

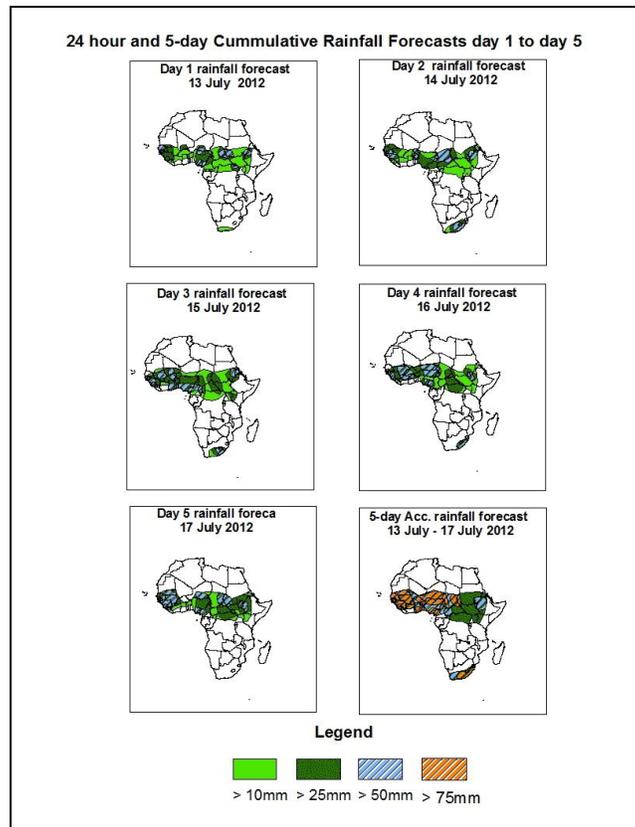


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid 06Z of July, 13<sup>th</sup> – 06Z of July, 17<sup>th</sup> 2012. (Issued at 13:00Z of July, 12<sup>th</sup> 2012)

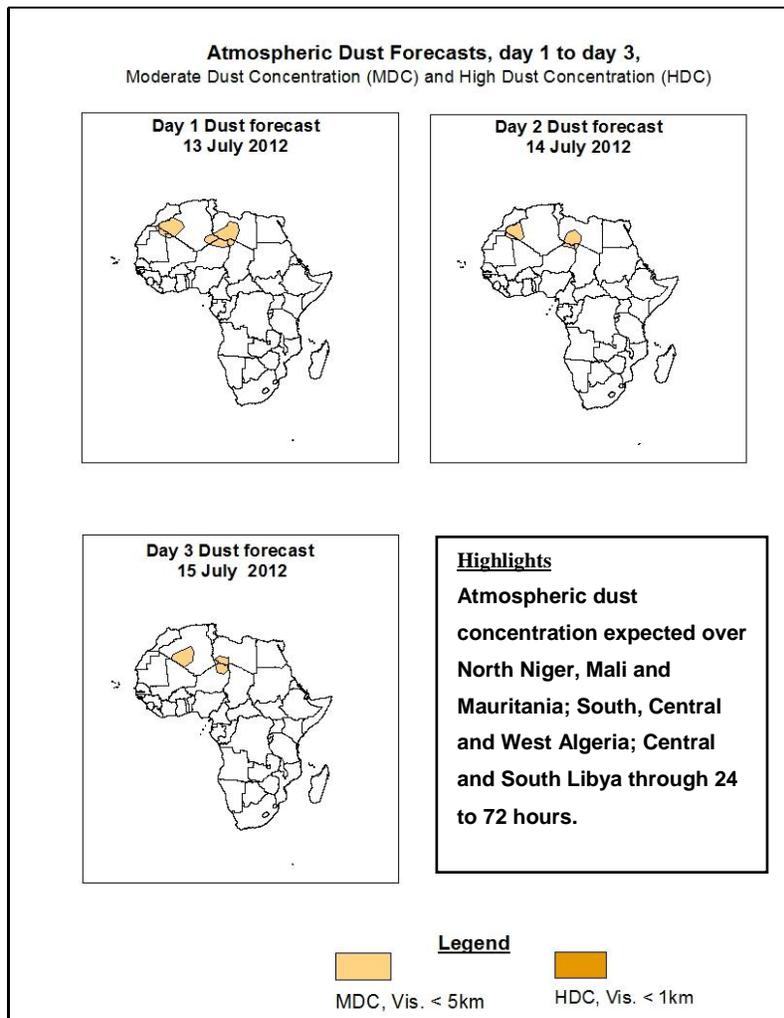
### 1.1. Twenty Four Hour Cumulative Rainfall Forecasts

