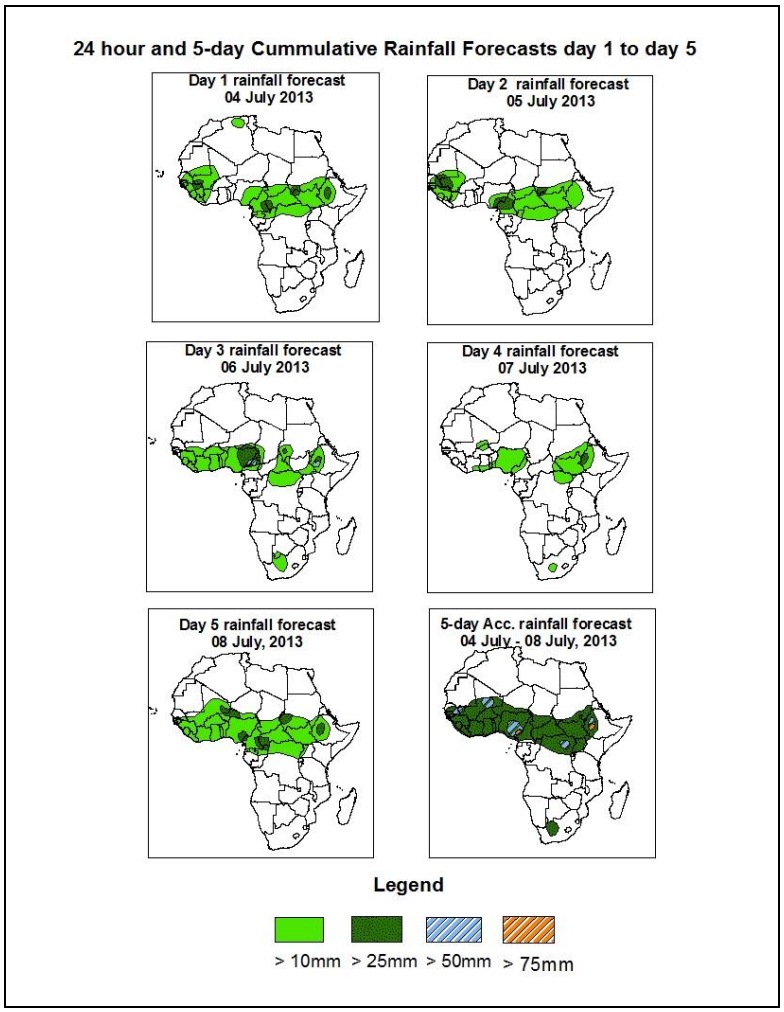
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 04 July – 06Z of 08 July, 2013. (Issued at 1700Z of 03 July, 2013)

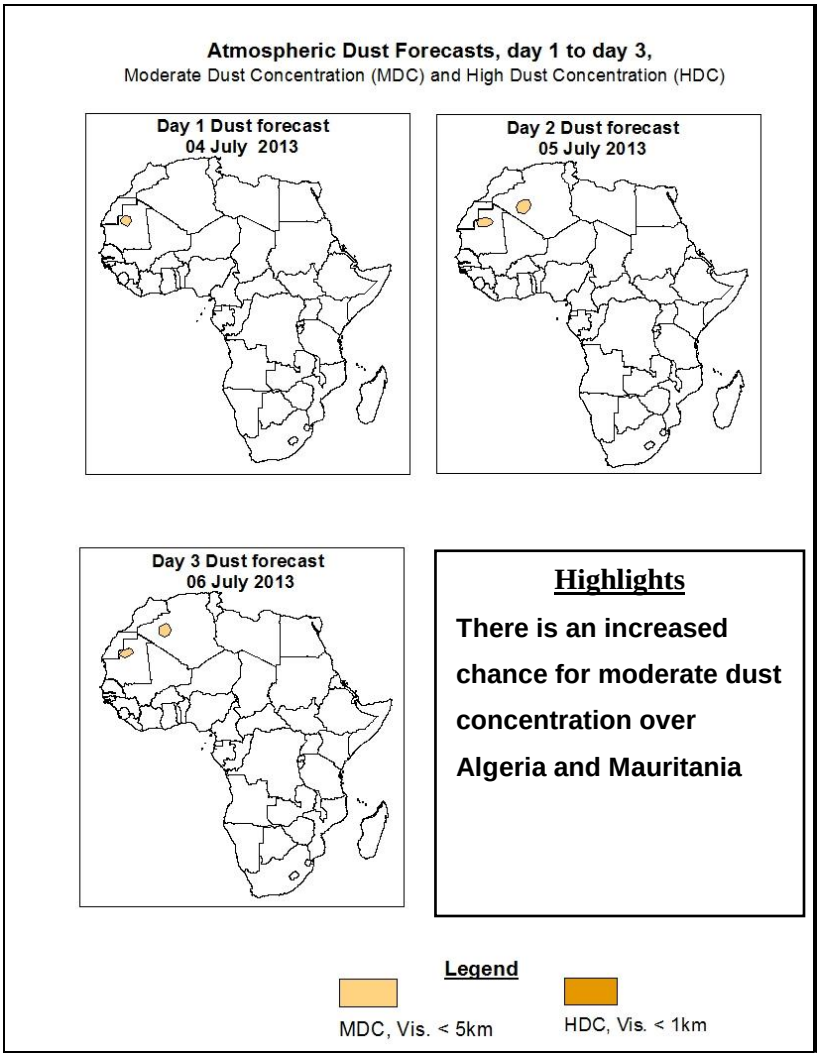
1.1. Twenty Four Hour Cumulative Rainfall Forecasts

