

Ten Days Climate Diagnostics Bulletin

N°34

Dekad 1, 1 – 10 December 2021

HIGHLIGHTS

- ✓ *Above-average to well above-average precipitation was recorded over the northern fringes of North Africa, Rwanda, south-eastern Cameroon, north of Uganda, eastern Angola, western half of South Africa, north-western Namibia, eastern and western Tanzania, southern DRC and Botswana, and over central Kenya. Below-average rainfall was observed over Madagascar, Mozambique, Malawi, Zambia, most of Gabon and Equatorial Guinea, central DRC, southern Uganda, Tanzania, Somalia, parts of Liberia, Cote D'Ivoire, Kenya, Congo, Angola, Namibia, 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 14th – 27th December 2021, depict a general tendency of low to moderate precipitation over parts of the central and most parts of the southern sub-regions of the African continent. Moderate to heavy precipitation is likely Eswatini, Lesotho, southern Congo, northern Angola, Mozambique, Malawi and Madagascar, eastern South Africa, southwestern*

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 1033hPa, the same as the previous dekad and maintained its intensification of 15hPa to its climatological mean (1991-2020). The high pressure was located at 32°W and 37°N, moving slightly southward of its climatological position over the North Atlantic Ocean.
- **St. Helena High** observed a central value of 1025hPa, intensifying by 2hPa when compared to the previous dekad and the climatological mean (1991-2020). It was located at 10°W and 32°S. It shifted westward of its climatological position over the South Atlantic Ocean.
- **Mascarene High** observed 1022hPa, the same as the previous dekad and by 1hPa compared to the climatological mean (1991-2020). Positioned at 65°E and 38°S, it moved westward of its climatological position over the south Indian Ocean.
- **Heat Low:** Twin Low-Pressure systems over the borders of Chad and CAR and North and South Sudan, both had a central value of 1008hPa, deepening by 1hPa when compared to the previous dekad. The heat-low were located at 20°E and 8°N and 32°E and 8°N respectively.

