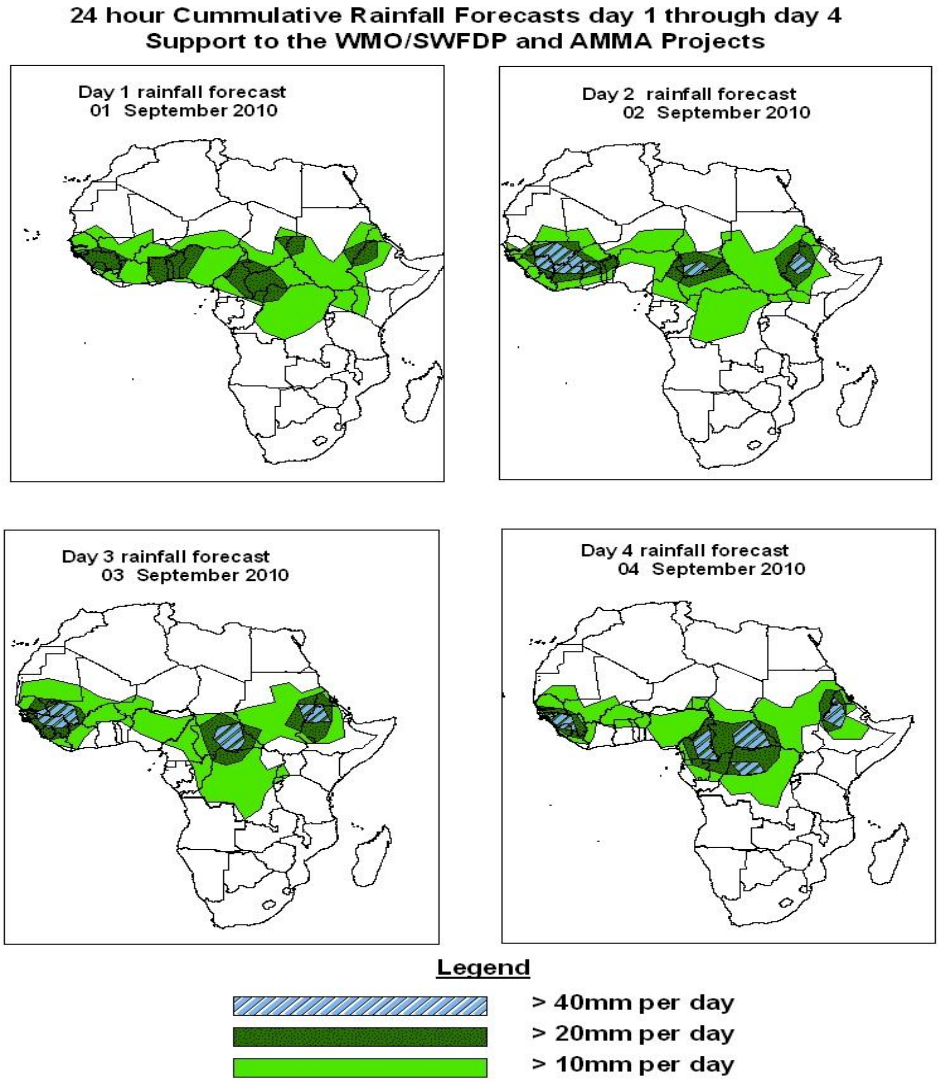
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 01 SEPTEMBER – 06Z of 04 SEPTEMBER 2010, (Issued at 14:00EST of 31 August 2010)

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 coming four days, the westward propagating convection systems and the active West African Monsoon are expected to enhance rainfall across many places of West Africa. Especially, there is an increased chance for rainfall to exceed 30mm per day in Guinea Conakry, Mali, Burkina Faso, southern Niger, Nigeria and southern Chad. The moderate to heavy rainfall activity is also expected to continue across Ethiopia and parts of Sudan, Central African Republic and DRC due to active Congo Air Boundary (CAB) and abundant rainfall from the cross equatorial flow.

1.2. Models Comparison and Discussion - Valid from 00Z of 31 August 2010

A low pressure system situated over northern Mali is expected to move westward while weakening. It central pressure value is expected to change from 1004 to 1008hPa on the GFS model and 1005 to 1009hPa on the ECMWF model through to 48 to 72hours. Another low pressure system located over eastern Niger is expected to move towards western Niger while deepening. Its central pressure value is expected to change from 1007 to 1006hPa on the ECMWF model. A low pressure system situated over central Chad is expected to move westward while slightly deepening. Its central pressure value is expected to change from 1006 to 1005hPa through 48 to 96hours on the GFS model, and 1006 to 1005hPa on the UKMET model. Another low pressure system over southern Sudan is expected to move westward. Its central pressure value is expected to change between 1010 to 1008hPa through 48 to 96 hours on the GFS model and 1011 to 1010hPa on the UKMET model. The seasonal low pressure system located over southern DRC is expected to change from central pressure value of 1010 to 1007hPa on the GFS model, 1010 to 1009hPa on the ECMWF and UKMET models. All the three models indicate a stretch of east-west oriented trough between Low pressure systems located over northeastern Atlantic Ocean and Mali through 24 to 48hours.

