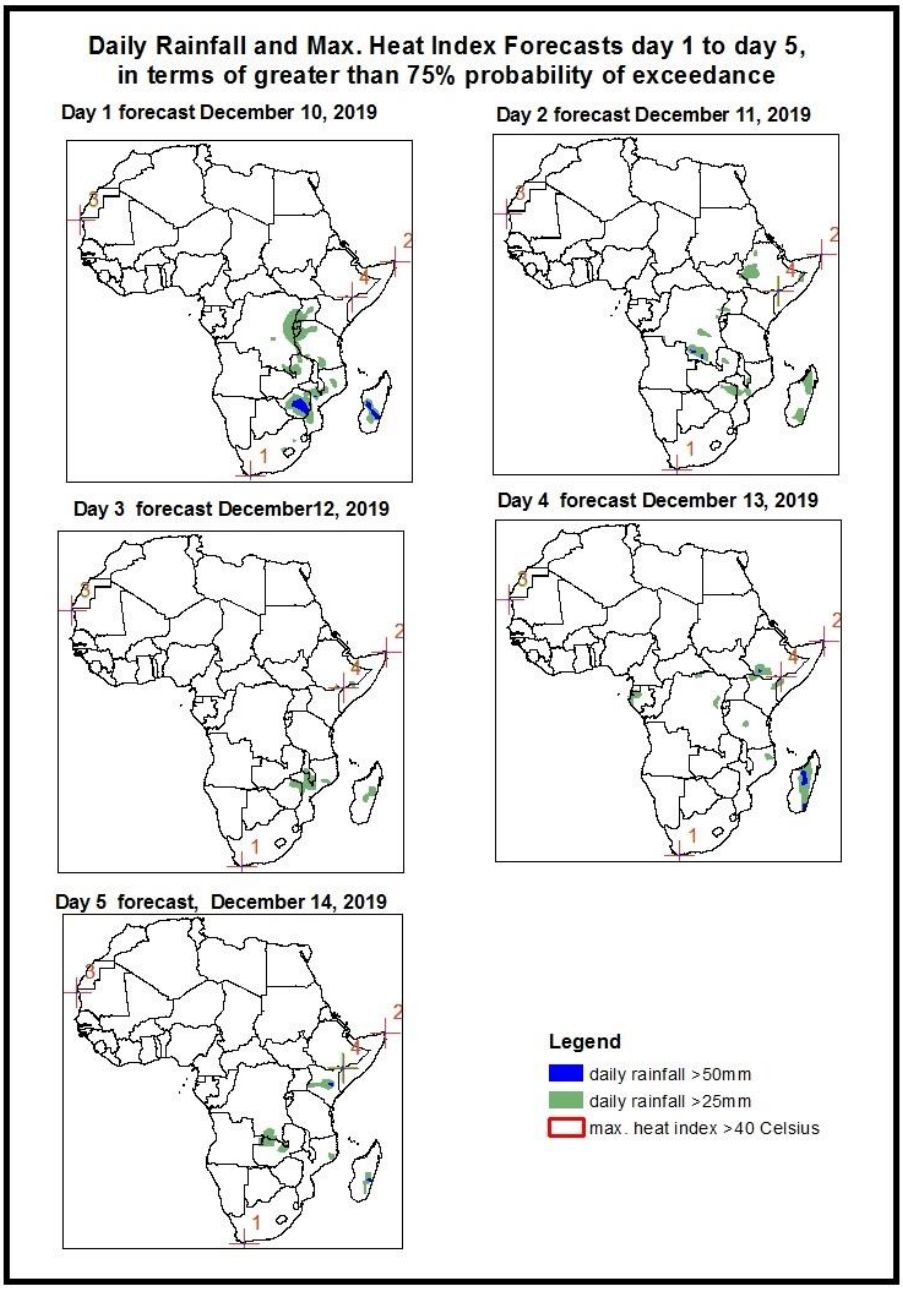
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

