

TEN-DAY CLIMATE DIAGNOSTICS BULLETIN

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HIGHLIGHTS

- ✓ *During the first dekad of December 2022, rainfall activities were observed over some parts of subequatorial and tropical bands of the Continent, with dominate by below-average to well below-average rainfall conditions observed over western parts of Central Africa, South-eastern of the East Africa regions, most of northern parts of SADC region. Above-average to well above-average rainfall was recorded over northern Congo, eastern DRC, western Kenya, Tanzania, south-eastern Angola, southern Botswana, north-eastern South Africa and central Madagascar.*
- ✓ *The dekad was characterized by neutral to cold SSTs conditions in the over northern band equatorial the Atlantic, neutral to warm SSTs over southern Atlantic. In addition, in the equatorial pacific region, La Nina conditions persisted during most of the last four weeks. Over the Indian Ocean, the SSTs were mostly dominated by neutral to cold conditions over western parts that led to suppress rainfall over parts of the eastern side of East African countries. While over Kelvin wave conducted the wet conditions in the most parts experienced above normal rainfall.*
- ✓ *The outlook for 18 – 31 December 2022 depicts a general bias for below to normal and normal to below and below average precipitation over northernmost of Morocco, much of Angola, western Zambia, Namibia, north-eastern Botswana, eastern South Africa, and northern parts of Madagascar. Normal to above average and Above average rainfall condition is expected over southern Gabon, Congo, DRC, Tanzania, Zambia, Malawi, Mozambique and 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 discussing the state of 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 1028hPa, a 19hPa strengthening compared to the climatological mean (1991-2020). It was located at 49°W and 49°N. It moved to the North-west over the northern Antarctic Ocean.
- **St. Helena High** observed a central pressure value of 1025hPa; it weakened by 1hPa from previous dekad and strengthening by 7hPa to the climatological mean (1991-2020). It was located at 17°W and 32°S.
- **Mascarene High:** The central value for Mascarene High was 1023hPa. It strengthening by 2hPa from the previous dekad and 2hPa from the climatological means (1991-2020). Positioned at 81°E and 34°S, it moved to the east over the south Indian Ocean.
- **Heat Low:** Thermal low was observed with the value of 1008hPa over southern Chad and north of the South-Sudan and filled to its climatological mean.

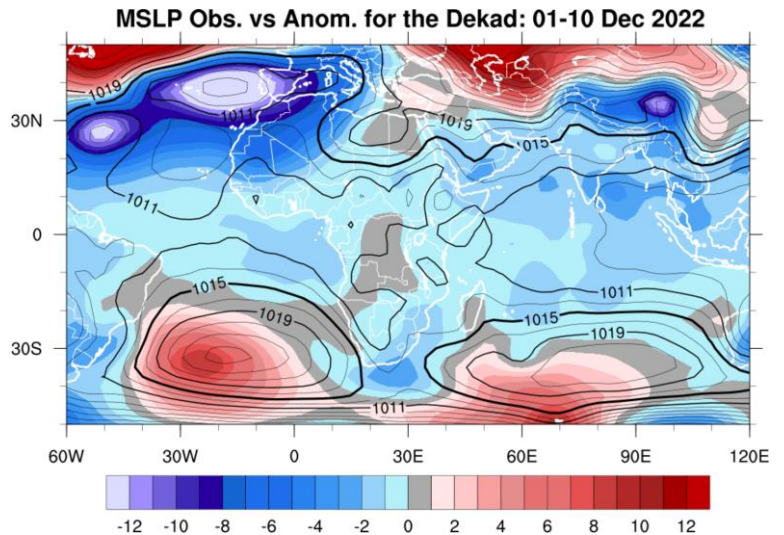


Figure 1. Observed Mean Sea Level Pressure (Contour) and anomaly (shaded) from 1st to 10th December 2022

1.2 TROPOSPHERE

1.2.1 African Monsoon

The African Monsoons combined influence of the Indo-Pacific and the Atlantic Oceans drive the inter-annual and the decadal monsoon variability over these regions.

Figure 2.a shows the dekad average wind at 850hPa. Positive vortex wind from north-easterly to easterly anomalies was observed over Libya, Egypt, Sudan and Chad. Negative wind anomalies from east to south easterly and north easterly were observed over Chad, Uganda, Burundi, Rwanda, Namibia, Tanzania, Botswana, Zambia, Cameroon, Mali and South Africa.

At the 700hpa level (see Fig.2b), the vortex wind anomaly was observed over north west parts of North Africa, in the central parts of the Continent neutral wind from east to western were observed.

