

Ten Days Climate Diagnostics Bulletin

N°35

Dekad 2, 11 – 20 December 2021

HIGHLIGHTS

- ✓ *Rainfall activity was mostly observed in the central, southern, and eastern regions of the continent during this dekad. Above-average to well above-average precipitation was recorded over Lesotho, Eswatini, Rwanda, the north eastern part of Libya, south eastern Liberia, eastern and western DRC, parts of Congo, Gabon, Angola, Zimbabwe, Zambia, Mozambique and Cameroon, northern Tanzania, most of Botswana, Uganda and Kenya, eastern Madagascar, and the eastern half of South Africa. Below-average rainfall was observed over the northern edges of Morocco, Algeria and Tunisia, Equatorial Guinea, southern Tanzania, most of Gabon, parts of Cameroon, Congo, DRC, Madagascar, Mozambique, Malawi, Zambia, Angola, Namibia, Zimbabwe and Botswana.*
- ✓ *This dekad was characterized by neutral to cold SSTs conditions in the Gulf of Guinea region, most of north Atlantic and western Indian Ocean with moderate anticyclone wind vector anomalies at 850hPa and 700hPa in the northern part of Africa and easterlies in the Gulf of Guinea into the Atlantic Ocean*
- ✓ *The outlook for 24th - 30th December AND 31st December 2021 - 06th January 2022, depict a general tendency of low to moderate precipitation over parts of the central and the southern Africa sub-region of the continent. Moderate to heavy precipitation will likely be observed over Malawi, Eswatini and parts of*

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 summary of monsoon and relative humidity thresholds.

1.1 SURFACE

Pressure Systems

- **The Azores High** observed a central value of 1025hPa, which was 1hPa less than the previous dekad and 4hPa greater than the climatological mean (1991-2020). Over the North Atlantic Ocean, the high pressure was located at 59°W and 33°N, moving eastward of its climatological position.
- **St. Helena High** observed a central pressure of 1023hPa, a 2hPa decrease from the previous dekad and the same as the climatological mean (1991-2020). It was located at 8°W and 32°S. It shifted eastward of its climatological position over the South Atlantic Ocean.
- **Mascarene High:** The central value at Mascarene High was 1025hPa. It intensified by 3hPa compared to the previous dekad and by 2hPa compared to the climatological mean (1991-2020). Positioned at 72°E and 38°S, it moved eastward of its climatological position over the south Indian Ocean.
- **Heat Low:** In the preceding dekad, the two Low-Pressure systems that were positioned over the borders of Chad and CAR, as well as North and South Sudan, have merged into a single heat-low with a central value of 1007hPa positioned over the border of North and South Sudan. In comparison to the preceding dekad, it deepened by 1hPa. The heat-low remained at 32°E and 8°N.

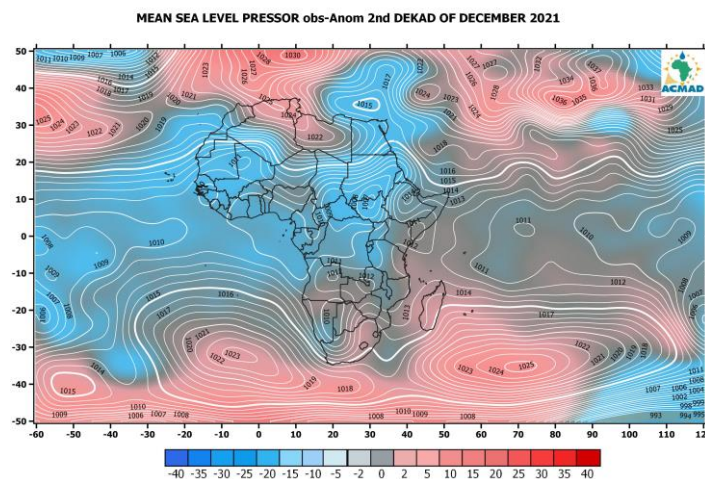


Figure 1. Observed Mean Sea Level Pressure (Contour) and anomaly (shaded) from 11th to 20th December 2021

1.2 TROPOSPHERE

1.2.1 African Monsoon

Figure 2a: This figure shows the average dekadal wind (m/s) at 850hPa. Light to moderate winds were observed over most areas with an anticyclone circulation over Libya and Egypt, with an average wind anomaly of about 6m/s-10m/s. Winds with the same speed were observed over the borders of Algeria, Mali, Mauritania and Morocco, northern Nigeria, as well as over Tanzania.

