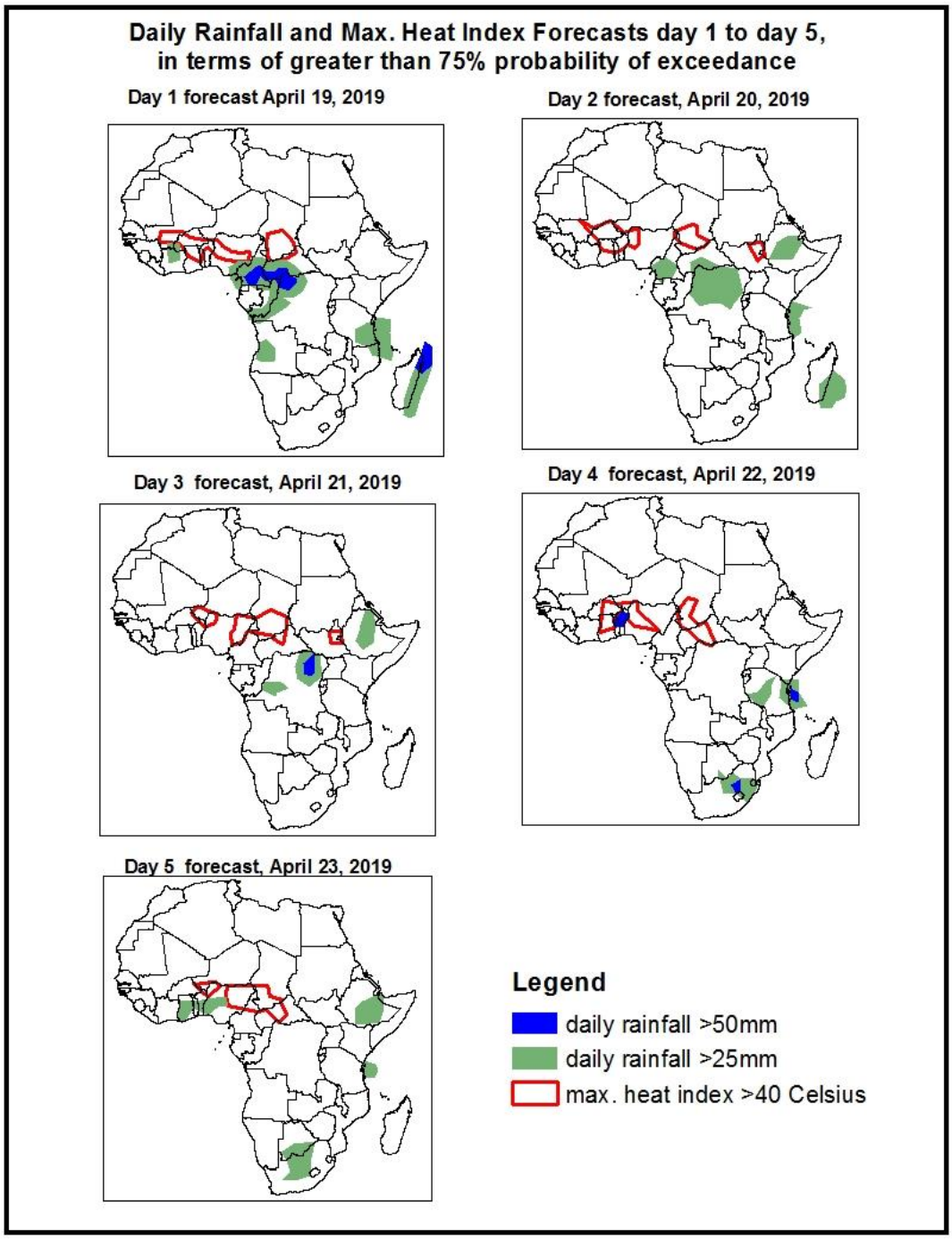
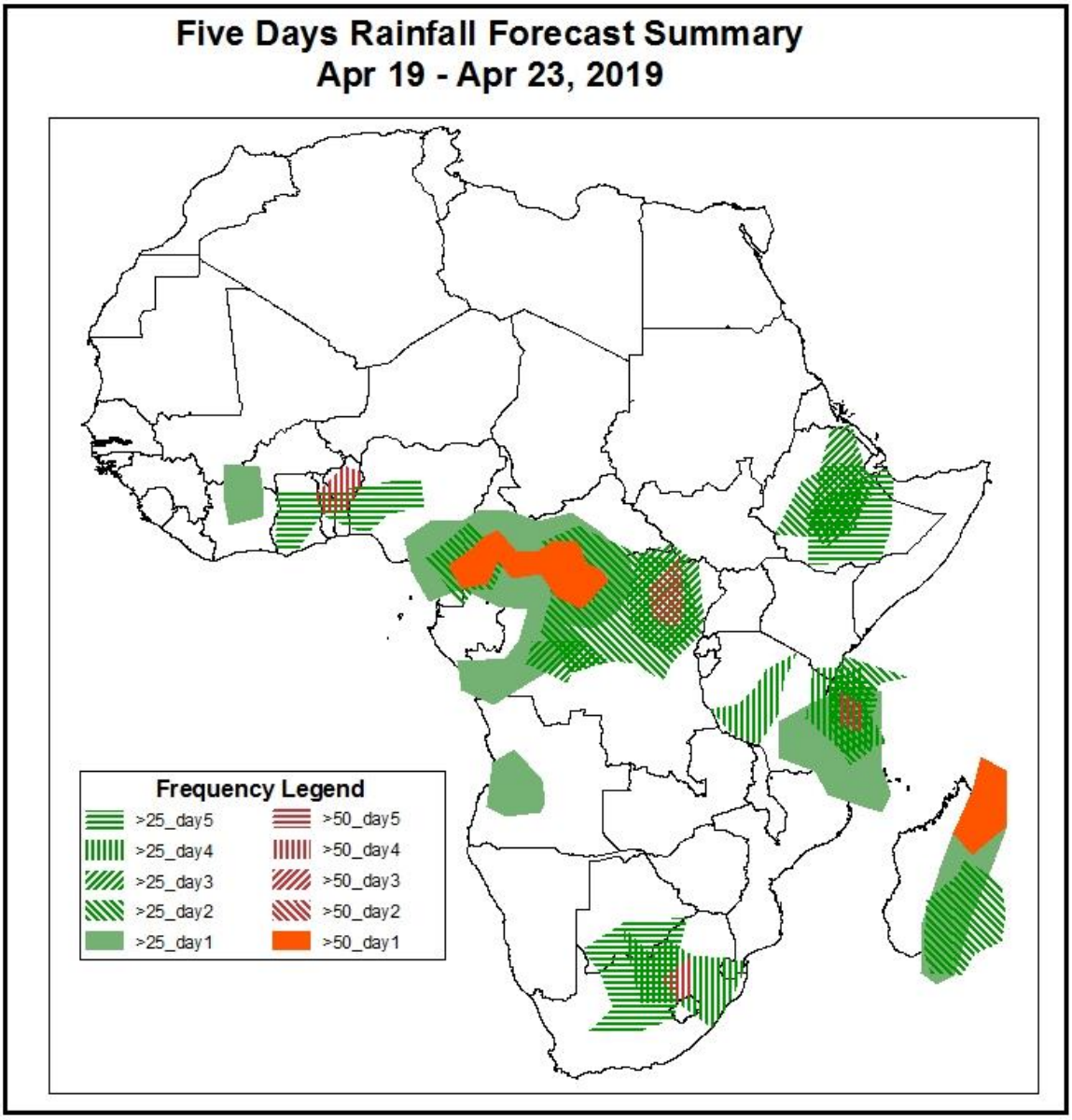
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on *April 18*, 2019)

