

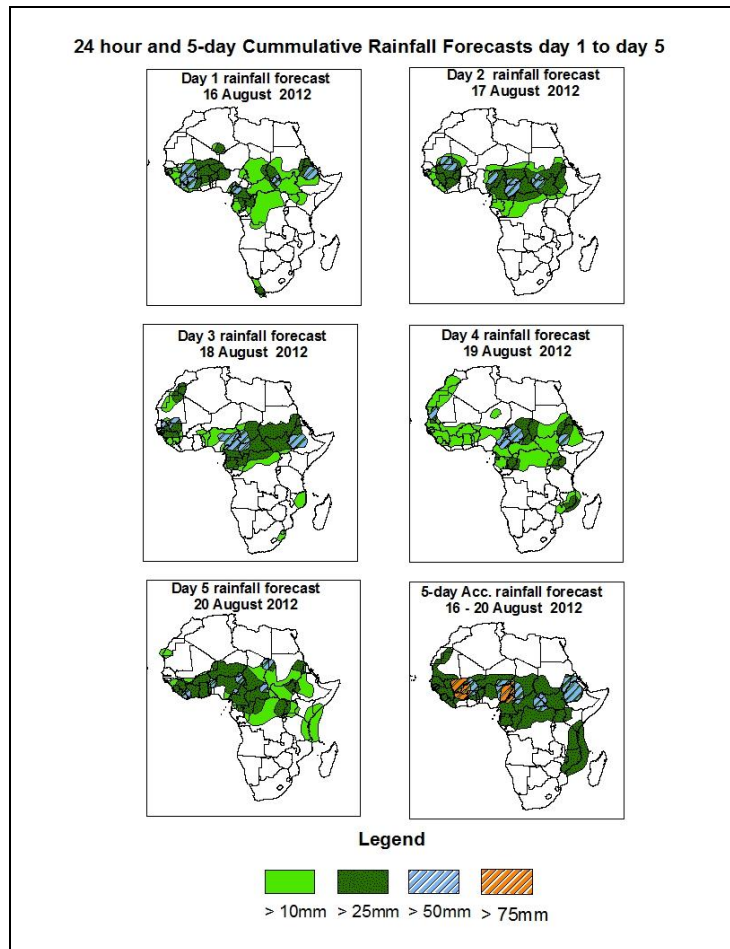


## NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

### 1.0. Rainfall Forecast: Valid 06Z of August 16<sup>th</sup> – 06Z of August, 20<sup>th</sup> 2012. (Issued at 13:00Z of August, 15<sup>th</sup> 2012)

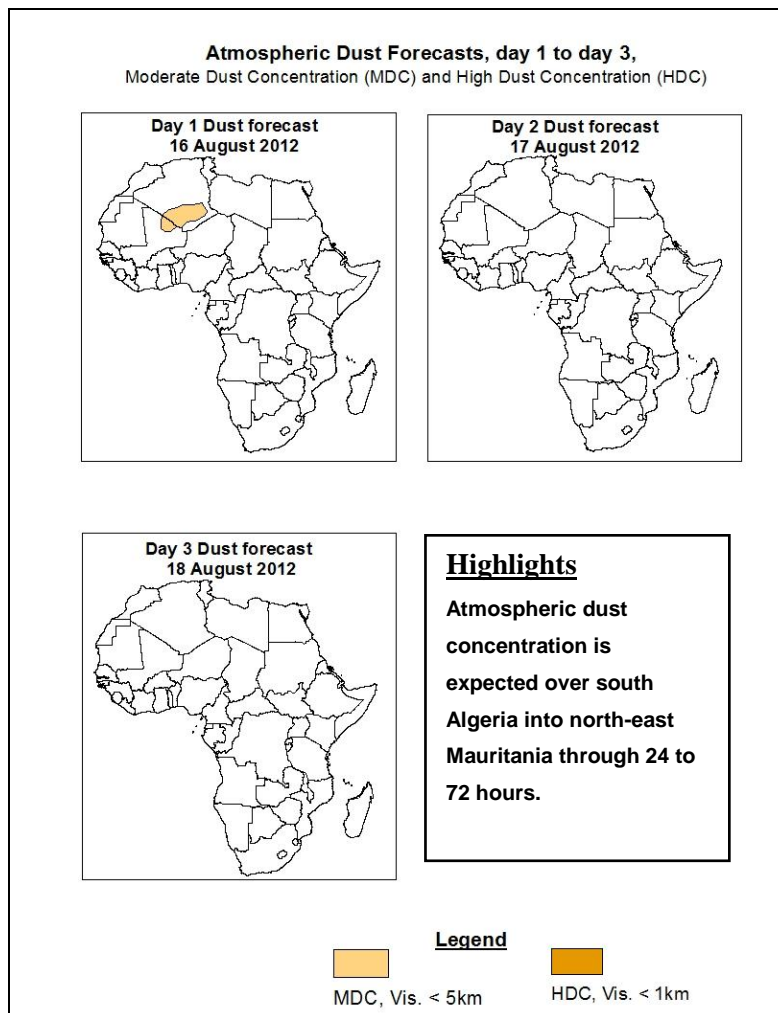
#### 1.1. Twenty Four Hour Cumulative Rainfall Forecasts