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, moisture convergence over West Africa, Central Africa regions and the seasonal wind convergence in Congo Air Boundary (CAB) region is generally expected to increase rainfall in these regions. Strong cross equatorial flow, with its associated convergence over the Horn of Africa is expected to shift rainfall activities further northwards over East and West Africa and enhance precipitation in these regions. There is an increased chance for moderate to heavy rainfall over Senegal, Guinea, Sierra Leone, Liberia, Mali, Burkina Faso, Cote d'Ivoire, Togo, Benin Republic, Nigeria, Cameroun, Chad, CAR, southern Sudan, northern DRC, western Ethiopia and Southern Africa.



1.2. Model Discussion: Valid from 00Z of 03 July 2013

Model comparison (Valid from 00Z;03 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 1027hPa to 1023hPa during the forecast period according to the GFS model, 1028hpa to 1024hPa according to the ECMWF model, 1028hPa 1025hPa according to the UKMET model.

The St. Helena High Pressure System over southeast Atlantic Ocean is expected to weaken during the forecast period. Its central pressure value is expected to be decrease from 1030hPa to 1025hPa through 24 to 120 hours according to the GFS model, 1031hPa to 1023hPa according to the ECMWF model, 1031hPa to 1024hPa according to UKMET model.

The Mascarene high pressure system over southwestern Indian Ocean is also expected to weaken through 24 to 72 hours and slightly intensify thereafter. Its central value is expected to decrease from 1033hPa to 1029hPa according to the GFS model, 1031hPa to 1030hPa according to the ECMWF model, 1033hPa to 1031hPa according to the UKMET model and increase slightly through 96 to 120 hours.

The heat lows over the central Sahel and neighboring areas are expected to deepen slightly through the forecast period especially in Mali. The lowest central pressure value is expected to vary between 1004hPa to 1006hPa during the forecast period according to the GFS model, 1005hPa to 1008hPa according to ECMWF model and 1002hPa to 1005hpa according to the UKMET model. The seasonal lows across the Red sea and its neighboring areas are expected to deepen slightly with values varying from 999hPa to 1000hPa according to the GFS model, while UKMET and ECMWF models maintain average values of 1002hPa and 1003hPa respectively during the forecast period.

At the 850hPa level, zonal monsoon wind convergence is expected to dominate the flow across western and central parts of the Sahel South of latitude 17^{o}N, while meridional wind convergence will dominate flow across Sudan, eastern DRC and Ethiopia. Rainfall along the coast of Togo, Ghana, Cote d'Ivoire is expected to be variable as the flow pattern over these areas change occasionally during the forecast period. The increase in number of vortices at this level coupled with the predominant Moist southwesterly to westerly flow over West Africa and its associated convergence over western Ethiopia is expected to maintain moderate to heavy rainfall over the region.

At 700hPa level, weakening of the broad subtropical anticyclone located at about latitude 30^{o}N is expected to favour northeasterly to easterly flow over West and central Africa during the period.

At 500hpa level, wind speed associated with mid-tropospheric easterly jet are still weak and show common speeds of 30kts only around isolated places in Mali, Mauritania, Niger and Senegal and Guinea during the forecast period.
The zone of maximum wind is expected to gradually shift westwards during the forecast period.

