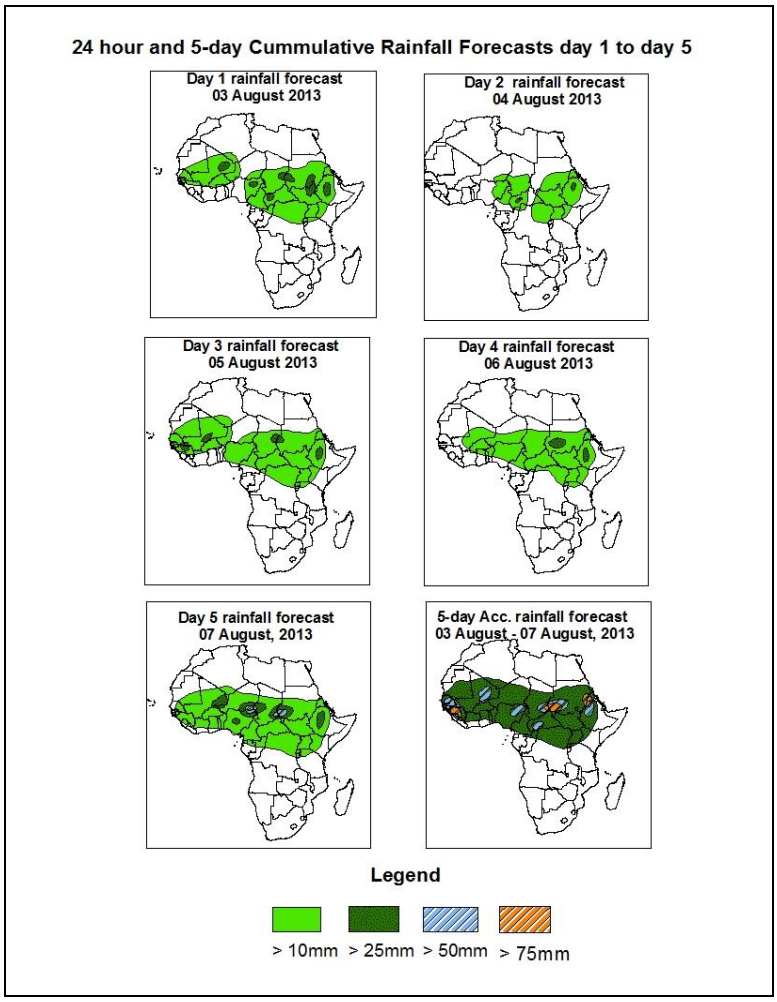
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 03 August – 06Z of 07 August, 2013. (Issued at 1600Z of 02 August 2013)

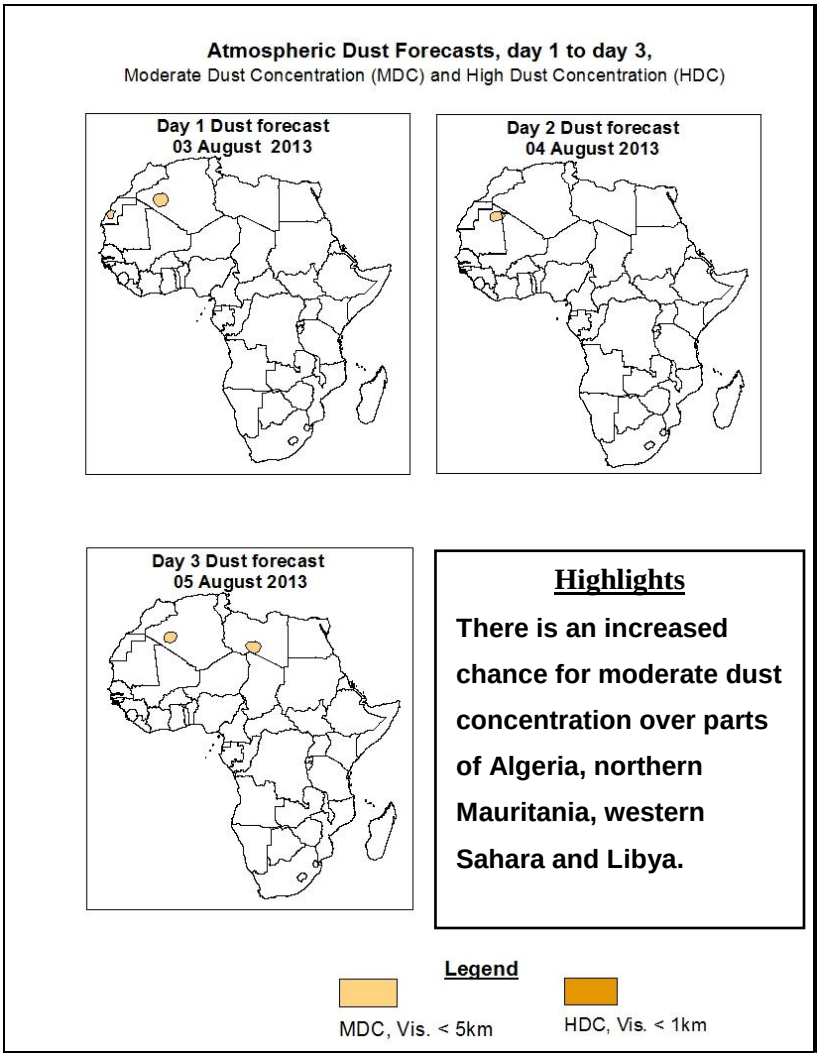
1.1. Twenty Four Hour Cumulative Rainfall Forecasts