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 17°E and 23°N with moderate to strong monsoon depth within 24 to 120 hours; Also the TEJ, AEJ and the AEW propagation with 850 to 700hpa vortices are expected to enhance rainfall activities over South and West Sudan; East and South Chad; North and Southwest Cameroon; North and Southeast Nigeria; Portion Central and South Sahel; North Guinea Gulf Countries; Part of Western Sahel, Sierra Leone and Guinea Conakry.



### 1.3. Model Discussion: Valid from 00Z of July, 12<sup>th</sup> 2012.

According to the GFS, ECMWF and UKMET models the heat lows are expected to deepen remain quasi-stationary, and then fill up and vice versa through 24 to 120 hours over Mauritania, Mali, Algeria, Niger, Chad and Sudan.

According to GFS model, a thermal low over West, Central and North Mauritania (1005hpa) in 24 hours is expected to decrease its core value to 1004hpa in 48 hours, and tends to increase to 1006hpa in 72 hours, then slightly decreases to 1005hpa within 96 to 120 hours. The second low over North Mali and South Algeria (1005hpa) in 24 hours is expected to increase its core value to 1006hpa in 48 hours, and tends to decrease it to 1004hpa in 72 hours, then slightly increases it to 1005hpa through 96 to 120 hours. The third low over North Chad and Niger (1005hpa) in 24 hours is expected to decrease its core value to 1004hpa within 48 to 72 hours, and tends to it increase

from 1006hpa to 1007hpa through 96 to 120 hours; while the low over North Sudan (1002hpa) in 24 hours is expected to increase its core value from 1004hpa to 1006hpa within 48 to 96 hours and tends to decrease it to 1004hpa in 120 hours.

The ECMWF model shows a thermal low over West, Central and North Mauritania (1006hpa) in 24 hours is expected to slightly increase its core value to 1007hpa in 48 hours, and tends to decrease it to 1005hpa in 72 hours, then slightly increases to 1006hpa through 96 to 120 hours. The second low over North Mali and South Algeria (1006hpa) in 24 hours is also expected to slightly increase its core value to 1007hpa in 48 hours, and tends to decrease to 1005hpa in 72 hours, and then slightly increase it to 1006hpa through 96 to 120 hours. The third low over North Chad and Niger (1007hpa) in 24 hours is expected to gradually decrease its core value to 1006hpa within 48 to 120 hours; while the low over North Sudan (1006hpa) in 24 hours is also expected to maintain almost its core value through 48 to 120 hours.

The UKMET model shows a thermal low over West, Central and North Mauritania (1004hpa) within 24 to 96 hours is expected to increase its core value to 1006hpa in 120 hours. The second low over North Mali and South Algeria (1006hpa) in 24 hours is also expected to gradually decrease its core value from 1005hpa to 1004hpa through 48 to 120 hours. The third low over North Chad and Niger (1005hpa) within 24 to 72 hours is expected to slightly decrease its core value to 1004hpa through 96 to 120 hours; while the low over North Sudan (1004hpa) in 24 hours is expected to maintain almost its core value within 48 to 120 hours.

According to the UKMET model, the St. Helena High pressure system over South Atlantic Ocean with a core value of 1045hpa in 24 hours locates at latitude 45°S is expected to gradually decrease from 10044hpa to 1033hpa through 48 to 120 hours by shifting northwards from latitude 40°S to 35°S.

According to the ECMWF model, the central pressure value of 1044hpa in 24 hours locates at latitude 40°S is also expected to gradually decrease from 1043hpa to 1034hpa by shifting northwards from latitude 40°S to 35°S through 48 to 96 hours and southwards from latitude 40°S to 35°S in 120 hours.

Lastly, according to the GFS model, the central pressure value of 1045hpa in 24 hours locates at latitude 40°S is expected to decrease its core value from 1044hpa to 1033hpa by shifting northwards from latitude 40°S to 35°S through 48 to 96 hours and southwards from latitude 40°S to 35°S in 120 hours.

