

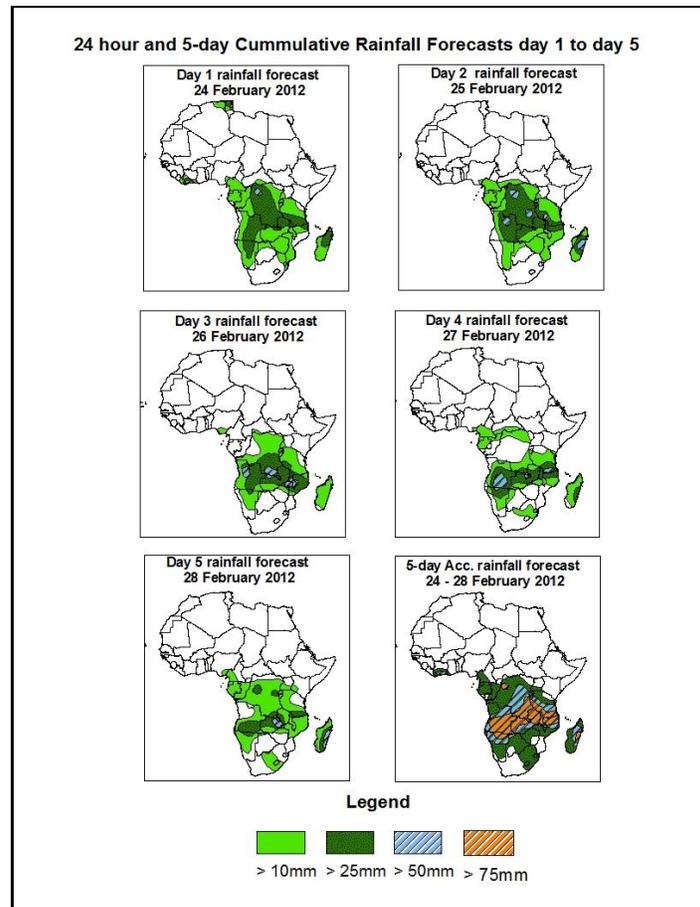


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid 06Z of 24 February – 06Z of 28 February 2012, (Issued at 16:30Z of 23 February 2012)

### 1.1. Twenty Four Hour Cumulative Rainfall Forecasts

The forecasts are expressed in terms of 75% 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, low level tropospheric wind convergence from western Nigeria to Southern Sudan passing through Cameroun, Central Africa Republic, northern DRC and northern Uganda, the low level convergence in the vicinity of northeastern DRC, northwestern Uganda, Rwanda, Burundi, Western Tanzania and northern Zambia associated with the meridional arm of the ITCZ, the zonal arm of the ITCZ over central Angola running across northern Zambia / southern DRC border and Malawi up to southern Tanzania, cyclonic circulations in the vicinity of northeastern Madagascar and Localized winds convergences over central and southern Angola are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over Angola, northern Namibia, Zambia, DRC, northern Mozambique, Malawi, Rwanda, Burundi, southern and central Tanzania and western Madagascar Island.

## 1.2. Models Comparison and Discussion-Valid from 00Z of 23 February 2012

The GFS, ECMWF and UKMET models indicate series of lows and their associated trough across central and the South African countries.

A low will form in the vicinity of northern DRC and CAR with a central MSLP of 1004mb at the beginning of the forecast period and will tend to remain stationary and maintain its central MSLP value throughout the forecast period, according to the **GFS** model. According to **ECMWF** model, this low with MSLP value of 1002mb will form in the vicinity of eastern Nigeria, northern DRC, Central Africa Republic and Southern Sudan at the beginning of the forecast period. It tends to fill up progressively with its central MSLP value increasing 1005mb towards the end of the forecast period. According to the **UKMET** model, this low with mean sea level pressure value of 1004mb will be located in the vicinity of northern DRC, CAR and central Nigeria at the beginning of the forecast. It tends to deepen through 24 to 72 hours with its central MSLP value decreasing to 1003mb and thereafter fill up with its central MSLP value increasing to 1005mb towards the end of the forecast period.

According to **GFS** model, a low will form in the vicinity of the Republic of Southern Sudan with a central MSLP value of 1002mb at the beginning of the forecast period. It tends to deepen through 24 to 72 hours with its central MSLP value decreasing to 1001mb and thereafter fill up with its central MSLP value increasing to 1003mb towards the end of the forecast period. According to the **UKMET** model, this low with a central MSLP value of 1002mb at the beginning of the forecast period tends to deepen through 24 to 72 hours with its central MSLP value decreasing to 1000mb and thereafter fill up with its central MSLP value increasing to 1003mb towards the end of the forecast period.

