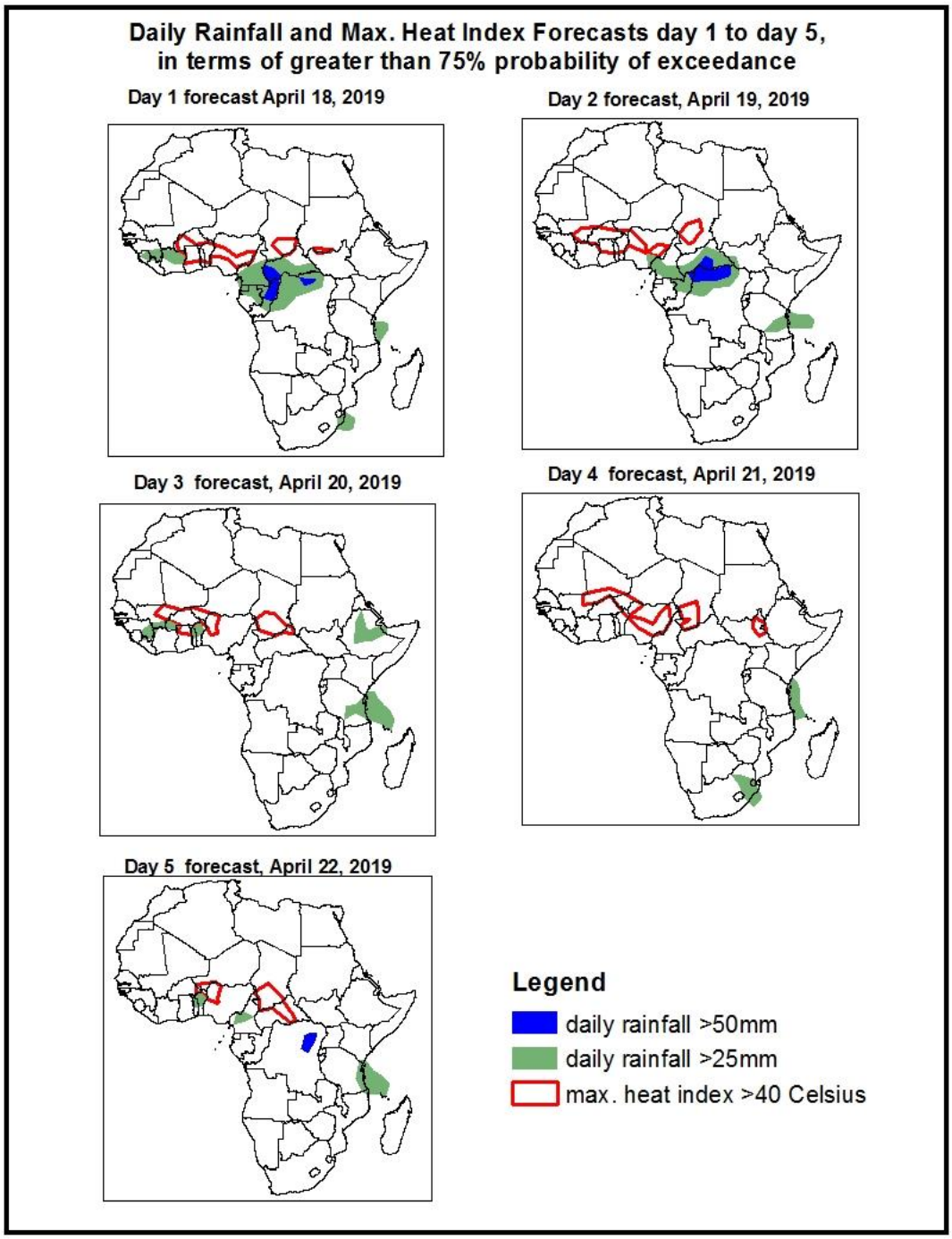
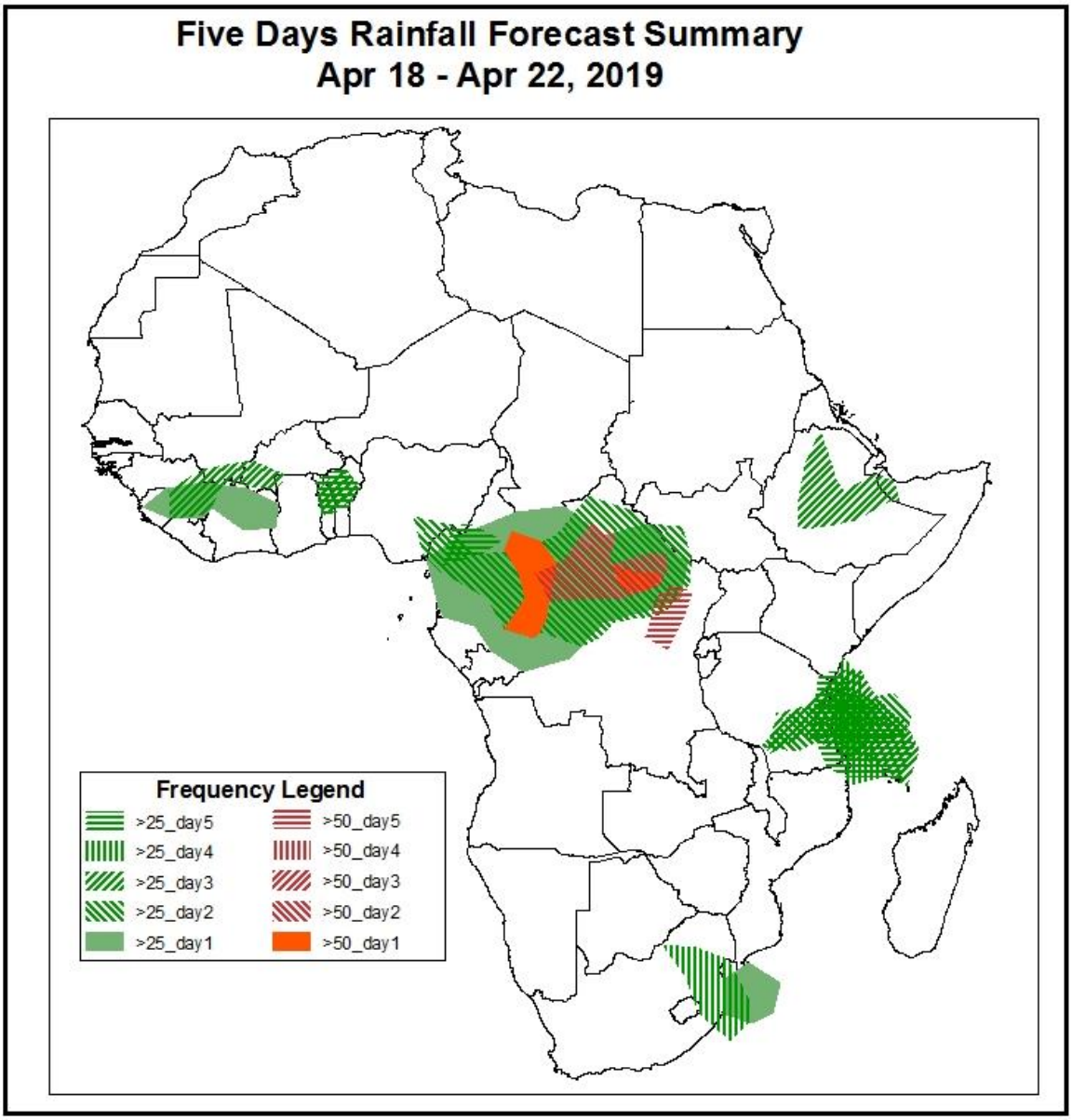
# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on *April 17*, 2019)

