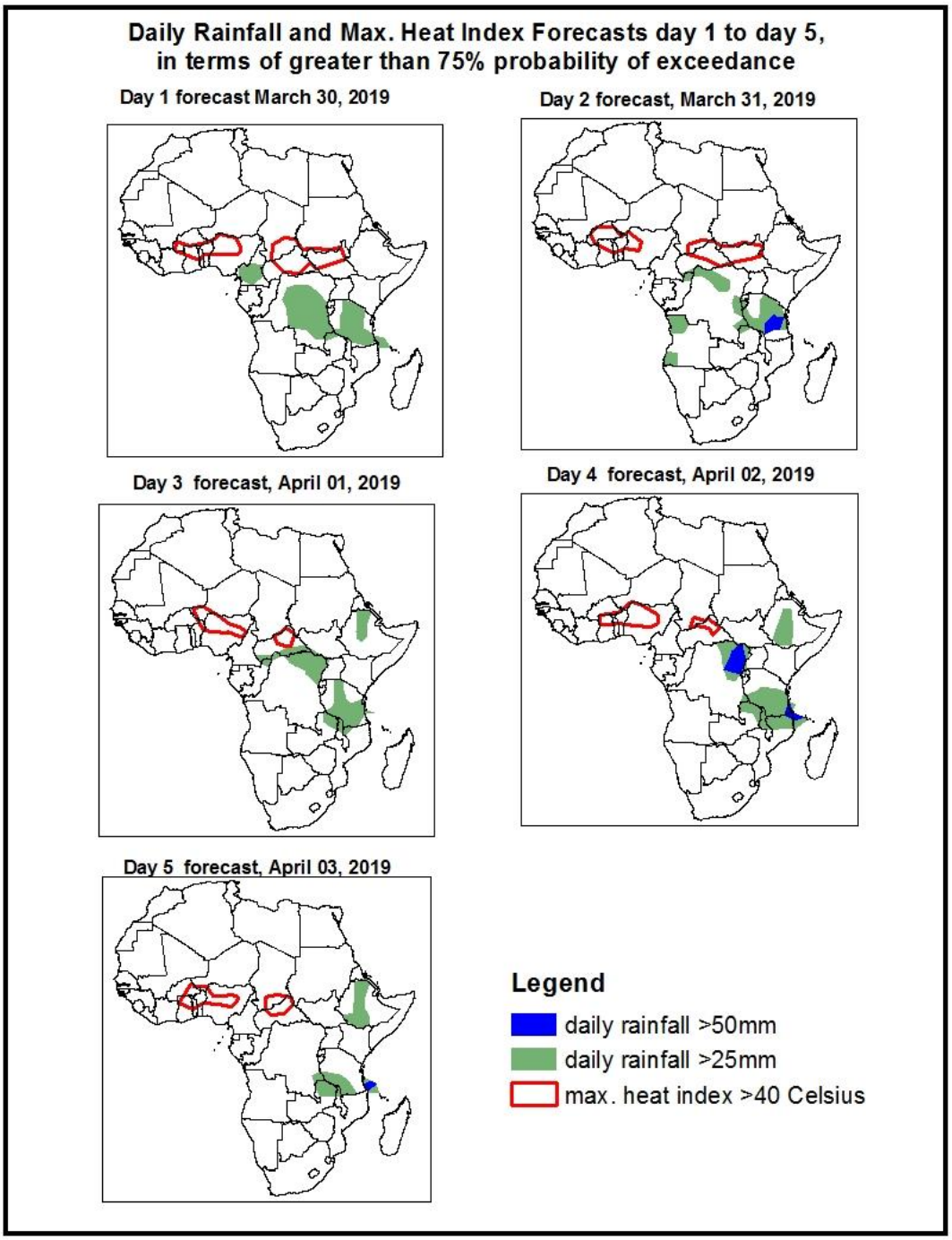
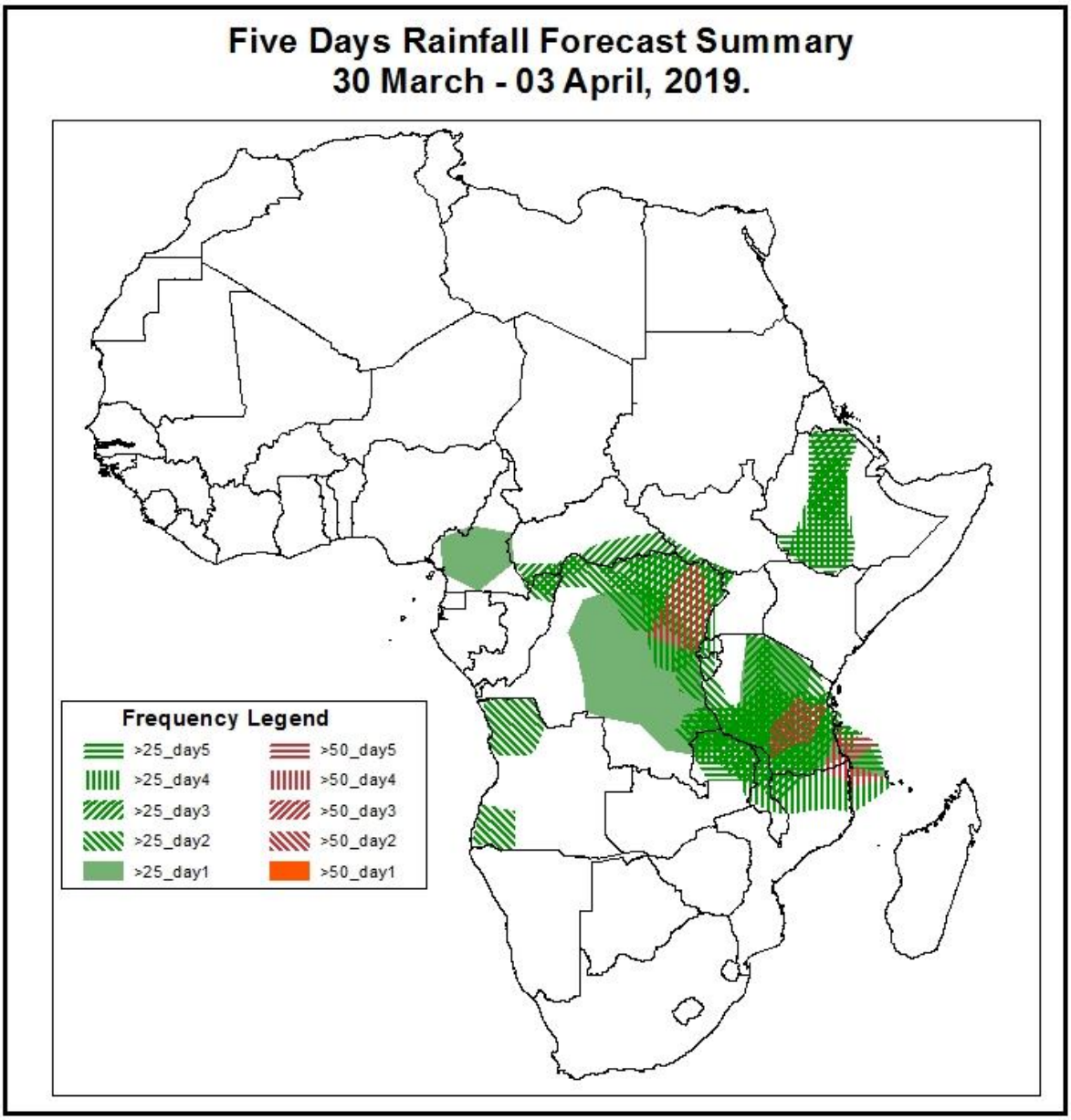
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on *March 29,* 2019)

