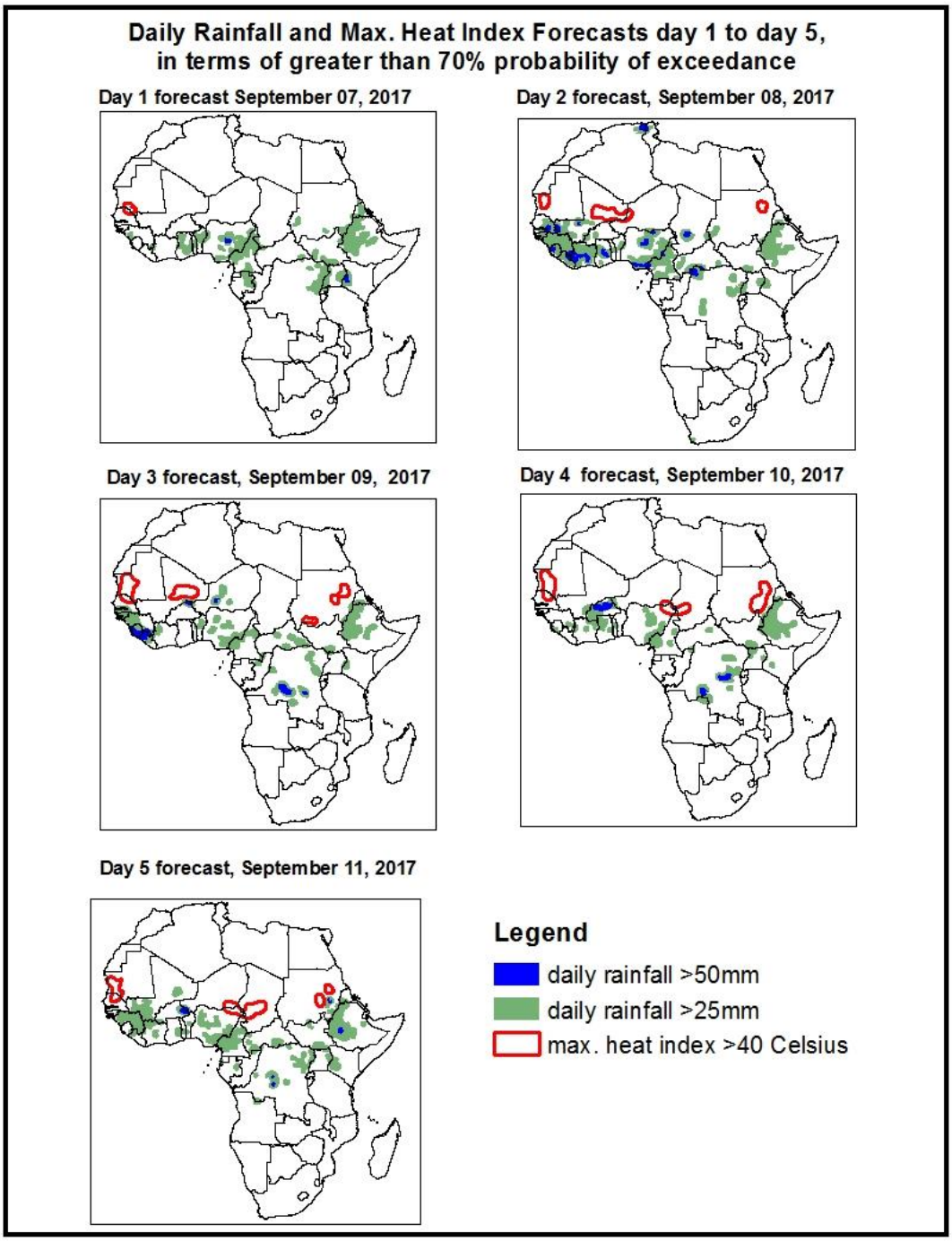
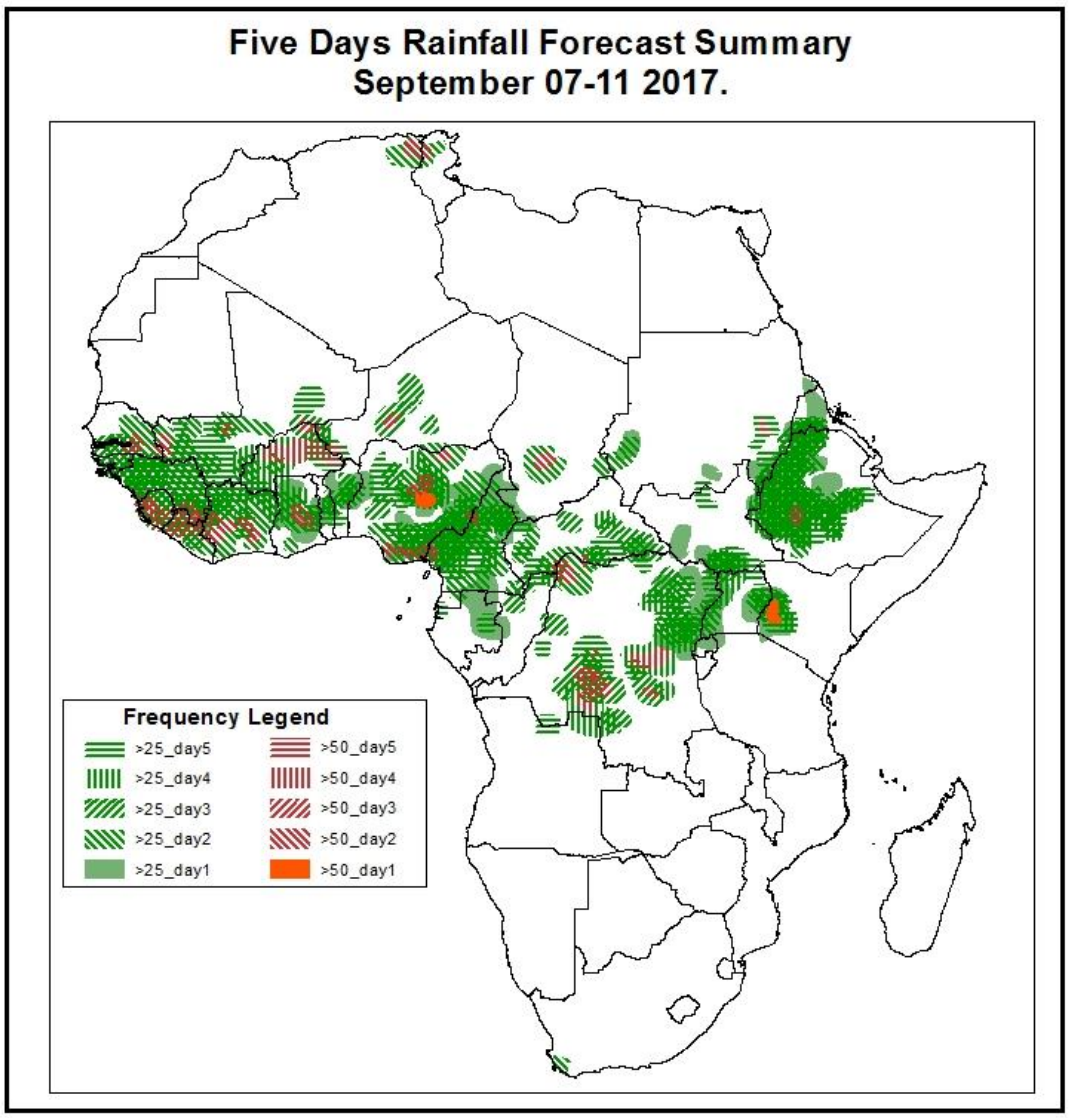
# NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

