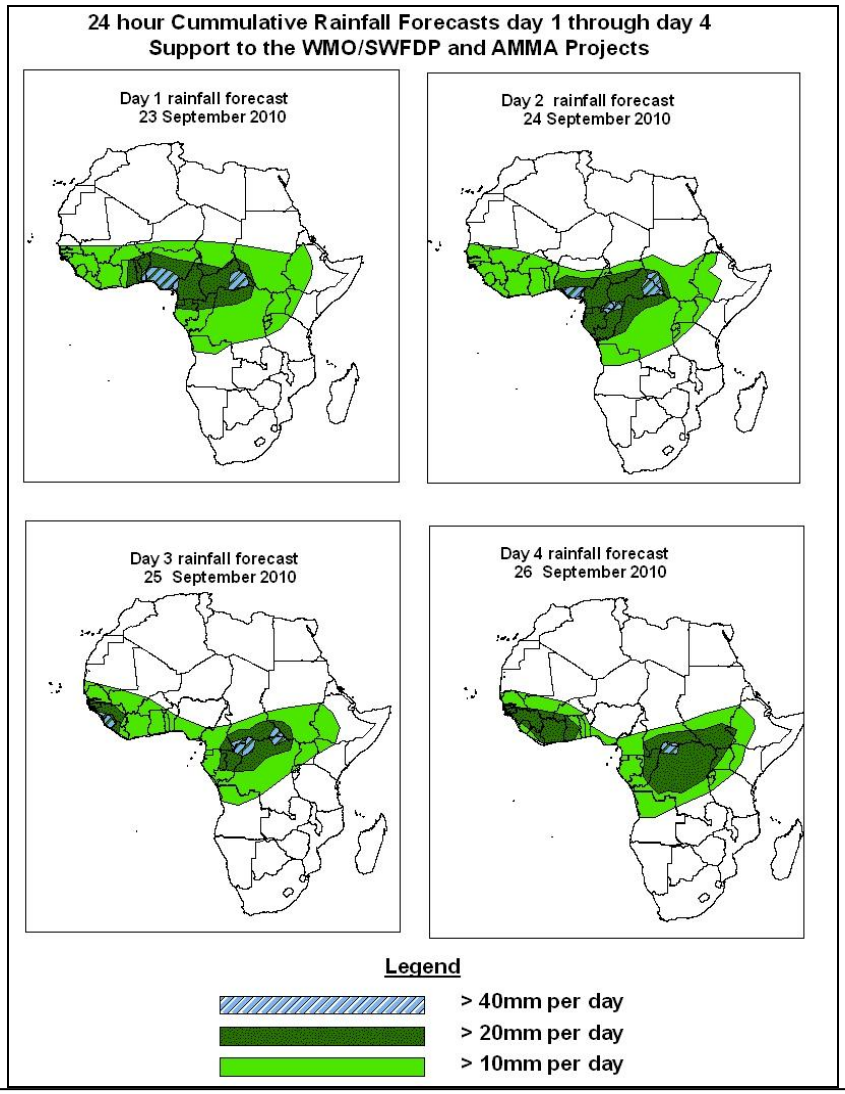
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 23 SEPTEMBER – 06Z of 26 SEPTEMBER 2010, (Issued at 14:00EST of 22 SEPTEMBER 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 cyclonic circulation over the central African countries and its associated movement towards the coastal areas of the Gulf of Guinea is expected to enhance rainfall in the regions. Hence, there is an increased chance for the rainfall to exceed 20mm per day over southern Nigeria, Cameroon, Guinea, CAR, and northern DRC. Heavy rainfall is also expected along the coastal areas of Guinea, Sera Leone and Liberia. The active convergence in the CAB region is also expected to maintain the moderate rainfall in parts of the Horn of African countries.

1.2. Models Comparison and Discussion-Valid from 00Z of 21 September 2010

The heat lows over the western parts of West Africa are expected to remain weak through 24 to 48 hours due to the subtropical high pressure system extending its ridge into this region. As a result of this, an east-west oriented weak trough is expected to replace the heat lows in the region between southern Mali southern Niger. However, the ridge is expected to weaken gradually through 48 to 96 hours, as a result of which two lows are expected to form over Mauritania and eastern Mali through, each of them attaining central pressure value of 1007mb. Another low pressure system over Chad is expected to shift towards Mali while slightly deepening, from central pressure value of 1007 in 24 hours to 1006mb in 96 hours according to the GFS model. However, this same low pressure system tends to appear weaker according to the ECMWF and UKMET models, changing its central pressure value from 1009mb to 1008mb through 24 to 96 hours. The heat low over northern Sudan is expected to deepen slightly. Its central pressure value is expected to change from 1006 to 1004hPa through 24 to 96hours on the GFS model, 1007 to 1005hPa according to the ECMWF model trough and 1005 to 1004hPa on the UKMET model. The seasonal low pressure system located over southern DRC is expected to maintain its central pressure value of 1009mb through 24 to 96 hours according to the GFS model, value of 1010mb according to the ECMWF model, while the UKMET model tends to increase its central pressure value from 1006mb to 1009mb through 24 to 96hours.

In general, the Inter-Tropical Front (ITF) is expected to shift slightly to the south over the western parts of West Africa through 24 to 48 hours due to intense sub-tropical ridge across northwest Africa and to shift back to its northern position through 48 to 96 hours due to the weakening of the ridge.