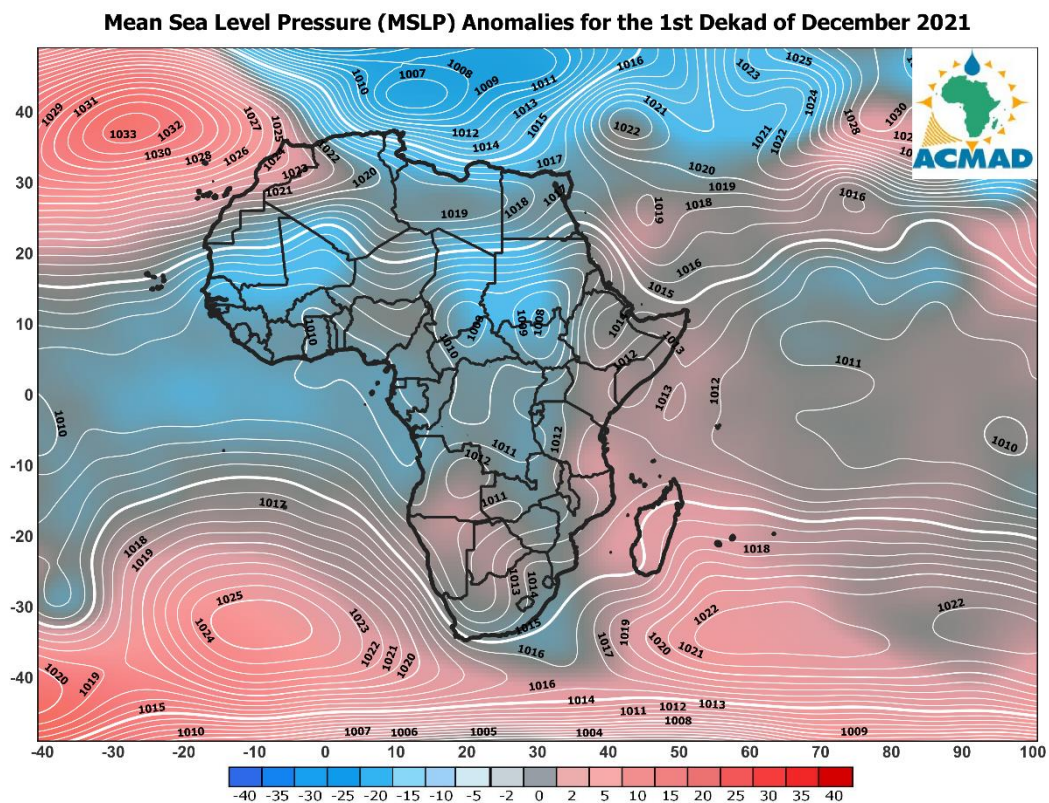


Figure 1. Observed Mean Sea Level Pressure (Contour) and anomaly (shaded) from 1st to 10th December 2021

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 was observed over most areas with an anticyclone circulation over Tunisia, Libya, and Algeria with an average wind anomaly of about 8m/s-13m/s. Winds with a speed of about 6m/s-8m/s were observed over the border of parts of Tanzania, Zambia, Morocco, Mauritania, and western Chad.

Figure 2b: At the 700hpa level, the western wind anomaly dominated circulation over northern Africa while the equatorial region, most of the central and southern region observed easterly wind anomalies of about 6m/s to 11m/s.

