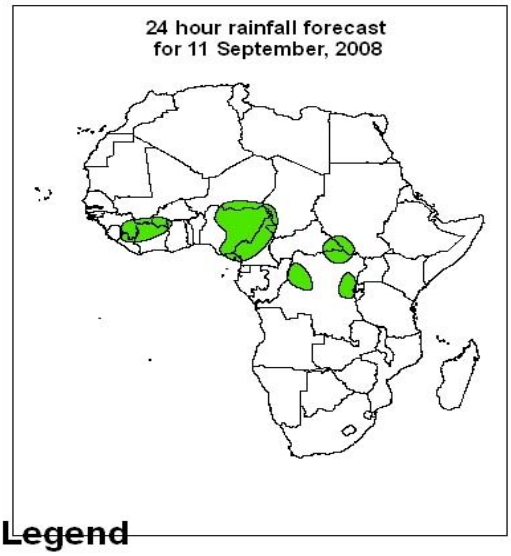
Forecast Guidance for Africa

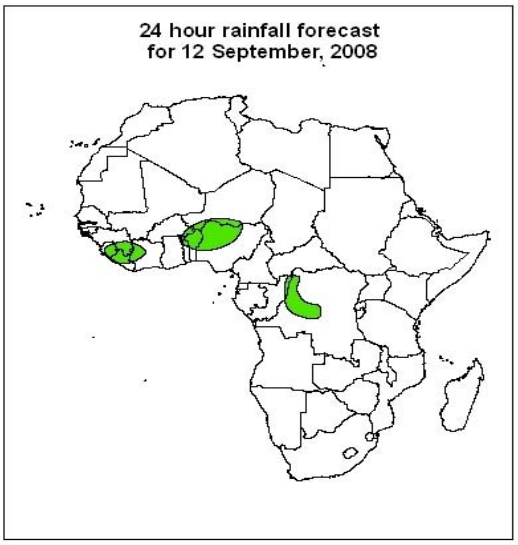
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative.

FORECAST DISCUSSION 14H00 EST, 10th SEPTEMBER, 2008
Valid: 00Z 11th September – 13th 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.



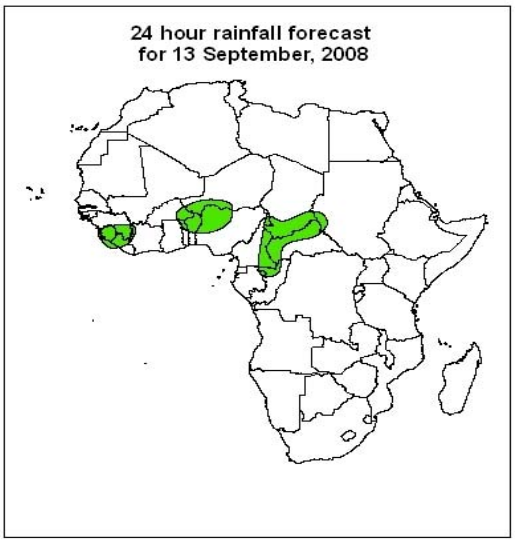


Legend

africa_countries_new

> 30mm, with probability 50%

> 20mm, with probability 40%



Summary

The Azores anticyclonic circulation featured at the mid and upper levels will likely suppress rain over western Sahel. However, cyclonic vortices and Localized convergence expected over other parts of west and central Africa coupled with Moisture influx from the Gulf of Guinea and Congo Basin will enchance chance for rain over those areas.

2. Model discussion

Model comparison (Valid from 00Z; 11th 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^oS and 10^oN) Continental Africa.

2.1. Flow at 850hPa:

T+24h, the Saharan anticyclonic circulation system is expected to dominate the flow over much of the Maghreb region with a cyclonic vortex centered over the Libyan coast. On the other hand, the wind flow over the western bulge of West Africa is expected to originate from the Azores anticyclonic circulation system. Between these two anticyclonic circulation systems will be a mid-latitude cyclonic vortex centered over northeastern Morocco. Localized convergence is likely over Niger, southeastern Nigeria, northeastern Chad, central and eastern Ethiopia, Lake Victoria region, central and southern DRC. Conversely, localized divergence is likely to occur over southern Mali and environs, the Gulf of Guinea, eastern CAR, Sudan, northern DRC and East Africa. Much of Southern Africa is expected to be under the influence of an anticyclonic ridge as a result of the merger between the St. Helena and Mascarene anticyclonic systems centered over the southeastern Atlantic and southern Indian Oceans respectively.