According to the GFS model, the Azores high pressure system over North Atlantic Ocean with its central pressure value of 1033hpa in 24 hours and locates at longitude 40°W is expected to gradually decrease its core value from 1032hpa to 1028hpa within 48 to 72 hours by shifting westwards from longitude 40°W to 45°W, and tends to increase its core value from 1029hpa to 1031hpa by moving to the east from longitude 45°W to 10°W 120 through 96 to 120 hours.

According to the ECMWF model, the central pressure value of 1032hpa in 24 hours and locates at longitude 40°W is expected to gradually decrease its core value from 1031hpa to 1028hpa by shifting eastwards from longitude 40°W to 05°W within 48 to 120 hours.

Lastly, according to the UKMET model, the central pressure value of 1033hpa in 24 hours and locates at longitude 40°W is expected to decrease from 1032hpa to 1027hpa by moving eastwards from longitude 40°W to 15°W through 48 to 120 hours.

At 925hpa level, zone of moderate dry Northerly and Northeasterly winds (20 to 50kts) are expected to prevail over North Niger, Mali and Mauritania; South, Central and West Algeria; Central and South Libya through 24 to 72 hours.

At the 850hpa level, a lower tropospheric wind convergence associated with significant West African Monsoon inflow and depth between latitude 14°N 20°N is expected to prevail over parts of Sudan, Cameroon, Chad, Central African Republic and Western Africa within 24 hours to 120 hours. Vortices are expected over Mauritania; North Central African Republic and Cameroon; South, Central and North Niger; Mali; West Burkina Faso; East and South Chad; North Ghana and Togo; West Sudan; East Guinea Conakry. The convergence associated with the meridional arm of the ITCZ is located over part of South Sudan Republic; North Democratic Republic of Congo; West Uganda; East and South Central African Republic through 24 hours to 120 hours.

At 700hpa level, the African Easterly Jet (AEJ) is expected to affect North Nigeria, Ghana, Cote d'Ivoire, Guinea Conakry; South Senegal; East Guinea Bissau and Gambia; Central, South and West Mauritania; West Mali. The African Easterly Waves (AEW) is also expected to propagate westwards waves to affect portion of Central Africa; part of Sahel Region and Guinea Gulf Countries within 24 to 120 hours.

At 500hpa level, a wave is expected to affect part of Sahel Region, Central African Republic, Guinea Gulf Countries; West Sudan; East, South and West Chad; North Cameroon through 24 to 120 hours.

At 150mb, the Tropical Easterly Jet with a maximum core of 35 to 70 Knots will affect Southern Chad and Sudan; Part of Ethiopia, Guinea Gulf Countries and Central African Republic through 24 to 120 Hours. Easterly winds flow will also continue to affect most part of West Africa.

In the next five days, ITD is expected to fluctuate between 17°E and 23°N with moderate to strong monsoon depth within 24 to 120 hours; Also the TEJ, AEJ and the AEW propagation with 850 to 700hpa vortices are expected to enhance rainfall activities over South and West Sudan; East and South Chad; North and Southwest Cameroon; North and Southeast Nigeria; Portion Central and South Sahel; North Guinea Gulf Countries; Part of Western Sahel, Sierra Leone and Guinea Conakry.

Atmospheric dust concentration expected over North Niger, Mali and Mauritania; South, Central and West Algeria; Central and South Libya through 24 to 72 hours.

