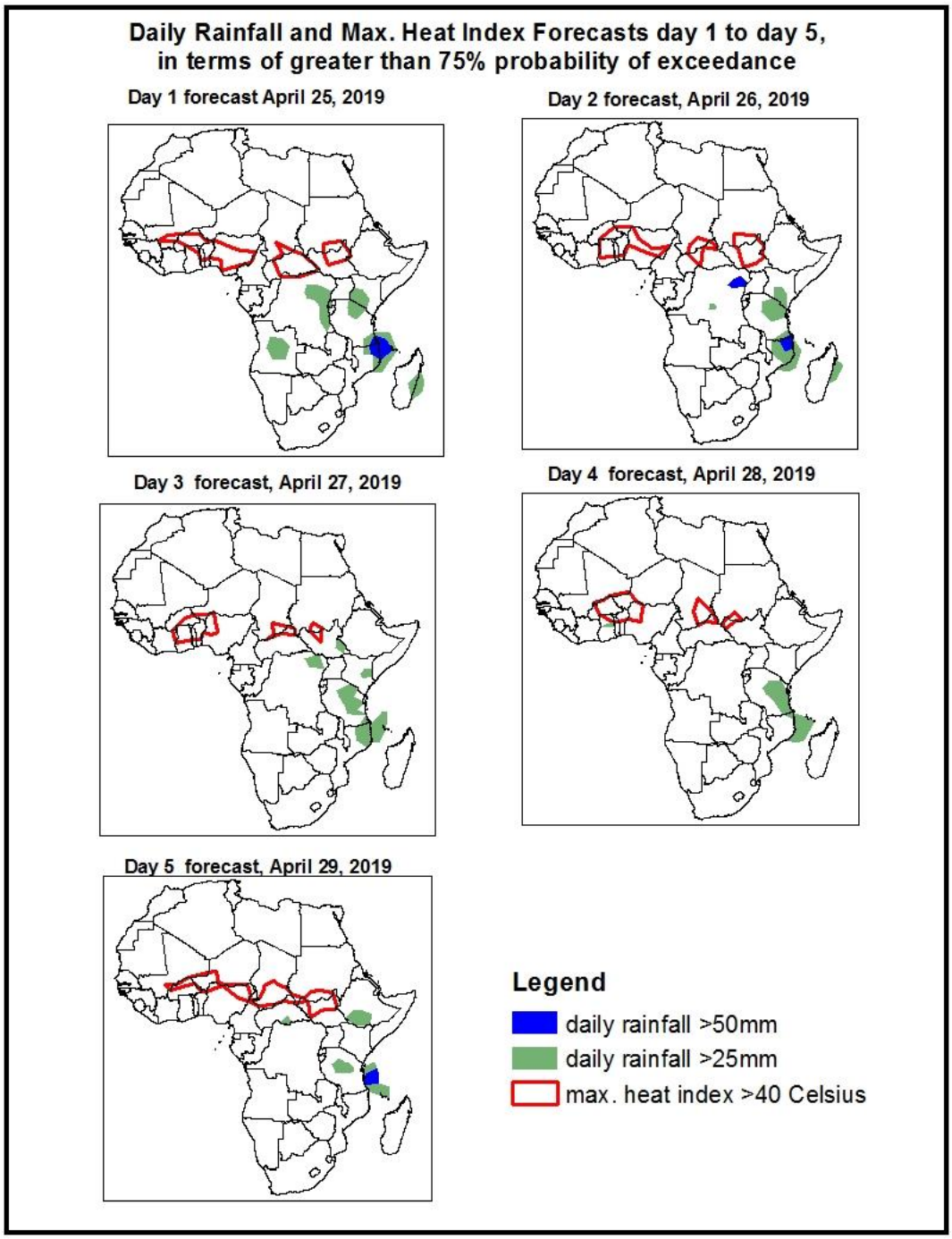
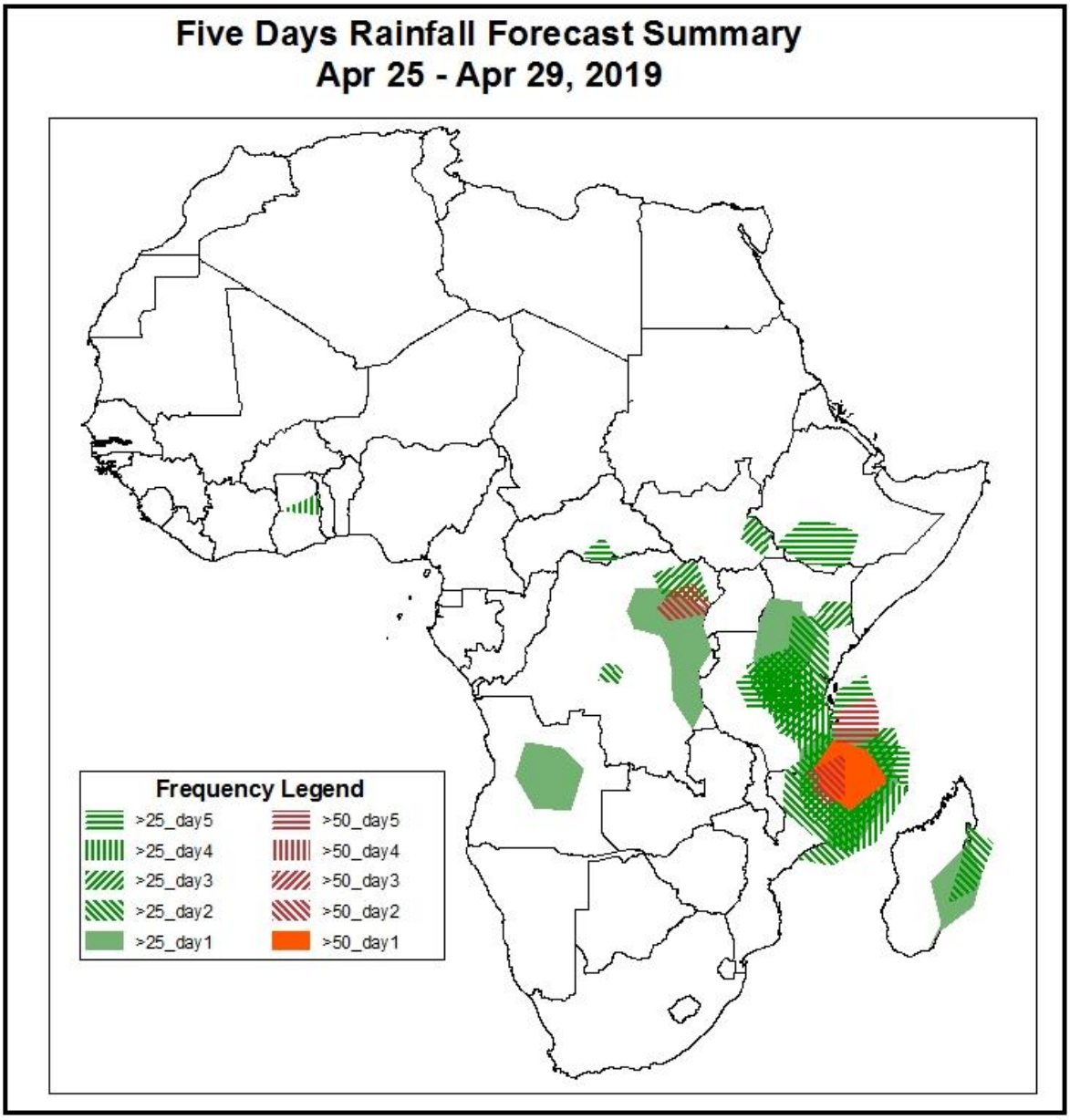
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on *April 24*, 2019)

