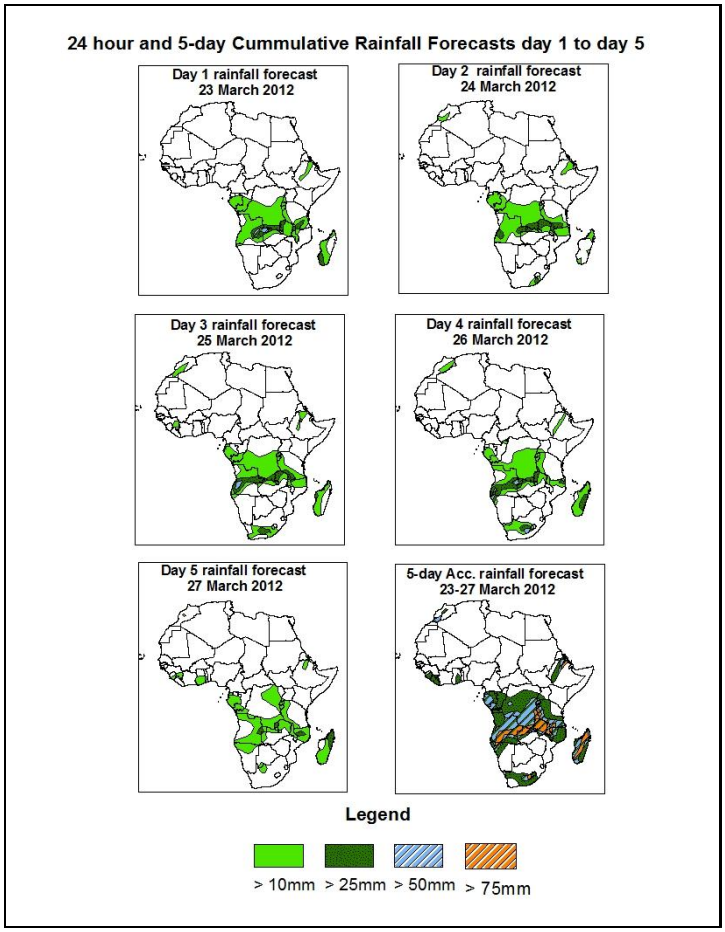
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid 06Z of 23 March – 06Z of 27 March 2012, (Issued at 15:30Z of 22 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.

