African Centre of Meteorological Applications for Development
Centre Africain pour les Applications de la Météorologie au Développement

Ten Days Climate Diagnostics Bulletin N°32

Dekad 1, 1st to 10th December 2019

HIGHLIGHTS

Above average to well above average rainfall was observed over northern Morocco, Algeria and Tunisia, south-eastern Liberia, southernmost of Côte d'Ivoire, central of Congo, western and south-eastern DRC, southern Kenya, much of Uganda, Rwanda, Burundi, Tanzania, western and eastern Zambia, southern Angola, Zimbabwe, northern and eastern Namibia, most parts of Botswana and eastern South Africa.

Below average to well below average rainfall was observed over southern Cameroon much of Guinea Equatorial, western Gabon, northernmost of Congo, northern DRC, central of Angola, Zambia, Malawi, much of Mozambique and Madagascar.

During the period from 14th to 20th December 2019, low to moderate precipitation will be likely southern over northern Morocco, Algeria, Tunisia, Libya and north-western Egypt, southern of Central Africa, central to southern Uganda and Kenya, northern and central of Southern Africa region and southern part of Madagascar. Moderate to heavy precipitation will be likely over south-eastern Congo, southern DRC, southernmost of Uganda, Kenya, much of Rwanda, Burundi, Tanzania, northern Angola, eastern Zambia, north parts of Malawi, Mozambique and central of Madagascar. Heavy precipitation is expected over southeastern Kenya, eastern of Tanzania and northern Madagascar.

During the period from 21st to 27th December, 2019 low to moderate precipitation will be very likely over most of the northern parts of Northern Africa Countries, southern Congo, central and eastern parts of DRC, south-western Uganda and Somalia, central Kenya, much of Angola, Zambia, central of Mozambique, eastern Zimbabwe, central and western parts of Botswana, north-eastern Namibia, north-eastern South Africa and southern Madagascar.. Moderate to heavy precipitation will be likely over southern and central of eastern DRC, most parts of Rwanda, Burundi and Tanzania, Malawi, northern Mozambique, eastern Zambia, northern Angola central of Madagascar. Heavy Precipitation will be likely over southernmost of Kenya, central and southern Tanzania and northern Madagascar.

1.0 GENERAL CLIMATOLOGICAL SITUATION

Subsection 1.1 provides the strength of the surface pressure systems, ITD, CAB and ITCZ displacements, while subsection 1.2 is on the troposphere and gives a brief on monsoon and relative humidity thresholds.

1.1 SURFACE

Pressure Systems

Figure 1 shows the map of decadal mean (isolines) and anomalies (colour) MSLP observed from NCEP reanalyses during the third dekad of November, 2019.

- **The Azores High** of 1028 hPa strengthened by 8 hPa compared to the previous dekad and by 7hPa with respect to the climatological means (1981-2010). It was located at 26°W and 37°N; it was in west comparing to the climatology position over North Atlantic Ocean.

- **St. Helena High** of 1020 hPa weakened by 1hPa compare to the previous dekad and stable 10hPa with respect to the climatological means (1981-2010). It was located at 3°E and 33°S of its in stable to the climatological position over South Atlantic Ocean.

- **Mascarene High** of 1017hPa weakened by 7hPa compare to the previous dekad and weakened by 2hPa compared with respect to the climatological mean (1981-2010). It was located at 30°S and 101°E, west of its climatological position over Indian Ocean.

- **Heat Low** of 1008hPa, deepened by 1hPa compared to the previous dekad, and with climatological mean (1981-2010). It was located at 9°N and 30°E in the northern South Sudan, and in eastern his climatological position.