At 200hpa level (see Fig.2c), the vortex wind anomaly was observed over south west parts of East Africa. Very strong westerly wind vector anomalies at 200hPa observed mainly over Northern and Southern parts of Africa region.

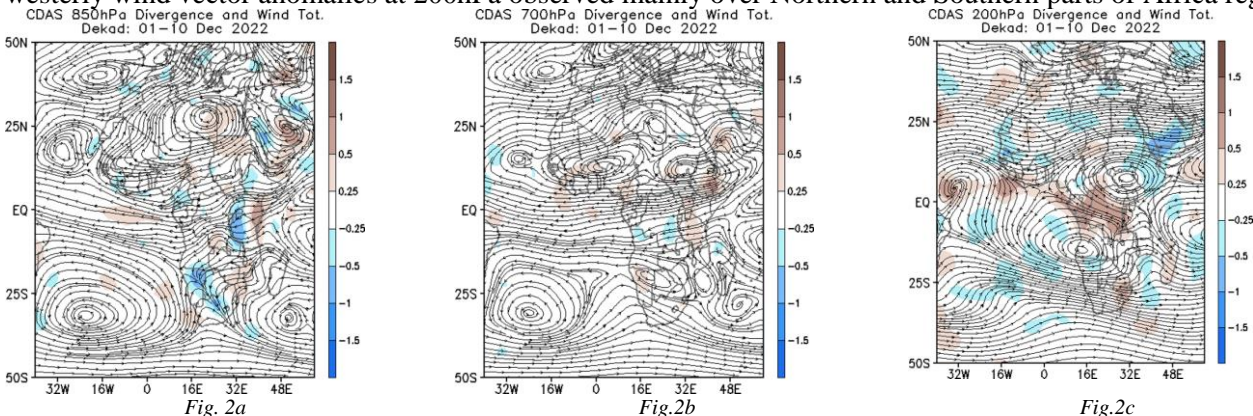


Figure 2: Mean wind (streamlines: m/s) and divergence (shaded: s⁻¹) observed at 850hPa (Fig.2a), 700hPa (Fig.2b) and 200hPa (Fig.2c) during the third dekad of 1st to 10th December 2022 (from 1st to 10th Dec). Source: NOAA/NCEP

1.2.2 Relative Humidity (RH) at 850hPa and 700hPa

Figure 3.a and 3.b respectively show the dekadal observed relative humidity and related anomalies at 850hPa and 700hPa for the first dekad of December 2022 compared to the reference period of 1991-2020.

At 850hPa (see Fig.3a), wet atmospheric conditions (relative humidity $\geq 60\%$) were observed over northern parts of Algeria, southern Gulf of Guinea, Central Africa, Southern Africa and East African regions. The rest of the continent observed RH values $\leq 60\%$. Negative anomalies were observed during the first dekad of December 2022 over most of Morocco, Mauritania, Senegal, Mali, Guinea, Sierra Leone, Liberia, Côte d'Ivoire, Ethiopia, Sudan and Kenya, while positive anomalies were recorded over the rest of the continent.

At 700hPa (Fig.3b), high relative humidity ($\geq 60\%$) were observed over South-Sudan, Ethiopia, Somalia, Kenya, Uganda, Rwanda, Burundi, DRC, Angola, Namibia, Zambia, Tanzania, Mozambique, South Africa and Madagascar. Relative humidity anomalies for the first dekad of December 2022 were positive over Morocco, Algeria, Tunisia, Libya, Egypt, Mauritania, Senegal, Mali, Guinea, Sierra Leone, Liberia, Côte d'Ivoire, Niger, Chad, Sudan, and South-Sudan, Ethiopia. While the rest of the Country had positive moisture anomalies observed.

