

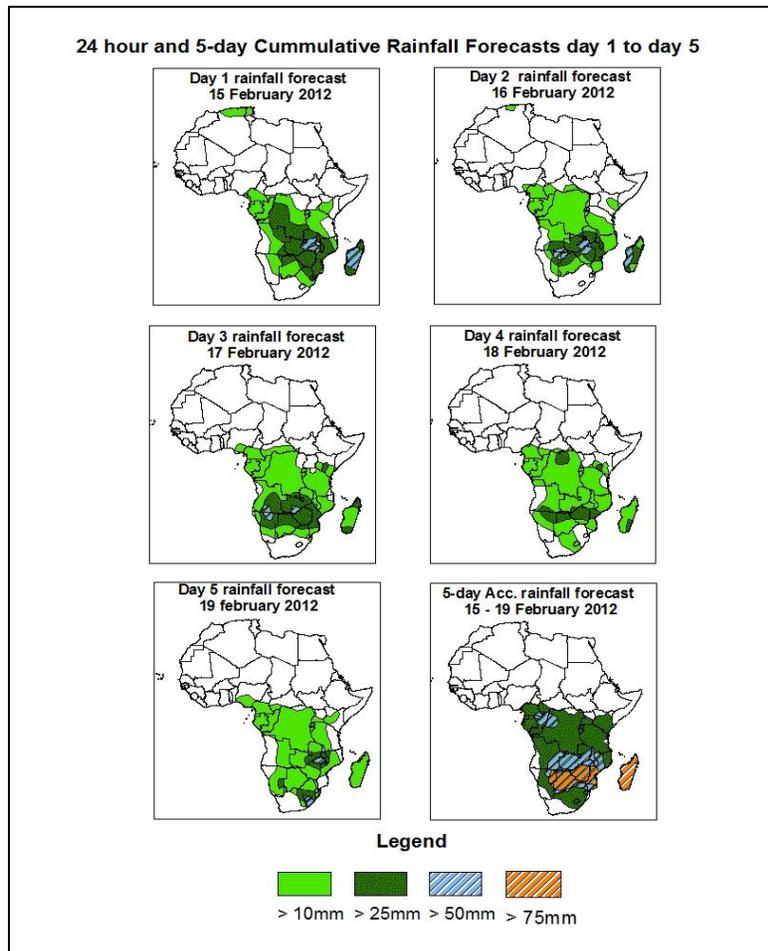


NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 15 February – 06Z of 19 February 2012, (Issued at 18:30Z of 14 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 through Central Africa Republic, northern DRC to Southern Sudan, the low level convergence in the vicinity of eastern DRC and western Tanzania, localized wind convergences and cyclonic circulations in the vicinity of central Angola and Namibia, the ITCZ across southern Africa (Botswana, Namibia, Zambia, Zimbabwe and Mozambique) and the presence of tropical cyclone (Giovanna) west of Madagascar (Mozambique Channel) are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over eastern Angola, eastern Namibia, Zambia, Zimbabwe, eastern South Africa, DRC, Mozambique, Malawi, southern Tanzania and Madagascar.

1.2. Models Comparison and Discussion-Valid from 00Z of 14 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 and Central Africa Republic is expected to deepen progressively, with its central mean sea level pressure value decreasing from 1004mb to 1003mb towards the end of forecast period. It is however expected to spread westwards and southwards through 48 to 72 hours to sit over central Cameroun and western DRC respectively, according to the **GFS** model. According to **ECMWF** model, this low with MSLP value of 1004mb will spread from Southern Sudan across northern DRC, Central Africa Republic and Cameroun up to western Nigeria. It tends to deepen through 24 to 72 hours with its mean sea level pressure value decreasing from 1004mb to 1003mb and then starts to fill up with its central MSLP value increasing to 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 over northern DRC and Central Africa Republic at the beginning of the forecast. Through 24 to 48 hours it will merger with the one sitting over Southern Sudan and deepen further with its central MSLP value reducing to 1001mb through 48 to 72 hours but will later on start to fill up with its central MSLP value increasing to 1004mb towards the end of the forecast period. Two low pressure systems will form in the vicinity of southern Angola / northern Namibia and southern Zambia northern / Zimbabwe with mean sea level pressure values of 1007mb and 1008mb respectively. Through 24 to 48 hours they will merger to one cell which will shifts westwards and deepen progressively with its MSLP central value reducing from 1007 to 1006mb towards the end of the forecast period, according **GFS** model. According to **ECMWF** model, one low will form at the border of Botswana, Zambia and Zimbabwe with a central MSLP value of 1010mb through 24 to 48 hours. It will however fill up through 48 to 72 hours. The other low will form in the vicinity of southern Namibia through 24 to 48 hours with a central MSLP value of 1009mb but will also fill up through 48 to 72 hours. According to the **UKMET** model, the low will form in the vicinity of southeastern DRC, Zambia and Zimbabwe 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. Another low over the Republic of South Sudan is expected to remain stationary but tends to deepen with its MSLP value decreasing from 1004mb to 1002mb towards the end of the forecast period according **GFS** model. The tropical cyclone (Giovanna) with MSLP of 997mb will be located in Mozambique

