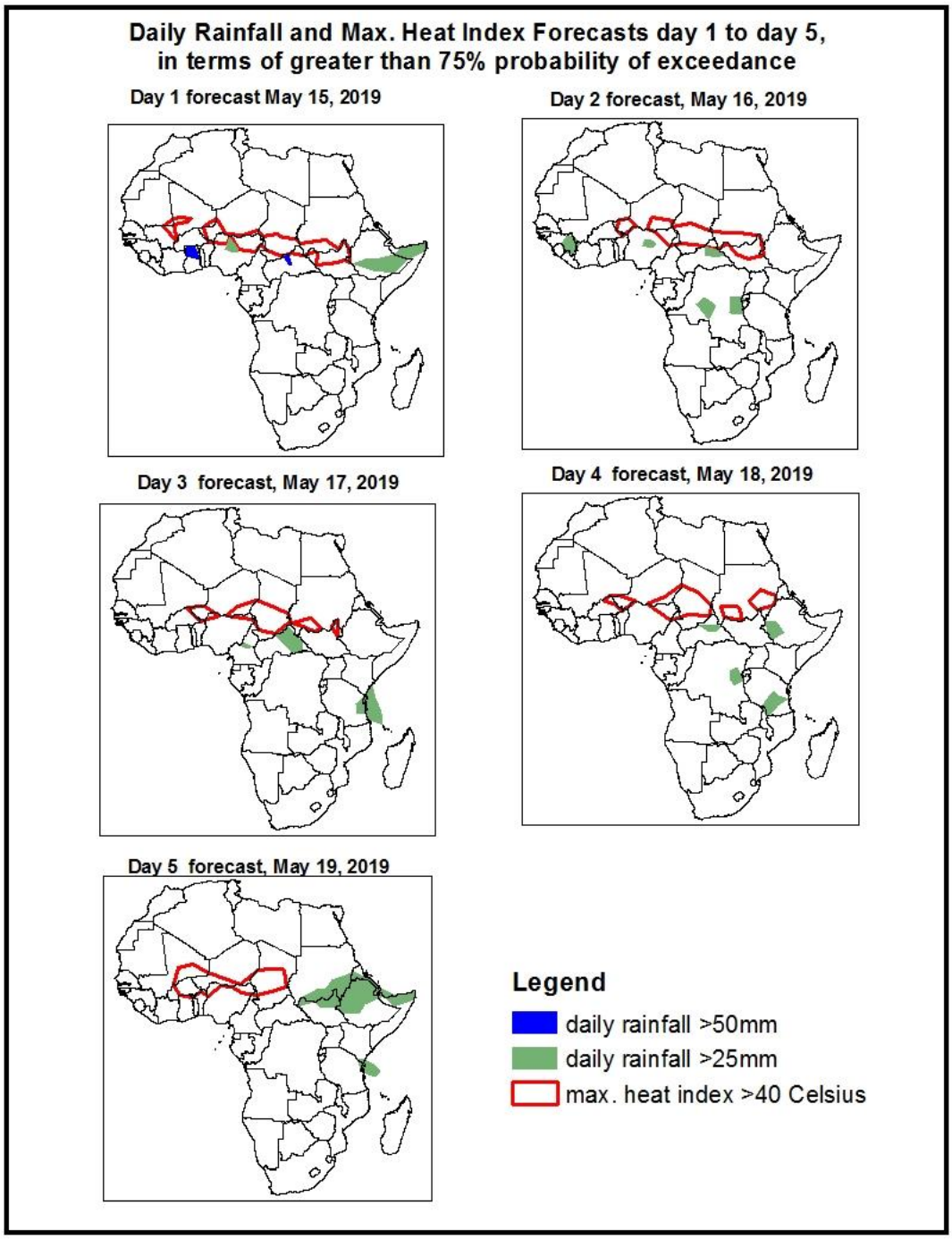
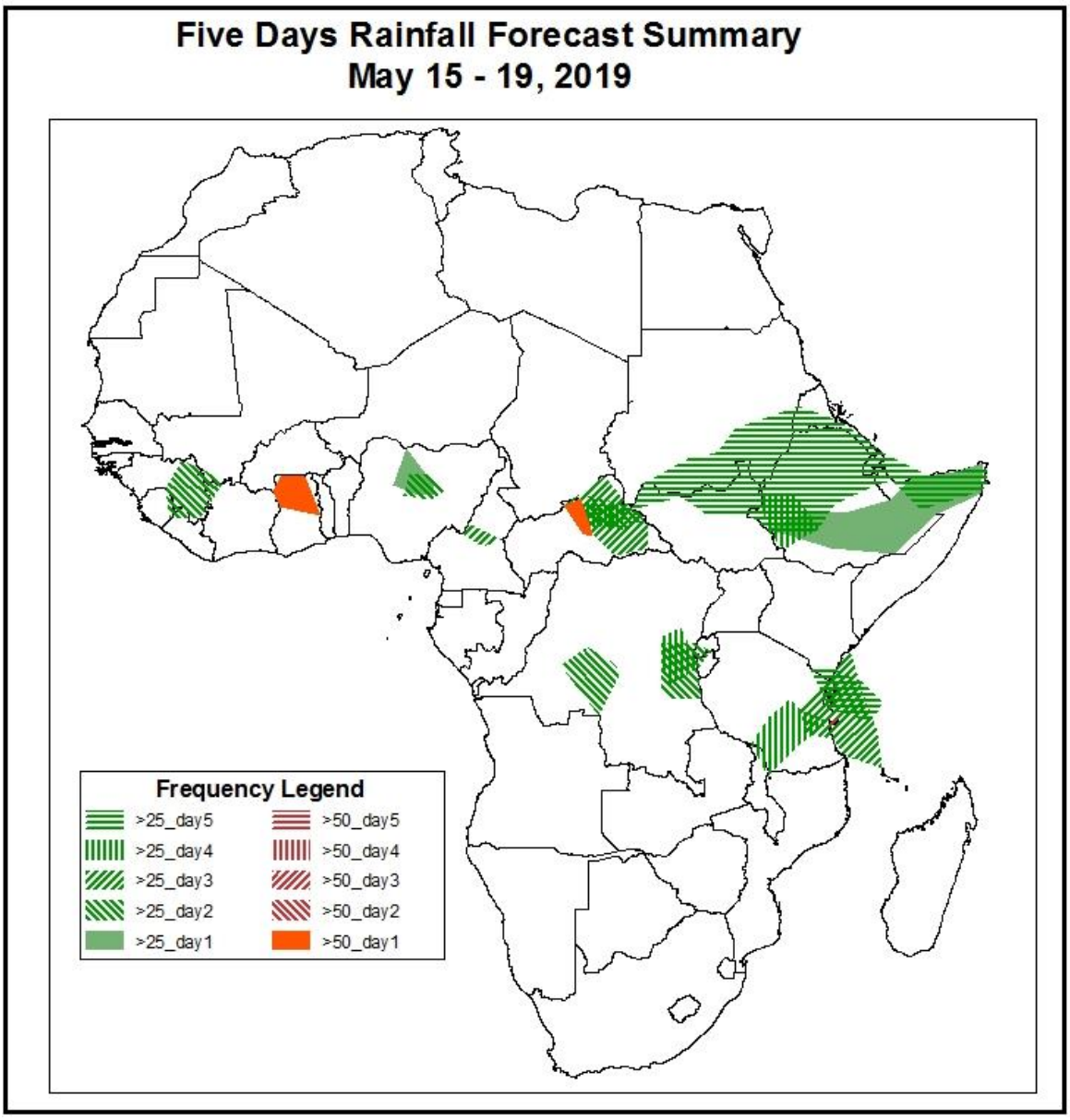
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on *May 14*, 2019)