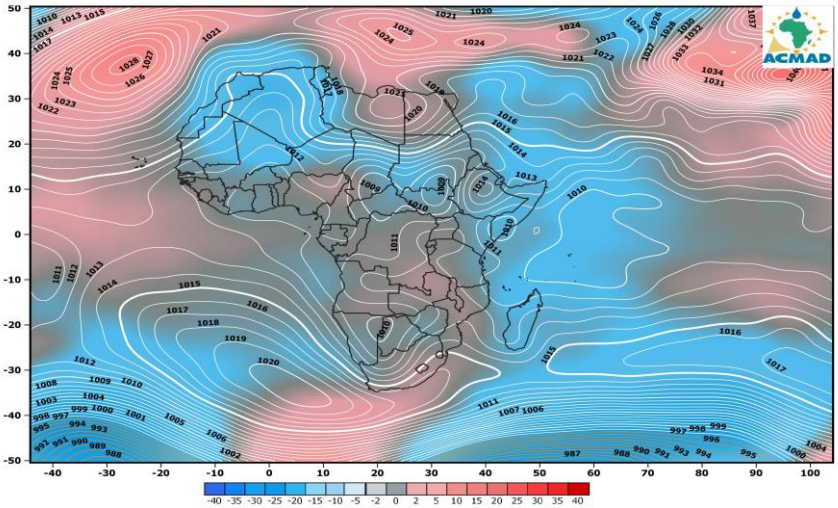

***Figure 1**. Observed Mean Sea Level Pressure (Contour) and anomaly (shaded) during the period from 1st to 10th December 2019.*
Source: NOAA/NCEP

1.2 TROPOSPHERE

1.2.1 African Monsoon

Figure 3a shows the average wind dekadal at 850 hPa. He indicates that moderate vortex winds have been observed over northern Chad, western Sudan, and easterly wind was observed over much of Somalia.
Figure 3b shows the dekadal mean wind at 700 hPa. It indicates that moderate to strong northwesterly wind was observed over southern Algeria, Tunisia, Mauritania and Mali.

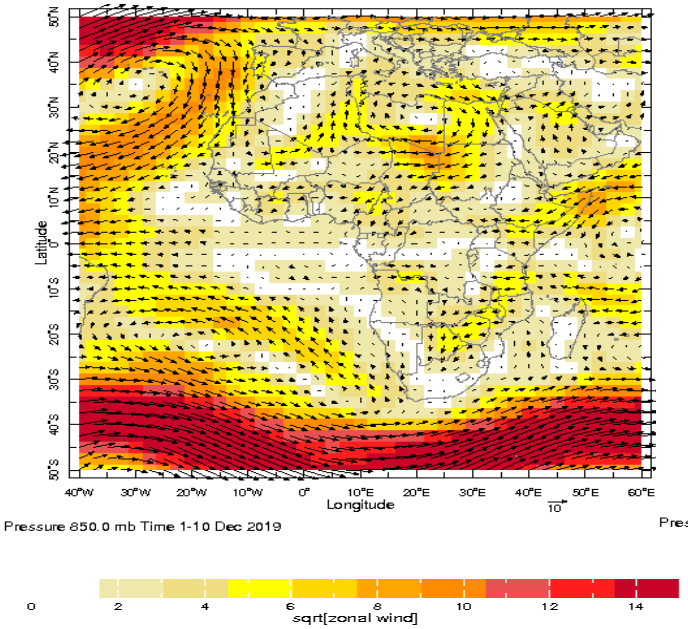

Figure 3a: Mean wind at 850 hPa (m/s) during the period from *1st to 10th December 2019. (Source: NOAA/NCEP).*

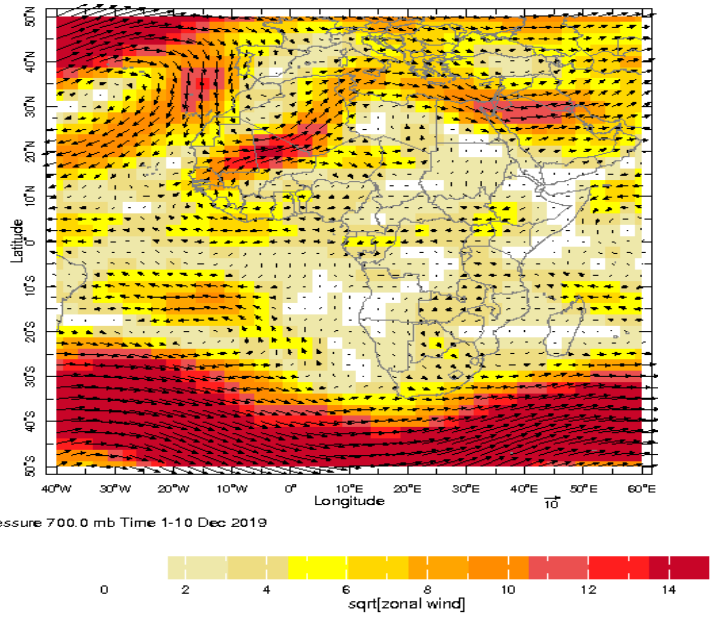

Figure 3b: Mean wind at 700 hPa (m/s) during the period *1st to 10th December 2019. (Source: NOAA/NCEP).*

1.2.2 Wind at 200 hPa.

Figure 5 shows the wind speed and direction at 200 hPa. During the first dekad of December 2019, strong westerly winds prevailed over northern Africa, Sahel Regions northern Guinea Gulf and South Africa. Moderate to weak winds were observed over the rest of the continent.

