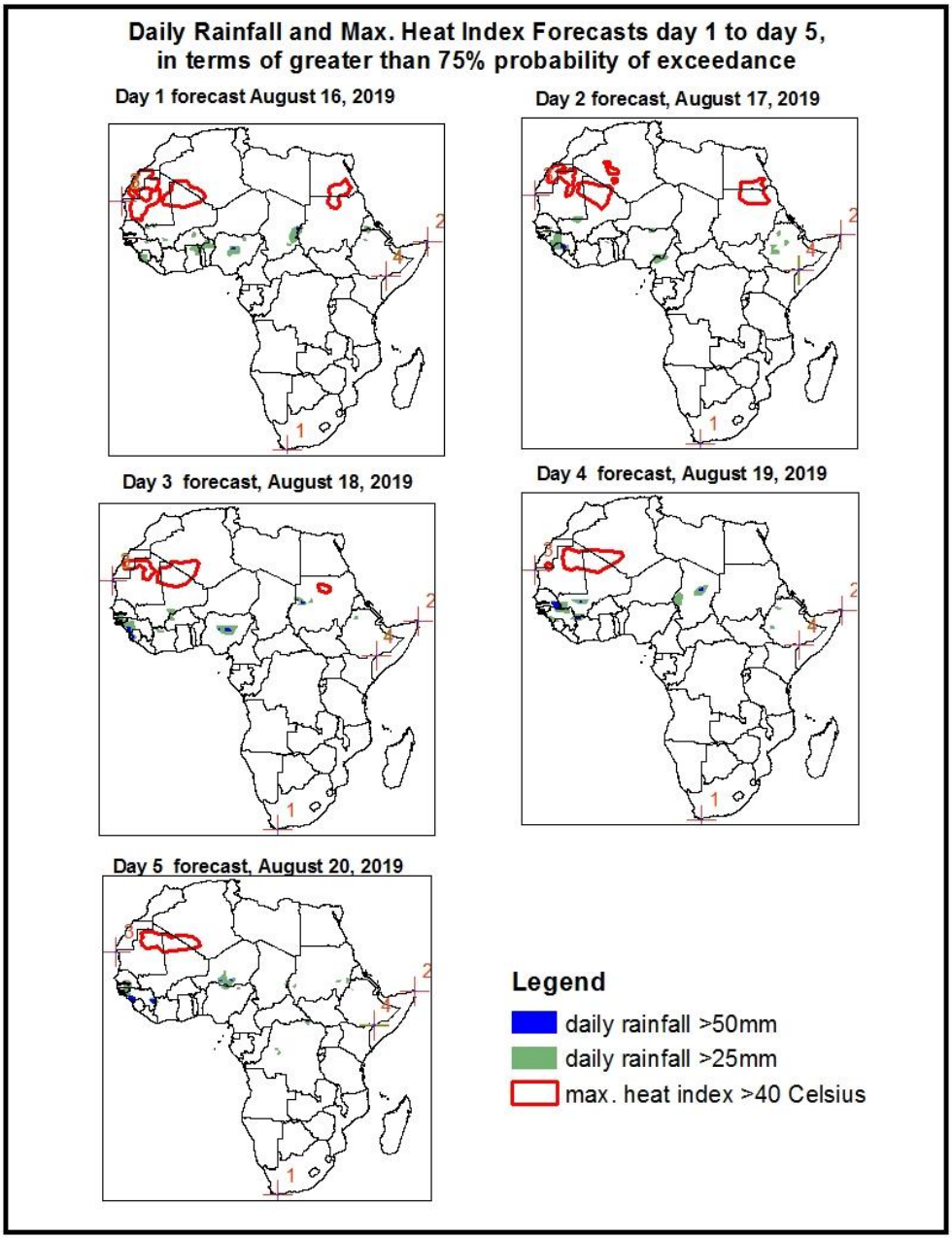
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

