

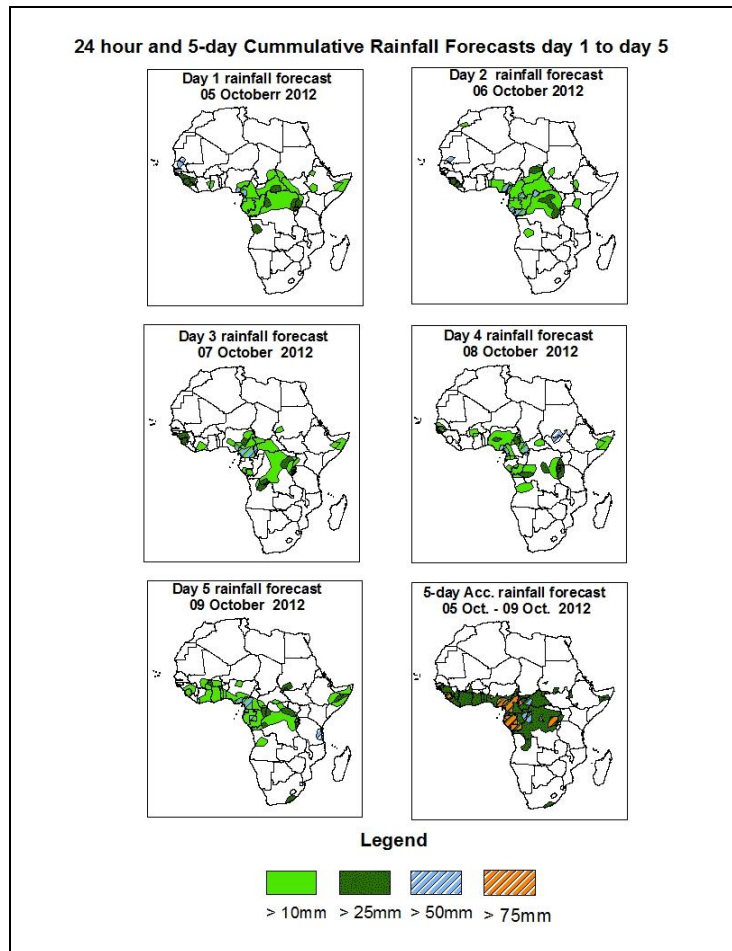


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid 06Z of October 05<sup>th</sup> – 06Z of October, 09<sup>th</sup> 2012. (Issued at 13:00Z of October, 04<sup>th</sup> 2012)

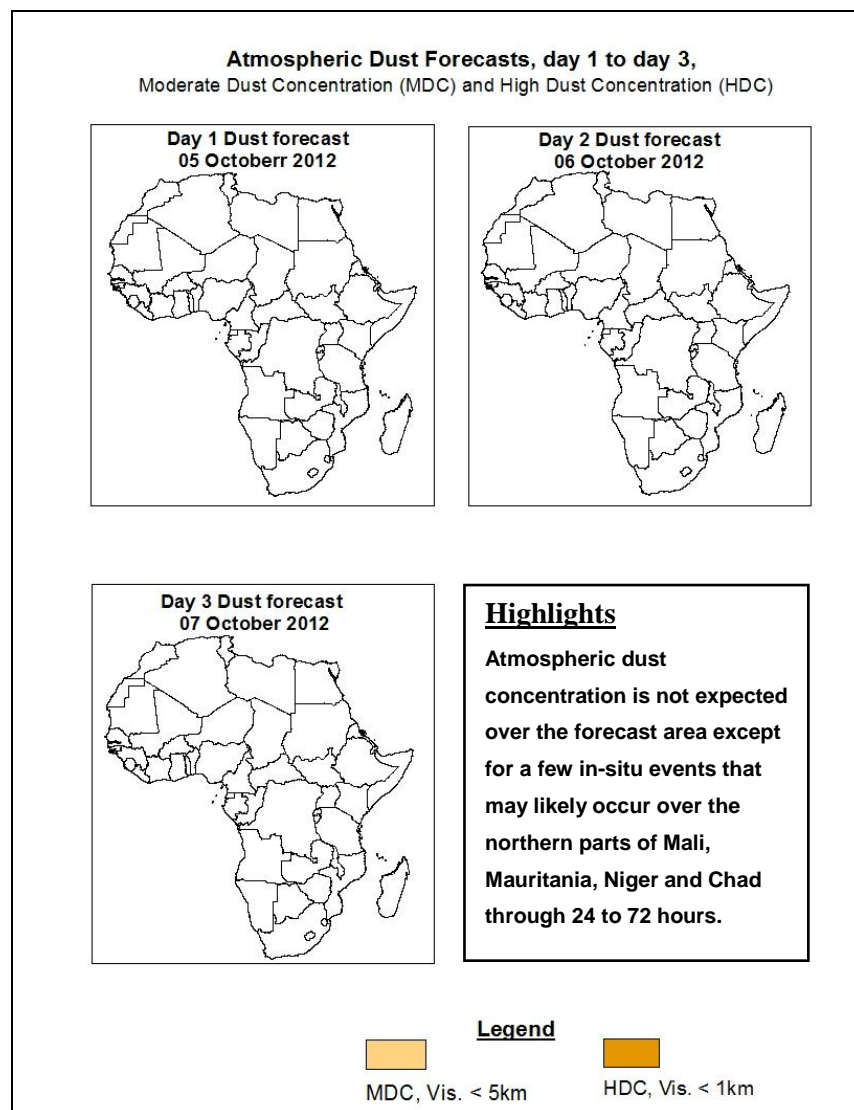
### 1.1. Twenty Four Hour Cumulative Rainfall Forecasts

