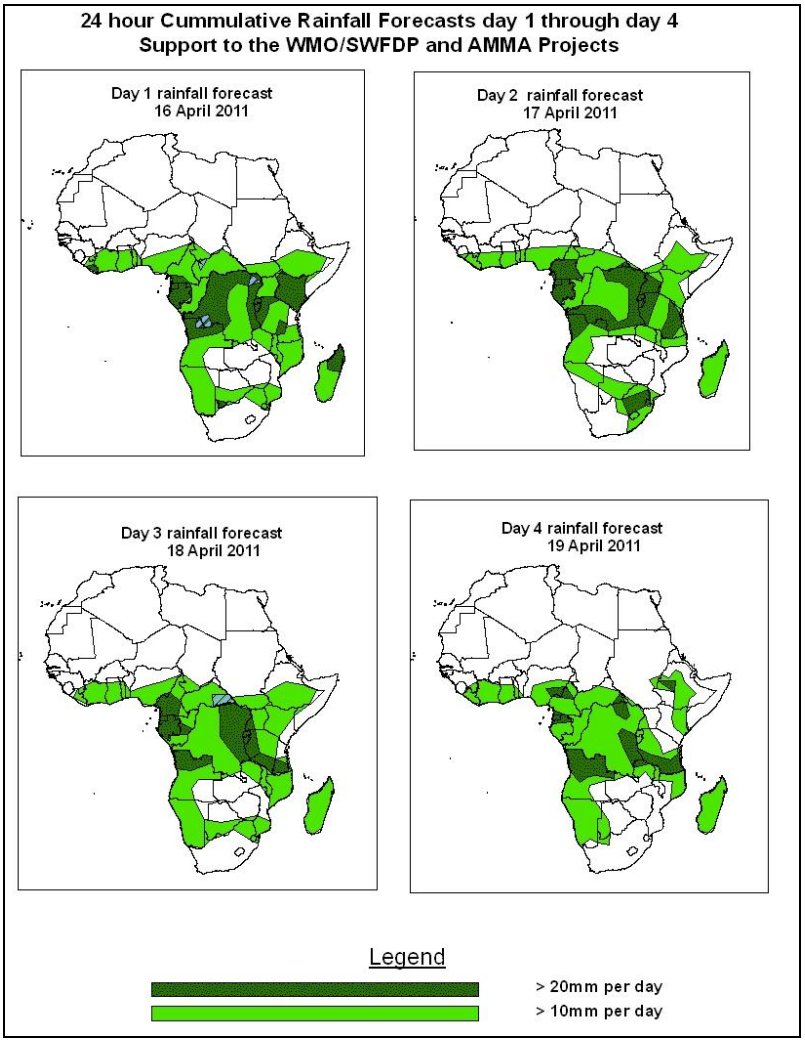
NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

1.0. Rainfall Forecast: Valid, 06Z of 16 April – 06Z of 19 April 2011, (Issued at 11:45Z of 15 April 2011)

1.1. Twenty Four Hour Cumulative Rainfall Forecasts

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



Summary

In the next four days, the active seasonal wind convergence in the CAB region, the persistent moist easterly winds into East Africa from western Indian Ocean and the westward propagating thunderstorms between central African region and the western parts of equatorial Africa are expected to maintain moderate to heavy rainfall in the respective region. In general, there is an increased chance for daily rainfall values to exceed 20mm over Gabon, Equatorial Guinea, southern Cameroon, Congo, and northern Angola, parts of DRC, CAR, Tanzania and portions of Ethiopia. Heavy rains are also expected over portions of South Africa and Swaziland due to the influence of mid-latitude frontal systems.

1.2. Models Comparison and Discussion-Valid from 00Z of 13 April 2011

In general the GFS, ECMWF and UKMET models more or less indicate the east-west oriented equatorial trough in its climatological position. This trough is formed by a series of cut off lows over southern Sudan, parts of Central African region and the coast of the Gulf of Guinea. In the coming four days, the lowest pressure values along this trough is expected to be as low as 1002hpa along its eastern end, according to GFS and UKMET models, while the ECMWF model forecasts lowest pressure value of 1003hpa during the forecast period. On the other hand, the GFS and the ECMWF models predicted mean sea level pressure values as low as 1004hpa in the Gulf of Guinea region, while the UKME model predicted slightly higher pressure values (1005hpa). The lows associated with the meridional arm of the ITCZ are expected to remain active over central DRC and northeastern Tanzania by 24 hours. The low pressure system near Angola maintains central pressure value of 1007hpa.

The St. Helena High pressure system over southeast Atlantic maintains a central pressure value of 1024hpa in 24 and 48 hours and tends to intensify to 1028hpa at 72 hours and back to 1024hpa through 96 hours. The Mascarene high pressure system over southwest Indian Ocean is expected to maintain a central pressure value of 1016hpa in 24 and 48 hours and tends to intensify to 1020hpa in 72hours and is expected to weaken to 1016hpa to 96 hours.

At the 850hpa level, the GFS model shows an east-west oriented convergence line in the region between the western parts of the Gulf of Guinea and the central African region. This convergence is expected to remain active through 24 to 48 hours and tends to weaken through 48 to 72 hours. The convergence is expected to regain its strength by 96hours. The wind convergence associated with the meridonal arm of the ITCZ is expected to shift from the vicinity of eastern DRC to the border between western DRC and Congo through 24 to 48hours. This convergence will return back to the CAB region while slightly weakening through 48 to 72 hours, and is expected to regain its strength by 96 hours. The localized convergence over western Ethiopia is expected to persist through 24 to 96 hours. Southwesterly winds from the Atlantic Ocean are expected to feed abundant moisture to the convergence line across the Gulf of Guinea region. However, these moist winds tend to weaken through 48 to 72 hours and will regain their strength by 96 hours. The moist easterly flow from the Indian Ocean into the GHA region is expected to persist through 24 to 96 hours and tends to weaken by 96 hours.

