

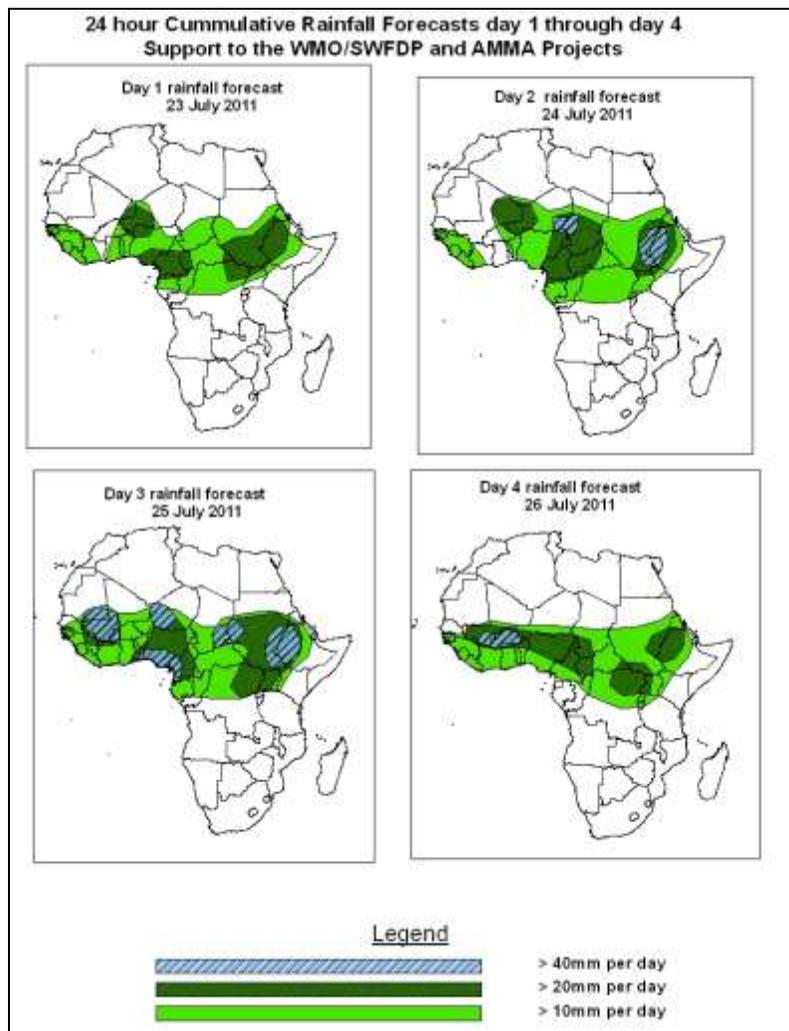


## NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

### 1.0. Rainfall Forecast: Valid 06Z of 23 July– 06Z of 26 July 2011, (Issued at 10:00Z of 22 July 2011)

#### 1.1. Twenty Four Hour Cumulative Rainfall Forecasts

The forecasts are expressed in terms of 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, enhanced rainfall is expected over parts of western and central Africa, and western Sudan due to westward propagating convergences and their associated thunderstorms. Hence, there is an increased chance for heavy rainfall over southern and central Mali, parts of southern Mauritania, parts of Niger, Nigeria, Chad and western Sudan. The seasonal monsoon flow is also expected to maintain moderate to heavy rains over parts of Ethiopia, eastern Sudan and Eritrea.

## **1.2. Models Comparison and Discussion-Valid from 00Z of 22 July 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 Mali) is expected to fill up through 24 to 48 hours and tends to deepen through 48 to 96 hours. Its central pressure value is expected to increase from 1008 to 1009mb through 24 to 48 hours and tends to deepen into mean Sea Level pressure value of 1002mb through 48 to 96 hours according to the GFS and ECMWF models. The mean sea level pressure value of this same heat low is expected to increase from 1007mb in 24 hours to 1008 in 48 hours and then it tends to decrease to mean sea level pressure value of 1001mb in 96 hours according to the UKMET model. Similarly, the heat low over central African region is expected to deepen through 48 to 96 hours, with its central pressure value changing from 1005 to 1003mb according to GFS, from 1008 to 1006mb according to ECMWF and from 1006mb to 1004 mb according to the UKMET model. The heat low over Sudan is expected to maintain its central pressure value during the forecast period according to the three models. The East African ridge across southeast and East Africa is expected to weaken gradually through 48 to 96 hours.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to intensify gradually through 24 to 96 hours, with its central pressure value increasing from 1028hpa in 24 hours to 1032 hpa in 96 hours, according to the GFS model. The Mascarene high pressure system over southwest Indian Ocean is expected to weaken, with its central pressure value changing from 1028 in 24 hours to 1016 in 72 hours.

