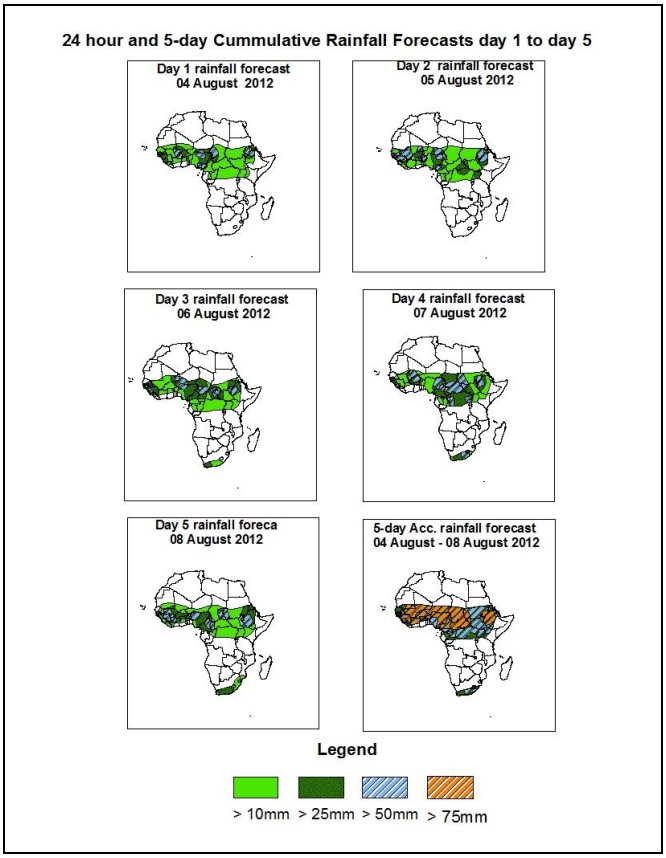
# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## *1.0. Rainfall Forecast: Valid 06Z of August 04th – 06Z of August, 08th 2012. (Issued at 13:00Z of August, 03rd 2012)*

### 1.1. Twenty Four Hour Cumulative Rainfall Forecasts

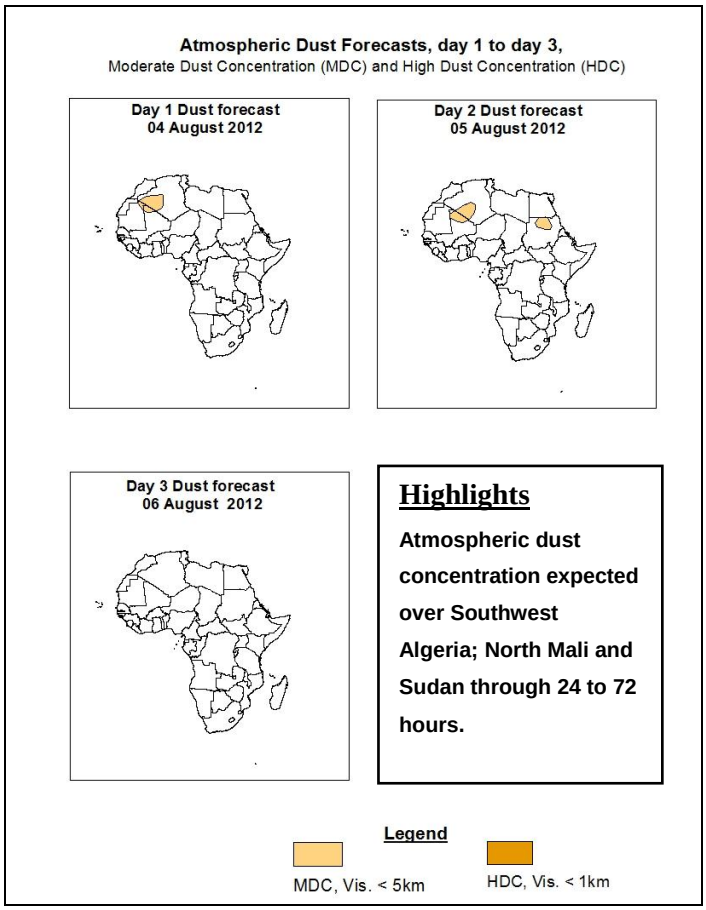
The forecasts are expressed in terms of 75% probability of precipitation (POP) exceeded, based on the NCEP, UK Met Office and the ECMWF NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.





