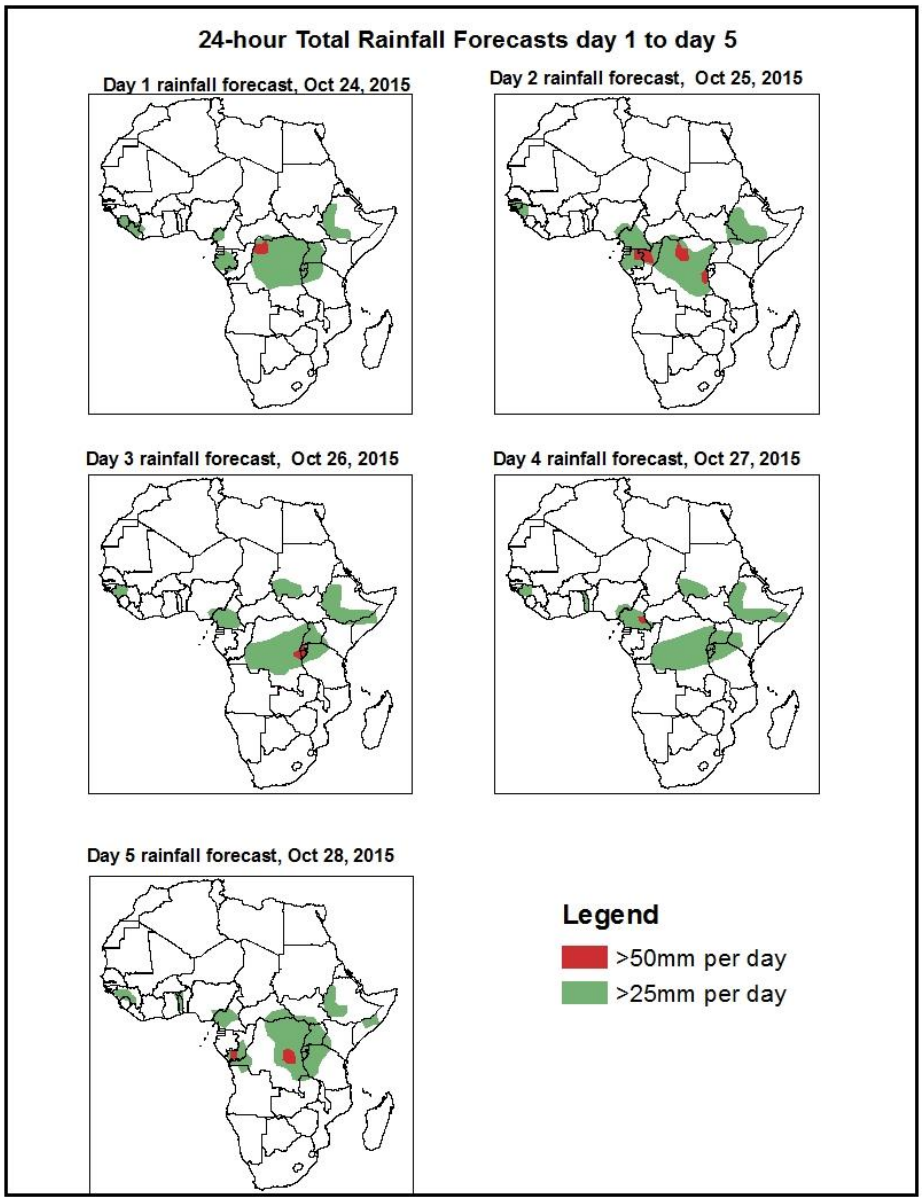
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

