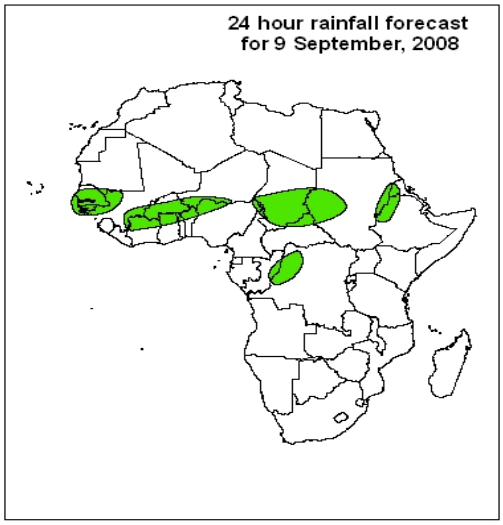
Forecast Guidance for Africa

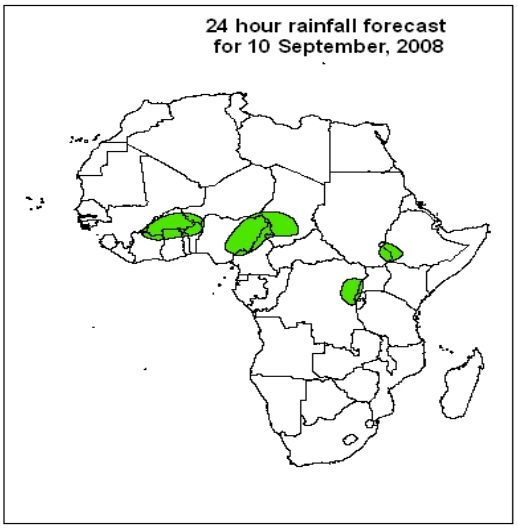
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative.

FORECAST DISCUSSION 14H00 EST, 08th SEPTEMBER, 2008
Valid: 00Z 09th September – 11th SEPTEMBER, 2008

1. Twenty Four Hour Cumulative Rainfall Forecasts

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

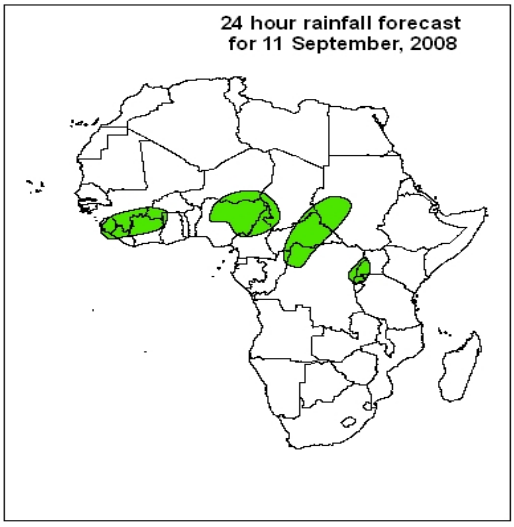




Legend

> 30mm, with probability 50%

> 20mm, with probability 40%



Summary

Cyclonic vortices and mid-level troughs traversing over west Africa coupled with the influx of moisture from the Gulf of Guinea will enchance chance for rain particularly over southern Sahel. Localized convergence and Moisture advection from the Gulf of Guinea and Congo Basin will also enhance rain over some parts of Central Africa.

2. Model discussion

Model comparison (Valid from 00Z; 09th September 2008): all the three models are in general agreement especially with respect to the positioning of large scale features, however, the UK model has a tendency to give lower values than the GFS and ECMWF models in the Equatorial (10°S and 10°N) Continental Africa.