**Summary**

In the next five days, ITD is expected to fluctuate between 15°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 portion South Sudan Republic, Chad, Cameroon and Nigeria; South, East and West Sudan; portion of Sahel Region; Northern Guinea Gulf Countries; part of Central African Republic, Sierra Leone and Guinea Conakry; West and North Ethiopia.




## 1.3. Model Discussion: Valid from 00Z of August, 03rd 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 North Mauritania (1010hpa) in 24 hours is expected to decrease its core value from 1006hpa to 1005hpa within 48 to 72 hours, and then slightly increase to 1006hpa 96 to 72 hours, and then tends to decrease to 1003hpa in 120 hours. The second low over North Mali and South Algeria (1006hpa) in 24 hours is expected to slightly decrease its core value to 1005hpa in 48 hours, and tends to increase from 1006hpa to 1007hpa through 72 to 120 hours. The third low over North Chad and Niger (1005hpa) in 24 hours is expected to increase its core value to 1010hpa within 48 to 72 hours, then gradually decrease from 1004hpa to 1002hpa through 96 to 120 hours; while the low over North Sudan (1006hpa) in 24 hours is expected to maintain almost the same core value within 48 to 120 hours.

The ECMWF model shows a thermal low over North Mauritania (1010hpa) in 24 hours is expected to decrease its core value to 1006hpa through 48 to 120 hours. The second low over North Mali and South Algeria (1007hpa) in 24 hours is expected to slightly decrease its core value to 1006hpa within 48 to 120 hours. The third low over North Chad and Niger (1007hpa) in 24 hours is expected to increase its core value to 1010hpa through 48 to 96 hours, thereafter decrease to 1006hpa in 120 hours; while the low over North Sudan (1006hpa) within 24 to 96 hours is expected to decrease its core value to 1004hpa in 120 hours.

The UKMET model shows a thermal low over North Mauritania (1008hpa) in 24 hours is expected to gradually decrease its core value from 1005hpa to 1003hpa within 48 to 72 hours, and tends to slightly increase to 1004hpa in 96 hours, then decrease to 1003hpa in 120 hours. The second low over North Mali and South Algeria (1006hpa) in 24 hours is expected to slightly decrease its core value to 1005hpa through 48 to 72 hours, and tends to slightly increase to 1006hpa in 96 hours, and then finally decrease to 1003hpa in 120 hours. The third low over North Chad and Niger (1005hpa) within 24 to 48 hours is expected to increase its core value to 1010hpa in 72 hours, thereafter decrease to 1006hpa through 96 to 120 hours; while the low over North Sudan (1006hpa) within 24 to 72 hours is expected to decrease its core value to 1004hpa through 96 to 120 hours.

According to the UKMET model, the St. Helena High pressure system over South Atlantic Ocean with a core value of 1029hpa in 24 hours locates at latitude 30$^{o}$S is expected to slightly decrease its core value to 1028hpa by maintaining almost the same position at latitude 30$^{o}$S in 48 hours, and tends to gradually increase its cores value from 1033hpa to 1035hpa within 72 to 96 hours by shifting southwards from latitude 30$^{o}$S to 40$^{o}$S, thereafter decrease to 1028hpa by moving northwards from latitude 40$^{o}$S to 35$^{o}$S in 120 hours.

According to the ECMWF model, the central pressure value of 1028hpa in 24 hours locates at latitude 30$^{o}$S is expected to slightly decrease its core value to 1027hpa by maintaining almost the same position at latitude 30$^{o}$S in 48 hours, and tends to gradually increase its cores value from 1032hpa to 1033hpa through 72 to 96 hours by shifting southwards from latitude 30$^{o}$S to 40$^{o}$S, then decrease to 1028hpa by moving to the north from latitude 40$^{o}$S to 35$^{o}$S in 120 hours.

