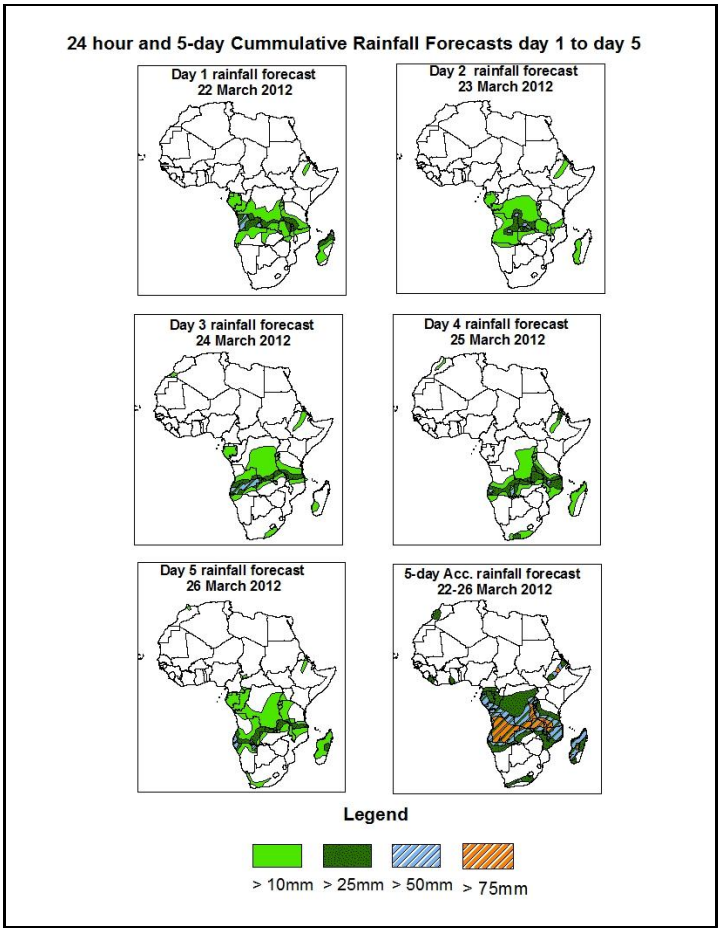
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 22 March – 06Z of 26 March 2012, (Issued at 18:00Z of 21 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.

