



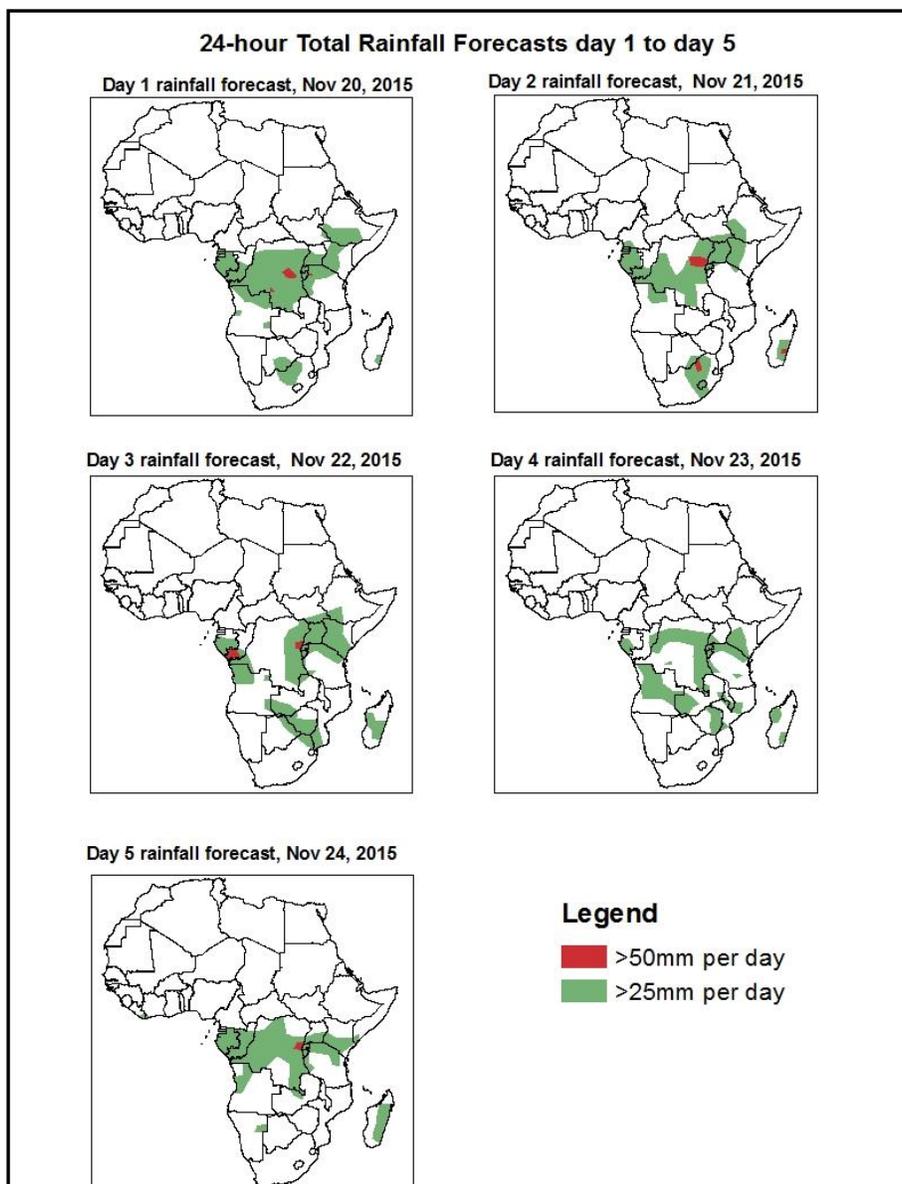
# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1. Rainfall and Dust Concentration Forecasts

