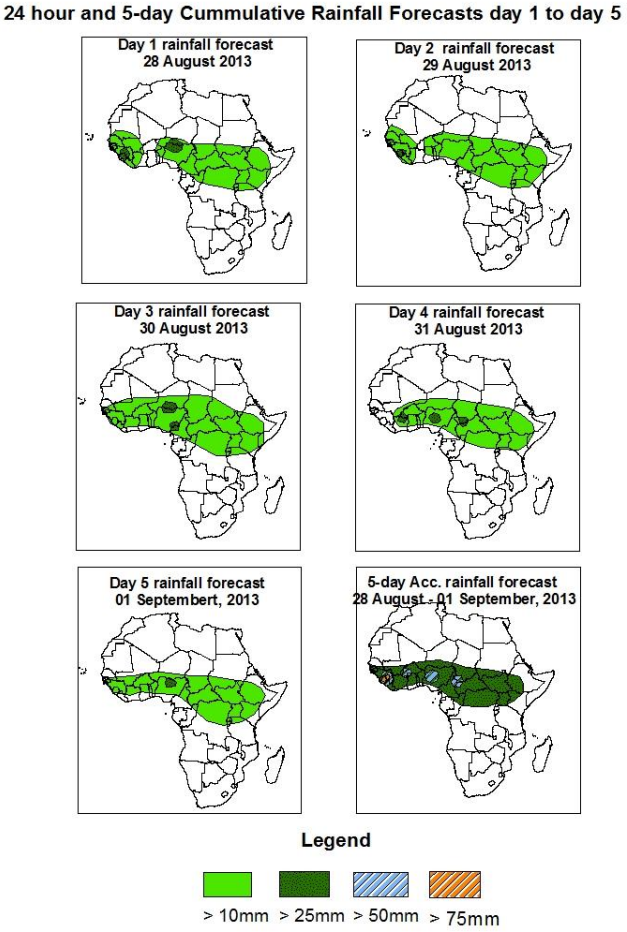
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 28 August – 06Z of 01 September, 2013. (Issued at 1700Z of 27 August 2013)

1.1. Twenty Four Hour Cumulative Rainfall Forecasts

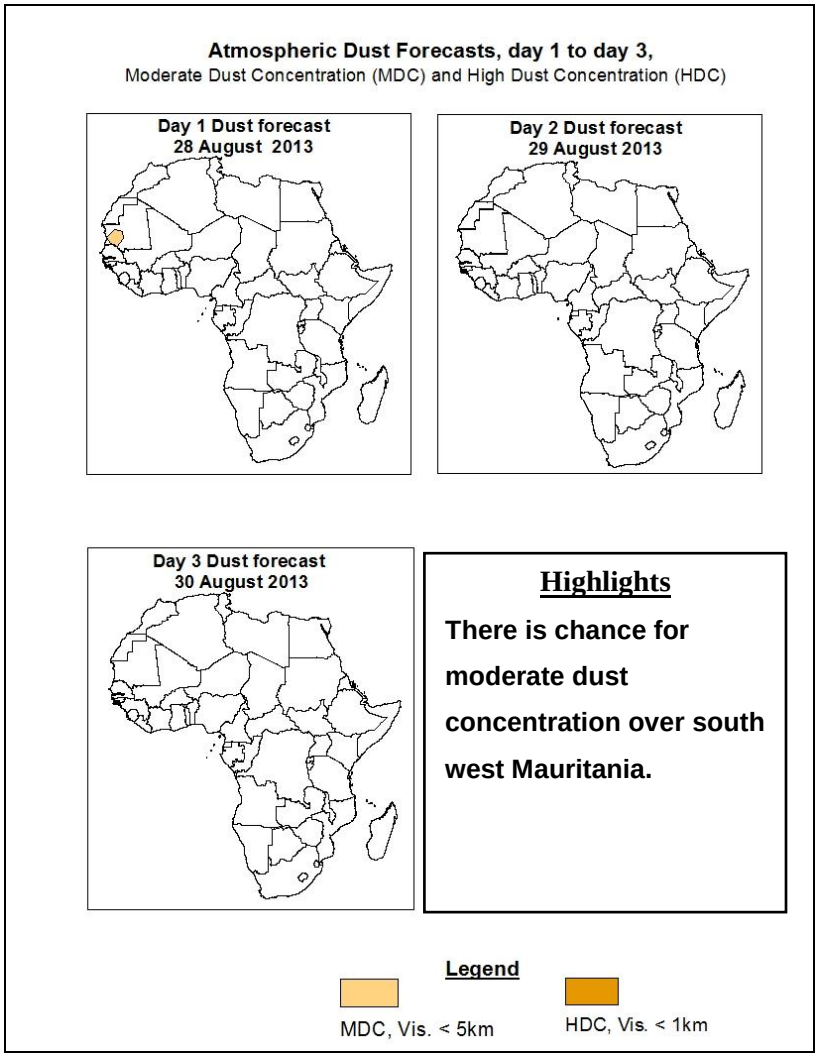
The forecasts are expressed in terms of 75% probability of precipitation (POP) exceeded, based on the NCEP, UK Met Office and the ECMWF NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.