1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: May 15 – 19, 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.



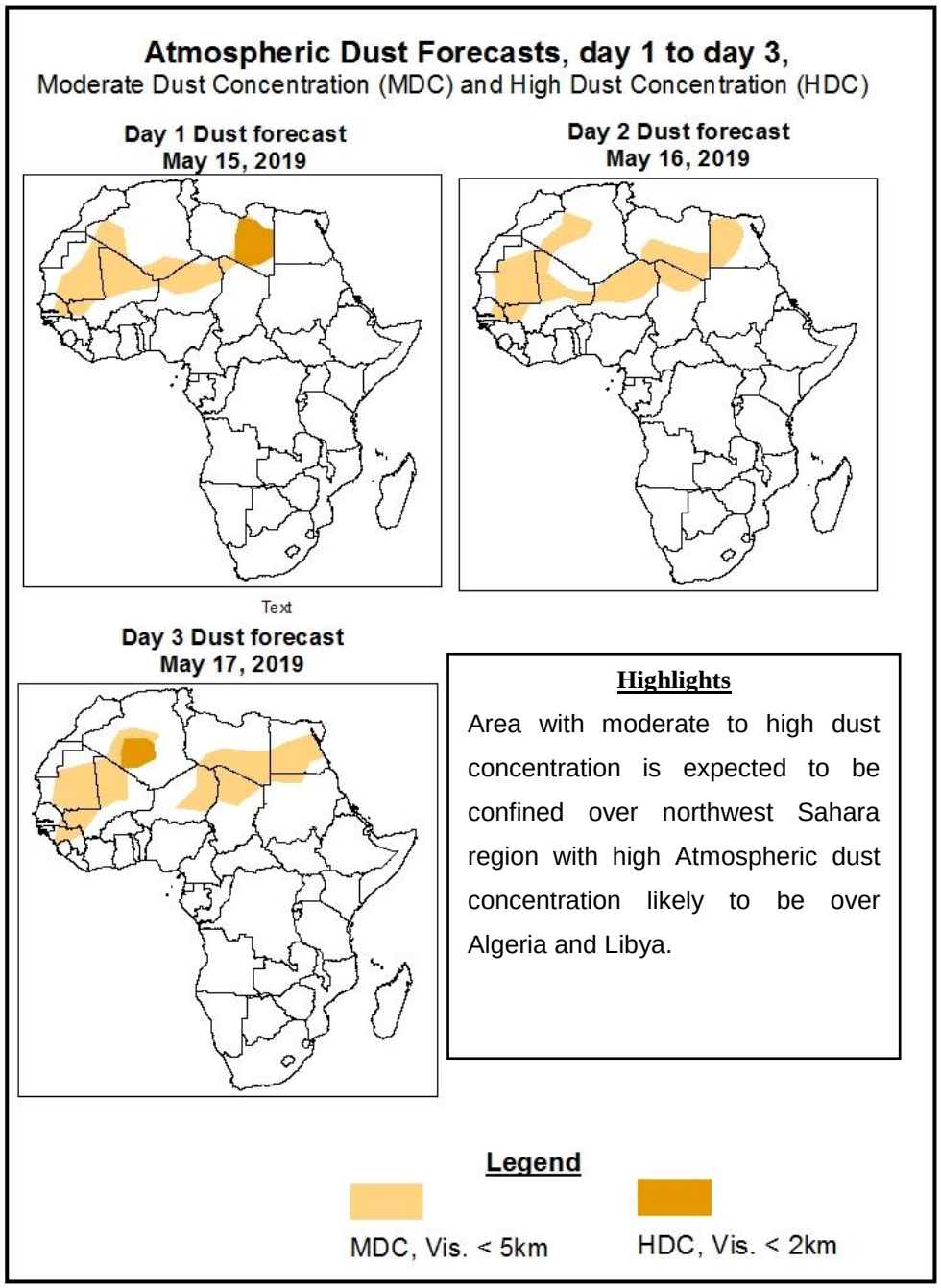


Highlights

- The Monsoon wind pattern over the Gulf of Guinea is expected to cause localized moderate to enhanced precipitation over there.
- Low level converging winds over central Africa (CAR), GHA (Sudan, South Sudan) and East Africa (coastal areas of Tanzania and Kenya) are likely to cause scattered moderate to localized enhanced precipitation.
- At least 25mm for two or more days is likely along the east African coast, central Africa (CAR, eastern DRC) and the GHA (western Ethiopia).
- Some areas in the Sahel, southern Sudan and Sudan are likely to feature increased chance for daily maximum heat index to exceed 40^{o}C.

1.2. Atmospheric Dust Concentration Forecasts *(valid: May 15 – 17 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: May 15 – 19 2019*

Throughout much of the forecast period, the Azores High Pressure system over the North of Atlantic is expected to intensify but lies further west leaving west Africa dominated by heat lows. No appreciable contribution of this system to African precipitation can be seen, particularly as the ITCZ is advancing towards the Sahel.

During much of the forecast period, the St. Helena High Pressure system over Southeast Atlantic Ocean is expected to remain rather weak only intensifying to 1030hPa towards the end of the period. This is likely to result into migration of the Meridional component of the ITCZ towards east influencing precipitation in eastern DRC and western Tanzania, particularly towards the end of the forecast period.

Throughout the forecast period, the Mascarene High Pressure system over Southwest Indian Ocean is expected to migrate eastwards while intensifying slightly from 1029hPa to 1030hPa at the end of the period. This is likely to favor southeasterly winds towards the east African coast and keep moderate to enhanced precipitation along the east African coast.

At 925hPa level, strong winds are expected the second half of the forecast period over Algeria and then Libya, influencing Atmospheric dust concentrations over there. On the other hand, Monsoon winds in the Gulf of Guinea are expected to be maintained and likely to keep occasional, moderate to enhanced, localized precipitation during the forecast period. Meanwhile, converging, moist southeasterly winds towards East Africa are likely to maintain moderate to enhanced, occasionally heavy, precipitation over there, particularly along the coastal areas of Tanzania and Kenya.

