

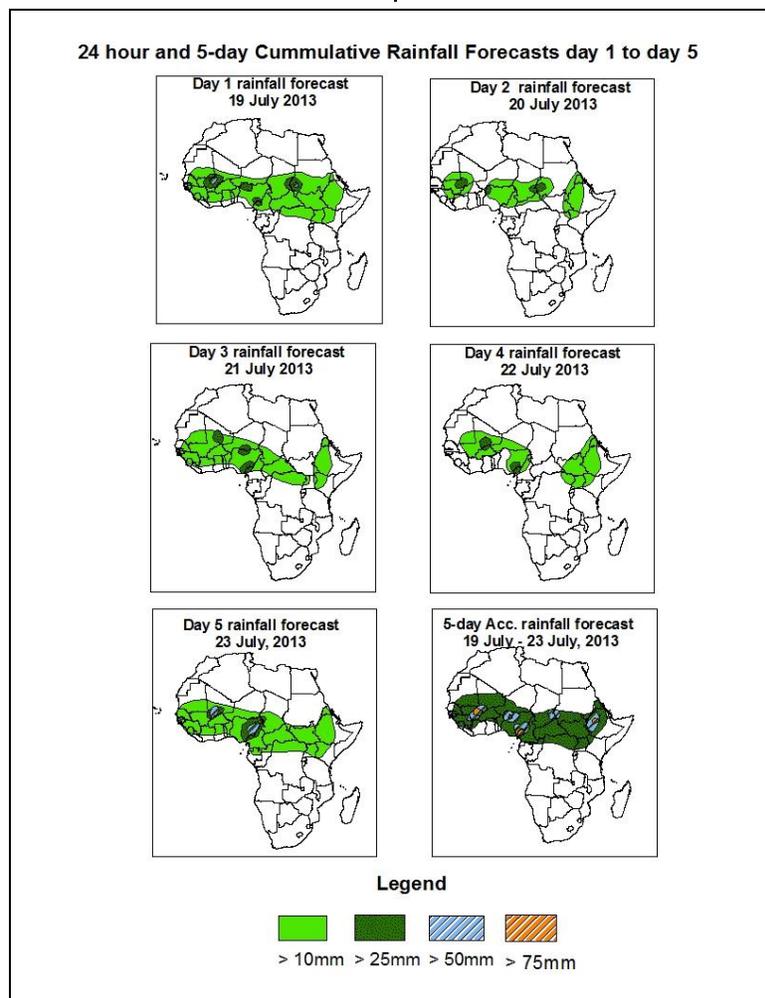


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid 06Z of 19 July – 06Z of 23 July, 2013. (Issued at 1700Z of 18 July, 2013)

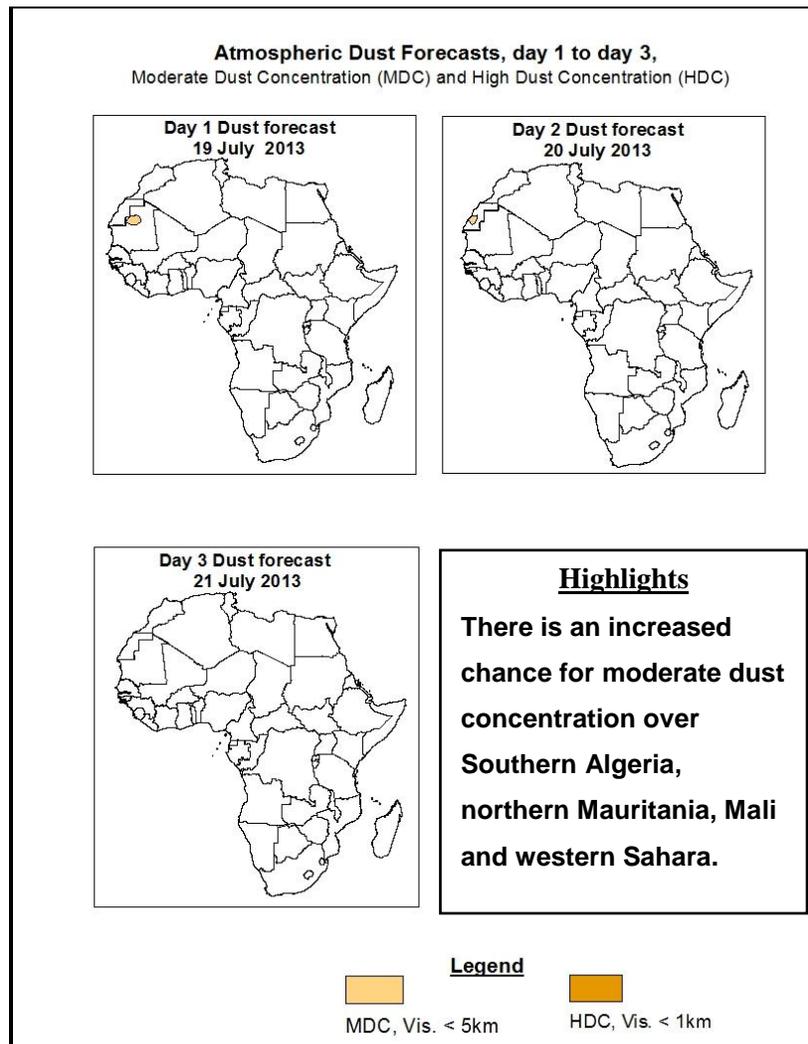
### 1.1. Twenty Four Hour Cumulative Rainfall Forecasts

