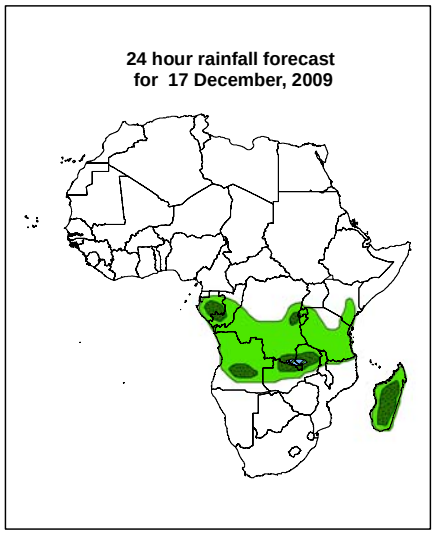
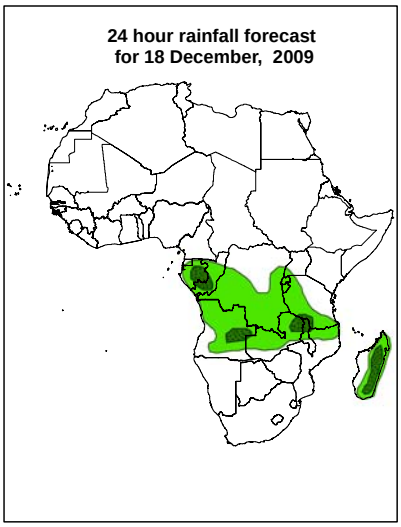
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 17 December – 06Z of 19 December 2009, (Issued at 14:00EST of 16 December 2009)

1.1. Twenty Four Hour Cumulative Rainfall Forecasts

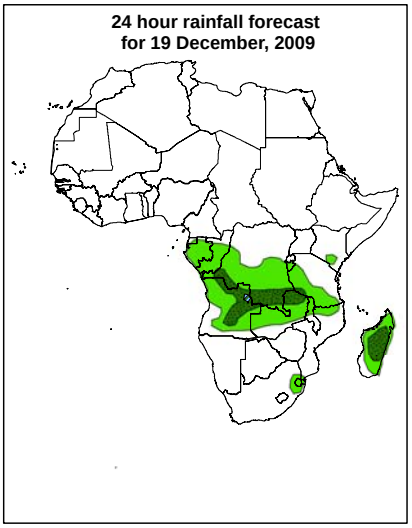
The forecasts are expressed in terms of probability of precipitation (POP) exceedence based on the NCEP, UK Met Office and the ECMWF NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.





Legend

- >40mm per day
- > 20mm per day
- > 10mm per day



Summary

In the coming three days, with the expected weakening of the seasonal and localized low level convergence and confluence zones, the rainfall activity is expected to remain weak, especially over northern parts of the Congo Air Boundary (CAB) region. However, as a result of conducive lower tropospheric conditions over southern African countries, the moderate to heavy rainfall activity is expected to continue over Angola, Zambia and Madagascar.

1.2. Models Comparison and Discussion - Valid from 00Z of 16 December 2009

At the surface level, a ridge associated with the Saharan High is expected to extend in the region between Western Sahara and Egypt, with central pressure value of about 1020mb during 24 hrs. In the succeeding 48 hrs, this ridge is expected to weaken over the western areas and persist over the eastern regions. The GFS and ECMWF models forecasts indicate that the mean sea level pressure values are expected to decrease between 1020mb at 24hrs to 1018 at 72 hrs over the western parts of the sub-tropical regions of Africa. On the other hand, the St. Helena Anticyclone over southeast Atlantic Ocean is expected to intensify slightly from mean sea level pressure value of 1019mb at 24hrs to 1020mb at 72hrs. The low pressure system over Botswana is expected to extend towards the adjacent areas of South Africa. This low pressure system is expected to slightly deepen from 1007mb mean sea level pressure value to 1006mb through 24 to 72 hrs. In general, the ECMWF model tends to deepen the low pressure systems by about 1mb, while it tends to intensify the high pressure systems by about 1mb, when compared with the GFS and UK Met Office Models.

At 850mb level, a northeasterly flow over the coastal areas of Somalia turns into a northerly flow over the coastal areas of Kenya and Tanzania and further changes its direction to northwesterly and westerly by the time it reaches the coastal areas of Mozambique. The flow is expected to maintain its meridonial component through 24 to 72hrs along the coastal areas of East African countries. In the coming three days, with less moist wind coming from the Indian Ocean side, the seasonal convergence over the Congo Air Boundary (CAB) area is expected to weaken, resulting in reduced rainfall activity, especially, in the northern parts of the CAB region. However, an east-west oriented lower level convergence is expected between northerly and southerly winds. As a result of this, the moderate to heavy rainfall activity is expected to remain in the region between Angola and Zambia. On the other hand, a cyclonic circulation, associated with mid- latitude frontal system, is expected to move from its current position over Mozambique Channel to a region south of Madagascar, while weakening.