### *1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: 18 – 22 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.



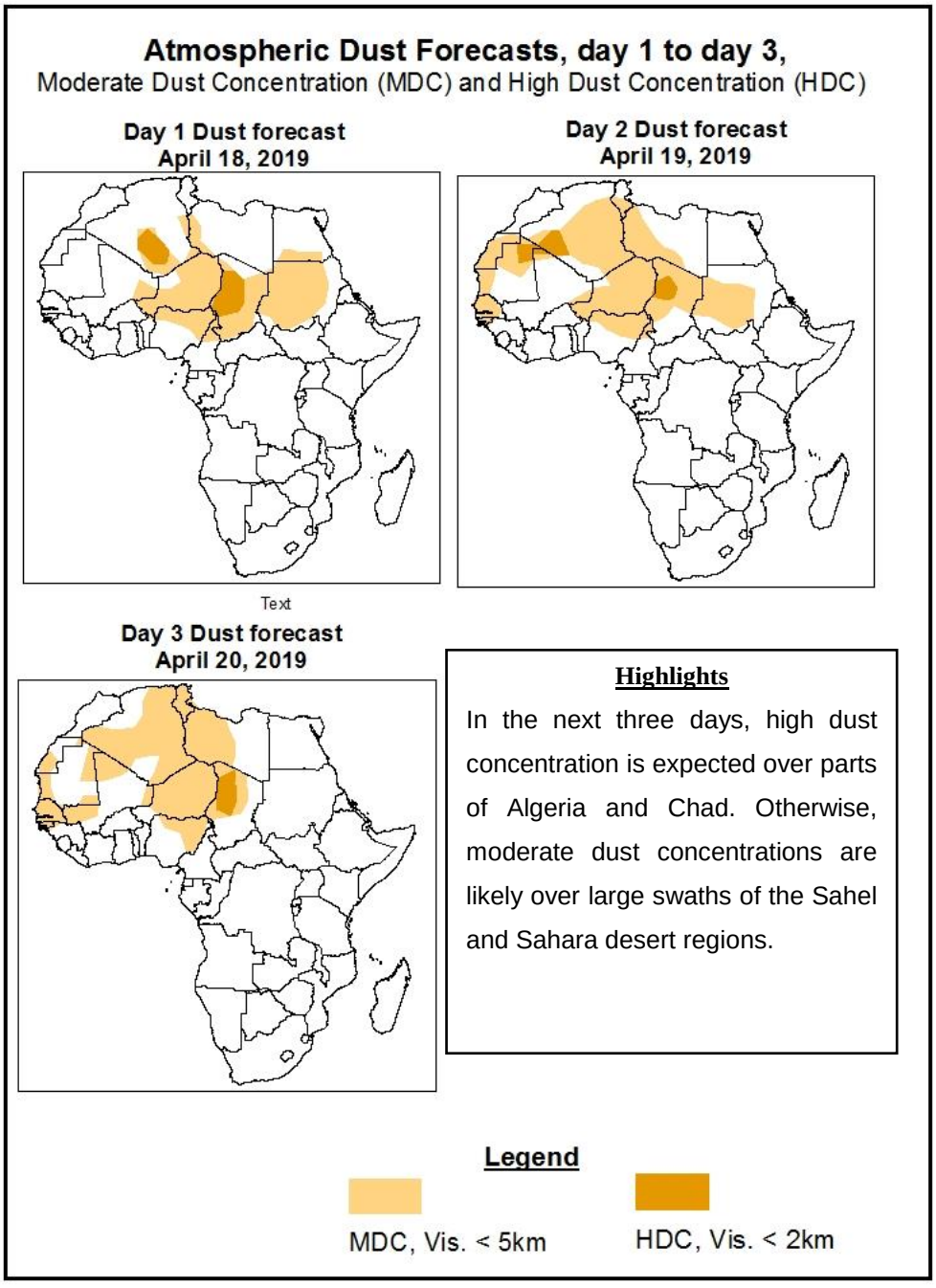



***Highlights***

- Quite isolated moderate to enhanced precipitation is expected over the Gulf of Guinea.
- Persistent lower-level wind convergences are likely to maintain enhanced to heavy precipitation over few areas in central Africa (Cameroon, Republic of Congo, DRC, CAR). Otherwise, the convergences are likely to cause moderate to enhanced precipitation over few areas in northeast (Ethiopia) and east (Tanzania) Africa.
- At least 25mm for two or more days is likely over few areas of the Gulf of Guinea (Liberia, Guinea, Ivory Coast, Ghana, Togo and Benin), central Africa (DRC, CAR), South Sudan and few areas in southern Africa (South 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.

## *1.2. Atmospheric Dust Concentration Forecasts* *(valid: 18 – 20 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: 18 – 22 April 2019*

During the forecast period, the Azores High Pressure system over the North of Atlantic is expected to intensify from 1020hPa to at least 1031hPa towards the end of the forecast period. However, due to heat lows over northern Africa the system is expected to be kept further west.

Throughout the forecast period, the St. Helena High Pressure system over Southeast Atlantic Ocean is expected to intensify from 1024hPa to as high as 1033hPa as it migrates towards east. This is likely to influence slight to moderate precipitation over western parts of East and southwest Africa.

The Mascarene High Pressure system over Southwest Indian Ocean is also expected to intensify from 1024hPa to 1033hPa while migrating towards east. Its influence on southern African precipitation is likely to be minimal.

