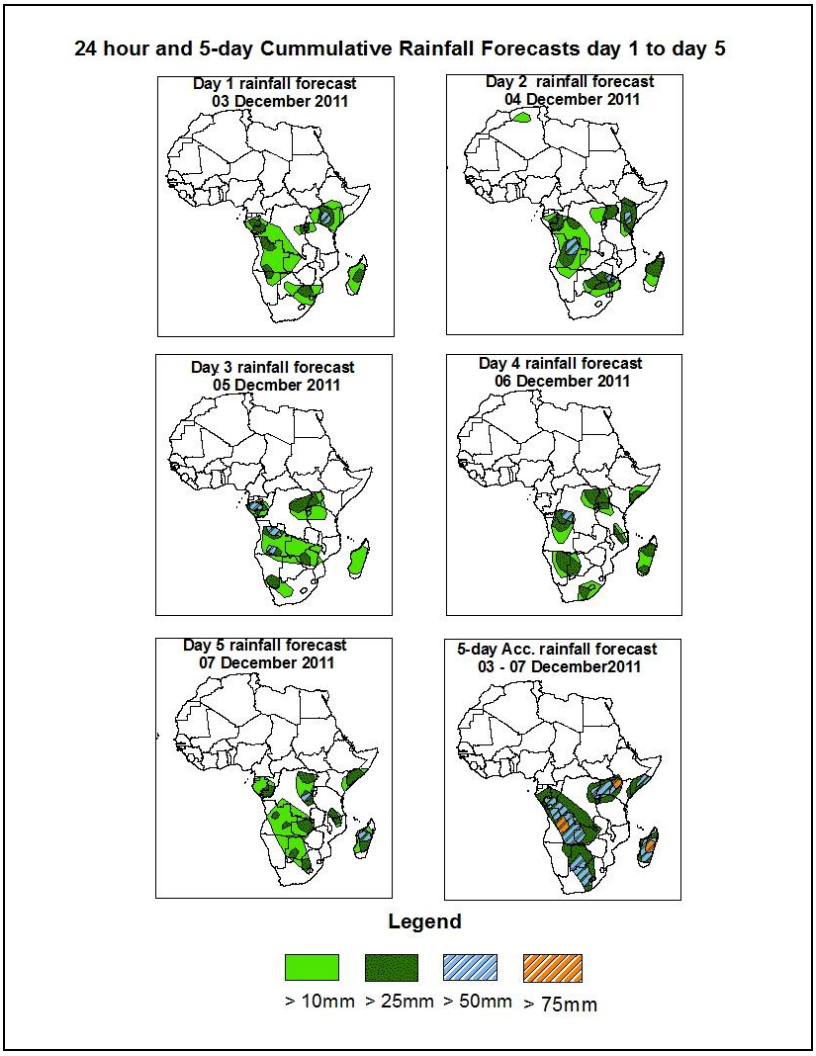
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 03December – 06Z of 07 December 2011, (Issued at 17:30Z of 02 December 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, seasonal and localized wind convergences are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over parts of Angola, parts of Gabon, parts of Congo Brazzaville, parts of DRC, north Tanzania, north eastern Namibia, parts of Zambia, Madagascar, Burundi, Rwanda, parts of Kenya, parts of Botswana, south Somalia Uganda and parts of southern Africa.

1.2. Models Comparison and Discussion-Valid from 00Z of 03 December 2011

The GFS, ECMWF and UKMET models indicate series of lows and their associated troughs across central and the South African countries. The low over DRC is expected to fill up, with its mean sea level pressure value increasing from 1008mb to 1009mb through 24 to 96hours and tends to deepen, with its central pressure value decrease to 1008mb towards the end of the forecast period according to the GFS model. While according to ECMWF model it is expected to fill up to 1009mb towards the end of the forecast period. Another low is expected to form in the vicinity of Angola and tends to deepen, with its MSLP value decreasing from 1010mb to 1006mb through 24 to 48 hours and tends to extend over Zimbabwe, Botswana and Namibia with its central pressure value decreasing to 1004mbby 72 hours and then fill up to 1007mb towards the end of the forecast period according to GFS model. Another low is expected to form in the vicinity of Tanzania and it tends to fill up, with its central pressure value increasing from 1008mb to 1009mb through 48 to 120 hours according to GFS model. A high pressure is expected to form over Arabian Peninsula and tends to intensify from 1020mb to 1023mb towards the end of the forecast period according to GFS model. While according to ECMWF model it tends to intensify to 1024mb through 24 to 72mb and then tends to weaken to 1020mb towards the end of the forecast period.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken, with its MSLP value decreasing from 1028mb to 1020mb through 24 to 72 hours and then it tends to intensify to 1024mb towards the end of the forecast period according to both GFS and ECMWF models. According to UKMET model it is expected to weaken, with its MSLP value decreasing from 1028mb to 1020mb through 24 to 72hours and then tends to intensify to 1028mb towards the end of the forecast period. The Mascarene high pressure system over southwest Indian Ocean is expected to weaken, with its central pressure value decreasing from 1020mb to 1016mb through 24 to 48hours and tends to intensify to 1020mb towards the end of the forecast period according to ECMWF. While according to UKMET it is expected to intensify, with its central pressure value increasing from 1020mb to 1021mb through 24 to 48hours and tends to weaken to 1020mb towards the end of the forecast period.

