



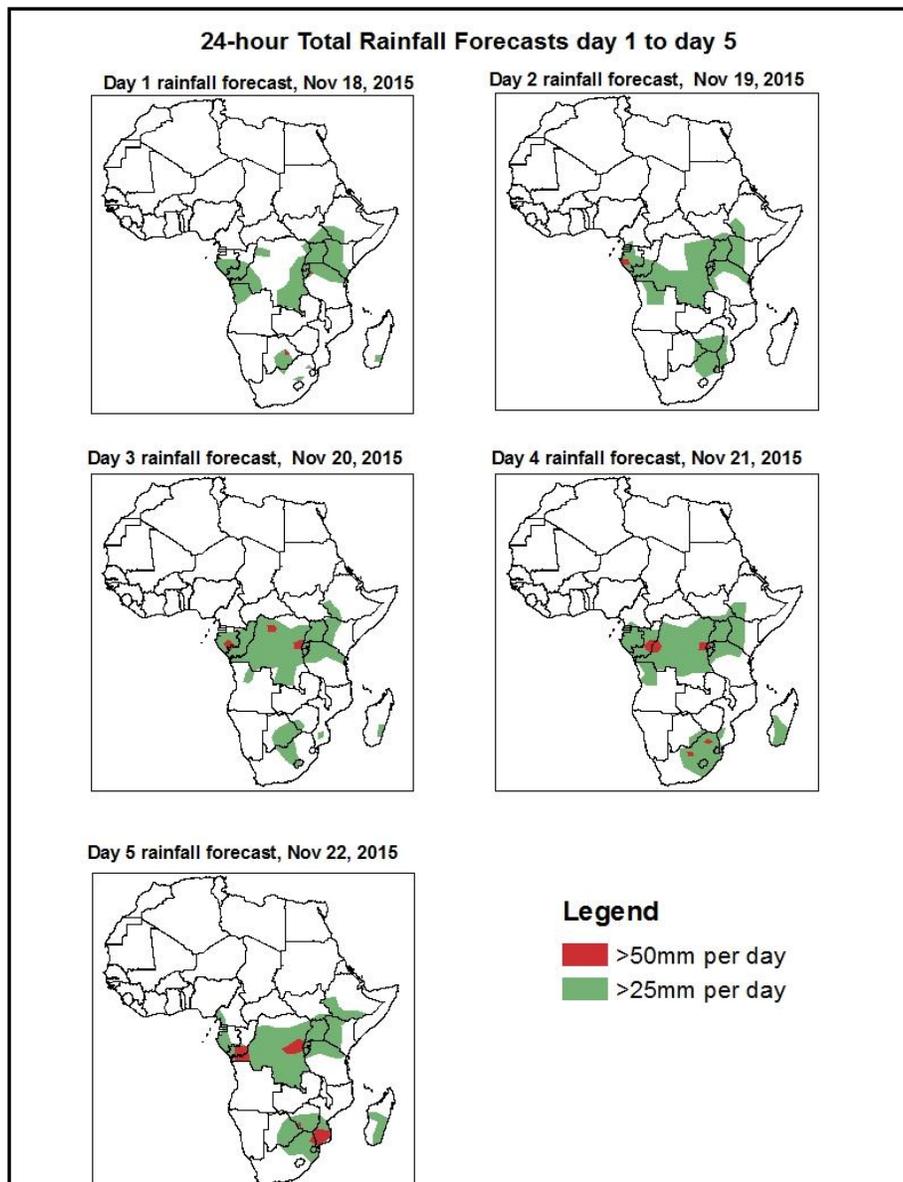
# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1. Rainfall and Dust Concentration Forecasts