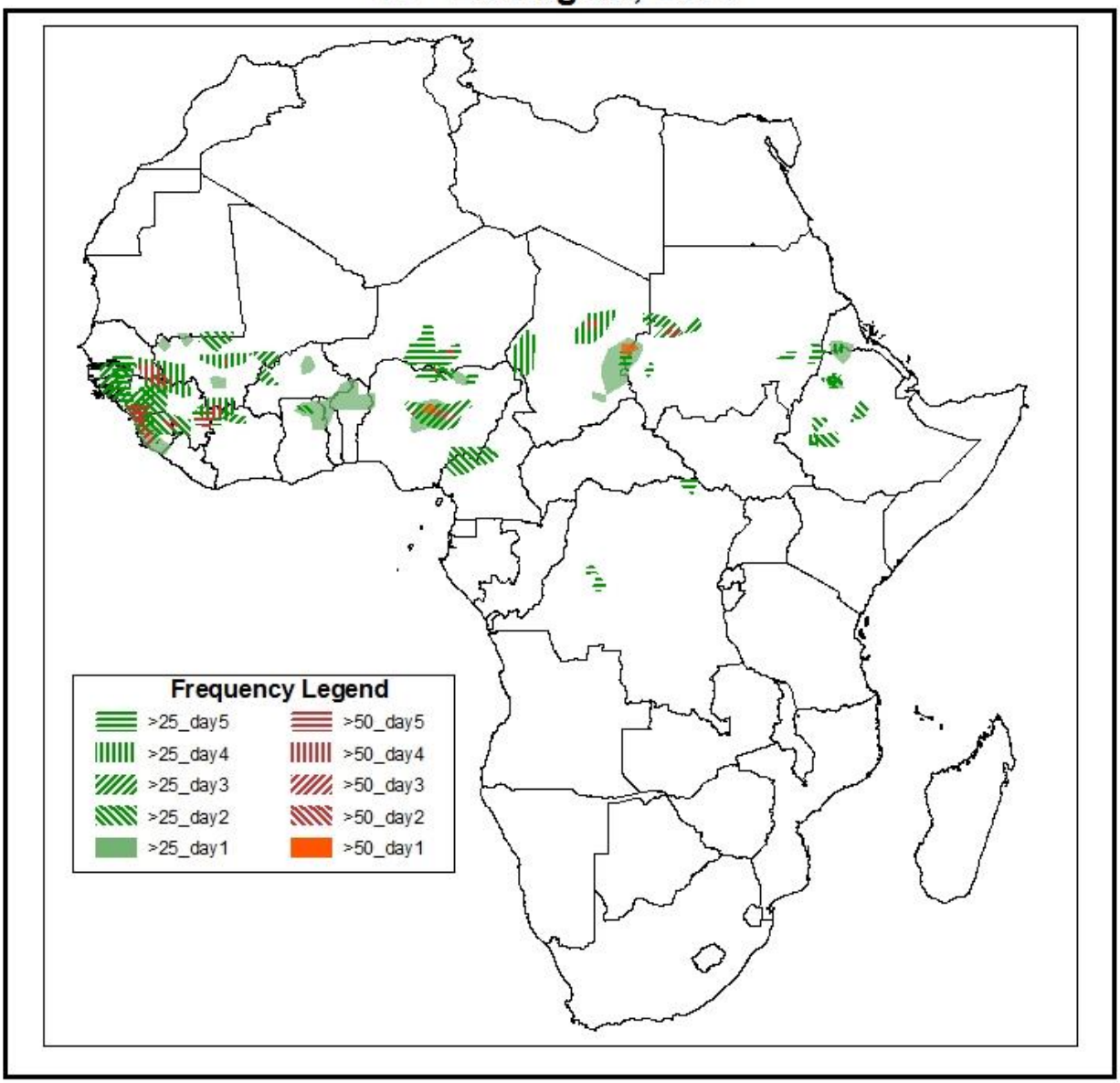
1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on August 15, 2019)

1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: 16 – 20 August, 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.