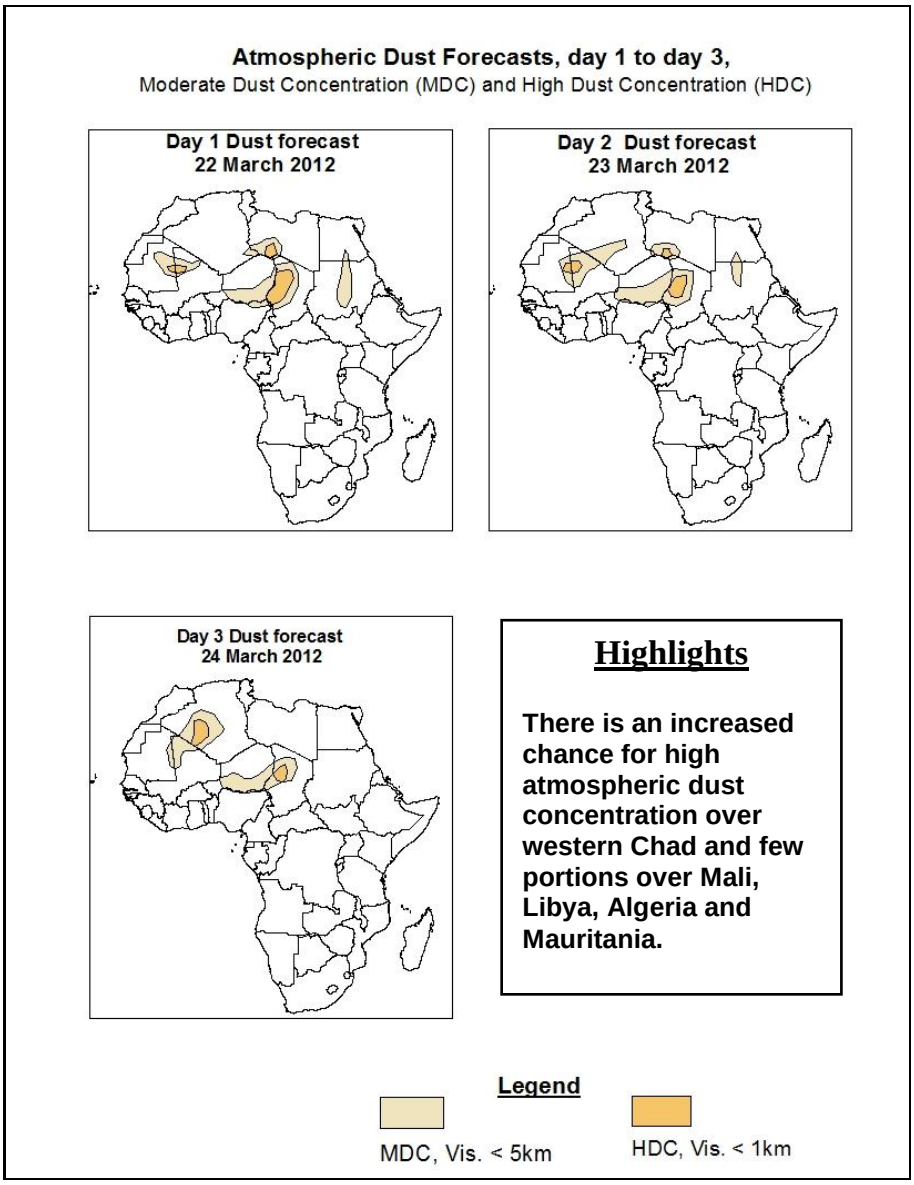


Summary

In the next five days, low level tropospheric wind convergences from the Gulf of Guinea to northeastern DRC passing through Congo and northern 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 and to southwestern 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 21 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 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, 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 Congo, northern DRC and Central Africa Republic 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. **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 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 1003mb at the beginning of the forecast period. It tends to fill with its central MSLP value increasing to 1004mb through 24 to 48 hours. It thereafter 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 1005mb 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 1003mb at the beginning of the forecast period. It tends to maintain its position and central MSLP value throughout the forecast period.

A low will form in the vicinity of southern DRC with a central MSLP of 1008mb through 48 to 72 hours after the beginning of the forecast period. It tends to fill with its central MSLP value increasing to 1010mb towards the end of the forecast period, according to the **GFS** model.

A low will form in the vicinity of northwestern Angola with a central MSLP of 1007mb 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. According to **UKMET** model, the low with a central MSLP value of 1008mb will form in the vicinity of southwestern 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 central Ghana with a central MSLP value of 1006mb at the beginning of the forecast period. It tends to maintain its position and central MSLP value throughout the forecast period. According to **ECMWF** model, the same low with a central MSLP value of 1007mb will form in the vicinity of central Ghana 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. The same low will form over northern Cote D'Ivoire 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 **UKMET** model.

A low will form in the vicinity of southwestern Nigeria with a central MSLP value of 1006mb at the beginning of the forecast period. It tends to maintain its position and central MSLP value throughout the forecast period, according to the **GFS** model. The same low will form over southern Nigeria with a central MSLP value of 1005mb 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 **UKMET** model.

Another low will form in the vicinity of western Mali with a central MSLP value of 1006mb 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 the **GFS** model. According to **ECMWF** model, this low with a central MSLP value of 1006mb will form in the vicinity of eastern Senegal / western Mali at the beginning of the forecast period. It tends to fill with its central MSLP value increasing to 1008mbthrough 24 to 72 hours. It thereafter tends to 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 western Mali with a central MSLP value of 1005mb at the beginning of the forecast period. It

tends to maintain its position and central MSLP value throughout 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 72 hours. It thereafter tends to weaken with its central MSLP value decreasing to 1022mb towards the end of the forecast period, according to **GFS** model. **A**ccording to **ECMWF** model, the high will be located over southeast Atlantic Ocean with a central MSLP value of 1024mb at the beginning of the forecast period. It tends to strengthen with its central MSLP value increasing to 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. According to **UKMET** model, the high is expected to strengthen, with its central MSLP value increasing from 1024mb to 1028mb through 24 to 72 hours. It thereafter tends to weaken with its central MSLP value decreasing to 1023mb 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 1024mb 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 1023mb 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 Congo and northern 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 and to southwestern Tanzania throughout the forecast period.

