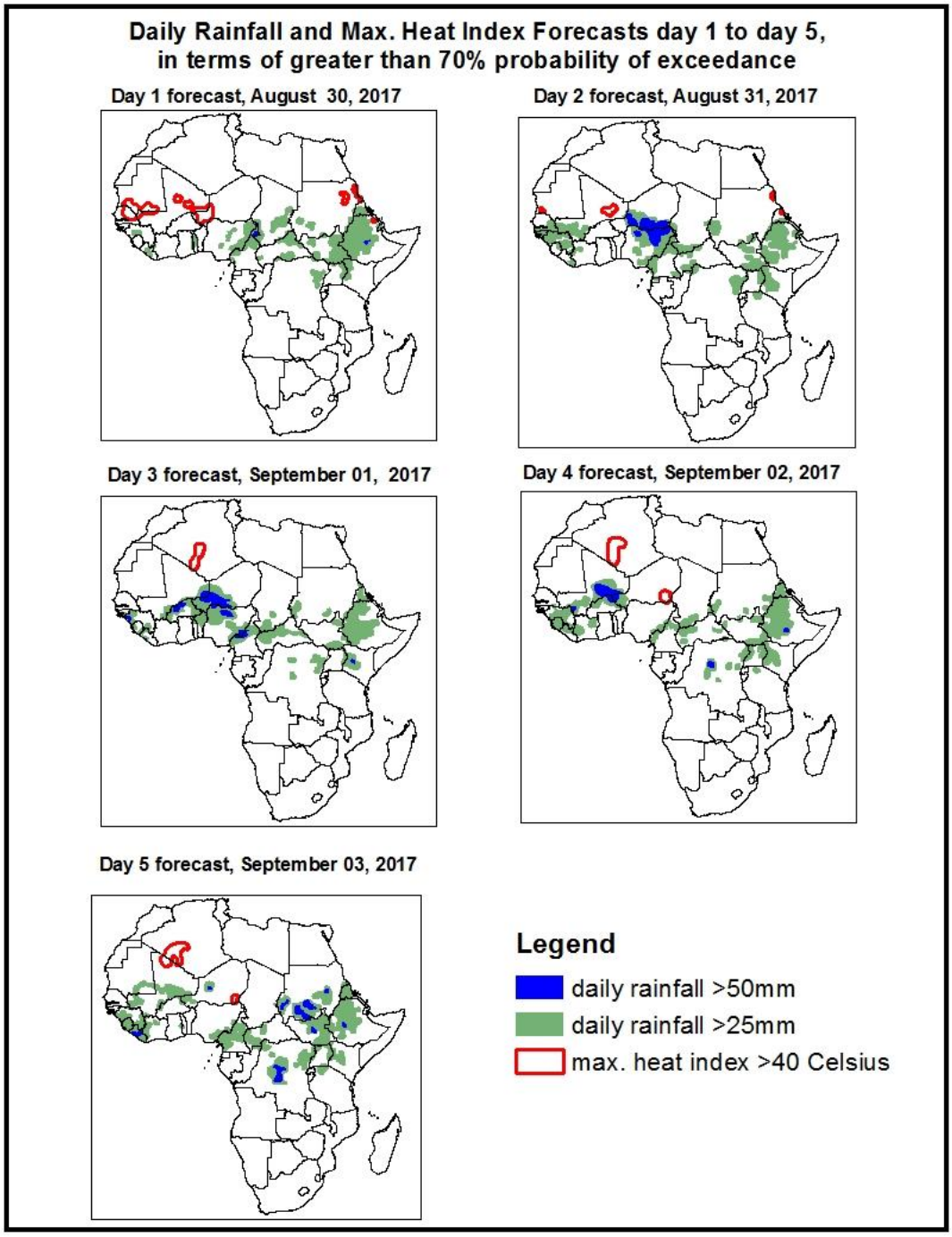
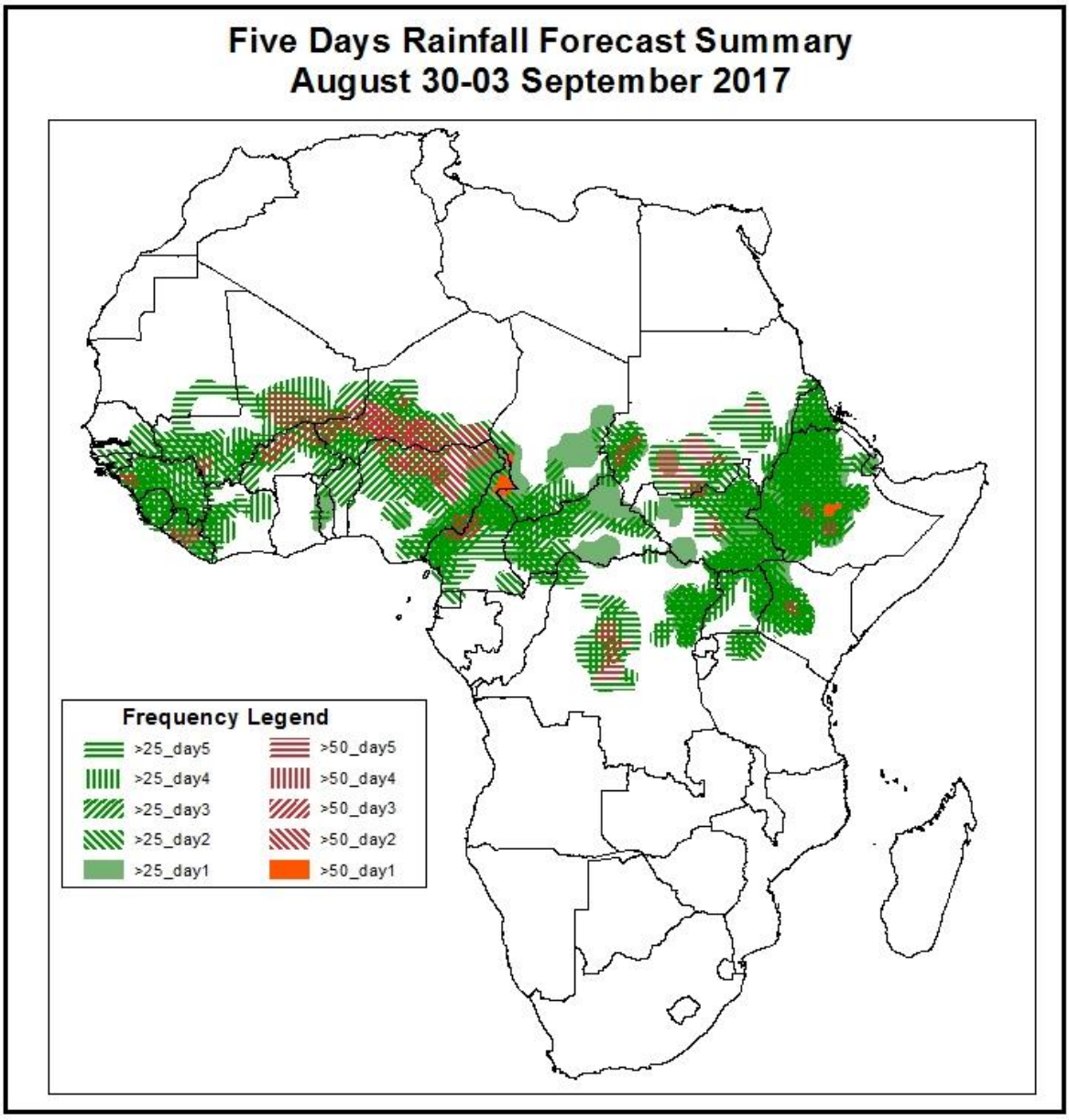
# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on August 29, 2017)

