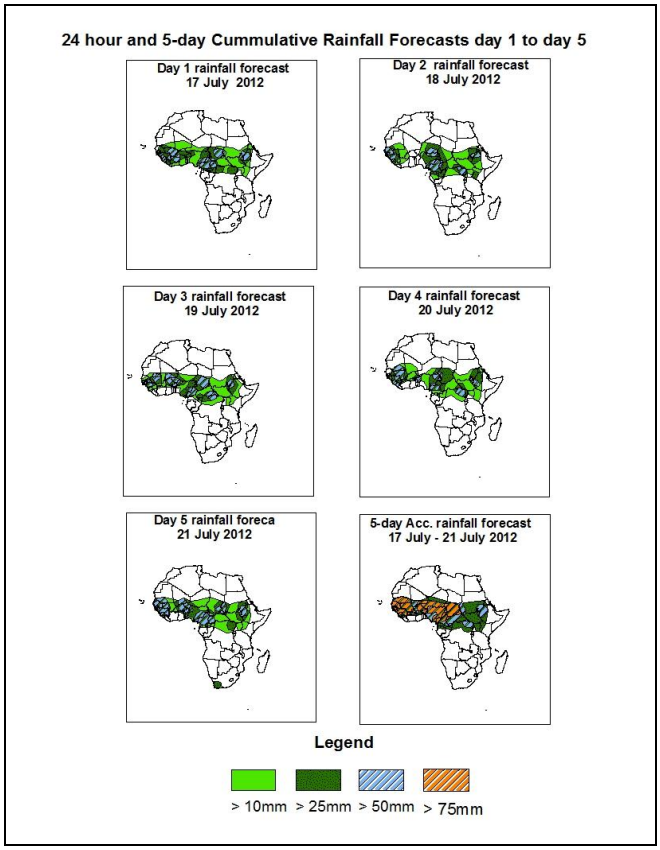
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of July, 17th – 06Z of July, 21st 2012. (Issued at 12:00Z of July, 16th 2012)

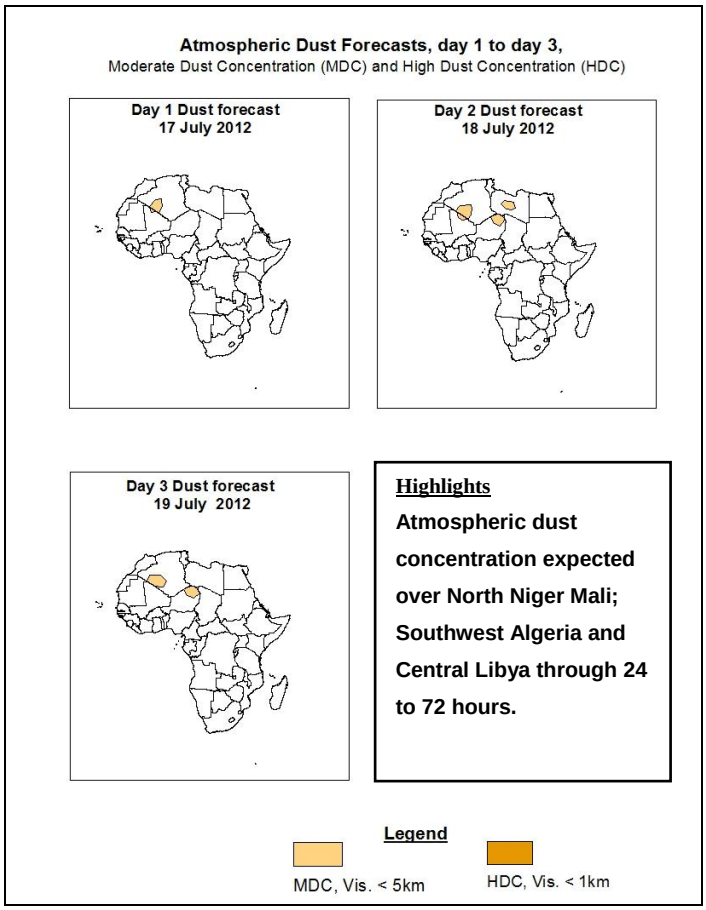
1.1. Twenty Four Hour Cumulative Rainfall Forecasts

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 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, 21st 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 (1007hpa) within 24 to 72 hours is expected to slightly decrease its core value to 1006hpa through 96 to 120 hours. The second low over North Mali and South Algeria (1007hpa) within 24 to 48 hours is also expected to slightly decrease its core value to 1006hpa through 72 to 120 hours. The third low over North Chad and Niger (1007hpa) in 24 hours is expected to gradually decrease its core value from 1005hpa to 1004hpa within 48 to 72 hours, and tends to increase it to 1006hpa through 96 to 120 hours; while the low over North Sudan (1002hpa) within 24 to 48 hours is expected to increase its core value to 1004hpa through 72 to 120 hours.