T+48, a similar flow to that of the previous day will prevail over North Africa. However, the cyclonic vortex over Morocco is expected to drift southwestwards to western Algeria while the one over Libya will remain quasi-stationary but weaken. Other cyclonic vortices will evolve over southern Senegal/Bissau, central Mali and northwestern Nigeria. Localized convergence is likely to occur over eastern Chad, eastern Ethiopia, central and southern DRC and Lake Victoria region; whereas, localized divergence will prevail over Mauritania, the Gulf of Guinea Countries stretching from Liberia onwards to Nigeria/Cameroon and further to western Ethiopia and over much of East Africa. The entire Southern African region is expected to be under the influence of an anticyclonic system centered at the southern coastline of South Africa; except for Madagascar which is likely to be affected by a cut-off cyclonic circulation.

T+72, there is a likelihood that the Saharan anticyclonic circulation will intensify and extend its ridge eastwards towards Arabia, while the flow from the Azores anticyclonic circulation is expected to be confined over the Atlantic Ocean . The cyclonic vortex over Morocco will remain quasi-stationary but weaken while the one over Libya will decay. The one over Senegal will propagate northwestwards to be centered off the coast of Mauritania while the other featured over central Mali will remain quasi-stationary. Localized convergence will likely occur over northern sectors of Ethiopia, western Congo Basin, southern DRC and over the border of Angola and Namibia. Diffluent flow will continue to prevail over the Gulf of Guinea Countries onwards to Sudan and over northwestern DRC. The entire Southern African region is expected to be under the influence of an off -Shore anticyclonic system centered off the southeastern coast of South Africa.

2.2. Flow at 500hPa:

T+24, an extensive Sub-Tropical anticyclonic circulation system is expected to prevail over Northern Africa with two well pronounced mid-level troughs featured over Morocco and Libya/Egypt respectively. Embedded within these troughs are cut-off cyclonic circulations with centers over western Morocco and northeastern Libya. South of the anticyclonic system are easterlies, in which shortwave troughs are embedded, with their axis centered over Lake Chad and central Sudan. A cyclonic circulation is expected to be featured over central Nigeria with confluent flow-lines stretching from southeastern Nigeria to western Chad and over Lake Victoria region. The flow over the northern sectors of Southern Africa will be dominated by a Sub-Tropical anticyclonic system; whereas, a westerly wave will prevail over the southern sectors and a mid-level cut-off cyclonic circulation is expected over the Mozambique Channel.

T+48, similar flow patterns to that of the previous day are expected to prevail over Northern Africa. However, the mid-level trough over Morocco is expected to extend southwestwards to Mauritania. The cyclonic circulation featured over Nigeria will propagate northwestwards to northeastern Nigeria/southern Niger. The mid-level shortwave troughs featured over Lake Chad and Sudan will decay while another is likely to evolve over Cote d'Ivorie leaning northeastwards to Burkina. An anticyclonic circulation is likely to evolve over eastern Nigeria. Confluent flows are likely to occur over CAR, and northwestern DRC; whereas, diffluent flow will prevail over much of Eastern Sahel and Eastern Africa. The cyclonic circulation over Mozambique Channel will weaken and be replaced by a back-hanging trough centered over Madagascar.

T+72, the main changes expected on the general flow as compared to that of the previous day will be the slight eastward propagation of the mid-level troughs over North Africa. The cyclonic vortex over northwestern Nigeria/southern Niger will shift to the border of Mali/ Niger. The anticyclonic circulation over eastern Nigeria will move to the coast of Benin, Togo and Ghana. Confluent flows are expected over the northern fringes of Cote d'Ivorie onto Benin and the Lake Victoria region, whereas diffluent flows will persist over Southeastern Sahel, DRC and parts of Eastern Africa. The trough over Madagascar will prevail but much of Southern Africa will be under the influence of an anticyclonic circulation.

2.3. Flow at 200hPa:

T+24h, an extensive upper-level anticyclonic flow pattern will prevail over Sahel/Sahara extending into Arabia. A westerly wave accompanied by upper-level troughs, are expected over North Africa with the trough axes centered over Morocco and Libya respectively. Easterlies will dominate the flow equator-wards with confluent flow featured over eastern Nigeria and CAR. The northern sector of Southern Africa will be dominated by an anticyclonic flow while the southern sector will be under the influence of a westerly wave and a cut-off cyclonic circulation likely over the Mozambique Channel.

T+48h, the flow is expected to be similar to that of the previous day except, that the cyclonic circulation over Mozambique Channel will fill-up.

T+72h, the main changes that are likely to influence the flow over Northern Africa will be the further extension of the trough over northwestern Maghreb onto western Mauritania, while over Southern Africa the westerly wave is expected to extend equator-ward.

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