1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: 19 – 23 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.



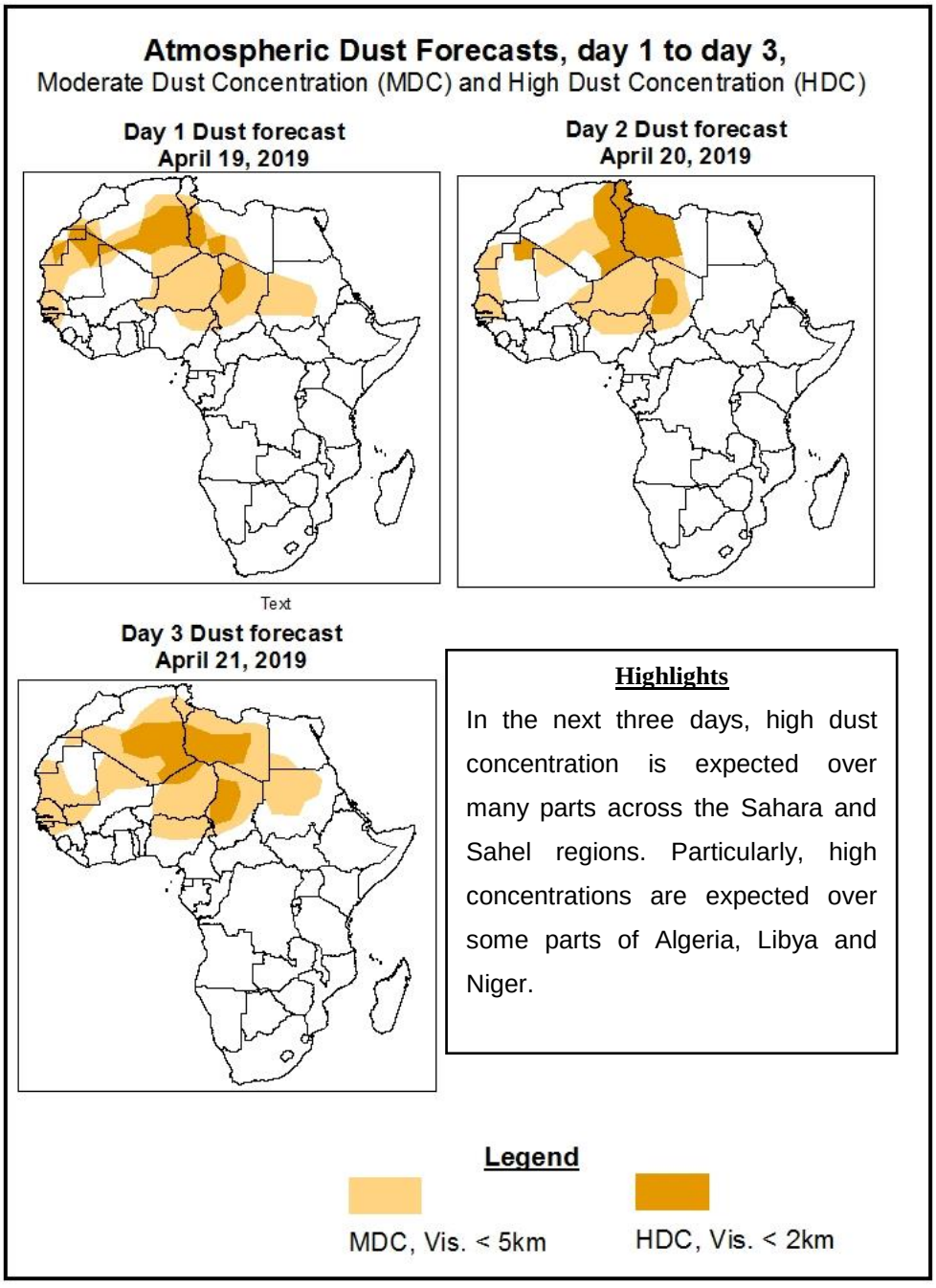


Highlights

- Very isolated moderate to enhanced precipitation is expected to be maintained over the Gulf of Guinea.
- Persistent lower-level wind convergences are likely to maintain enhanced to heavy precipitation over some 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. A frontal system is expected to keep moderate to enhanced precipitation over South 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 and Botswana).
- There is an increased chance for daily maximum heat index to exceed 40^{o}C across portions of the Sahel region, South Sudan and few parts of the Gulf of Guinea.

1.2. Atmospheric Dust Concentration Forecasts *(valid: 19 – 21 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: 19 – 23 April 2019*

During the forecast period, the Azores High Pressure system over the North of Atlantic is expected to continue intensifying significantly, reaching as high as 1037hPa towards the end of the forecast period. However, due to heat lows dominating over northern Africa, the system is expected to be kept further west and have minimal influence on African weather.