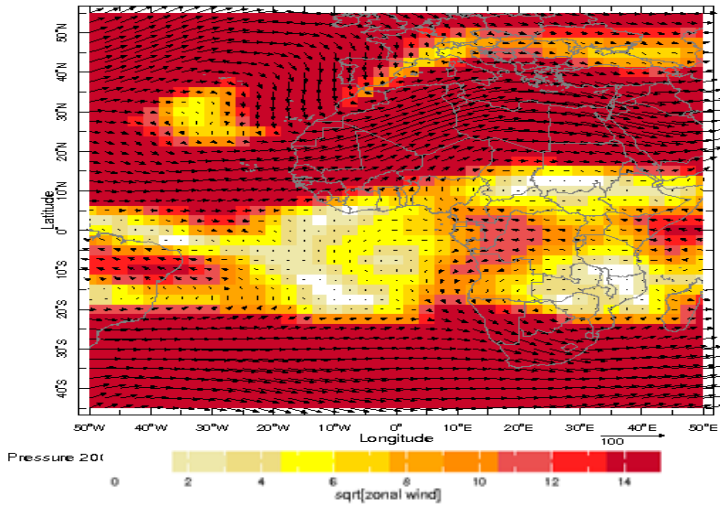

Figure 5: Mean wind at 200 hPa (m/s) during the period from *1st to 10th December 2019. (Source: NOAA/NCEP)*

1.2.5 Relative Humidity (RH) at 850 hPa

Figure 6 presents the dekadal mean and anomalies of relative humidity at 850 hPa. Wet atmospheric conditions (humidity relative ≥60%) were observed over northern Morocco, Algeria, Tunisia, and southern Gulf of Guinea countries, Central Africa Region, East Africa southeastern South Africa and Madagascar. Dry air (humidity relative between 20 and 40%) was observed over Sahel Regions, North Africa and western Southern Africa.

The RH anomalies for the first dekad of December 2019 were positive over Morocco, Algeria, northern Tunisia, northwestern Libya and Egypt, most of Sahel Region, much of western and Northern Guinea Gulf Countries, central western DRC, western Angola, much of Sudan, northern South Sudan, much of Djibouti, Eritrea, northern Ethiopia, eastern Mozambique, southern South Africa, much of Comoros, Seychelles Island and northern Madagascar. Negative anomalies of RH were observed over the rest of the continent. The anomalies were determined based on the reference period 2002-2011.

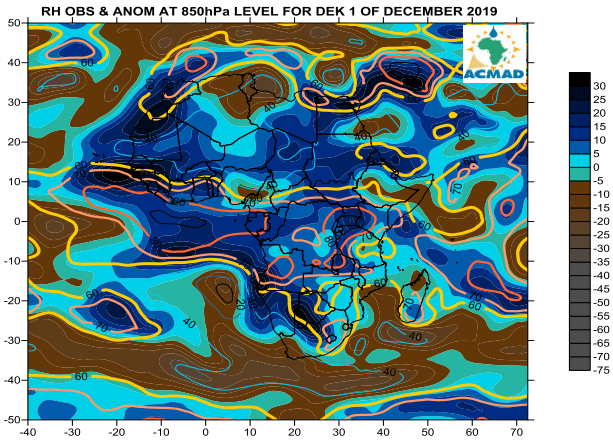

Figure 6. *RH (%) at 850hPa (contour) and anomaly (shaded) during the period from 1st to 10th December 2019. (SOURCE/. NOAA/. NCEP-CAR/. CDAS1)*

1.2.6 Relative Humidity at 700hPa

Figure 7 presents the dekadal mean and anomalies of relative humidity at 700 hPa. It shows that the High RH with values ≥ 60% at 700hPa were observed over Algeria, Libya, southeastern Egypt, southeastern Bissau Guinea, Mali, Burkina Faso, most of Guinea Gulf Countries, Central Africa Countries, East Africa Countries, western Mozambique, much of Zambia, northern Namibia, Botswana, Zimbabwe, Malawi, eastern South Africa, much of Eswatini, Lesotho, and southern Madagascar. Elsewhere over the continent, RH with values ≤ 40% were observed.

