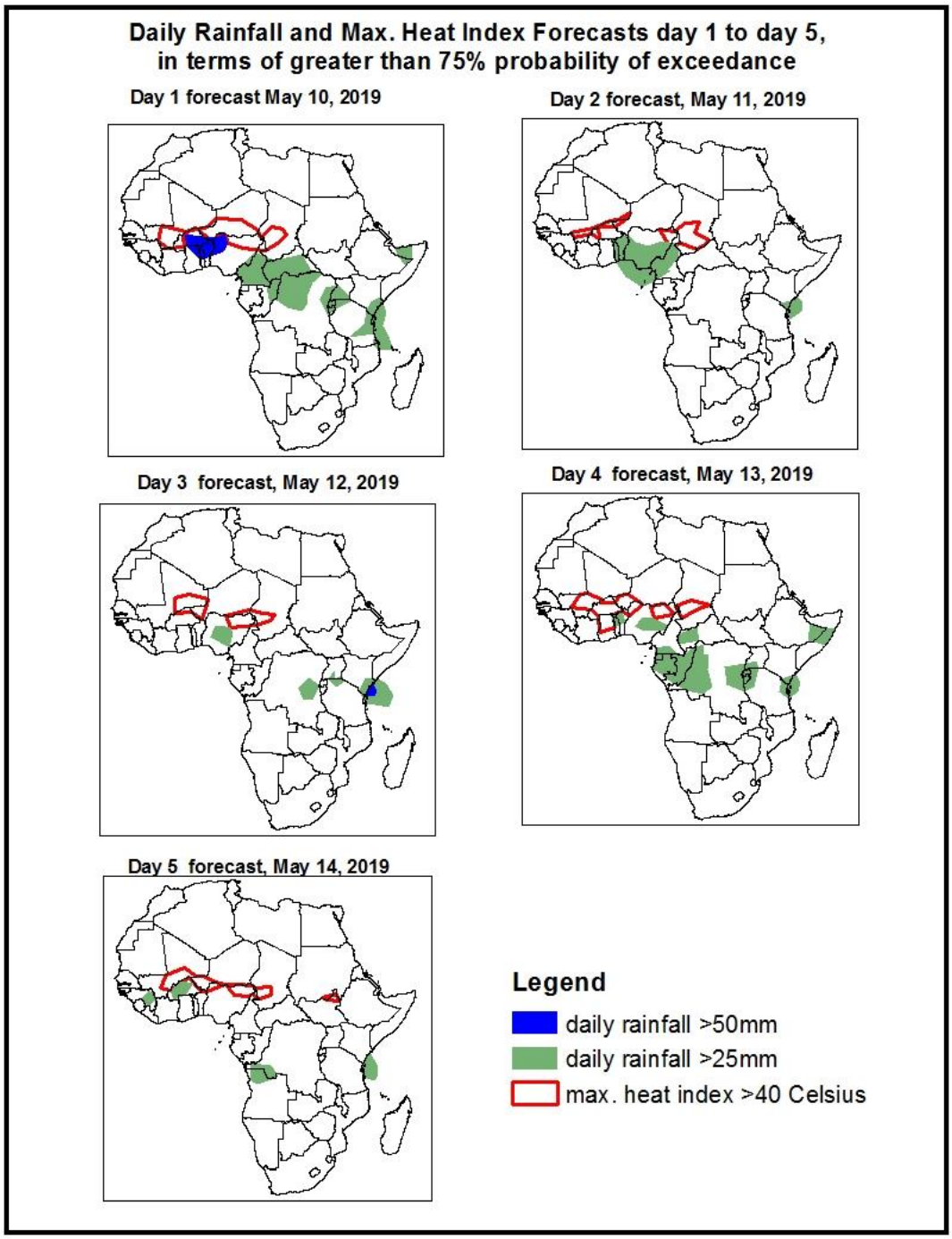
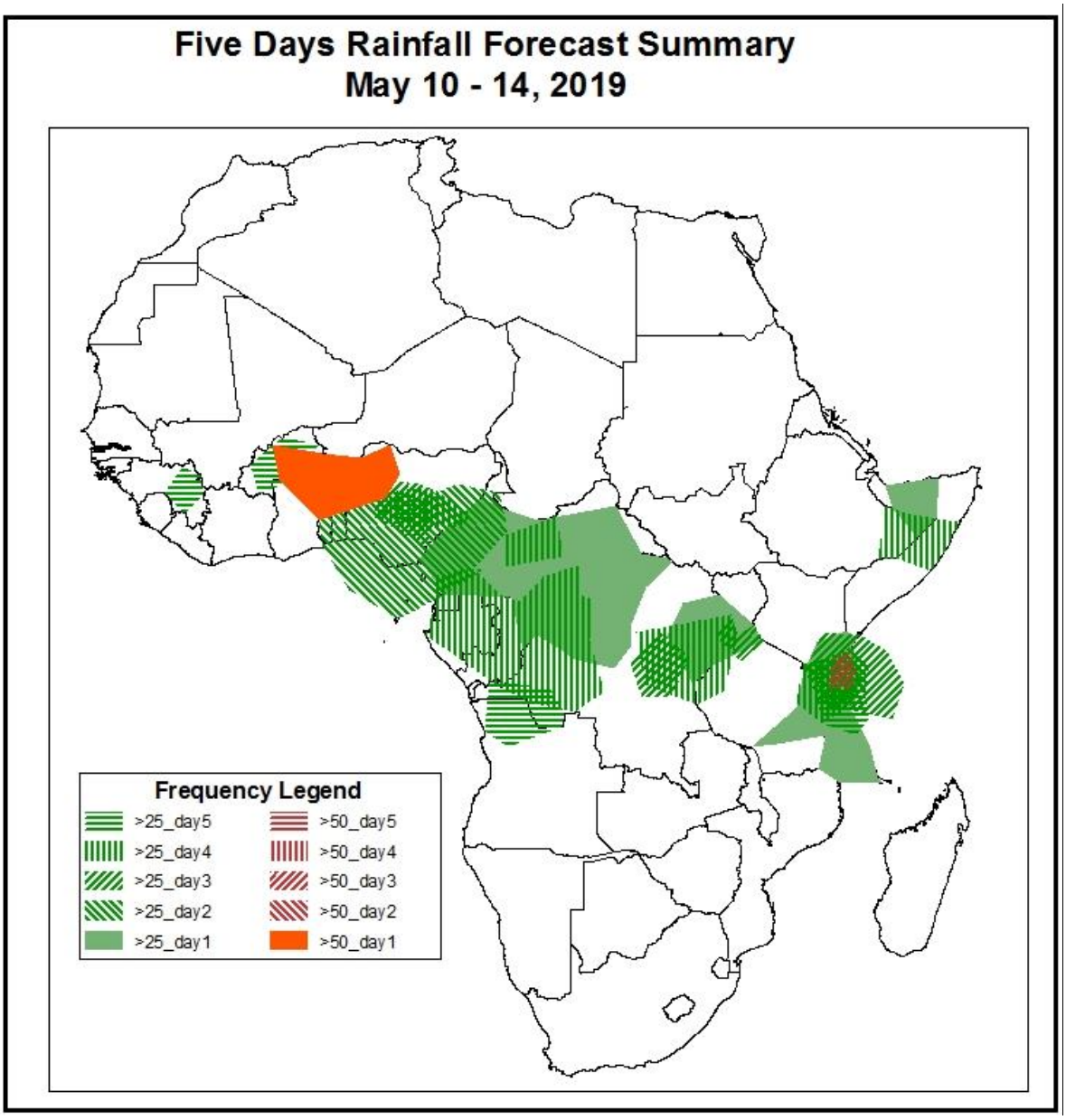
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on *May 09*, 2019)