At the 850hpa level, a lower tropospheric wind convergence is expected to dominate the flow over parts of Angola during the forecast period. The seasonal wind convergence across central African countries is expected to remain active during the forecast period extending across DRC. Localized wind convergences are also expected to dominate the flow over portions of Ethiopia, Congo, Madagascar, Zambia, South Africa, Tanzania, Algeria, Namibia, Zimbabwe and Uganda during the forecast period.

At 500hpa, eastward propagating trough in the westerly is expected to dominate the flow over Mediterranean Sea during the forecast period; with the low geopotential value of 5820gpm extending to the latitudes Egypt by 24.Another trough is expected to propagate over Tunisia, Algeria and Morocco by 24hours and is expected to extend over Libya by 48 hours. A mid latitude frontal system is expected to propagate eastwards across the Southern African countries through 24 to 48hours.

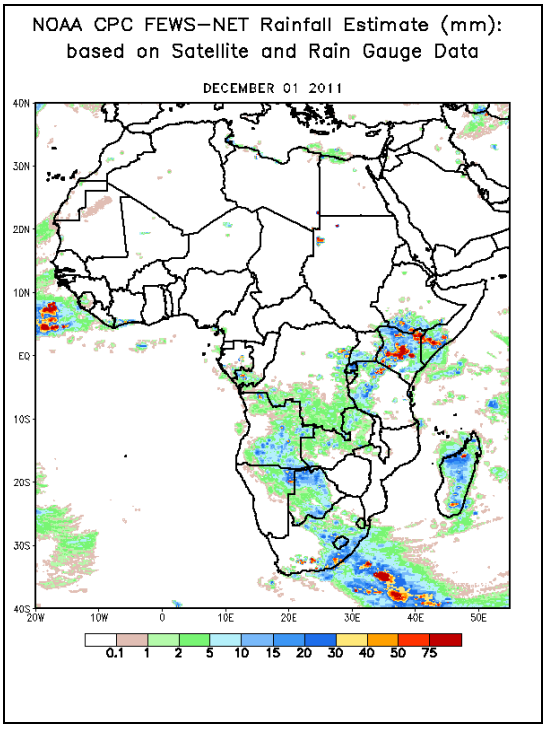
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow over northern Africa, during the forecast period. The intensity of the jet is expected to exceed 110kts over Morocco, Libya and Algeria by 24hours. While by 72 it is expected to propagate over Egypt and Libya with wind speed exceed 130kt. By the end of the forecast period it is expected to propagate over Egypt with wind speed exceeded 90kts. Wind speed values associated with the southern Hemisphere sub-tropical westerly jet are expected to exceed 90kts and tends to weaken towards the end of the forecast period.

In the next five days, seasonal and localized wind convergences are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over parts of Angola, parts of Gabon, parts of Congo Brazzaville, parts of DRC, north Tanzania, north eastern Namibia, parts of Zambia, Madagascar, Burundi, Rwanda, and parts of Kenya, parts of Botswana, south Somalia Uganda and parts of southern Africa.

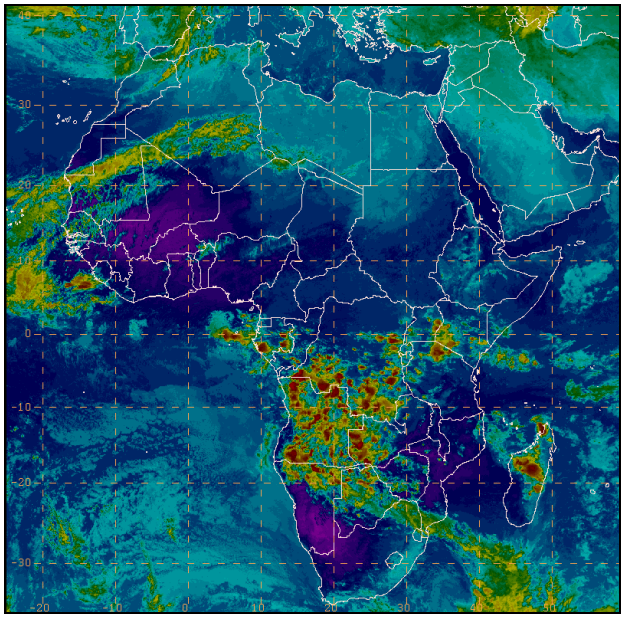
2.0. Previous and Current Day Weather Discussion over Africa (01December – 02December 2011)

2.1. Weather assessment for the previous day (01December 2011): During the previous day, moderate to locally heavy rainfall was observed over much of DRC, southern Ethiopia, parts of Madagascar, parts of Angola, parts of Botswana, parts of Congo, parts of Tanzania, parts of Namibia, parts of South Africa, southern Somalia, Rwanda, parts of Kenya and parts of Uganda.

2.2. Weather assessment for the current day (02December2011): Intense clouds are observed over Angola, Zambia, parts of Tanzania, much of DRC, portion of Madagascar, parts of Kenya, north Namibia, north Botswana and parts of Gabon.



IR Satellite Image (valid 1700Z of 02December 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): Amira Ibrahim (Egyptian Meteorological Authority) / CPC-African Desk), Amira.ibrahim@noaa.gov,