At 500hpa, an eastward propagating mid latitude trough with the low geo-potential value of 5760gpm is expected to dominate the flow over eastern Egypt throughout the end of the forecast period. **A**nother northeast-southwest oriented, northeastwards propagating mid latitude trough with the low geo-potential value of 5700gpm is expected to dominate the flow over northeastern Morocco through 24 to 48 hours.

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 90kts while moving to the east with its core values occasionally increasing to more than 130kts throughout the forecast period.

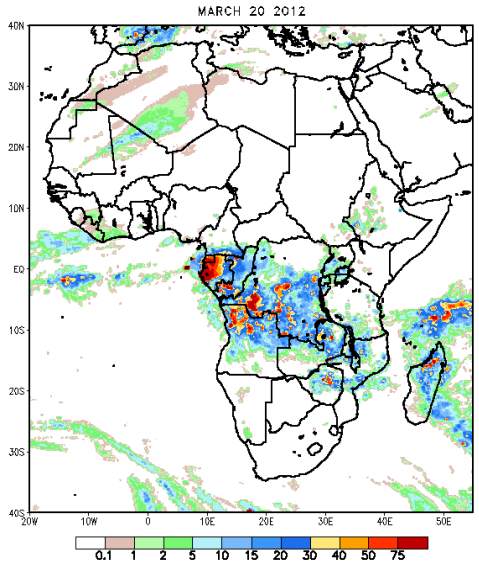
In the next five days, low level tropospheric wind convergences from the Gulf of Guinea to northeastern DRC passing through Congo and northern DRC, the low level weak convergence in the vicinity of eastern DRC, western Uganda, Rwanda, Burundi and western Tanzania associated with the meridional arm of the ITCZ, the zonal arm of the ITCZ over eastern Angola running across southern DRC and to southwestern 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 (20 March – 21 March 2012)

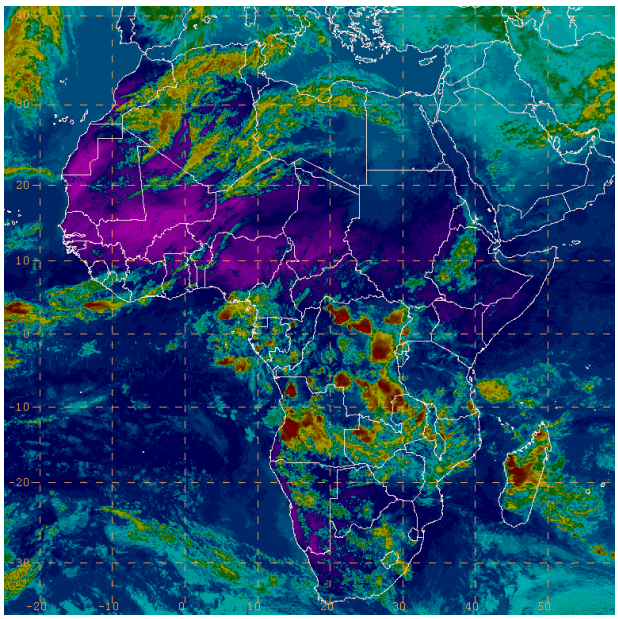
2.1. Weather assessment for the previous day (20 March 2012): During the previous day, moderate to locally heavy rainfall was observed over northern Madagascar, northwestern Mozambique, Malawi, southern and eastern DRC, eastern Zambia, northern Angola, northwestern Gabon, Equatorial Guinea and Congo.

2.2. Weather assessment for the current day (21 March 2012): Intense clouds are observed over DRC, northern Zambia, Malawi, central Angola and eastern Madagascar.

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



IR Satellite Image (valid 1630Z of 21 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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