Lastly, according to the GFS model, the central pressure value of 1029hpa in 24 hours locates at latitude 30$^{o}$S is expected to decrease its core value to 1027hpa by maintaining almost the same position at latitude 30$^{o}$S in 48 hours, and tends to gradually increase its cores value from 1032hpa to 1035hpa within 72 to 96 hours by shifting southwards from latitude 30$^{o}$S to 40$^{o}$S, thereafter decrease to 1028hpa by moving northwards from latitude 40$^{o}$S to 35$^{o}$S in 120 hours.

According to the GFS model, the Azores high pressure system over North Atlantic Ocean with its central pressure value of 1025hpa in 24 hours and locates at longitude 35$^{o}$W is expected to slightly increase its core value to 1026hpa by shifting eastwards from longitude 35$^{o}$W to 30$^{o}$W in 48 hours, and tends to slightly decrease to 1025hpa by maintaining almost the same position at longitude 30$^{o}$W through 72 to 96hours and by moving to the west from longitude 30$^{o}$W to 45$^{o}$W in 120 hours.

According to the ECMWF model, the central pressure value of 1026hpa within 24 to 72 hours and locates between longitude 30$^{o}$W and 50$^{o}$W is expected to decrease its core value to 1024hpa by shifting eastwards from longitude 50$^{o}$W to 40$^{o}$W in 96 hours, and tends to slightly increase to 1025hpa by moving to the west from longitude 40$^{o}$W to 45$^{o}$W in 120 hours.

Lastly, according to the UKMET model, the central pressure value of 1027hpa within 24 to 72 hours and locates between longitude 30$^{o}$W and 50$^{o}$W is expected to decrease its core value to 1024hpa by shifting eastwards from longitude 50$^{o}$W to 40$^{o}$W in 96 hours, and tends to increase to 1026hpa by moving to the west from longitude 40$^{o}$W to 45$^{o}$W in 120 hours.

At 925hpa level, zone of moderate dry northerly and northeasterly winds (20 to 50kts) are expected to prevail over Southwest Algeria; North Mali and Sudan 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$^{o}$N 21$^{o}$N is expected to prevail over parts of Sudan, Cameroon, Chad, Central African Republic and Western Africa through 24 hours to 120 hours. Vortices are expected over East, Central, South and Northwest Mauritania; South, Central, East and North Mali; East, North and Central Niger; South and West Sudan; West, South and East Chad; North Central African Republic; North South Sudan Republic. The convergence associated with the meridional arm of the ITCZ is expected to oscillate between portion of South Sudan Republic; North Democratic Republic of Congo; West and North Uganda; South and East Central African Republic through 24 hours to 120 hours.

At 700hpa level, the AEJ with a core value between 25 and 50 knots is expected to affect portion of Chad, Niger, Mali and Mauritania; North Central African Republic and Cameroon. The African Easterly Waves (AEW) is also expected to propagate westwards waves to affect Central and North Nigeria; North Cameroon and Benin; portion of Chad, Niger, Mali, Guinea Gulf Countries, Central African Republic and Mauritania within 24 to 120 hours.

**A**t 500hpa level, a wave is expected to affect portion of Burkina Faso; North Nigeria and Benin; portion of Chad, Niger, Mali, Guinea Gulf Countries, Senegal, Burkina Faso, Central African Republic and Mauritania through 24 to 120 hours.

**A**t 150mb, the Tropical Easterly Jet with a maximum core of 35 to 75 Knots will affect portion of South Sudan Republic and Guinea Gulf Countries; Part of Ethiopia and Central African Republic; Easterly winds 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 $15^{o}$E and $23^{o}$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 portion South Sudan Republic, Chad, Cameroon and Nigeria; South, East and West Sudan; portion of Sahel Region; Northern Guinea Gulf Countries; part of Central African Republic, Sierra Leone and Guinea Conakry; West and North Ethiopia.