Figure 2b: At the 700hpa level, western wind anomalies of 6m/s-14m/s dominated circulation over some parts of northern Africa such as Tunisia, Libya and Egypt, and also the Sahel while the equatorial region and most of central Africa observed easterly wind anomalies of about 6m/s to 10m/s.

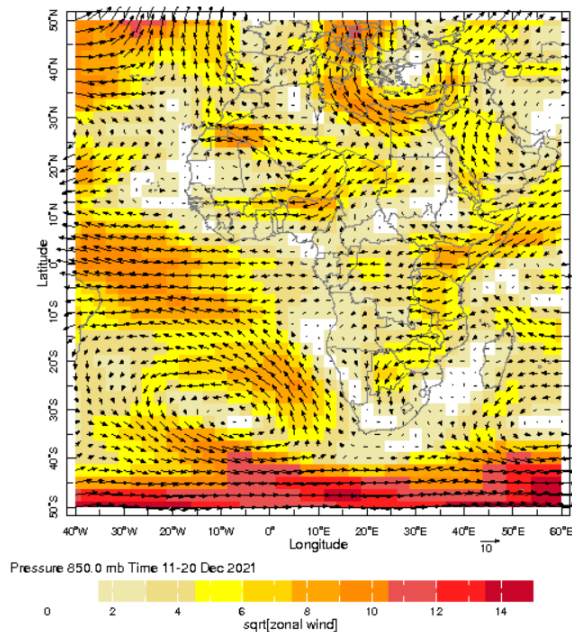


Figure 2a: Mean wind (m/s) at 850hpa from 11-20 December 2021
Source: NOAA/NCEP

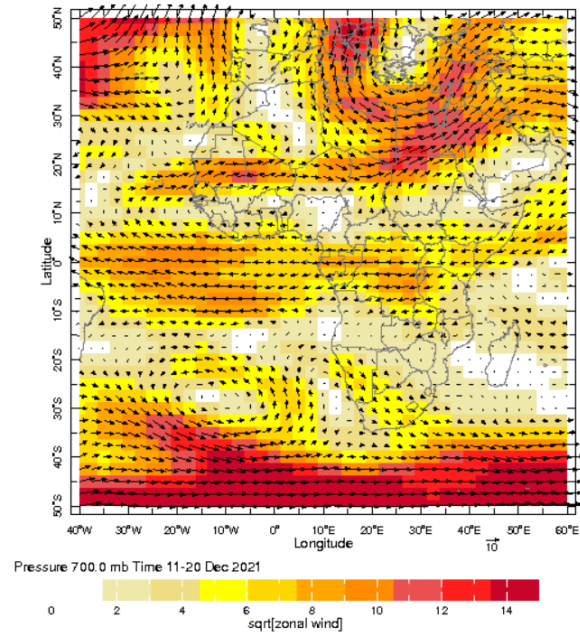


Figure 2b: Mean wind (m/s) at 700hpa from 11-20 December 2021
Source: NOAA/NCEP

Figure 2c: shows the wind vector anomaly at 200hPa. During the second dekade of December 2021, very strong westerly winds of about 14m/s were observed mainly over most of the continent except over most parts of the central region and northern Angola that observed low to moderate wind speeds of about 3m/s-6m/s.

