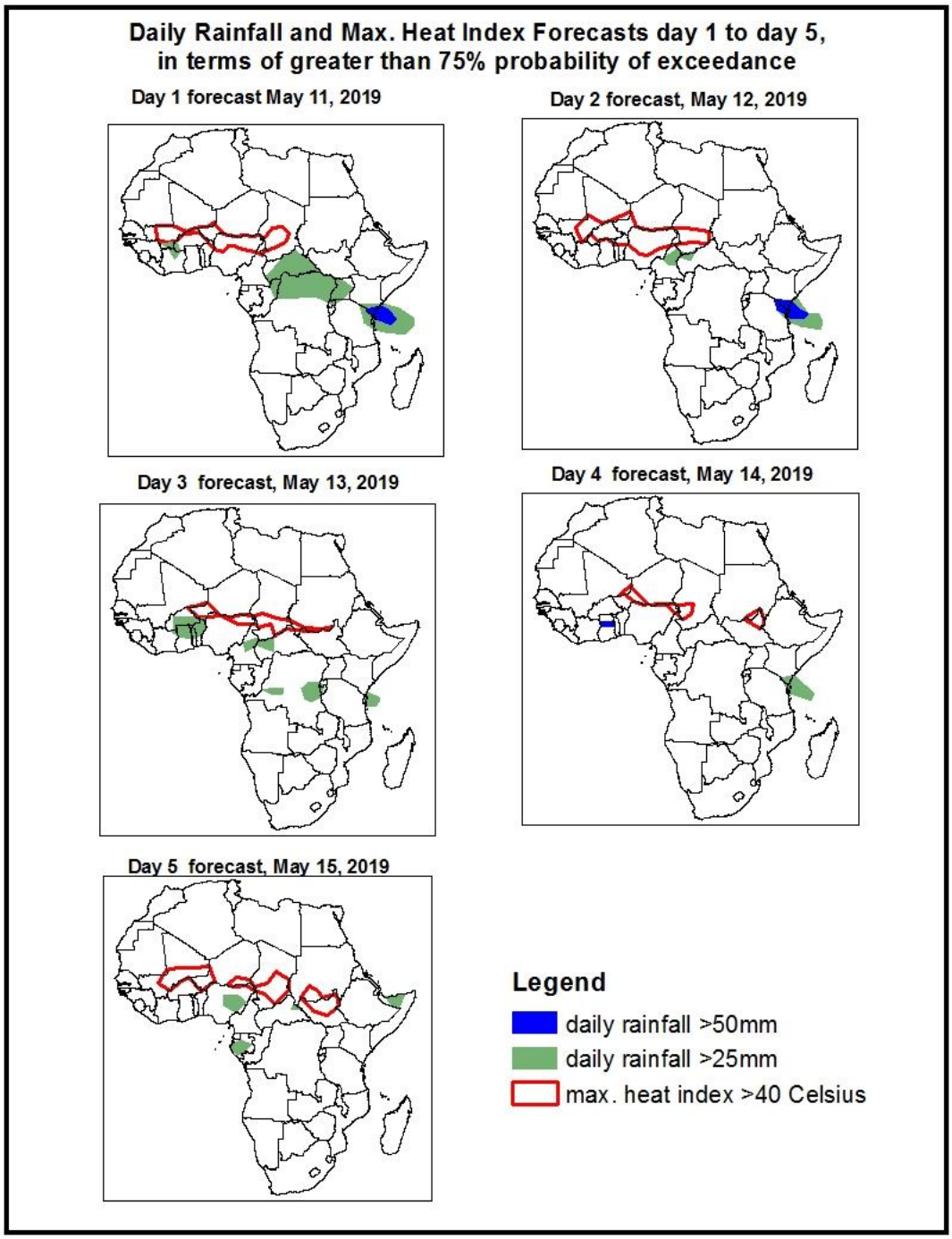
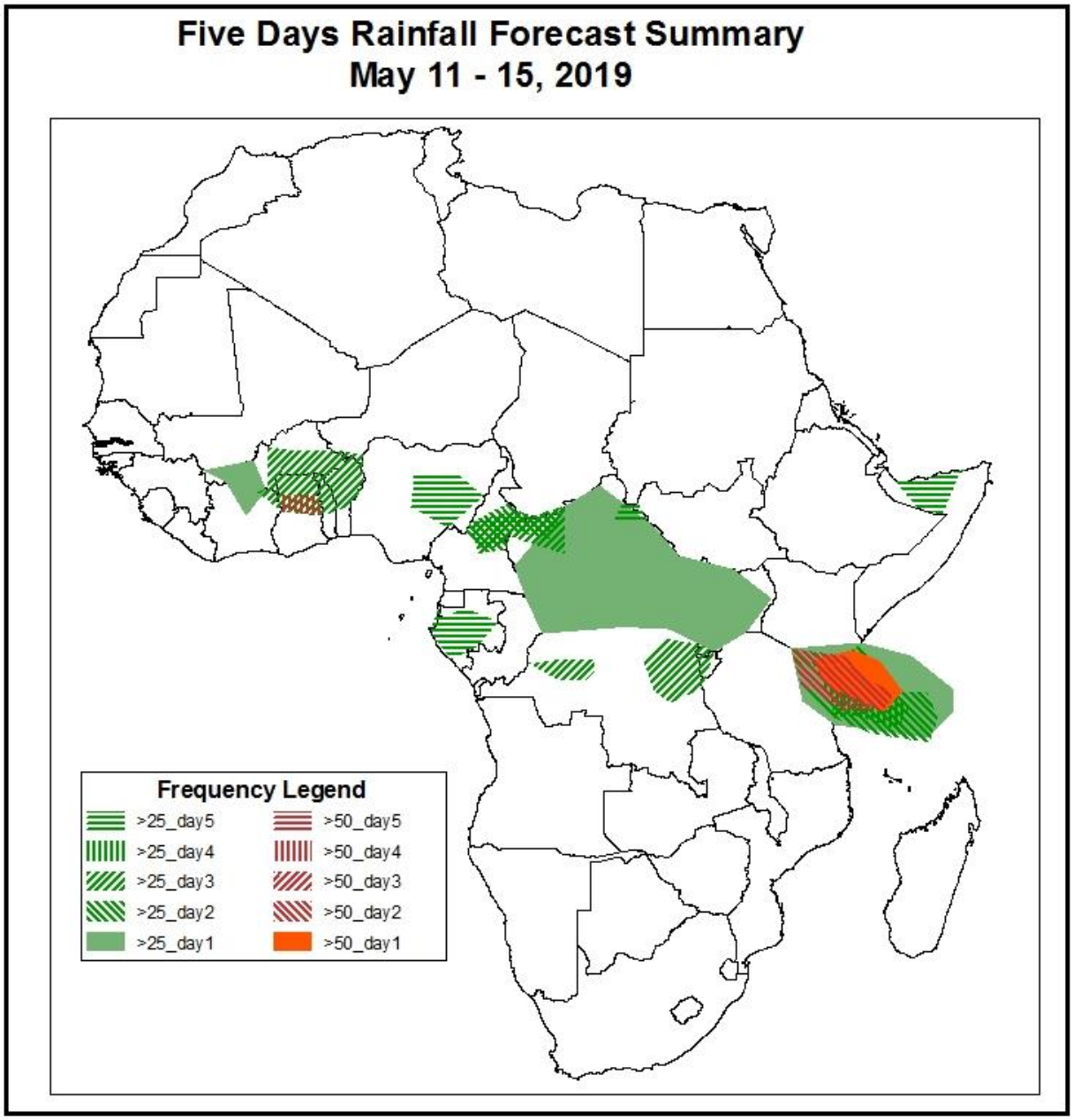
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on *May 10*, 2019)