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 12°N and 23°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 August, 15<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 north, central and coastal Mauritania (1005hpa) in 24 hours is expected to steadily increase to 1010hpa through 48 hours to 96 hours, and tends to significantly decrease its core value to 1006hpa in 120 hours especially over east Mauritania. The second low over south and central Algeria and Mali (1005hpa) in 24 hours is expected to significantly increase its core value to 1010hpa in 48 hours, and then significantly decrease to 1004hpa in 72 hours, and tends to maintain its core value of 1004hpa through 96 to 120 hours. The third low over North Chad and

Niger (1009hpa) in 24 hours is expected to significantly decrease to 1005hpa through 48 to 72 hours and increase steadily to 1008hpa in 120 hours; while the low over North Sudan (1006hpa) in 24 hours is expected to maintain its core value at 1006hpa within 48 hours and thereafter decrease to 1004hpa in 72hours and tends to increase its core value to 1006hpa through 96 to 120 hours.

The ECMWF model shows a thermal low over North and Central Mauritania (1007hpa) in 24 hours is expected to increase to 1010hpa pressure value from 48 to 96 hours, thereafter significantly decrease to 1006hpa in 120 hours over east Mauritania. The second low over South Algeria and North Mali (1007hpa) in 24 hours is expected to increase its core value to 1009hpa in 48 hours, and then decrease to 1006hpa in 120 hours. The third low over North Chad and Niger (1010hpa) in 24 hours is expected to decrease in its core value to 1005hpa in 72 hours before increasing to 1010hpa through 96 to 120 hours; while the low over North Sudan (1006hpa) in 24 hours is expected to maintain almost the same core value through 48 to 120 hours.

The UKMET model shows a thermal low over north Mauritania (1005hpa) in 24 hours is expected to increase its core value to 1008hpa in 72 hours, and is expected to steadily decrease to 1004hpa through 96 to 120 hours. The second low over south Algeria and north Mali (1005hpa) in 24 hours is expected to significantly increase its core value to 1010hpa in 48 hours and to steadily decrease to 1004hpa through 72 to 120 hours. The third low over North Chad and Niger (1008hpa) in 24 hours is expected to steadily decrease to 1004hpa through 48 to 72 hours before a slight increase to 1006hpa in 120hours; while the low over North Sudan (1003hpa) in 24 hours is expected to maintain its core value at 1003hpa 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 1039hpa in 24 hours locates at latitude 35°S is expected to increase its core value to 1045hpa by moving southward to around latitude 40°S in 72 hours, and tends to decrease its cores value to 1038hpa by moving steadily northwards from latitude 40°S to 30°S through 96 to 120 hours.

According to the ECMWF model, the central pressure value of 1038hpa in 24 hours locates at latitude 35°S is expected to steadily increase its core value to 1045hpa by

moving southwards to around latitude  $40^{\circ}\text{S}$  within 72 hours, and tends to significantly decrease its core value to 1037hpa while moving northwards to latitude  $30^{\circ}\text{S}$  through 96 to 120 hours.

