

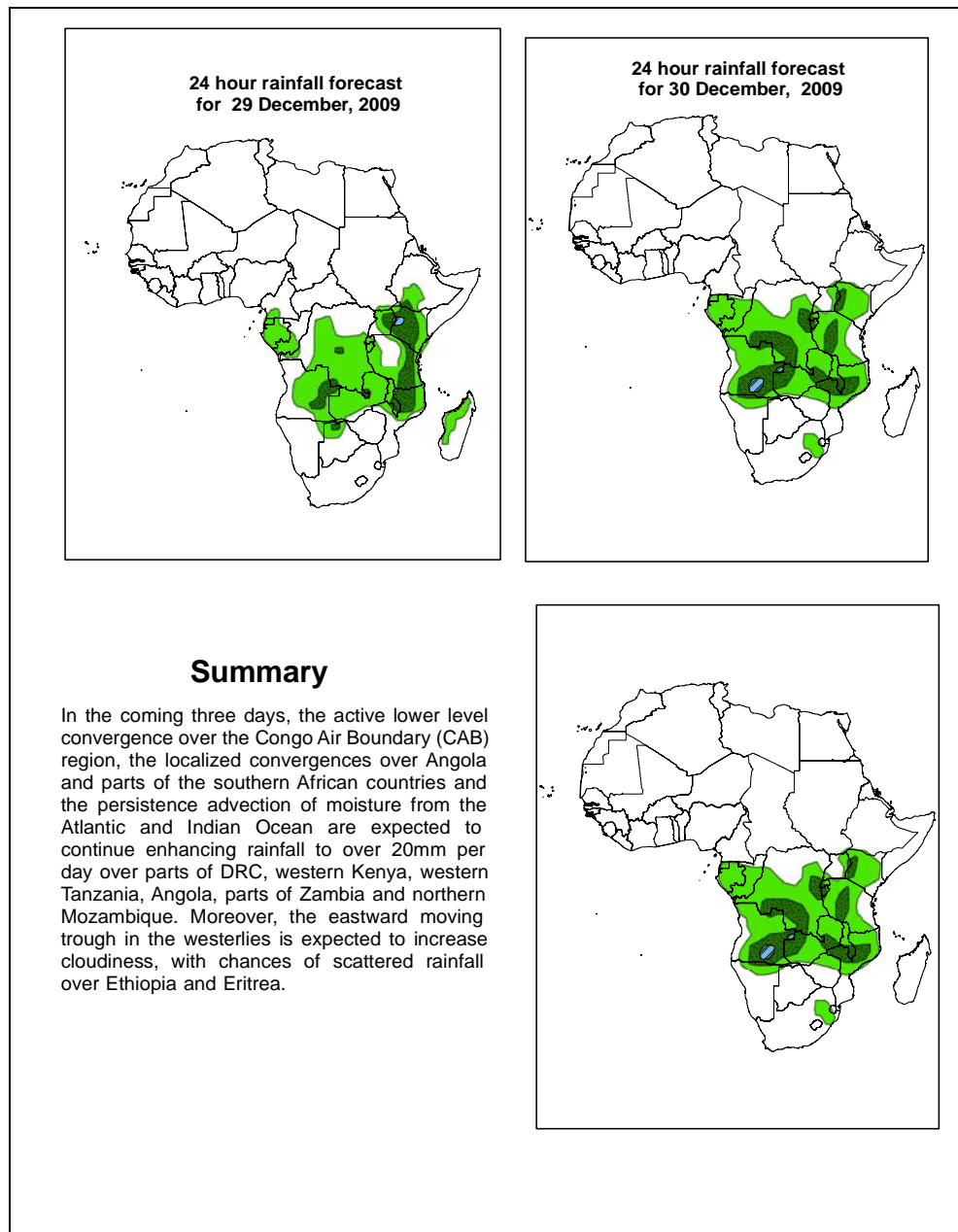


NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 29 December –06Z of 31 December 2009, (Issued at 14:00EST of 28 December 2009)

1.1. Twenty Four Hour Cumulative Rainfall Forecasts

The forecasts are expressed in terms of probability of precipitation (POP) exceedence based on the NCEP, UK Met Office and the ECMWF NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.