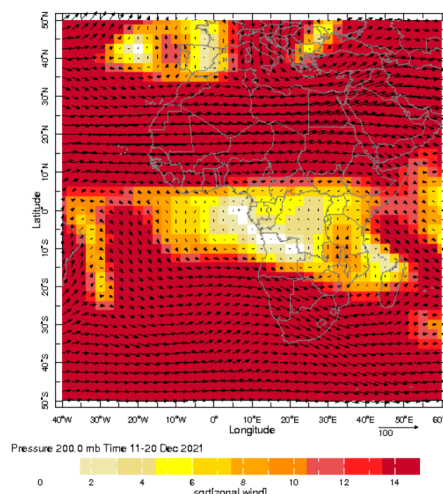


Figure 2c: Mean wind at 200 hPa (m/s) during the period 11-20 December 2021
(Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH) at 850hPa

Figure 4 presents the dekadal observed relative humidity at 850hPa for the second dekad of December 2021 and anomalies of the reference period 1991-2020. Wet atmospheric conditions (relative humidity $\geq 60\%$) were observed over Tunisia, Sierra Leone, Liberia, Cote D'Ivoire and Somalia, most of Libya, Ghana and Kenya, north eastern Egypt, Morocco and Tanzania, southern Togo, Benin, Nigeria and Ethiopia, as well as over most of central and southern Africa. The rest of the continent observed RH values $\leq 60\%$.

The relative humidity anomalies for the second dekad of December 2021 were negative over Burundi, Rwanda, Uganda, Eritrea and Malawi, most of South Sudan and Tanzania, northern Algeria and Mozambique, western Ethiopia and Kenya, eastern North Sudan and DRC as well as north eastern Zambia.

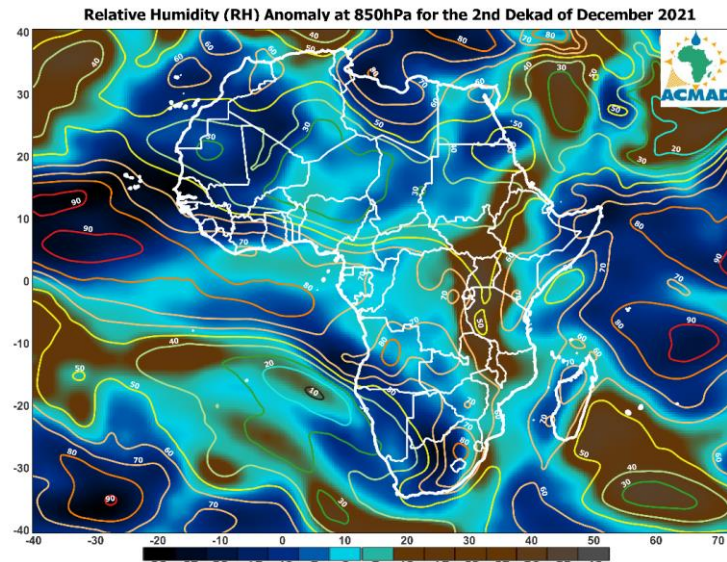


Figure 4. RH (%) at 850hPa (contour) and anomaly (shaded) during the period 11th to 20th December 2021
(SOURCE/. NOAA/. NCEP-CAR/. CDAS1)

1.2.4 Relative Humidity at 700hPa

Figure 5 presents the dekadal observed and anomalies of relative humidity at 700 hPa. The figure shows that the high relative humidity belt with values $\geq 60\%$ at 700hPa was observed over Senegal, Gambia, northern Guinea Conakry, most of Mauritania, Mali, Guinea Bissau, central and southern Africa and also part of eastern Africa. The rest of the continent observed RH values $\leq 60\%$.

The relative humidity anomalies for the second dekad of December 2021 were negative over central DRC, most of Nigeria, Togo, Benin, Ghana, Madagascar and eastern Africa. The rest of the continent observed positive anomalies.