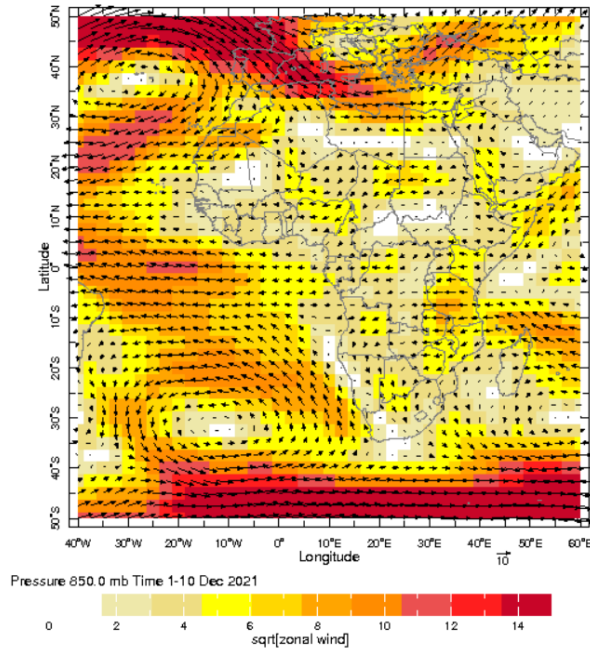


Figure 2a: Mean wind (m/s) at 850hpa from 21-30 November 2021
Source : NOAA/NCEP

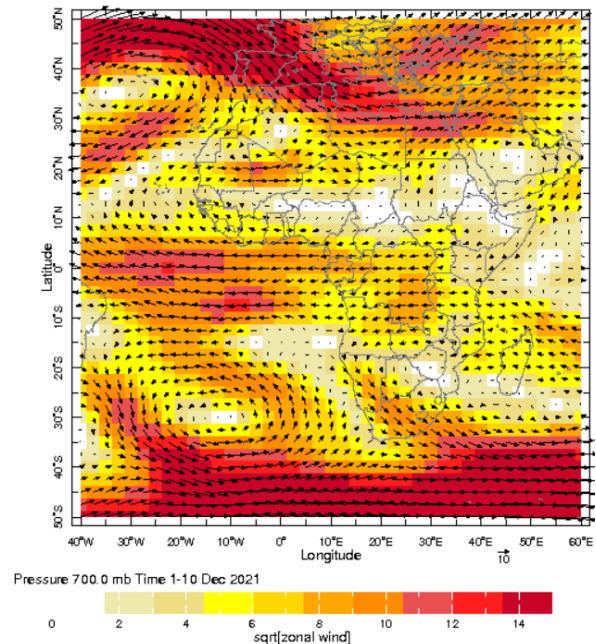


Figure 2b: Mean wind (m/s) at 700hpa from 21-30 November 2021
Source : NOAA/NCEP

Figure 2c: shows the wind vector anomaly at 200hPa. During the first dekad of December 2021, very strong westerly winds of more than 14m/s were observed mainly over northern Africa, countries in the Sahel, eastern and part of southern Africa. Countries in the Gulf of Guinea, central and part of southern Africa observed low to moderate winds.

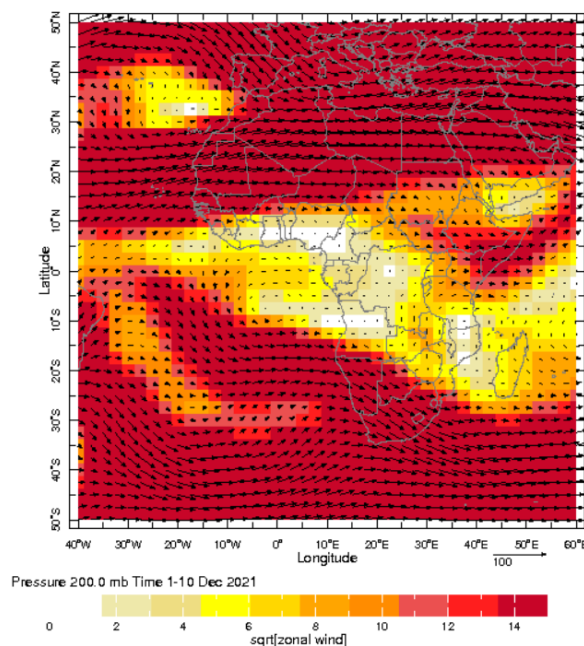


Figure 2c: Mean wind at 200 hPa (m/s) during the period from 21-30 November 2021
(Source: NOAA/NCEP)

1.2.3 Relative Humidity (RH) at 850hPa

Figure 4 presents the dekadal observed relative humidity at 850hPa for the first dekad of December 2021 and anomalies to the reference period 1991-2020. Wet atmospheric conditions (relative humidity $\geq 60\%$) were witnessed over the northern edges of North Africa, over most countries in the Gulf of Guinea, central and eastern Africa, Angola, Madagascar, northern Mozambique, and south-eastern South Africa. The rest of the continent observed RH values $\leq 60\%$.

The relative humidity anomalies for the second dekad of November 2021 were negative over Burundi, Rwanda, most of North Africa, Uganda, Zambia, parts of North and South Sudan, Ethiopia, Kenya, DRC, Tanzania, Zimbabwe, and Mozambique.

