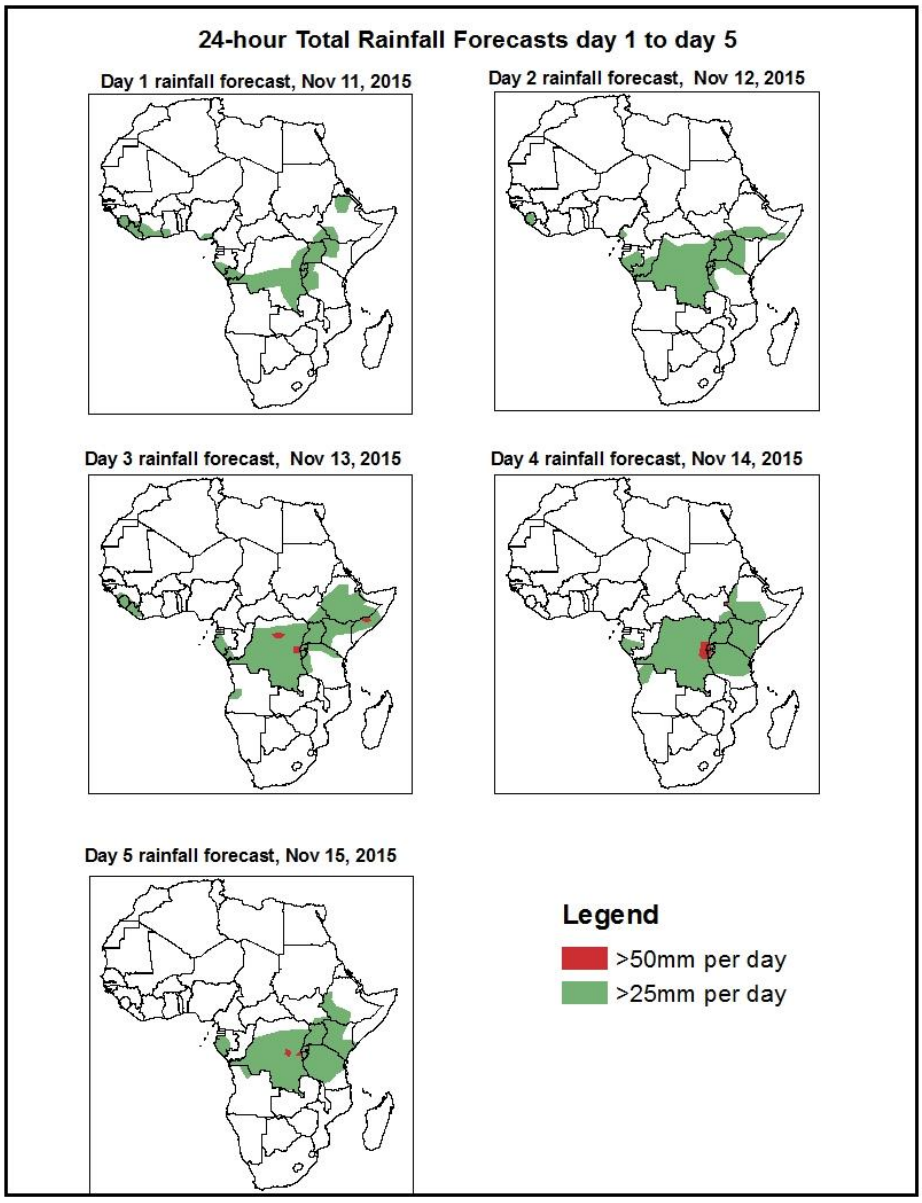
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1. Rainfall and Dust Concentration Forecasts