1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: 25 – 29 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.



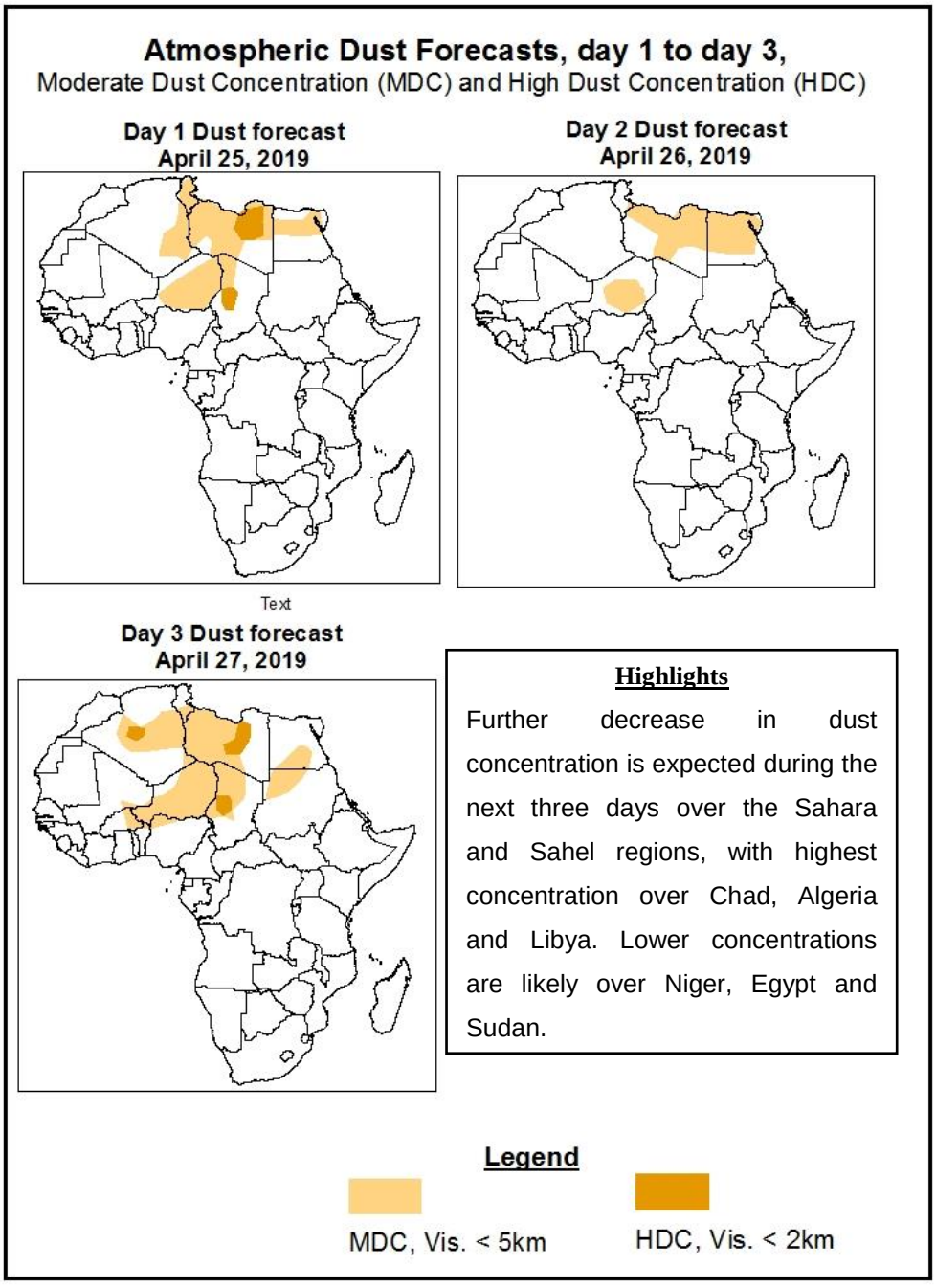


Highlights

- Less pronounced lower-level wind convergences are likely to keep precipitation minimal over many parts of central Africa. Isolated cases of enhanced convective precipitation are expected, however, over eastern DRC. The tropical storm Kenneth is also expected to enhance convergence over central towards northeast Tanzania and southern Kenya. Kenneth is also likely to trigger heavy precipitation along parts of Mozambique and Tanzania coastal areas.
- At least 25mm for two or more days is likely over very few areas of the Gulf of Guinea, some parts of central Africa. This is also true for some areas in central to northern Tanzania, southern Kenya, along the south coast of Tanzania and northern coast of Mozambique.
- There is an increased chance for daily maximum heat index to exceed 40^{o}C across portions of the Gulf of Guinea and Sahel regions as well as CAR and southern Sudan.

1.2. Atmospheric Dust Concentration Forecasts *(valid: 25 – 27 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: 25 – 29 April 2019*

The Azores High Pressure system over the North of Atlantic is expected to continue intensifying, reaching as high as 1033hPa during the mid of forecast period. However, during the second half of the period, it is likely to relax, giving way to heat lows. Its influence on African precipitation is minimal, rather.

During the forecast period, the St. Helena High Pressure system over Southeast Atlantic Ocean, currently at around 1027hPa, is expected to migrate steadily towards east while relaxing significantly due to the incoming frontal low from the west. During the end of the period, the system will turn into the ridging high influencing light stratiform precipitation along the southern Africa coastal areas.

The Mascarene High Pressure system over Southwest Indian Ocean is currently far to the east but expected to rebuild from mid towards the end of the forecast period, strengthening the moist southeasterly flow towards the east African coastal areas. Meanwhile, the tropical storm Kenneth, in the Southwest Indian Ocean, is expected to move westwards, hitting mostly northern Mozambique; extreme southern coast of Tanzania is also likely to be hit. This is likely to trigger enhanced to heavy precipitation as well as very strong winds especially along the coastal areas.

