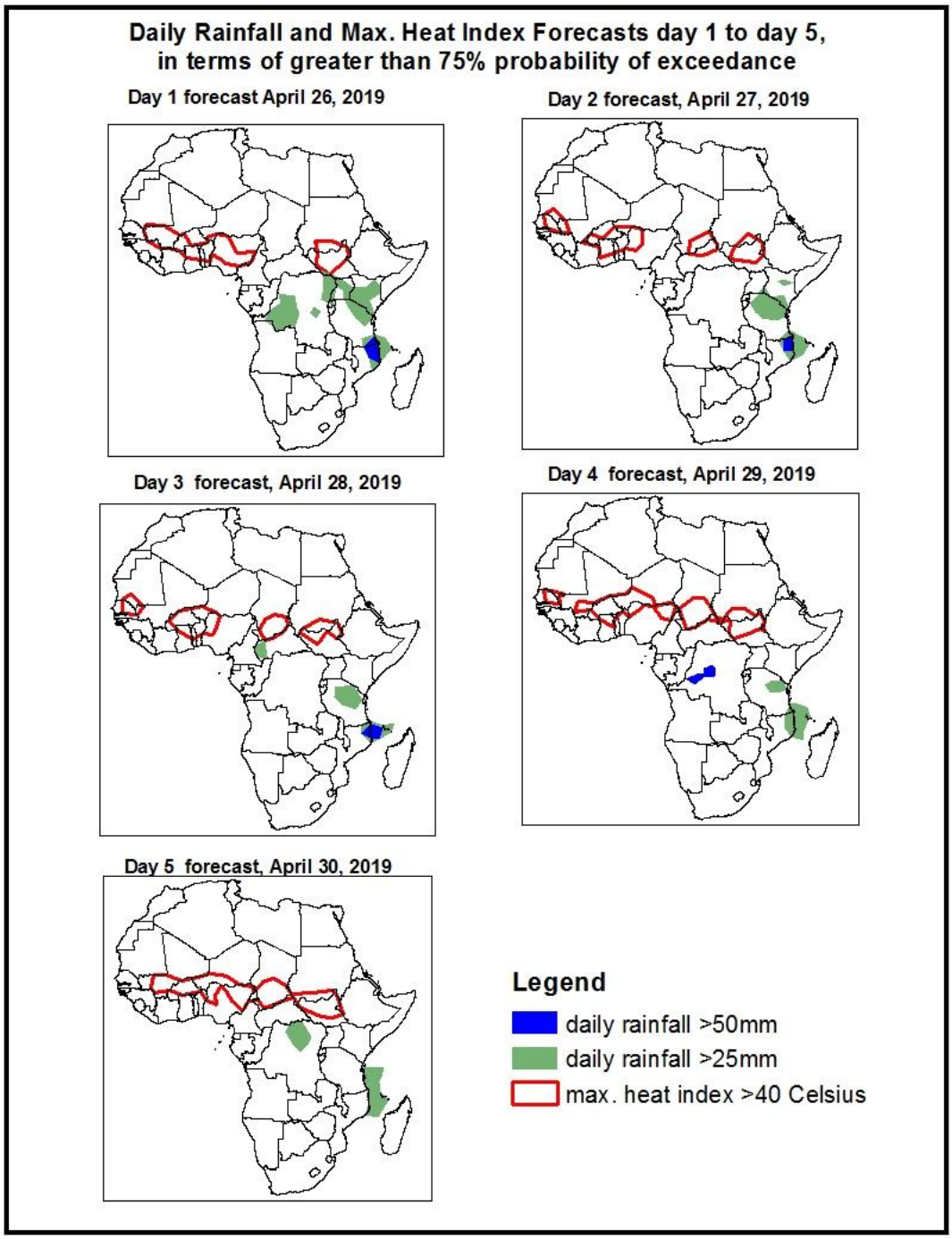
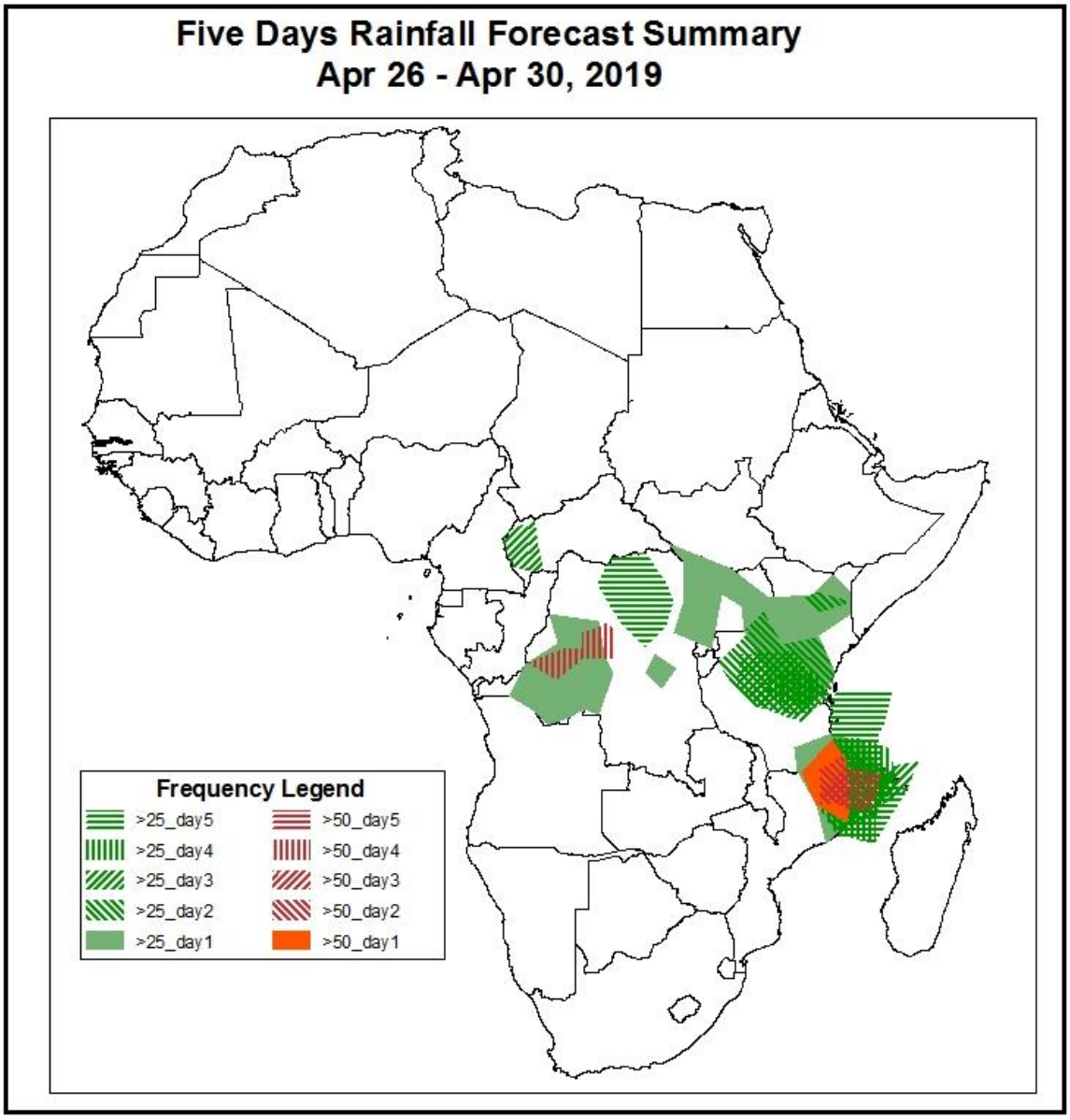
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on *April 25*, 2019)