Lastly, according to the GFS model, the central pressure value of 1039hpa in 24 hours locates at latitude  $35^{\circ}\text{S}$  is expected to drop, and then increase its core value to 1046hpa by shifting southwards to latitude  $40^{\circ}\text{S}$  through 48 to 72 hours before moving northwards to latitude  $30^{\circ}\text{S}$  with a core value of 1036hpa in 120 hours.

According to the GFS model, the Azores high pressure system over North Atlantic Ocean with its central pressure value of 1024hpa in 24 hours and locates at longitude  $45^{\circ}\text{W}$  is expected to gradually decrease its core value to 1020hpa while shifting westwards to longitude  $55^{\circ}\text{W}$  in 96 hours, before a slight increase to 1023hpa while moving east to longitude  $20^{\circ}\text{W}$  in 120 hours.

According to the ECMWF model, the central pressure value of 1023hpa in 24 hours and locates at longitude  $45^{\circ}\text{W}$  is expected to gradually decrease its core value to 1020hpa while moving to the west from longitude  $45^{\circ}\text{W}$  to  $60^{\circ}\text{W}$  through 48 to 120 hours.

Lastly, according to the UKMET model, the central pressure value of 1023hpa within 24 and locates at longitude  $45^{\circ}\text{W}$  is expected to steadily decrease to 1019hpa through 48 to 120 hours while its position will move westwards to longitude  $55^{\circ}\text{W}$ .

At 925hpa level, a zone of moderate dry northerly and northeasterly winds (20 to 35kts) is expected to prevail over south Algeria, south Niger, east Mali and north Mauritania through 24 to 72 hours.

At the 850hpa level, a lower tropospheric wind convergence associated with strong and significant West African Monsoon inflow and depth between latitude  $12^{\circ}\text{N}$  and  $23^{\circ}\text{N}$  is expected to prevail over parts of Mauritania, Mali, Niger, Sudan, Cameroon, Chad, Central African Republic and Western Africa through 24 hours to 120 hours. Vortices are expected over north-east and west Niger; east and west Mali; central, east and coastal Mauritania; south-east Chad and north and east Sudan. 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; Great Lake Countries through 24 hours to 120 hours.

At 700hpa level, the AEJ with a core value between 30 and 50 knots is expected to affect parts of Algeria, Nigeria, Chad, Niger and Mauritania. Vortices are expected over parts of Sudan, Chad, Cameroon and Ethiopia. The African Easterly Waves (AEW) is also expected to propagate westwards affecting parts of Niger, Mali, Chad, Sudan, Central African Republic, Ethiopia, Burkina Faso, Algeria, Senegal, Cameroon and Mauritania within 24 to 120 hours.

At 500hpa level, a wave is expected to affect parts of Mali, Mauritania, Nigeria, Guinea-Conakry, Liberia, Togo, Niger, Benin, Cameroon, Ghana, Cote D'Ivoire, Burkina Faso and Chad, through 24 to 120 hours with vortices over north-central Nigeria in 120 hours.

At 150mb, the Tropical Easterly Jet with a maximum core of 25 to 65 Knots will affect portions of South Sudan Republic and South Guinea Gulf Countries; parts of Ethiopia, Cameroon, Kenya and Central African Republic; Easterly wind flow will also continue to affect most part of West Africa, Chad, Cameroon and Sudan through 24 to 120 Hours.

In the next five days, ITD is expected to fluctuate between 12°N and 23°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.

Atmospheric dust concentration is expected over south Algeria into north-east Mauritania through 24 to 72 hours.