At the 850hpa level, a cyclonic circulation over northern Mali is expected to move westwards across southern Mauritania and Senegal through 24 to 72 hours, leaving the West Africa coast by 96 hours. A strong lower tropospheric convergence over Niger is expected to move westwards and it is expected to become a cyclonic circulation by the time it reaches northern Mali in 96 hours. Another lower tropospheric convergence near the border between Chad and Sudan is also expected to strengthen and become a closed cyclonic circulation by 96 hours, maintain its position during the forecast period. The seasonal cross equatorial flow across East and Southeast Africa is expected to be more of meridional as the Mascarene anticyclone remains in the vicinity of the Mozambique Channel through 24 to 72 hours and it tends to weaken through 72 to 96 hours, with the weakening of the Mascarene anticyclone. Moreover, southwesterly flow

across the Gulf of Guinea is expected to dominate the flow over central African countries and parts of the GHA region throughout the forecast period.

At 700mb level, a weak wave in the easterlies is expected to propagate in the region between Mali and southern Senegal during the forecast period, while an anticyclonic circulation dominates the flow over northern Senegal and southern Mauritania.

At 500hpa, easterly winds with moderate intensity (10 to 25knots) are expected to dominate the flow over western Sudan, central African and the Gulf of Guinea and southern Sahel region, with the stronger winds associated with the African easterly Jet are expected in the region extending between eastern Senegal and northern Chad, across Niger, Mali and southern Mauritania.

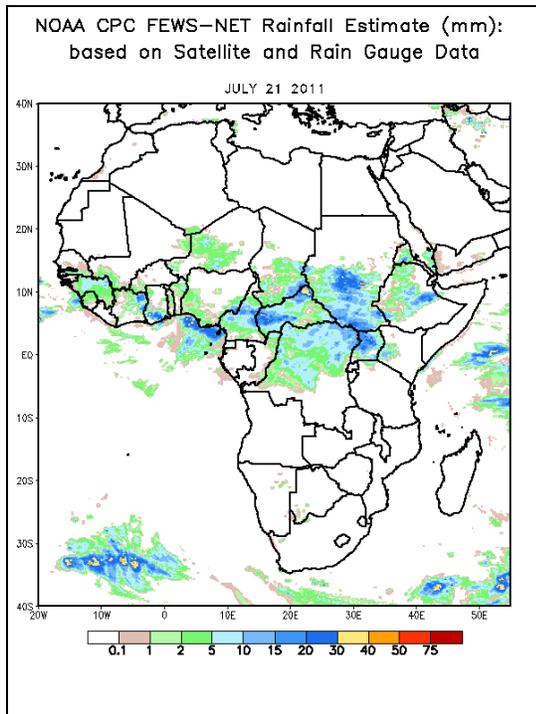
A zone of strong wind (>110Kts) at 200hpa level associated with the Sub Tropical westerly Jet in the southern hemisphere is expected to propagate between southeast Atlantic Ocean and southwest Indian Ocean across South Africa during the forecast period.

In the next four days, enhanced rainfall is expected over parts of western and central Africa, and western Sudan due to westward propagating convergences and their associated thunderstorms. Hence, there is an increased chance for heavy rainfall over southern and central Mali, parts of southern Mauritania, parts of Niger, Nigeria, Chad and western Sudan. The seasonal monsoon flow is also expected to maintain moderate to heavy rains over parts of Ethiopia, eastern Sudan and Eritrea.

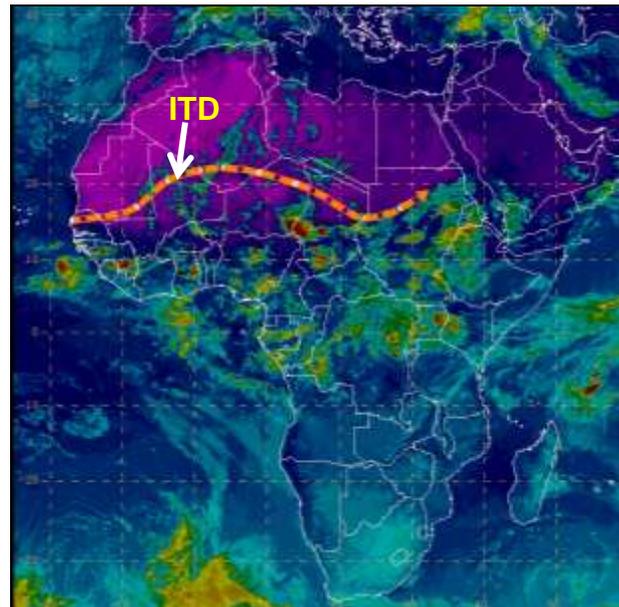
## 2.0. Previous and Current Day Weather Discussion over Africa (21 July - 22 July 2011)

**2.1. Weather assessment for the previous day (21 July 2011):** During the previous day, moderate rainfall was observed over northwest Cote D'Ivoire, southern Ghana, CAR, northern DRC, Sudan, Uganda and portions of Ethiopia.

**2.2. Weather assessment for the current day (22 July 2011):** Locally intense clouds are observed over Guinea, Ghana, Nigeria, Niger, Chad, DRC, Uganda, western Kenya, Sudan and Ethiopia.



IR Satellite Image (valid 1545Z) and position of ITD,  
based on 1200Z Surface Analysis; 20 July 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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