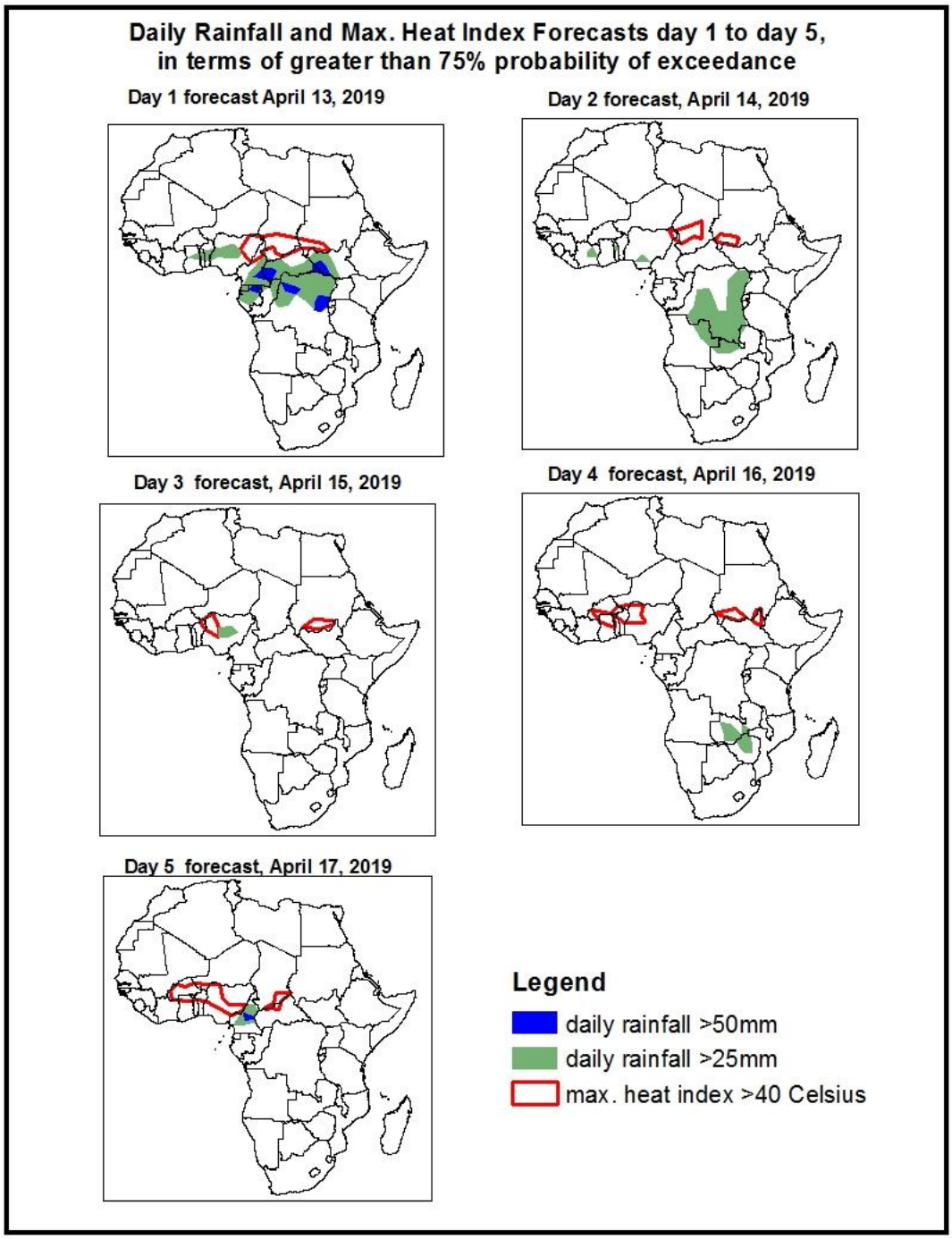
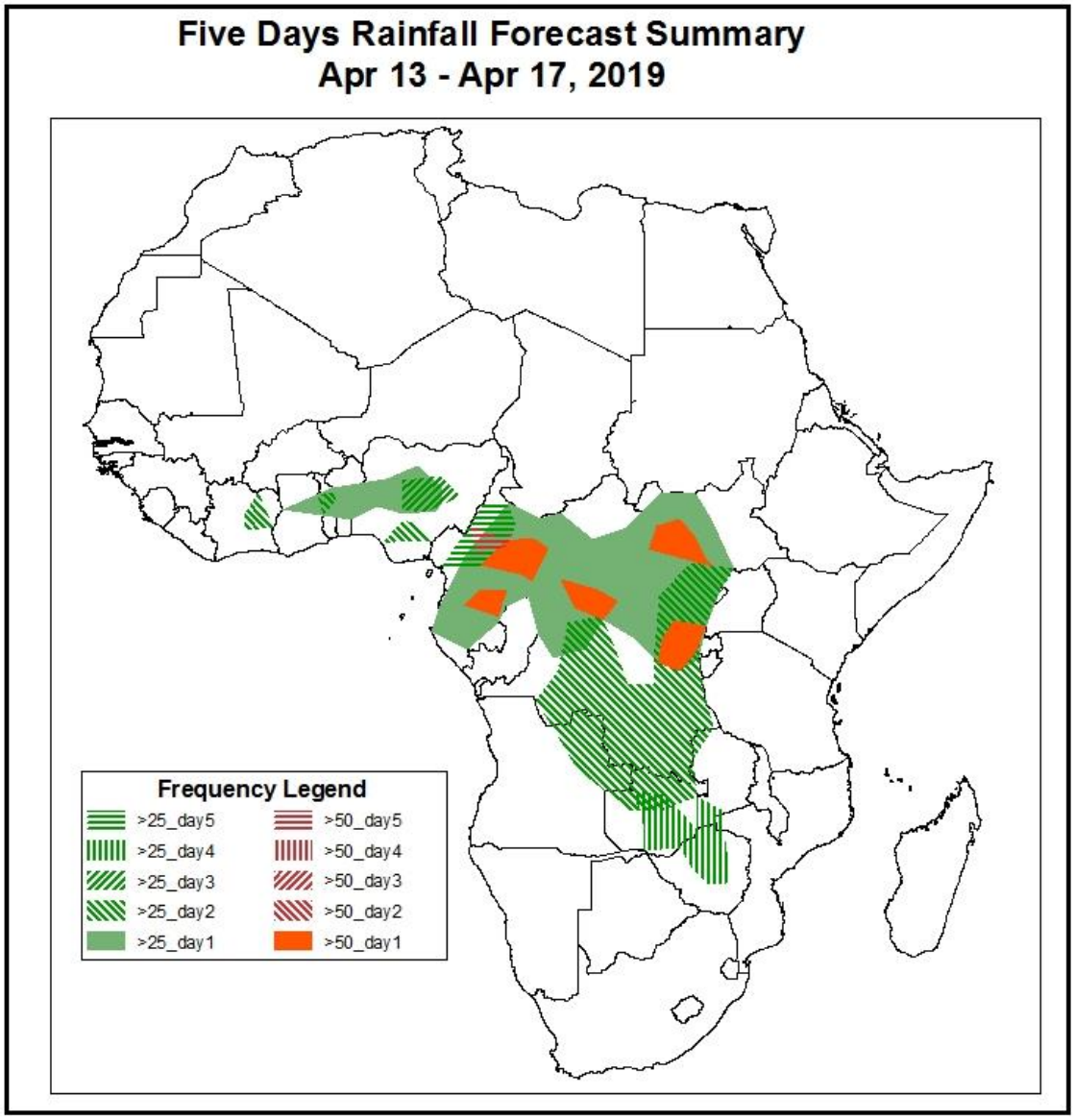
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on *April 12*, 2019)

