

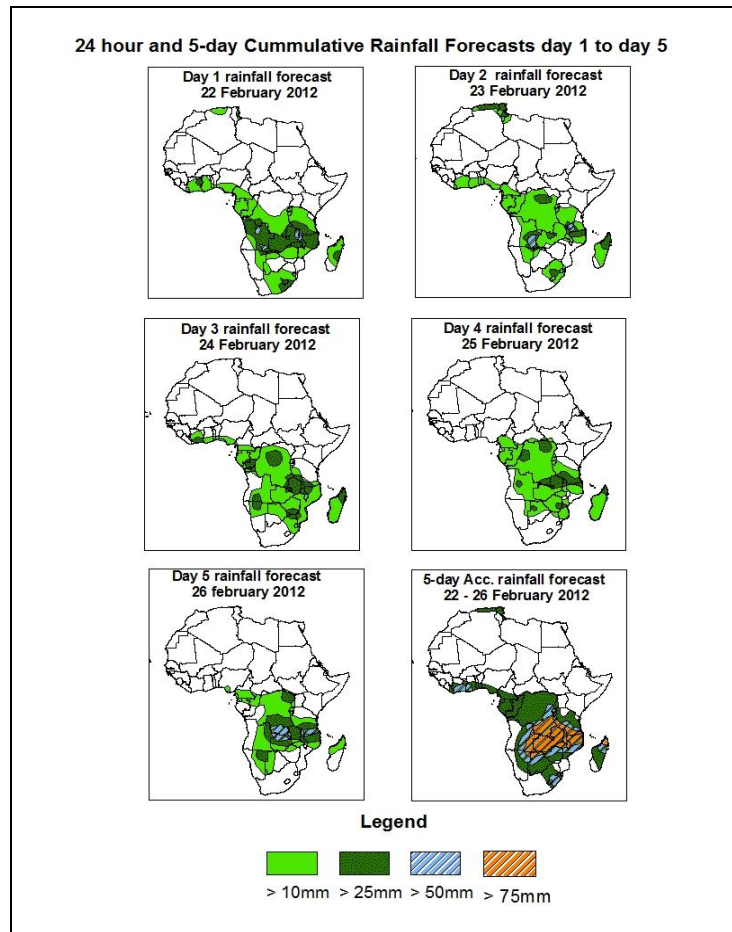


# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1.0. Rainfall Forecast: Valid 06Z of 22 February – 06Z of 26 February 2012, (Issued at 18:30Z of 21 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 over the Gulf of Guinea extending eastwards across southern Cameroun, northern Gabon and Congo, southern Central Africa Republic and northern DRC up to western Uganda, the low level convergence in the vicinity eastern DRC, Western Uganda, Rwanda, Burundi, Western Tanzania and southern Zambia, localized wind convergences and cyclonic circulations in the vicinity of eastern Angola and Namibia, the ITCZ over eastern Angola running across central Zambia and Malawi up to northern Mozambique and cyclonic circulations over Mozambique Channel and later over the coast of eastern Madagascar are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over eastern Angola, eastern Namibia, Zambia, northern Zimbabwe and Botswana, eastern South Africa, southeastern DRC, Mozambique, Malawi, southern Rwanda, Burundi, southern Tanzania, northern Madagascar Island, southern Ghana and southern Cote D'Ivoire.

## 1.2. Models Comparison and Discussion-Valid from 00Z of 21 February 2012

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

The low sitting over northern DRC with a central MSLP of 1004mb tends to fill up with its central MSLP value increasing to 1008mb and shifts southeastwards to sit in the vicinity of central DRC through 24 to 72 hours. It will afterwards tend to shift northwards towards northern DRC and deepen to a central MSLP value of 1003mb towards the end of the forecast period, according to the **GFS** model. According to **ECMWF** model, this low with MSLP value of 1004mb will be located in the vicinity of northern DRC, Central Africa Republic and Southern Sudan. It tends to deepen progressively with its mean sea level pressure value increasing to 1003mb towards the end of the forecast period. According to the **UKMET** model, this low with mean sea level pressure value of 1007mb will be located in the vicinity of eastern DRC and western Tanzania at the beginning of the forecast. It tends to deepen through 24 to 48 hours with its central MSLP value decreasing to 1006mb. It will thereafter fill up through 72 to 96 hours.

According to **GFS** model, a low will form in the vicinity of the Republic of Southern Sudan with a central MSLP value of 1008mb at the beginning of the forecast period. It tends to deepen progressively with its central MSLP value decreasing to 1001mb towards the end of the forecast period. The **UKMET** model locates this low over the southern part of the Republic of Southern Sudan with a central MSLP value of 1003mb at the beginning of the forecast period. It tends to deepen with its central MSLP value decreasing to 1002mb towards the end of the forecast period.