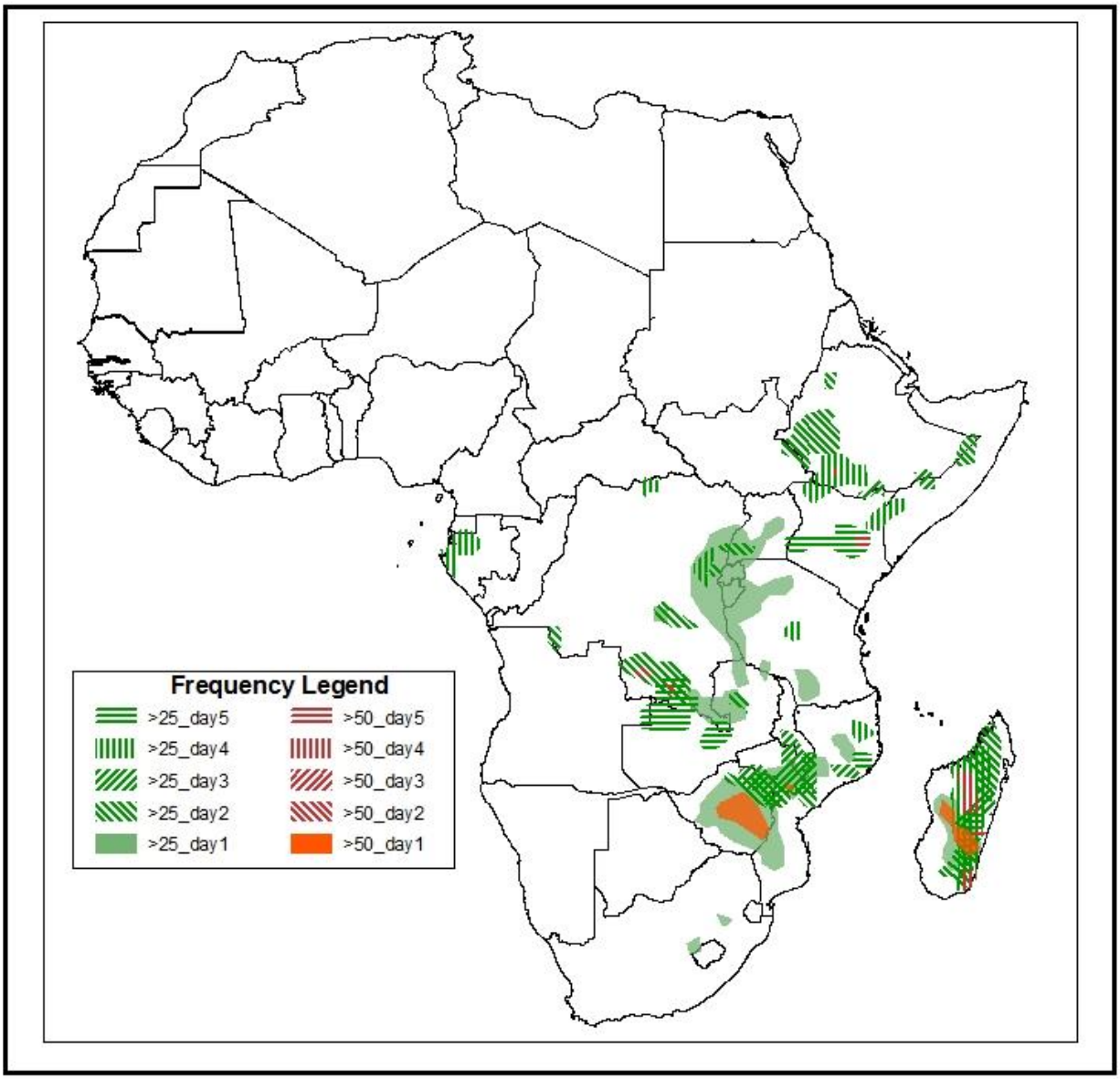
1. Rainfall, Heat Index and Dust Concentration Forecasts, (Issued on December 09, 2019)

1.1. Daily Rainfall and Maximum Heat Index Forecasts *(valid: 10 December – 14 December, 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^{o}C), based on the NCEP/GFS and the NCEP Global Ensemble Forecasts System (GEFS) and expert assessment.