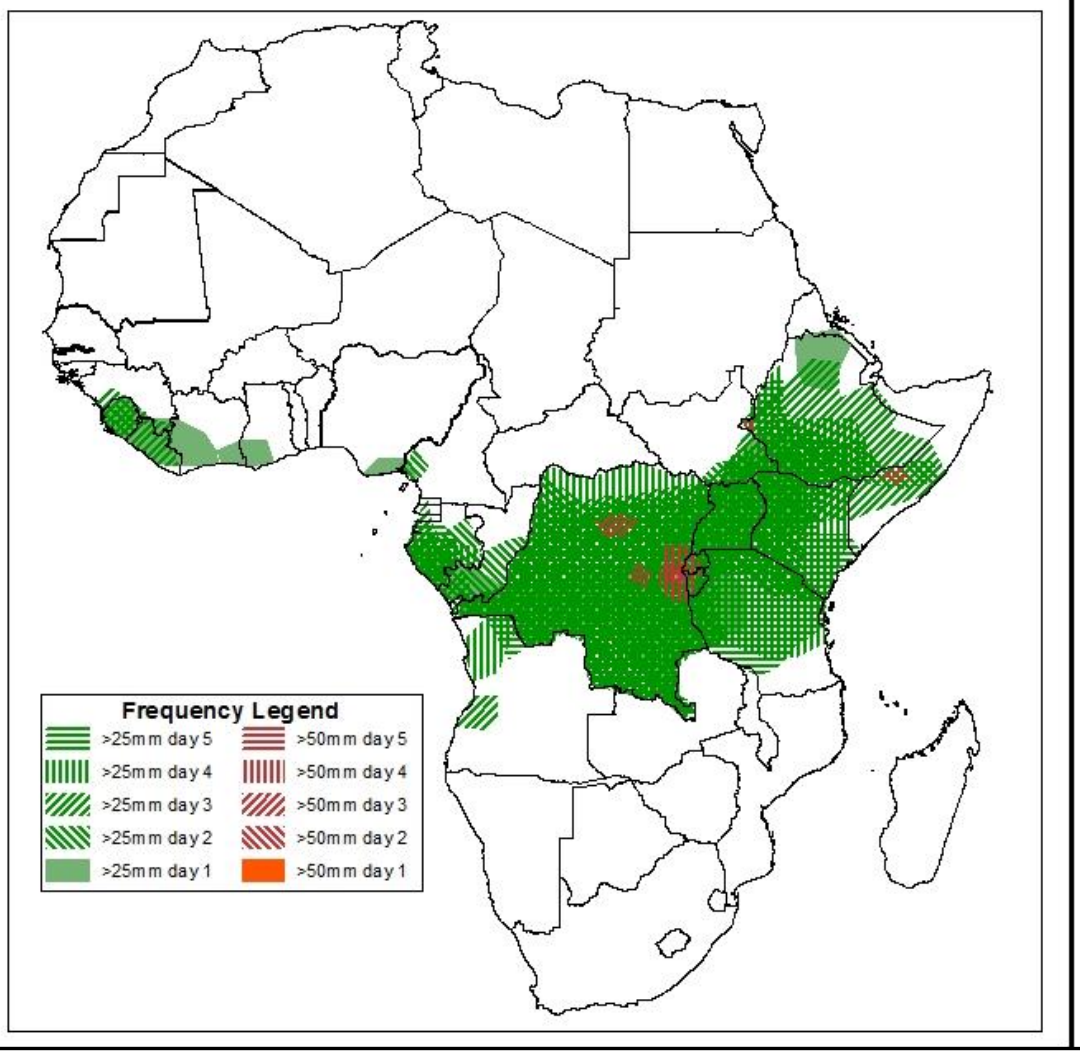
Valid: 06Z of Nov 11 – 06Z of Nov 15, 2015. (Issued on November 10, 2015)

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.



