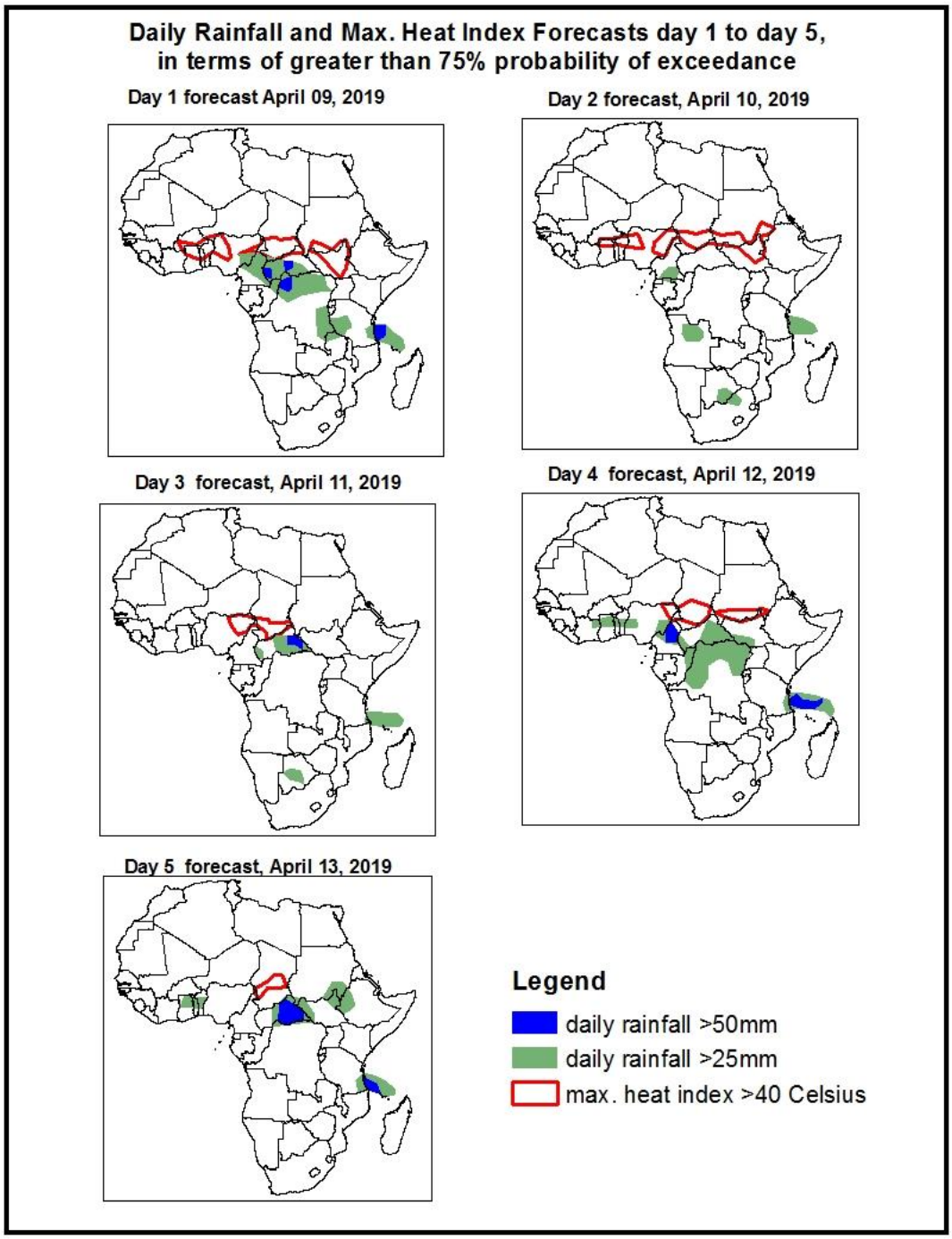
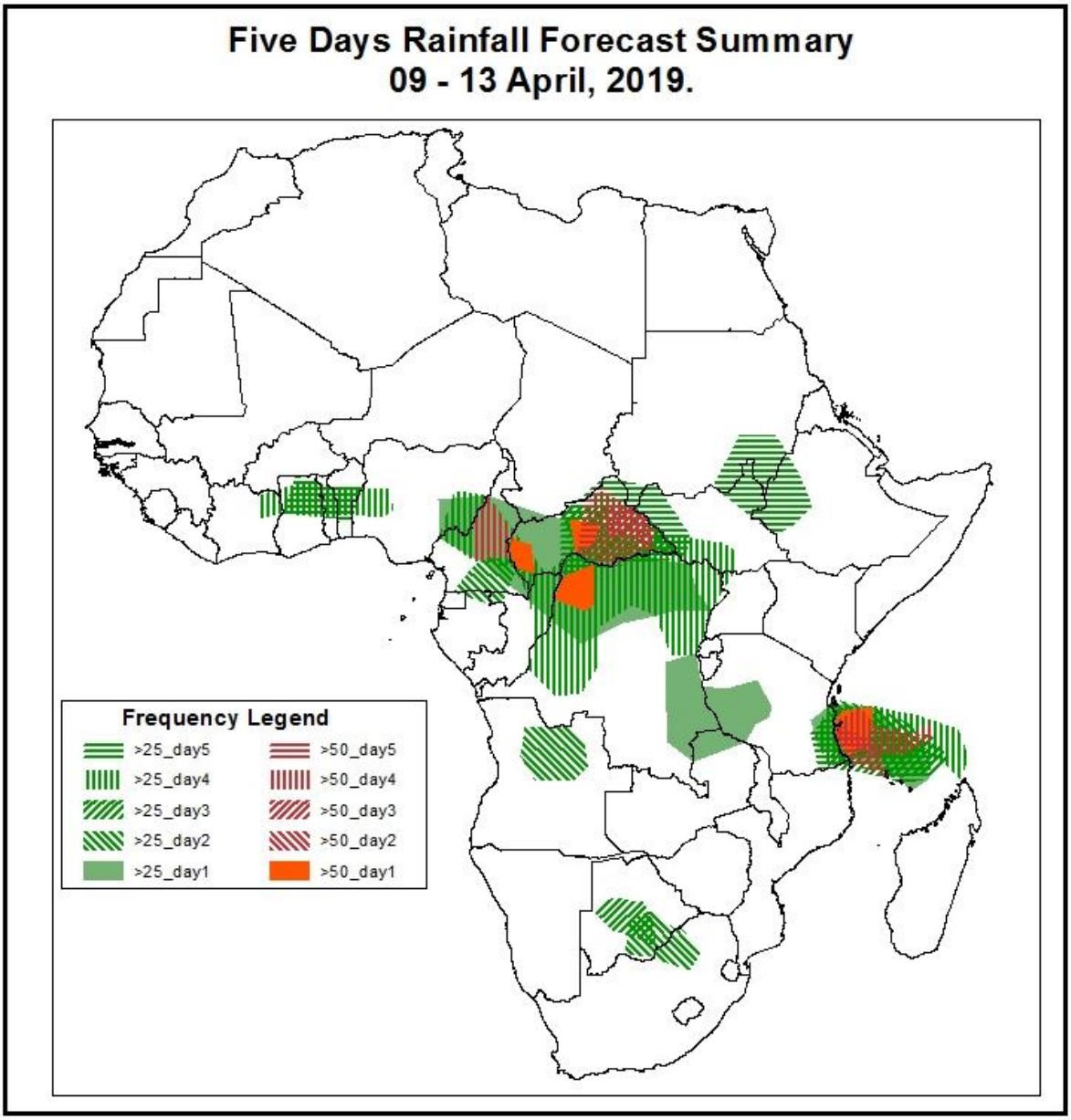
# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on *April 08*, 2019)