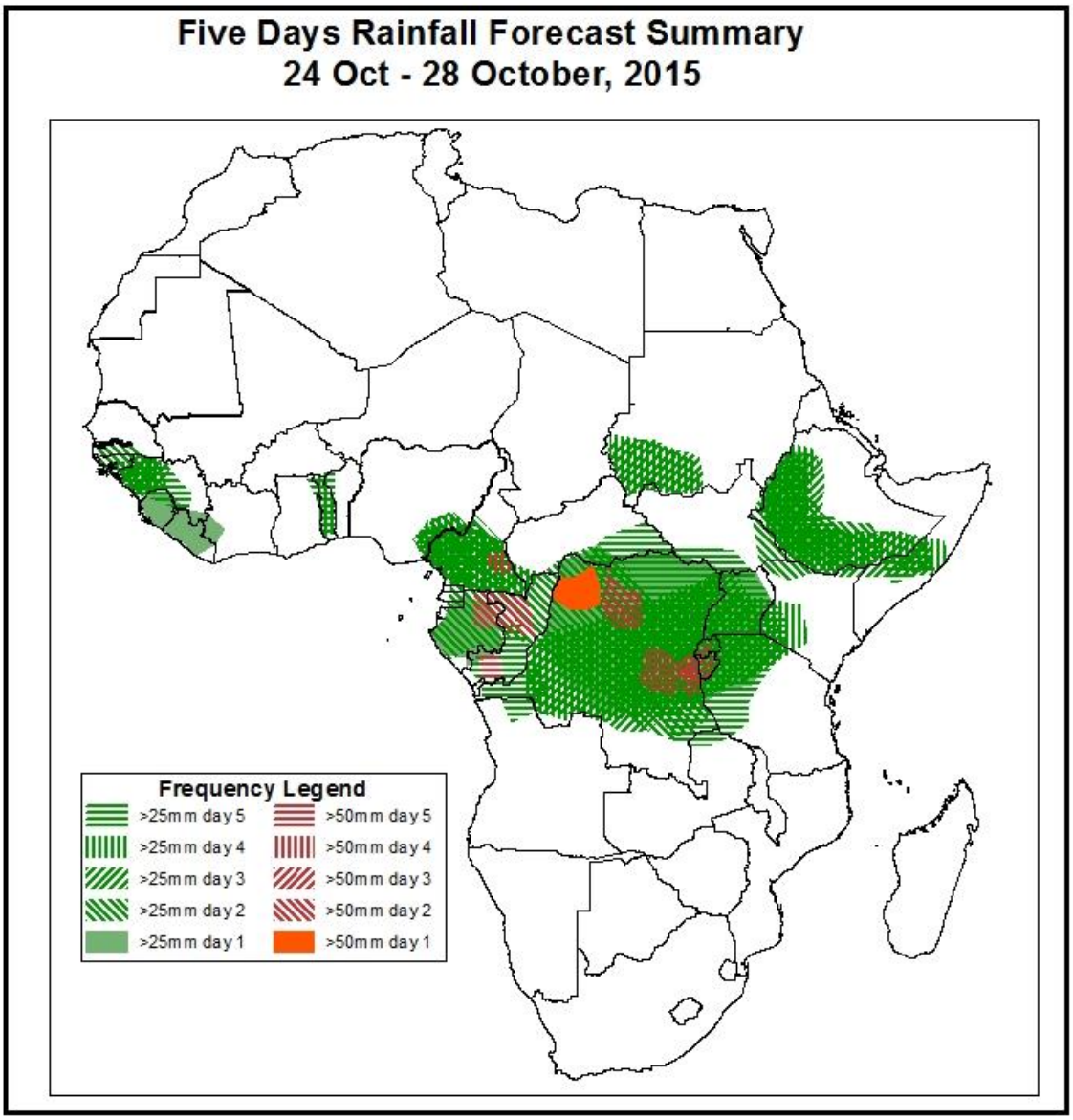
1. Rainfall and Dust Concentration Forecasts

Valid: 06Z of Oct 24 – 06Z of Oct 28 2015. (Issued on October 23, 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.