1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: 26 – 30 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.



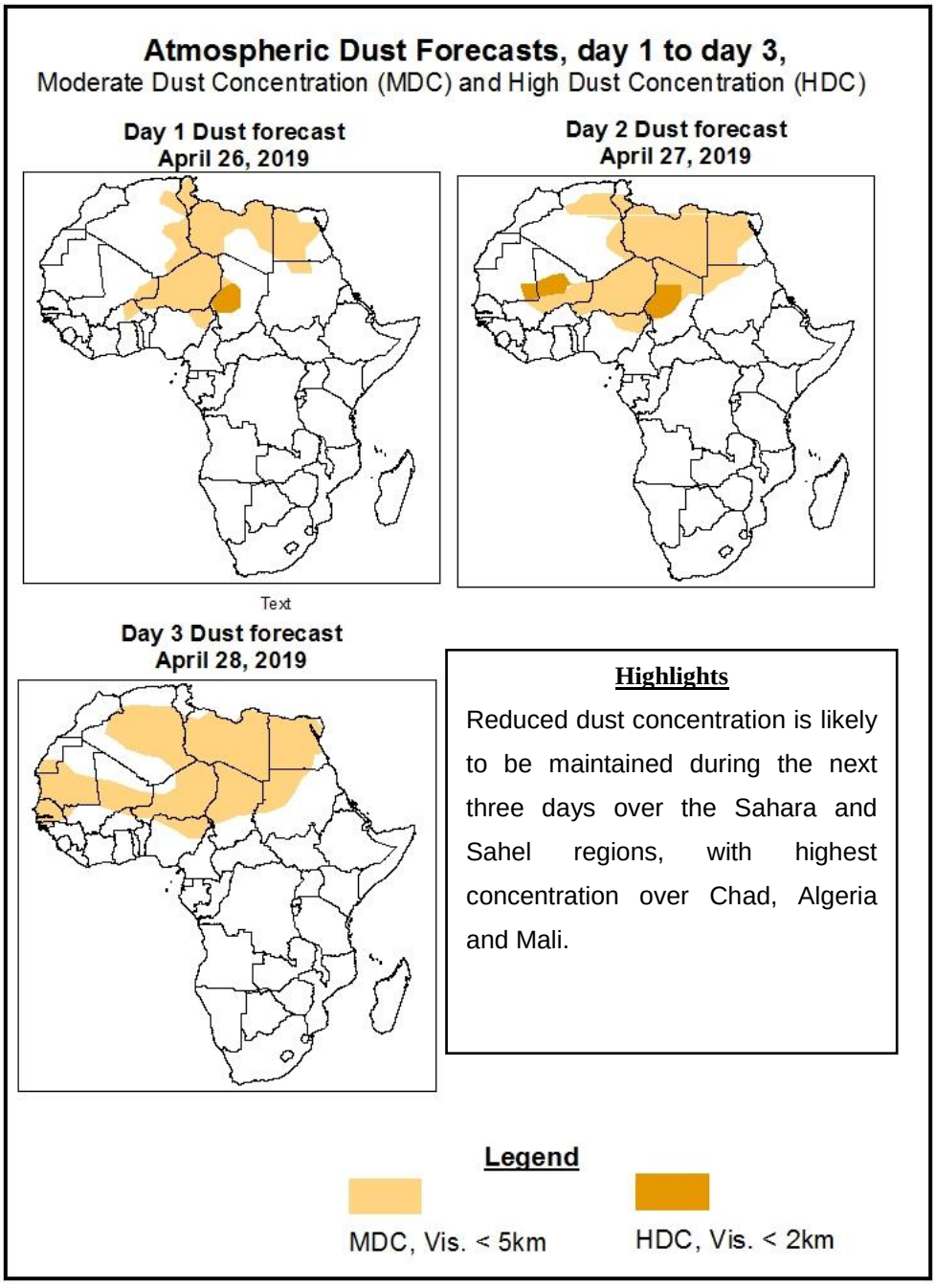


Highlights

- Less pronounced lower-level wind convergences are likely to keep precipitation less significant over many parts of central Africa. Occasional isolated cases of enhanced convective precipitation are expected, however, over few areas.
- The tropical storm Kenneth is also expected to cause heavy rainfall along the coastal areas of northern Mozambique and southern Tanzania. The cyclone is also likely to enhance low level convergence over central towards northeast Tanzania and southern Kenya causing significant precipitation over there.
- At least 25mm for two or more days is likely over very few areas 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 many areas of the Sahel region as well as few areas of Gulf of Guinea, CAR, southern Sudan and South Sudan.

1.2. Atmospheric Dust Concentration Forecasts *(valid: 26 – 28 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: 26 – 30 April 2019*

During the first half of the period, the Azores High Pressure system over the North of Atlantic is expected to continue intensifying, reaching as high as 1032hPa then relaxing during the second half of the period, giving way to heat lows.

During much of the forecast period, the St. Helena High Pressure system over Southeast Atlantic Ocean, currently at around 1022hPa, is expected to be highly eroded even more due to the frontal low from the west, only starting recovering during the second half of the period. Since it is rather weak, its influence on African weather is minimal.