The RH anomalies for the first dekad of December 2019 were Positive over most of north Africa, Sahel Region, and western Africa, western Gabon, southern Congo, central DRC, southern Angola, much of Sudan, southeastern South Sudan, much of Ethiopia, northern Somalia, much of Eritrea, Djibouti, western Tanzania, northern Namibia, much of Zambia, Mozambique, Zimbabwe, northwestern Botswana, south half South Africa, much of Comoros, Seychelles Island and Madagascar. Negative anomalies of RH were observed the rest of Continent. The anomalies were determined based on the reference period: 2002-2011.

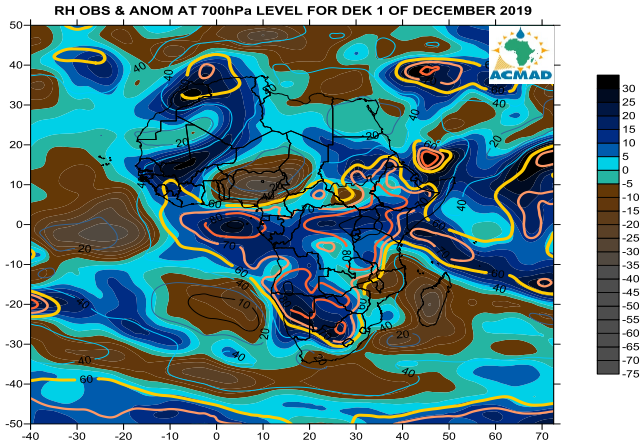

Figure 7. *RH (%) at 700hPa (contour) and anomaly (shaded) during the period from 1st to 10th December 2019. 2019. (SOURCE/. NOAA/. NCEP-CAR/. CDAS1)*

2.0 PRECIPITATION

Figure 8 shows the observed precipitation estimate in percentage of average for the second dekad of November, 2019.

2.1 Precipitation

Above average to well above average rainfall was observed over northern Morocco, Algeria and Tunisia, south-eastern Liberia, southernmost of Côte d'Ivoire, central of Congo, western and south-eastern DRC, southern Kenya, much of Uganda, Rwanda, Burundi, Tanzania, western and eastern Zambia, southern Angola, Zimbabwe, northern and eastern Namibia, most parts of Botswana and eastern South Africa.

Below average to well below average rainfall was observed over southern Cameroon much of Guinea Equatorial, western Gabon, northernmost of Congo, northern DRC, central of Angola, Zambia, Malawi, much of Mozambique and Madagascar.

Details:

- **North Africa**: Observed Above average precipitations.
- **The Sahel** Observed near average precipitations.
- **Gulf of Guinea countries** observed above average precipitations over, south-eastern Liberia, southernmost of Côte d'Ivoire.
- **Central Africa countries** Observed Above average precipitations over central of Congo, western and south-eastern DRC below average precipitations were observed over southern Cameroon much of Guinea Equatorial, western Gabon, northernmost of Congo, northern DRC.
- **East Africa countries** Observed above average precipitations southern Kenya, much of Uganda, Rwanda, Burundi, and Tanzania.
- **Southern Africa countries** observed above average precipitations over western and eastern Zambia, southern Angola, Zimbabwe, northern and eastern Namibia, most parts of Botswana and eastern South Africa and below average were observed over central of Angola, Zambia, Malawi, much of Mozambique and Madagascar.

