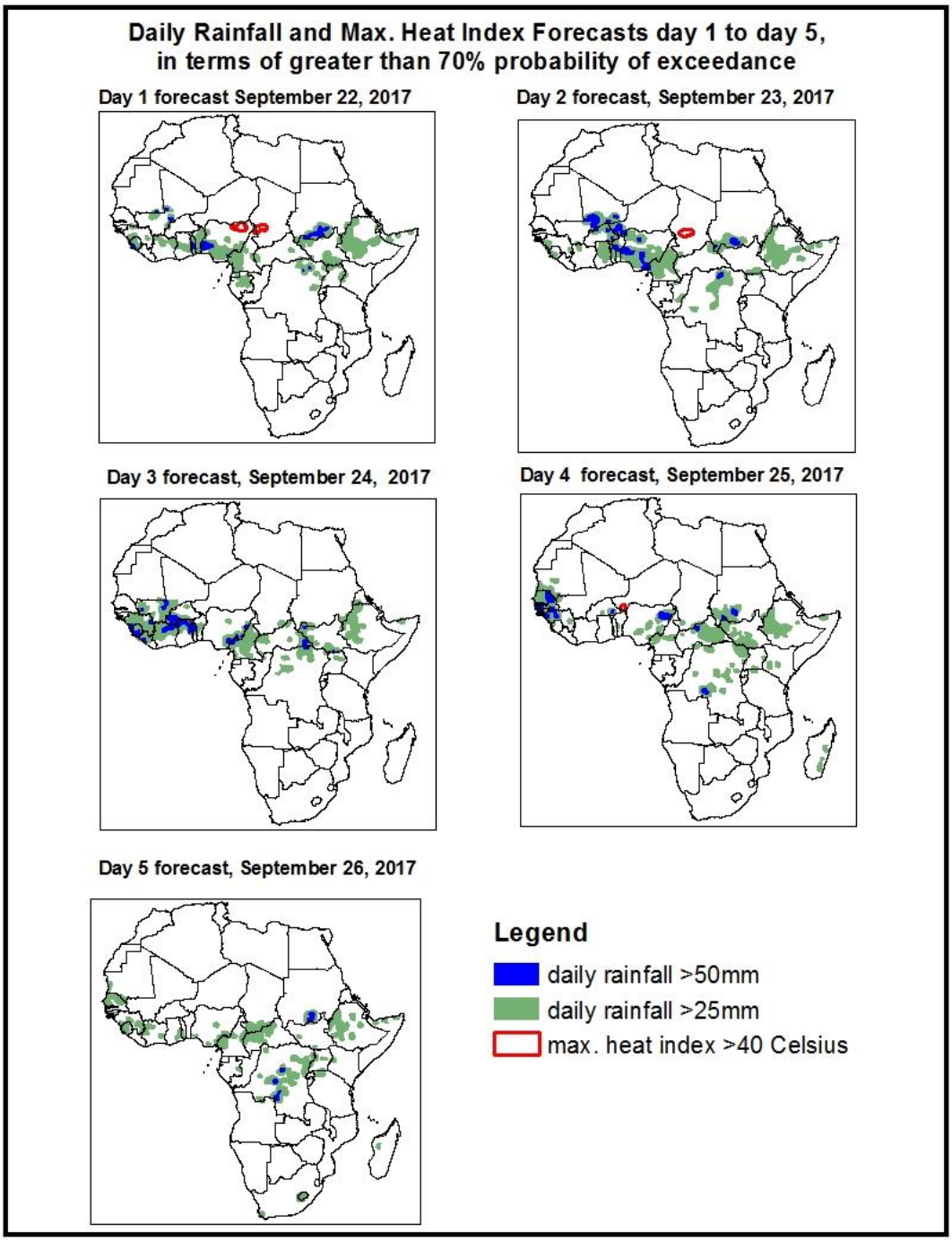
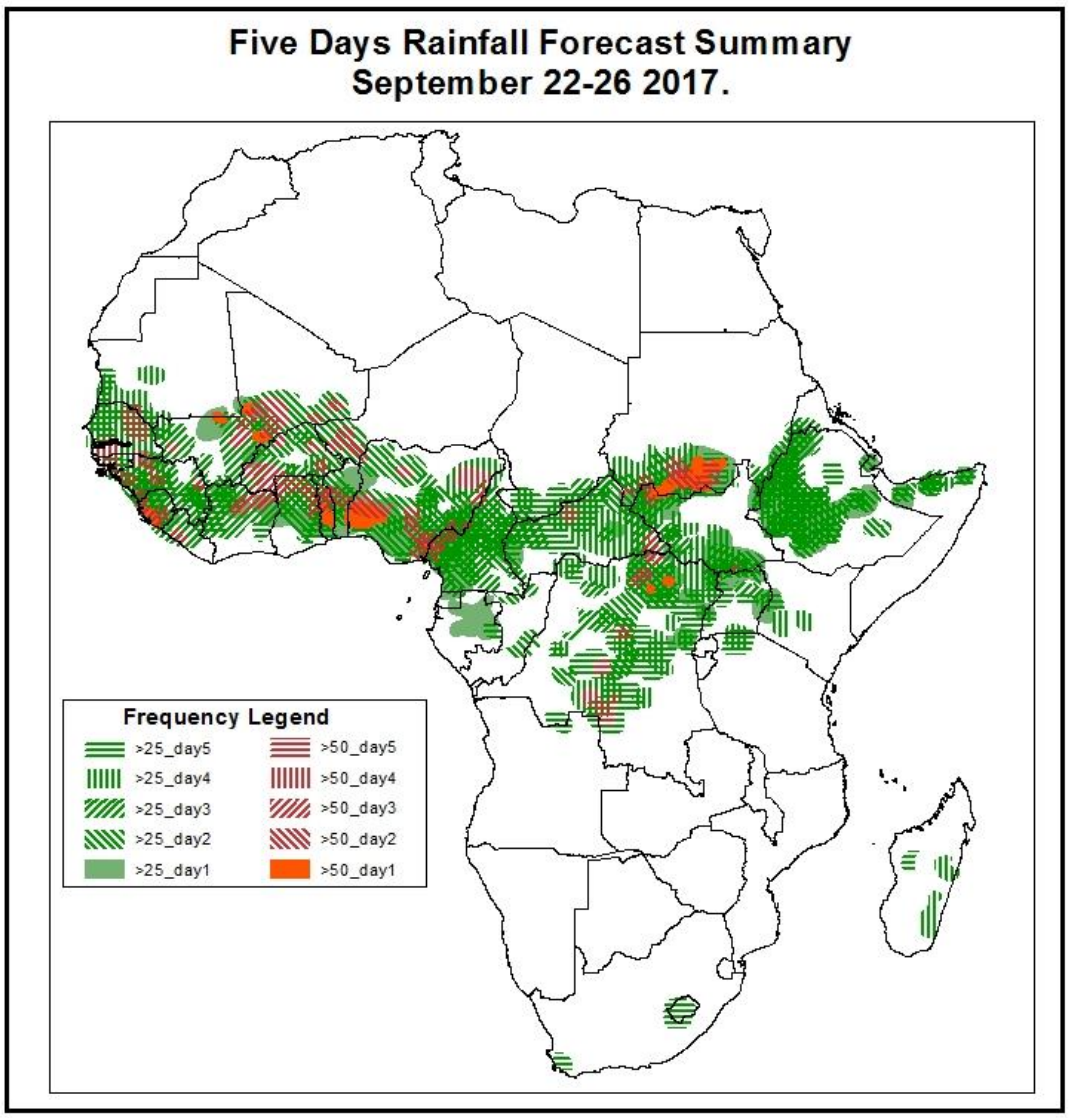
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on September 21, 2017)