The forecasts are expressed in terms of 75% probability of precipitation (POP) exceeded, based on the NCEP, UK Met Office and the ECMWF NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.



### Summary

In the next five days, ITD is expected to fluctuate between 05°N and 10°N with moderate to strong monsoon depth within 24 to 120 hours; also the TEJ, AEJ and the AEW propagation with vortices within the 850 to 700hpa pressure level fields are expected to enhance rainfall activities over parts of South Sudan Republic, Cameroon and Nigeria; South Chad; portions of the Sahel Region, Sierra Leone and Guinea Conakry; Northern Guinea Gulf Countries; part of Central African Republic; West and North Ethiopia.



### 1.3. Model Discussion: Valid from 00Z of October, 04<sup>th</sup> 2012.

The heat lows over Mauritania, Mali, Algeria, Niger, Chad and Sudan are expected to fluctuate in their positions while deepening and filling up and vice versa, through 24 to 120 hours, according to the GFS, ECMWF and UKMET models.

According to the GFS model, a thermal low over Mauritania (1010hpa) in 24 hours is expected to decrease to 1009hpa central value in 72 hours and tends to maintain this core value through 72 to 120 hours over the country. The second low over south Algeria and Mali (1008hpa) in 24 hours is expected to decrease its core value to 1007hpa in 48 hours and tends to increase to 1009hpa central value through 72 to 120 hours. The third low over North Chad and Niger (1006hpa) in 24 hours is expected to increase in value to 1007hpa in 48 hours and tends to decrease to 1006hpa through 96 to 120 hours;

while the low over North Sudan (1005hpa) in 24 hours is expected to maintain this core value through 48 to 120 hours.

The ECMWF model shows a thermal low over the east Mauritania (1010hpa) in 24 hours that is expected to increase to 1011hpa in 72 hours and tends to maintain this core value through 96 to 120 hours over Mauritania. The second low over South Algeria and North Mali (1009hpa) in 24 hours is expected to increase in central value to 1010hpa in 72 hours and tends to maintain the 1010hpa core value through 96 to 120 hours. The third low over North Chad and Niger (1008hpa) in 24 hours is expected to increase to 1010hpa in 72 hours and tends to maintain this central value through 96 to 120 hours; while the low over North Sudan (1007hpa) in 24 hours is expected to increase to 1008hpa in 72 hours and tends to maintain this core value through 72 to 120 hours.

The UKMET model shows a thermal low over north and central Mauritania (1011hpa) in 24 hours is expected to decrease to 1010hpa in 72 hours and maintains this core value through 96 to 120 hours. The second low over south Algeria and north Mali (1009hpa) in 24 hours is expected to increase to 1010hpa in 48 hours and tends to fluctuate between 1009hpa and 1010hpa central values through 48 to 120 hours. The third low over North Chad and Niger (1008hpa) in 24 hours is expected to maintain this central value through 48 to 120 hours; while the low over North Sudan (1005hpa) in 24 hours is expected to maintain this core value through 48 to 120 hours.

According to the UKMET model, the St. Helena High pressure system over South Atlantic Ocean with a core value of 1035hpa in 24 hours locates at latitude 35°S is expected to gradually increase to 1039hpa in 96 hours and tends to decrease significantly to 1032hpa through 96 to 120 hours while fluctuating between latitudes 30°S and 40°S.

According to the ECMWF model, the central pressure value of 1035hpa in 24 hours locates at latitude 35°S is expected to gradually increase to 1037hpa in 96 hours and tends to decrease significantly to 1031hpa through 96 to 120 hours while fluctuating between latitudes 30°S and 40°S.