According to **GFS** model, a low will form in the vicinity of northern Botswana and southern Zambia with a central MSLP value of 1006mb at the beginning of the forecast period. It tends to fill with its central MSLP value increasing to 1008mb and shifts towards Zambia through 24 to 48 hours and thereafter shifts westwards to eastern Angola towards the end of the forecast period. According to the **UKMET** model, this low will form over northern Zimbabwe / southern Zambia border with a central MSLP value of 1005mb. It tends to fill up with its central MSLP value increasing to 1007mb and shift

northwestwards to southeastern Angola through 48 to 72 hours. According to **ECMWF** model, a low with a central mean sea level pressure value of 1010mb will form in the vicinity of southern Namibia at the beginning of the forecast period. It tends to shift southeastwards through 24 to 96 hours and merge with incoming mid latitude through towards the end of the forecast period.

According **GFS** model, a low will form over Mozambique Channel with a central MSLP value of 1004mb at the beginning of the forecast period. It tends to shift northeastwards and fill up at the same time with its central MSLP value increasing to 1005mb through 24 to 72 hours. Afterwards, it will merge with an incoming low over northeastern coast of Madagascar. This low tends to deepen to a central MSLP value of 983mb towards the end of the forecast period. According to **ECMWF** model, the low will form over Mozambique Channel with a central MSLP value of 1007mb at the beginning of the forecast period. It tends to shift northeastwards and merger with another low over northeastern coast of Madagascar through 48 to 72 hours. It will thereafter tends to deepen with its central MSLP value decreasing to 1001mb towards the end of the forecast period.

According **GFS** model, a low will form over northwestern Nigeria with a central MSLP value of 1007mb at the beginning of the forecast period. It tends to deepen with its central MSLP value decreasing to 1006mb towards the end of the forecast period.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken with its central MSLP value decreasing from 1021mb to 1016mb through 24 to 96 hours and thereafter strengthen with its central MSLP value increasing to 1024mb towards the end of the forecast period, according to **GFS** model. According to **ECMWF** model, this high pressure system with a central MSLP value of 1020mb at the beginning of the forecast period tends to weaken with its central MSLP value decreasing to 1016mb through 24 to 96 hours and thereafter strengthen with its central MSLP value increasing to 1020mb towards the end of the forecast period. According to **UKMET** model, the high is expected to weaken, with its central MSLP value decreasing from 1021mb to 1016mb through 24 to 96 hours and thereafter strengthen with its central MSLP value increasing to 1020mb towards the end of the forecast period.

All the **three** models locate a high pressure system at southeastern coast of South Africa with a central MSLP of 1016mb. The cell tends to shift eastwards to take the control of Mascarene high pressure system over southwest Indian Ocean through 24 to 48 hours. It will however propagate eastwards and strengthens progressively to a central MSLP value of 1024mb towards the end of the forecast period.

At the 850hpa level, a lower tropospheric wind convergence is expected to be active from western Nigeria to Southern Sudan passing through Cameroun, Central Africa Republic, northern DRC and northern Uganda throughout the forecast period. A low level convergence zone is expected to form in the vicinity northeastern DRC, northwestern Uganda, Rwanda, Burundi, Western Tanzania and northern Zambia associated with the meridional arm of the ITCZ and it is expected to be stationary throughout the forecast period. Another convergence zone associated with the zonal arm of the ITCZ will be located over central Angola running across northern Zambia / southern DRC border, and Malawi up to southern Tanzania throughout the forecast period. Localized winds convergences are also expected to dominate the flow over central and southern Angola but will tend to weaken throughout the forecast period. Cyclonic circulations are expected to dominate the flow in the vicinity of northeastern Madagascar throughout the forecast period.

At 500hpa, an eastward propagating mid latitude trough is expected to dominate the flow over central Morocco with the low geo-potential value of 5640gpm at the beginning of forecast period. The northeast-southwest oriented trough extending southwestwards up to central Mauritania and associated with a low is expected to propagate northeastwards to reach northern Egypt with a geo-potential value of 5700gpm towards the end of the forecast period.

