

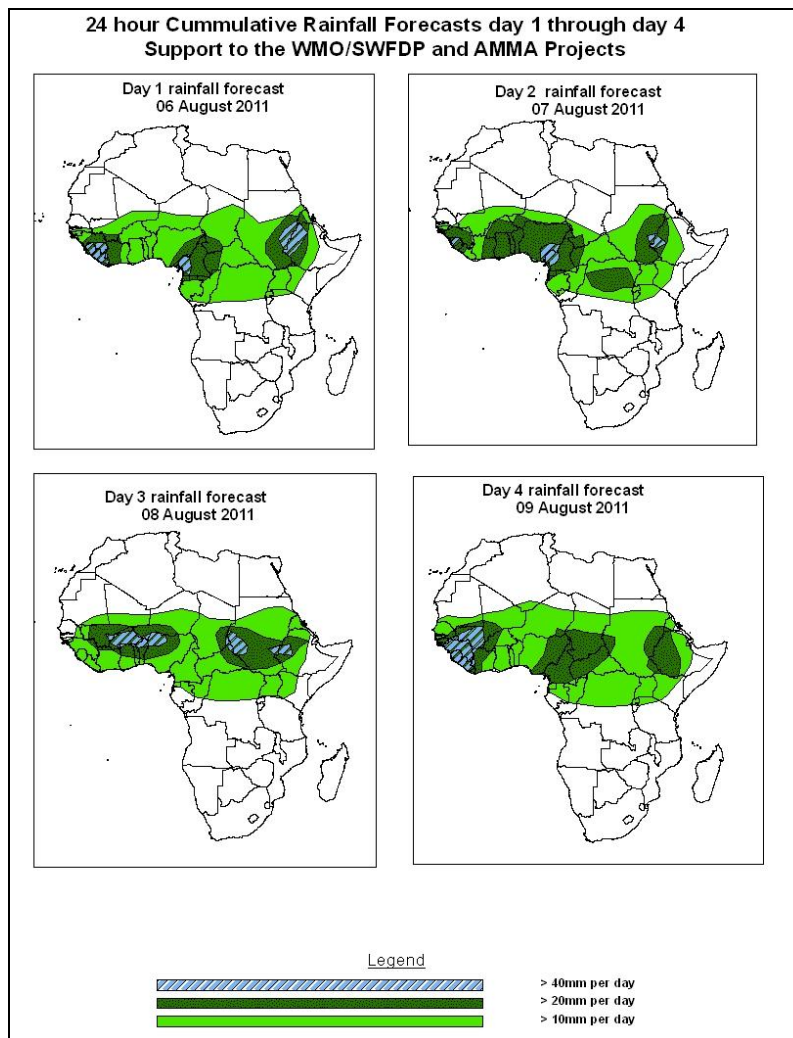


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid 06Z of 06 August – 06Z of 09 August 2011, (Issued at 10:15Z of 05 August 2011)

### 1.1. Twenty Four Hour Cumulative Rainfall Forecasts

The forecasts are expressed in terms of high 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 four days, westward propagating waves and their associated convective activities are expected to continue enhancing rainfall over western Africa. The persistent lower tropospheric convergence near the border between Chad and Sudan is also expected to maintain moderate to heavy rainfall in the region. The active convergence in the Congo Air Boundary (CAB) region and the cross equatorial flow towards the Horn of Africa is expected to increase rainfall in the regions. In general, there is an increased chance for moderate to heavy rainfall over southern Senegal, Gambia, Guinea, Sierra Leone, Liberia, portions of southern Mali, Burkina Faso, Cote D'Ivoire, Ghana, Togo, Benin, Nigeria, Cameroon, southern Niger and portions of southeastern Chad, northern DRC, parts of Sudan and Ethiopia.

## **1.2. Models Comparison and Discussion-Valid from 00Z of 05 August 2011**

According to the NCEP/WRF, GFS, ECMWF and UKMET models, the monsoon trough with its associated heat lows across the Sahel region is expected to maintain its east-west orientation during the forecast period. The heat low along its western end (near the border between Mali and Mauritania) tends to deepen, with its central pressure value decreasing from 1004mb to 1003mb through 24 to 48 hours, according to the ECMWF model, from 1004mb to 1003mb according to the GFS model and from 1002mb to 1000mb according to the UKMET model. However, this heat low tends to fill up through 48 to 96 hours, with its central pressure value increasing from 1003mb to 1008mb according to the ECMWF model; from 1003mb to 1007mb according to the GFS model and from 1000mb to 1005mb according to the UKMET model. All the three models tend to show little or no change in terms of central pressure value of the heat low over central African region. The mean sea level pressure value is expected to remain between 1006mb to 1007mb during the forecast period. On the other hand, the heat low over eastern Arabian Peninsula is expected to fill up from central pressure value of 993mb in 24 hours to pressure value of 996mb in 72 hours according to the ECMWF, it tends to change from 992mb to 996mb through 24 to 72 hours according to the GFS model and it tends to increase slightly from 992mb to 993mb through 24 to 72 hours according to the UKMET model. This heat low tends to deepen by 96hours according to all the three models. The East African ridge across southeast and East Africa is expected to remain weak during the forecast period.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken, with its central pressure value decreasing from 1035 in 24 hours to 1023mb through 24 to 72 hours, while moving across the southern tip of South Africa. The Mascarene high pressure system over southwest Indian Ocean is also expected to weaken, with its central pressure value decreasing from 1032mb to 1023mb during the forecast period, while shifting southeastwards.