Five Days Rainfall Forecast Summary
December 10 - December 14, 2019

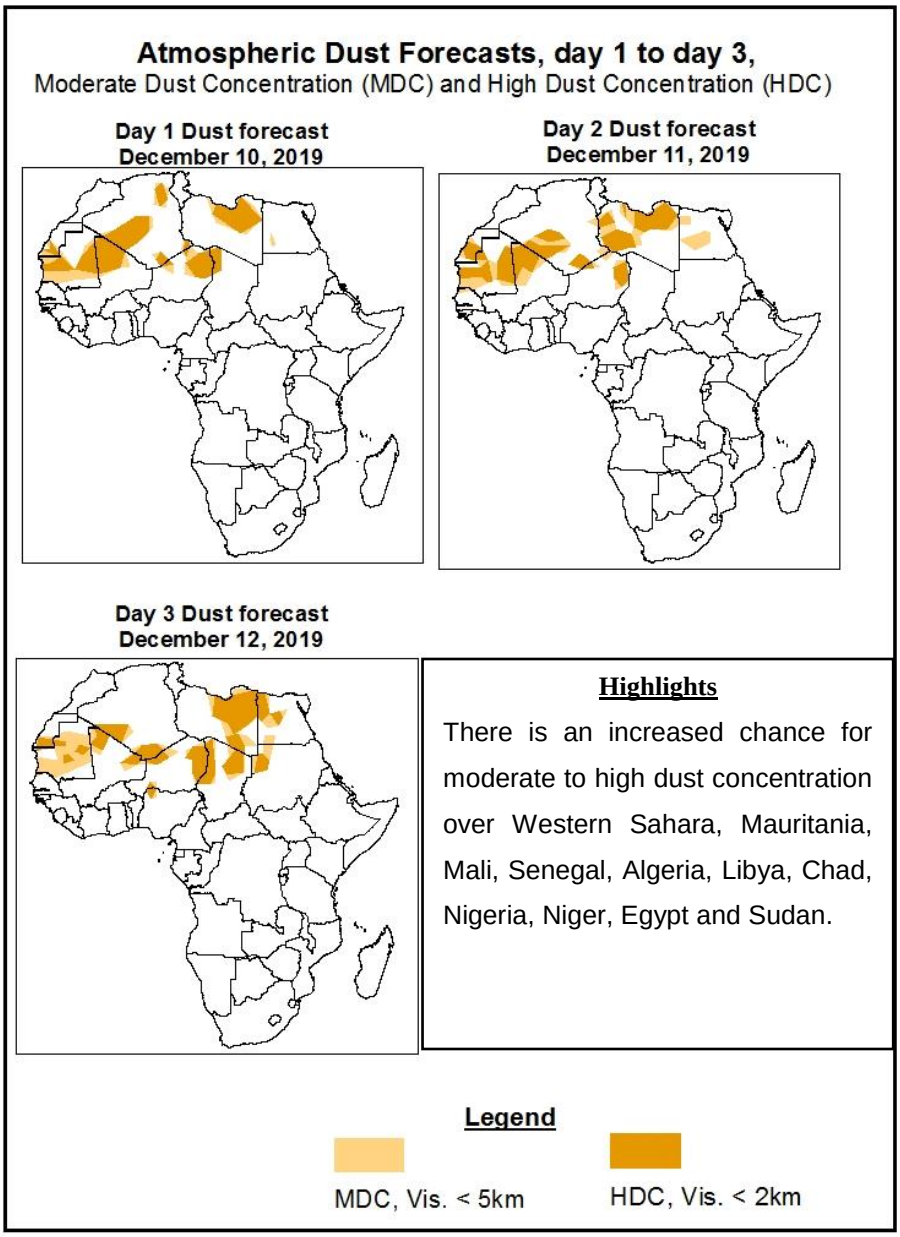


Highlights

- Strong lower-level convergence in the Lake Victoria region and onshore flow from the Indian Ocean with its associated lower-level convergence is expected to enhance rainfall over Central and eastern Africa. On the other hand, the frontal systems in the southeastern Atlantic Ocean together with the onshore flow from the Indian Ocean are expected to enhance rainfall over the southeastern Africa.
- At least 25mm for two or more days is likely over portions of Gabon, Equatorial Guinea, DRC, Angola, Zimbabwe, Mozambique, Madagascar, Zambia, Malawi, Tanzania, Uganda, Kenya, Ethiopia and Somalia.
- There is an increased likelihood for daily rainfall to exceed 50mm over local areas in DRC, Zimbabwe, Mozambique, Madagascar, Kenya and Ethiopia.

1.2. Atmospheric Dust Concentration Forecasts *(valid: 10 Dec – 12 Dec 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: 10 December – 14 December 2019*

The Azores High Pressure system over the Northeast Atlantic is expected to intensify while shifting eastwards with its central pressure value increasing from 1033hPa to 1040hPa during the first two days of the forecast period and then it is expected to start weakening from 1040hPa to 1025hPa during the remainder of the forecast period.

The St. Helena High Pressure system over the Southeast Atlantic Ocean is expected to remain slightly constant at 1023hPa for the first two days of the forecast period while shifting eastwards and then it is expected to intensify with its central pressure value increasing from 1023hPa to 1027hPa during the rest of the forecast.

The Mascarene High Pressure system over Southwest of Indian Ocean is expected to intensify while shifting eastwards with its central pressure value increasing from 1021hPa to 1034hPa during the forecast.

The relatively strong Arabian Ridge is expected to remain active during the forecast period and hence, it will have a significant impact on the weather across most parts of northeastern Africa and Great Horn of Africa.