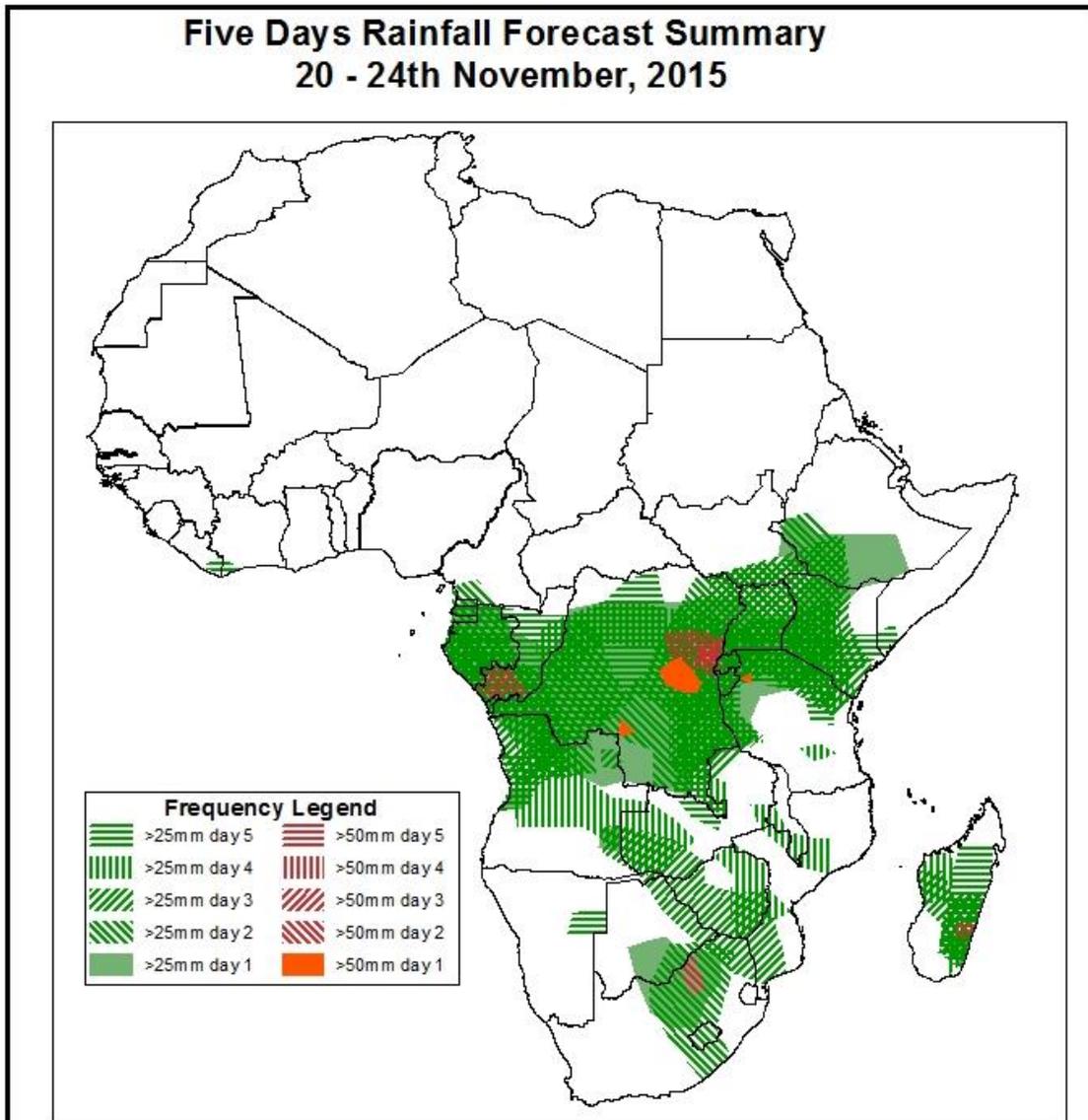
Valid: 06Z of Nov 20 – 06Z of Nov 24, 2015. (Issued on November 19, 2015)