1.2. Models Comparison and Discussion - Valid from 00Z of 28 December 2009

A ridge associated with the Saharan high is expected to fill up through 24 to 72 hrs with its central pressure value decreasing from 1024mb to 1021mb (on GFS model), from 1023 to 1020mb (on ECMWF model) and from 1022 to 1020 (on UK Met Office model). Similarly, the Arabian high pressure system is expected to weaken, while shifting towards the east through 24 to 72 hrs. Especially, the UK Met Office model indicates a significant decrease in mean sea level over the Arabian Peninsula, from 1018mb to 1011mb through 24 to 72 hrs. This decrease in mean sea level pressure value over the Arabian Peninsula is associated with an approach of a mid-latitude frontal system in the coming three days.

At 850mb level, a strong cross equatorial flow is expected across the coastal areas of eastern and southern African countries through 24 hrs. However, the cross equatorial flow is expected to weaken gradually with development of lower level circulation over western Indian Ocean. Moreover, a westerly trough associated with a mid-latitude frontal system is expected to move between 30°E longitude and 40°E longitude through 24 to 72 hrs. The southern extent of the trough is expected to reach the latitudes of northern Sudan and Eritrea. Moreover, with the approach of the westerly trough the Arabian anticyclone is expected to shift towards the periphery of Arabian Sea, resulting in increase in the zonal component of the flow towards the Horn of Africa countries. However, the ECMWF and UK Met Office models tend to underestimate the influence of the mid-latitude frontal system over northeast African region. On the other hand, the lower level convergence over the Congo Air Boundary (CAB) region as well as the lower level convergence over Angola is expected to remain active through 24 to 72 hrs, maintaining moderate to heavy rainfall over much of the seasonal rain-getting areas.

At 500mb level, consistent with the lower tropospheric flow, the axis of the mid-latitude trough in the westerlies is expected to shift from about 30°E longitude to about 40°E longitude through 24 to 72 hrs. With the southern extent of the trough reaching the Eritrean latitude, its associated northwesterly flow, west of the trough axis, is expected to advect mid-tropospheric cold air into the tropical latitudes, resulting in interaction between mid-latitude and tropical air mass. On the other hand, the sub-tropical areas of the southern hemisphere are expected to remain under the influence of mid-tropospheric zonal westerly flow through 24 to 72 hrs.

At 200mb, consistent with the lower and mid-tropospheric flow, places ahead of the troughs in the westerlies are characterized by strong jet wind. Hence, the jet speed is expected to exceed 130kts over northeast Atlantic Ocean and adjacent areas, with the maximum wind exceeding 150kts at places through 24 hrs. This jet core is expected to shift eastward while slightly weakening in the intensity through 48 to 72hrs. On the other hand, a southwest-northeast oriented strong jet is expected ahead of the axis of the westerly trough in the region between southern Egypt and Iraq. The zone of maximum wind is expected to shift eastward, with the movement of the trough in the westerlies.