### *1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: 09 – 13 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.



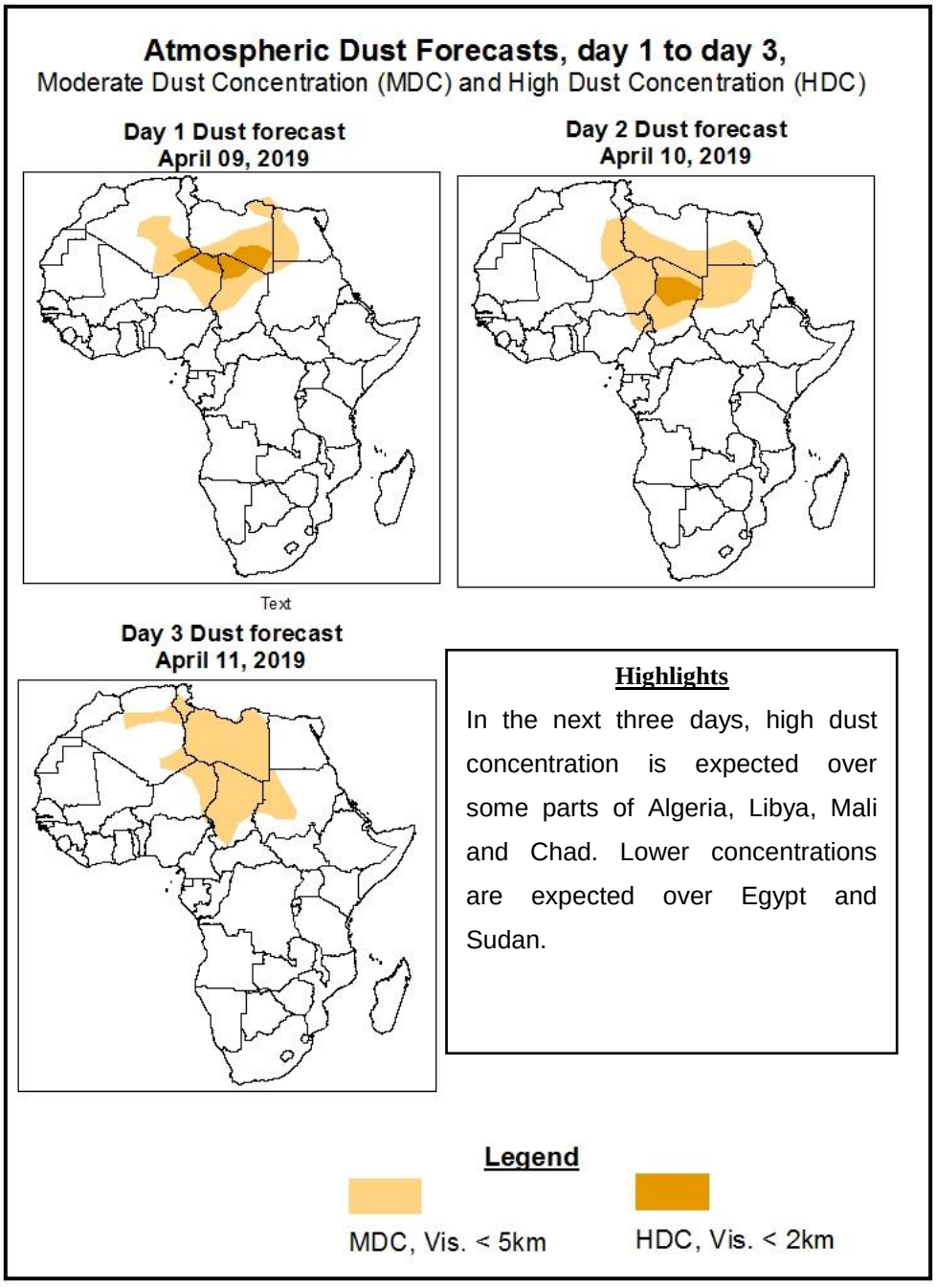



***Highlights***

- Extension of the Azores high towards Northwest Africa and the position of West African Monsoon convergent zone is expected to reduce precipitation along the Gulf of Guinea.
- Persistent lower-level wind convergences are likely to maintain significant precipitation over some areas across the Equatorial Africa as well as those in East Africa.
- The forcing from cold front, Southeast of Southern Africa is likely to keep moderate precipitation over few areas in southern Africa, particularly over South Africa and Botswana.
- At least 25mm for two or more days is likely over the Gulf of Guinea, central Africa, southern parts of East Africa, southern Africa and Ethiopia. Heavy precipitation is likely over some parts of central and East 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: 09 – 11 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: 09 – 13 April 2019*

Throughout the forecast period, the Azores High Pressure system over the North of Atlantic Ocean is expected extend a ridge over Northwest Africa. However, the system is expected to remain relatively weak at around 1024hPa.

At the start of the forecast period, the St. Helena High Pressure system over Southeast Atlantic Ocean is expected to be at 1020hPa but relaxing shortly afterwards to 1016hPa due to the coming frontal system from the West. However, during the second half of the period, the system is expected to rebuild significantly to as high as 1026hPa.

The Mascarene High Pressure system over Southwest Indian Ocean is expected to progressively intensify from 1027hPa to as high as 1034hPa towards the end of the forecast period.

At 925hPa, zone with dry northerly to northeasterly winds speeds (>35) starting over Chad and then migrating Northwest towards Libya is likely to maintain highest dust concentration over there. Along the East African coast, persistent converging winds are likely to cause enhanced to heavy precipitation over some parts. Otherwise, convergent winds are likely to continue influencing some convective precipitation over central Africa.