1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: May 11 – 15, 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.



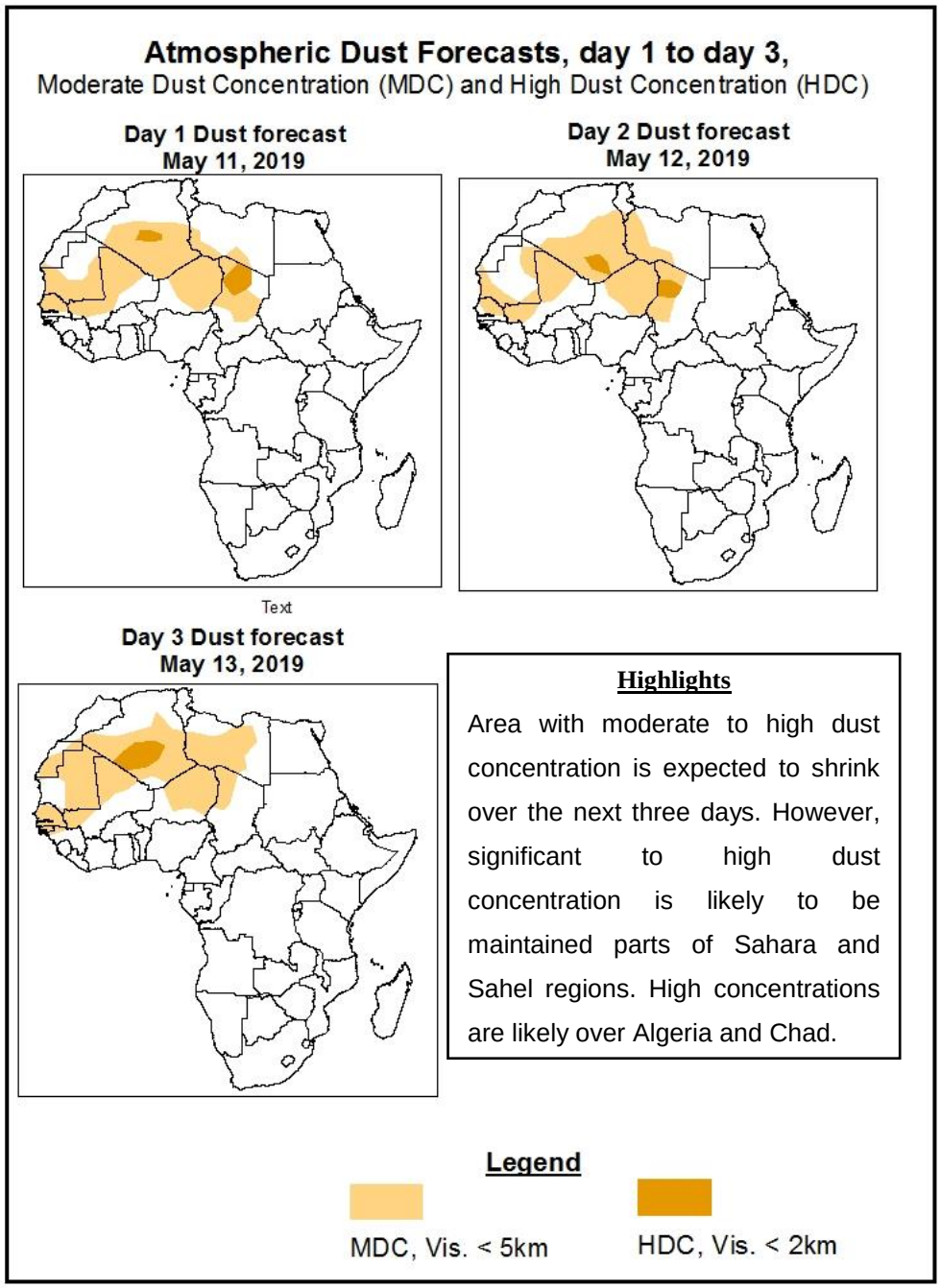


Highlights

- The Monsoon wind pattern over the Gulf of Guinea is expected to maintain enhanced precipitation over there; spreading a bit further north as Azores relaxes.
- 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 scattered moderate to localized enhanced precipitation.
- 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 few areas along the east African coast, central Africa and the Gulf of Guinea.
- 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 11 – 13 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 11 – 15 2019*

During the first half 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. This is expected to allow very slight spread of convection towards north. However, during the second half of the forecast period the system shows signs of intensification and thus keeping convective activities in southern areas of the Sahel region and over the Gulf of Guinea.