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, colder than normal sea surface temperatures observed over the Gulf of Guinea coastline and the intensification of the St. Helena high pressure system in the southern hemisphere is expected to suppress rainfall along the coastal areas of West Africa especially over CIV and Ghana. However, seasonal wind convergence will modulate rainfall in other areas of West and central Africa while strong cross equatorial flow, with its associated convergence over the Horn of Africa is expected to enhance precipitation over East Africa. Thus, there is an increased chance for moderate to heavy rainfall over Mauritania, Senegal, Guinea, Sierra Leone, Mali, Burkina Faso, northern Ghana, Nigeria, Cameroun, southern Chad, CAR, Gabon, Sudan, northern DRC, Eritrea and Ethiopia.



## 1.2. Model Discussion: Valid from 00Z of 18 July 2013

*Model comparison (Valid from 00Z; 18 July, 2013) shows all the three models are in general agreement in terms of depicting positions of the northern and southern hemisphere sub-tropical highs, while they showed slight differences in depicting their intensity.*

The Azores High Pressure System over Northeast Atlantic Ocean is expected to weaken during the forecast period. Its central pressure value is expected to decrease from 1024hPa to 1022hPa according to the GFS and, maintain average value of 1024hpa according to the ECMWF and UKMET models.

The St. Helena High Pressure System over southeast Atlantic Ocean is expected to intensify through 24 to 96 hours. Its central pressure value is expected to increase from 1028hPa to 1033hPa according to the GFS model, 1027hPa to 1032hPa according to the ECMWF model, 1026hPa to 1032hPa according to the UKMET model and a decrease thereafter.

The Mascarene high pressure system over southwestern Indian Ocean is also expected to weaken during the forecast period. Its central value is expected to decrease from 1030hPa to 1027hPa during the forecast period according to the GFS model, 1030hPa to 1026hPa according to the ECMWF model, 1040hPa to 1025hPa according to UKMET model.

The heat lows over the central Sahel and neighboring areas are expected to slightly deepen during the forecast period. The lowest central pressure value is expected to vary between 1004hPa to 1005hPa according to the GFS model, 1005hPa to 1007hPa according to ECMWF model and 1004hPa to 1005hPa according to the UKMET model. The seasonal lows across the Red sea and its neighboring areas are expected to deepen slightly during the forecast period with values expected to vary from 997hPa to 1001hPa according to the GFS model, 1000hPa to 1003hPa according to ECMWF model and 1000hPa to 1002hPa according to UKMET model.

At the 850hPa level, monsoon wind flow is expected to dominate flow across West Africa and penetrate further inland and northwards. Zonal monsoon wind convergence is also expected to dominate the flow across central parts of the Sahel South of latitude 19°N, while meridional wind convergence will dominate flow across Sudan, eastern DRC and Ethiopia. Rainfall along the coast of Togo, Ghana, Cote d'Ivoire, southwest Nigeria, is therefore expected to decrease as winds diverge from these areas and converge over the inland areas during the forecast period. The slight increase in number of vortices at this level and wind convergence over Africa is expected to maintain moderate to heavy rainfall over the region.

At 700hPa level, intensification of the subtropical anticyclone in the northern and southern hemispheres is expected to maintain northeasterly to easterly flow over West and central Africa during the period.

At 500hpa level, wind speed associated with mid-tropospheric easterly jet are weak and show common speeds of 30kts around isolated places in Mali, Mauritania, Burkina Faso, Nigeria, Ghana, eastern Sudan, Chad, Ethiopia and Eritrea during the forecast period.