Atmospheric dust concentration expected over Southwest Algeria; North Mali and Sudan through 24 to 72 hours.

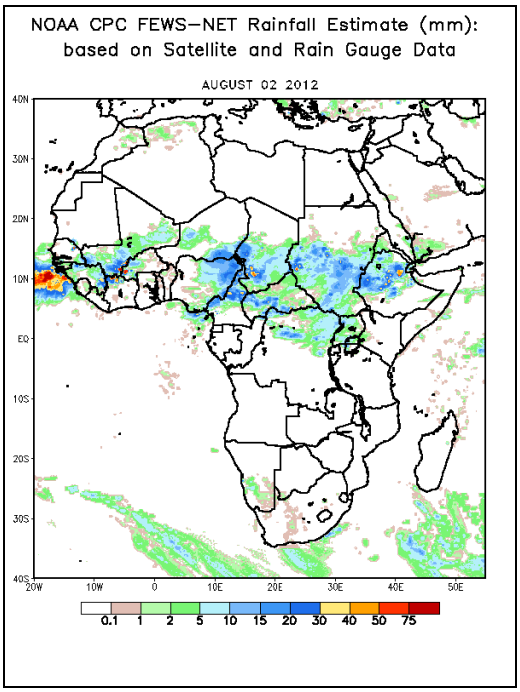
## 2.0. Previous and Current Day Weather Discussion over Africa (August, 02nd 2012– August, 03rd 2012)

### 2.1. Weather assessment for the previous day (August, 02nd 2012)

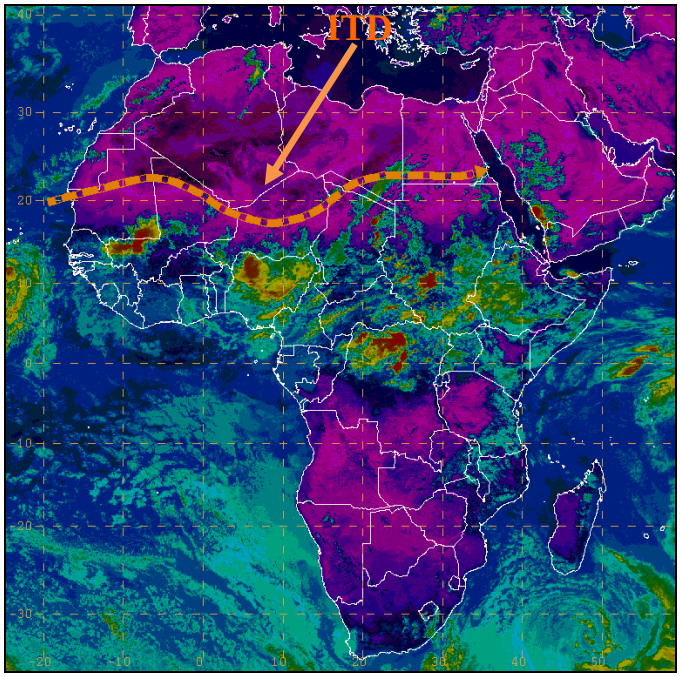
During the previous day, moderate to heavy rainfall was observed over Southeast Senegal; West Mali; North, East and Coastal Guinea Conakry; West Burkina Faso; North Cote d`Ivoire; South Niger and Chad; Southeast, East and North Nigeria; West, Central and North Cameroon; North Democratic Republic of Congo; Central, West and South Central African Republic; portion of South Sudan Republic; West, Central and North Ethiopia; South Sudan.

### 2.2. Weather assessment for the current day (August, 03rd 2012)

Convective activities observed across Southeast Mauritania; West Mali; East Senegal; Central and North Nigeria; South Sudan; North Democratic Republic of Congo; North and West South Sudan Republic; West Ethiopia.




**ITD Position and IR Satellite Image (valid 1200Z of August, 03rd 2012)**




*Previous day rainfall condition over Africa (top Left) based on the NCEP CPCE/RFE and current day ITD Position and cloud cover (top right) based on IR Satellite image and Synoptic Plotting*

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