At 925-hPa level, moist southwesterly flow from the Atlantic Ocean with its low-level convergence is expected to prevail across the Gulf of Guinea, southern Sahel regions and most neighboring areas of Central, western equatorial and southwestern Africa. On the other hand, the combination of southeasterly, easterly and northeasterly flow from the Indian Ocean with their low-level convergences is expected to prevail across most parts of the Greater Horn of Africa, parts of Central and southern Africa.

At 850-hPa level, strong dry northerly flow is expected remain active and prevail across southern Sahel countries. On the other hand, meridional and seasonal wind convergence is expected to remain active across the Lake Victoria region, Congo Basin and the neighboring areas of Central Africa, southern Cameroon, Gabon, Angola, CAR and South Sudan during the forecast period. Converging winds over Kenya, Tanzania, Uganda, DRC, Burundi, Rwanda, Ethiopia, South Sudan, Mozambique, Malawi, Zimbabwe, Zambia, Angola, Namibia,

Botswana, Lesotho and South Africa; these are likely to maintain the occasional enhanced to moderate precipitation over these areas.

Strong lower-level convergence in the Lake Victoria region and onshore flow from the Indian Ocean with its associated lower-level convergence is expected to enhance rainfall over Central and eastern Africa. On the other hand, the frontal systems in the southeastern Atlantic Ocean together with the onshore flow from the Indian Ocean are expected to enhance rainfall over the southeastern Africa. At least 25mm for two or more days is likely over portions of Gabon, Equatorial Guinea, DRC, Angola, Zimbabwe, Mozambique, Madagascar, Zambia, Malawi, Tanzania, Uganda, Kenya, Ethiopia and Somalia. There is an increased likelihood for daily rainfall to exceed 50mm over local areas in DRC, Zimbabwe, Mozambique, Madagascar, Kenya and Ethiopia.