Lastly, according to the GFS model, the central pressure value of 1035hpa in 24 hours locates at latitude 35°S is expected to gradually increase to 1036hpa in 72 hours and tends to decrease significantly to 1031hpa through 96 to 120 hours while fluctuating between latitudes 30°S and 40°S.

According to the GFS model, the Azores high pressure system over North Atlantic Ocean with its central pressure value of 1019hpa in 24 hours and locates at longitude 0° is expected to steadily increase in value to 1027hpa through 48 to 120 hours while moving westwards to longitude 45°W.

According to the ECMWF model, the central pressure value of 1019hpa in 24 hours and locates at longitude 15°W is expected to steadily increase in value to 1023hpa in 96 hours and tends to decrease to 1020hpa in 120 hours while fluctuating between longitudes 05°W and 50°W

Lastly, according to the UKMET model, the central pressure value of 1019hpa in 24 hours and locates at longitude 0° is expected to steadily increase in value to 1031hpa through 48 to 120 hours while moving westwards to longitude 50°W.

At 925hpa level, a zone of moderate dry northerly and northeasterly winds (25kts) is expected to prevail over central Algeria, north Chad, north Mauritania, north Mali, north Sudan and north Niger through 24 to 72 hours.

At the 850hpa level, a lower tropospheric wind convergence associated with a weak West African Monsoon inflow and depth between latitude 08°N and 10°N is expected to prevail over parts of Mauritania, Mali, Niger, Sudan, Chad and Western Africa through 24 hours to 120 hours. Dry continental winds appear to prevail over most parts of West Africa. Vortices are expected over the south of Nigeria, north Cameroon, south Benin Republic, south Chad and south Central Africa Republic. The convergence associated with the meridional arm of the ITCZ is expected to oscillate between portions of South Sudan Republic; North and Central Democratic Republic of Congo; West and North Uganda; South and East Central African Republic and the Great Lake Countries through 24 hours to 120 hours and supplying some of the moisture over that area.

At 700hpa level, the AEJ with a core value between 30 to 40 knots is expected to affect parts of Togo, Benin Republic, Ghana, Nigeria, Senegal, Burkina Faso and Mali. The African Easterly Waves (AEW) is also expected to propagate westwards affecting parts of Chad, Democratic Republic of Congo, Guinea-Conakry, Cote d'Ivoire, Cameroon, Central African Republic, South Sudan Republic, Gambia and Nigeria within 24 to 120 hours. Vortices are expected over parts of Nigeria and Cameroon.

At 500hpa level, a wave is expected to affect parts of Ethiopia, Sudan, Liberia, Guinea-Conakry, Nigeria, Niger, Cameroon, Central Africa Republic, Senegal, Ghana, Togo, Benin Republic, Cote d'Ivoire, Democratic Republic of Congo, Chad, South Sudan Republic and Gambia, through 24 to 120 hours with no visible vortices observed within 24 to 120 hours.

At 150mb, the Tropical Easterly Jets are weak with a maximum core of 05 to 15 Knots and no easterly orientation to the wind flow, but will continue to affect most parts of West Africa, Chad, Cameroon, South Sudan Republic, the South Guinea Gulf Countries; parts of Ethiopia, Kenya and Central African Republic, and North Sudan through 24 to 120 Hours.

In the next five days, ITD is expected to fluctuate between 05°N and 10°N with weak to moderate monsoon depth within 24 to 120 hours; also the TEJ, AEJ and the AEW propagation with vortices within the 850 to 700hpa pressure level fields are expected to contribute in enhancing rainfall activities over parts of South Sudan Republic, Cameroon and Nigeria; South Chad; portions of the Sahel Region, Sierra Leone and Guinea Conakry; Northern Guinea Gulf Countries; part of Central African Republic; West and North Ethiopia.

Atmospheric dust concentration is not expected over the forecast area except for a few in-situ events that may likely occur over the northern parts of Mali, Mauritania, Niger, Algeria, Chad and Sudan through 24 to 72 hours.

