

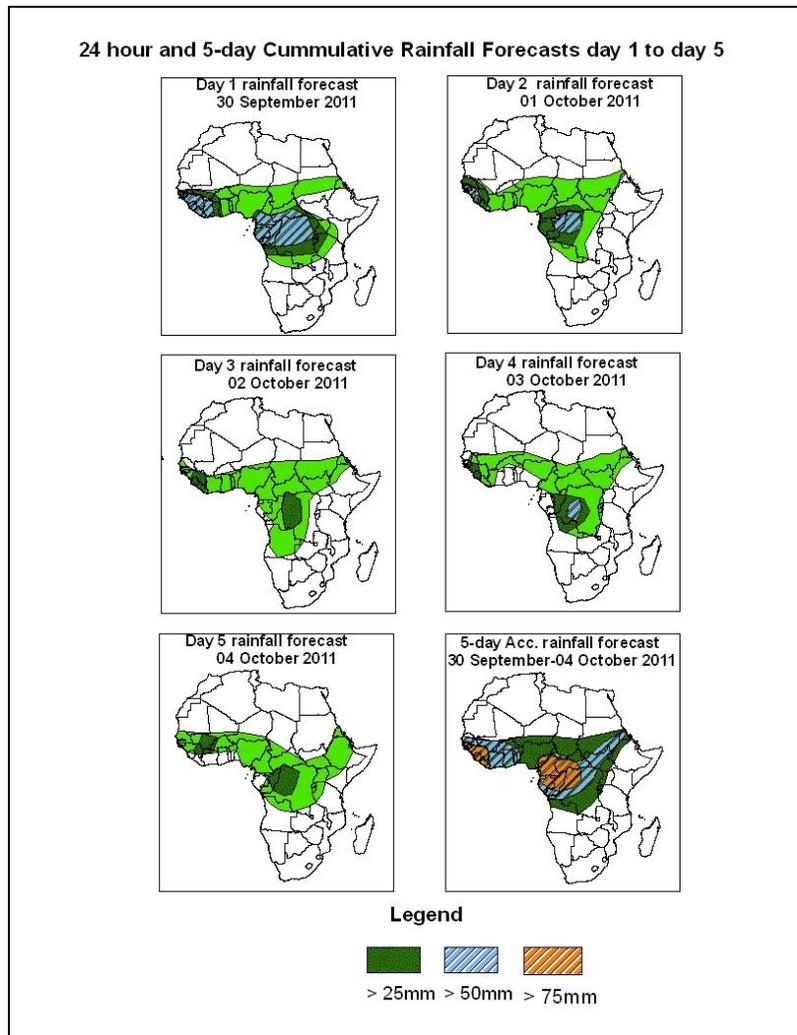


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid 06Z of 30 September – 06Z of 04 October 2011, (Issued at 10:15Z of 29 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, 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 much of Guinea Conakry, Sierra Leone, Liberia, Guinea Bissau, Cote D'Ivoire, southern Mali, Ghana, Togo, southern Benin, southeastern Nigeria, much of Cameroon, western CAR, northern DRC, central South-Sudan Republic, eastern Sudan and Eritrea.

## **1.2. Models Comparison and Discussion-Valid from 00Z of 28 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. The ECMWF model indicates a low pressure over the border between southwestern Niger and eastern Mali, which is expected to shift westward, while maintaining its central pressure value of 1010mb through 48 to 120 hours. According to the GFS model, a low located over coastline of Mauritania is expected to maintain a central pressure value of 1009mb, while shifting westward to the Atlantic Ocean through 24 to 72 hours. Another low over the border between western Mali and eastern Mauritania is expected to maintain a central pressure value of 1009mb through 24 to 48 hours, extending westward to the eastern Mauritania, and filling up through 72 hours. A third low is expected to develop over the border across Mali, Niger and Burkina Faso, shifting westward to the border between Mauritania and Senegal, while deepening with its central pressure value decreasing from 1009mb to 1008mb through 24 to 72 hours and then filling up with its central pressure value increasing from 1008mb to 1009mb through 72 to 120hours. According to the UKMET model, a low located over western Mauritania with a central pressure value of 1010mb is expected to fill up through 24 to 48 hours. A second low over northern Mali is expected to maintain a central pressure value of 1010mb through 24 to 48 hours and then to fill up through 48 to 72 hours. A third low over border between Mali and Niger is expected to deepen with its central pressure value decreasing from 1010mb to 1009mb through 24 to 72 hours, and then to fill up totally by 96 hours.

