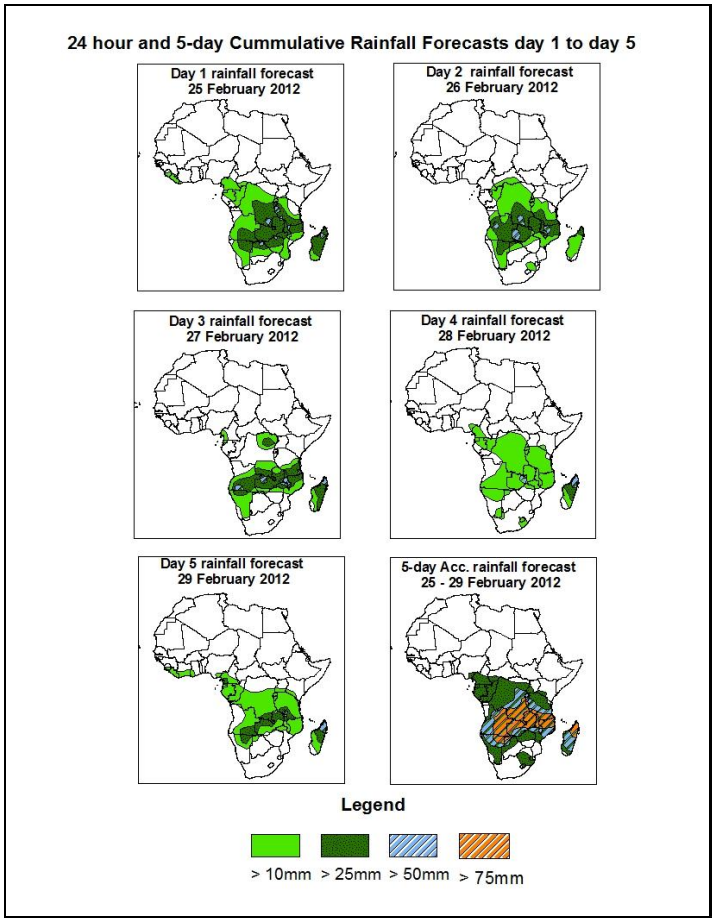
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 25 February – 06Z of 29 February 2012, (Issued at 16:30Z of 24 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 the Gulf of Guinea to northeastern DRC passing through southern Cameroun, Equatorial Guinea, northern Gabon, Congo and southern Central Africa Republic, the low level convergence in the vicinity of eastern DRC, western Uganda, Rwanda, Burundi and Western Tanzania 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 / northern Mozambique border, cyclonic circulations in the vicinity of northeastern and later northwestern Madagascar and Localized winds convergences running along central Angola up to southern Namibia are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over Angola, northern Namibia, Zambia, southern DRC, northern Mozambique, Malawi, Rwanda, Burundi, southern and central Tanzania and northern Madagascar Island.

1.2. Models Comparison and Discussion-Valid from 00Z of 24 February2012

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. It tends to deepen with its central MSLP value decreasing to 1003mb towards the end of the forecast period. It will however extend southwards up to central DRC through 24 to 48 hours, according to the **GFS** model. According to **ECMWF** model, this low with MSLP value of 1002mb will form in the vicinity of northern DRC, Central Africa Republic and Southern Sudan at the beginning of the forecast period. It tends to fill up with its central MSLP value increasing 1005mb through 24 to 72 hours. It will thereafter tend to deepen with its central MSLP value decreasing to 1003mb towards the end of the forecast period. **A**ccording to the **UKMET** model, this low with mean sea level pressure value of 1003mb will be located in the vicinity of northern DRC and CAR at the beginning of the forecast. It tends to deepen through 24 to 72 hours with its central MSLP value decreasing to 1002mb 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 48 hours with its central MSLP value decreasing to 1001mb and thereafter fill up with its central MSLP value increasing to 1004mb 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 48 hours with its central MSLP value decreasing to 1001mb and thereafter fill up with its central MSLP value increasing to 1004mb towards the end of the forecast period.