## 2.0. Previous and Current Day Weather Discussion over Africa

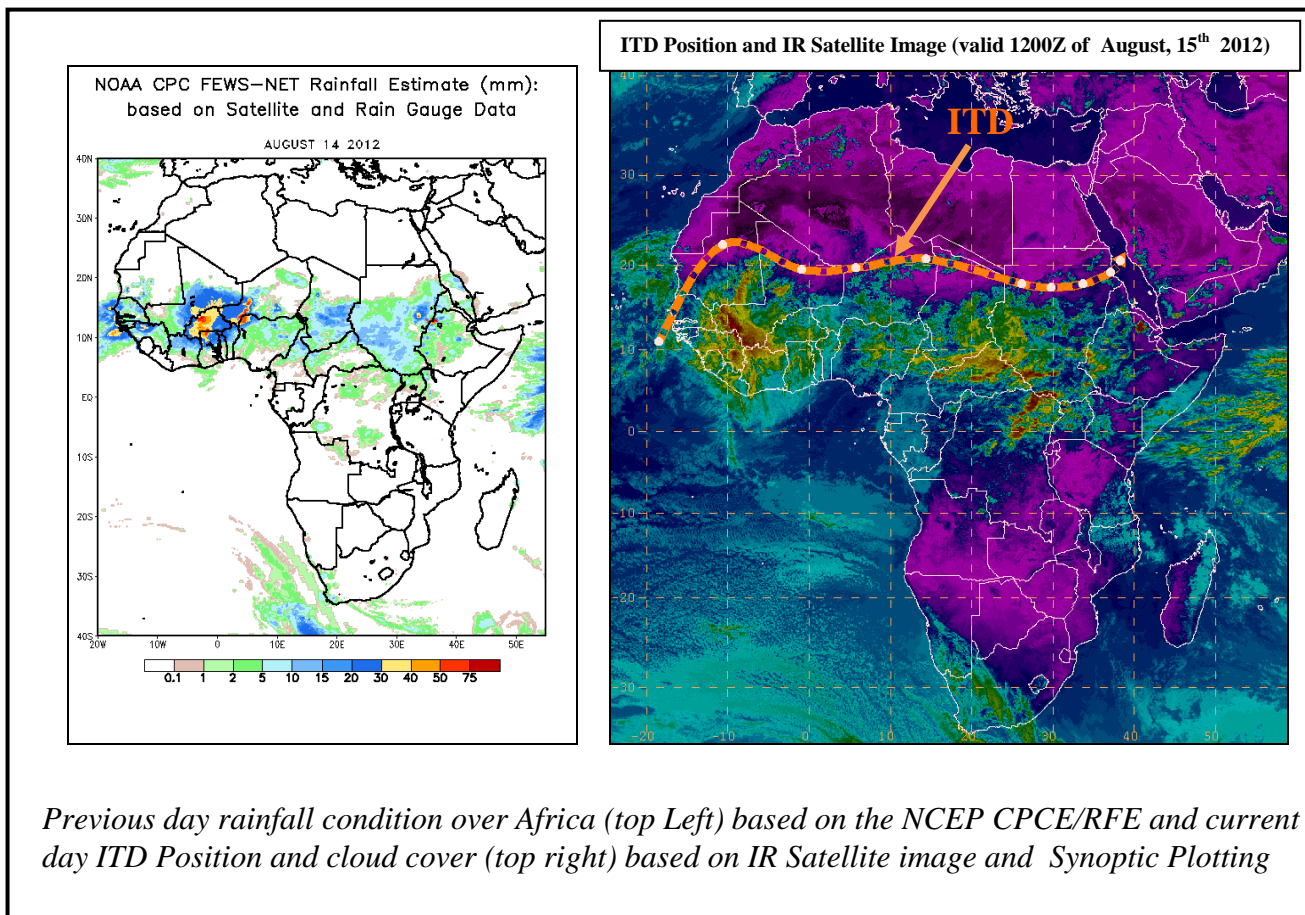
(August, 14<sup>th</sup> 2012– August, 15<sup>th</sup> 2012)

### 2.1. Weather assessment for the previous day (August, 14<sup>th</sup> 2012)

During the previous day, moderate to heavy rainfall was observed over parts of Guinea Conakry; Senegal; south Mauritania; south Mali; south Niger; north and central Nigeria; south and central Chad; North Cameroon; Democratic Republic of Congo; Central African Republic and South Sudan Republic; West Ethiopia; Uganda; Central African Republic and north Cameroon.

### 2.2. Weather assessment for the current day (August, 15<sup>th</sup> 2012)

Convective activities observed across south Mali; south Niger; Burkina Faso; Nigeria; south Chad; Democratic Republic of Congo; Cameroon; Congo; South Sudan Republic; western and central Ethiopia; Uganda; Somalia; south east Mauritania; Senegal; Guinea-Conakry; Sierra Leone; Ghana; Togo; Kenya; Somalia and Central African Republic.



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