Channel near the west coast of Madagascar at the beginning of the forecast period, according to **GFS** model. It will deepen further and shift southwestwards and by the end of the forecast period it will be located over southwest Madagascar with a central MSLP value of 993mb. **ECMWF** model tends to locate the tropical cyclone in Mozambique Channel near the west coast of Madagascar with a central MSLP value of 1002mb at the beginning of the forecast period. It is expected to take a southwestward track to reach near the coast of southern Mozambique through 48 to 72 hours. Later on it will take a southeastern track and tends to fill with the central MSLP value increasing to 1004mb towards the end of the forecast period. On the other hand **UKMET** model locates the cyclone in Mozambique Channel near the west coast of Madagascar with a central MSLP value of 999mb. The storm is predicted to take a southern track and at the end of the forecast period it will be located southwest of Madagascar with a central MSLP value of 1001mb.

The St. Helena High pressure system over southeast Atlantic Ocean is expected to strengthen, with its MSLP value increasing from 1019mb to 1020mb through 24 to 72 hours but the center will be displaced westwards. Afterwards, it will progressively shift southeastwards and weaken further with central MSLP value decreasing to 1016mb towards the end of the forecast period, according to **GFS** model. This high pressure system with a central MSLP value of 1018mb tends to progressively shift southeastwards and strengthen with its central MSLP value increasing to 1020mb towards the end of the forecast period, according to **ECMWF**. According to **UKMET** model, it is expected to strengthen, with its MSLP value increasing from 1019mb to 1020mb 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 reducing from 1016mb to 1012mb through 24 to 96 hours while shifting southeastwards. Afterward a new cell will emerge from the west near the tip of South Africa with a central MSLP of 1016mb, according to **GFS** model. According to **ECMWF** and **UKMET** models it is expected to weaken, with its central pressure value reducing from 1016mb at the beginning of the forecast to 1012mb through 24 to 96 hours while shifting southeastwards. Afterward a new cell will emerge from the west near the tip of South Africa with a central MSLP of 1016mb.

At the 850hpa level, a lower tropospheric wind convergence is expected to be active over Gulf of Guinea region extending eastwards across Central Africa republic, northern DRC to Southern Sudan during the forecast period. A low level convergence zone is expected to form in the vicinity eastern DRC and Western Tanzania associated with the meridional arm of the ITCZ and it is expected to remain sited over there throughout the forecast period. The second convergence zone associated with the zonal arm of the ITCZ will be located over central Mozambique running Zimbabwe and Botswana up to central Namibia throughout the forecast period. Localized winds convergences are also expected to dominate the flow over central Namibia/Angola throughout the forecast period. Cyclonic circulations associated with the tropical cyclone (Giovanna) are expected to dominate near the western coast of Madagascar at the beginning of the forecast period but will tend to shift southwestwards throughout the forecast period.

At 500hpa, eastward propagating trough is expected to dominate the flow over the west coast of Morocco after 72 hours with the low geo-potential value of 5640gpm. The northeast-southwest oriented trough, associated with a low is expected to shift eastwards to central Morocco at the end of the forecast period.