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, the zone of seasonal and monsoon wind convergence is expected to push further northwards and shift rainfall activities further to the North with chances of organized thunderstorms over the region. Coastal rainfall along the Gulf of Guinea is expected to decrease while strong cross equatorial flow, with its associated convergence over the Horn of Africa is expected to modulate rainfall over East Africa. Thus, there an increased chance for moderate to heavy rainfall over Senegal, Guinea, Sierra Leone, Mali, Algeria, Mauritania, Niger, northern Ghana, CIV, Cameroun, southern Chad, CAR, Gabon, Sudan, northern DRC, Uganda, Kenya, Eritrea and Ethiopia.



1.2. Model Discussion: Valid from 00Z of 02 August 2013

Model comparison (Valid from 00Z;02 August, 2013) shows all the three models are in general agreement in terms of depicting positions of the 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 slightly intensify during the forecast period. Its central pressure value is expected to increase from about 1027hpa to 1028hpa through 24 to 120 hours according to the GFS model, 1027hpa to 1029hpa according to the ECMWF model, 1028hpa to 1029hpa according to the UKMET model.

The St. Helena High Pressure System over southeast Atlantic Ocean is expected to intensify during the forecast period. Its central pressure value is expected increase from about 1025hpa to 1038hpa according to the GFS model, from 1025hpa 1035hpa according to the ECMWF and UKMET models.
The Mascarene high pressure system over southwestern Indian Ocean is expected to intensify through 24 to 72 hours and weaken thereafter. Its central pressure value is expected to increase from 1031hpa to 1042hpa through 24 to 72 hours according to the GFS model, 1036hpa 1040hpa according to the ECMWF model, 1036hpa to 1039hpa according to the UKMET model and a decrease thereafter.

The heat lows over the central Sahel and neighboring areas are expected to fill up through 24 to 48 hours and deepen thereafter. Its lowest values are expected to vary from 1002hpa to 1005hpa according to the GFS model, 1004hpa to 1007hpa according to the ECMWF model, 1002hpa to 1004hpa according to the UKMET model. The seasonal lows across the red sea and its neighboring areas are expected to deepen through 72 to 120 hours with pressure values likely to vary from 1002hpa to 1006hpa according to the GFS model, 1004hpa to 1008hpa according to the ECMWF and UKMET models.

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 20^{o}N, while meridional wind convergence will dominate flow across Sudan, eastern DRC and Ethiopia. Rainfall along the coast of Liberia, Togo, Ghana, Cote d'Ivoire and southwest Nigeria, is therefore expected to decrease as winds diverge from these areas during the forecast period. The slight increase in number of vortices at this level and wind convergence over places located around Latitude 10^{o}N and above is expected to increase rainfall over the region with higher rainfall amounts likely over Sudan, Ethiopia, Chad, Cameroun Nigeria, Mali and Guinea.

At 700hpa level, wind flow is wavy and northeasterly. Broad vortices and extensive northeasterly trough lines from western Sudan to CIV during the 96 to 120 hours period are expected to facilitate westward propagation of potential organized thunderstorms across the region during the period.

At 500hpa level, winds associated with mid-tropospheric easterly jet are generally weak with common speeds of 10 to 15kts over most places.