Five Days Rainfall Forecast Summary
16 - 20 August, 2019

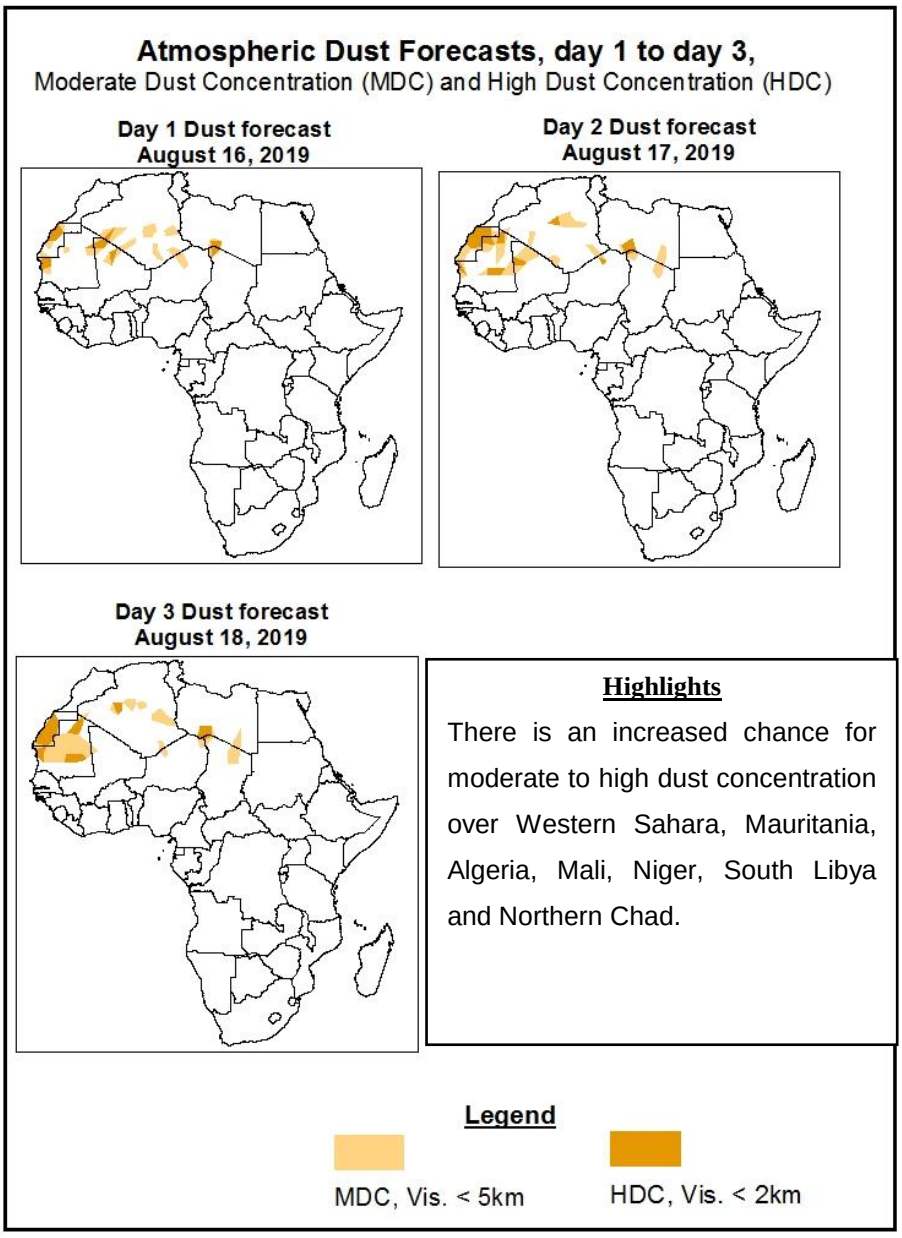


Highlights

- The monsoon flow from the Atlantic Ocean with its associated lower-level convergence, and westward propagating meso-scale convective systems are expected to enhance rainfall over Western Africa, portions of the Sahel and central Africa countries.
- Lower-level wind convergences are expected to enhance rainfall across portions of the Greater Horn of Africa.
- At least 25mm for two or more days is likely over portions of the Sahel region and the Greater Horn of Africa. There is an increased chance for daily rainfall to exceed 50mm over portions of Guinea, Sierra Leone, Southeast Senegal, Northwestern Cote D'Ivoire, Niger, Nigeria, Chad and Sudan.
- There is an increased chance for daily maximum heat index to exceed 40^{o}C over portions of Northwest Africa, Sudan and Egypt.

1.2. Atmospheric Dust Concentration Forecasts *(valid: 15 – 18 August 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: 16 – 20 August 2019*

The Azores High Pressure system over the Northeast Atlantic is expected to strength with its central pressure value increasing from 1025hPa to 1027hPa, while shifting northward during the forecast period.

The St. Helena High Pressure system over Southeast Atlantic Ocean is expected to weaken with its central pressure value decreasing from 1029hPa to 1028hPa during the forecast period.

The Mascarene High Pressure system over Southwest Indian Ocean is expected to strength with its central pressure value increasing from 1027hPa to 1033hPa during the forecast period.

Thermal low across the Sahel region is expected to deepen with its central pressure decreasing from 1007hPa to 1005hPa. The thermal low over Chad is also expected to deepen with its central pressure value decreasing from 1009hPa to 1005hPa moving westward to Niger, during the forecast period.