The ECMWF model shows a thermal low over West, Central and North Mauritania (1008hpa) in 24 hours is expected to increase its core value to 1009hpa in 48 hours and tends to decrease it from 1007hpa to 1006hpa within 72 to 120 hours. The second low over North Mali and South Algeria (1008hpa) in 24 hours is also expected to slightly increase its core value to 1009hpa in 48 hours, and then decreases it from 1007hpa to 1006hpa through 72 to 120 hours. The third low over North Chad and Niger (1010hpa) in 24 hours is expected to gradually decrease its core value from 1008hpa to 1006hpa within 48 to 120 hours; while the low over North Sudan (1006hpa) in 24 hours is 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 (1007hpa) in 24 hours is expected to gradually decrease its core value from 1006hpa to 1004hpa through 48 to 120 hours. The second low over North Mali and South Algeria (1005hpa) in 24 hours is expected to slightly increase its core value to 1006hpa in 48 hours and tends to gradually decrease to 1004hpa within 72 to 120 hours. The third low over North Chad and Niger (1010hpa) in 24 hours is expected to decrease its core value from 1006hpa to 1004hpa through 48 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 1035hpa in 24 hours locates at latitude 40^{o}S is expected to gradually decrease from 1033hpa to 1025hpa by shifting southwards around latitude 55^{o}S in 48 hours and northwards from latitude 55^{o}S to 50^{o}S within 72 to 120 hours.

According to the ECMWF model, the central pressure value of 1034hpa in 24 hours locates at latitude 40^{o}S is also expected to gradually decrease from 1032hpa to 1029hpa by shifting southwards around latitude 55^{o}S in 48 hours and northwards from latitude 50^{o}S to 40^{o}S within 72 to 120 hours.

Lastly, according to the GFS model, the central pressure value of 1034hpa in 24 hours locates at latitude 40^{o}S is expected to gradually decrease from 1031hpa to 1028hpa by shifting southwards around latitude 55^{o}S in 48 hours and northwards from latitude 50^{o}S to 40^{o}S within 72 to 120 hours.

According to the GFS model, the Azores high pressure system over North Atlantic Ocean with its central pressure value of 1030hpa in 24 hours and locates at longitude 10^{o}W is expected to slightly increase its core value to 1031hpa in 48 hours by shifting westwards from longitude 10^{o}W to 30^{o}W, and tends to gradually decrease its core value from 1030hpa to 1027hpa by moving to the west from longitude 40^{o}W to 50^{o}W through 72 to 120 hours.

According to the ECMWF model, the central pressure value of 1029hpa in 24 hours and locates at longitude 20^{o}W is expected to slightly increase its core value to 1030hpa in 48 hours by shifting westwards from longitude 20^{o}W to 30^{o}W, and tends to gradually decrease its core value from 1030hpa to 1025hpa by moving to the west from longitude 40^{o}W to 50^{o}W through 72 to 120 hours.

Lastly, according to the UKMET model, the central pressure value of 1030hpa in 24 hours and locates at longitude 10^{o}W is expected to slightly increase its core value to 1031hpa in 48 hours by shifting westwards from longitude 10^{o}W to 30^{o}W, and tends to gradually decrease its core value from 1030hpa to 1025hpa by moving to the west from longitude 40^{o}W to 45^{o}W through 72 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; Southwest Algeria and Central Libya 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 15^{o}N 20^{o}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 East, Central and South Mauritania; West Mali; Northeast Guinea Conakry, East and Central Niger; North Ghana; Southeast and North Senegal. 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, Central and South Central African Republic through 24 hours to 120 hours.