During the first half of the forecast period, the St. Helena High Pressure system over Southeast Atlantic Ocean is expected to rebuild to 1030hPa. However, during the second half of the period, the system is likely to start relaxing again down to 1024hPa 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 1020hPa 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, Mali 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 around the border between Tanzania and Kenya along the coastal areas.

At 850hPa, converging winds over central Africa (CAR, South Sudan), GHA (Somalia and Ethiopia) and east Africa (Uganda, coastal Tanzania and Kenya) are likely to cause moderate to enhanced rainfall over these areas. 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 much of central Africa, east Africa and the Great Horn of Africa region. This is likely to favor deep convection over these areas where are also expected to feature low level (850hPa) convergence.

Progressive organization of winds at this level into easterlies is expected during the forecast period, favoring advection of convective activities towards west.

During the period, a Subtropical Westerly Jet at 200hPa is expected to be weak, only occasionally (>130kts). Also, no bending is likely and therefore the GHA region is likely to feature mainly moderate localized precipitation.

The Monsoon wind pattern over the Gulf of Guinea is expected to maintain enhanced precipitation over there; spreading a bit further north as Azores relaxes. 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 scattered moderate to localized enhanced precipitation. 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 few areas along the east African coast, central Africa and the Gulf of Guinea. 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.

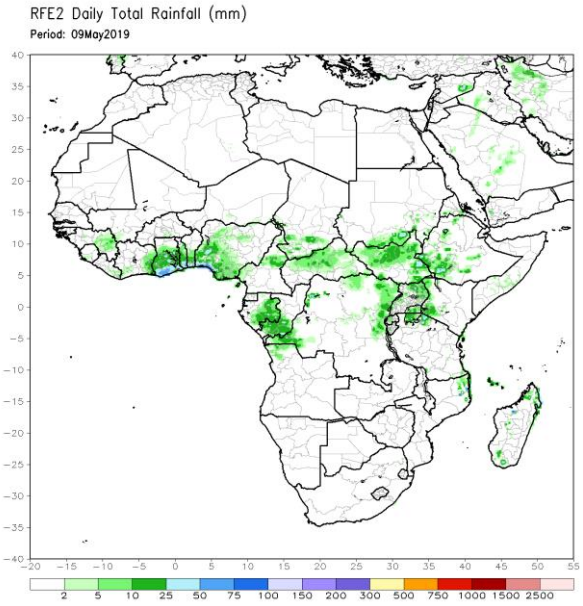
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (May 09, 2019)

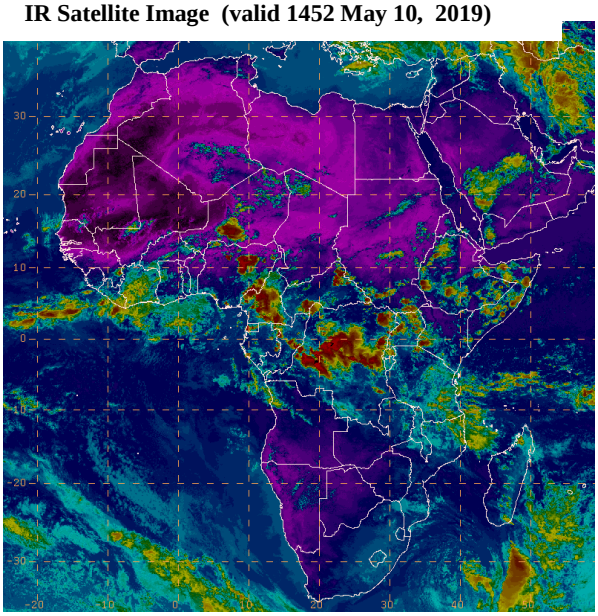
Daily rainfall totals exceeding 25mm have been observed over few areas in the Gulf of Guinea (coastal areas of Ghana, Togo, Benin and Nigeria), Ethiopia and South Sudan.

2.2. Weather assessment for the current day (*May 10,* 2019)

Significant convection is observed over central DRC and Cameroon. Otherwise, convective clouds over Mali underscores the progress of the Monsoon rains further north bring the onset of the rain season over there.



IR Satellite Image (valid 1452 May 10, 2019)



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