At the 850hpa level, a cyclonic circulation over northern Mali is expected to weaken, with little westward shift during the forecast period. Another cyclonic circulation near eastern Nigeria is expected to weaken gradually, slightly shifting towards western Nigeria during the forecast period. A lower tropospheric convergence near the border between eastern Chad and western Sudan is expected to strengthen gradually, with little or no shift during the forecast period. The seasonal meridional convergence in the

Congo Air Boundary (CAB) region is expected to become gradually active along its southern end (near Uganda and northern DRC) during the forecast period. The monsoon flow from the Atlantic Ocean and the moist equatorial flow from the Indian Ocean are expected to continue providing abundant moisture to the lower tropospheric convergences in western and central African region and the northern parts of the GHA region.

At 700mb level, a cyclonic circulation is expected to propagate across the southwest coast of West Africa through 24 to 48 hours, while another cyclonic circulation is expected to move between central African region and coastal West Africa during the forecast period.

At 500hpa, easterly winds with moderate intensity (10 to 25knots) are expected to dominate the flow over the Gulf of Guinea, southern Sahel region and Sudan. A Zone of strong easterlies associated with the African Easterly Jet (AEJ) is expected to propagate westwards between Mali and the west coast of West Africa through 24 to 72 hours. Another zone of strong easterlies is expected to propagate between western Sudan and eastern Chad through 72 to 96hours.

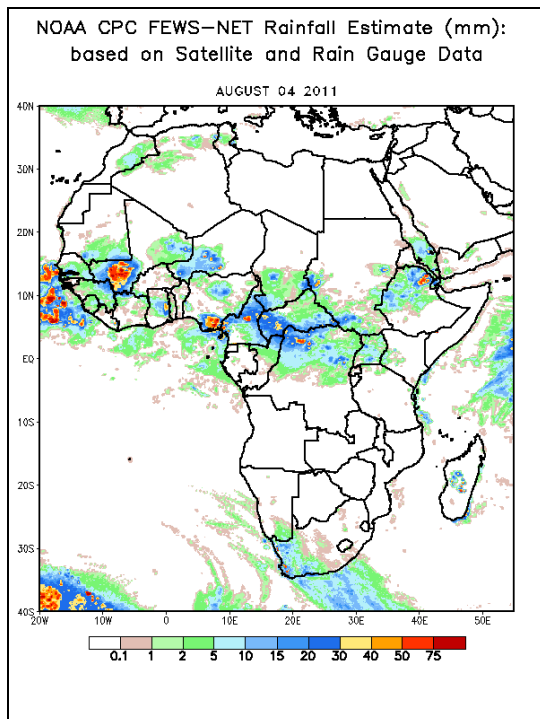
At 150mb, a zone of easterly flow that exceeds 70kts, associated with Tropical Easterly Jet (TEJ) is expected to dominate the flow over northern Somalia, Ethiopia and Sudan through 72 to 96 hours.

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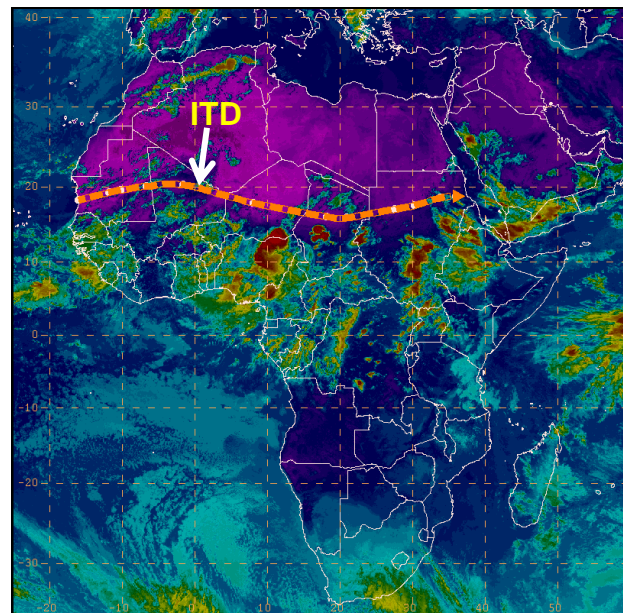
## 2.0. Previous and Current Day Weather Discussion over Africa (04 – 05 August 2011)

**2.1. Weather assessment for the previous day (04 August 2011):** During the previous day, moderate to heavy rainfall was observed over western Mali, coastal Nigeria, northern Cameroon, western CAR, northern DRC and northern Ethiopia.

**2.2. Weather assessment for the current day (05 August 2011):** Intense clouds are observed over Nigeria, Sudan and Ethiopia, northern DRC and Uganda.



IR Satellite Image (valid 1545Z) and position of ITD,  
based on 1200Z Surface Analysis; 05 August 2011



*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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