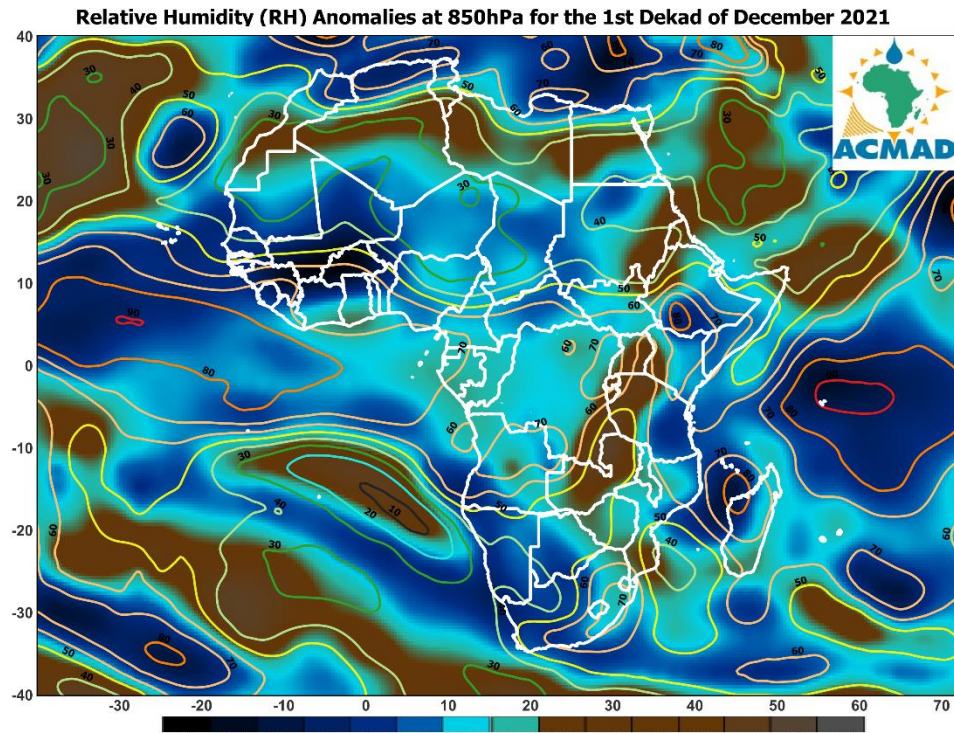


Figure 4. RH (%) at 850hPa (contour) and anomaly (shaded) during the period of 1st to 10th December 2021
SOURCE/. NOAA/. NCEP-CAR/. CDAS1)

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 some countries in central Africa such as Equatorial Guinea, Gabon, CAR and DRC. Most of the eastern and southern African regions also experienced high relative humidity values. The rest of the continent observed RH values $\leq 60\%$.

The relative humidity anomalies for the third dekad of November 2021 were negative over Cameroon, Equatorial Guinea, Gabon, Congo, eastern Nigeria, North Sudan and Madagascar, northern Mauritania, Algeria and Ethiopia, central Morocco, southern Kenya, Mozambique, and most of Tanzania. The rest of the continent observed positive anomalies.

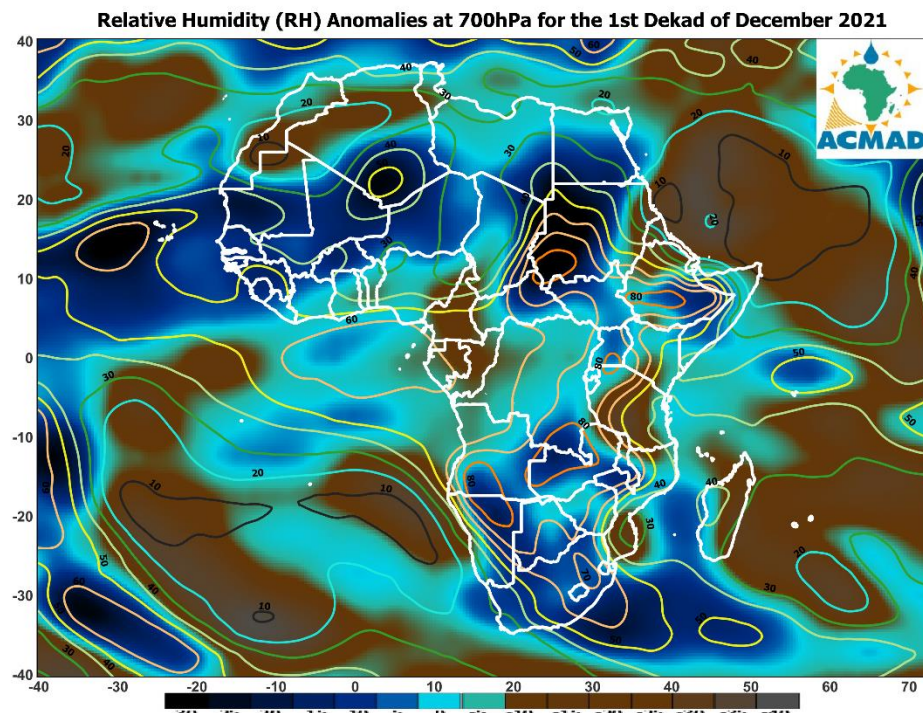


Figure 5. RH (%) at 700hPa (contour) and anomaly (shaded) during the period 1st to 10th December 2021
(SOURCE/. NOAA/. NCEP-CAR/. CDAS1)