According to **GFS** model, a low will form in the vicinity of eastern Angola and western Zambia with a central MSLP value of 1008mb 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. This low will form in the vicinity of eastern Angola and western Zambia with a central MSLP value of 1007mb at the beginning of the forecast period

according to the **UKMET** model. It tends to deepen with its central MSLP value decreasing to 1006mb through 24 to 72 hours.

A low will form in the vicinity of southern Namibia with a central MSLP value of 1008mb at the beginning of the forecast period. It tends to weaken with its central MSLP value decreasing to 1006mb towards the end of the forecast period, according **GFS** model. **A**ccording to **ECMWF** model, the low with a central mean sea level pressure value of 1009mb will form in the vicinity of southern Namibia at the beginning of the forecast period but will fill 24 hours later.

According **GFS** model, a low will form over Mozambique Channel with a central MSLP value of 1006mb at the beginning of the forecast period. It tends to shift northeastwards and merge with an incoming low over northeastern coast of Madagascar. This low tends to deepen to a central MSLP value of 990mb towards the end of the forecast period. According to **ECMWF** model, the low will form over northeastern Madagascar with a central MSLP value of 1000mb. It tends to shift westwards up to the northwestern coast of the Island and deepen at the same time with its central MSLP value decreasing to 998mb towards the end of the forecast period. This low will form off the coast of eastern Madagascar with a central MSLP value of 996mb through 24 to 48 hours, according to **UKMET** model. It will however shift northwestwards to sit over northwestern coast of the island and deepen to a central pressure of 994mb towards the end of the forecast period.

According **GFS** model, a low will form over western 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 1005mb towards the end of the forecast period. The low will form over central Ghana through 24 to 48 hours with a central MSLP value of 1007mb. It tends to shift northeastwards to northeastern Ghana towards the end of the forecast period, according to **ECMWF** model. **A**ccording to **UKMET** model, the low will form over western Nigeria with a central MSLP value of 1007mb at the beginning of the forecast period. It tends to shift westwards toward central Ghana and deepen at the same time to a central MSLP value of 1006mb towards the end of the forecast period.

The St. Helena High pressure system over southeast Atlantic Ocean with a central MSLP value of 1016mb at the beginning of the forecast period is expected to strengthen with its central MSLP value increasing to 1020mb towards the end of the forecast period, according to **GFS** model. **A**ccording to **ECMWF** model, this high pressure system with a central MSLP value of 1018mb at the beginning of the forecast period tends to weaken with its central MSLP value decreasing to 1016mb through 24 to 48 hours and thereafter tends to strengthen with its central MSLP value increasing to 1021mb towards the end of the forecast period. According to **UKMET** model, the high is expected to weaken, with its central MSLP value decreasing from 1019mb to 1016mb through 24 to 48 hours and thereafter tends to strengthen with its central MSLP value increasing to 1020mb towards the end of the forecast period.

The entire **three** models locate the Mascarene high pressure system over southwestern Indian Ocean with a central MSLP of 1012mb. It tends propagates 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 the Gulf of Guinea to northeastern DRC passing through southern Cameroun, Equatorial Guinea, northern Gabon, Congo and southern Central Africa Republic throughout the forecast period. A low level convergence zone is expected to form in the vicinity of eastern DRC, western Uganda, Rwanda, Burundi and Western Tanzania associated with the meridional arm of the ITCZ. It tends to remain 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 / northern Mozambique border throughout the forecast period. Localized winds convergences are also expected to dominate the flow from central Angola up to southern Namibia throughout the forecast period. Cyclonic circulations are expected to dominate the flow in the vicinity of northeastern Madagascar at the beginning of the forecast period and northwest of the island towards the forecast period.

At 500hpa, an eastward propagating mid latitude trough is expected to dominate the flow over central Morocco and eastern Algeria with the low geo-potential value of 5700gpm at the beginning of forecast period. The north-south oriented trough extending southwards up to southern Algeria is expected to propagate northeastwards to reach northeastern Egypt with a geo-potential value of 5580gpm towards the end of the forecast period. Another mid latitude trough with a geo-potential value of 5820gpm is expected to dominate the flow over South Africa 96 hours after the beginning of the forecast period.

