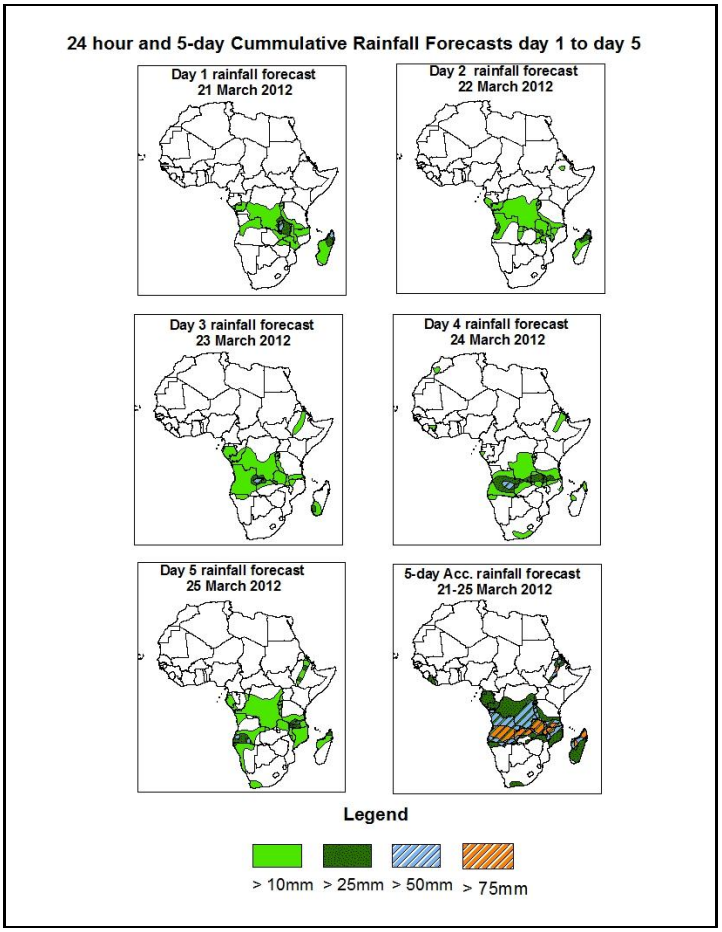
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 21 March – 06Z of 25 March 2012, (Issued at 18:00Z of 20 March 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.