### *1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: August 30–03 September,2017)*

The forecasts are expressed in terms of high probability of precipitation (POP) and high probability of maximum heat index, based on the NCEP/GFS, ECMWF and the NCEP Global Ensemble Forecasts System (GEFS) and expert assessment.



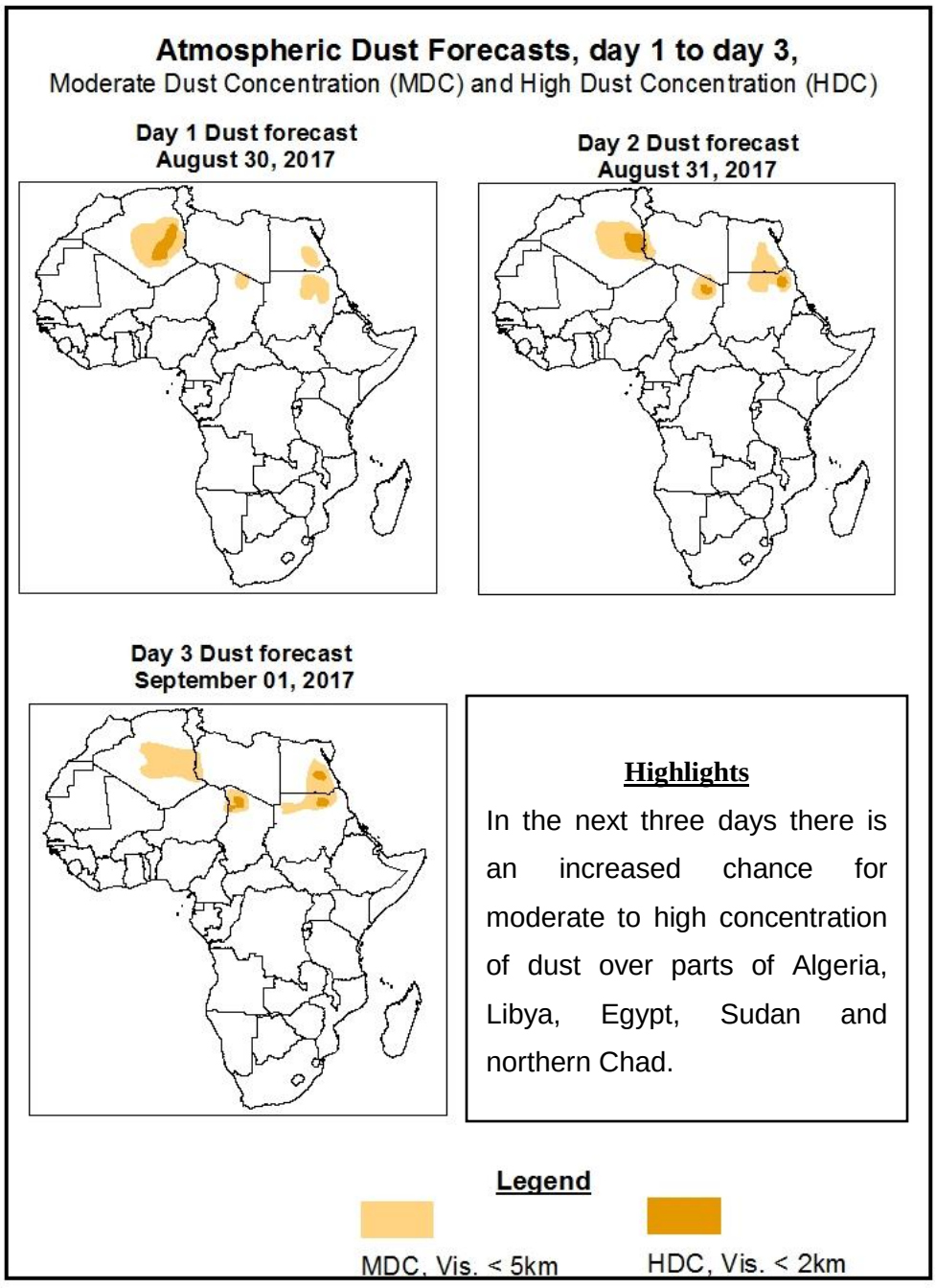



## ***Highlights***

In the next five days, a strong monsoon flow from the Atlantic Ocean across West and Central Africa combined with a lower-level cyclonic circulation propagating across the Sahel countries coupled with upper level divergence is expected to enhance rainfall over many places in West and Central African countries. Active lower-level convergence over southern DRC, northern Tanzania and the Lake Victoria region towards Kenya is also expected to enhance rainfall in the region. As a result, there is an increased chance for two or more days of moderate to heavy rainfall over many places in southern Senegal, Guinea Bissau, Guinea, Sierra Leone, Liberia, southern Mali, Northern Cote D'Ivoire, Burkina Faso, northern Benin, southern Niger, Nigeria, Cameroon, southern Chad, and CAR, parts of DRC, southern Sudan, western South Sudan, western Kenya, Ethiopia and Eritrea.

## *1.2. Atmospheric Dust Concentration Forecasts (valid: August 30-01 Sept.,2017)*

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: August 30-03 September 2017*

The Azores High Pressure system over the North Atlantic Ocean is expected to intensify from its central pressure value of 1026hpa to 1028hpa in the next 48hours and then falls back to its initial value of 1026hpa towards the end of the forecast period.

The St. Helena High Pressure system over the Southeast Atlantic Ocean is expected to intensify from its central pressure value of 1028hpa to 1035hpa in the next 72hours and then maintain this value towards the end of the forecast period.

The Mascarene High Pressure system over the Southwest Indian Ocean is expected to gradually weaken from its central pressure value of 1039hpa to 1032hpa towards the end of the forecast period with its center gradually moving eastward.

The heat low over western Sahel is expected to fill up from its value of 1003hpa to 1009hpa towards the end of the forecast period.