1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: May 10 – 14, 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.



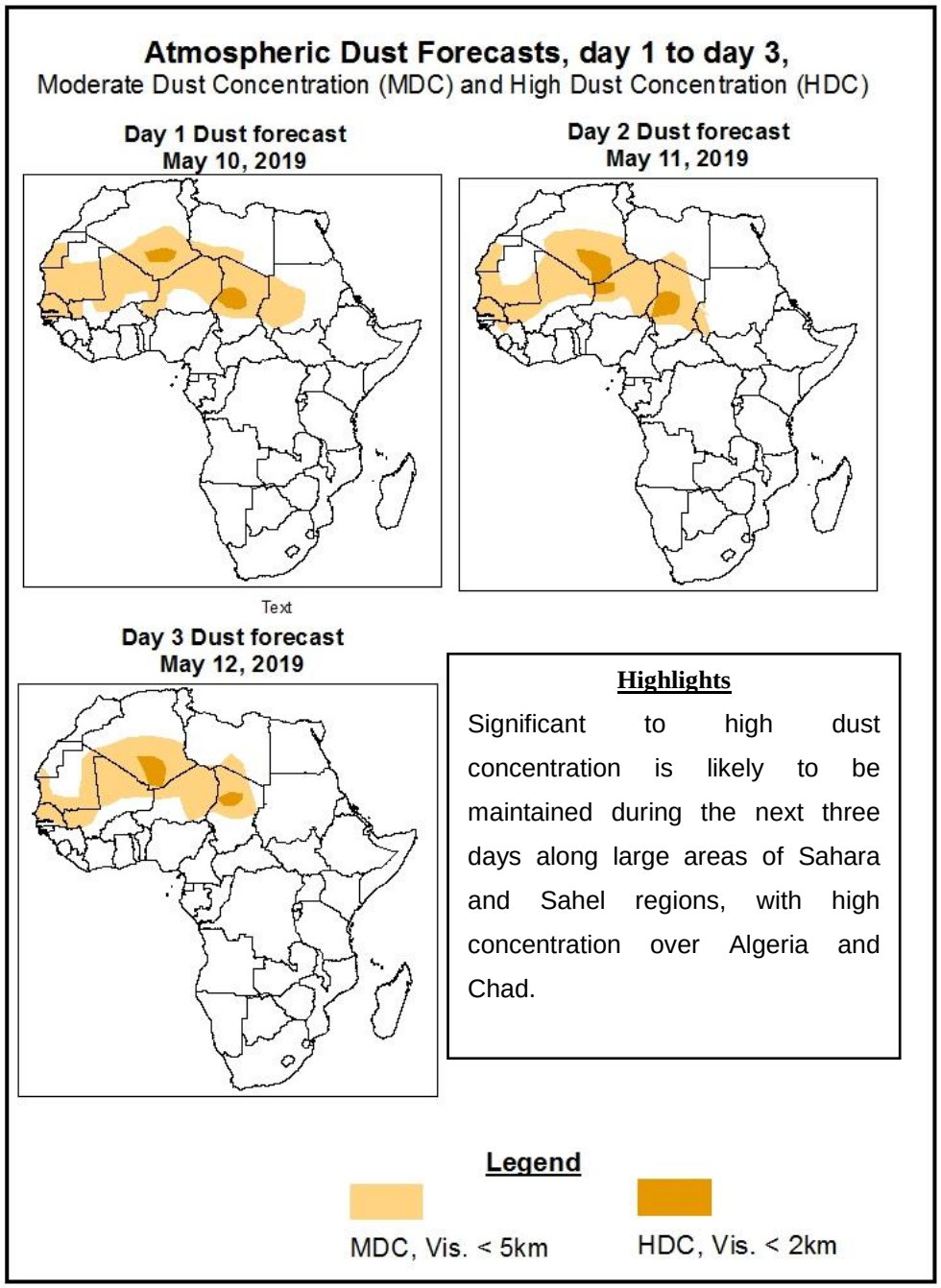


Highlights

- The Monsoon wind pattern over the Gulf of Guinea is expected to cause enhancement and spread of precipitation over there.
- Low level converging winds over central Africa (CAR, South Sudan), GHA (Somalia) and east Africa (western and coastal Tanzania and Kenya) are likely to cause moderate to enhanced rainfall.
- The ITCZ across the coast of east Africa is likely to migrate further north, spreading enhanced precipitation further north over Kenya.
- At least 25mm for two or more days is likely over some areas over east Africa, particularly along the coastal areas of Tanzania and Kenya, LVB, and parts of Gulf of Guinea (Nigeria, Benin, Togo and Ghana).
- As the Monsoon rains shift further north, fewer 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 10 – 12 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 10 – 14 2019*

During much of the forecast period, the Azores High Pressure system over the North of Atlantic is expected to continue relaxing due to the incoming frontal low pressure system from west. However, signals of intensifications are seen towards the end of the period. Influence on weather over Africa is rather limited to slight spreading of precipitation further north over the Sahel region and the Gulf of Guinea.

As the frontal low pressure system passes through, the St. Helena High Pressure system over Southeast Atlantic Ocean starts showing signs on rebuilding especially from during the mid-period of the forecast, reaching as high as 1031hPa at times. At the end of the period, however, the system is likely to start relaxing again as another frontal low comes from west. Its influence on precipitation over southwest Africa is minimal as frontal lows dominate.

Throughout the forecast period, the Mascarene High Pressure system over Southwest Indian Ocean is expected to relax, down to 1024hPa at times due to the frontal low from west. Therefore its influence on southwesterly winds towards the east African coast is expected to diminish, reducing precipitation along the east African coast.

At 925hPa level, strong winds are expected over Chad and Algeria. This translates to enhanced Atmospheric dust concentrations over these areas, during the period. In the Gulf of Guinea, Monsoon winds pattern has remained the same and is likely to be maintained during the forecast period. This favors localized enhanced precipitation over some areas. Meanwhile, converging, moist southeasterly winds towards East and Great Horn of Africa are likely to cause moderate to enhanced precipitation over there, particularly along the Tanzanian Kenyan coastal areas as well as Somalia.