1.1. Daily Rainfall and Maximum Heat Index Forecasts (valid: September, 22-26 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.



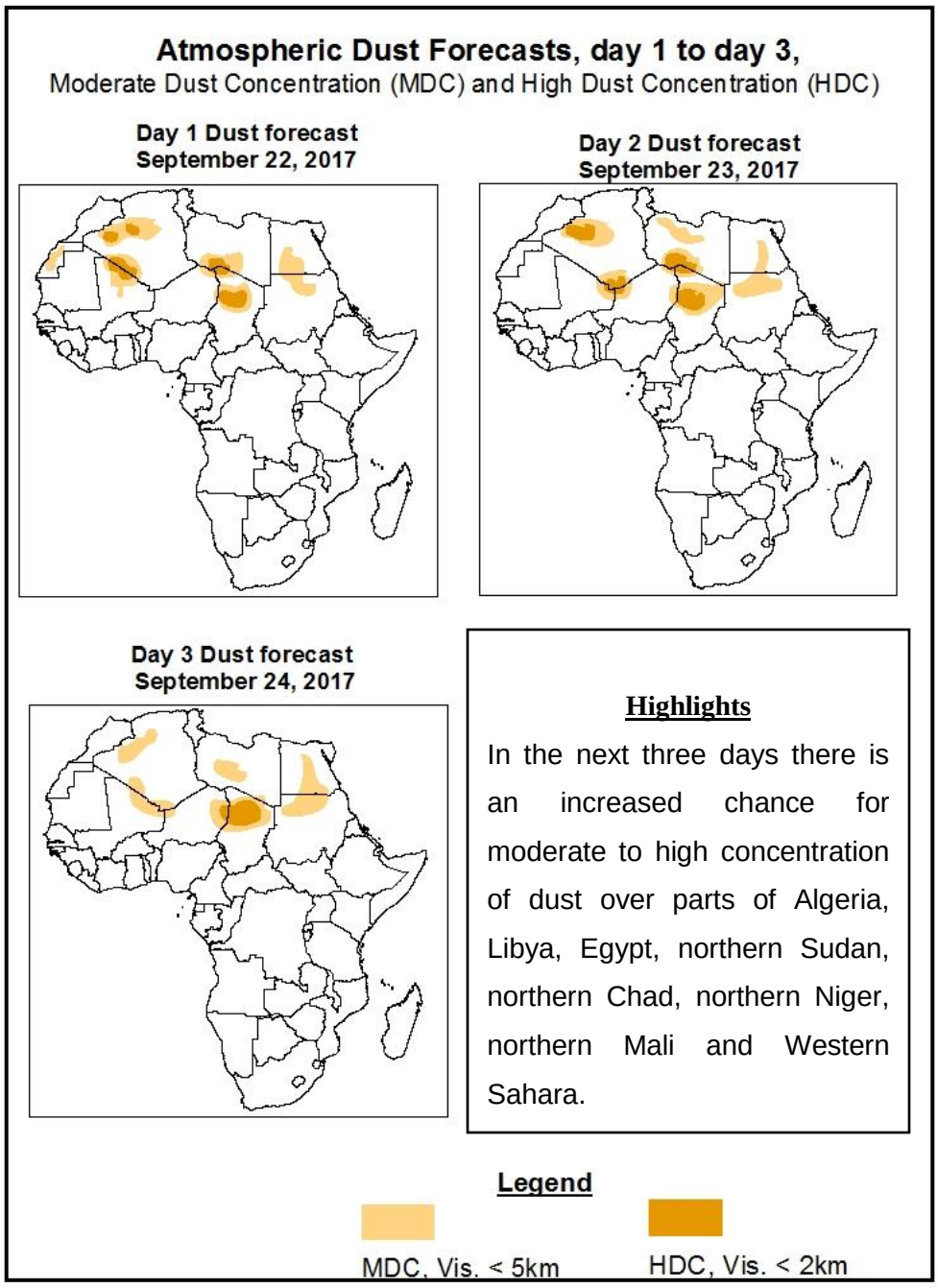


Highlights

In the next five days, a 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 Angola to DRC and traversing through Burundi, Rwanda, northern Tanzania, the Lake Victoria, and Uganda then to the South Sudan 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 Cote D`Ivoire, Burkina Faso, Ghana, Togo, Benin, southwestern Niger, Nigeria, Cameroon, CAR, DRC, Uganda, southern Sudan, South Sudan, Ethiopia and northern Somalia.

1.2. Atmospheric Dust Concentration Forecasts (valid: September 22-24 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 22-26 2017*

The Azores High Pressure system over the North Atlantic Ocean is expected to gradually weaken from its central pressure value of 1024hpa to 1020hpa 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 1033hpa in the next 72hours and then later weaken to 1030hpa towards the end of the forecast period.

The Mascarene High Pressure system over the Southwest Indian Ocean is expected to maintain its central pressure value of 1038hpa in the next 72hours and then intensify to 1040hpa towards the end of the forecast period.

The heat low over western Sahel is expected to fill up from its value of 1005hpa in the next 24hours to 1008hpa and then maintain this value for another 48hours, then deepen to 1006hpa towards the end of the forecast period.
Over the central Sahel, the heat low is expected to fill up from its value of 1008hpa to 1010hpa in the next 24hours and then maintain this value towards the end of the forecast period.
Over the Sudan area, the heat low is expected to fill up from its value of 1007hpa in the next 24hours to 1009hpa and thereafter deepen back to 1007hpa 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 regions with vortices developing which are dominated by the continental winds and are moving westward towards the end of the forecast period. Over the west Sahel region, a big vortex dominated by maritime winds develops with a sustained movement towards the northwest direction to the end of the forecast period.
Another convergence is established over the Angola to DRC and traversing through Uganda and South Sudan which remains quasi-stationary towards the end of the forecast period.
The dry north easterlies to easterly winds propagating from the subtropical high pressure system over North Africa sustained the spreading and transportation of the Saharan dust

over Algeria, Libya, Egypt, northern Sudan, northern Chad, northern Niger, northern Mali and the Western Sahara.