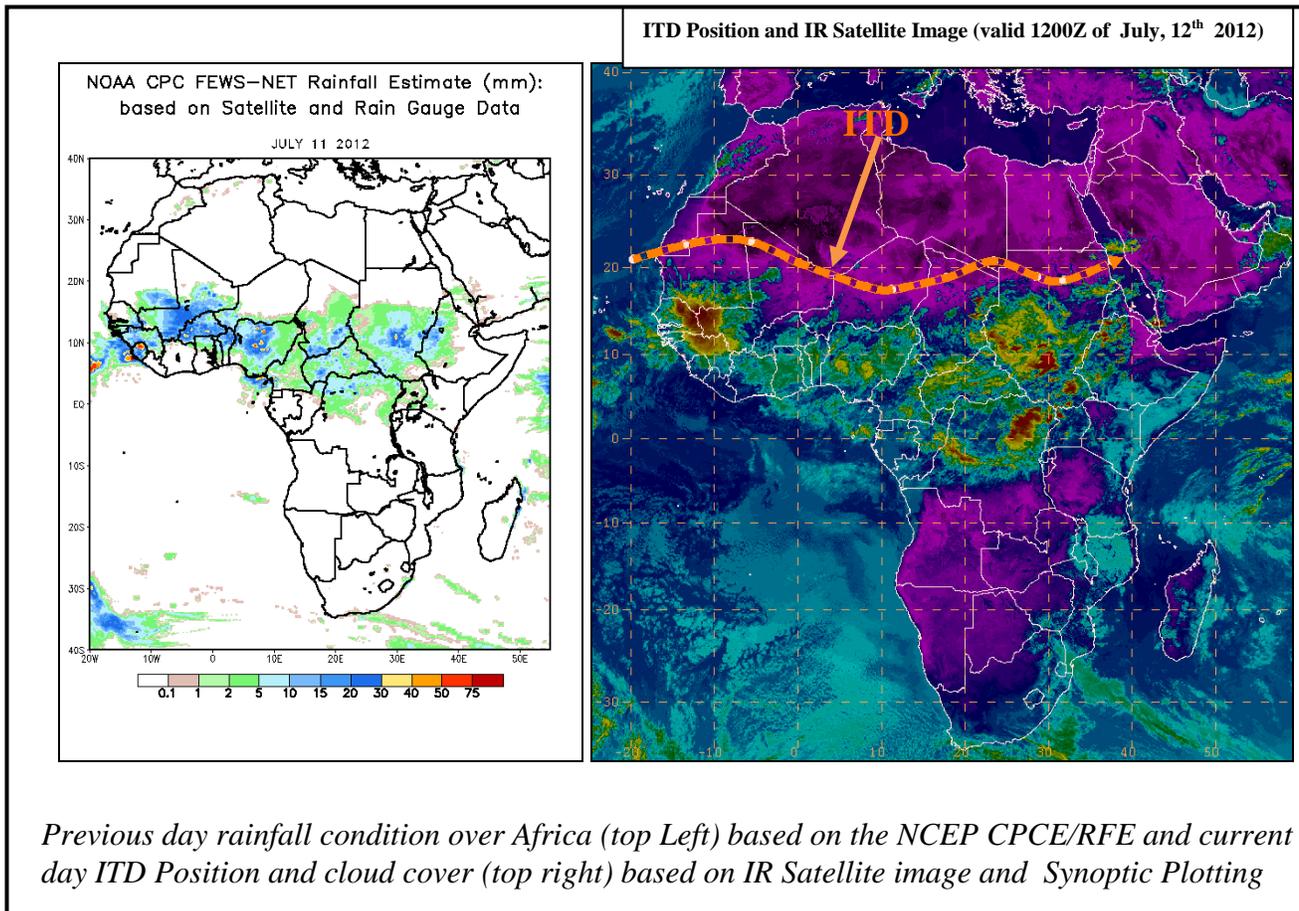
## **2.0. Previous and Current Day Weather Discussion over Africa (July, 11<sup>th</sup> 2012– July, 12<sup>th</sup> 2012)**

## 2.1. Weather assessment for the previous day (July, 11<sup>th</sup> 2012)

During the previous day, moderate to heavy rainfall was observed over South Mauritania; Southeast Senegal; South and West Mali; Central, West and North Sierra Leone; South and West Guinea Conakry; South, Central and West Burkina Faso; North Benin; West and South Niger, Southeast, Central, North and West Nigeria; South Chad; North, South and West Central African Republic; Southwest Cameroon; South Sudan; Southwest and North South Sudan Republic; North democratic Republic of Congo; West Ethiopia.

## 2.2. Weather assessment for the current day (July, 12<sup>th</sup> 2012)

Convective activities observed across South Mauritania; West Mali; East Senegal; North, Central and South Guinea Conakry; South and North South Sudan Republic; West Ethiopia; South Sudan; Northeast Democratic Republic of Congo; Northwest Ethiopia.



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