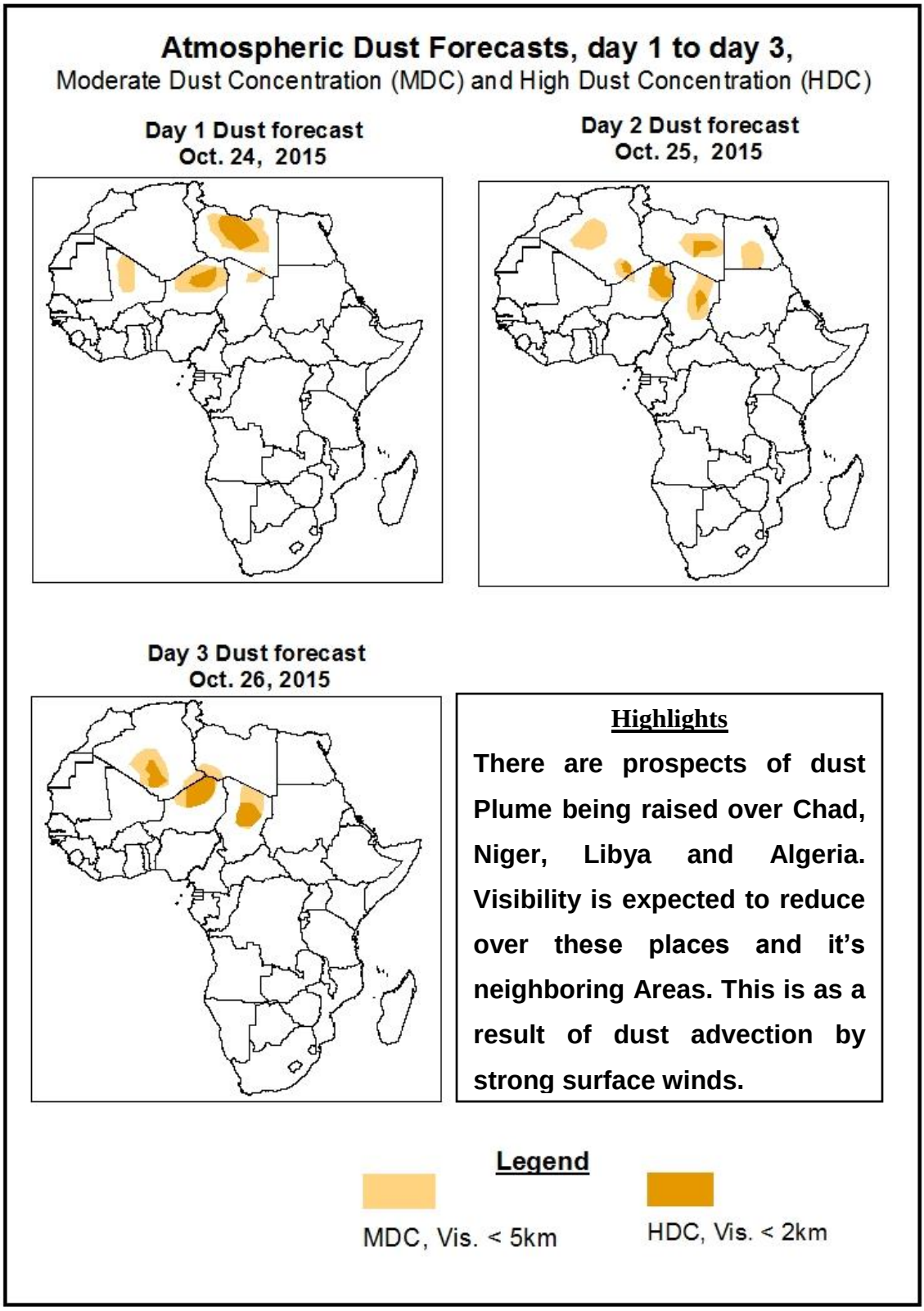


Review of recent updates in the upcoming five days, shows that the maritime southwesterly wind flow from the Atlantic Ocean with its associated convergence across West Africa (ITD) is expected to still propagate southward towards the Equator; this will limit weather activity mostly to the coast, mountain ranges or elevated highlands over the West African region. The meridional convergence over DRC and the East African monsoon convergence over the Horn of Africa are still very much active, so there influence is also expected to enhance rainfall in their respective regions. Therefore the following places are expected to have moderate to heavy rainfall. Guinea, Sierra Leone, Liberia, Ghana, Togo, Benin, Nigeria. Cameroun and Congo, Equatorial Guinea, Gabon, CAR, DRC in Central Africa and South Sudan ,Kenya, Uganda, Rwanda, Tanzania, in East Africa and Ethiopia and Somalia in the horns of Africa.