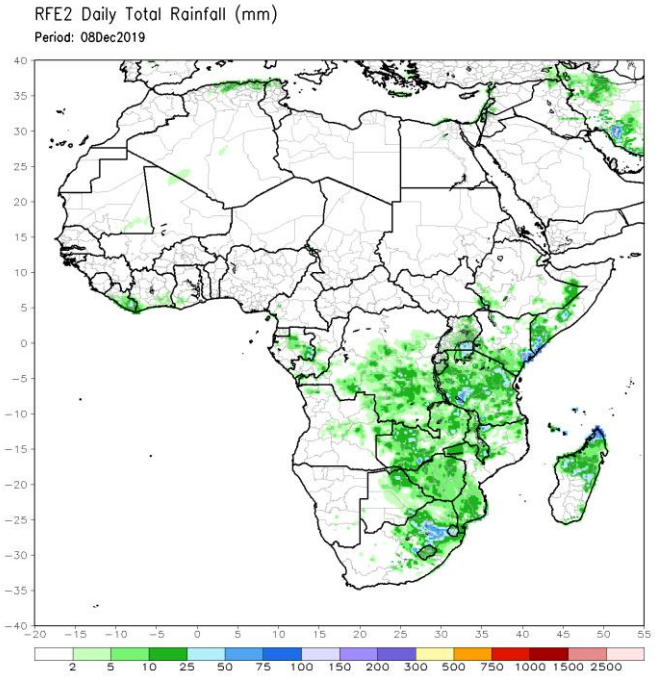
2.0. Previous and Current Day Weather over Africa

2.1. Weather assessment for the previous day (Dec 08, 2019)

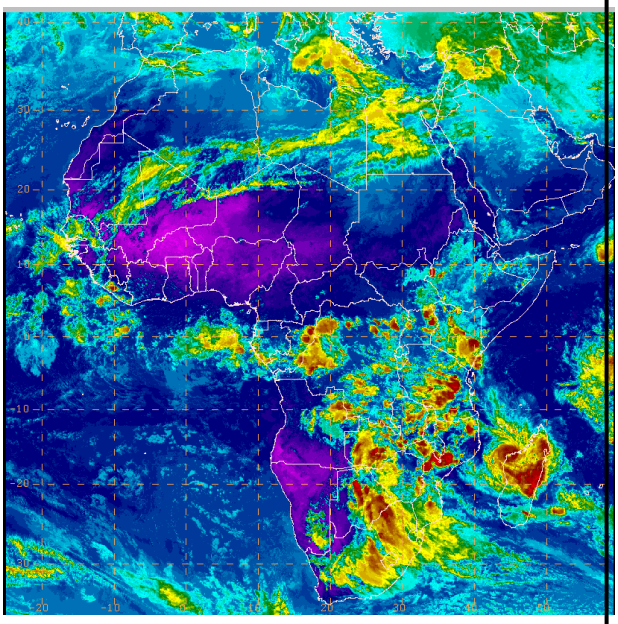
Daily rainfall amount exceeded 25mm over Algeria, Liberia, Cameroon, Gabon, DRC, Uganda, South Sudan, Kenya, Ethiopia, Somalia, Tanzania, Malawi, Zambia, Namibia, Botswana, Zimbabwe, South Africa, Lesotho, Eswatini, Mozambique and Madagascar; and exceeded 50mm over South Africa, Eswatini, Zambia, Malawi, Mozambique, Madagascar, Tanzania, Kenya, Somalia, Uganda and Gabon.

2.2. Weather assessment for the current day (Dec 09, 2019)

Deep convective clouds are observed over many places in the equatorial western Africa, Greater Horn of Africa, Central Africa and portions in southern Africa. The tropical cyclone previous near the tip of Madagascar has made a landfall today over Madagascar



IR Satellite Image (valid 1552 December 09, 2019)



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