At the 700hPa level, a cyclonic circulation over northern Red Sea is expected to persist through 24 to 72 hours and tends to weaken by 96 hours. The flow over the sub-tropical areas of Africa is expected to attain a wavy pattern through 72 to 96 hours, with a westerly trough extending towards central Sudan by 96 hours. Persistent northeasterly wind is expected to dominate the flow over the tropical Africa, in the region between the Horn of Africa and the eastern coastal regions of the Gulf of Guinea through 24 to 96 hours.

At 500hpa, zonal westerlies are expected to dominate the flow over sub-tropical areas of northern Africa, while easterly winds with moderate intensity (10 to 15knots) are expected to dominate the flow between the Horn of Africa and Cameroon through 24 to 96 hours. Locally strong winds (>30kts) are also expected to propagate between southern Sudan and southwest Nigeria through 24 to 96 hours. Two mid-latitude troughs are expected to persist over the Atlantic and Indian Ocean side of South Africa through 24 to 96 hours, while the trough in the Indian Ocean side tends to weaken slightly by 96 hours.

A zone of strong wind (>110Kts) at 200hpa level associated with the Sub Tropical westerly Jet is expected across northeast Atlantic Ocean, Algeria, Niger, Libya, Egypt and the Middle East region through 24 hours, and it is expected to weaken progressively to (>90Kts) through 48 to 96 hours. On the other hand, strong winds (>90Kts) associated with the Sub-Tropical Westerly Jet is expected in the Sub Tropical region of southern Africa, Namibia and Botswana is expected to intensify to (>110kts) through 24 to 48 hours and tends to weaken back to (>90kts) by 72hours.

In the next four days, the active seasonal wind convergence in the CAB region, the persistent moist easterly winds into East Africa from western Indian Ocean and the westward propagating thunderstorms between central African region and the western parts of equatorial Africa are expected to maintain moderate to heavy rainfall in the respective region. In general, there is an increased chance for daily rainfall values to exceed 20mm over Gabon, Equatorial Guinea, southern Cameroon, Congo, and northern Angola, parts of DRC, CAR, Tanzania and portions of Ethiopia. Heavy rains are also expected over portions of South Africa and Swaziland due to the influence of mid-latitude frontal systems.

2.0. Previous and Current Day Weather Discussion over Africa (14 April – 15 April 2011)

2.1. Weather assessment for the previous day (14 April 2011):

During the previous day, a combination of moderate and heavy rainfall was observed over Equatorial Guinea, Gabon, south or Nigeria, parts of DRC, CAR, , and Rwanda.

2.2. Weather assessment for the current day (15 April 2011): Intense clouds are observed over Cameroon, parts of Nigeria, CAR, Equatorial Guinea, DRC, Uganda, West of Tanzania, South of Sudan, part West of Ethiopia, North of Madagascar, North of Angola, Congo, Gabon and part of South Africa.

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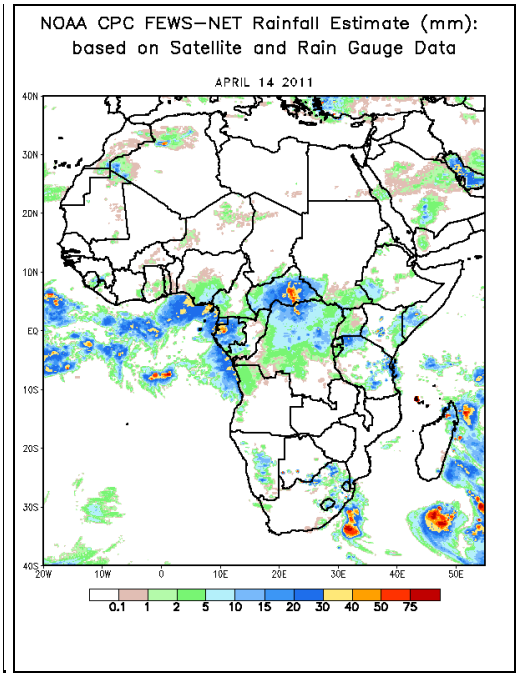
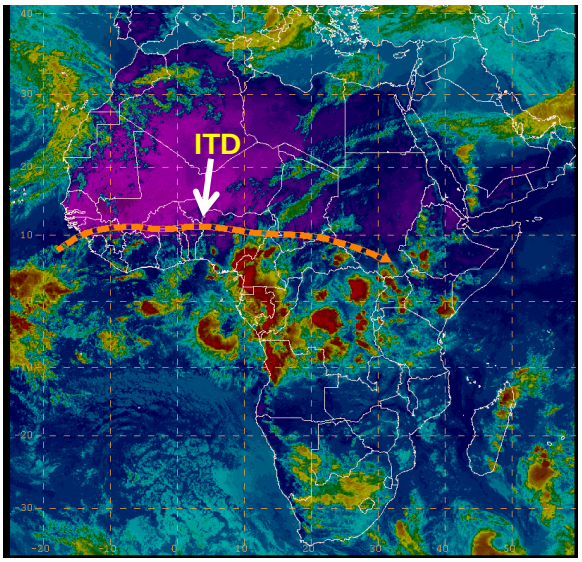


IR Satellite Image (valid 1622Z) and position of ITD, based on 1200Z Surface Analysis; 15 April 2011



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

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