eastern Africa as result of this the minimum temperature may intensify over high land areas. The North east trade wind is expected to still remain dominant over its counterpart the south west trade wind over all the countries with exception of a few in West Africa, Cameroun, Niger, CAR and Sudan. Over East, Central Africa and the Horn of Africa, the meridional convergence over DRC and the East African monsoon are expected to remain active

There is an increased chance for two or more days of moderate to heavy rainfall over western Angola, eastern DRC, Rwanda, Burundi, much of Tanzania, portions of western Ethiopia, eastern South Africa, Swaziland, and portions of Madagascar, with the heaviest rainfall amount expected over local areas in western Angola eastern DRC and Tanzania.

2.0. Previous and Current Day Weather over Africa

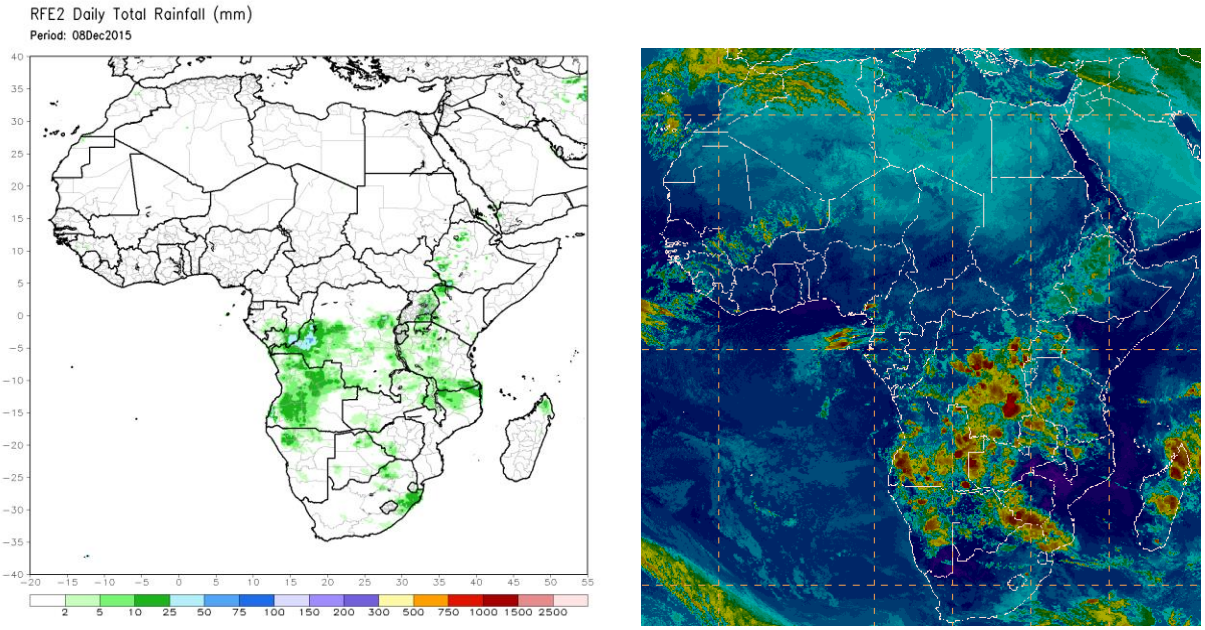
2.1. Weather assessment for the previous day (December 08, 2015)

Over Democratic Republic of Congo heavy amount of rainfall were observed. Over Angola, Namibia, western South Africa, Mozambican, Tanzania, Burundi, western Kenya, SW Ethiopia and NE Madagascar moderate rainfall were observed. This is due to the fact that rain producing systems are significantly getting down to south.

2.2. Weather assessment for the current day (December 09, 2015)

Convective, dense clouds observed over DRC, Namibia, Zambia SE Angola and southern Zimbabwe.

IR Satellite Image (valid 1745z of December 08, 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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