At 925-hPa level, strong dry northerly to northeasterly flow is expected to prevail across portions of Northwest Africa. In contrast, moist southwesterly flow from the Atlantic Ocean is expected to prevail across the Gulf of Guinea and the Sahel regions, and the neighboring areas of Central Africa.

At 850-hPa, lower-level wind convergences are expected to remain active over portions of the Sahel and Lake Victoria regions. A cyclonic circulation in front of Senegal is expected to shift to the west during the forecast period.

At 700-hPa, a broad area of anticyclonic flow is expected to prevail across much of Northwest and West Africa during the forecast period.

At 500-hpa, wind speed associated with easterly flow is expected to exceed 30kts across Sahel region and Greater Horn of Africa during the forecast period.

At 150-hPa, a strong wind (>70kts) associated with tropical easterly jet (TEJ) is expected across the Greater Horn of Africa during the first 24 hours at the forecast period.

The monsoon flow from the Atlantic Ocean with its associated lower-level convergence, and westward propagating meso-scale convective systems are expected to enhance rainfall over Western Africa, portions of the Sahel and central Africa countries. Lower-level wind convergences are expected to enhance rainfall across portions of the Greater Horn of Africa. At least 25mm for two or more days is likely over portions of the Sahel region and the Greater Horn of Africa. There is an increased chance for daily rainfall to exceed 50mm over portions of Guinea, Sierra Leone, Southeast Senegal, Northwestern Cote D'Ivoire, Niger, Nigeria, Chad and Sudan. There is an increased chance for daily maximum heat index to exceed 40oC over portions of Northwest Africa, Sudan and Egypt.

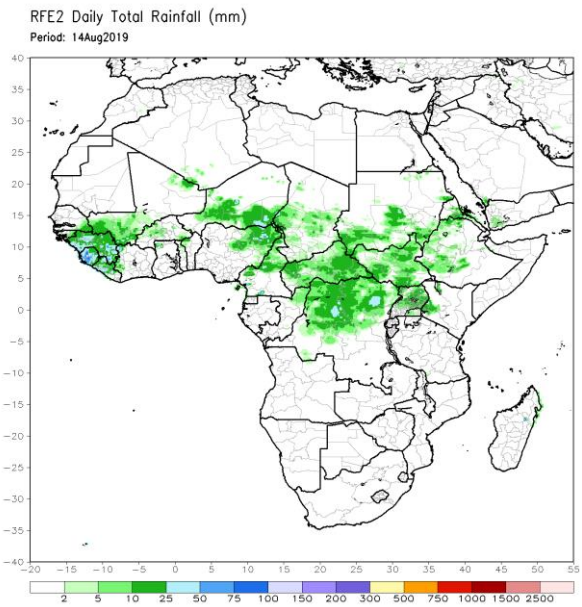
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (August 14, 2019)

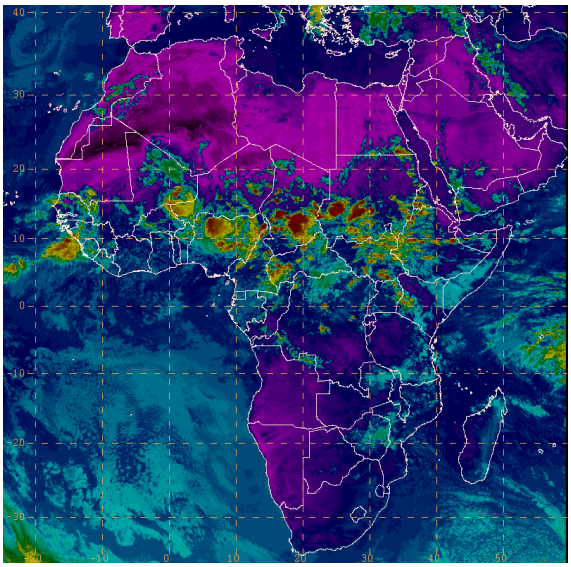
Daily rainfall amount exceeded 25mm over portions of Sierra Leone, Guinea, Liberia, Niger, Nigeria and DRC and exceeded 50mm over Sierra Leone.

2.2. Weather assessment for the current day (*August 15,* 2019)

Deep convective clouds are observed over portions of the Sahel, Central Africa and the Greater Horn of Africa regions.



IR Satellite Image (valid 1452 August 15, 2019)



Author: Ahmadou Diallo & Denise de Pina (CPC-African Desk / Guinea & Cabo Verde Meteorological Service – DNM/INMG)