Summary

In the next five days, the *ITD is expected to fluctuate between 18 and 21degree north.* Favorable conditions are expected to modulate rainfall activities over eastern and West Africa with more activities over the south Sahel while suppressed conditions are also expected to continue along the Gulf of Guinea coast, with slight improvement. Strong cross equatorial flow, with its associated convergence over the Horn of Africa is expected to increase rainfall over East Africa. Thus, there is an increased chance for moderate to heavy rainfall over Conakry Guinea, Bissau Guinea, Sierra Leone, Liberia, south west *Niger, South Chad, Sudan, West Ethiopia and central Nigeria.*

1.2. Atmospheric Dust Forecasts: Valid 28 - 30 August 2012



1.2. Model Discussion: Valid from 00Z of 27 August 2013

Model comparison (Valid from 00Z;27 August, 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 slightly intensify during 72 to 120 hours. Its central pressure value is expected to increase from about 1028hpa to 1033hpa according to GFS and UKMET models, from about 1027hpa to 1035hpa according to ECMWF model.

The St. Helena High Pressure System over southeast Atlantic Ocean is expected to also intensify during 24 to 72 hours period; its central pressure value is expected to increase from about 1028hpa to 1034hpa according to GFS model, from about 1029hpa to 1033hpa according to ECMWF model, from about 1029hpa to 1034hpa according to UKMET model.

The Mascarene high pressure system over southwestern Indian Ocean is expected to decrease during 24 to 120 hours. Its central pressure value is expected to decrease from about 1036hpa to 1024hpa according to GFS model, from about 1036hpa to 1026hpa according to ECMWF model, from about 1036hpa to 1026hpa according to UKMET model.

The heat lows over the central Sahel and neighboring areas are expected to weaken slightly during 24 to 72 hours period especially over Mali and Mauritania according to GFS, ECMWF and UKMET models. Its value is expected to increase from about 1007hpa to 1008hpa according GFS model, from about 1008hpa to 1009hpa according to UK model and from about 1006hpa to 1008hpa according UKMET model, the seasonal lows across the red sea and its neighboring areas are expected to maintain its positions during the forecast period according ECMWF and UKMET models, it's expected to be around 1004hpa according both ECMWF and UKMET models.

At the 850hPa level, monsoon wind flow continues to dominate flow across West Africa and the Horn of Africa. The inter-tropical front is also expected to fluctuate between 18 and 21degree north, while meridional wind convergence will dominate flow across East Africa. Suppressed rainfall along Guinea Gulf coast is expected to continue with slight improvement as wind and surface pressure conditions gradually improve over the area during the forecast period. The frequency in number of vortices at this level and wind convergence over the region is expected to reduce over West Africa with high to moderate rainfall over south of Sahel.

The African Easterly Waves (AEW) is also expected to propagate westwards waves to affect part of Guinea Gulf Countries, south Sahel and portion of Central Africa within 24 to 120 hours

At 700hpa level, wind flow maintains northeasterly to easterly flow pattern between few vortices and trough lines also are expected to occur from East to west with lest intensity compare to the last week and likely to facilitate westward propagation of systems across the region during the period.
At 500hpa level, winds associated with mid-tropospheric easterly jet are expected to have common speeds of 30kts over Sahel.