At 925hPa, a zones with dry northerly to northeasterly winds speeds (>35) are expected to over Chad, Niger and Libya, maintaining moderate to enhanced atmospheric dust concentration over the area. Further South over the Sahel and the Gulf of Guinea, Monsoon winds are likely to influence only slight to moderate precipitation. Over the central Africa, significant precipitation is likely due to the converging wind patterns over there. Along the East African coast (Tanzania), converging winds, especially during the second half of the period, are unlikely to cause significant to enhanced 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, during the first half of the period, wind pattern over East Africa is not favoring enhanced precipitation up until the second half where indication of convergence is expected to cause quite enhanced activities.

At 700hPa, easterly to northeasterly wind pattern is expected to continue dominate over the areas expected to receive significant convective activities. Convective activities are likely to be propagated generally towards southwest.

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 central and East Africa.

The Subtropical Westerly Jet at 200hPa associated with strong winds (>130kts) is expected to be maintained across extreme northern Africa throughout the forecast period. The jet, however, is rather weak and only slight bending (trough) is expected. Its influence on precipitation over northeast Africa is likely to be minimal.

Quite isolated moderate to enhanced precipitation is expected over the Gulf of Guinea. Persistent lower-level wind convergences are likely to maintain enhanced to heavy precipitation over few areas in central Africa (Cameroon, Republic of Congo, DRC, CAR). Otherwise, the convergences are likely to cause moderate to enhanced precipitation over few areas in northeast (Ethiopia) and east (Tanzania) Africa. At least 25mm for two or more days is likely over few areas of the Gulf of Guinea (Liberia, Guinea, Ivory Coast, Ghana, Togo and Benin), central Africa (DRC, CAR), South Sudan and few areas in southern Africa (South 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.

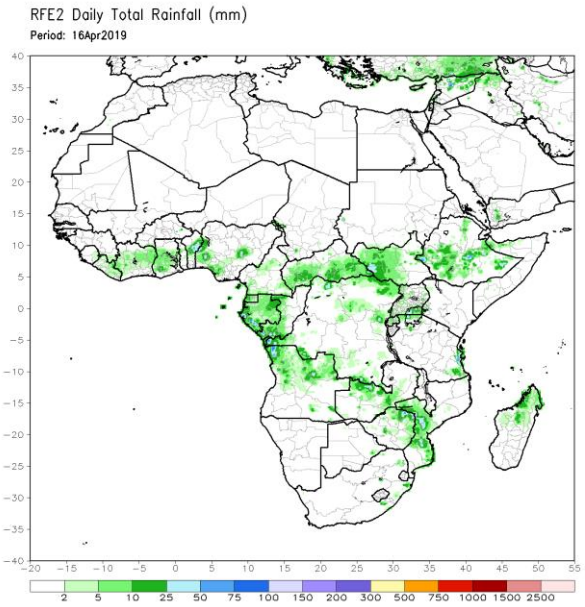
## 2.0. Previous and Current Day Weather over Africa

### *2.1. Weather assessment for the previous day* (April 16, 2019)

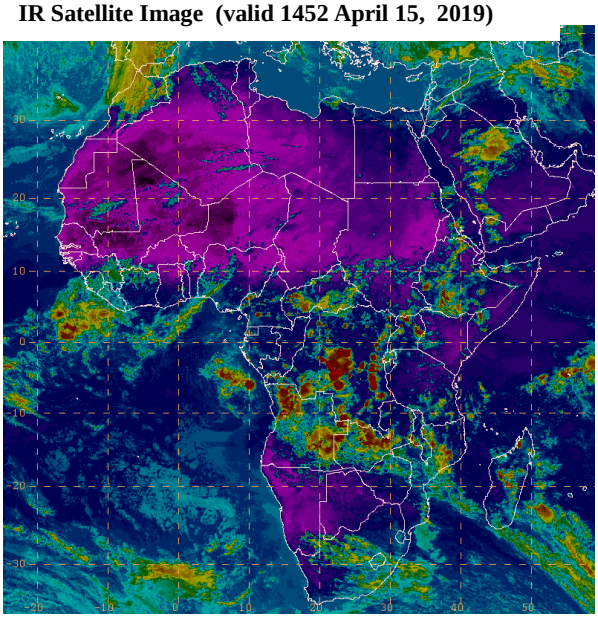
Daily rainfall totals exceeding 25mm is observed over few areas in southwest Angola, South Sudan, central and western Ethiopia as well as Benin.

### *2.2. Weather assessment for the current day* (*April 17,* 2019)

Enhanced convective clouds are observed over the DRC, Angola and Zambia.




**IR Satellite Image (valid 1452 April 15, 2019)**



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