1.2. Atmospheric Dust Concentration Forecasts

Valid: 12Z of Oct 24– 12Z of Oct 26, 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: 24– 28 October, 2015

The Azores high pressure system is expected to intensify in the next 48 hours by 4 mb, from 1025 mb to 1029 mb The High pressure system will weaken in its central pressure value in the next 96 hours by 3 mb there by having a central value of 1026 mb and then weaken further to 1022 mb at the end of the forecast period. Whereas in the next 96 hours it is expected that the extension of the Azores high relatively Known as the Libyan high pressure system established itself over Libya with its associated 1016 isobar crossing the 20 degree North latitude ,which is mostly an indication to that dust will be raised over the dust source regions of West and North Africa.

The St Helena high pressure system over the Atlantic Ocean will intensify in the next 72 hours, by 6 mb with its central pressure values varying from 1026 up to 1032 mb. It will later weaken to 1021 mb .This high pressure system is also expected to retreat southward into the Atlantic Ocean and merge with Mascarene high pressure in the next 72 hours, thereby exercising a little less influence to the West African region but establishing itself more to the continent of Southern Africa.

The Mascarene high pressure system will intensify remarkably within 72 hours with central pressure values varying from 1027 mb to 1033 mb then weaken in the next 96 hours by 5 mb, with the pressure value becoming 1028 mb. It further weakens to 1031 mb at the end of the forecast period according to the GFS model. The influence of this high pressure system is expected to become more prominent as its isobars were observed throughout the forecast period extending well into over East and Southern Africa.

Broad Thermal Equatorial lows pressure system was observed lying in phase with the Mid latitude trough in the next 48 hours forecast analysis. In the next 96 hours, the interface between the Equatorial low and mid latitude low pressure System was cut by The Libyan High pressure system. **T**he Equatorial low pressure system was also observed extending from East Africa through Central Africa up to Liberia in West Africa. Its central pressure values filled from 1008 mb to 1009 mb over East and Western Africa. At the end of the forecast period the center pressure values was observed to fill to 1010 mb at the forecast period.

At 925 mb, Maritime winds flow from the Atlantic Ocean was observed over places like Guinea, Liberia, Ivory Coast, Ghana, Togo, Benin Republic, Nigeria, Gabon, and Cameroun and into the inlands of central Africa like Congo, central Africa Republic and DRC. Whereas an Anticyclone situated over the Indian Ocean directs moist wind into

the inlands of Kenya, Uganda, Somalia, South Sudan and Ethiopia thereby establishing Congo boundary convergence.

At 850 mb level, Continental wind flows dominated over West Africa, whereas maritime wind flow patterns were also observed streaming into Congo, CAR AND DRC in Central Africa and Kenya. Uganda, Ethiopia and Somalia in East Africa. A low pressure System was observed also over Northeastern DRC establishing a strong Meridional flow. The winds at this level were predominantly easterlies,

At 700 mb level, a high pressure system observed over Algeria, establishing an anticyclonic flow over most places in West Africa like Mali, Burkina Faso and part of Nigeria. A persistent easterly flow is also expected to propagate westwards in the region between central Sudan toward the gulf of Guinea during the forecast period.

At 250 mb level, Divergent Flow patterns associated with strong winds were observed over most Central and some parts of Eastern Africa. Cyclonic flow patterns were observed over most places in West Africa.