### 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 20 - 24th November, 2015

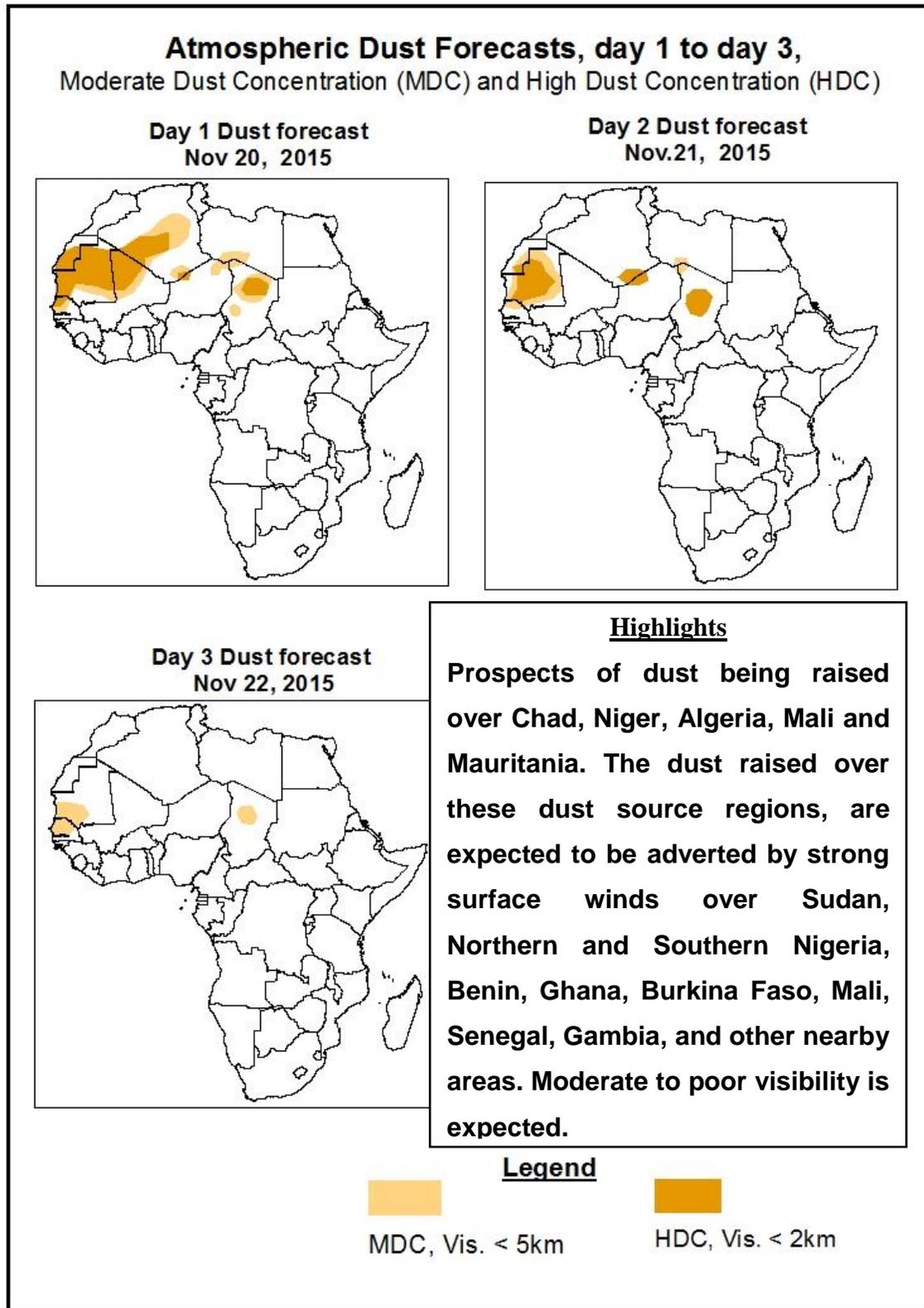


Prognostic evaluation of rainfall estimate and distribution for the next five days over West, central, East and Southern Africa reveals that the North easterly trade wind is presently well established over its counterpart the southwesterly trade wind over West Africa, Chad and Sudan. The Intertropical Discontinuity (ITD) is propagating towards its minimum position southwards. The ITD is expected to propagate approximately between 6 and 8 degrees north of the Equator. In view of above, few incident 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 East part of Southern Africa. Therefore the following places are expected to have moderate to heavy rainfall; Liberia, Ivory Coast, Cameroun, Gabon, Congo, DRC, South Sudan, Kenya, Uganda, Rwanda, Burundi, Tanzania, Angola. Ethiopia, East part of South Africa, Mozambique, Zimbabwe, Botswana, Lesotho, Namibia and Swaziland. Moderate to heavy volume of rainfall is also expected over the island of Madagascar.

## 1.2. Atmospheric Dust Concentration Forecasts

Valid: 12Z of Nov 20– 12Z of Nov 22, 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: 20 – 24 November, 2015**

The Azores high pressure system is expected to intensify in the next 48 hours, its central value will increase from 1031 mb to 1040 mb. This High pressure system will weaken by 5 mb in the next 72 hours; thereby having a central pressure value of 1035 mb. It will then weaken further from 1035 to 1034 mb in the next 96 hours. This pressure system will intensify by 1 mb, thereby having a central value of 1035 mb by 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, between 14 and 15 degrees north of the Equator approximately, 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 1032 mb. This high pressure system is expected to intensify in the next 48 hours, by 7 mb with its center pressure value increasing from 1032 to 1039 mb. It will weaken from 1039 to 1029 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 1023 mb according to GFS Models. This pressure system was observed throughout the forecast period to have moved away remarkably from the coast of Western Africa reposition itself well into the Atlantic Ocean, moving over southern Africa. This was observed on the 72 hours surface prognostic charts. This feature mentioned above will most likely cut off convection from the surface and enhance the formation of more stratiform clouds over the South African region

