

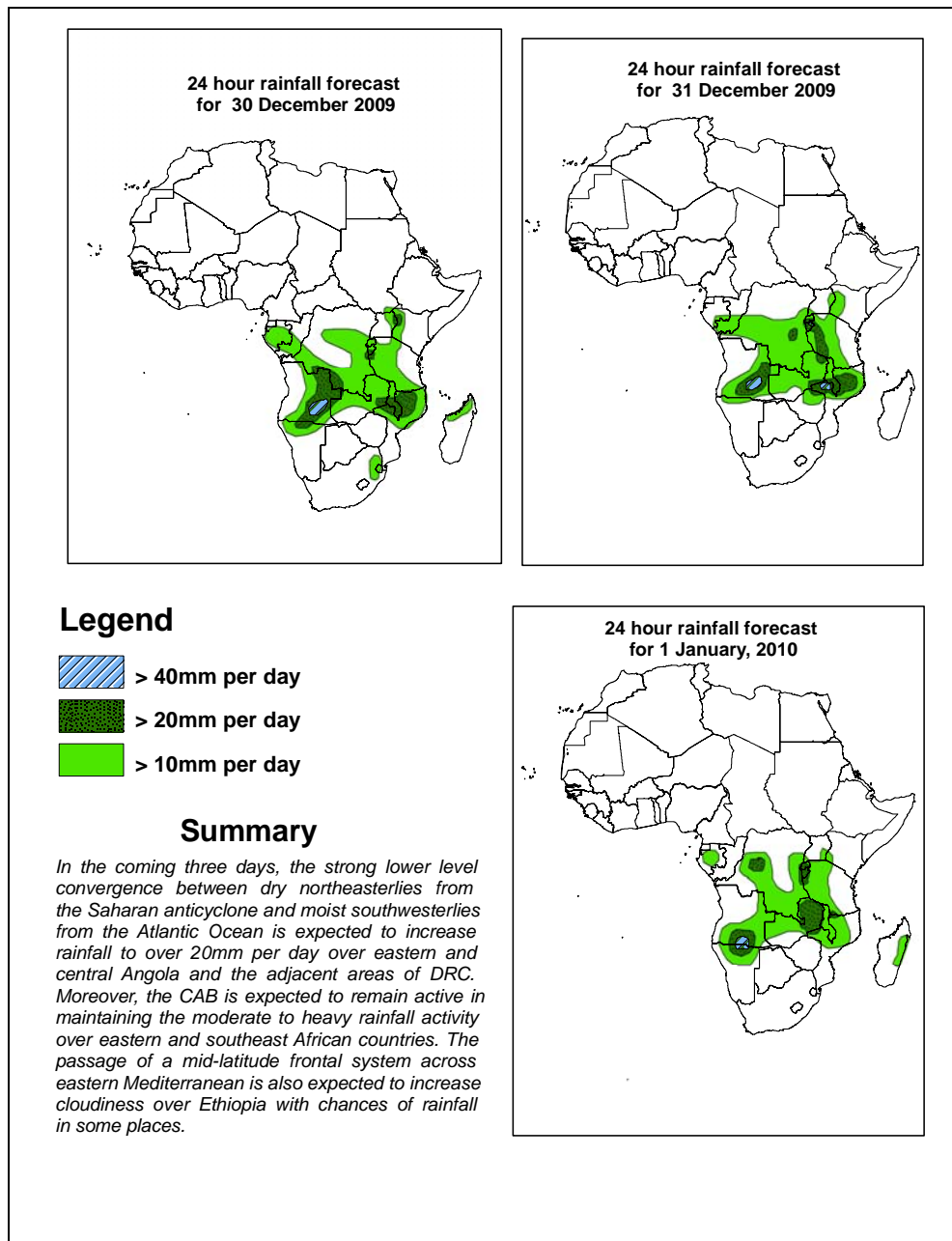


NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 30 December –06Z of 01 January 2009, (Issued at 14:00EST of 29 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, while expanding towards the Arabian Peninsula. The maximum mean sea level pressure within the extent of the ridge is expected to decrease from 1023mb to 1019mb (on GFS model) and from 1022 to 1020mb (on ECMWF model). Similarly, the Arabian high is expected to fill up gradually while shifting towards the Arabian Sea. The weakening of the Arabian High is associated with the approach of a mid-latitude frontal system in the coming three days.

At 850mb level, the peripheral winds from the Saharan Anticyclone are expected to dominate the flow over northern Africa. The associated cross equatorial flow is expected to dominate the flow over western parts of equatorial Africa and expected to expand eastwards covering central and parts of northeast Africa through 24 to 72 hrs. On the other hand, a westerly trough associated with a mid-latitude frontal system is expected to move between 35°E longitude and 50°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 enhanced easterly flow towards the Horn of Africa countries. However, the ECMWF and UK Met Office models tend to underestimate the influence of the lower tropospheric mid-latitude frontal system over northeast African region. In general, as the westerly trough crosses the 40°E longitude, the persistent convergence over the CAB region tends to expand towards the northern latitudes. Hence, a strong north-south oriented lower level convergence is expected in the region between central Ethiopia and Zambia through 24 to 72 hrs. On the other hand, the lower level convergence between northeasterly winds from the Saharan anticyclone and westerly to southwesterly winds from the Atlantic Ocean is expected to remain active over Gabon, Congo, Angola and parts of DRC. The models also expect localized convergences over parts of Namibia and South Africa in the coming three days. The ECMWF model indicates a deep cyclonic circulation approaching Madagascar within 72 hrs. However, the GFS and UK Met Office models tend to underestimate the intensity of this system.