At 850hPa, convergent wind patterns over the Gulf of Guinea, East and central Africa are likely to maintain moderate to enhanced precipitation over there. Due to troughs along the coast of East Africa, heavy precipitation is likely over there.

At 700hPa, Northerly to Northeasterly wind pattern is expected throughout the forecast period. This, together with 500hPa pattern below, is likely to be advecting convective activities towards Southwest.

At 500hPa, a quite organized Easterly wind flow is likely to be maintained over the Gulf of Guinea, central and East Africa, helping advecting convective activities towards West.

At 200hPa, strong wind (>130kts), associated with the Subtropical Westerly Jet, is expected to be maintained across northern Africa throughout the forecast period. However, no signs of bending (trough) are seen over northeast Africa. This is likely to reduce precipitation over there.

Extension of the Azores high towards Northwest Africa and the position of West African Monsoon convergent zone is expected to reduce precipitation along the Gulf of Guinea. Persistent lower-level wind convergences are likely to maintain significant precipitation over some areas across the Equatorial Africa as well as those in East Africa. The forcing from cold front, Southeast of Southern Africa is likely to keep moderate precipitation over few areas in southern Africa, particularly over South Africa and Botswana. At least 25mm for two or more days is likely over the Gulf of Guinea, central Africa, southern parts of East Africa, southern Africa and Ethiopia. Heavy precipitation is likely over some parts of central and East 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.

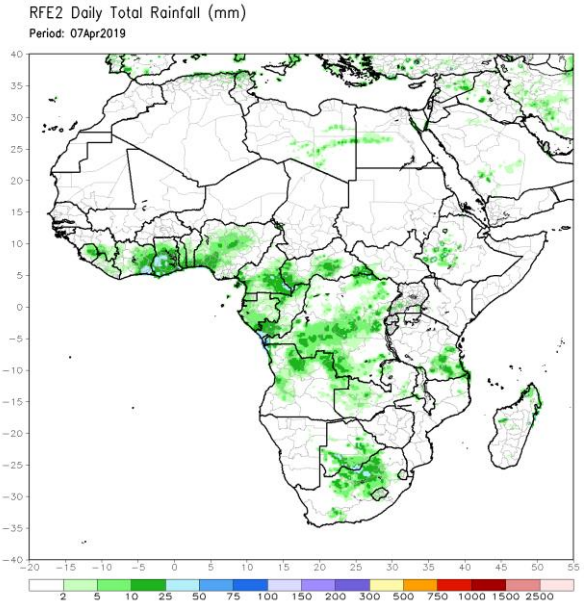
## 2.0. Previous and Current Day Weather over Africa

### *2.1. Weather assessment for the previous day* (April 7, 2019)

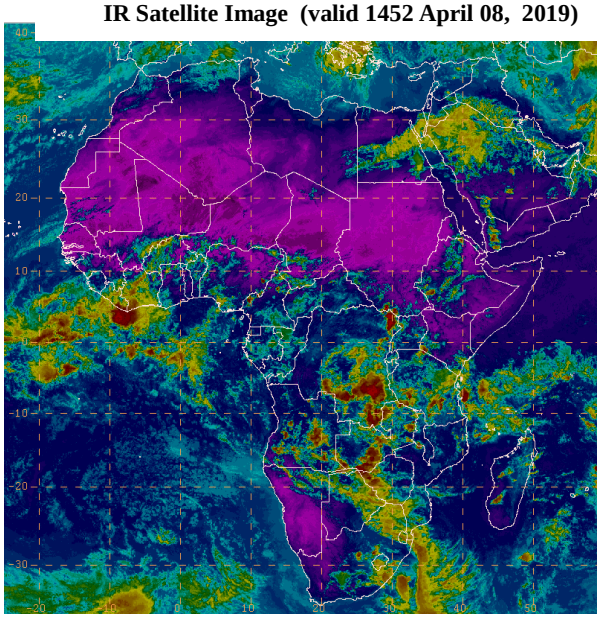
Daily rainfall totals exceeded 25mm over few areas of Ghana and Ivory Coast.

### *2.2. Weather assessment for the current day* (*April 8,* 2019)

Significant convective clouds are observed off the coasts of Liberia and Ivory Coast, southeast DRC and some parts of Zambia, Tanzania. Shallow convection is also over few areas of Botswana and South Africa.




**IR Satellite Image (valid 1452 April 08, 2019)**



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