## 1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on September 06, 2017)

### *1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: September, 07-11 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.



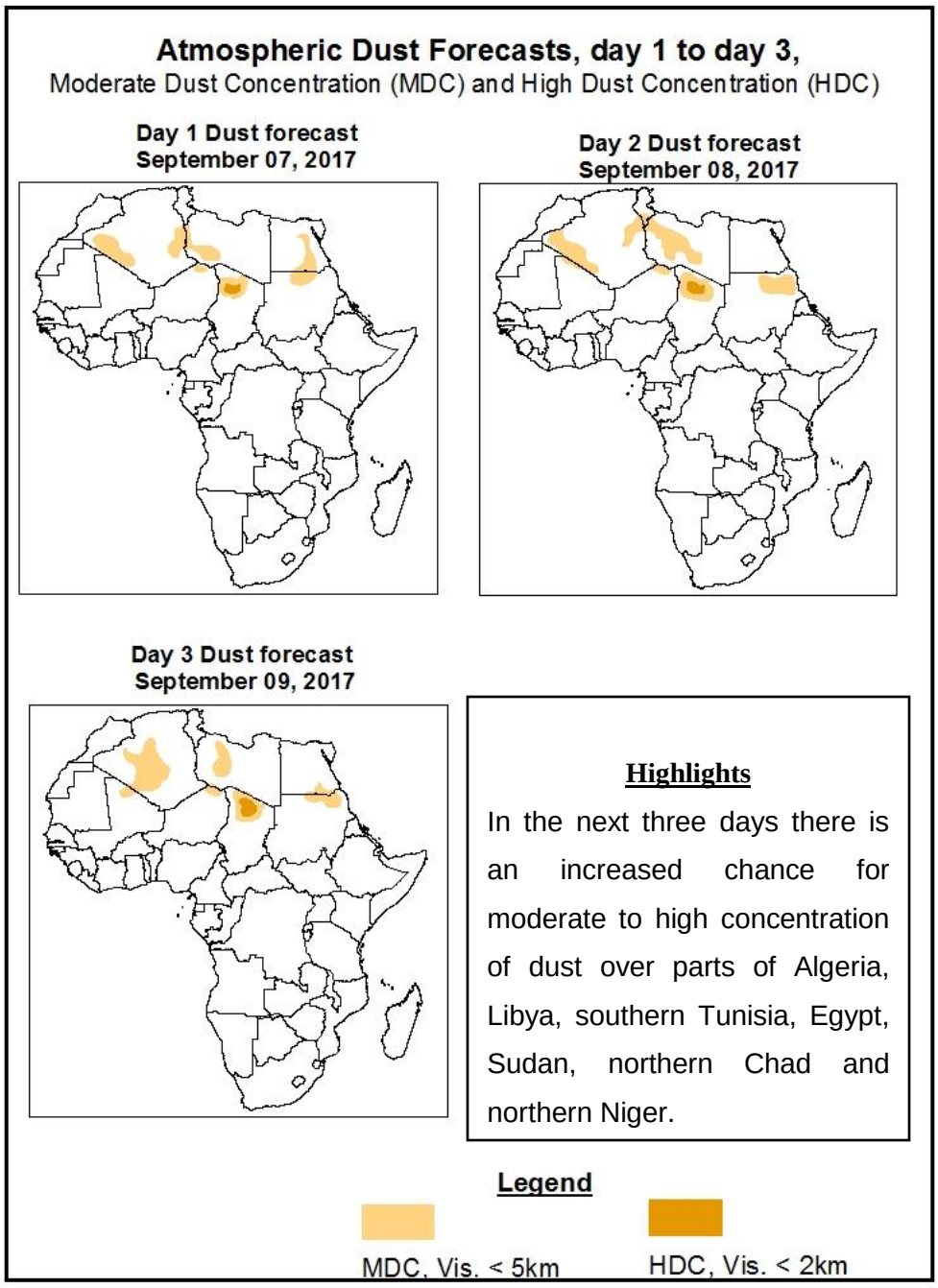



## ***Highlights***

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 north east Angola to DRC traversing to Lake Victoria 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 Senegal, Gambia, Guinea Bissau, Guinea, Sierra Leone, Liberia, southern Mali, northern Tunisia, Cote D'Ivoire, Burkina Faso, Ghana, Togo, and Benin, Nigeria, southern Niger, Cameroon, southern Chad, CAR, DRC, Uganda, Kenya and Ethiopia.

## *1.2. Atmospheric Dust Concentration Forecasts (valid: September 07-09 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: September 07-11 2017*

The Azores High Pressure system over the North Atlantic Ocean is expected to gradually weaken from its central pressure value of 1032hpa to 1028hpa towards the end of the forecast period.

The St. Helena High Pressure system over the Southeast Atlantic Ocean is expected to gradually intensify from its central pressure value of 1034hpa to 1039hpa towards the end of the forecast period.

The Mascarene High Pressure system over the Southwest Indian Ocean is expected to intensify from its central pressure value of 1030hpa to 1033hpa in the next 48hours and thereafter weakens to 1027hpa towards the end of the forecast period.

The heat low over western Sahel is expected to fill up from its value of 1007hpa to 1008hpa in the next 48hours and then later deepen to 1006hpa towards the end of the forecast period.
Over the central Sahel, the heat low is expected to deepen from 1010hpa to 1006hpa towards the end of the forecast period.
Over the Sudan area, the heat low is expected to maintain its value of 1008hpa in the next 72hours and then deepen to 1005hpa towards the end of the forecast period.