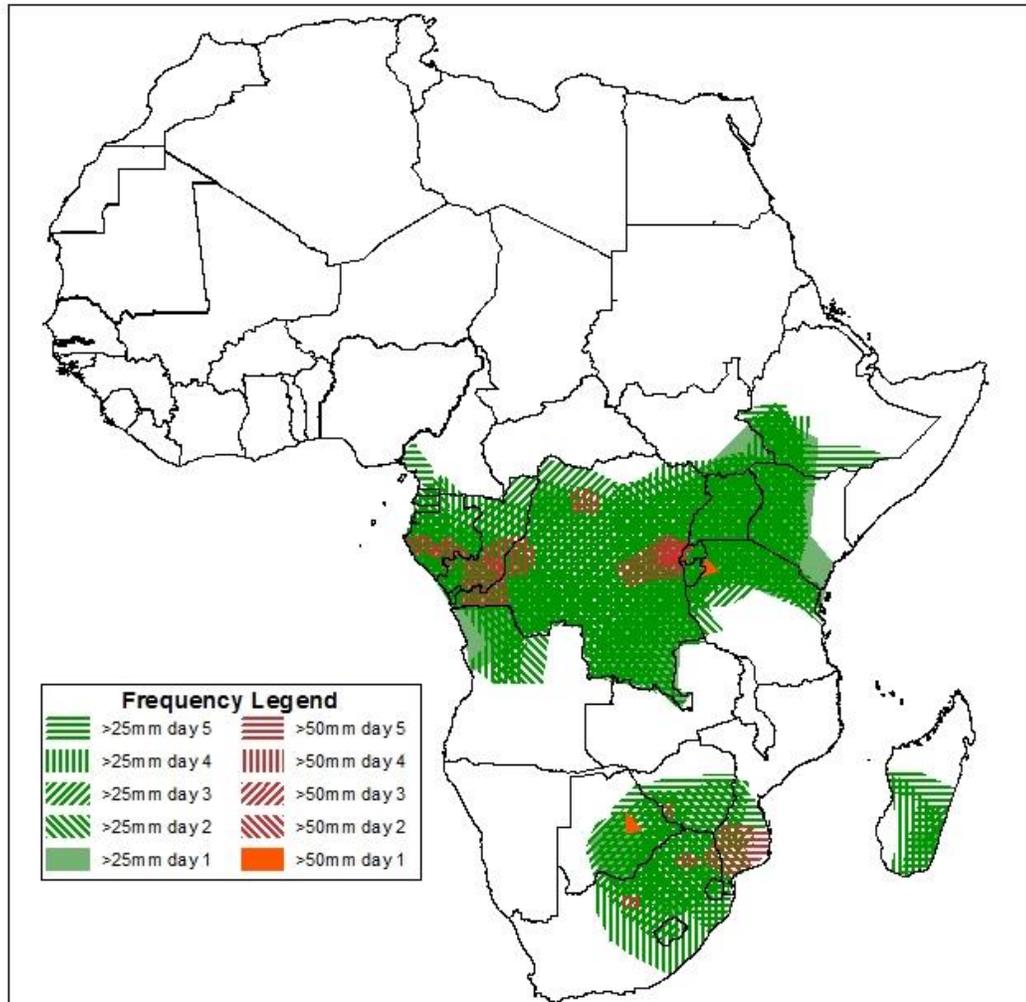
Valid: 06Z of Nov 19 – 06Z of Nov 23, 2015. (Issued on November 18, 2015)