150mb, the Tropical Easterly Jet with a maximum core of 35 to 70 Knots will affect Southern Chad and South Sudan; Part of Ethiopia, Guinea Gulf Countries and Central African Republic through 24 to 120 Hours period. Speeds exceeding 60kts and above are observed over Ethiopia, eastern Sudan and Somalia during the forecast period.

In the next five days, the ITD is expected to fluctuate between 18 and 21degree north. Favorable conditions are expected to modulate rainfall activities over eastern and West Africa with more activities over the south Sahel while suppressed conditions are also expected to continue along the Gulf of Guinea coast, with slight improvement. Strong cross equatorial flow, with its associated convergence over the Horn of Africa is expected to increase rainfall over East Africa. Thus, there is an increased chance for moderate to heavy rainfall over Conakry Guinea, Bissau Guinea, Sierra Leone, Liberia, south west Niger, South Chad, Sudan, West Ethiopia and central Nigeria.

2.0. Previous and Current Day Weather Discussion over Africa

(26 August 2013 – 27 August 2013)

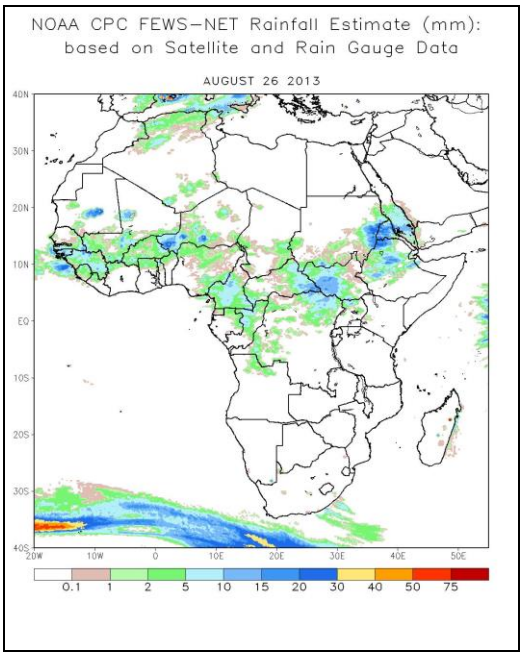
2.1. Weather assessment for the previous day (26 August 2013)

During the previous day, moderate to heavy rainfall was observed over West Niger, Central Mauritania, over Conakry Guinea, South Sudan, North Ethiopia, Central Mali, East CAR, north East DRC.

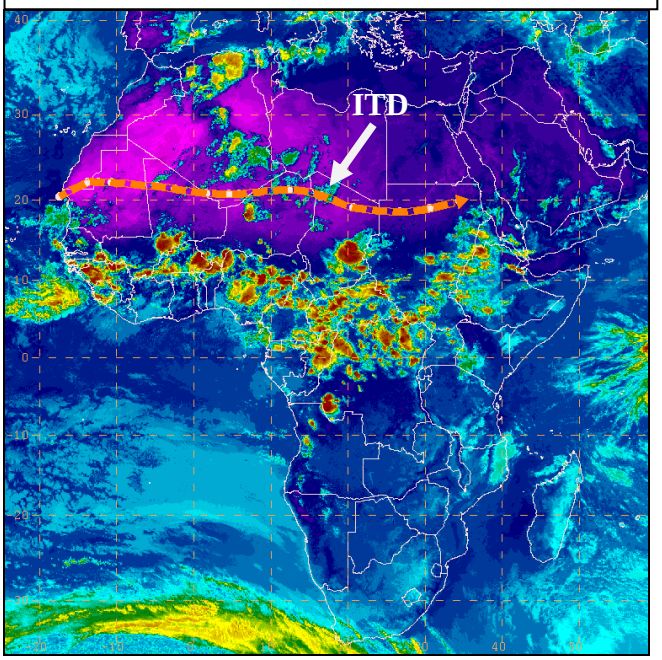
2.2. Weather assessment for the current day (27 August 2013)

Intense clouds were observed over West Niger, Central Mali, Conakry Guinea, Central Nigeria, South east Chad, North Cameroon, CAR, West Ethiopia, North East DRC.

The ITD is located at an average position of latitude 20^{o}N over Africa.



IR Satellite Image (valid 1630Z of 27 August 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

Author: **Kassimou Abdou**, (ACMAD / CPC-African Desk); kassimou.abdou@noaa.gov