Throughout the forecast period, the St. Helena High Pressure system over Southeast Atlantic Ocean is expected to intensify from 1026hPa to as high as 1035hPa 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 1027hPa to 1031hPa 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 particularly Libya, enhancing atmospheric dust concentration over the area. Further South over the Sahel and the Gulf of Guinea, Monsoon winds are likely to influence mainly moderate precipitation but with chances for enhanced to heavy over isolated areas. Over the central and northeast Africa as well as and along the East African coast, significant precipitation is likely due to the converging wind patterns over there. On the other hand, a trough associated with frontal low is likely to enhance precipitation over South Africa, especially during the first half of the period.

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, along the East African coast, a trough is likely to enhance rainfall during the period.

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. Moderate bending (trough) is expected and is likely to influence slight increase precipitation over northeast Africa.

Very isolated moderate to enhanced precipitation is expected to be maintained over the Gulf of Guinea. Persistent lower-level wind convergences are likely to maintain enhanced to heavy precipitation over some 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. A frontal system is expected to keep moderate to enhanced precipitation over South 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 and Botswana). There is an increased chance for daily maximum heat index to exceed 40oC across portions of the Sahel region, South Sudan and few parts of the Gulf of Guinea.

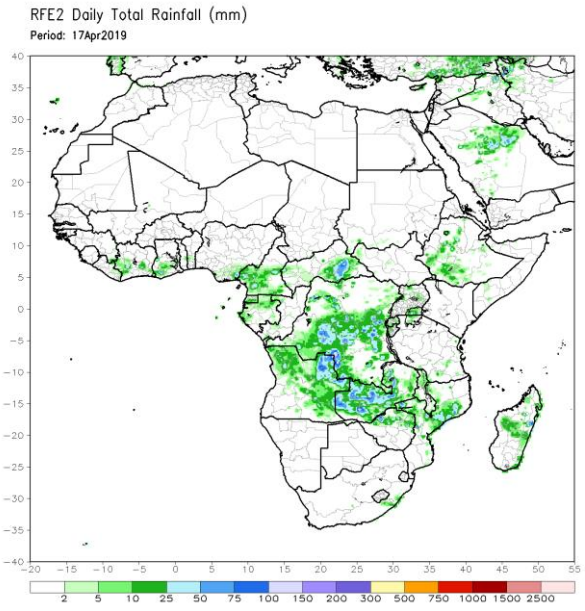
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (April 17, 2019)

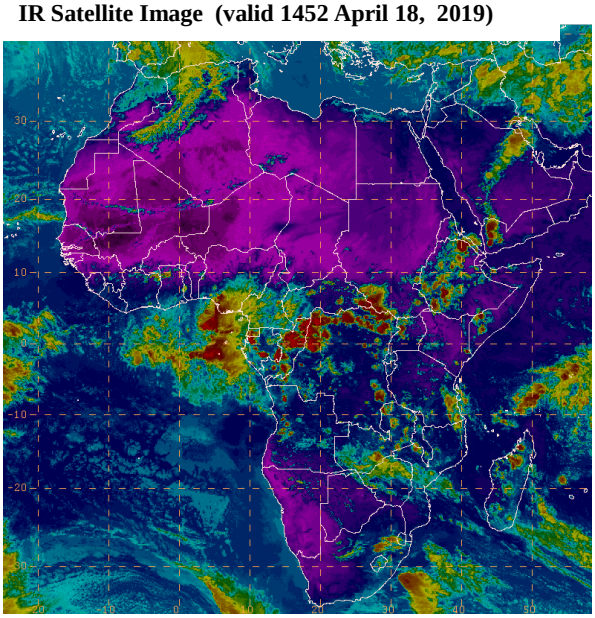
Daily rainfall totals exceeding 25mm is observed over few areas in CAR, northeast Angola, Zambia and central Mozambique.

2.2. Weather assessment for the current day (*April 18,* 2019)

Significant convective clouds are observed over the Republic of Congo, DRC, Angola and Ethiopia.



IR Satellite Image (valid 1452 April 18, 2019)



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