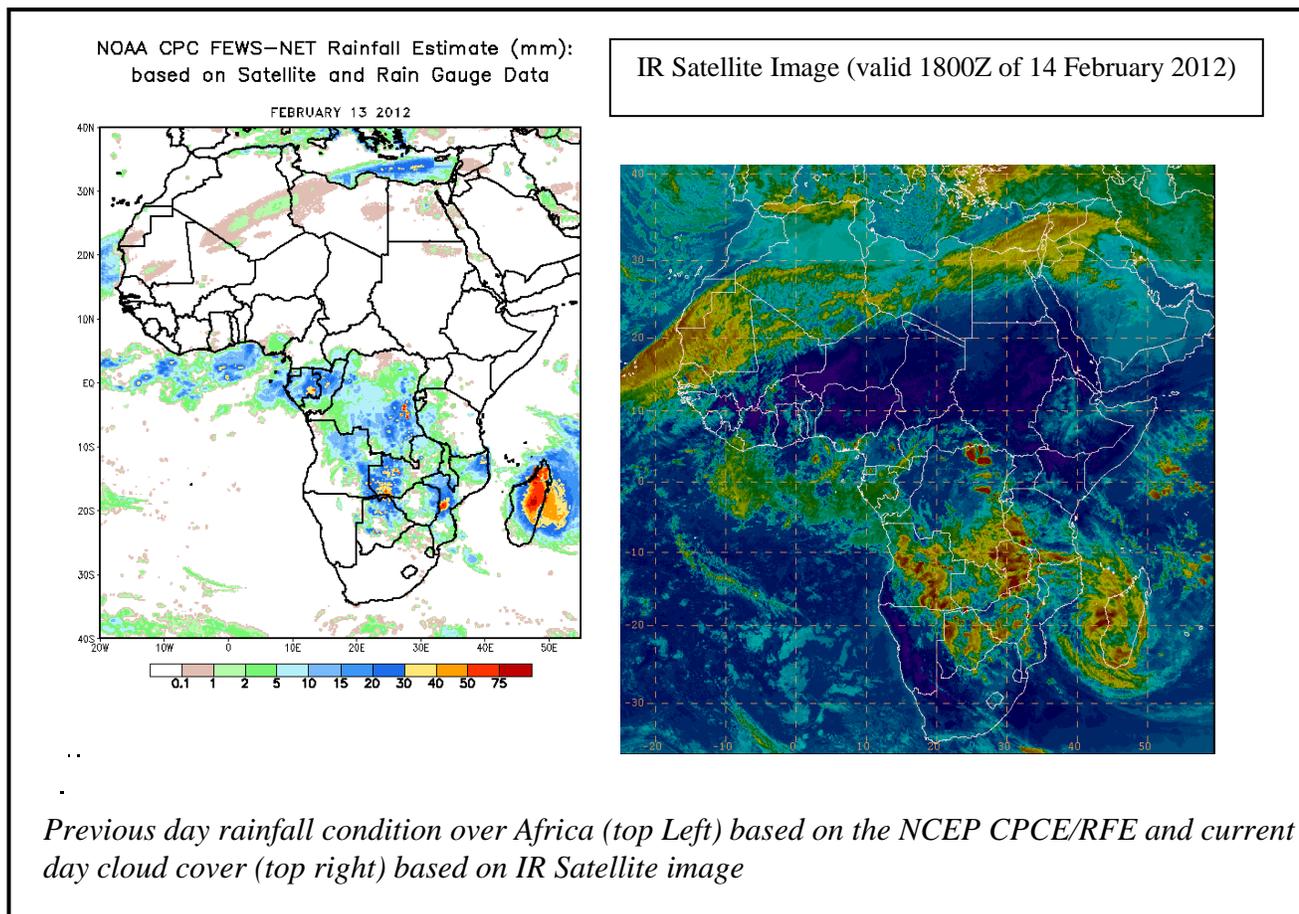
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow across northern Africa, during the forecast period. The intensity of the jet is expected to exceed 130kts in the region between Atlantic Ocean and the Persian Gulf while moving to the east with its core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

In the next five days, low level tropospheric wind convergence over the Gulf of Guinea across Central Africa Republic, northern DRC to Southern Sudan, the low level convergence in the vicinity of eastern DRC and western Tanzania, localized wind convergences and cyclonic circulations in the vicinity of central Angola and Namibia, the ITCZ across southern Africa (Botswana, Namibia, Zambia, Zimbabwe and Mozambique) and the presence of tropical cyclone (Giovanna) west of Madagascar (Mozambique Channel) are expected to enhance rainfall in their respective regions. Hence, there is an increased chance for heavy rainfall over eastern Angola, eastern Namibia, Zambia, Zimbabwe, eastern South Africa, DRC, Mozambique, Malawi, southern Tanzania and Madagascar.

2.0. Previous and Current Day Weather Discussion over Africa (13 February – 14 February 2011)

2.1. Weather assessment for the previous day (13 February 2012): During the previous day, moderate to locally heavy rainfall was observed over western and central Mozambique, western Zambia, northern Botswana eastern DRC, western Congo, eastern Gabon and Madagascar Island.

2.2. Weather assessment for the current day (14 February 2012): Intense clouds are observed over western Madagascar associated with tropical cyclone (Giovanna), eastern DRC, Zambia, Botswana, eastern and central Angola.



**Author(s): Ezekiel Njoroge, (Kenyan Meteorological Department / CPC-African Desk);
ezekiel.njoroge@noaa.gov , and**

**Author(s): Lotfi Khammari, (Tunisian Meteorological Authority / CPC-African Desk);
lotfi.khammari@noaa.gov**