### 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 18 - 22th November, 2015

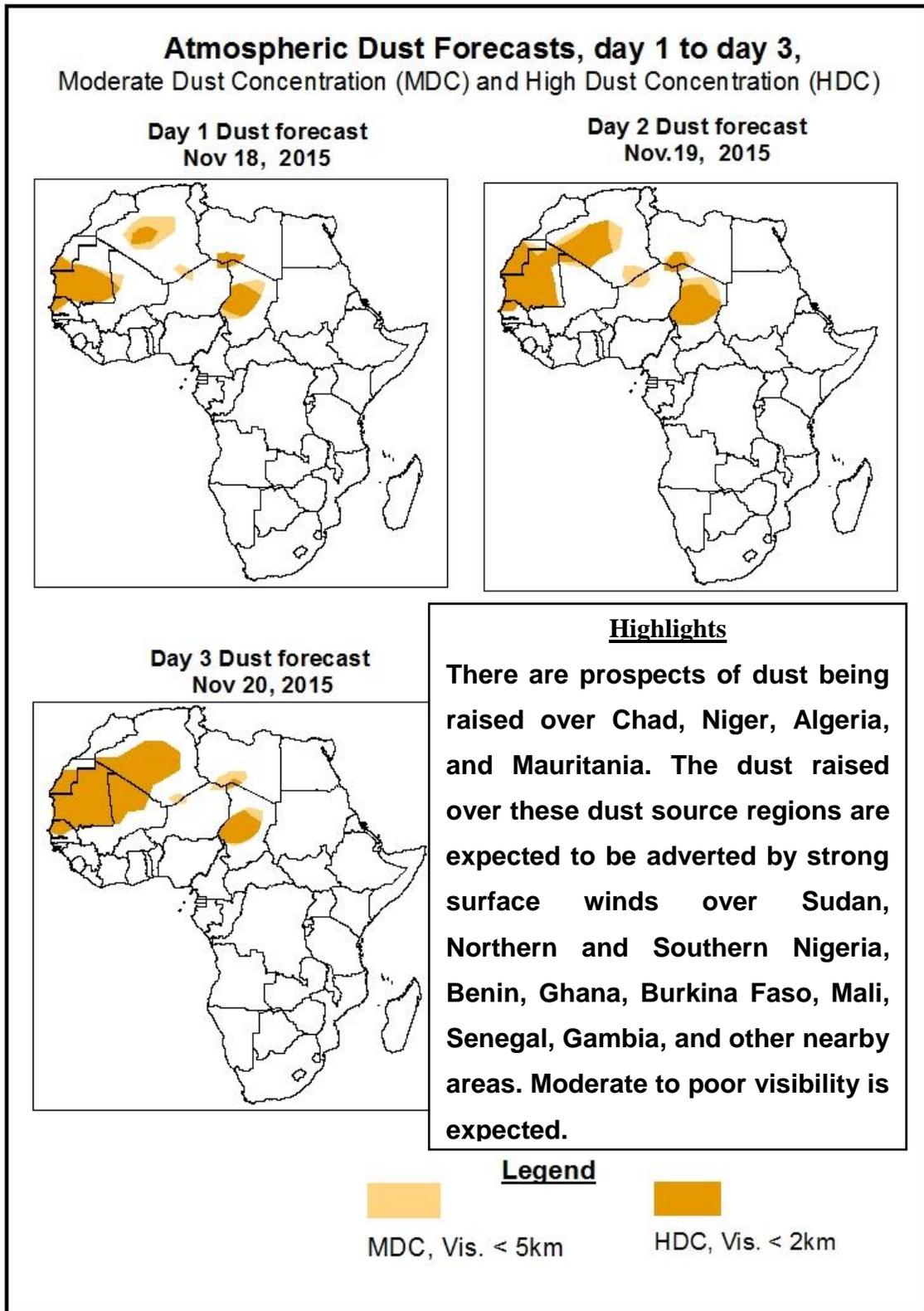


Forecast review of rainfall estimate and distribution for the next five days over West, central, East and Southern Africa reveals that the North easterly trade wind is presently well established over its counterpart the southwesterly trade wind over West Africa, Chad and Sudan. The Intertropical Discontinuity (ITD) is propagating towards its minimum position southwards. The ITD is expected to propagate between 6 and 8 degrees north of the Equator. In view of above, few event of rainfall is expected over the Coastlines of West African region. The meridional convergence over DRC and the East African monsoon are still expected be active; therefore rainfall is expected to continue over most part of Central, Eastern and the Horn of Africa. Convection and low level moisture convergence from the Indian Ocean has prompted rainfall over the South African region. Therefore the following places are expected to have moderate to heavy rainfall Southern Cameroun, Gabon, Congo, Equatorial Guinea, DRC in Central Africa and South Sudan, Kenya, Uganda, Rwanda, Burundi, Tanzania, and Angola in East Africa. Ethiopia in the horns of Africa. South Africa, Mozambique, Zimbabwe, Botswana, Lesotho and Swaziland in Southern Africa. Moderate to heavy amount of rain is also expected over the island of Madagascar.

## 1.2. Atmospheric Dust Concentration Forecasts

Valid: 12Z of Nov 19– 12Z of Nov 21, 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: 19 – 23 November, 2015**

The Azores high pressure system is expected to intensify in the next 48 hours, its central value will increase from 1029 mb to 1033 mb. This High pressure system will intensity further by 7 mb in the next 72 hours, thereby having a central pressure value of 1040 mb. It will then weaken from 1040 to 1033 mb at the end of the forecast period according to GFS models.