According to **GFS** model, a low will form in the vicinity of eastern Namibia and western Botswana 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 through 24 to 72 hours. It will thereafter tend to fill up with its central MSLP value increasing to 1008mb towards the end of the forecast period. A second low will form in the vicinity of southern Zambia and northern Zimbabwe with a central MSLP value 1009mb at the beginning of the forecast period. It will however merge with the one sitting over eastern Namibia and western Botswana through 24 to 48 hours. According to **ECMWF** model, a low will form

over central Namibia with a central MSLP value of 1010mb at the beginning of the forecast period. It tends to shift eastwards through 24 to 72 hours to sit over central Zimbabwe and deepen to a central MSLP of 1008mb. It will thereafter tend to deepen further with its central MSLP value reducing to 1003mb towards the end of the forecast period. According to the **UKMET** model, this low with mean sea level pressure value of 1007mb will form in the vicinity of Botswana and Zimbabwe at the beginning of the forecast period. It tends to shift northeastwards through 24 to 48 hours to sit over southern Zambia / northern Zimbabwe border and deepen at the same time with its central MSLP value decreasing to 1003mb. It will afterwards tend to shift southwestwards to sit over southern Namibia, filling up at the same time with its central MSLP value decreasing to 1007mb towards the end of the forecast period.

According to **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 progressively shift eastwards and fill up at the same time. Towards the end of the forecast period this low will be located over the eastern coast of Madagascar with a central MSLP value of 1006mb. On the other hand **UKMET** model locates the low over the Mozambique Channel with a central MSLP value of 1004mb at the beginning of the forecast period. It tends to deepen and shift eastwards and by the end of the forecast period, the low will be located off the coast of eastern Madagascar with a central MSLP value of 998mb.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to weaken with its central MSLP value decreasing from 1022mb to 1018mb 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 1022mb at the beginning of the forecast period tends to weaken with its central MSLP value decreasing to 1016mb towards the end of the forecast period. According to **UKMET** model, the high is expected to weaken, with its central MSLP value decreasing from 1023mb to 1016mb towards the end of the forecast period.

Both the **GFS** and **ECMWF** models locate Mascarene high pressure system over southwest Indian Ocean with a central pressure value of 1020mb at the beginning of the forecast period. It tends to propagate southeastwards and weaken at the same time with its central MSLP value decreasing to 1008mb through 24 to 72 hours. Thereafter a

new cell will emerge from the west near the tip of South Africa with a central MSLP of 1016mb to form the Mascarene high pressure system. According to **UKMET** model, the high with MSLP value of 1020mb tends to propagate eastwards through 24 to 48 hours and weaken at the same time to a central MSLP value of 1012mb. Afterwards a new cell will emerge from the west with a central MSLP of 1016mb to take control of the Mascarene high pressure system.

At the 850hpa level, a lower tropospheric wind convergence is expected to be active over the Gulf of Guinea extending eastwards across southern Cameroun, northern Gabon and Congo, southern Central Africa Republic and northern DRC up to western Uganda during the forecast period. A low level convergence zone is expected to form in the vicinity eastern DRC, Western Uganda, Rwanda, Burundi, Western Tanzania and southern Zambia associated with the meridional arm of the ITCZ and it is expected to remain sited over there throughout the forecast period. Another convergence zone associated with the zonal arm of the ITCZ will be located over eastern Angola running across central Zambia and Malawi up to northern Mozambique through 24 to 72 hours. It however tends to extend further eastwards up to northern Madagascar towards the end of the forecast period. Localized winds convergences are also expected to dominate the flow over central Namibia/Angola but will tend to weaken throughout the forecast period. Cyclonic circulations are expected to dominate in the Mozambique Channel at the beginning of the forecast period but will progressively tend to shift eastwards and by the end of the forecast period they will be located off the coast of eastern Madagascar.

At 500hpa, eastward propagating mid latitude trough is expected to dominate the flow over eastern Algeria and western Tunisia with the low geo-potential value of 5520gpm at the beginning of forecast period. The northeast-southwest oriented trough, associated with a low is expected to propagate northeastwards to reach northern Egypt with a geo-potential value of 5640gpm through 24 to 72 hours. Thereafter the trough with northwest southeast orientation will tend to propagate southeastwards and by the end of the forecast period, it will be located over western Saudi Arabia with geo-potential value of 5700gp. Another eastwards propagating mid-latitude trough is expected to form over central Morocco with a geo-potential value of 5640gpm 72 hours after the beginning of the forecast period. It tends to propagate northeastwards and by

the end of the forecast period it will be located over central Algeria with a geo-potential value of 5700gpm.