At 925hPa, there is a convergence which is dominated by the continental winds over the Sudan area and the central Sahel region while the west Sahel region is dominated by the maritime winds towards the end of the forecast period. Therefore, the undulation of the trough line tilts more to the north in the western Sahel region.
Another convergence is established over north east Angola and the DRC and traversed through Tanzania, Burundi, Rwanda, Uganda and Lake Victoria with a slight movement to the north east direction during the forecast period.
The dry north easterlies propagating from the subtropical high pressure over North Africa will result to sustained spreading and transport of the dust over Algeria, Libya, southern Tunisia, Egypt, Sudan, northern Chad and northern Niger.

At 850hPa, there is a cyclonic circulation over West Africa with a vortex established in the extreme western part towards the coast and is dominated by maritime winds all through the forecast period. Over the Sudan area, there is a vortex established of predominantly continental winds and starts to move westward in the next 48hours to the end of the forecast period.
The convergence zone over central and some parts of east and south east Africa is intensifying and continually developing with a slight propagation to the south eastern direction towards the end of 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 towards the end of the forecast period.
Divergence over central, eastern and the southern part of Africa predominate and persist over regions.

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 north east Angola to DRC traversing to Lake Victoria 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 Senegal, Gambia, Guinea Bissau, Guinea, Sierra Leone, Liberia, southern Mali, northern Tunisia, Cote D'Ivoire, Burkina Faso, Ghana, Togo, and Benin, Nigeria, southern Niger, Cameroon, southern Chad, CAR, DRC, Uganda, Kenya and Ethiopia.

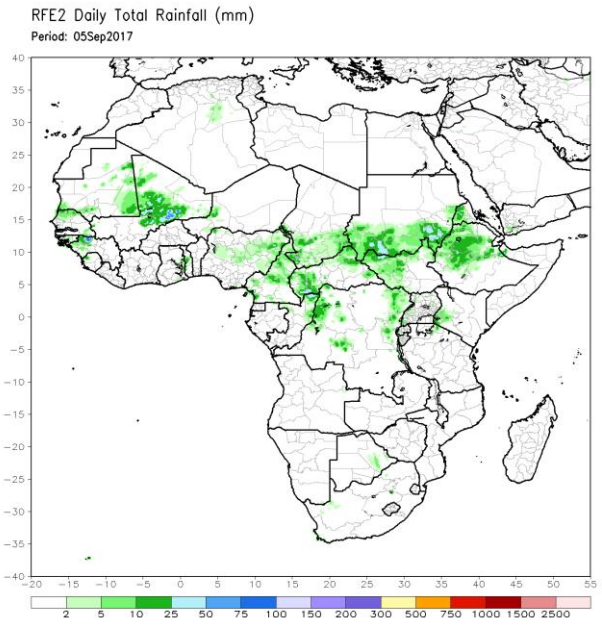
## 2.0. Previous and Current Day Weather over Africa

### *2.1. Weather assessment for the previous day* (September 05, 2017)

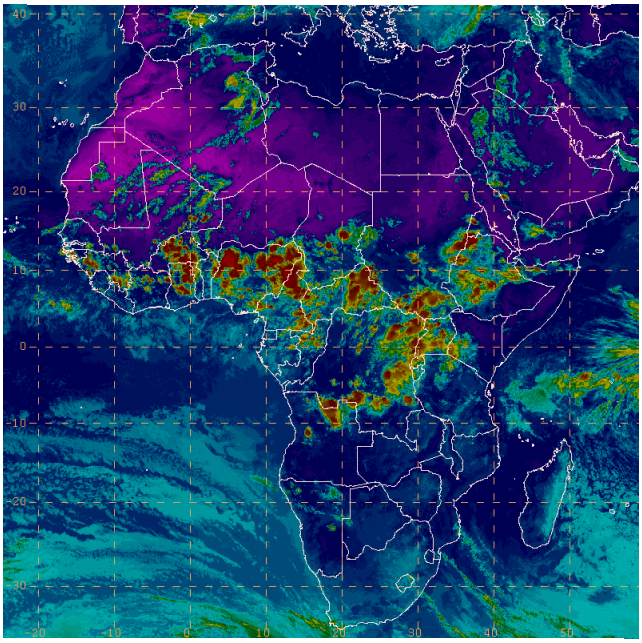
Moderate to locally heavy rainfall was observed over parts of northern Senegal, South east Mauritania, north west Guinea, Mali, eastern Nigeria, southern Chad, parts of Cameroon, CAR, pats of DRC, Southern Sudan, parts of South Sudan, Ethiopia and Eritrea.

### *2.2. Weather assessment for the current day* (September 06, 2017)

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




**IR Satellite Image (valid 1652 September 06 , 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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