1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: 13 – 17 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°C), based on the NCEP/GFS and the NCEP Global Ensemble Forecasts System (GEFS) and expert assessment.



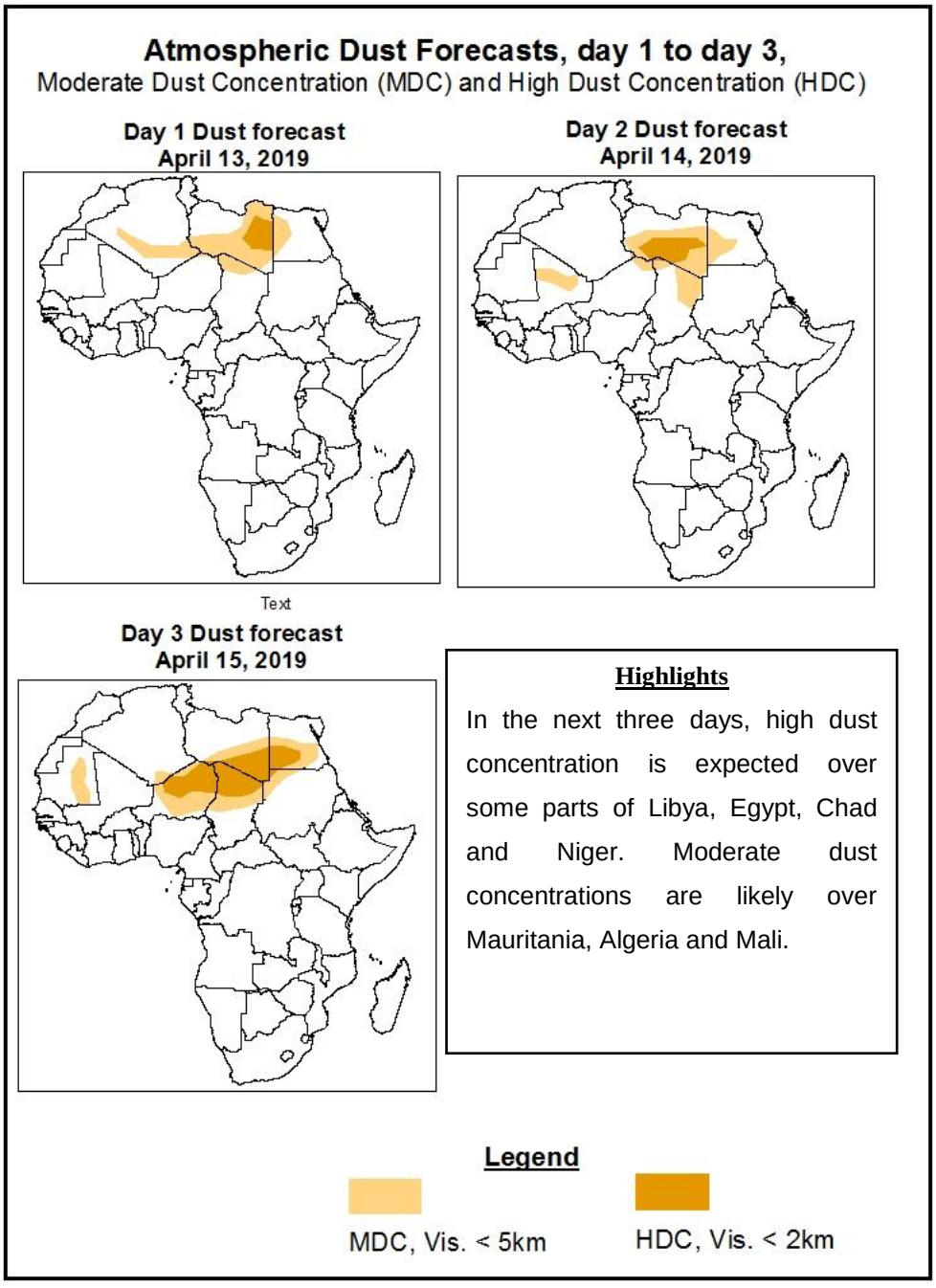


Highlights

- With the main rain causing Monsoon pattern further South, only moderate precipitation over few areas is expected along the Gulf of Guinea.
- Persistent lower-level wind convergences are likely to maintain significant to enhanced precipitation over some areas over central (Cameroon, Republic of Congo, DRC, CAR) and northeast Africa (South Sudan).
- At least 25mm for two or more days is likely over few areas of the Gulf of Guinea (Ivory Coast, Ghana, Togo, Benin and Nigeria), central Africa (DRC, CAR), South Sudan and some areas in southern Africa (Zambia, Zimbabwe and Angola). Heavier precipitation is expected over some parts of central Africa.
- There is an increased chance for daily maximum heat index to exceed 40^{o}C across portions of the Sahel region as well as South Sudan and southern Sudan.

1.2. Atmospheric Dust Concentration Forecasts *(valid: 13 – 15 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: 13 – 17 April 2019*

During the forecast period, the Azores High Pressure system over the North of Atlantic is expected to progressively extend towards northern Africa while intensifying from 1019hPa to 1022hPa at the end of the period.

During the first half of the forecast period, the St. Helena High Pressure system over Southeast Atlantic Ocean is expected to continue intensifying to as high as 1032hPa. During the second half of the period, however, it is expected to relax down to 1020hPa due to a frontal system from the West.

Throughout the forecast period, the Mascarene High Pressure system over Southwest Indian Ocean is expected to relax from 1032hPa down to 1026hPa.

At 925hPa, an isolated zone with dry northerly to northeasterly winds speeds (>35) is expected over Chad, Niger and Mali. This is likely to maintain moderate dust concentration over these areas. Further South off the Gulf of Guinea, the trough is limited over the ocean and therefore coastal areas are unlikely to be influenced by the system. Over the central Africa, significant precipitation is likely due to the converging wind patterns over there. Along the East African coast (Tanzania and Kenya), converging winds, especially during the first half of the period, are unlikely to cause significant precipitation over there.