1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: 30March - 03 April, 2019)

The forecasts are expressed in terms of high probability of precipitation (POP), valid 06Z to 06Z, and exceedance probability of maximum heat index (>40^{o}C), based on the NCEP/GFS and the NCEP Global Ensemble Forecasts System (GEFS) and expert assessment.



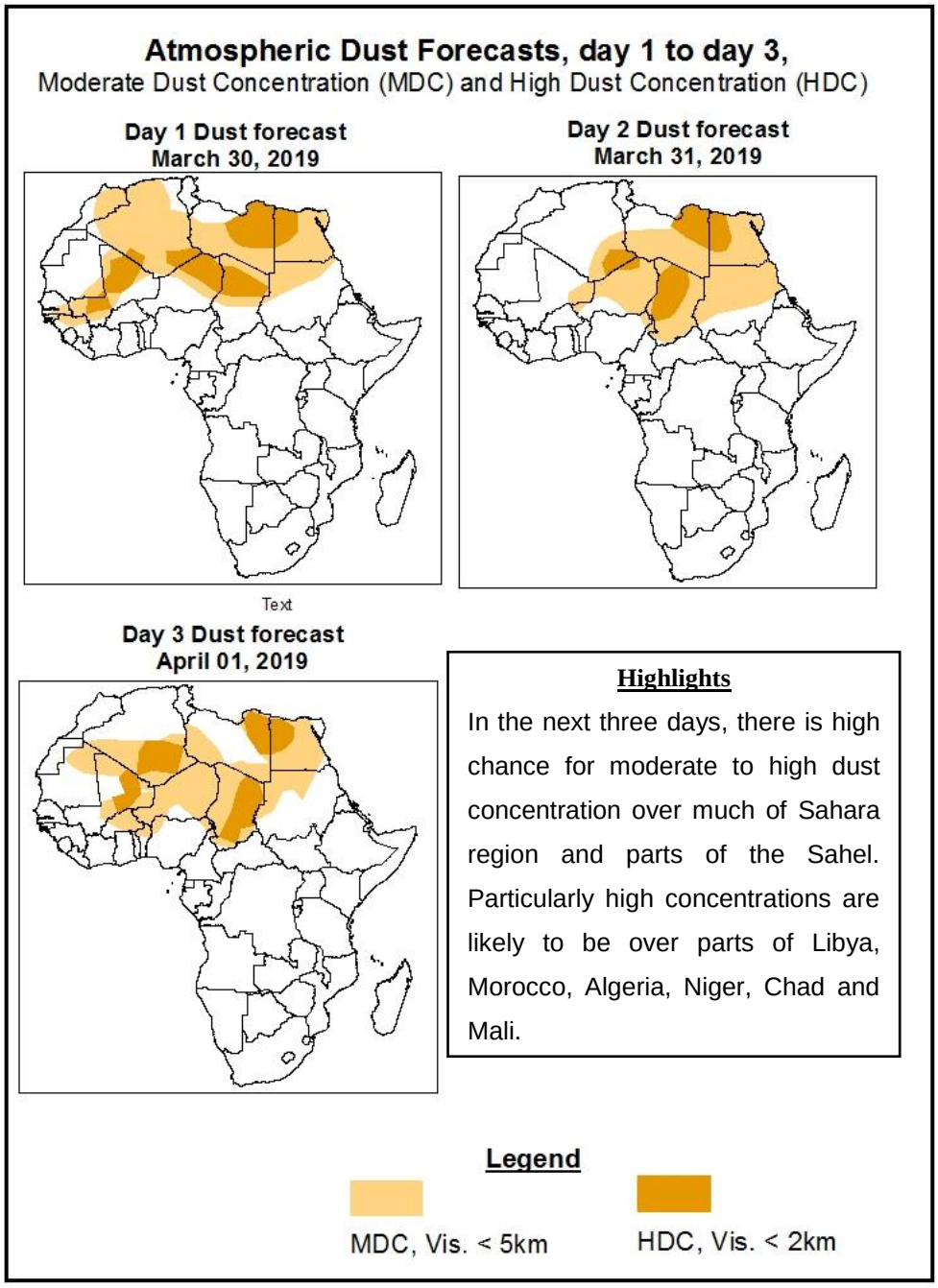


Highlights

- In the next five days, lower-level wind convergences are likely to cause significant precipitation over some areas across the Equatorial Africa as well as those in East and few in the Great Horn of Africa.
- At least 25mm for two or more days is likely over central Ethiopia, southern CAR, northeast DRC and much of central and southern Tanzania.
- There is an increased chance for daily rainfall amount to exceed 50mm for two or more days over much of Southeast Tanzania as well as few areas in northeast DRC.
- There is a high likelihood for heat index to exceed 40^{o}C across parts of Sahel region, specifically Cote d'Ivoire, Ghana, Togo, Benin, Chad as well as those in CAR.

1.2. Atmospheric Dust Concentration Forecasts *(valid: 30 March – 01 April 2019)*

The forecasts are expressed in terms of high probability of dust concentration, based on the Navy Aerosol Analysis and Prediction System, NCEP/GFS lower-level wind forecasts and expert assessment.



1.3. Model Discussion, *Valid: 30 March - 03 April 2019*

The frontal low pressure, currently over the extreme eastern Mediterranean Ocean ahead of the Azores high, is moderately influencing weather over Northeast Africa, particularly over Ethiopia and Southern Sudan. As it progresses further East, it gives the chance for the Azores High Pressure system over the North of Atlantic Ocean to start rebuilding from 1028hPa to as high as 1037hPa towards the end of the forecast period.

The St. Helena High Pressure system over Southeast Atlantic Ocean is expected to continue intensifying from 1027 to 1030 as it migrates towards the East, just behind the frontal low, before relaxing to 1029hPa and splitting into a ridging high towards the end of the forecast period. This configuration is likely to influence precipitation along the East coast of Southern Africa.

The influence of Mascarene High Pressure system over Southwest Indian Ocean, on Southern Africa weather, is expected to be rather minimal as it is likely to generally maintain a central pressure of around 1030hPa and be located far to the East. Only towards the end of the forecast period when it is expected to rebuild off the East coast of South Africa.