At 500mb level, consistent with lower tropospheric flow, the axis of the mid-latitude trough in the westerlies is expected to shift from about 38°E longitude to about 45°E longitude through 24 to 72 hrs. With the southern extent of the trough reaching the Eritrean latitude, its associated northerly 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. Unlike, the lower tropospheric level, all the three models are in agreement in indicating the time and space evolution of this mid latitude frontal system. In the southern hemisphere, a mid latitude frontal system is expected to approach the western coastal areas of South Africa after 72hrs.

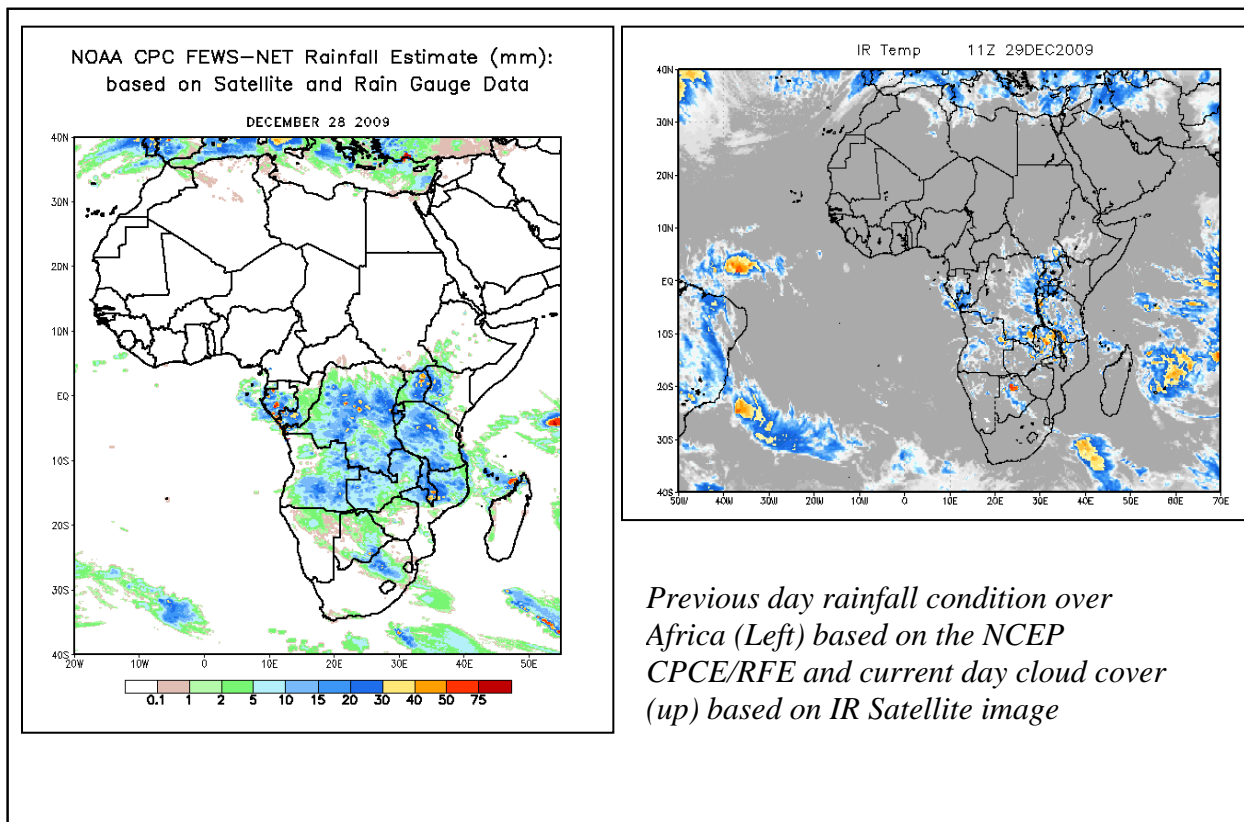
At 200mb, consistent with the lower and mid-tropospheric flow, places ahead of the troughs in the westerlies are characterized by strong jet wind. Hence, the jet is expected to exceed 130kts over northeast Atlantic Ocean and adjacent areas, with the maximum wind exceeding 150kts in some places through 24 to 72 hrs. This jet core is expected to shift eastward maintaining its intensity. On the other hand, a southwest-northeast oriented strong jet is expected ahead of the axis of the westerly trough. The zone of maximum wind is expected shift eastward along with the movement of the westerly trough. Especially, the UK Met Office model indicates strong persistent jet wind in this area through 24 to 72 hrs.

In the coming three days, the strong lower level convergence between dry northeasterlies from the Saharan anticyclone and moist southwesterlies from the Atlantic Ocean is expected to increase rainfall to over 20mm per day over eastern and central Angola and the adjacent areas of DRC. Moreover, the CAB is expected to remain active in maintaining the moderate to heavy rainfall activity over eastern and southeast African countries. The passage of a mid-latitude frontal system across eastern Mediterranean is also expected to increase cloudiness over Ethiopia with chances of rainfall in some places.

2. 0. Previous and Current Day Weather Discussion over Africa (28 –29 December 2009)

2.1. Weather assessment for the previous day (28 December 2009): During the previous day, moderate to heavy rainfall events were observed over Gabon, DRC, Uganda, Tanzania, Malawi, southern Angola, parts of Zambia and Mozambique.

2.2. Weather assessment for the current day (29 December 2009): Intense clouds are observed over Gabon, southern parts of Congo, The Great Lake Region, parts of Tanzania, Zambia, Malawi and Botswana.



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 States.