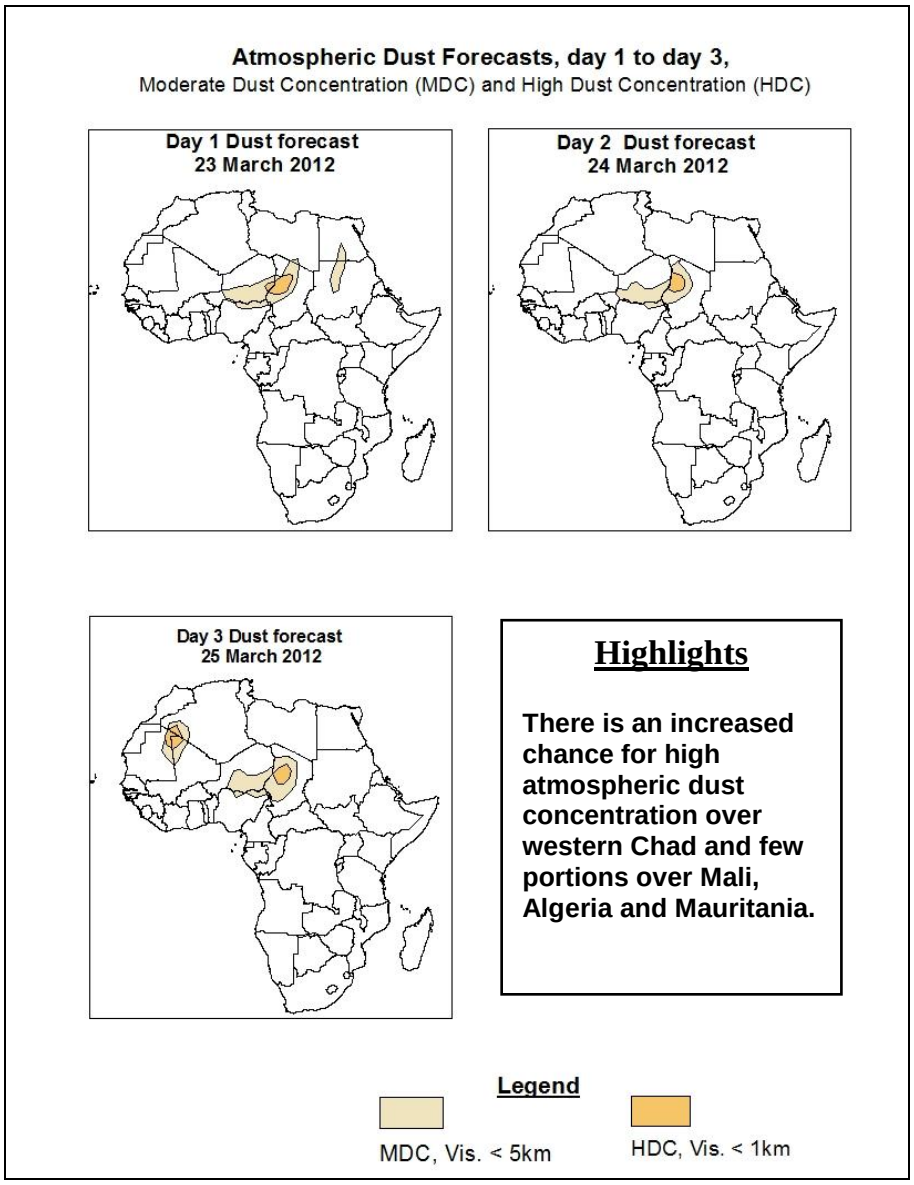


Summary

In the next five days, low level tropospheric wind convergences from the Gulf of Guinea to northeastern DRC passing through northern Gabon, southern Cameroun, northern 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 to southwestern Tanzania, convergences over central Ethiopia and the mid-latitude trough over South Africa 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, DRC, Rwanda, Burundi, northern Mozambique, Malawi, southern and western Tanzania, central portion of South Africa, 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 22 March 2012

The GFS, ECMWF and UKMET models indicate series of lows and their associated troughs across northern, 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 1004mb 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 a central MSLP 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 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 **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 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 fill with its central MSLP value increasing to 1004mb through 24 to 72 hours. It thereafter 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 western Angola with a central MSLP of 1008mb at 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. According to **UKMET** model, the low with a central MSLP value of 1006mb will form in the vicinity of southern 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. This low will form over the same area 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 **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 1007mb 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, according to the **GFS** model. According to **ECMWF** model, this low with a central MSLP value of 1005mb will form in the vicinity of western Mali through 48 to 72 hours after 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 in the vicinity of western Mali 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 **UKMET** model.

The St. Helena High pressure system over southeast Atlantic Ocean with a central MSLP value of 1024mb at the beginning of the forecast period tends to strengthen with its central MSLP value increasing to 1028mb through 24 to 48 hours. It thereafter tends to weaken with its central MSLP value decreasing to 1023mb 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 48 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 weaken, with its central MSLP value decreasing from 1028mb to 1020mb towards the end of the forecast period.

The **GFS** model locates the Mascarene high pressure system over southwestern Indian Ocean with a central MSLP of 1028mb at the beginning of the forecast period. It tends propagate southeastwards and weaken progressively to a central MSLP value of 1016mb towards the end of the forecast period. Both the **UKMET** and **UKMET** models locate the Mascarene high pressure system over the same area with a central MSLP value of 1028mb at the beginning of the forecast period. It tends propagate southeastwards and weaken 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 northern Gabon, southern Cameroun, northern 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 to southwestern Tanzania throughout the forecast period. Localized winds convergences associated with a mid-latitude trough are expected to dominate the flow over South Africa throughout the forecast period.