2.0 PRECIPITATION

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

2.1 Precipitation

Above-average to well above-average precipitation was recorded over the northern fringes of North Africa, Rwanda, south-eastern Cameroon, north of Uganda, eastern Angola, the western half of South Africa, north-western Namibia, eastern and western Tanzania, southern DRC and Botswana and over central Kenya. Below-average rainfall was observed over Madagascar, Mozambique, Malawi, Zambia, most of Gabon and Equatorial Guinea, central DRC, southern Uganda, Tanzania, Somalia, parts of Liberia, Cote D'Ivoire, Kenya, Congo, Angola, Namibia, and Botswana.

Details:

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

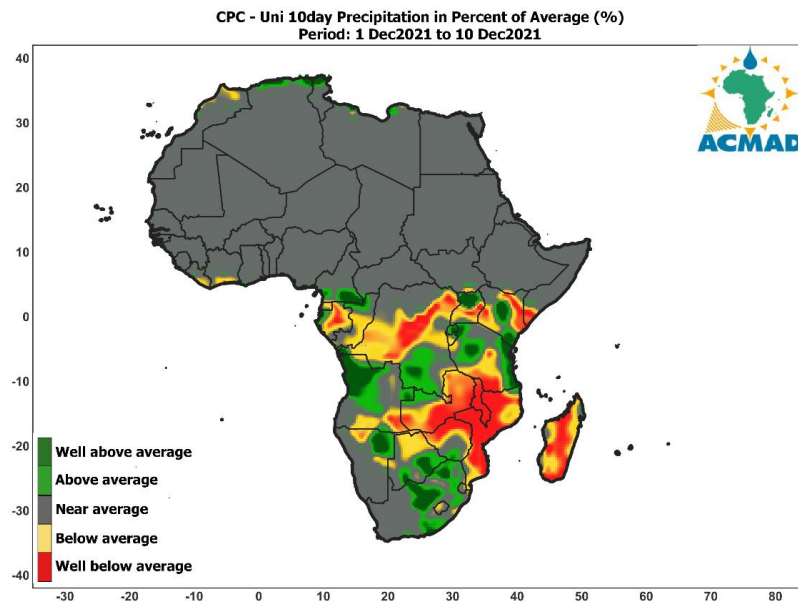


Figure 6: Precipitation in the percentage of average for the first dekad 1st to 10th December 2021. The reference period used is 1991-2020. Source: NOAA/. NCEP/. CPC/. UNIFIED/. Africa/. DAILY/)

3.0 OUTLOOK VALID FOR 14th - 20th AND 21st - 27th December 2021

3.1 PRECIPITATION

During the period of 14th - 20th December 2021, low to moderate precipitation is expected over some parts of the central to most parts of southern Africa sub-region such as southern Congo, DRC, Angola, Zambia, Zimbabwe, Malawi, Botswana, Madagascar, South Africa, Namibia, Mozambique as well as over the northern fringes of northern Africa. Moderate to heavy precipitation will likely be observed over Eswatini, northern Angola, Mozambique, Malawi and Madagascar, eastern South Africa, southwestern DRC, and Tanzania.