At 150hPa level, tropical easterly jets are weak and cover smaller areas over East Africa. Speeds are dominantly 30kts over West and East Africa. However, speeds exceeding 70kts are common over Ethiopia, Eritrea, Sudan and Somalia through 72 to 120 hours period.

In the next five days, colder than normal sea surface temperatures observed over the Gulf of Guinea coastline and the intensification of the St. Helena high pressure system in the southern hemisphere is expected to suppress rainfall along the coastal areas of West Africa especially over Cote d'Ivoire and Ghana. However, seasonal wind convergence will modulate rainfall in other areas of West and central Africa while strong cross equatorial flow, with its associated convergence over the Horn of Africa is expected to enhance precipitation over East Africa. Thus, there is an increased chance for moderate to heavy rainfall over Mauritania, Senegal, Guinea, Sierra Leone, Mali, Burkina Faso, northern Ghana, Nigeria, Cameroun, southern Chad, CAR, Gabon, Sudan, northern DRC, Eritrea and Ethiopia.

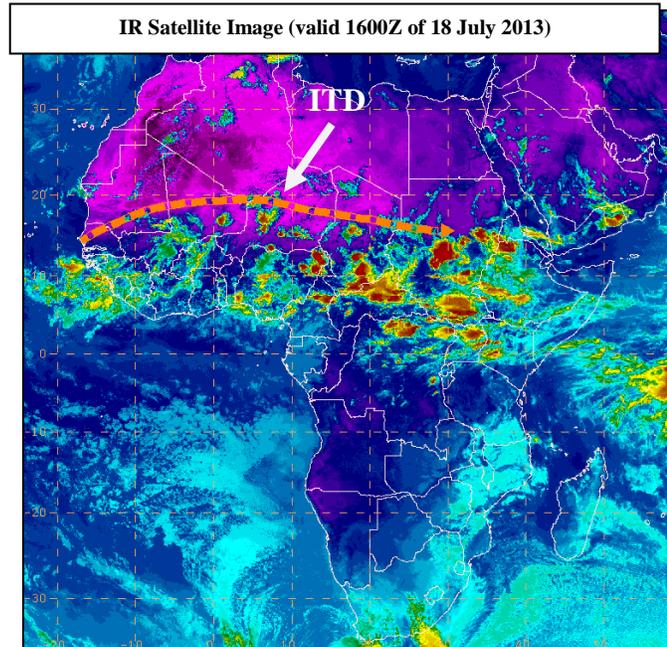
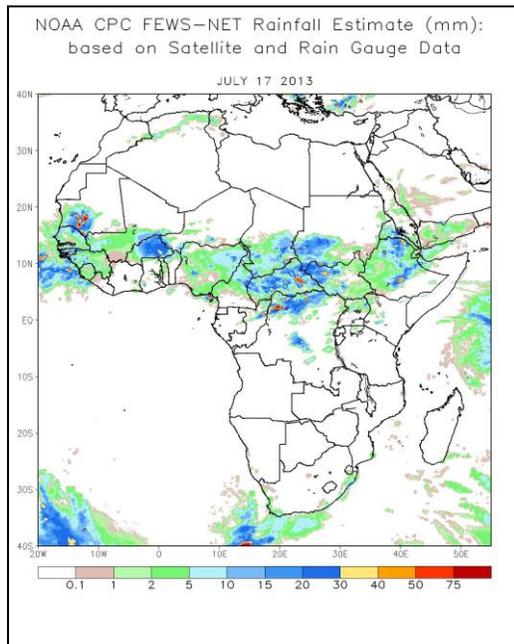
## 2.0. Previous and Current Day Weather Discussion over Africa (17 July 2013 – 18 July 2013)

### 2.1. Weather assessment for the previous day (17 July 2013)

During the previous day, moderate to locally heavy rainfall was observed over Ethiopia, Sudan, CAR, Cameroun, DRC, Nigeria, Burkina Faso, Mauritania, Senegal, Guinea, and Mali.

### 2.2. Weather assessment for the current day (18 July, 2013)

Intense clouds were observed over Ethiopia, Sudan, CAR, northern DRC, Uganda, Kenya, Cameroun, southern Chad, Nigeria, Niger, Guinea and Sierra Leone. The ITD is located at an average position of latitude 19°N over Africa.



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

**Author:** Paul Ugbah, (Nigeria Meteorological Agency / CPC-African Desk); [paul.ugbah@noaa.gov](mailto:paul.ugbah@noaa.gov)