Five Days Rainfall Forecast Summary
11 - 15th November, 2015

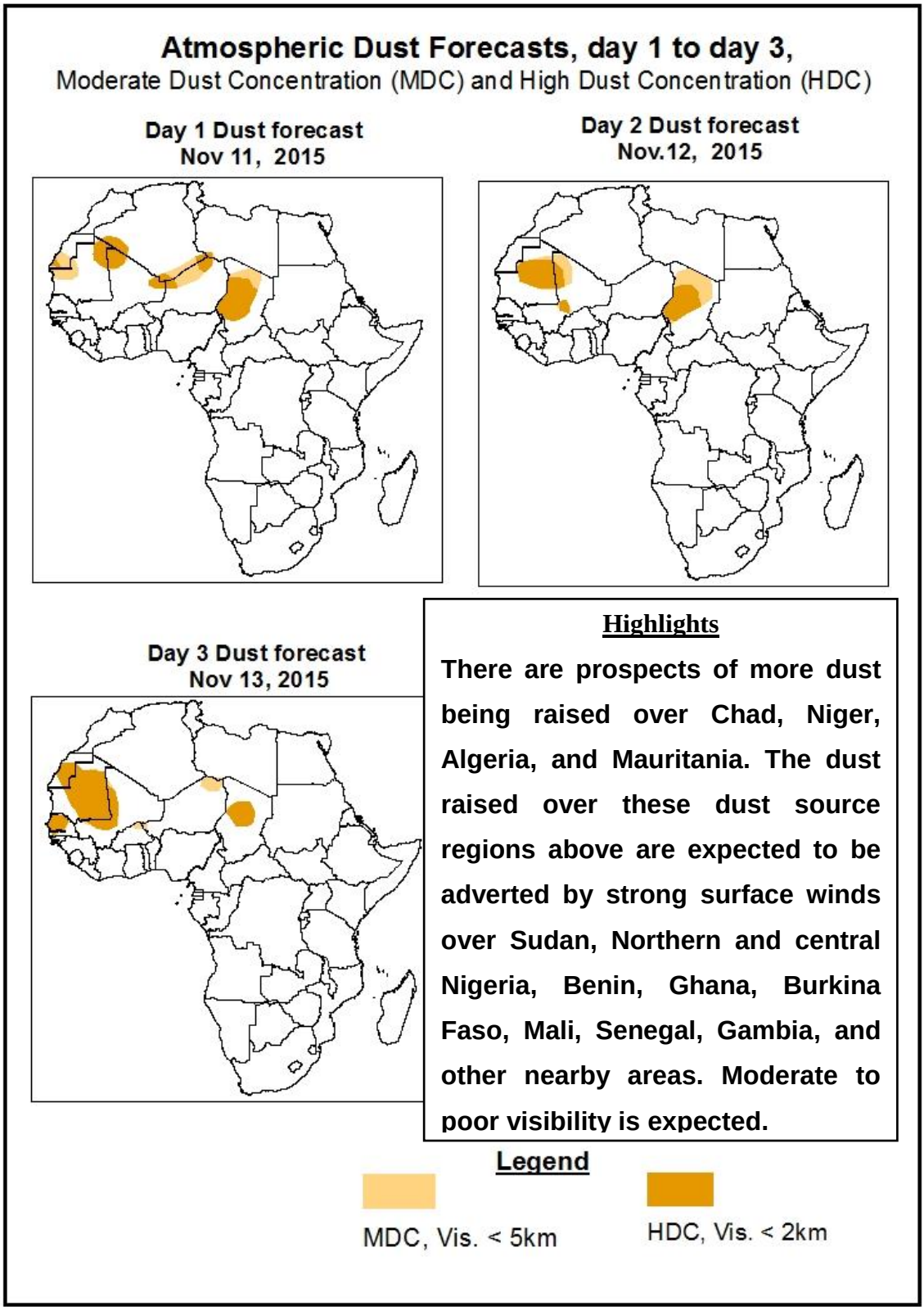


Forecast review of rainfall occurrence for the upcoming five days over Western, central and Eastern Africa shows that the Intertropical Discontinuity (ITD) is expected to maintain its current position, as the North easterly trade winds becomes more resilient and dominant over its counterpart the southwesterly trade wind. The ITD is expected to propagate between 7 and 9 degrees north of the Equator. In view of above, atmospheric convection leading to formation of weather systems will only occur some distance away from this convergence zone. Therefore rainfall and weather related activities will likely occur over the coastal regions and few high weather trigger zones over the West African region. The meridional convergence over DRC and the East African monsoon are expected to remain active; therefore rainfall is expected to continue over most part of central, Eastern and the Horn of Africa. The following places are expected to have moderate to heavy rainfall. Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, coastal areas of Nigeria in West Africa. Southern Cameroun, Gabon, Congo, Equatorial Guinea, DRC in Central Africa and South Sudan, Kenya, Uganda, Rwanda, Burundi, Tanzania and Angola in East Africa and Ethiopia and Somalia in the horns of Africa.