Figure 7b shows that during week 2 of 21st - 27th December 2021, low to moderate precipitation is expected over Zambia, Mozambique, Zimbabwe, Botswana, Madagascar, parts of Congo, DRC, Namibia, South Africa, and Tanzania. Moderate to heavy precipitation is likely over Lesotho, southern Congo, southwestern DRC, eastern Angola, north of Madagascar, and parts of South Africa

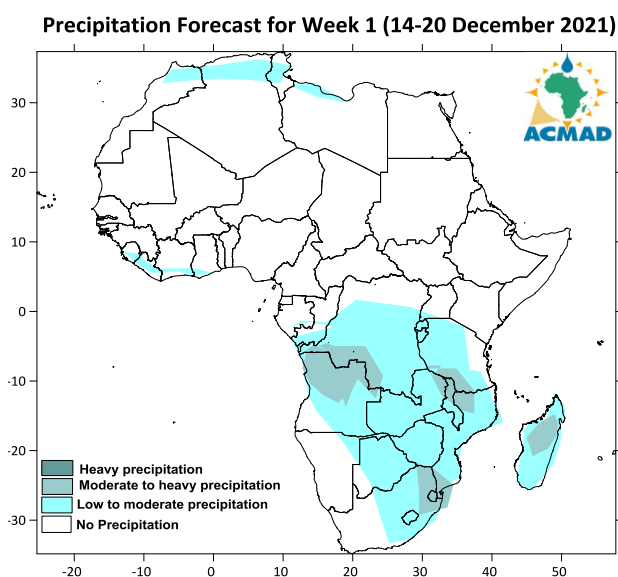


Figure 7a: Precipitation forecast for 14th- 20th December 2021

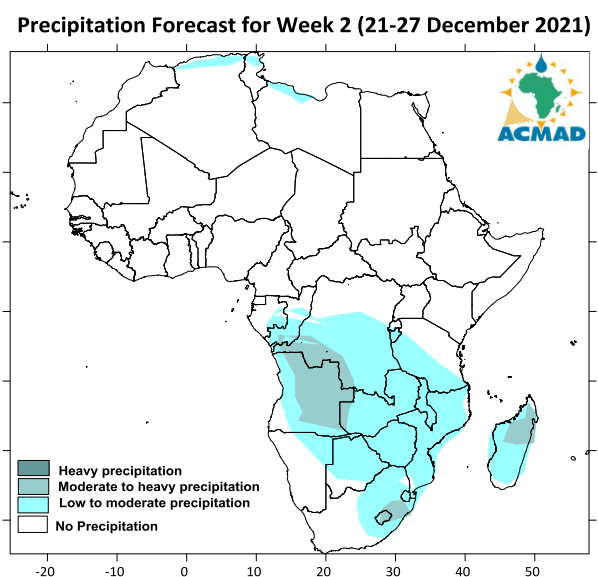


Figure 7b: Precipitation forecast for 21st-27th December 2021

3.2 TEMPERATURE

Figure 8 presents the temperature anomalies forecast for the week of 13th – 21st 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.