According to the ECMWF model a low pressure is expected to develop over central Chad, while filling up with its central pressure value increasing from 1009mb to 1011mb through 24 to 72 hours and then deepening with its central pressure value decreasing from 1011mb to 1010mb through 72 to 120 hours. According to the GFS model this low over Chad, is expected to fill up with its central pressure value increasing from 1009mb to 1010mb through 24 to 96 hours and then deepening with its central pressure value decreasing from 1010mb to 1009mb through 96 to 120 hours. According to the UKMET model this low pressure is located over south east Chad, shifting to the center of Chad, maintaining its central pressure value at 1008mb through 24 to 72 hours and then, filling

up by 96 hours. According to the GFS model, another low pressure is expected to develop over northeastern Sudan, while filling up with its central pressure value increasing from 1008mb to 1010mb during the forecast period. Through 96 to 120 hours this low pressure is expected to have two centers: the first center located over northeastern Sudan and the second over southern or central Sudan. According to the UKMET model this low is expected with two centers: the first center over the north-east Sudan is expected to fill up with its central pressure value increasing from 1005mb to 1006mb during the forecast period. The second center over southeastern Sudan Republic tends to maintain its central pressure value at 1008mb through 24 to 72 hours and then to fill up totally by 96 hours. During the forecast period the low pressure located over the Arabian Peninsula is expected deepen with its central pressure value decreasing from 1006mb to 1004mb, according to the ECMWF model, from 1008mb to 1005mb according to the GFS model. According to the UKMET model this low tends to shift eastward away from the Arabian Peninsula, while deepen with its central pressure value decreasing from 1006mb to 1005mb through 24 hours to 72 hours.

According to the ECMWF model, the St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken with its central pressure value decreasing from 1025mb to 1024mb through 24 to 48 hours and then tends to intensify with its central pressure value increasing from 1024mb to 1028mb through 48 hours 120hours. According to the GFS model, this High pressure system over southeast Atlantic Ocean is expected to weaken with its central pressure value decreasing from 1025mb to 1024mb through 24 hours to 48 hours, and it tends to intensify with its central pressure value increasing from 1024mb to 1032mb through 48 to 120 hours. According to the UKMET model the St. Helena High pressure system is expected to intensify with its central pressure value increasing from 1020mb to 1031mb during the forecast period.

The Mascarene high is expected to weaken with its central pressure value decreasing from 1020mb to 1016mb during the forecast period. The East African ridge is expected to weaken with the weakening of the Mascarene high pressure system.

At the 850hpa level, a deep cyclonic circulation is expected to dominate the flow over southern Senegal, southern Mali, Guinea Bissau, Sierra Leone, Liberia, Guinea Conakry, western Cote D'Ivoire, while shifting westward to the Atlantic Ocean through

24 hours to 48 hours. Another deep cyclonic circulation is expected to dominate the flow over northern Nigeria and southwestern Niger, while shifting southwestward to the Atlantic Ocean through 24 to 72 hours. Through 96 to 120 hours, a cyclonic circulation with three way troughs is expected across the borders of Mali and Mauritania, northern Nigeria and southern Niger, shifting westward through 96 to 120 hours. A deep cyclonic circulation with four associated vortexes is expected to dominate the flow over CAR, southern Cameroon, northern DRC, northeastern Sudan, southern DRC and Angola through 24 to 72 hours. Wind convergences are expected to dominate the flow over central Chad, western Sudan Republic, from border between Ethiopia and Sudan and Eritrea through 48 to 72 hours, extending between Rwanda to Botswana through 96 to 120 hours

At 700mb level, an easterly wave is expected to propagate westward over western Cote D'Ivoire, Guinea Conakry, southern Cameroon and southeastern Nigeria through 24 to 48 hours.