At 700hpa level, the African Easterly Jet (AEJ) is expected to affect South, Central and West Mauritania; South and West Mali; North Senegal; The African Easterly Waves (AEW) is also expected to propagate westwards waves to affect West and South Niger and Mali; South Chad; Portion of Burkina Faso, Togo, Ghana, Benin and Senegal; North Guinea Conakry; South Mauritania within 24 to 120 hours.

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

At 150mb, the Tropical Easterly Jet with a maximum core of 35 to 80 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^{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 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; Southwest Algeria and Central Libya through 24 to 72 hours.

2.0. Previous and Current Day Weather Discussion over Africa (July, 15th 2012– July, 16th 2012)

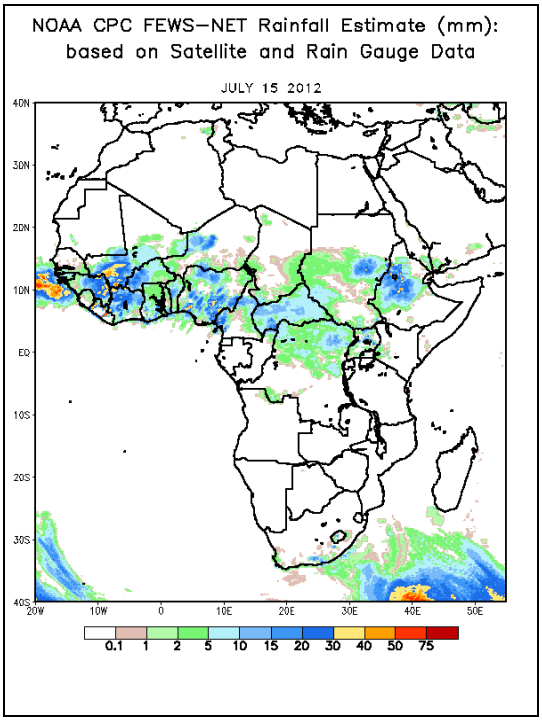
2.1. Weather assessment for the previous day (July, 15th 2012)

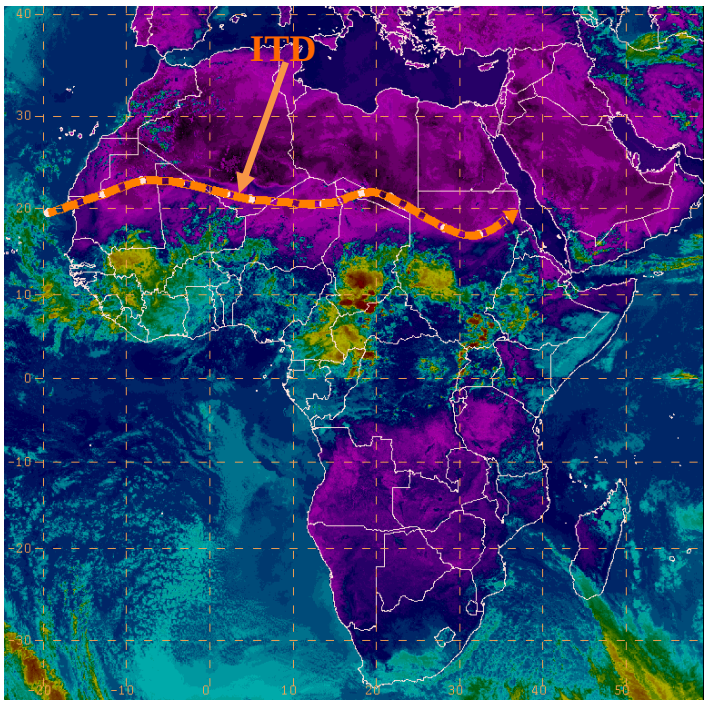
During the previous day, moderate to heavy rainfall was observed over West Mali; East Guinea Conakry; West Burkina Faso; North Cote d`Ivoire; Central and South Niger; Part of Nigeria; Southwest Cameroon; part of Central African Republic; Northeast democratic Republic of Congo; Southeast Sudan; and West Ethiopia.

2.2. Weather assessment for the current day (July, 16th 2012)

Convective activities observed across West Mali; South Chad; North and West Central African Republic; Southeast Cameroon; North Congo; East Gabon; South and Central South Sudan Republic; Northwest and Northwest Democratic Republic of Congo.

ITD Position and IR Satellite Image (valid 1200Z of July, 16th 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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