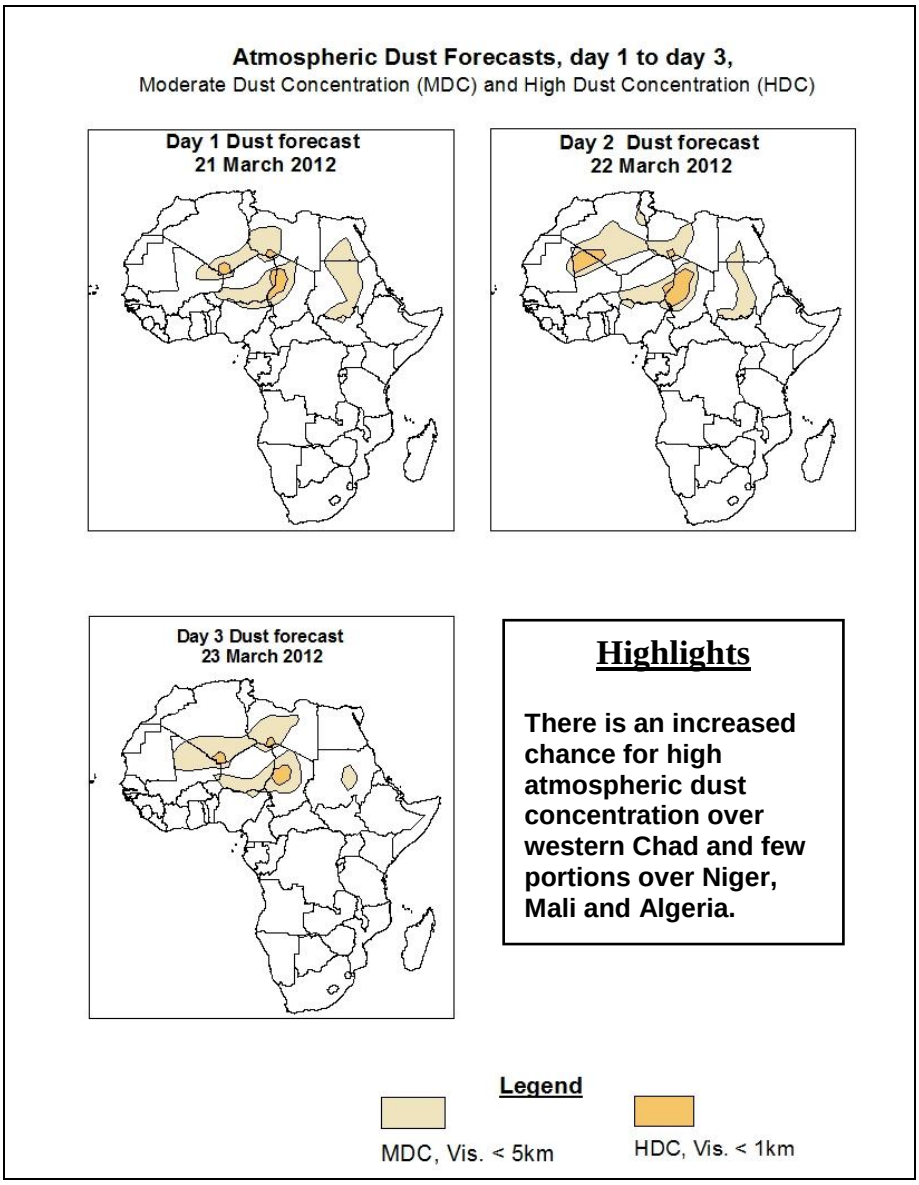


Summary

In the next five days, low level tropospheric wind convergences from the Gulf of Guinea to eastern DRC passing through Gabon, Congo and central DRC, the low level weak 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 eastern Angola running across southern DRC, northern Zambia and northern Malawi up to southern Tanzania and convergences over central Ethiopia are expected to enhance rainfall in their respective regions. Hence, there is a chance of heavy rainfall over Equatorial Guinea, Gabon, Angola, northern Zambia, southern Congo, southern and central DRC, northern Mozambique, Malawi, southern and western Tanzania, central Ethiopia and Madagascar Island.

1.2. Atmospheric Dust Forecasts

The NCEP/GFS, the UK Met Office, the ECMWF and the NCEP/WRF outputs are used to identify areas with high probability of dust concentration.



1.3. Models Comparison and Discussion-Valid from 00Z of 20 March 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 northeastern Congo, northern DRC and CAR with a central MSLP of 1005mb 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, according to the **GFS** model. According to **ECMWF** model, the same low with a central MSLP value of 1005mb will form in the vicinity of northern DRC and Central Africa Republic at the beginning of the forecast period. It tends to deepen with its central MSLP value decreasing to 1004mb towards the end of the forecast period. **A**ccording to the **UKMET** model, this low with mean sea level pressure value of 1004mb will be located in the vicinity of northern DRC and CAR at the beginning of the forecast. It tends to deepen with its central MSLP value decreasing to 1003mb through 24 to 72 hours. It thereafter tends to fill with its central MSLP value increasing to 1008mb 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 1005mb 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. According to **ECMWF** model, the same low with a central MSLP value of 1005mb will form in the vicinity of southern Sudan at the beginning of the forecast period. It tends to deepen with its central MSLP value decreasing to 1004mb through 24 to 72 hours. It thereafter tends to fill with its central MSLP value increasing to 1008mb towards the end of the forecast period. **A**ccording to the **UKMET** model, the low will form over the same area with a central MSLP value 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.

A low will form in the vicinity of eastern Angola and western Zambia with a central MSLP of 1011mb at the beginning of the forecast period. It tends to shift northwestwards to northwestern Angola and deepen progressively with its central MSLP value decreasing to 1006mb towards the end of the forecast period, according to the **GFS** model. According to **UKMET** model, the low with a central MSLP value of 1008mb

will form in the vicinity of northwestern Angola at the beginning of the forecast period. It tends to fill with its central MSLP value increasing to 1009mb towards the end of the forecast period.

According to **GFS** model, a low will form in the vicinity of northern Ghana 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. According to **ECMWF** model, the same low with a central MSLP value of 1007mb will form in the vicinity of Ghana, Togo, Benin and western Nigeria 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 same low will form over central Ghana 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, according to **UKMET** model.

A low will form in the vicinity of southern Nigeria 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 towards the end of the forecast period, according to the **GFS** model. The same low will form over southeastern 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 through 24 to 72 hours. It thereafter tends to fill with its central MSLP value increasing to 1008mb towards the end of the forecast period, according to **UKMET** model.

Another low will form in the vicinity of eastern Senegal and western Mali with a central MSLP value of 1007mb at the beginning of the forecast period. It tends to shift eastwards to eastern Mali and deepen at the same time with its central MSLP value decreasing to 1005mb towards the end of the forecast period, according to the **GFS** model. According to **ECMWF** model, this low with a central MSLP value of 1007mb will form in the vicinity of eastern Senegal / western Mali at the beginning of the forecast period. It tends to shift eastwards to eastern Mali and deepen with its central MSLP value decreasing to 1005mb towards the end of the forecast period. The same low will form in the vicinity of eastern Senegal and western Mali 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, according to **UKMET** model.

The St. Helena High pressure system over southeast Atlantic Ocean with a central MSLP value of 1020mb at the beginning of the forecast period tends to strengthen with its central MSLP value increasing to 1028mb through 24 to 96 hours. It thereafter tends to weaken with its central MSLP value decreasing to 1024mb towards the end of the forecast period, according to the **three models**.