At 925hPa, strong wind speeds (>35) over Libya are likely to trigger high dust concentrations over there, throughout the forecasting period. Also, from mid forecasting period, strong winds are also likely to develop over Chad, Niger and Sudan. Over the Sahel and the Gulf of Guinea, Monsoon winds are likely to maintain their influence over the area, characterized by highly isolated but moderate to enhanced convective precipitation. Over the central Africa the low level convergence is expected to be less pronounced, occasionally triggering some moderate precipitation over there. On the other hand, strong winds associated with a tropical cyclone Kenneth are expected to affect coasts of Mozambique and Tanzania.

Again, at 850hPa level, some weak convergence patterns over southern CAR and Ethiopia as well as central DRC are likely to result into slight to moderate precipitation over there. This is also the case for central towards northern Tanzania.

700hPa wind pattern is dominated by mainly northeasterlies, advecting convection over the Gulf of Guinea, central Africa towards southwest. Quite significant cyclonic flow associated with Kenneth is expected to travel from Mozambique Channel to Mozambique and southern Tanzania during the first half of the forecasting period.

Being mainly easterly, 500hPa wind pattern is expected to help propagating activities towards west over most of the areas expected to feature significant convection, particularly in the Gulf of Guinea, central and east Africa regions.

During the period, a Subtropical Westerly Jet at 200hPa is expected to be generally weak with winds less than 130kts, occasionally peaking to 130kts, and no significant bending (trough). Its influence on precipitation over north and northeast Africa is virtually non-existent.

Less pronounced lower-level wind convergences are likely to keep precipitation minimal over many parts of central Africa. Isolated cases of enhanced convective precipitation are expected, however, over eastern DRC. The tropical storm Kenneth is also expected to enhance convergence over central towards northeast Tanzania and southern Kenya. Kenneth is also likely to trigger heavy precipitation along parts of Mozambique and Tanzania coastal areas. At least 25mm for two or more days is likely over very few areas of the Gulf of Guinea, some parts of central Africa. This is also true for some areas in central to northern Tanzania, southern Kenya, along the south coast of Tanzania and northern coast of Mozambique. There is an increased chance for daily maximum heat index to exceed 40oC across portions of the Gulf of Guinea and Sahel regions as well as CAR and southern Sudan.

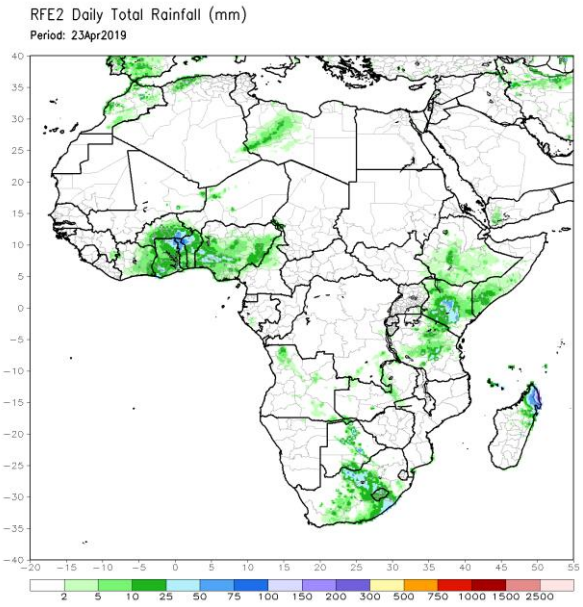
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (April 23, 2019)

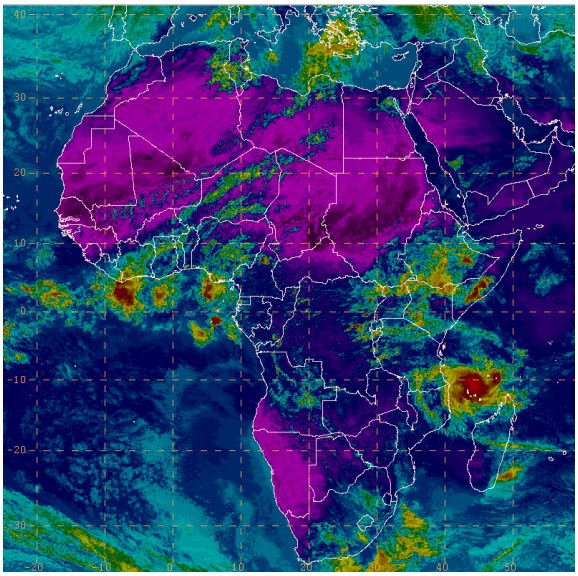
Daily rainfall totals exceeding 25mm is observed over Ghana, Togo, Benin, central Kenya and northern Madagascar as well as Northwest and KwaZulu Natal regions in South Africa.

2.2. Weather assessment for the current day (*April 24,* 2019)

Deep convective clouds associated with the Tropical Storm Kenneth are observed over the Mozambique Channel.



IR Satellite Image (valid 1452 April 24, 2019)



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