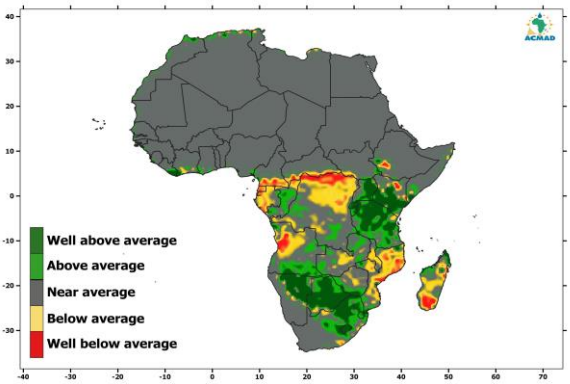

Figure 8: *Precipitation in percent of average for first dekad 1st to 10th December 2019... The reference period used is 1981-2010. Source: NOAA/. NCEP/. CPC/. FEWS/. Africa/. DAILY/)*

3. Outlook valid from

3.1 PRECIPITATION

During the period from 14th to 20th December 2019, low to moderate precipitation will be likely southern over northern Morocco, Algeria, Tunisia, Libya and north-western Egypt, southern of Central Africa, central to southern Uganda and Kenya, northern and central of Southern Africa region and southern part of Madagascar. Moderate to heavy precipitation will be likely over south-eastern Congo, southern DRC, southernmost of Uganda, Kenya, much of Rwanda, Burundi, Tanzania, northern Angola, eastern Zambia, north parts of Malawi, Mozambique and central of Madagascar. Heavy precipitation is expected over southeastern Kenya, eastern of Tanzania and northern Madagascar.

During the period from 21st to 27th December, 2019 low to moderate precipitation will be very likely over most of the northern parts of Northern Africa Countries, southern Congo, central and eastern parts of DRC, south-western Uganda and Somalia, central Kenya, much of Angola, Zambia, central of Mozambique, eastern Zimbabwe, central and western parts of Botswana, north-eastern Namibia, north-eastern South Africa and southern Madagascar.. Moderate to heavy precipitation will be likely over southern and central of eastern DRC, most parts of Rwanda, Burundi and Tanzania, Malawi, northern Mozambique, eastern Zambia, northern Angola central of Madagascar. Heavy Precipitation will be likely over southernmost of Kenya, central and southern Tanzania and northern Madagascar.

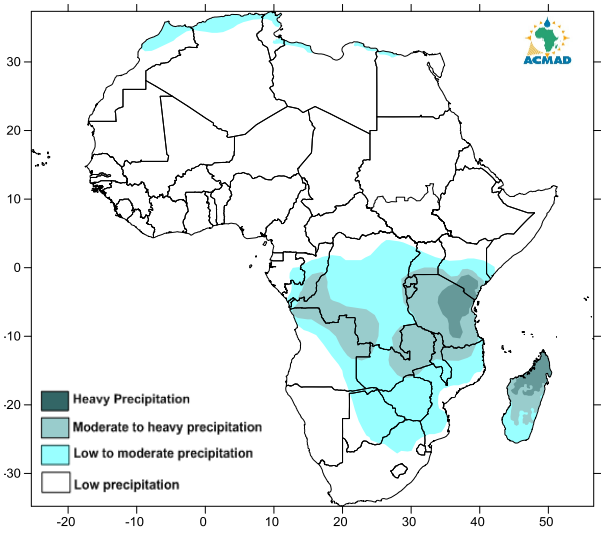

Figure 9a: Precipitation forecast from 14th to 20th December 2019
(Source: ACMAD)

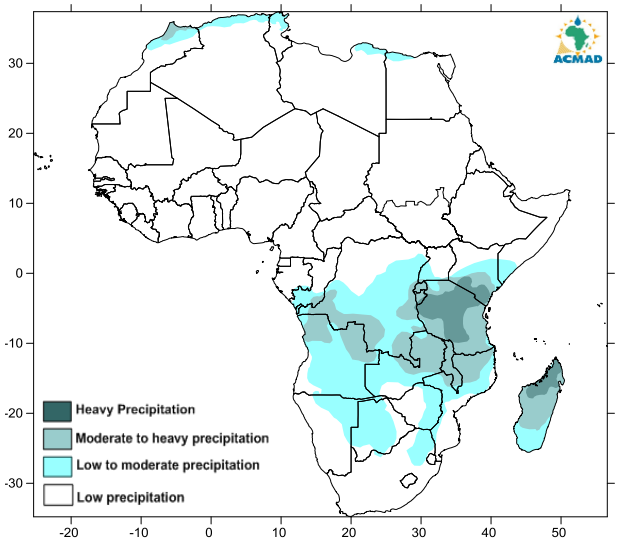

Figure 9b: Precipitation forecast from 21th to 27th December 2019
(Source: ACMAD)

3.2 Temperature

Figure 10 presents the temperature anomalies prospected for this week from 14th to 22th December, 2019. It shows that hot temperature is expected over Sahel region, northern Guinea Gulf, northern Cameroon, Congo, much of CAR, northern DRC, southern Angola, most of East Africa, southern Africa and Madagascar. Cold to normal temperature could be found over southern Gulf of Guinea countries, most of central Africa Countries, much of Ethiopia, Uganda, much of Somalia, Tanzania, southern South Africa and eastern Madagascar.