The entire **three** models locate the Mascarene high pressure system over southwestern Indian Ocean with a central MSLP of 1020mb at the beginning of the forecast period. It tends propagate southeastwards and strengthen progressively to a central MSLP value of 1028mb through 24 to 72 hours. It thereafter tends to weaken with its central MSLP value decreasing to 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 eastern DRC passing through Gabon, Congo and central DRC throughout the forecast period. A low level weak 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 maintain its position throughout the forecast period. Another convergence zone, also associated with the meridional arm of the ITCZ will be located over central Ethiopia running from north to south throughout the forecast period. Another weak convergence zone associated with the zonal arm of the ITCZ will be located over eastern Angola running across southern DRC, northern Zambia and northern Malawi up to southern Tanzania throughout the forecast period.

At 500hpa, an eastward propagating mid latitude trough with the low geo-potential value of 5720gpm is expected to dominate the flow over eastern Egypt extending southwards to Ethiopia throughout the end of the forecast period. **A**nother northeast-southwest oriented, eastwards propagating mid latitude trough with the low geo-potential value of 5680gpm is expected to dominate the flow over Morocco throughout the end of the forecast period.

At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow from northern Atlantic Ocean across North Africa to Persian Gulf during the forecast period. The intensity of the jet is expected to exceed 80kts while moving to the east with its core values occasionally increasing to more than 160kts especially towards the forecast period.

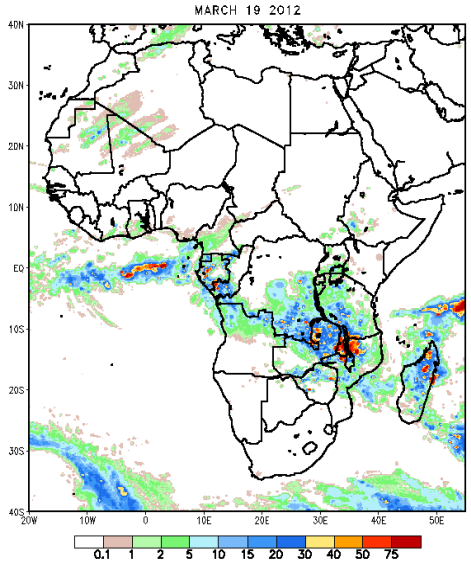
In the next five days, low level tropospheric wind convergences from the Gulf of Guinea to eastern DRC passing through Gabon, Congo and central DRC, the low level weak convergence in the vicinity of eastern DRC, western Uganda, Rwanda, Burundi and western Tanzania associated with the meridional arm of the ITCZ, the zonal arm of the ITCZ over eastern Angola running across southern DRC, northern Zambia and northern Malawi up to southern Tanzania and convergences over central Ethiopia are expected to enhance rainfall in their respective regions. Hence, there is a chance of heavy rainfall over Equatorial Guinea, Gabon, Angola, northern Zambia, southern Congo, southern and central DRC, northern Mozambique, Malawi, southern and western Tanzania, central Ethiopia and Madagascar Island.

2.0. Previous and Current Day Weather Discussion over Africa (19 March – 20 March 2012)

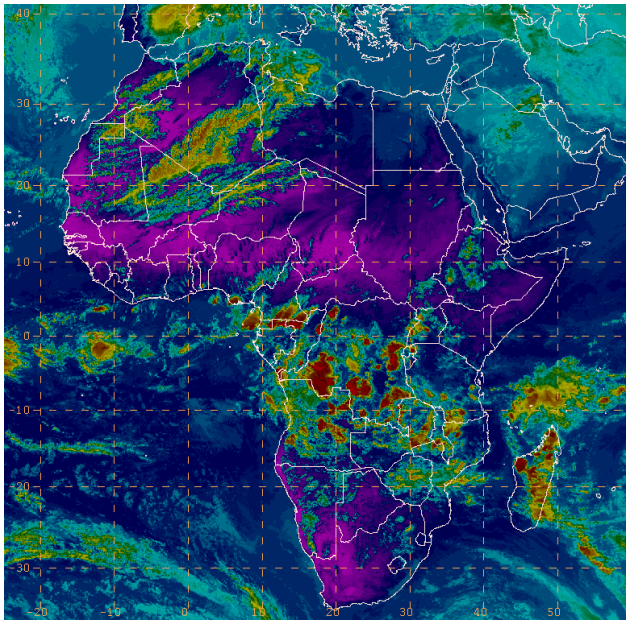
2.1. Weather assessment for the previous day (19 March 2012): During the previous day, moderate to locally heavy rainfall was observed over northern Madagascar, northwestern Mozambique, Malawi, southern DRC, eastern Zambia, southwestern Tanzania, western Gabon, Equatorial Guinea and southern Congo.

2.2. Weather assessment for the current day (20 March 2012): Intense clouds are observed over DRC, Rwanda, Burundi, western Uganda, eastern Zambia, Malawi, western Mozambique, eastern Angola, southern Tanzania, southern Cameroun, northern Gabon, Equatorial Guinea, southern Congo and Madagascar.

NOAA CPC FEWS–NET Rainfall Estimate (mm): based on Satellite and Rain Gauge Data



IR Satellite Image (valid 1500Z of 20 March 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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