At 150hPa level, tropical easterly jets are gradually becoming stronger and now cover wider areas over East Africa with Wind speeds of 50kts while speeds of 30kts are common over West Africa during the forecast period. However, wind speeds exceeding 70kts are common over Somalia, Ethiopia, Kenya and Sudan through 24 to 72 hours.

In the next five days, moisture convergence over West Africa, Central Africa regions and the seasonal wind convergence in Congo Air Boundary (CAB) region is generally expected to increase rainfall in these regions. Strong cross equatorial flow, with its associated convergence over the Horn of Africa is expected to shift rainfall activities slightly northwards over East and West Africa and enhance precipitation in these regions. There is an increased chance for moderate to heavy rainfall over Senegal, Guinea, Sierra Leone, Liberia, Mali, Burkina Faso, Cote d'Ivoire, Togo, Benin Republic, Nigeria, Cameroun, Chad, CAR, southern Sudan, northern DRC, western Ethiopia and Southern Africa.

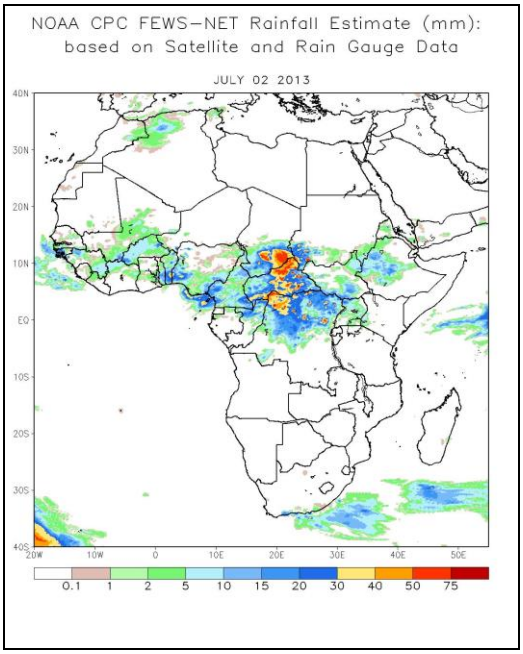
2.0. Previous and Current Day Weather Discussion over Africa
(02 July 2013 – 03 July 2013)

2.1. Weather assessment for the previous day (02 July 2013)

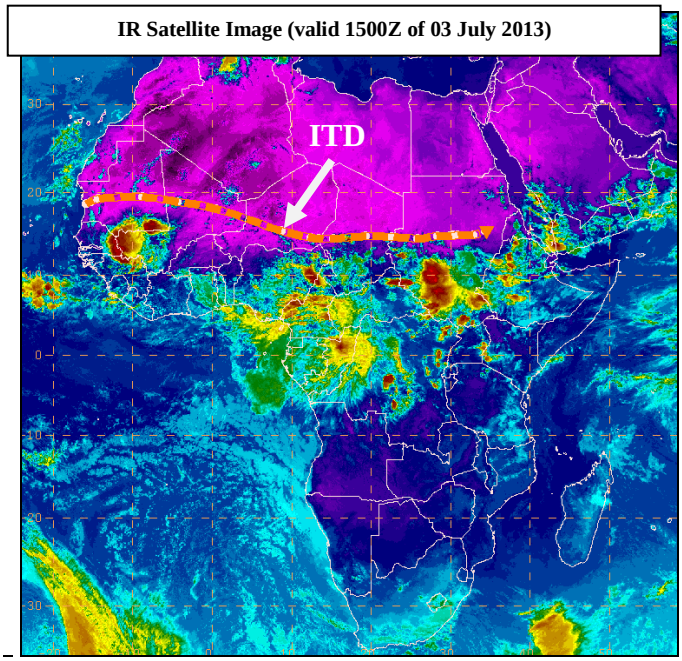
During the previous day, moderate to locally heavy rainfall was observed over western Ethiopia, Southern Sudan, Chad, northern DRC, northwest Uganda, Nigeria, Benin republic, Togo, Burkina Faso, Mali, Guinea and northern Algeria.

2.2. Weather assessment for the current day (03 July, 2013)

Intense clouds were observed over Ethiopia, Sudan, CAR, northern DRC, Uganda, Cameroun, Nigeria, Congo Brazzaville, Mali, Senegal and Mauritania. The ITD is located at an average position of latitude 17^{o}N over Africa.



IR Satellite Image (valid 1500Z of 03 July 2013)



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

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