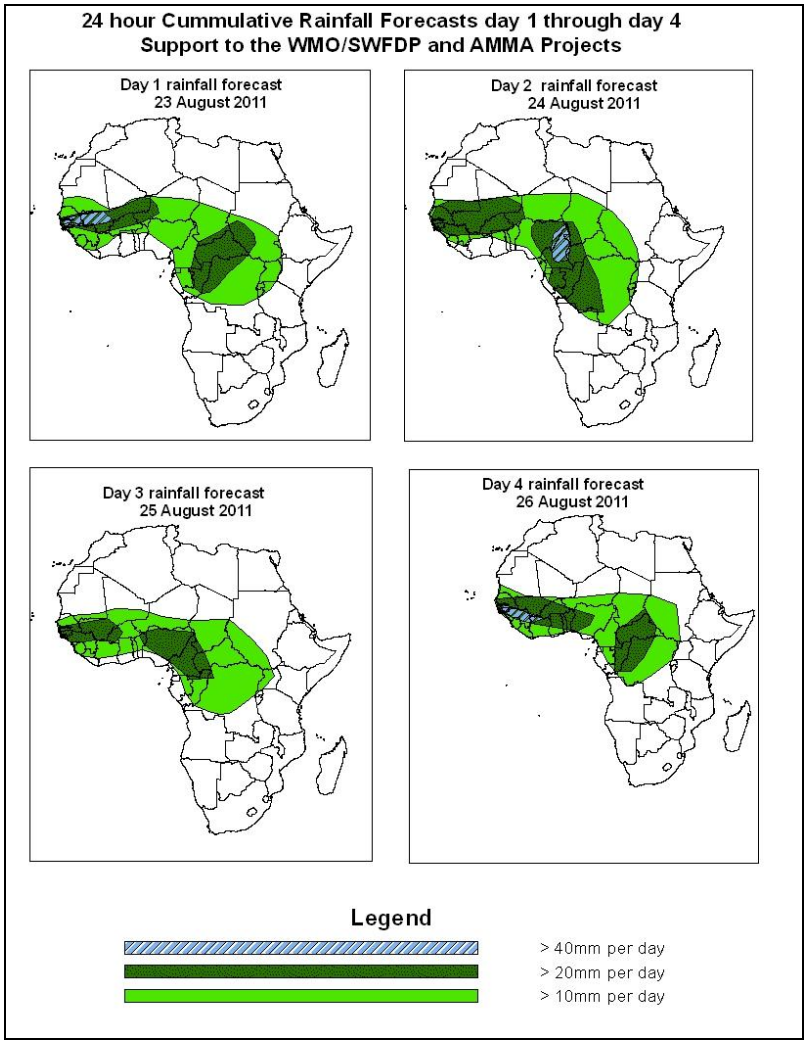
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 23 August – 06Z of 26 August 2011, (Issued at 10:15Z of 12 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, westwards propagating waves with their associated convective activities, together with the strong monsoon flow, are expected to enhance rainfall over parts of western and central African countries. In general, there is an increased chance for moderate to heavy rainfall over Senegal, Mali, Burkina Faso, Guinea, CAR, Nigeria, and Cameroon, portions of Cote d'Ivoire, Liberia and parts of western DRC, Gabon, southern Chad and southern Sudan.

1.2. Models Comparison and Discussion-Valid from 00Z of 22 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 southern Algeria and northern Mali) tends to fill up, with its central pressure value increasing from 1007mb to 1008mb according to the ECMWF model during the forecast period. This low tends to maintain pressure value of 1006mb according to the ECMWF and UKMET models during the forecast period. The heat low over central Africa region tends to fill up, with its mean sea level pressure value increasing from 1008mb to 1010mb during the forecast period. The mean sea level pressure value of this heat is expected to increase from 1006mb to 1008mb according to the GFS model through 24 to 48 hours and it tends to decrease from 1008mb to 1006mb towards end of the forecast period. This same heat low is expected to deepen from 1007mb to 1006mb according to the UKMET model during the forecast period. On the other hand, the heat low over eastern Arabian Peninsula is expected to deepen from 999mb to 996mb, according to the ECMWF model, from 1000mb to 997mb, according to the GFS model and from 1000mb to 996mb according to the UKMET model though 24 to 72 hours. This same heat low tends to fill up, with its central pressure value increasing to 997mb, 998mb and 997mb, according to ECMWF, GFS and UKMET models, respectively towards end of the forecast period. The East African ridge across southeast and East Africa is expected to weaken during the forecast period.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to intensify from 1025mb to 1032mb during the forecast period. The Mascarene high pressure system over southwest Indian Ocean is expected to weaken from 1029mb to 1023mb during the forecast period.

