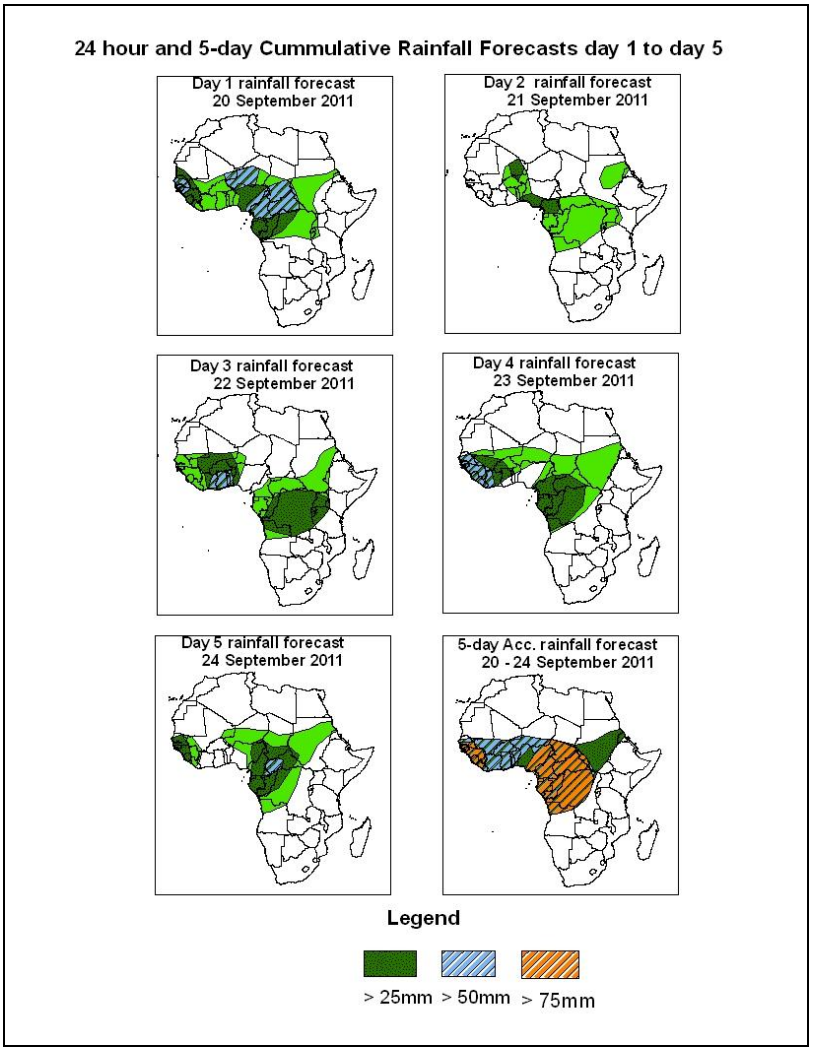
# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## *1.0. Rainfall Forecast: Valid 06Z of 20 September – 06Z of 24 September 2011, (Issued at 10:15Z of 19 September 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 five days, westward propagating thunderstorms localized cyclonic circulations and lower tropospheric wind convergences are expected to enhance rainfall across the Gulf of Guinea, central African and the Congo Air boundary (CAB) region. In general, there is an increased chance for heavy rainfall over southern Senegal, Guinea Conakry, Guinea Bissau, Serra Leone, Liberia, eastern Nigeria, Cameroon, Car, southern Chad, Congo, northwestern DRC and northwestern Angola.

## 1.2. Models Comparison and Discussion-Valid from 00Z of 20 September 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. During the forecast period, a low across northern Mali, Mauritania Niger and Chad is expected to shift westward, while deepening with its central pressure value decreasing from 1010mb to 1008mb according to the ECMWF model, from 1010mb to 1007mb according to the UKMET model. The GFS model tends to indicate two centers associated with heat low. The first one across Guinea Bissau, Senegal, Mauritania, Mali and southwestern Algeria is expected to shift westward, while deepening with its central pressure value decreasing from 1009mb to 1006mb through 24 to 96 hours and then tends to fill up with its central pressure value increasing from 1006mb to 1008mb through 96 to 120 hours. The second one over the border between Niger and Chad is expected to shift westward, while deepening with its central pressure value decreasing from 1010mb to 1009mb during the forecast period.

During the forecast period, the low pressure located over the Arabian Peninsula is expected deepen with its central pressure value decreasing from 1005mb to 1003mb according to the ECMWF model, from 1006mb to 1005mb according to the GFS model and from 1005mb to 1001mb according to the UKMET model.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken with its central pressure value decreasing from 1032mb to 1024mb according to the ECMWF, from 1032mb to 1025mb according to the UKMET model during the forecast period. According to the GFS model, this High pressure system over southeast Atlantic Ocean is expected to weaken with its central pressure value decreasing from 1028mb to 1027mb through 24 hours to 72hours, and it tends to intensify with its central pressure value increasing from 1027mb to 1028mb through 72 to 96 hours and then tends to weaken with its central pressure value decreasing from 1028mb to 1026mb through 96 hours to 120 hours.

The Mascarene high is expected to weaken with its central pressure value decreasing from 1024mb to 1020mb through 24 hours to 48 hours, and it tends to intensify with its central pressure value increasing from 1020mb to 1028mb through 48 to 120 hours. The East African ridge is expected to weaken with the weakening of the Mascarene high pressure system and then tends to strengthen along with the intensification of the Mascarene high pressure system.