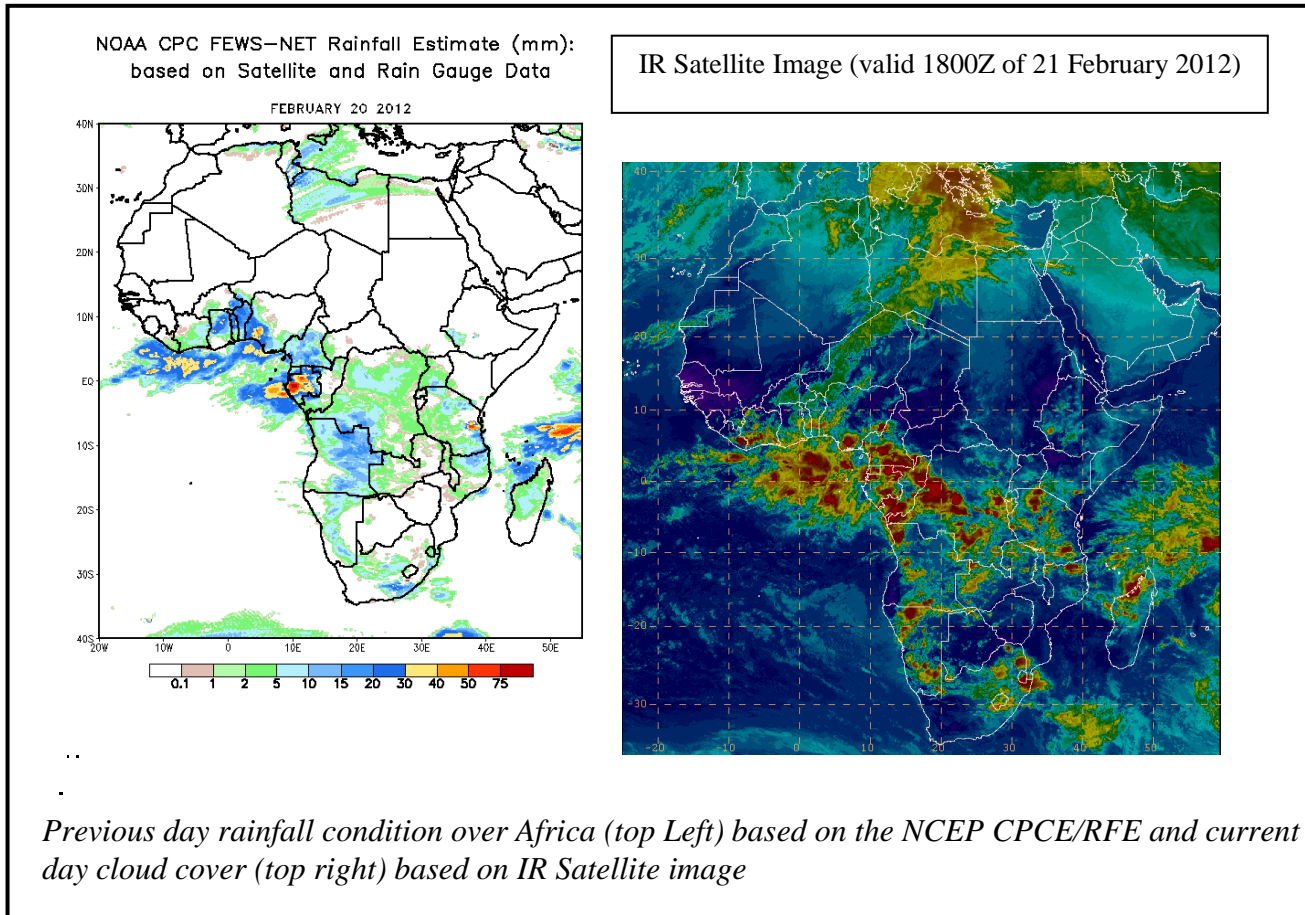
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow from northeastern Atlantic Ocean across northern Africa to Persian Gulf during the forecast period. The intensity of the jet is expected to exceed 130kts while moving to the east with its core values occasionally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

In the next five days, low level tropospheric wind convergence over the Gulf of Guinea extending eastwards across southern Cameroun, northern Gabon and Congo, southern Central Africa Republic and northern DRC up to western Uganda, the low level convergence in the vicinity eastern DRC, Western Uganda, Rwanda, Burundi, Western Tanzania and southern Zambia, localized wind convergences and cyclonic circulations in the vicinity of eastern Angola and Namibia, the ITCZ over eastern Angola running across central Zambia and Malawi up to northern Mozambique and cyclonic circulations over Mozambique Channel and later over the coast of eastern Madagascar are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over eastern Angola, eastern Namibia, Zambia, northern Zimbabwe and Botswana, eastern South Africa, southeastern DRC, Mozambique, Malawi, southern Rwanda, Burundi, southern Tanzania, northern Madagascar Island, southern Ghana and southern Cote D'Ivoire.

## 2.0. Previous and Current Day Weather Discussion over Africa (20 February – 21 February 2011)

**2.1. Weather assessment for the previous day (20 February 2012):** During the previous day, moderate to locally heavy rainfall was observed over Gabon, Equatorial Guinea, Cameroun, southwestern Nigeria, Benin, Togo, central Ghana, and the coast of central Tanzania.

**2.2. Weather assessment for the current day (21 February 2012):** Intense clouds are observed over southern Cameroun, Congo, western and southern DRC, northern Zambia, northern, Mozambique, Swaziland, Angola, Namibia, Tanzania, northwestern Madagascar, southern Cote D'Ivoire and southeastern Nigeria.



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