2.1. Flow at 850hPa:

T+24h, the flow over North Africa will be dominated by the Saharan anticyclonic circulation system centered over the coast of Tunisia. However, the wind flow over northwestern Sahel is expected to originate from the Azores anticyclonic circulation system. Between these two anticyclonic circulation systems will be a mid-latitude trough from the northeast Atlantic Ocean penetrating deep onto western Algeria. Cyclonic vortices are expected over eastern Mali and southeastern Chad; whereas an anticyclonic vortex will occur over the border between CAR and DRC. Scattered Localized convergence is likely over Mali and central Sahel, eastern Sudan, Cote d'Ivorie, central CAR, central Ethiopia, Lake Victoria region, southern DRC and northeastern Angola. Conversely, localized divergence is likely to occur over the coast of Liberia, eastern Gulf of Guinea, western Sudan and East Africa. Much of Southern Africa is expected to be under the influence of an anticyclonic ridge from both the St. Helena and Mascarene Anticyclonic systems centered over the southern Atlantic and Indian Oceans respectively. However, the southwestern sector will be under the influence of a mid-latitude trough.

T+48, a similar flow to that of the previous day will prevail over North Africa and western Sahel. The cyclonic vortex over eastern Mali will drift slightly southwestwards to central Mali and the one over eastern Chad will propagate towards Lake Chad area. Localized convergence will prevail over central Sahel, northern Sudan, scattered over the Gulf of Guinea Countries eastern Ethiopia Lake Victoria region and western DRC; whereas, localized divergence will prevail over eastern Gulf of Guinea, southern Sudan, northern DRC and East Africa. The mid-latitude trough featured over southwestern Southern Africa will weaken; but, the southern coast will be affected by a westerly wave.

T+72, the Azores anticyclonic circulation is expected to extend its ridge further northeastwards. A new cyclonic vortex will evolve over east of Atlas mountain while those featured traversing the Sahel will be centered over the borders between Mali/ Cote d'Ivorie and Niger/ Nigeria. The St. Helena's ridge is expected to extend further eastwards over Southern Africa.

2.2. Flow at 500hPa:

T+24, an extensive Sub-Tropical anticyclonic circulation system is expected to prevail over Northern Africa with two mid-level troughs featured over northeastern Atlantic Ocean and Libya respectively. South of the anticyclonic system are easterlies, in which shortwave troughs are embedded, with their axes lying over Ghana and southwestern Nigeria. A deep cyclonic Vortex is expected to be featured over southern Chad; whereas, confluent flows are likely to occur over central Nigeria, southern CAR, southern Ethiopia and western

DRC. Much of Southern Africa will be under the influence of a Sub-Tropical anticyclonic system. The southern most part will be dominated by a westerly wave while a mid-level cut-off cyclonic circulation will be featured over the Mozambique Channel.

T+48, similar flow patterns to that of the previous day are expected to prevail over Northern and Southern Africa. However, the mid-level shortwave trough featured over Ghana will decay while the one over Nigeria will prevail. The cyclonic vortex over Chad will propagate southwestwards to eastern Nigeria. Confluent flows are likely over southern Chad, southern Ethiopia and the Lake Victoria region while diffluent flow will prevail over much parts of Congo Basin.

T+72, the main changes expected on the general flow as compared to that of the previous day will be the development of a cyclonic circulation over Gibraltar, northwestern coast of Egypt and over the border between Mali, Guinea and Cote d'Ivorie.

2.3. Flow at 200hPa:

T+24h, an extensive upper-level anticyclonic flow pattern is expected to prevail over the entire Northern Africa. A westerly wave will dominate the flow over the northwestern Maghreb region, north of the anticyclonic flow; while easterlies will prevail to the south with a shortwave trough featured over Sudan. Much of Southern Africa will be dominated by a Sub-Tropical anticyclonic flow except over South Africa and Mozambique Channel which are likely to be under the influence of a westerly wave and cyclonic circulation.

T+48h, the flow is expected to be similar to that of the previous day. However, the centers of action over Northern Africa will propagate eastward by ~8 degrees longitude.

T+72h, the westerly wave over North Africa is expected to deepened with cyclonic circulations developing over Gibraltar and northeastern coast of Libya and their associated trough extending further south over the coastline of Morocco and southeastern Libya respectively. The cyclonic circulation over Mozambique Channel is likely to persist and shift slightly southwards.

Authors:

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