At the 850hpa level, a cyclonic circulation is expected to prevail across Senegal and Guinea through 24 to 48 hours. Another cyclonic circulation is expected to dominate the flow across Niger and Chad, while weakening during the forecast period. The seasonal convergence in the vicinity of Lake Victoria is expected to remain active 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, an easterly wave across coastal West Africa is expected to propagate westwards into the Atlantic Ocean during the forecast Period. Another weak wave over central African region is expected to propagate towards western end of West Africa through 24 to 96 hours.

At 500hpa, strong easterly winds associated with the AEJ is expected to propagate across western portions of West Africa while gradually weakening towards end of the forecast period. Localized mid-tropospheric easterly winds are also expected to prevail across portions of central African countries during the forecast period.

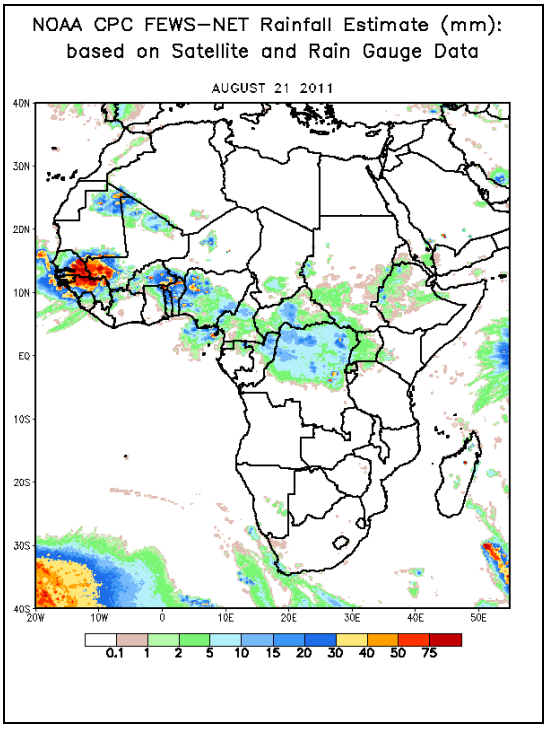
At 150mb, strong winds associated with Tropical Easterly Jet (TEJ) are expected to remain weak during the forecast period.

In the next four days, westwards propagating waves with their associated convective activities, together with the strong monsoon flow, are expected to enhance rainfall over parts of western and central African countries. In general, there is an increased chance for moderate to heavy rainfall over Senegal, Mali, Burkina Faso, Guinea, CAR, Nigeria, and Cameroon, portions of Cote d'Ivoire, Liberia and parts of western DRC, Gabon, southern Chad and southern Sudan.

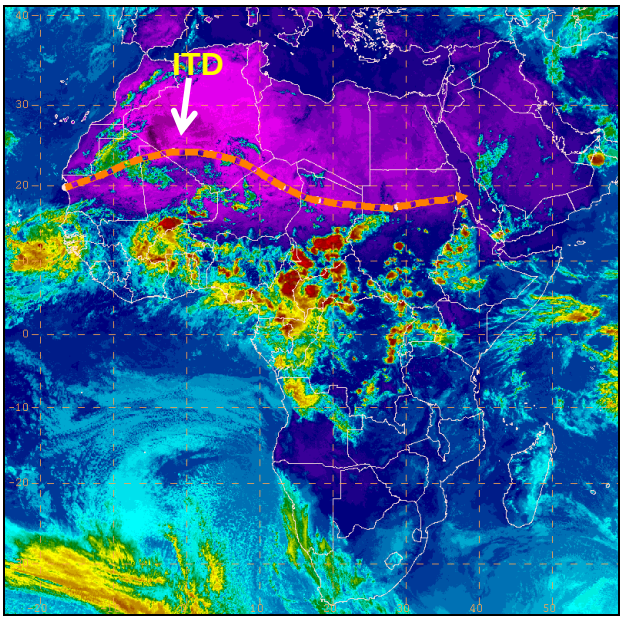
2.0. Previous and Current Day Weather Discussion over Africa (21 – 22 August 2011)

2.1. Weather assessment for the previous day (21 August 2011): During the previous day, very heavy rainfall was observed in the region that includes eastern Senegal, southwestern Mali and northern Guinea. Moderate to heavy rainfall was also observed over Burkina Faso, Togo, Benin, western Nigeria, northern DRC and CAR.

2.2. Weather assessment for the current day (22 August 2011): Intense clouds are observed over Mali, Burkina Faso, southern Chad, CAR, Cameroon, Gabon, northern DRC, southern Sudan, and western Ethiopia.



IR Satellite Image (valid 1545Z) and position of ITD, based on 1200Z Surface Analysis; 22 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

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

---