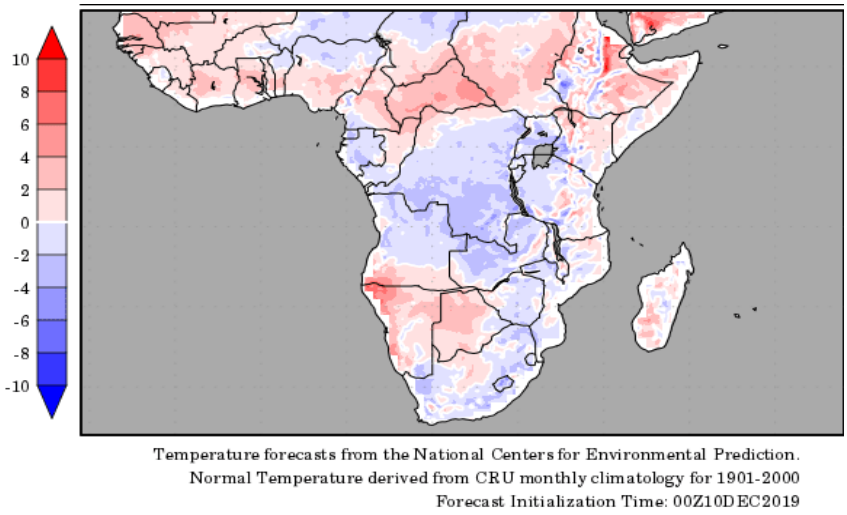

Figure 10: Temperature anomalies prospected from 14th to 22th December, 2019
(Source: COLA)

3.3 Soil Moisture

Figure 11 shows soil moisture anomalies prospected for the week from 14th to 22th December, 2019. It indicates that during this week an increase in soil moisture is expected over most of Central Africa Countries, eastern Somalia, southern Uganda, much of Rwanda, Burundi, southern Kenya, much of Tanzania, Zambia, northern Mozambique, South-eastern Botswana, eastern South Africa, eastern Lesotho and northern Madagascar. The rest of the area represented in this map could indicate dry soil moisture.

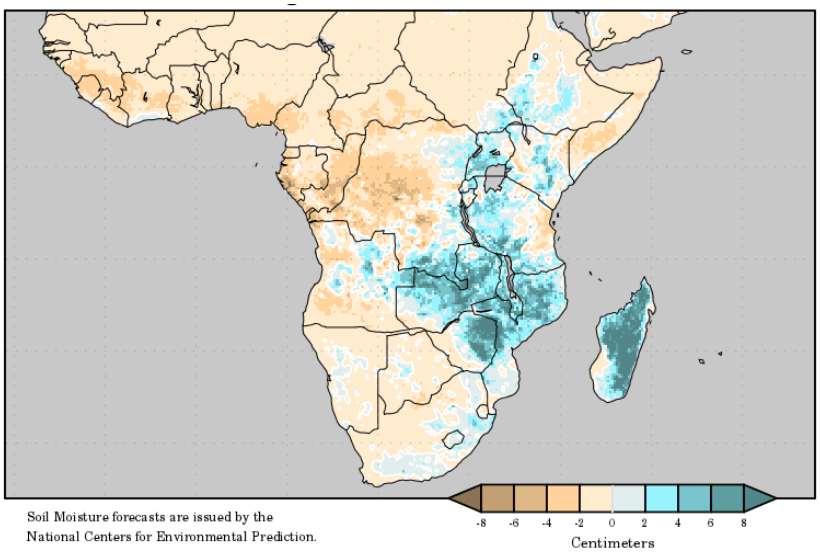

Figure 11: Soil moisture change prospected for the period from 14th to 22th December, 2019
(Source: COLA)