The Azores high-pressure system is expected to relax from central pressure value of 1022 to 1020hPa through 24 to 96hours. The St. Helena high, situated over southern Atlantic Ocean is expected to relax from central pressure values of 1036 to 1034hPa through 24 to 72 hours and regain its intensity 72 hours later. On the other hand, the Mascarene high pressure system is expected to intensify slightly from central pressure values of 1022mb to 1022mb through 24 to 96 hours.

At 850hpa, dry northwesterly winds are expected to dominate the flow over the western parts of the Sahel region through 24 to 48 hours due to the intense sub-tropical

anticyclone over northwest Africa. However, the anticyclone is expected to weaken through 48 to 96 hours giving way for formation of zones of wind discontinuity and cyclonic circulation across the southern Sahel region. The cyclonic circulation in the vicinity of CAR is expected to move towards southern Nigeria across Cameroon, while the cyclonic circulation over southern Cote D'Ivoire is expected to move towards Liberia and Sera Leone through 24 to 96 hours. The convergence associated with the CAB is expected to remain active across eastern Namibia, Angola, Zambia, DRC, southwest Sudan, Kenya and southwest Ethiopia through 24 to 96 hours.

At 700Hpa**,** while much of West Africa is expected to remain under the influence of the peripheral winds from the sub-tropical anticyclones, two troughs in the easterly flow are expected to propagate across the coastal regions of the Gulf of Guinea countries though 24 to 96 hours.

At 500hpa, the African Easterly Jet is expected to remain weak with its associated wind speeds remaining below 35Kts in many areas of western and central African regions.

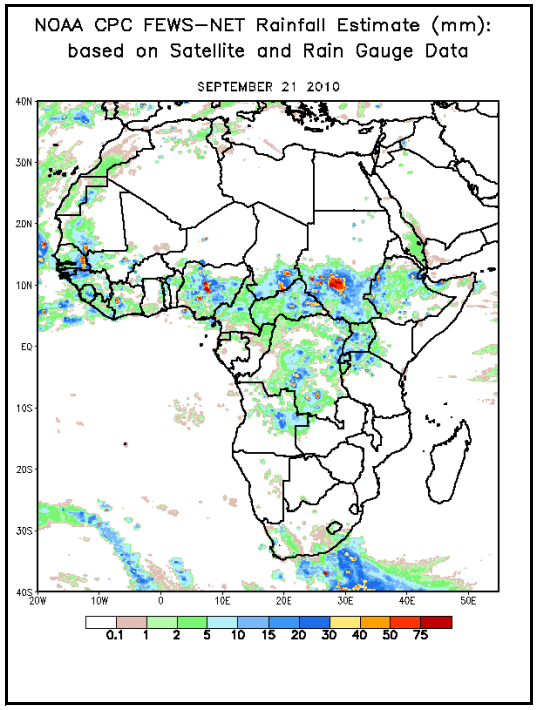
At 200hPa**,** a deep trough in the westerly flow is expected to propagate eastwards along the Mediterranean region with the southern extent of the trough reaching 15^{o}N latitude. The axis of the trough is expected to shift between latitudes of 25^{o}E and 35^{o}E through 24 to 96 hours. On the other hand, high wind speed values, associated with the TEJ, are expected in the vicinity of eastern Ethiopia and the neighboring areas of Somalia.

In the coming four days, the cyclonic circulation over the central African countries and its associated movement towards the coastal areas of the Gulf of Guinea is expected to enhance rainfall in the regions. Hence, there is an increased chance for the rainfall to exceed 20mm per day over southern Nigeria, Cameroon, Guinea, CAR, and northern DRC. Heavy rainfall is also expected along the coastal areas of Guinea, Sera Leone and Liberia. The active convergence in the CAB region is also expected to maintain the moderate rainfall in parts of the Horn of African countries.

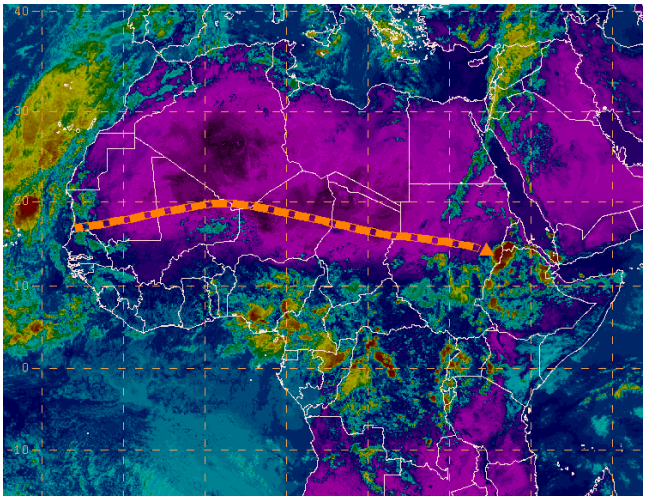
2.0. Previous and Current Day Weather Discussion over Africa (20 - 21 September 2010)

2.1. Weather assessment for the previous day (21 September 2010): During the previous day, moderate to heavy rainfall was observed over parts of eastern Senegal, western Cote D'Ivoire, Nigeria, southeastern Chad, eastern CAR, southern Sudan, western Ethiopia, Uganda, parts of DRC and northern Tanzania.

2.2. Weather assessment for the current day (22 September 2010): Intense clouds are observed over many places of Nigeria, Cameroon, Congo, southern Chad, northern DRC, Uganda, southern Sudan, parts of Kenya and Ethiopia.



IR Satellite Image, Valid 1252Z, September 22, 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

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