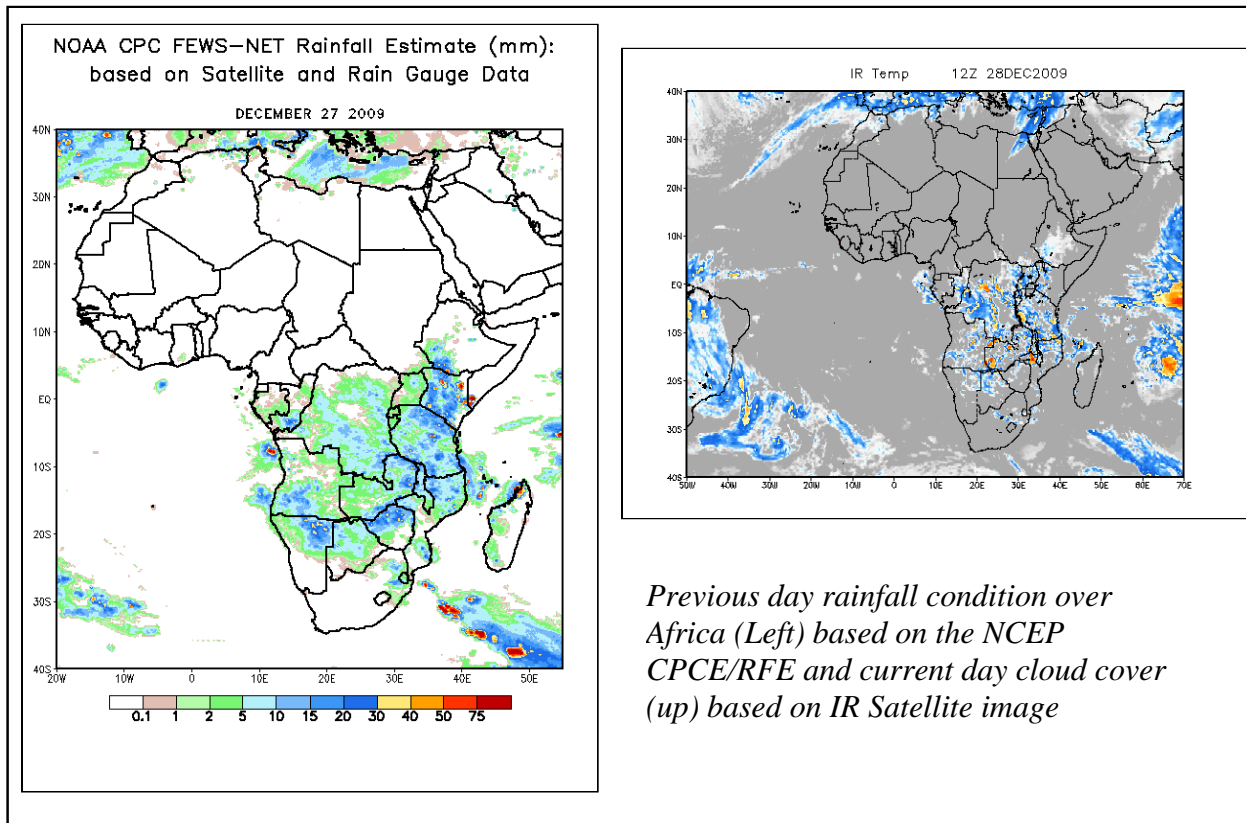
Especially, the UK Met Office model indicates strong persistent jet wind in this area through 24 to 72 hrs.

In general, the active lower level convergence over the Congo Air Boundary (CAB) region, the localized convergences over Angola and parts of the southern African countries and the persistence advection of moisture from the Atlantic and Indian Ocean are expected to continue enhancing rainfall to over 20mm per day over parts of DRC, western Kenya, western Tanzania, Angola, parts of Zambia and northern Mozambique. Moreover, the eastward moving trough in the westerlies is expected to increase cloudiness, with chances of scattered rainfall over Ethiopia and Eritrea.

2. 0. Previous and Current Day Weather Discussion over Africa (27 –28 December 2009)

2.1. Weather assessment for the previous day (27 December 2009): During the previous day, moderate to heavy rainfall events were observed over southwest Ethiopia, Kenya, Tanzania, southern Angola, northern Namibia, parts of Zambia and Zimbabwe and northern Madagascar.

2.2. Weather assessment for the current day (28 December 2009): Intense clouds are observed over western parts of equatorial Africa, the CAB region and parts of the south African countries.



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

Author(s): Edson Nkonde (Zambia Meteorological Department/CPC-African Desk)
Anthony Twahirwa (Rwanda Meteorological Services / CPC-African Desk)

Disclaimer: *This bulletin is for training purposes only and should be used as guidance. NOAA does not make forecasts for areas outside of the United State.*