At 850hPa, converging winds over coastal areas of East Africa (Tanzania and Kenya) are likely to maintain enhanced to heavy precipitation over these areas. Also, converging winds are expected over Sudan, South Sudan, parts of CAR, western Tanzania and Ethiopia and LVB. These areas are likely to feature moderate to enhanced rainfall.

At 700hPa, mainly easterly wind pattern is expected to be maintained, converging over central Africa (CAR, DRC), Gulf of Guinea (Cameroon, Republic of Congo, Gabon, Equatorial

Guinea), east Africa (northern Kenya and Uganda), Great Horn of Africa (Ethiopia) as well as South Sudan. This is likely to favor deep convection over some of these areas which are also expected to feature low level (850hPa) convergence i.e. Sudan, South Sudan and CAR).

Flow at 500hPa is expected to be almost purely easterly during the period over many parts which are expected to feature convective activities. This is likely to favor advection of convective activities towards west.

During the period, a Subtropical Westerly Jet at 200hPa is expected to feature moderate winds, occasionally (>130kts). Also, a slight bending (trough) is likely to pass further north of Africa influencing slight increase in precipitation over the GHA.

The Monsoon wind pattern over the Gulf of Guinea is expected to cause localized moderate to enhanced precipitation over there. Low level converging winds over central Africa (CAR), GHA (Sudan, South Sudan) and East Africa (coastal areas of Tanzania and Kenya) are likely to cause scattered moderate to localized enhanced precipitation. At least 25mm for two or more days is likely along the east African coast, central Africa (CAR, eastern DRC) and the GHA (western Ethiopia). Some areas in the Sahel, southern Sudan and Sudan are likely to feature increased chance for daily maximum heat index to exceed 40^{o}C.

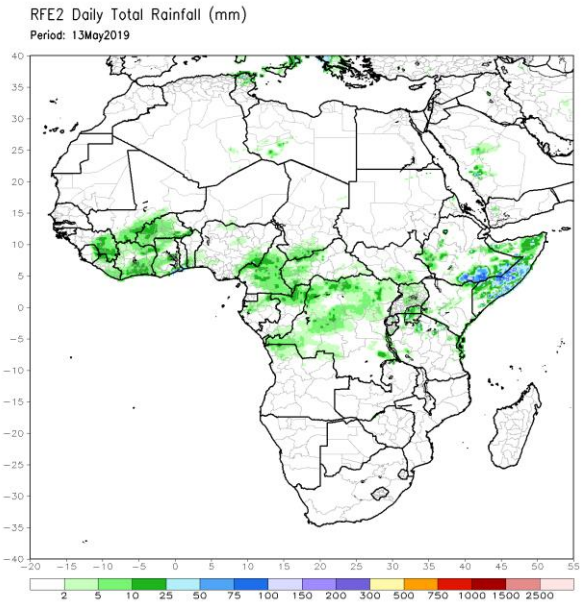
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (May 13, 2019)

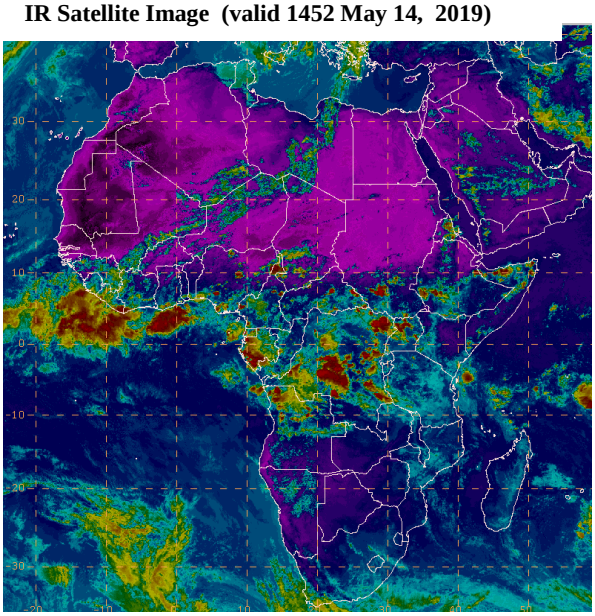
Daily rainfall totals exceeding 25mm have been observed over the GHA (Somalia and southern Ethiopia).

2.2. Weather assessment for the current day (*May 14,* 2019)

Deep convection is observed over northern DRC and Uganda.



IR Satellite Image (valid 1452 May 14, 2019)



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