Over the central Sahel, the heat low is expected to slightly fill up from its value of 1009hpa to 1010hpa in the next 48hours and then deepen to 1008hpa towards the end of the forecast period.
Over the Sudan area, the heat low is expected to maintain its value of 1007hpa towards the end of the forecast period.

At 925hPa, there is a low pressure system established over Sudan and propagating westwards. The convergence over the Sudan area is dominated by the north easterlies but moving to the central and west Sahel the south westerlies dominated the cyclonic circulation during the forecast period. Therefore, the undulation of the trough line tilts more to the north in central and the west Sahel region.
Another convergence is established over southern DRC with the trough line extending to Tanzania and Kenya towards Lake Victoria moving to the north east direction during the forecast period.
The dry north easterlies propagating from the subtropical high pressure over North Africa will suppress the south westerlies over the Sudan area in the next 48hours which will result to sustained spreading and transport of the dust over Algeria, Libya, Egypt and Sudan. The

south westerlies dominate the flow over the Central and West Sahel during the forecast period.

At 850hPa, the cyclonic circulation over West Africa is gradually dominated by the north easterlies with pockets of vortices developing over the region and moving westward during the forecast period. Over the west Sahel a low pressure system is established which is mostly dominated by maritime flow and persisting all through the forecast period. Over the central Sahel and the Sudan area the vortices are dominated by continental flow.
The convergence zone over central and some parts of east Africa is intensifying and continually developing all through the forecast period.

At 700hPa, there is the divergence of an easterly flow from the subtropical high pressure system over West Africa to its coasts in the next 72hours but towards the end of the forecast period, the subtropical high pressure system is weakened with the intrusion of the mid latitude trough thereby creating a series of cut-off highs.
Divergence over central, eastern and the southern part of Africa predominate and persist over regions but towards the end of the forecast period, some cut-off lows starts to develop.