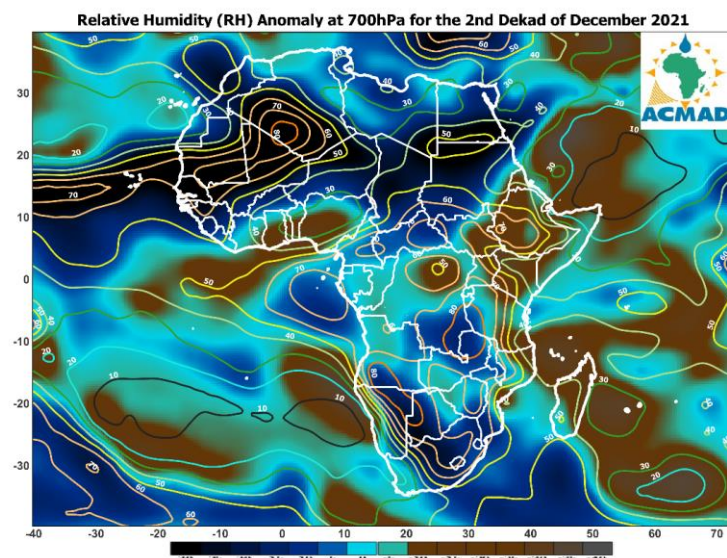


Figure 5. RH (%) at 700hPa (contour) and anomaly (shaded) during the period 11th to 20th December 2021
(SOURCE/. NOAA/. NCEP-CAR/. CDAS1)

2.0 PRECIPITATION

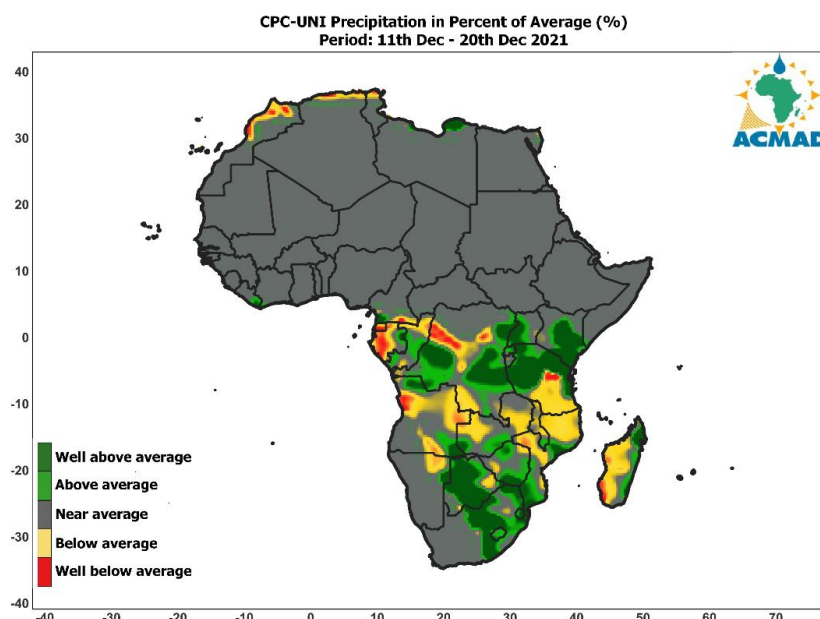
Figure 6 shows the observed precipitation in the percentage of average for the third dekad of November 2021.

2.1 Precipitation

Rainfall activity was mostly observed in the central, southern, and eastern regions of the continent during this dekad. Above-average to well above-average precipitation was recorded over Lesotho, Eswatini, Rwanda, the north eastern part of Libya, south eastern Liberia, eastern and western DRC, parts of Congo, Gabon, Angola, Zimbabwe, Zambia, Mozambique and Cameroon, northern Tanzania, most of Botswana, Uganda and Kenya, eastern Madagascar, and the eastern half of South Africa. Below-average rainfall was observed over the northern edges of Morocco, Algeria and Tunisia, Equatorial Guinea, southern Tanzania, most of Gabon, parts of Cameroon, Congo, DRC, Madagascar, Mozambique, Malawi, Zambia, Angola, Namibia, Zimbabwe and Botswana.