The Mascarene high pressure system is expected to intensify from 1020 to 1025 mb in the next 24 hours. It will intensify further in the next 48 hours by 4 mb. Its central pressure values increasing from 1025 mb to 1029 mb. This pressure system will then weaken by 3 mb, having a central pressure of 1026 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 2 mb, thereby having a central pressure value of 1024 mb. This high pressure system was observed to have moved away remarkably from the coastline of southern Africa and moved deeper into the Indian Ocean just like the previous days. 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 that were observed over West and Eastern Africa did not respond remarkably to thermal heating, thereby causing their central pressure values to remain stationary. 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 instituting 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 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 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, Zimbabwe, Swaziland and Lesotho in Southern Africa.

At 700 mb streamlines; a wet ridge was observed over east 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. Anticyclone was observed over Botswana in the next 72 hours, thereby inducing anticyclonic wind flow patterns over Zambia, Namibia, Zimbabwe, Swaziland and Lesotho. The easterly jets are 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; Anticyclonic flow patterns were observed over West, central and Eastern Africa. Over South Africa anticyclonic flow patterns was also observed. The jets associated with this flow pattern had moderate to strong wind speeds.

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## 2.0. Previous and Current Day Weather over Africa

### 2.1. Weather assessment for the previous day (November 18, 2015)

Evaluation of weather assessment for the previous day over Africa revealed that only Ivory Coast recorded cases of moderate to heavy rainfall over West Africa. This is due to the fact that this is almost the end of rainfall season in that part of the continent. In central Africa, Gabon, Congo, and DRC recorded moderate to heavy rainfall. Also Kenya, Tanzania, Zambia and Somalia 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 19, 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, Swaziland, Mozambique, South Africa in Southern Africa, Significant presence of Dust particles suspended in the atmosphere were observed over Senegal, Gambia, Western Sahara, Algeria, Southern Mauritania, Guinea, Mali, Burkina Faso, Ghana, Niger, Benin, Togo, Northern, central and Southern Nigeria, Chad and Sudan.