In the next five days, a strong monsoon flow from the Atlantic Ocean across West and Central Africa combined with a lower-level cyclonic circulation propagating across the Sahel countries coupled with upper level divergence is expected to enhance rainfall over many places in West and Central African countries. Active lower-level convergence over southern DRC, northern Tanzania and the Lake Victoria region towards Kenya is also expected to enhance rainfall in the region. As a result, there is an increased chance for two or more days of moderate to heavy rainfall over many places in southern Senegal, Guinea Bissau, Guinea, Sierra Leone, Liberia, southern Mali, Northern Cote D'Ivoire, Burkina Faso, northern Benin, southern Niger, Nigeria, Cameroon, southern Chad, and CAR, parts of DRC, southern Sudan, western South Sudan, western Kenya, Ethiopia and Eritrea.

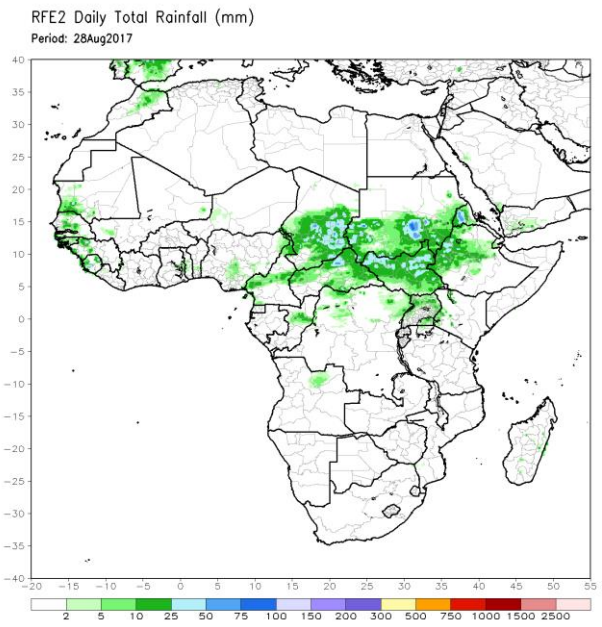
## 2.0. Previous and Current Day Weather over Africa

### *2.1. Weather assessment for the previous day* (August 28, 2017)

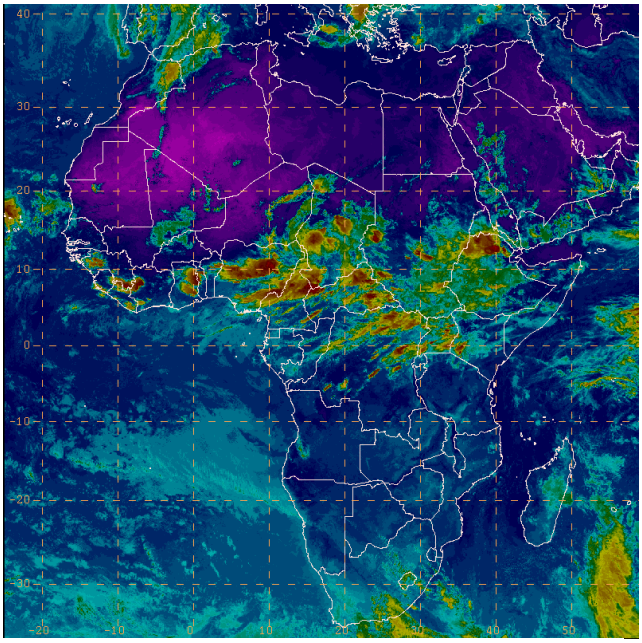
Moderate to locally heavy rainfall was observed over parts of southern Senegal, Guinea, Guinea Bissau, southern Mauritania, Sierra Leone, central Cameroon, southern Chad, and central Republic of the Congo, southern Sudan, South Sudan, Uganda, Ethiopia and Eritrea.

### *2.2. Weather assessment for the current day* (August 29, 2017)

Intense convective clouds are observed over portions of West, Central and East Africa.




**IR Satellite Image (valid 1722 August 29 , 2017)**



*Previous day rainfall condition over Africa (Left) based on the NCEP CPCE/RFE and current day cloud cover (right) based on IR Satellite image.*

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