The Libyan high pressure system which is an extension or a cut off High from Azores 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 still expected over the dust source regions of West and Northern Africa during the upcoming days. 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 St Helena high pressure system at the beginning of the forecast period had a central pressure value of 1019 mb. This high pressure system is expected to intensify in the next 48 hours, by 15 mb with its center pressure value increasing from 1019 to 1034 mb. It will weaken from 1034 to 1032 mb in the next 72 hours. By the end of the forecast period, it is expected that this high pressure system will weaken further to 1026 mb according to GFS Models. This pressure system was observed to have moved away remarkably from the coast of Western Africa, but moved closer to the tips of southern Africa, towards the end of the forecast period.

The Mascarene high pressure system is expected to weaken from 1026 to 1022 mb in the next 24 hours. It will intensify in the next 48 hours by 2 mb. Its central pressure values increasing from 1022 mb to 1024 mb. This pressure system will intensify again by 4 mb, having a central pressure of 1028 mb. At the end of the forecast period according to the GFS model it is expected that the Mascarene high pressure system will weaken by 7 mb, Thereby having a central pressure value of 1021 mb. This high pressure system was observed to have moved away remarkably from the coastline of southern African and moved deeper into the Indian Ocean. Its current position has given room for maritime winds and active convection to start taking over that region.

Isolated cut off low pressure systems were observed over West, Central, Eastern and Southern Africa. The central pressure values of these thermal Lows observed over West and Eastern Africa did not retort remarkably to thermal heating, thereby causing their central pressure values to remain stationery. Their center values deepen from 1010 mb to 1008 mb over East and Western Africa. At the end of the forecast period, the center pressure values of these isolated thermal low were observed to fill back from 1008 to 1011 mb at the end of the forecast period. Thermal low pressure systems were also observed over Southern Africa and the deepen remarkably within the forecast period.

At 925 mb streamlines; 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 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, and DRC. Maritime wind flow patterns from the Indian Ocean were also observed streaming into the inlands of Kenya, Uganda, Tanzania, Malawi, Zambia, thereby establishing the Congo boundary convergence. Indian Ocean monsoon was also observed over Mozambique, Malawi, Botswana, Swaziland and Lesotho in Southern Africa. Whereas The Northeasterly continental wind flow pattern was predominantly 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 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, Southern Sudan and DRC in Central Africa and Kenya. Burundi, Rwanda, Uganda, Ethiopia and Somalia in East Africa. Also a low pressure system was observed over Tanzania and Botswana. Maritime winds from the Indian Ocean were also observed over Mozambique, Swaziland and Lesotho in Southern Africa.

At 700 mb streamlines; a wet ridge was observed over west part of South Africa. High pressure systems 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. The winds were observed at this level to converge over Tanzania and DRC. Anticyclonic flows were also observed over Angola and Namibia within the forecast period. 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 streamlines; Anticyclonic flow patterns were observed over West, central and Eastern Africa whereas over South Africa a cyclonic flow pattern was observed. 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 17, 2015)

Evaluation of weather assessment for the previous day over Africa revealed that there were few cases of moderate to heavy rainfall over West Africa namely Ivory Coast and Ghana. This is due to the fact that raining season is at its cessation stage in that part of the continent. In central Africa, Equatorial Guinea, Gabon, CAR, DRC, South Sudan, and Angola recorded moderate to heavy rainfall. Also Kenya, Tanzania, Zambia and Ethiopia recorded moderate to Heavy rainfall. Over Southern Africa; Botswana, Namibia, South Africa and Madagascar also recorded the same.

### 2.2. Weather assessment for the current day (November 18, 2015)

Convective, dense clouds with small and large ice particles observed over Cameroon, Equatorial Guinea, Gabon, Congo, Angola and DRC in central Africa. Same convective cloudy were observed over South Sudan, Kenya, Angola, Uganda, Tanzania, and Ethiopia in East Africa. Likewise Zambia, Zimbabwe, Botswana, Swaziland and Mozambique in South Africa, Dust plume observed over Senegal, Gambia, Western Sahara, Algeria, Southern Mauritania, Guinea, Mali, Burkina Faso, Ghana, Niger, Benin, Togo, Northern and Southern Nigeria, Chad and Sudan.