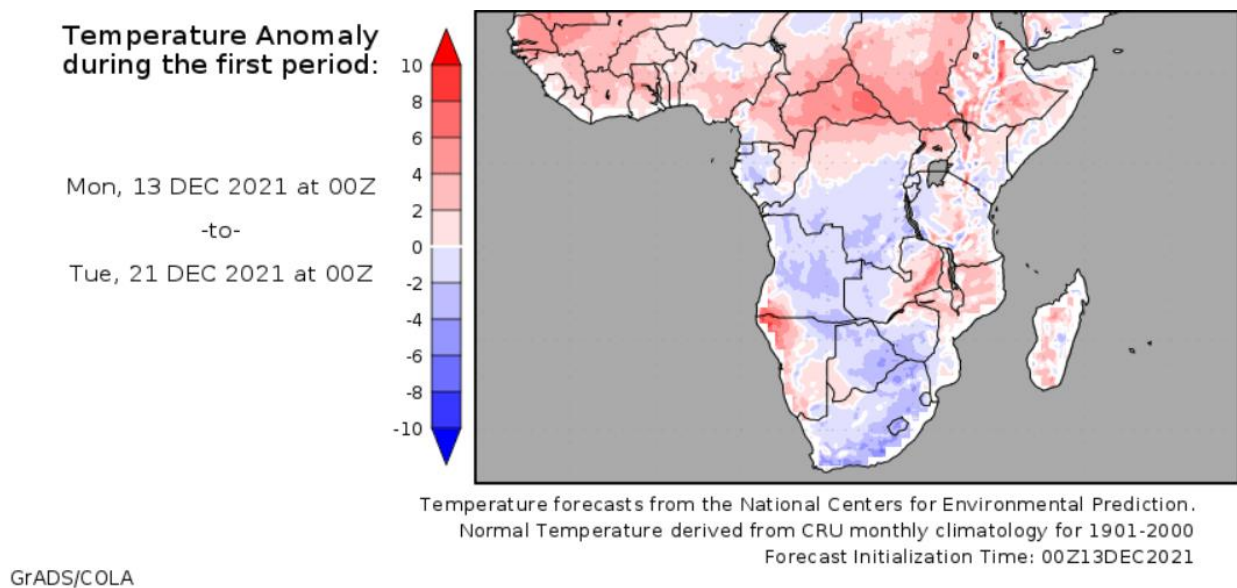


Figure 8: Temperature anomalies prospect from 13th – 21st December 2021
(Source: COLA)

3.3 SOIL MOISTURE

Figure 9 shows soil moisture anomalies forecast for the week of 13th – 21st December 2021 where positive soil moisture is expected over parts of central and eastern Africa and most of southern Africa. The rest of the continent is expected to observe negative soil moisture values during the forecast period.

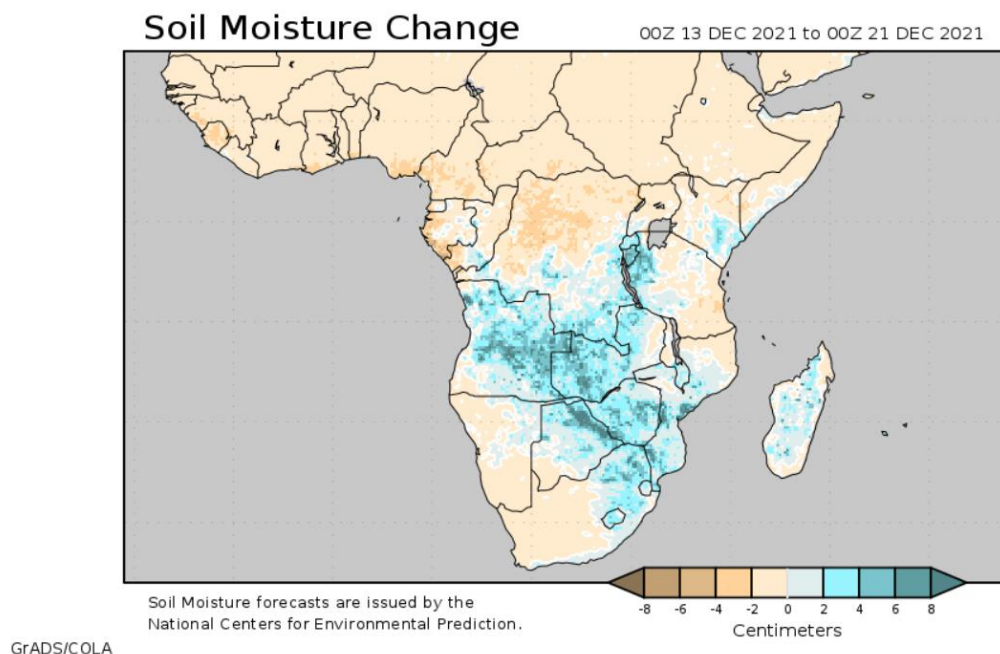


Figure 9: Soil moisture change prospect for the period 13th – 21st December 2021
(Source: COLA)