Details:

- **North Africa:** This region experienced mostly near average rainfall conditions. Below-average to well below-average rainfall was recorded over the northern edges of Morocco, Algeria and Tunisia while above average rainfall conditions were observed over the north eastern part of Libya.
- **Gulf of Guinea countries:** Near-average precipitation was observed in this region except over south eastern Liberia that recorded above-average to well above-average rainfall.
- **Central Africa countries:** Rwanda, eastern and western DRC, part of Congo, Gabon and Cameroon experienced above-average to well above-average precipitation while below average to well below-average precipitation was observed over Equatorial Guinea, most of Gabon, and parts of Cameroon, Congo and DRC.
- **East Africa countries:** Near-average precipitation was observed in this region except over northern Tanzania and most of Uganda and Kenya that observed above average to well above average rainfall conditions in the dekad under review. Below average to well below average rainfall conditions was observed over southern Tanzania.
- **Southern Africa countries:** Parts of Madagascar, Mozambique, Malawi, Zambia, Angola, Namibia, Zimbabwe and Botswana observed below-average to well below-average precipitation. Above-average to well-above-average rainfall was experienced in Lesotho, Eswatini, eastern Madagascar, the eastern half of South Africa, most of Botswana, and over parts of Angola, Zimbabwe, Zambia and Mozambique.



3.0 OUTLOOK VALID FOR 24th - 30th December AND 31st December 2021 - 06th January 2022

3.1 PRECIPITATION

During the period of 24th - 30th December 2021, low to moderate precipitation is expected over parts of the central and the southern Africa sub-region. Moderate to heavy precipitation will likely be observed over Malawi, parts of Congo, DRC, Zambia, Zimbabwe, Mozambique and Madagascar.

Figure 7b shows that during week 2 of 31st December 2021– 06th January 2022, low to moderate precipitation is expected over parts of the central and the southern Africa sub-region. Moderate to heavy precipitation is likely over Eswatini and parts of DRC, South Africa and Madagascar.

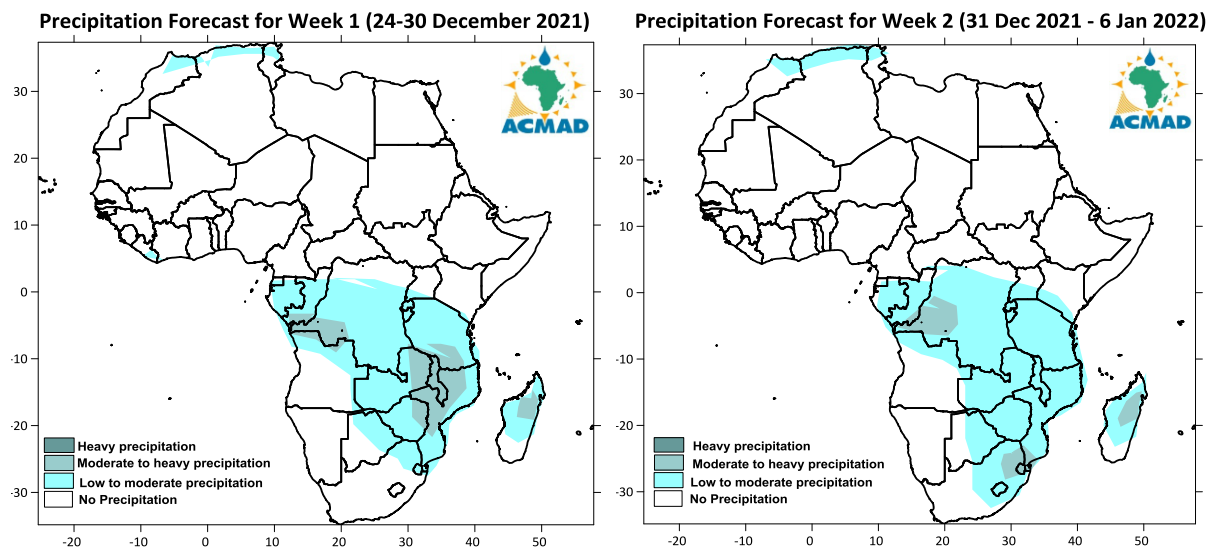


Figure 7a: Precipitation forecast for 24th - 30th December 2021

Figure 7b: Precipitation forecast for 31st Dec 2021– 06th Jan 2022

3.2 TEMPERATURE

Figure 8 presents the temperature anomalies forecast for the week of 23rd – 31st December 2021. Temperatures are expected to be above average over most of the eastern to western parts of the continent except for the central and most of the southern African region.

