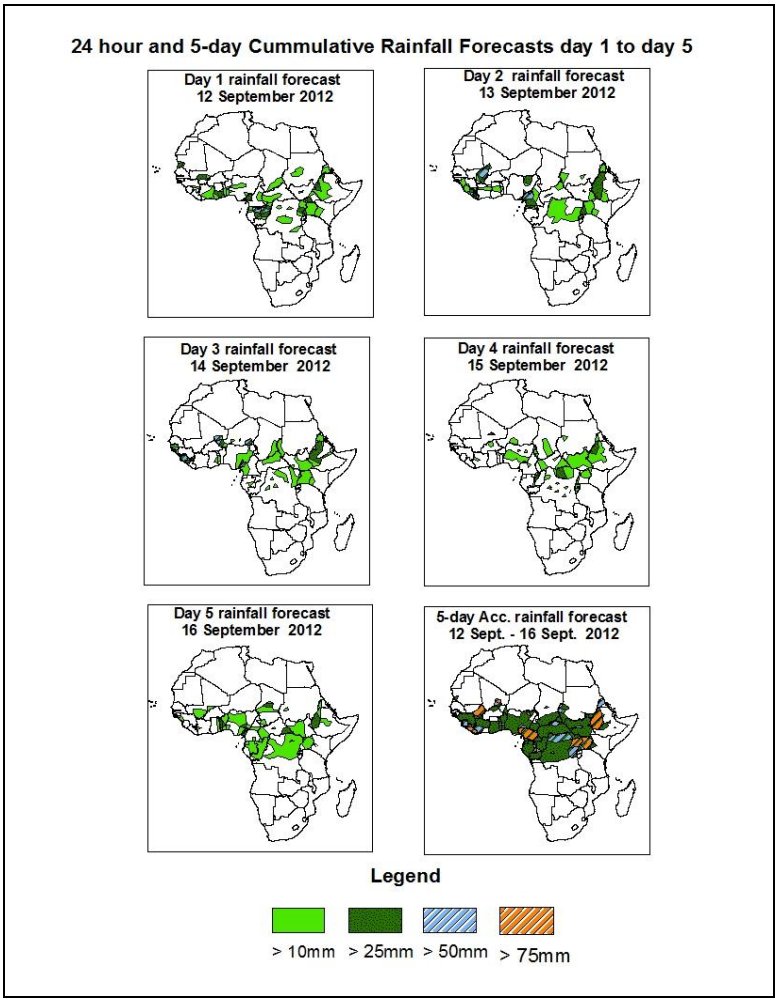
# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## *1.0. Rainfall Forecast: Valid 06Z of September 12th – 06Z of September, 16th 2012. (Issued at 13:00Z of September 11th 2012)*