Review of recent updates in the upcoming five days, shows that the maritime southwesterly wind flow from the Atlantic Ocean with its associated convergence across West Africa (ITD) is expected to still propagate southward towards the Equator; this will limit weather activity mostly to the coast, mountain ranges or elevated highlands over the West African region. The meridional convergence over DRC and the East African monsoon convergence over the Horn of Africa are still very much active, so there influence is also expected to enhance rainfall in their respective regions. Therefore the following places are expected to have moderate to heavy rainfall. Guinea, Sierra Leone, Liberia, Ghana, Togo, Benin, Nigeria. Cameroun and Congo, Equatorial Guinea, Gabon, CAR, DRC in Central Africa and South Sudan ,Kenya, Uganda, Rwanda, Tanzania, in East Africa and Ethiopia and Somalia in the horns of Africa..

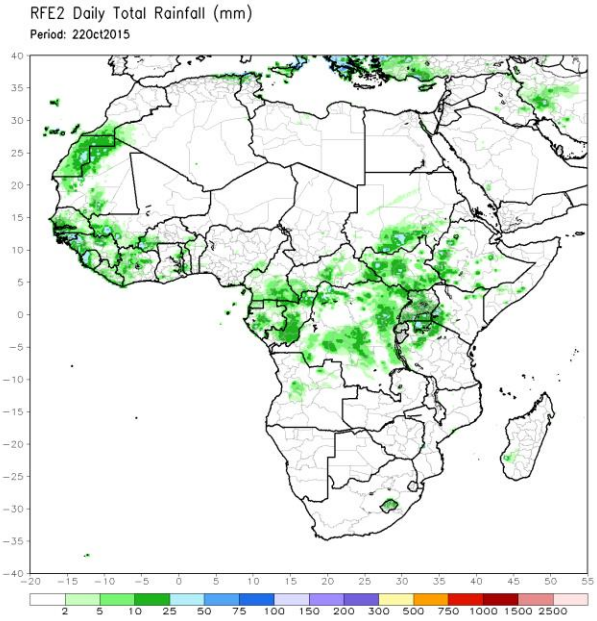
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (October 22, 2015)

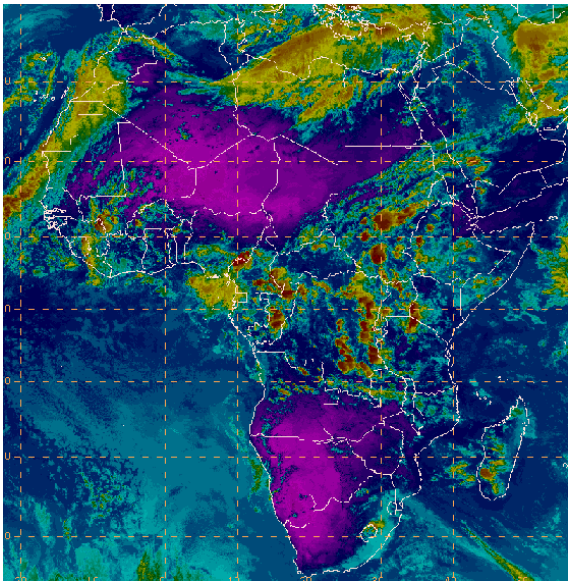
Moderate to locally heavy rainfall was observed over Guinea, Southern Mali, Ivory Coast, Southern Mali, Liberia, Ghana, Togo, Gabon, Congo, CAR, DRC, Sudan, Kenya, Uganda, South Sudan, Ethiopia and Somalia.

2.2. Weather assessment for the current day (October 23, 2015)

Convective clouds are observed in some parts of West Africa namely Guinea and Coastal areas of Nigeria while Cameroon, Southern Chad, Gabon, Congo, Angola. CAR, DRC and some places in East Africa, South Sudan, Kenya, Uganda, Somalia and Ethiopia. Dust plume observed over Niger, Chad, Mali and Algeria.



IR Satellite Image (valid 1500 of October 23, 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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