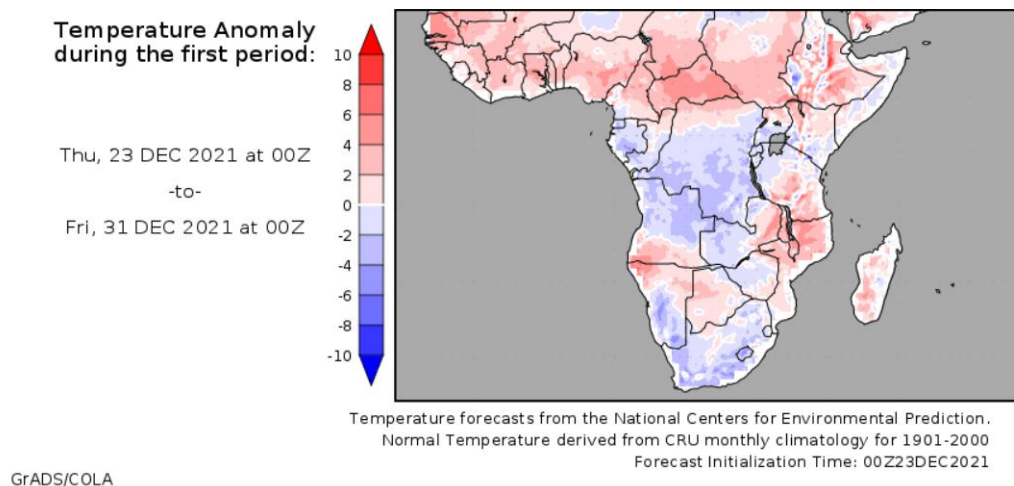
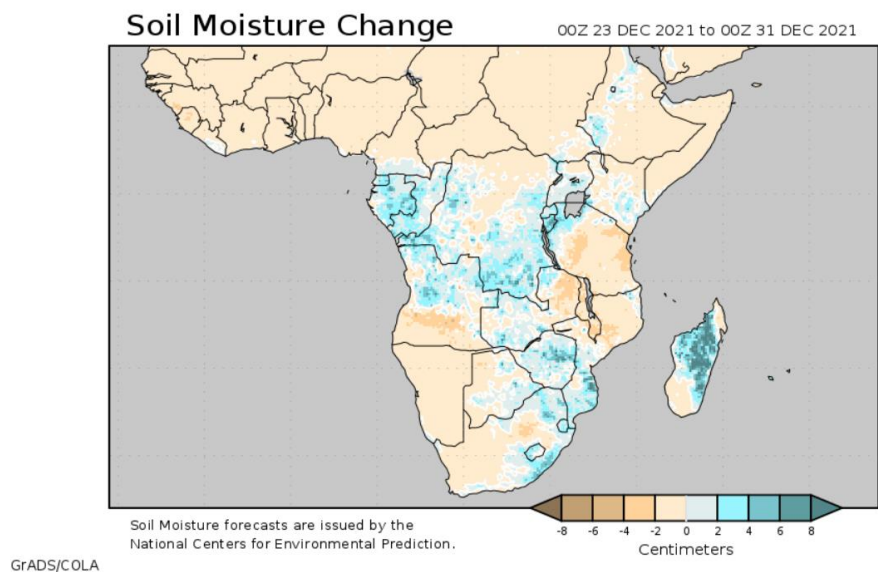


Figure 8: Temperature anomalies prospect from 23rd – 31st December 2021 (Source: COLA)

3.3 SOIL MOISTURE

Figure 9 shows soil moisture anomalies forecast for the week of 23rd – 31st December 2021 where positive soil moisture is expected over parts of central and eastern Africa and southern Africa. The rest of the continent is expected to observe negative soil moisture values during the forecast period.



*Figure 9: Soil moisture change prospect for the period 23rd – 31st December 2021
(Source: COLA)*