At the 850hpa level, a series of cyclonic circulations are expected to dominate the flow across eastern Nigeria, southern Chad, Cameroon, CAR, Gabon and northern DRC, while shifting southwestward to southeastern Cameroon, CAR, Gabon and northwestward DRC. A cyclonic circulation is expected to dominate the flow across eastern Sudan and western Eritrea during the forecast period. North-south oriented seasonal convergences are expected to remain active near the Lake Victoria region 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 GHA region.

At 700mb level, an easterly wave is expected to propagate southwestward from border between Niger and Chad southern Mauritania, Senegal, Guinea Bissau, Guinea Conakry and western Mali during the forecast period.

At 500hpa, easterly winds with moderate intensity (10 to 25knots) are expected to dominate the flow over Mali and eastern Senegal during the forecast period. The AEJ is expected to remain weak during the forecast period.

At 150hpa Strong winds, the TEJ is expected to remain weak.

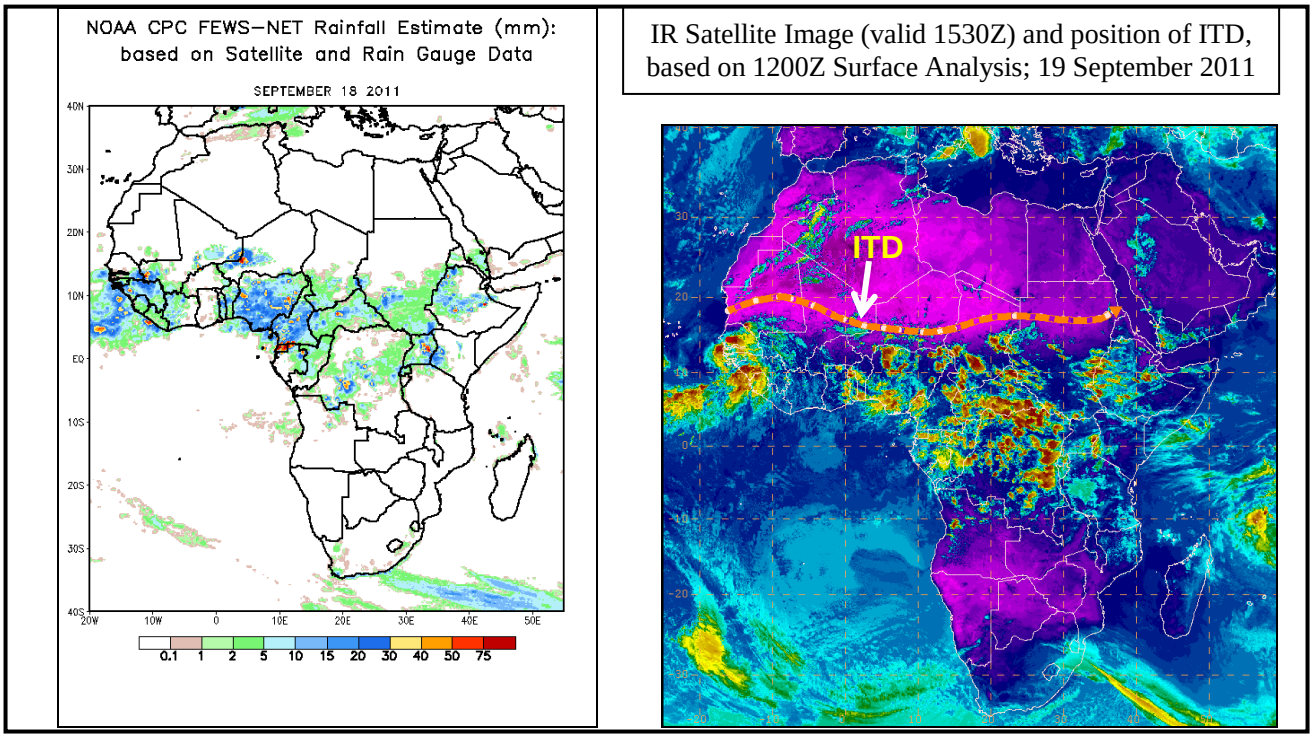
In the next five days, westward propagating thunderstorms localized cyclonic circulations and lower tropospheric wind convergences are expected to enhance rainfall across the Gulf of Guinea, central African and the Congo Air boundary (CAB) region. In general, there is an increased chance for heavy rainfall over southern Senegal, Guinea

Conakry, Guinea Bissau, Serra Leone, Liberia, eastern Nigeria, Cameroon, Car, southern Chad, Congo, northwestern DRC and northwestern Angola.

## *2.0. Previous and Current Day Weather Discussion over Africa (18 – 19 September 2011)*

**2.1. Weather assessment for the previous day (18 September 2011):** During the previous day, moderate to heavy rainfall was observed near the Mali-Senegal-Guinea border, the border between Mali and Niger, much of Nigeria, much of Cameroon, border between Uganda and Kenya, parts of Ethiopia, and local areas of DRC.

**2.2. Weather assessment for the current day (19 September 2011):** Intense clouds are observed over southern Senegal, Gambia, Serra Leone, western Liberia, Togo, southern Benin, part of Nigeria, eastern Cameroon, CAR, southern Chad, much of Congo, northern and eastern DRC, much of southern Sudan, eastern Uganda and parts of Ethiopia.




*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(s): Sadibou Ba (Agence Nationale de la Meteorologie du Senegal) / CPC-African Desk), sadibou.ba@noaa.gov and**
**Aminata Makalou (Direction Nationale de la Meteorologie du Mali-ASECNA) / CPC-African Desk), aminata.makalou@noaa.gov**

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