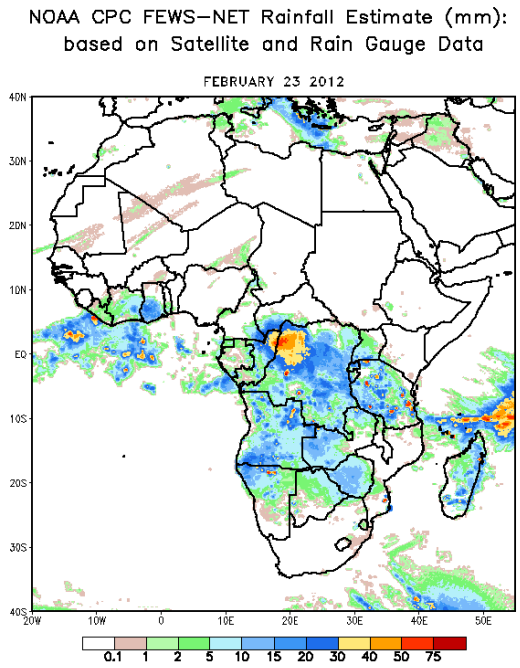
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow from northeastern Atlantic Ocean across northern Africa to Persian Gulf during the forecast period. The intensity of the jet is expected to exceed 130kts while moving to the east with its core values occasionally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

In the next five days, low level tropospheric wind convergence from the Gulf of Guinea to northeastern DRC passing through southern Cameroun, Equatorial Guinea, northern Gabon, Congo and southern Central Africa Republic, the low level convergence in the vicinity of eastern DRC, western Uganda, Rwanda, Burundi and Western Tanzania 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 / northern Mozambique border, cyclonic circulations in the vicinity of northeastern and later northwestern Madagascar and Localized winds convergences running along central Angola up to southern Namibia are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over Angola, northern Namibia, Zambia, southern DRC, northern Mozambique, Malawi, Rwanda, Burundi, southern and central Tanzania and northern Madagascar Island.

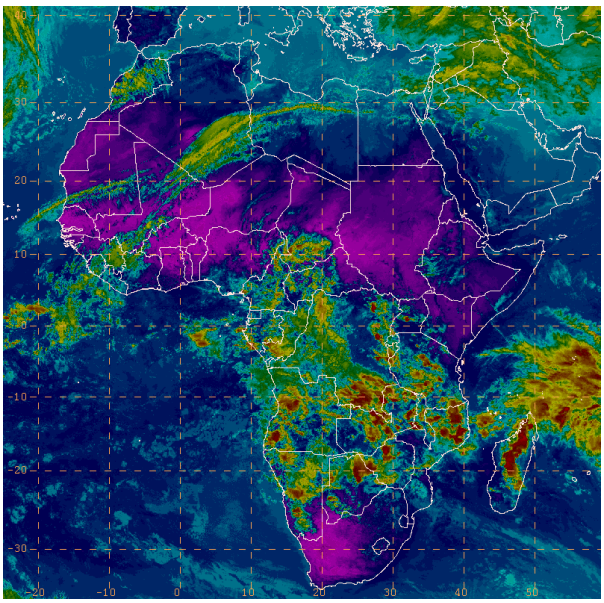
2.0. Previous and Current Day Weather Discussion over Africa (23 February – 24 February 2011)

2.1. Weather assessment for the previous day (23 February 2012): During the previous day, moderate to locally heavy rainfall was observed over northwestern and central DRC, northern Congo, southern CAR, Tanzania, northern Namibia, southern and northeastern Angola and southern Ghana.

2.2. Weather assessment for the current day (24 February 2012): Intense clouds are observed over southern and eastern DRC, western Uganda, Burundi, Rwanda, Zambia, Angola, Namibia, northern Botswana, western Zimbabwe, Malawi, southern Tanzania, northern Mozambique and central Madagascar.



IR Satellite Image (valid 1500Z of 24 February 2012)



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

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