At 850hPa, convergent wind patterns over central Africa (DRC and CAR) are likely to keep moderate precipitation over these areas with good chances of isolated enhanced precipitation. Otherwise, over East Africa the wind pattern is not supporting the lower level convergence seen at 925hPa and hence reduced activities are likely.

At 700hPa, easterly to northeasterly wind pattern is expected over the areas expected to receive significant convective activities. In light of this, convective activities are likely to be propagated towards southwest.

Being mainly easterly, 500hPa wind pattern is expected to help propagating activities towards southwest over most of the areas expected to feature significant convection.

At 200hPa, strong wind (>130kts), associated with the Subtropical Westerly Jet, is expected to be maintained across northern Africa throughout the forecast period. The slight bending (trough) expected over northwest Africa towards northeast Africa the mid of the forecast period is unlikely to influence precipitation over these regions.

With the main rain causing Monsoon pattern further South, only moderate precipitation over few areas is expected along the Gulf of Guinea. Persistent lower-level wind convergences are likely to maintain significant to enhanced precipitation over some areas over central (Cameroon, Republic of Congo, DRC, CAR) and northeast Africa (South Sudan). At least 25mm for two or more days is likely over few areas of the Gulf of Guinea (Ivory Coast, Ghana, Togo, Benin and Nigeria), central Africa (DRC, CAR), South Sudan and some areas in southern Africa (Zambia, Zimbabwe and Angola). Heavier precipitation is expected over some parts of central Africa. There is an increased chance for daily maximum heat index to exceed 40oC across portions of the Sahel region as well as South Sudan and southern Sudan.

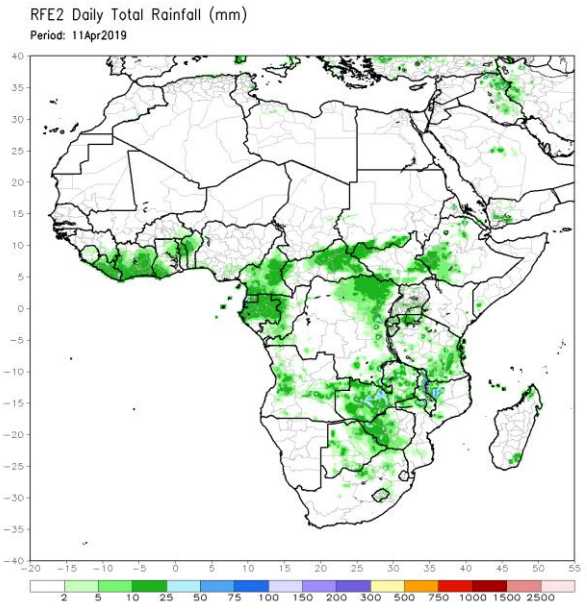
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (April 11, 2019)

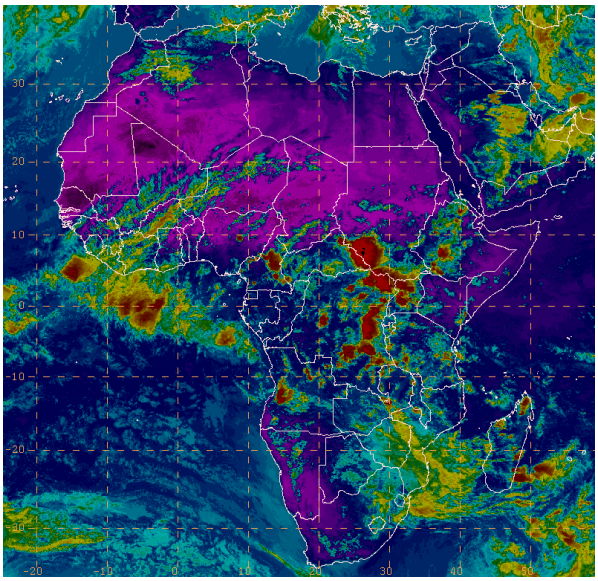
Daily rainfall totals exceeding 25mm is observed over parts of Zambia and Mozambique.

2.2. Weather assessment for the current day (*April 12,* 2019)

Deep convective clouds are observed over the Gulf of Guinea while moderate convection is observed CAR, DRC, Angola, Zambia and Tanzania.



IR Satellite Image (valid 1452 April 12, 2019)



Authors: Elias Lipiki (CPC-African Desk / Tanzania Meteorological Agency —TMA); elias.lipiki@noaa.gov