The Azores high-pressure system is expected to weaken slightly from central pressure value of 1020hPa in 24 hours to a value of 1019hPa in 48hours, while its ridge is expected to remain across the northern African countries. The St. Helena high, situated over southern Atlantic Ocean is expected to relax from central pressure values of 1037 to 1028hPa through 24 to 48hours. The Mascarene high pressure system is also expected to relax through 24 to 48hours. Its central pressure values are expected to change from 1030 to 1028hPa through 24 to 48 hours.

At 850hpa, a cyclonic circulation situated over northern Mali is expected to move towards central Mauritania through 48 to 96 hours. Another cyclonic circulation over northern Sudan is expected to move towards central Chad through 24 to 72hours. A cyclonic circulation situated over Central African Republic is expected to move slightly to the west through 48 to 96hours.The lower level convergence associated with the Congo Air Boundary (CAB) is expected to remain active across southern Sudan and southwest Ethiopia through 24 to 72 hours. Localized zones of lower level wind convergence are expected over Namibia, Angola, Congo, DRC, Uganda, Kenya, Somalia and parts of Sudan through 24 to 96 hours.

At 700Hpa**,** a trough associated with the easterly wave is expected to propagate westwards across longitudinal positions of Burkina Faso/Mali through 24 to 48hours and Nigeria/Niger through 48 to 72hours, and parts of CAR/Cameroun/Sudan through 72 to 96hours.

At 500hpa, winds associated with the African Easterly Jet are expected to exceed 30Kts in the vicinity of Burkina Faso/southern Mali.

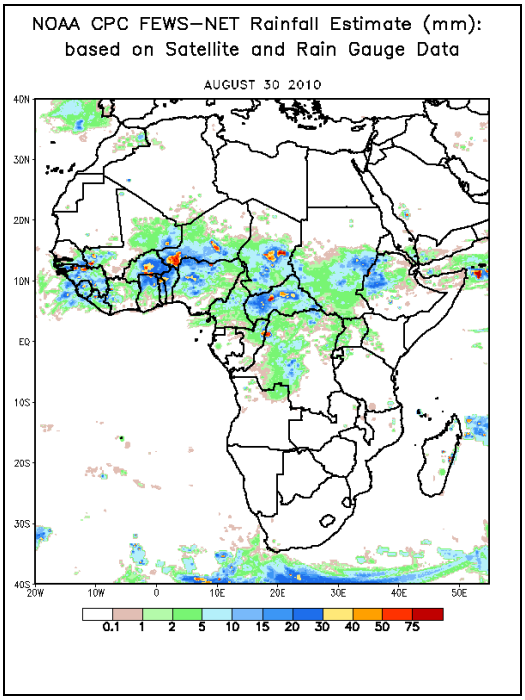
At 200hPa**,** zone of strong wind (>50Kts) is expected to dominate the flow in the vicinity of Algeria and the adjoining areas of Mediterranean region, while strong upper tropospheric easterly wind (>35Kts) is expected to dominate the flow across Ethiopia, Sudan, Chad, Niger, Burkina Faso and Guinea Conakry.

In the coming four days, there is an increased chance for rainfall to exceed 30mm per day in Guinea Conakry, Mali, Burkina Faso, southern Niger, Nigeria and southern Chad due to the westward propagating convection systems and abundant moisture available from the West African Monsoon. Meanwhile the steep pressure gradient between the high pressure systems in southern hemisphere and the heat lows over northeast Africa as well as the active convergence in the vicinity of the CAB region are expected to maintain the moderate to heavy rainfall activity across Ethiopia and parts of Sudan and DRC.

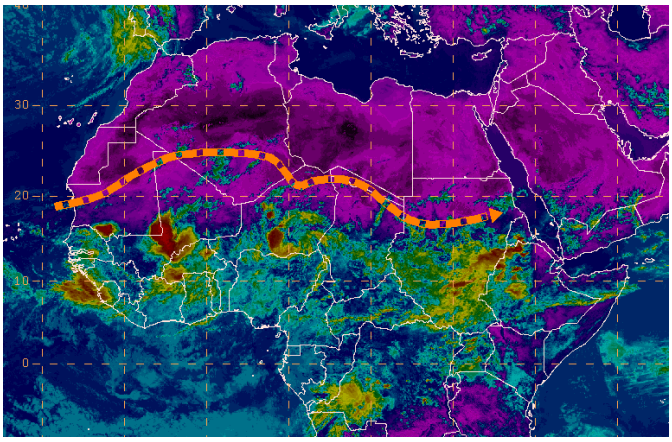
2.0. Previous and Current Day Weather Discussion over Africa (30 August 2010 – 31 August 2010)

2.1. Weather assessment for the previous day (30 August 2010): During the previous day, moderate to heavy rainfall was observed over parts of Guinea, Burkina Faso, Niger, Chad, Central Africa Republic, Sudan, Cameroon and northern DRC.

2.2. Weather assessment for the current day (31 August 2010): Convective clouds are observed over much of western Africa, central Africa and the Horn of Africa countries, with the intense clouds observed over Mauritania, Mali, Burkina Faso, Niger, Chad, DRC, Sudan and Ethiopia.



IR Satellite Image, Valid 1200Z, August 31, 2010 and position of ITD (based on 1200Z observation)



Previous day rainfall condition over Africa (Left) based on the NCEP CPCE/RFE and current day cloud cover (top) based on IR Satellite image

Author(s): *Diakaria Drame (Centre Meteorologique Principal de Bamako-Mali) / CPC-African Desk)*