At 500mb level, the westerly flow in the southern hemisphere is expected to have a stationary wave pattern, with trough axes extending northwards off the eastern and western coasts of South Africa. Between these two trough axes, a mid tropospheric ridge is expected to remain over Namibia and the adjacent areas of Botswana through 24 to 72 hrs. On the other hand, the mid-latitude westerlies are expected to dominate the flow over Libya, Egypt, northern Sudan and Eritrea through 24 to 72 hrs. In general, the UK Met Office model indicates relatively stronger ridge in the mid-tropospheric flow over the sub-tropical areas as compared to the ECMWF and GFS models.

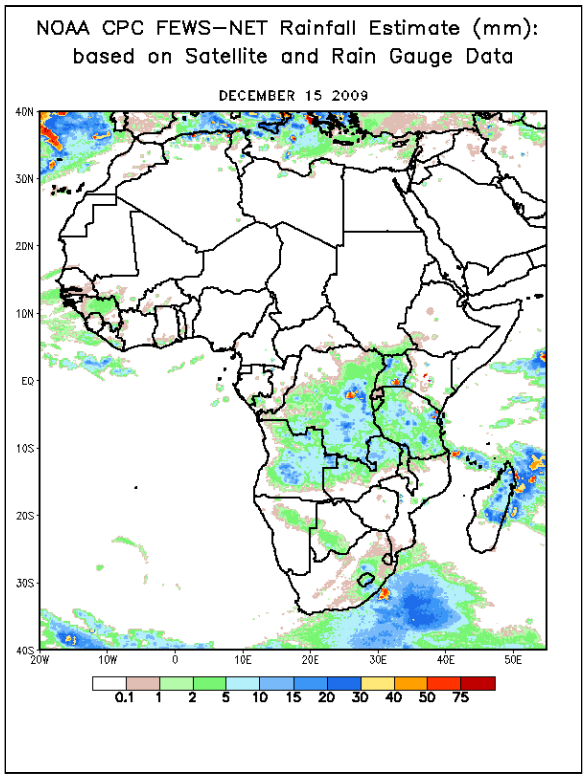
The maximum wind peed at 200mb level is expected to exceed 110kts over Egypt during 24 hrs. However, the wind speed is expected to weaken slightly after 48 hrs while shifting towards the Mediterranean area. On the other hand, with southward expansion of the upper tropospheric westerly flow, the zone of sub-tropical westerly Jet wind is also expected to expand southwards to the extent of the latitudes of Eritrea, as indicated in the UK Met Office model forecasts. In general, the UK Met Office model indicates stronger jet wind, covering relatively wider area as compared with the ECMWF and GFS models.

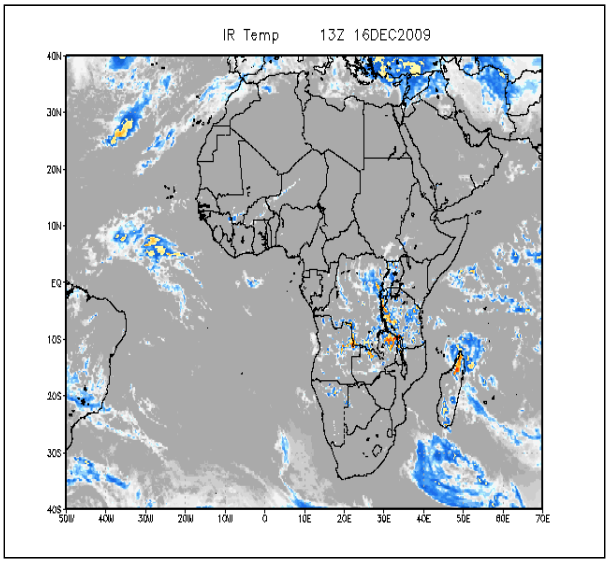
In the coming three days, with the expected weakening of the seasonal and localized low level convergence and confluence zones, the rainfall activity is expected to remain weak, especially over northern parts of the Congo Air Boundary (CAB) region. However, as a result of conducive lower tropospheric conditions over southern African countries, the moderate to heavy rainfall activity is expected to continue over Angola, Zambia and Madagascar.

2. 0. Previous and Current Day Weather Discussion over Africa (15 –16 December to 2009)

2.1. Weather assessment for the previous day (15 December 2009): During the previous day, moderate to heavy rainfall events were observed over much of DRC, Angola, Uganda, parts of Zimbabwe, Tanzania and northern Madagascar.

2.2. Weather assessment for the current day (16 December 2009): Intense are observed over eastern DRC, Rwanda, Burundi, Uganda, parts of Tanzania and Zambia.





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

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