The Mascarene High Pressure system over Southwest Indian Ocean is rebuilding and intensifying throughout the forecast period from 1023 to 1028 at the end of the period, feeding the Tropical Cyclone Kenneth with moist southeasterly. This is likely to influence heavy precipitation along parts of the east African coast.

At 925hPa, winds have subsided significantly over the Sahar and Sahel region, reducing dust concentrations over there, throughout the forecasting period. Over the Gulf of Guinea, Monsoon winds are not likely to influence significant convective precipitation over there. On the other hand, isolated cases of very strong winds associated with a tropical cyclone Kenneth are expected to affect coasts of Mozambique and Tanzania during the first half of the period. In addition, heavy precipitation is expected over there.

At 850hPa level, rather weak convergence patterns over CAR, DRC, Ethiopia as well as Kenya are likely to result into slight to moderate precipitation over there. The cyclonic flow associated with Kenneth is likely to influence heavy falls over parts of east African coast.

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 over northern Mozambique and southern Tanzania during the first half of the forecasting period.

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 and central Africa.

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 less significant over many parts of central Africa. Occasional isolated cases of enhanced convective precipitation are expected, however, over few areas. The tropical storm Kenneth is also expected to cause heavy rainfall along the coastal areas of northern Mozambique and southern Tanzania. The cyclone is also likely to enhance low level convergence over central towards northeast Tanzania and southern Kenya causing significant precipitation over there. At least 25mm for two or more days is likely over very few areas 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 many areas of the Sahel region as well as few areas of Gulf of Guinea, CAR, southern Sudan and South Sudan.

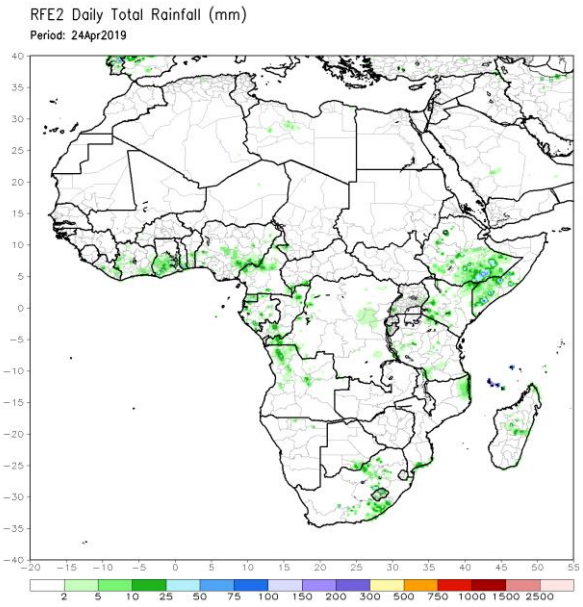
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (April 24, 2019)

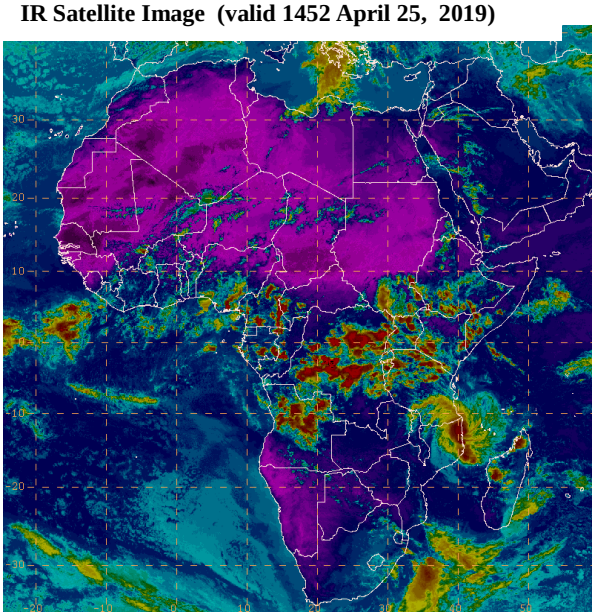
Daily rainfall totals exceeding 25mm is observed over southern Ethiopia.

2.2. Weather assessment for the current day (*April 25,* 2019)

Deep convective clouds associated with the Tropical Storm Kenneth are observed over the northern Mozambique and south coast of Tanzania. Also, quite intense convention is observed over DRC and northwest Angola.



IR Satellite Image (valid 1452 April 25, 2019)



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