At 925hPa, strong and dry, mainly northeasterly, winds are expected to continue blowing over the Sahel and Sahara regions during the period. Despite marked convergence of these winds with the Southeasterly winds along the Gulf of Guinea, there seems to be minimal forcing to cause enhanced convection. Otherwise, low level convergences are expected to influence enhanced to heavy precipitation over some areas in the rest of Equatorial Africa as well as East and Great Horn of Africa.

At 850hPa, the Monsoon winds are expected to continue converging along the Gulf of Guinea as well as over parts of central Africa, particularly over the DRC and neighboring countries, influencing isolated to scattered, moderate to enhanced precipitation over these areas. Converging winds are likely to be maintained over western Ethiopia, central and western Tanzania.

At 700hPa, generally easterly winds over the Equatorial Africa are expected, becoming more organized, even covering parts of East and Great Horn of Africa, from mid to end of the forecast period. The frontal low pressure over the eastern Mediterranean is also evident at this level.

At 500hPa, a general easterly wind flow over the Equatorial Africa is expected to be maintained during the entire period. Alongside 700hPa easterly winds, the flow is expected to maintain advection of convective activities towards West.

At 200hPa, a strong wind (>90kts), associated with the subtropical westerly jet, is expected to prevail across northern Africa, with the strongest wind (>130kts) and significant bending over extreme northern parts of Africa.

In the next five days, lower-level wind convergences are likely to cause significant precipitation over some areas across the Equatorial Africa as well as those in East and few in the Great Horn of Africa. At least 25mm for two or more days is likely over central Ethiopia, southern CAR, northeast DRC and much of central and southern Tanzania. There is an increased chance for daily rainfall amount to exceed 50mm for two or more days over much of Southeast Tanzania as well as few areas in northeast DRC. There is a high likelihood for heat index to exceed 40oC across parts of Sahel region, specifically Cote d'Ivoire, Ghana, Togo, Benin, Chad as well as those in CAR.

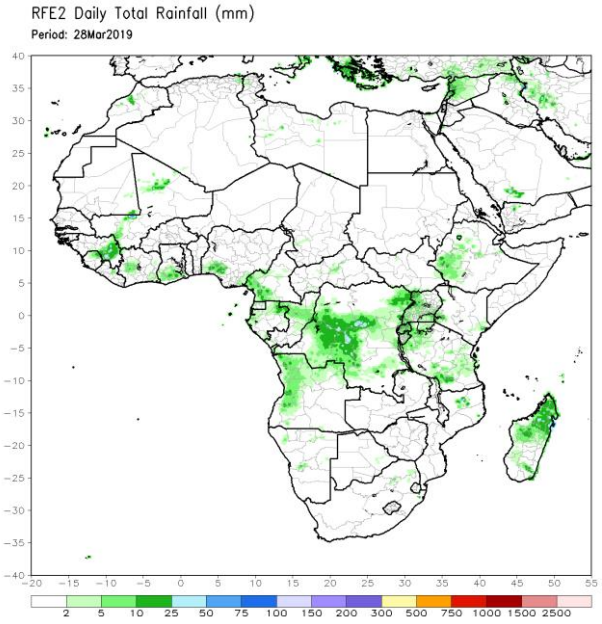
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (March 28, 2019)

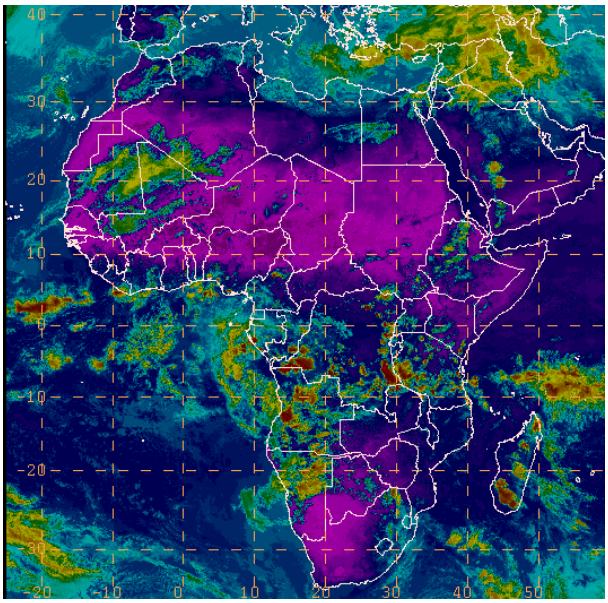
Daily rainfall totals exceeded 25mm over parts of central DRC.

2.2. Weather assessment for the current day (*March 29,* 2019)

Enhanced convective clouds are observed over few areas of extreme western and eastern DRC, western Angola as well as western Tanzania.



IR Satellite Image (valid 1453 March 29, 2019)



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