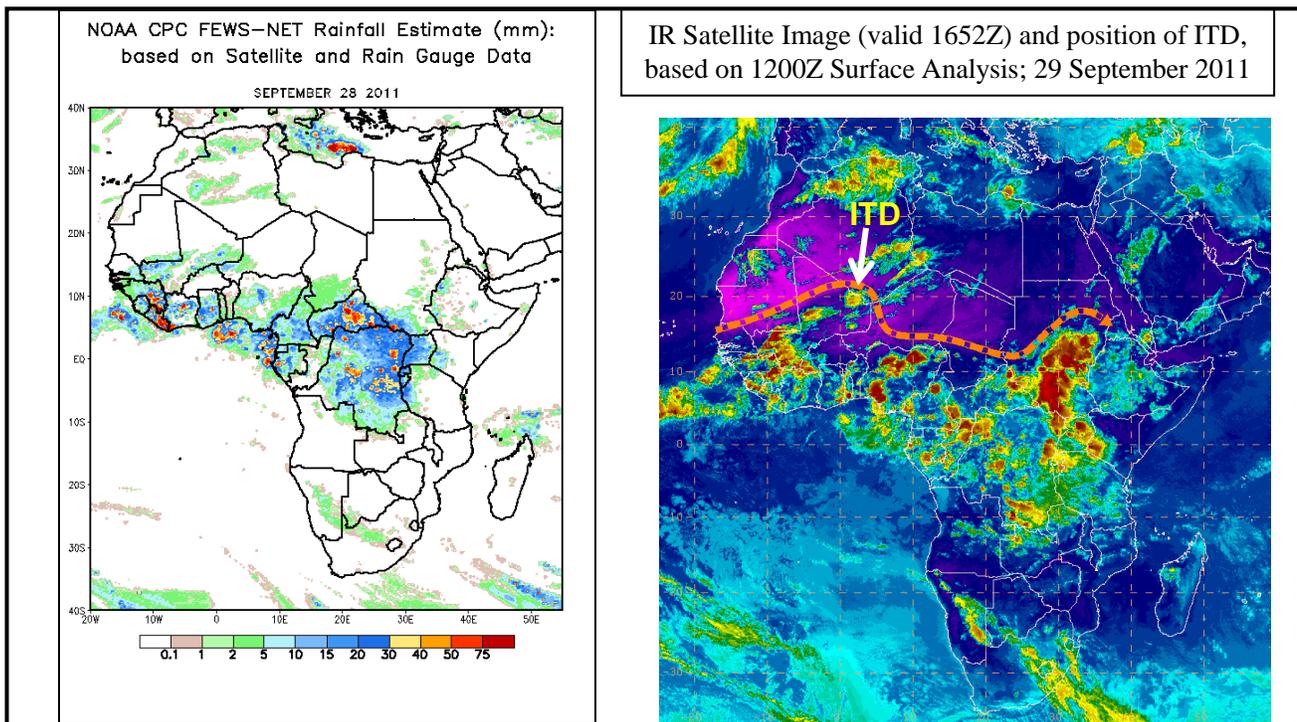
At 500hpa, easterly winds with moderate intensity (10 to 25knots) are expected to dominate the flow over Mali and eastern Senegal during the forecast period. In general, the AEJ is expected to remain weak during the forecast period.

In the next five days, 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 much of Guinea Conakry, Sierra Leone, Liberia, Guinea Bissau, Cote D'Ivoire, southern Mali, Ghana, Togo, southern Benin, southeastern Nigeria, much of Cameroon, western CAR, northern DRC, central South-Sudan Republic, eastern Sudan and Eritrea.

## 2.0. Previous and Current Day Weather Discussion over Africa (28 – 29 September 2011)

**2.1. Weather assessment for the previous day (28 September 2011):** During the previous day, moderate to heavy rainfall was observed near the Gambia, southeastern Guinea, eastern Liberia, part of Cote D'Ivoire, central Ghana, central Nigeria, much of CAR, much of DRC, coastline of Cameroon and Gabon and western Uganda.

**2.2. Weather assessment for the current day (29 September 2011):** Intense clouds are observed over central and southern Mali, western Burkina Faso, much of Guinea Conakry, much of Cote D'Ivoire, much of Liberia, much of Togo and Benin, part of Nigeria, part of Cameroon and Gabon, much of DRC, Uganda, Burundi, Rwanda, southern and southeastern Sudan, western CAR and western Kenya.



*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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