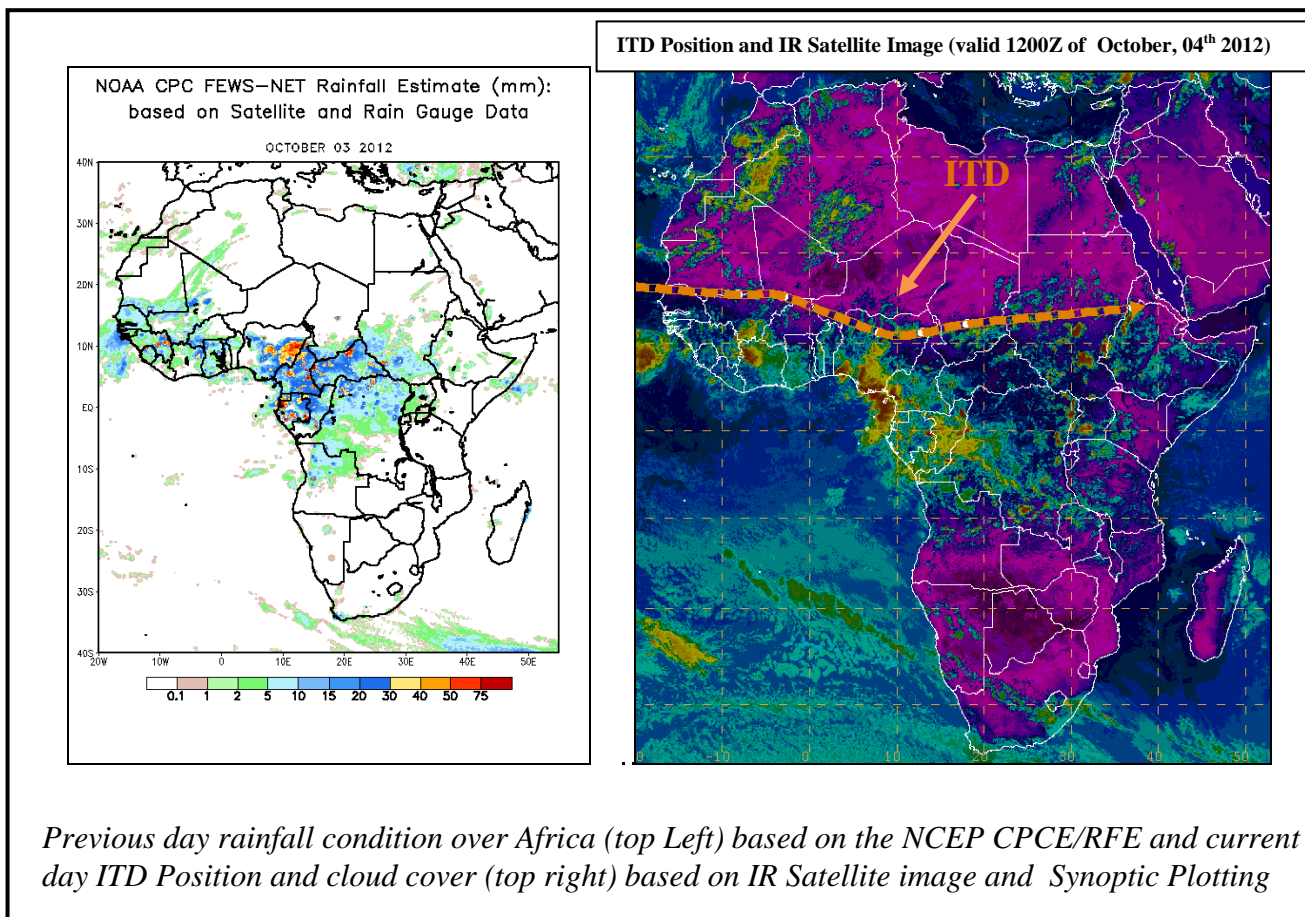
## 2.0. Previous and Current Day Weather Discussion over Africa (October, 03<sup>rd</sup> 2012 – October, 04<sup>th</sup> 2012)

### 2.1. Weather assessment for the previous day (October, 3<sup>rd</sup> 2012)

During the previous day, moderate to heavy rainfall was observed over parts of Mauritania; Togo; Algeria; Guinea Conakry; Cote d'Ivoire; Congo; Gabon; Sierra Leone; Mali; Niger; Nigeria; Chad; Cameroon; Democratic Republic of Congo; Central African Republic; South Sudan Republic; Ethiopia; Angola; Ghana; Burkina Faso and Gambia.

### 2.2. Weather assessment for the current day (October, 04<sup>th</sup> 2012)

Convective activities observed across parts of Mali; Niger; Burkina Faso; Nigeria; Chad; Democratic Republic of Congo; Cameroon; Congo; South Sudan Republic; Ethiopia; Uganda; Somalia; Zambia; Senegal; Guinea-Conakry; Sierra Leone; Ghana; Togo; Kenya; Zimbabwe; Gabon; Angola and Central African Republic.



**Author:** Izuchukwu Ebenebe, (Nigeria Meteorological Agency / CPC-African Desk); [izu.ebenebe@noaa.gov](mailto:izu.ebenebe@noaa.gov)