### 1.1. Twenty Four Hour Cumulative Rainfall Forecasts

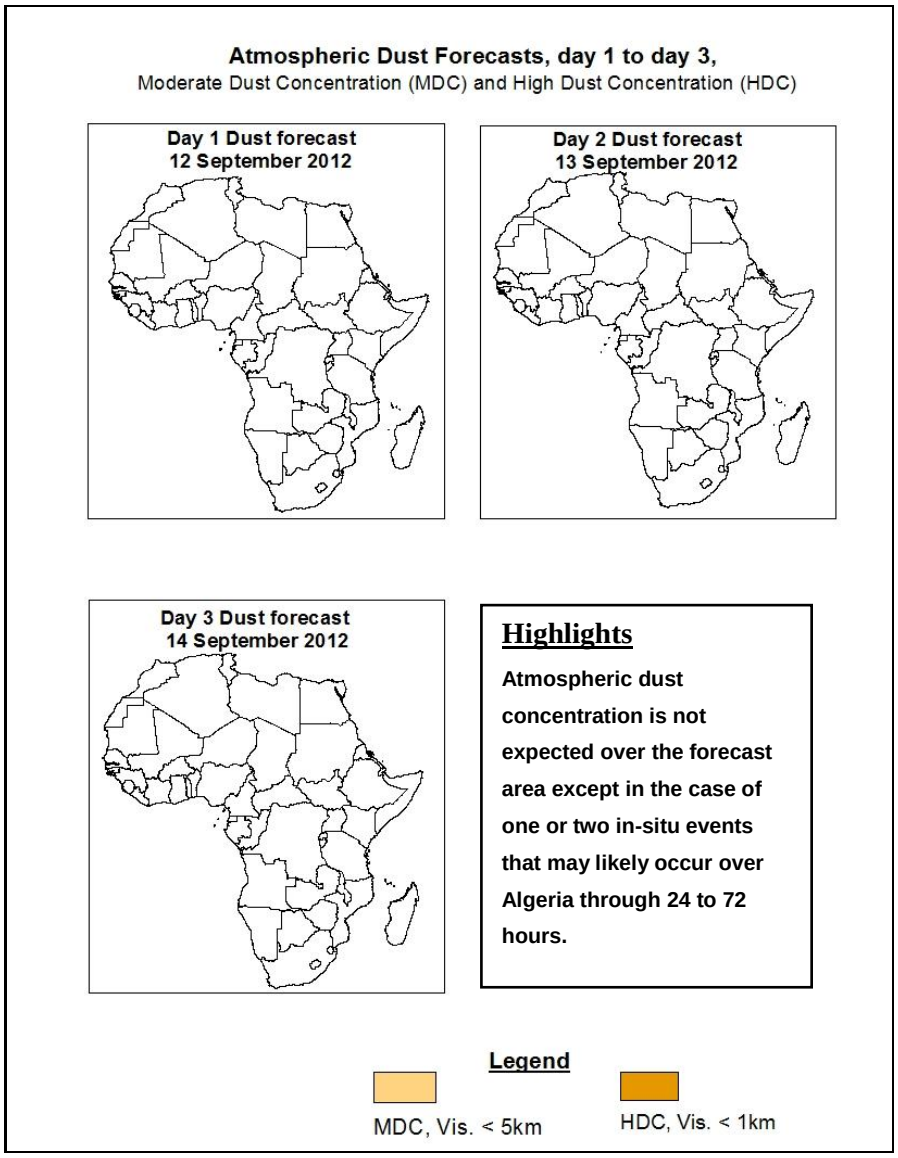
The forecasts are expressed in terms of 75% probability of precipitation (POP) exceeded, based on the NCEP NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.





**Summary**

In the next five days, ITD is expected to fluctuate between 10°N and 19°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, Nigeria, South Chad, the Sahel Region, Sierra Leone, Guinea Conakry, the Northern Guinea Gulf Countries, Central African Republic and Ethiopia.




## 1.3. Model Discussion: Valid from 00Z of September 11th 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 model.

According to the GFS model, a thermal low over Mauritania (1010hpa) in 24 hours is expected to maintain this central value around east Mauritania through 48 to 72 hours and tends to decrease to 1008hpa through 96 to 120 hours. The second low over south Algeria and north Mali (1010hpa) in 24 hours is expected to decrease to 1006hpa in 72

hours and tends to maintain the 1006hpa central value through 96 to 120 hours. The third low over central Niger and central Chad (1010hpa) in 24 hours is expected to decrease to 1008hpa in 72 hours and tends to maintain its central value at 1008hpa through 96 to 120 hours; while the low over North Sudan (1008hpa) in 24 hours is expected to maintain this core value through 48 to 72 hours and tends to decrease to 1006hpa through 96 to 120 hours.

According to the GFS model, the St. Helena High pressure system over the South Atlantic Ocean with a central value of 1024hpa in 24 hours located at latitude 25$^{o}$S is expected to gradually increase to 1034hpa in 72 hours while moving to latitude 40$^{o}$S, and tends to decrease in core value to 1028hpa in 120 hours while shifting to latitude 30$^{o}$S.

According to the GFS model, the Azores high pressure system over the North Atlantic Ocean with its central pressure value of 1028hpa in 24 hours and locates at longitude 25$^{o}$W is expected to gradually decrease its core value to 1024hpa in 72 hours before decreasing to 1020 in 120 hours while steadily moving eastward to longitude 05$^{o}$W through 48 to 120 hours.

At 925hpa level, a zone of moderate dry northerly and northeasterly winds (15 to 35kts) is expected to prevail over north Mali, central and south Algeria, north Niger, north Mauritania and north Chad 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 10$^{o}$N and 19$^{o}$N is expected to prevail over parts of Mauritania, Mali, Niger, Sudan, Cameroon, Central African Republic, Chad and Western Africa through 24 hours to 120 hours. Vortices are expected over Ghana, Nigeria, Cote d'Ivoire, Central African Republic, Niger and Chad. 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.

At 700hpa level, the AEJ with a core value between 15 and over 35 knots is expected to affect parts of Mali, Niger, Nigeria, Ghana, Burkina Faso, Sudan, Chad, and Mauritania. Vortices are expected over parts of Nigeria, Cameroon and Chad. The African Easterly Waves (AEW) is also expected to propagate westwards affecting parts of Chad, Sudan, Ghana, Democratic Republic of Congo, Central Africa Republic, Chad, South Sudan Republic, Nigeria, Cote d'Ivoire, and Cameroon within 24 to 120 hours.