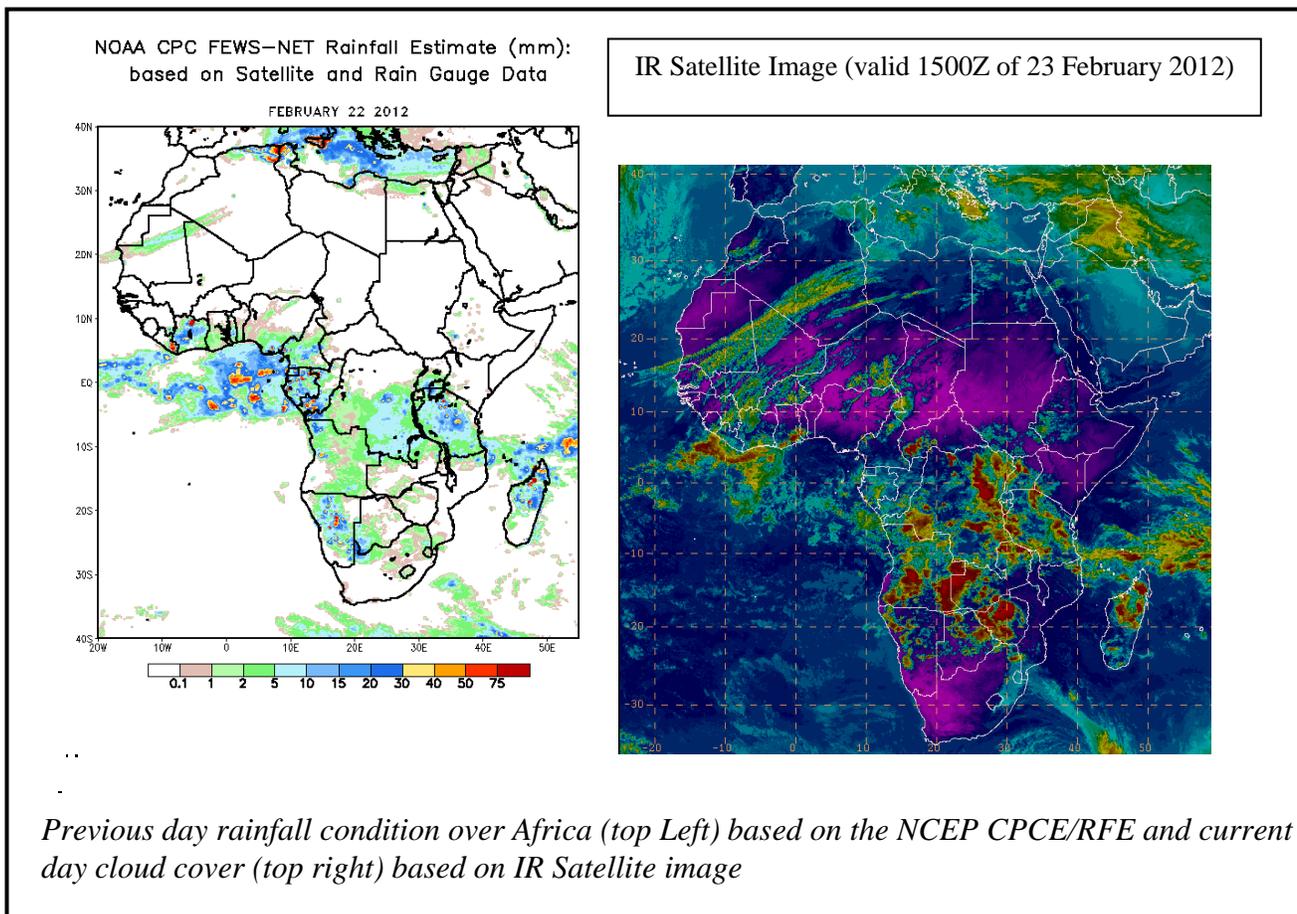
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow from northeastern Atlantic Ocean across northern Africa to Persian Gulf during the forecast period. The intensity of the jet is expected to exceed 130kts while moving to the east with its core values occasionally increasing to more than 150kts especially at the beginning of the forecast period.

In the next five days, low level tropospheric wind convergence from western Nigeria to Southern Sudan passing through Cameroun, Central Africa Republic, northern DRC and northern Uganda, the low level convergence in the vicinity of northeastern DRC, northwestern Uganda, Rwanda, Burundi, Western Tanzania and northern Zambia associated with the meridional arm of the ITCZ, the zonal arm of the ITCZ over central Angola running across northern Zambia / southern DRC border and Malawi up to southern Tanzania, cyclonic circulations in the vicinity of northeastern Madagascar and Localized winds convergences over central and southern Angola are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over Angola, northern Namibia, Zambia, DRC, northern Mozambique, Malawi, Rwanda, Burundi, southern and central Tanzania and western Madagascar Island.

## 2.0. Previous and Current Day Weather Discussion over Africa (22 February – 23 February 2011)

**2.1. Weather assessment for the previous day (22 February 2012):** During the previous day, moderate to locally heavy rainfall was observed over central Tanzania, northern Madagascar, Gabon, Equatorial Guinea, southern Congo, central Cote D'Ivoire, central Namibia, northwestern Tunisia and northeastern Algeria.

**2.2. Weather assessment for the current day (23 February 2012):** Intense clouds are observed over western and eastern DRC, western Uganda, Burundi, Zambia, eastern and central Angola, Zimbabwe, western Tanzania and northern Madagascar.



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