At 150hPa level, tropical easterly jets are weaker over West Africa but stronger over East Africa. Speeds of 30 to 40kts are common over Nigeria, Ghana, Burkina Faso, Mali and the Gulf of Guinea coast while speeds of 50 to 60kts are common over East Africa during the period. Speeds exceeding 70kts are however observed over Ethiopia, Kenya, Sudan, Uganda and Somalia during 24, 48 and 120 hours.

In the next five days, the zone of seasonal and monsoon wind convergence is expected to push further northwards and shift rainfall activities further to the North with chances of organized thunderstorms over the region. Coastal rainfall along the Gulf of Guinea is expected to decrease while strong cross equatorial flow, with its associated convergence over the Horn of Africa is expected to modulate rainfall over East Africa. Thus, there an increased chance for moderate to heavy rainfall over Senegal, Guinea, Sierra Leone, Mali, Algeria, Mauritania, Niger, northern Ghana, CIV, Cameroun, southern Chad, CAR, Gabon, Sudan, northern DRC, Uganda, Kenya, Eritrea and Ethiopia.

2.0. Previous and Current Day Weather Discussion over Africa

(01 August 2013 – 02 August 2013)

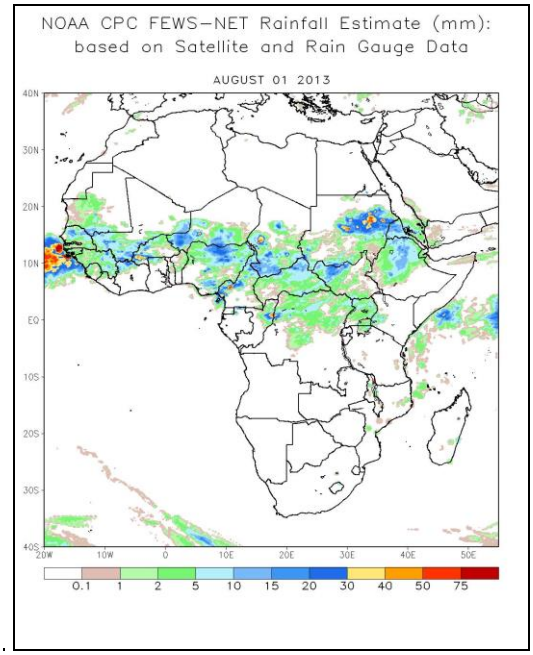
2.1. Weather assessment for the previous day (01 August 2013)

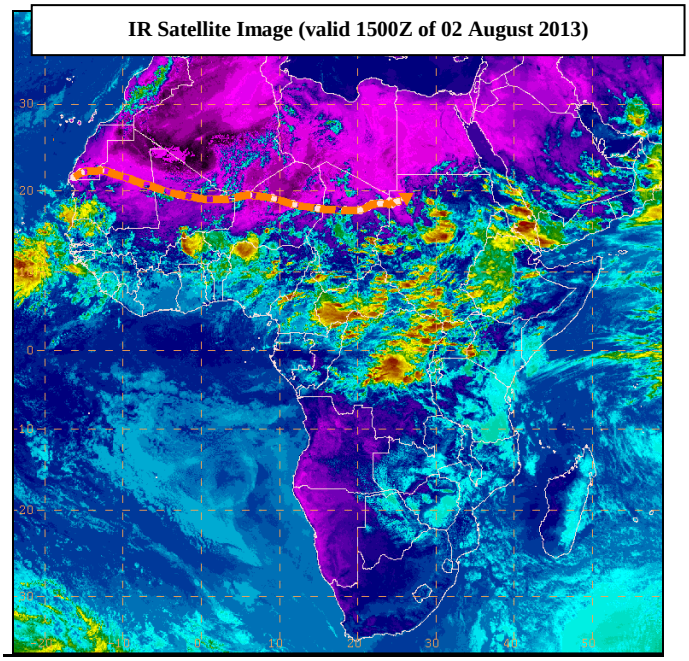
During the previous day, moderate to locally heavy rainfall was observed over Guinea, Senegal, northern Cote D'Ivoire, northwest Ghana, Mali, Burkina Faso, Nigeria, Niger, Congo Brazzaville, Cameroun, Chad, CAR, Sudan and Ethiopia.

2.2. Weather assessment for the current day (02 August 2013)

Intense clouds were observed over Ethiopia, Eritrea, Uganda, Kenya, Sudan, CAR, DRC, Congo Brazzaville, Cameroun, Nigeria, southern Chad, Niger republic, Burkina Faso, Mali, Senegal and Mauritania.

The ITD is located at an average position of latitude 20^{o}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