1.2. Atmospheric Dust Concentration Forecasts

Valid: 12Z of Nov 11– 12Z of Nov 13, 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: 11 – 15 November, 2015

The Azores high pressure system is expected to weaken in the next 48 hours, its center value will decrease from 1030 to 1024 mb. This High pressure system will intensify from 1024 to 1031mb in the next 72 hours, thereby having a central pressure value of 1031 mb. This high pressure system will weaken again from 1031 to 1027 mb at the end of the forecast period according to GFS models.

The extension of the Azores high pressure relatively known as the Libyan high pressure system is expected to maintain its current position, at approximately 14 and 15 degrees north of the Equator just like the previous days. Therefore, widespread dust is expected to be raised in the upcoming days over the dust source regions of West and Northern Africa. The dust raised will be propagated by relatively moderate Northeasterly trade winds towards areas and zones along their trajectory. This development is a strong indication that active weather activities are moving towards the southern hemisphere.

The St Helena high pressure system at the beginning of the forecast period had a central pressure value of 1030 mb. This high pressure system is expected to weaken in the next 48 hours, by 4 mb with its central pressure value decreasing from 1030 to 1026 mb. It will intensify from 1026 to 1028 mb in the next 96 hours. By the end of the forecast period it is expected that this high pressure system will weaken to 1025 mb according to GFS Models. This pressure system was observed to have retreated remarkably from the coast of Western Africa and moved over tips of southern Africa towards the end of the forecast period.

The Mascarene high pressure system is expected to weaken in the next 48 hours with central pressure values varying from 1024 mb to 1021 mb, and intensify in its central value by 1 mb in the next 72 hours. At the end of the forecast period, the high pressure center is expected to intensify further from 1022 to 1024 mb, according to the GFS model. This high pressure system was observed to have retreated from southern African and moved more into the Indian Ocean.

Isolated cut off Equatorial low pressure systems were observed over West, Central and Eastern Africa. Its central pressure values did respond remarkably to thermal heating thereby remaining stationery. Their center values deepen from 1012 mb to 1010 mb over East and Western Africa. At the end of the forecast period the center pressure values these isolated thermal low was observed to fill back from 1010 to 1012 mb at the end of the forecast period.

At 925 mb, at this level, Maritime winds from the Atlantic Ocean were still observed streaming into some countries in West Africa namely Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Benin Republic, and Southern Nigeria. Maritime winds were also observed streaming into Cameroun, Equatorial Guinea, Gabon and into the inlands of central Africa like, central Africa Republic, Angola, and DRC. Maritime wind flow patterns from the Indian Ocean were also observed streaming into the inlands of Kenya, Uganda, Somalia, South Sudan and Ethiopia thereby establishing the Congo boundary convergence. Whereas The Northeasterly continental wind flow pattern was predominantly over Senegal, Guinea, Burkina Faso, Mali, Chad, Niger, Northern and central Nigeria, and Sudan.

At 850 mb level, continental flows, predominant North easterly trade winds were observed over most parts of West Africa namely Senegal, Gambia, Mauritania, Sierra Leone, Liberia, Burkina Faso, Ghana, Togo, Niger, Chad, Nigeria and Cameroun. A high pressure system was also observed over the Indian Ocean, this induced maritime wind flows patterns to stream into Congo, CAR and DRC in Central Africa and Kenya. Uganda, Ethiopia and Somalia in East Africa. Also a low pressure system was observed over central DRC. Maritime winds from the Atlantic Ocean were also observed over Equatorial Guinea and Gabon.