At 850hPa, there is a convergence flow over West Africa and the Sudan area with pockets vortices spreading over the central Sahel and the Sudan areas which are dominated by the continental winds and are in continuous development with a westward propagation to the end of the forecast period. Over the west Sahel, a low pressure system is established which is dominated by the maritime winds and moving westward but after the next 48hours the continental winds will retard and dominate the flow to the end of the forecast period.
There is another strong convergence over the eastern Angola to the DRC which traverse and extends to Burundi, Rwanda, the Lake Victoria and Uganda then to the South Sudan and remains quasi-stationary for the next 72hours and then slightly moves to the northeast direction towards the end of the forecast period.

At 700hPa, there is the divergence of a northeasterly to easterly flow from the subtropical high pressure system over the north and 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 towards the end of the forecast period.

In the next five days, a 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 Angola to DRC and traversing through Burundi, Rwanda, northern Tanzania, the Lake Victoria, and Uganda then to the South Sudan 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 Cote D`Ivoire, Burkina Faso, Ghana, Togo, Benin, southwestern Niger, Nigeria, Cameroon, CAR, DRC, Uganda, southern Sudan, South Sudan, Ethiopia and northern Somalia.

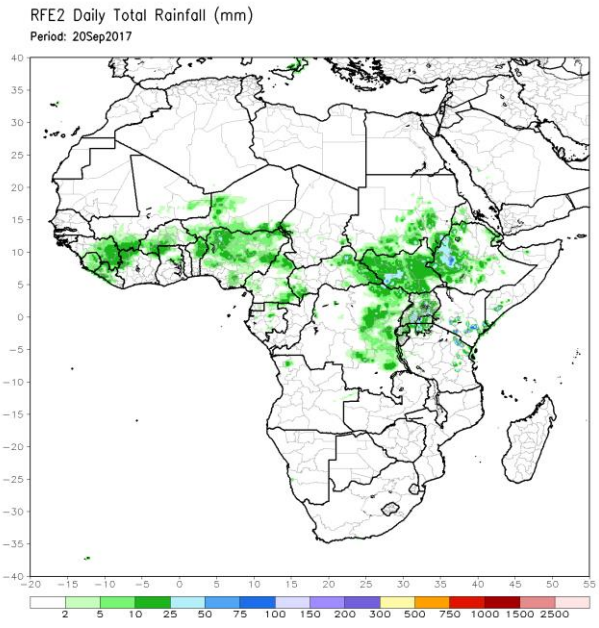
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (September 20, 2017)

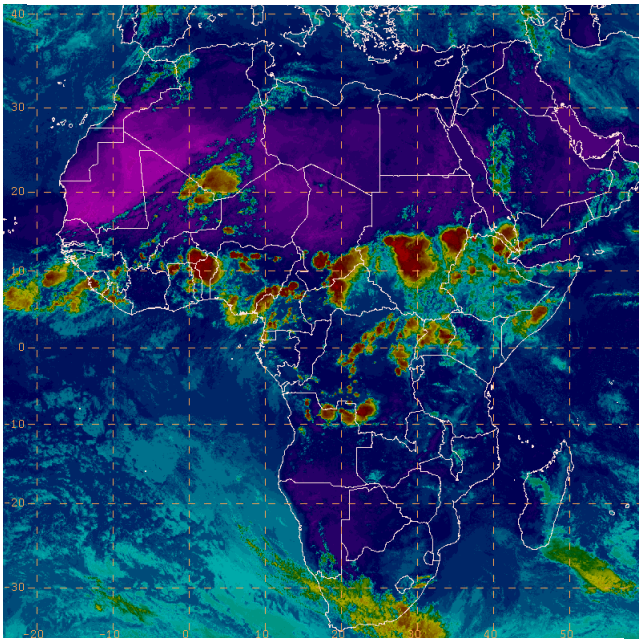
Moderate to locally heavy rainfall was observed over eastern Guinea, Sierra Leone, Liberia, northwestern Cote D`Ivoire, Burkina Faso, northern Benin, southern Niger, Nigeria, northern Cameroon, eastern CAR, DRC, southern Sudan, South Sudan, Uganda and Ethiopia.

2.2. Weather assessment for the current day (September 21, 2017)

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



IR Satellite Image (valid 1652Z September 21 , 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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