At 850hPa, converging winds over central Africa (CAR, South Sudan), GHA (Somalia) and east Africa (western and coastal Tanzania) are likely to cause moderate to enhanced rainfall. Further south (Angola, southern DRC and Tanzania, Zimbabwe and beyond), no significant wind pattern is expected at this level, signaling a trend towards cessation of rainfall season.

At 700hPa, mainly easterly wind pattern is expected to be maintained, converging over central Africa (South Sudan, CAR and DRC) as well as east Africa (Uganda, Kenya and Tanzania). This is likely to favor deep convection over these areas.

During the first half of the forecast period, the wind pattern at 500hPa is not well organized. However, during the second half, majority of the winds are easterlies especially over central and east Africa. Advection of convective activities towards west is therefore likely.

During the period, a Subtropical Westerly Jet at 200hPa is expected to be weak, rarely hitting (>130kts). Also, no bending is likely and therefore the GHA region is likely to remain generally calm with little to moderate localized precipitation.

The Monsoon wind pattern over the Gulf of Guinea is expected to cause enhancement and spread of precipitation over there. Low level converging winds over central Africa (CAR, South Sudan), GHA (Somalia) and east Africa (western and coastal Tanzania and Kenya) are likely to cause moderate to enhanced rainfall. The ITCZ across the coast of east Africa is likely to migrate further north, spreading enhanced precipitation further north over Kenya. At least 25mm for two or more days is likely over some areas over east Africa, particularly along the coastal areas of Tanzania and Kenya, LVB, and parts of Gulf of Guinea (Nigeria, Benin, Togo and Ghana). As the Monsoon rains shift further north, fewer areas in the Sahel, southern Sudan and Sudan are likely to feature increased chance for daily maximum heat index to exceed 40^{o}C.

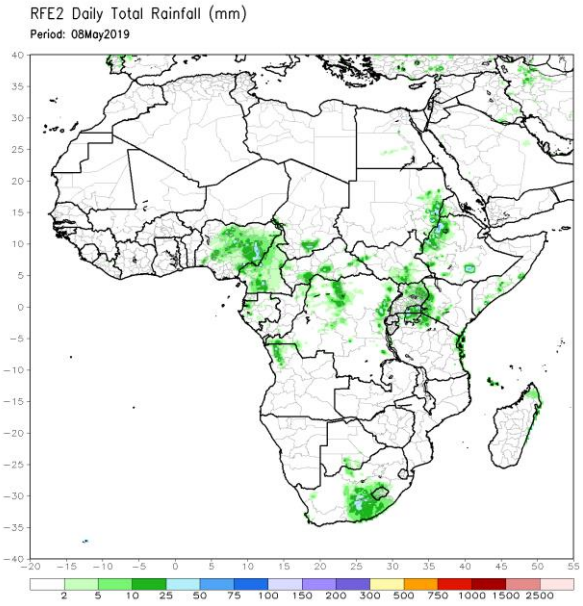
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (May 08, 2019)

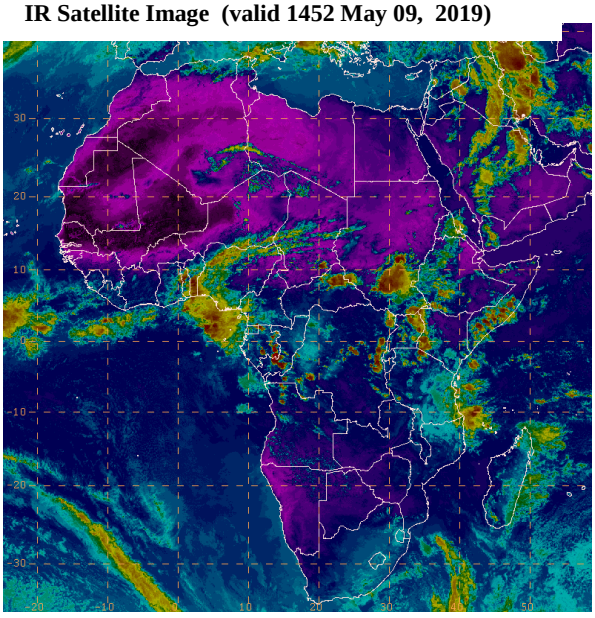
Daily rainfall totals exceeding 25mm have been observed over some areas in eastern Nigeria, western Ethiopia, eastern Sudan and over South Africa.

2.2. Weather assessment for the current day (*May 09,* 2019)

Significant convection is observed over Cameroon. Otherwise, scattered moderate convection is seen over Uganda and Somalia. More stratiform but significant clouds are evident over the coat of Tanzania and southeastern South Africa



IR Satellite Image (valid 1452 May 09, 2019)



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