At 700 mb level, High pressure systems were also observed Mauritania and Northern chad, establishing anticyclonic flow patterns over Mauritania, Senegal, Guinea, Sierra Leone, Ghana, Benin, Burkina Faso, chad, Niger, Nigeria, Sudan, and central African Republic. The easterly jets are expected to propagate westwards from central 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 level, Anticyclonic flow patterns were observed over West, central and Eastern Africa. The jets associated with this flow pattern had moderate to strong wind speeds. Meridional Flow patterns were observed at this level over West and, Central Africa.

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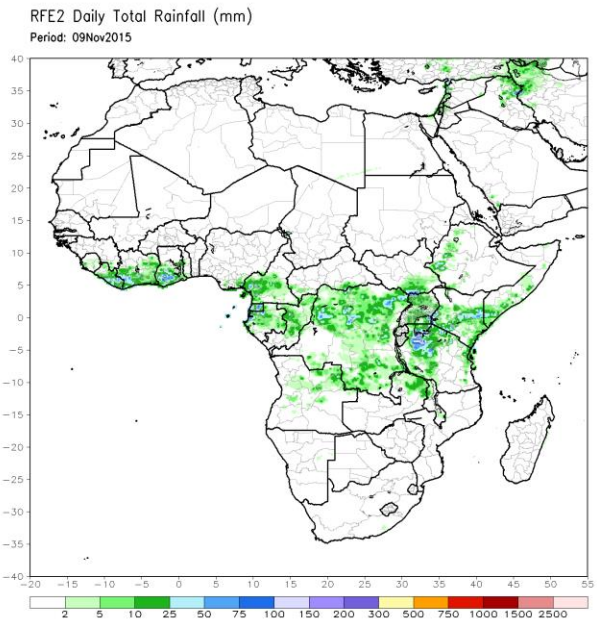
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (November 9, 2015)

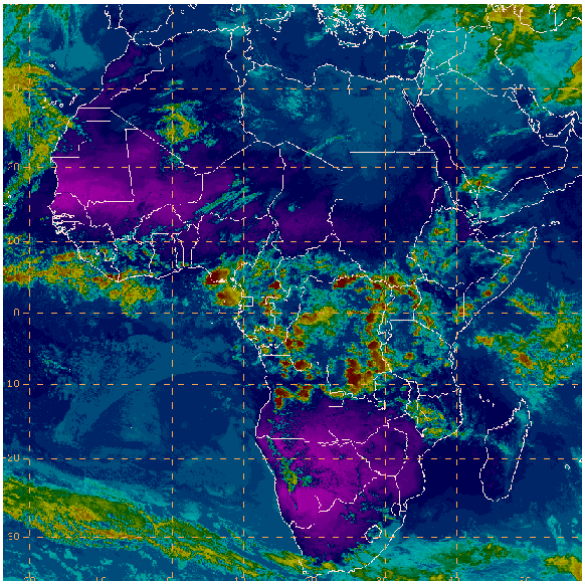
Evaluation of daily total rainfall for the previous day over Africa disclosed that moderate to heavy rainfall was recorded over few countries in West Africa because raining season is at cessation stage in that part of the continent, and some countries in central and Eastern Africa. These countries are as follows; Liberia, Ivory Coast, Ghana, Southern Nigeria, Cameroun, Equatorial Guinea, Gabon, Congo, Angola, DRC, South Sudan, Uganda, Kenya, Tanzania, Ethiopia, and Somalia.

2.2. Weather assessment for the current day (November 10, 2015)

Convective and dense clouds with small and large ice particles observed over few countries in West Africa and mostly countries in Central and Eastern Africa, namely Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Benin, Sothern Nigeria, Cameroon, Equatorial Guinea, Gabon, Congo, Angola and DRC in central Africa and South Sudan, Kenya, Uganda, Tanzania, Somalia and Ethiopia in East Africa. Dust plume observed over Senegal, Gambia, Western Sahara, Algeria, Southern Mauritania, Guinea, Mali, Burkina Faso, Ghana, Niger, Benin, Togo, Northern and central Nigeria, Chad and Sudan.



IR Satellite Image (valid 1600z of November 10, 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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