**A**t 500hpa level, a wave is expected to affect parts of Sudan, Mali, Nigeria, Chad, Niger, Cote d'Ivoire, Cameroon and Central African Republic, through 24 to 120 hours with no visible vortices observed on the forecast charts.

**A**t 200mb, the Tropical Easterly Jet with a maximum core of 20 to 40 Knots will affect portions of South Sudan Republic and the South Guinea Gulf Countries; parts of Ethiopia, Cameroon and Central African Republic; a slight easterly wind flow will also continue to affect most parts of West Africa, Chad, Cameroon and Sudan through 24 to 120 Hours.

In the next five days, ITD is expected to fluctuate between $10^{o}$N and $19^{o}$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 not expected over the forecast area except in the case of one or two in-situ events that may likely occur over Algeria through 24 to 72 hours.

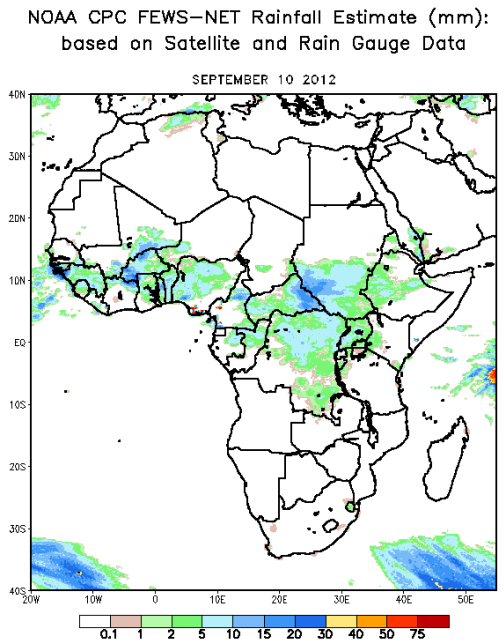
## 2.0. Previous and Current Day Weather Discussion over Africa (September 10th 2012– September 11th 2012)

### 2.1. Weather assessment for the previous day (September 10th 2012)

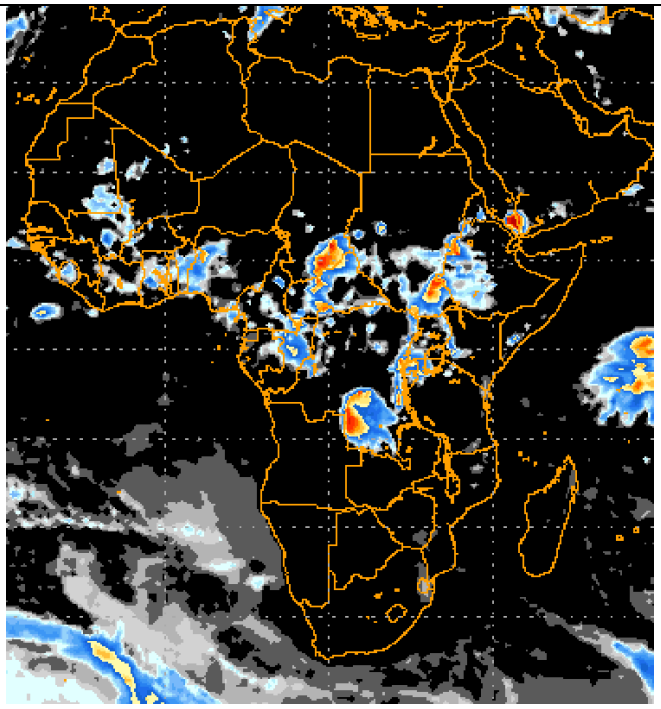
During the previous day, moderate to heavy rainfall was observed over parts of south Mauritania; south Mali; south-western Niger; Sierra Leone; Nigeria; south Chad; Guinea Conakry; Liberia; Senegal; Burkina Faso; Benin Republic; Cameroon; Democratic Republic of Congo; Central African Republic and South Sudan Republic; Kenya; Uganda and Ethiopia.

### 2.2. Weather assessment for the current day (September 11th 2012)

Convective activities observed across parts of Mali; Mauritania; Ghana; Nigeria; south Chad; Central African Republic; Cameroon; Democratic Republic of Congo; South Sudan Republic; Burkina Faso; Ethiopia; Benin Republic; Kenya and Togo.




**ITD Position and IR Satellite Image (valid 1200Z of September 11th 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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