At 500hpa, a northeastward propagating mid latitude trough with the low geo-potential value of 5720gpm is expected to dominate the flow over northern 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 5760gpm is expected to dominate the flow over western West Sahara through 24 to 72 hours. **A** mid-latitude trough with a geo-potential value of 5720gpm is expected to dominate the flow over western South Africa through 72 hour after the beginning of the forecast period. It tends to propagate eastwards reaching central South Africa towards the end of the forecast period.

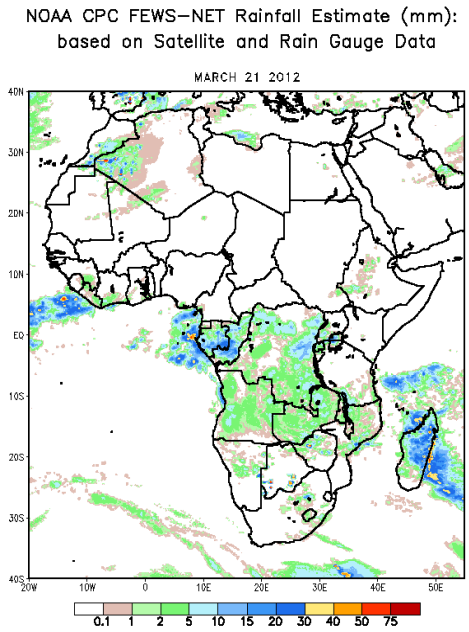
At 200mb, strong winds associated with Sub-Tropical Westerly Jet are expected to dominate the flow from northern Atlantic Ocean across North Africa to Persian Gulf during the forecast period. The intensity of the jet is expected to exceed 100kts while moving to the east with its core values occasionally increasing to more than 160kts especially the forecast period.

In the next five days, low level tropospheric wind convergences from the Gulf of Guinea to northeastern DRC passing through northern Gabon, southern Cameroun, northern 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 to southwestern Tanzania, convergences over central Ethiopia and the mid-latitude trough over South Africa 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, DRC, Rwanda, Burundi, northern Mozambique, Malawi, southern and western Tanzania, central portion of South Africa, central Ethiopia and Madagascar Island.

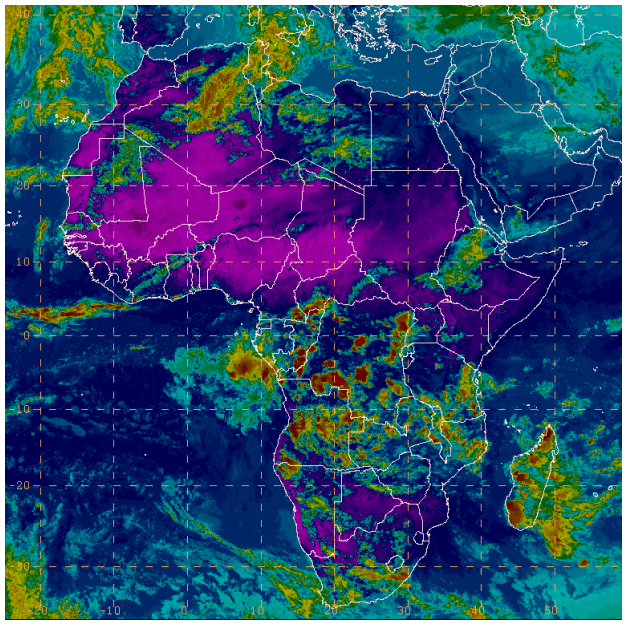
2.0. Previous and Current Day Weather Discussion over Africa (21 March – 22 March 2012)

2.1. Weather assessment for the previous day (21 March 2012): During the previous day, moderate to locally heavy rainfall was observed over eastern Madagascar, southeastern Gabon, southern Congo and western Algeria.

2.2. Weather assessment for the current day (22 March 2012): Intense clouds are observed over DRC, Zambia, southern and eastern Tanzania, Malawi, Angola, Congo, southwestern CAR, southern South Africa, central and northeastern Algeria, Tunisia and Madagascar.



IR Satellite Image (valid 1500Z of 22 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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