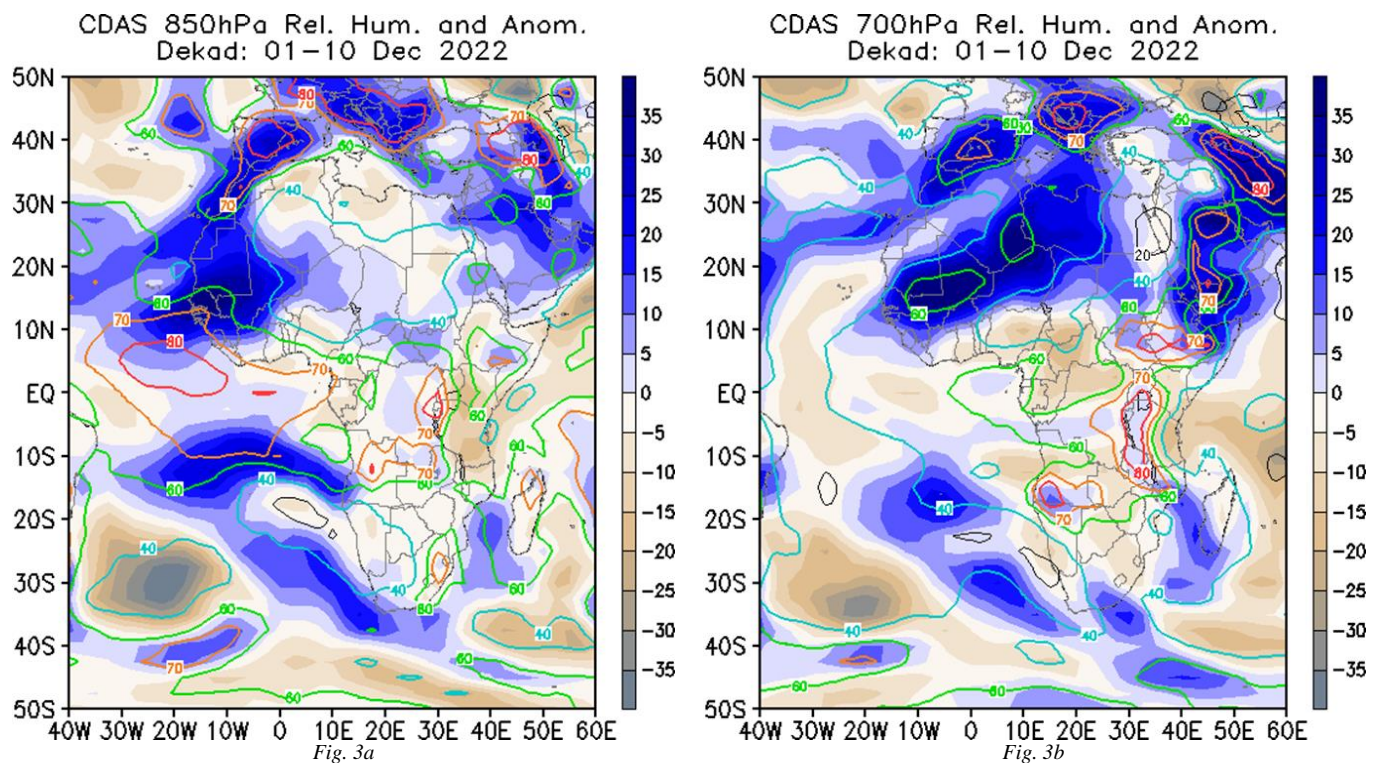


Figure 3. Relative Humidity (contour; %) and associated anomalies (shaded) observed at 850hPa (Fig.3a) and 700hPa (Fig.3b) during the first dekad of December 2022 (from 1st to 10th Dec). SOURCE/. NOAA/. NCEP-CAR/. CDAS1

2.0 PRECIPITATION

Figure 8 shows, during the first dekad of December 2022, rainfall activities were observed over some parts of subequatorial and tropical bands of the Continent, with dominate by below-average to well below-average rainfall conditions observed over western parts of Central Africa, South-eastern of the East Africa regions, most of northern parts of SADC region. Above-average to well above-average rainfall was recorded over northern Congo, eastern DRC, western Kenya, Tanzania, south-eastern Angola, southern Botswana, north-eastern South Africa and central Madagascar.

Details:

- **North Africa:** This region experienced below average rainfall conditions over Morocco experience above average while over northern Algeria, Tunisia and Libya experienced below average.
- **Sahel:** This region received near average rainfall conditions.
- **Gulf of Guinea countries:** Southernmost parts of the region received below to well below average precipitation over Liberia, Ghana, and Côte d'Ivoire.

- **Central Africa countries:** experienced above to well above normal precipitation over South-eastern Cameroon, northern Congo and eastern DRC; below average rainfall over most of Gabon, southern Congo, central and western parts of DRC and northern and central Angola.
- **East African countries:** some eastern parts observed above to well above average rainfall conditions over north-western Uganda, Rwanda, Burundi, western Kenya and Tanzania; below to well below average rainfall were observed over eastern Kenya, central and eastern parts of Tanzania.
- **Southern Africa countries:** Some parts of the region received above to well above average precipitation over western of Zambia, southern Botswana, north-eastern parts of South Africa and eastern Madagascar. Below average over north-eastern Namibia, central of South Africa, much of Zimbabwe, Mozambique and Madagascar.

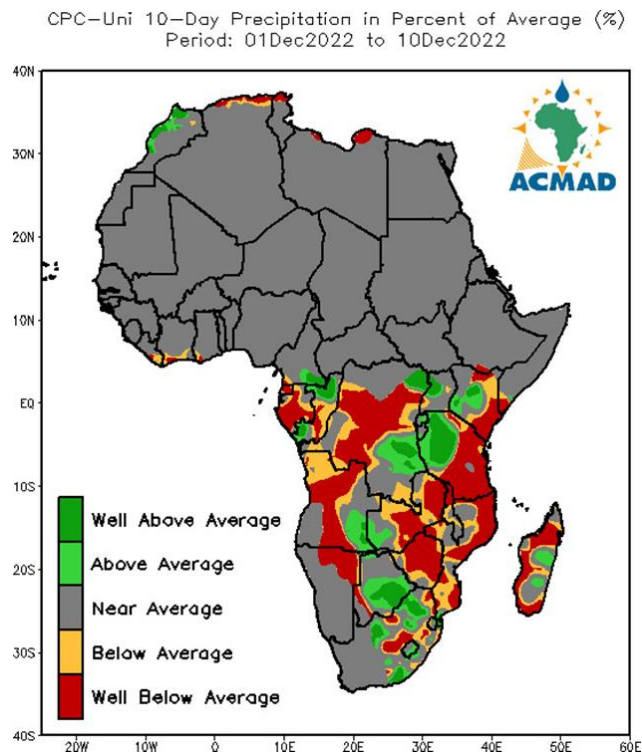


Figure 6: Precipitation in the percentage of the average for the first decade 1st to 10th December 2022. The reference period used is 1991-2020. Source: NOAA/ NCEP/ CPC/ UNIFIED/ Africa/ DAILY/

3.0 RAINFALL OUTLOOK VALID FOR 18 - 31 December 2022

The outlook for 18 – 24 December 2022 depicts a general bias for below to normal and normal to below precipitation over northernmost of Morocco, much of Angola, western Zambia, Namibia, north-eastern Botswana, eastern South Africa, and northern parts of Madagascar. Above average rainfall condition is expected over southern Gabon, Congo, DRC, Tanzania, Zambia, Malawi, Mozambique and Madagascar. During the second from 25 to 31 December normal to below average rainfall is expected Angola, Botswana, South Africa, Lesotho, Eswatini, southern Madagascar and normal to above average over southern DRC, much of Rwanda, Burundi, southern Tanzania, eastern Zambia, most of Malawi, Mozambique, eastern Zimbabwe and northern Madagascar.

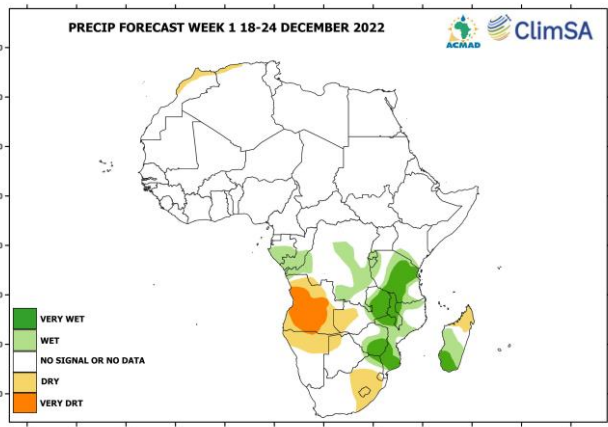


Figure 9a: Precipitation forecast for 18 – 24 December 2022

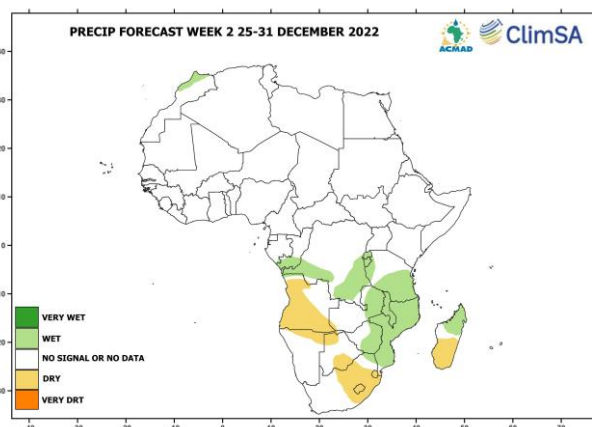


Figure 9b: Precipitation forecast for 25-31 December 2022