CENTRE AFRICAIN POUR LES APPLICATIONS DE LA METEOROLOGIE AU DEVELOPPEMENT

AFRICAN CENTRE OF METEOROLOGICAL APPLICATIONS FOR DEVELOPMENT

Institution Africaine parrainée par la CEA et l'OMM African Institution under the aegis of UNECA and WMO

TEN-DAY CLIMATE DIAGNOSTICS BULLETIN

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HIGHLIGHTS

- ✓ *During the first dekad of September 2022, rainfall activities were observed over most of the subtropical and tropical bands of the Continent, with above-average to well above-average rainfall conditions observed over most of Western Africa, most of Central Africa and some western parts of Eastern Africa regions. Below-average to well below-average rainfall was recorded over southern and central parts of West Africa and eastern parts of Central Africa and northern side of East Africa.*

- ✓ *The dekad was characterized by neutral to cold SSTs conditions in the eastern parts of the Atlantic Ocean closer to the western coastline of the Continent. In addition, in the equatorial pacific region, La Nina conditions have 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 reduced rainfall over most of the eastern side of East African countries.*

- ✓ *The outlook for August 14 – 20 September 2022 is more towards a below to normal precipitation over Ivory Coast, Ghana, Cameroon, Gabon and western Republic of Congo in the first week. Whereas normal to above precipitation can be expected in Mali, Burkina Faso, Niger, Nigeria, Chad, Cameroon, Sudan, CAR and DRC during the second week with below normal precipitation over Gabon, Equatorial Guinea, southern, Benin, Togo, Ghana, Ivory Coast, Liberia and Guinea.*

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 1021hPa, a 1hPa weakening compared to the climatological mean (1991-2020). It was located at 25°W and 33°N.
- **St. Helena High** observed a central pressure value of 1023hPa; a 2hPa weakening from the previous dekad and strengthened by 3hpa from the climatological mean (1991-2020). It was located at 30°W and 33°S. It moved to the west of its climatological position over the South Atlantic Ocean.
- **Mascarene High:** The central value for Mascarene High was 1023hPa. It weakened by 10hPa from the previous dekad and by 3hpa from the climatological mean (1991-2020). Positioned at 75°E and 30°S, it moved to the east over the south Indian Ocean.

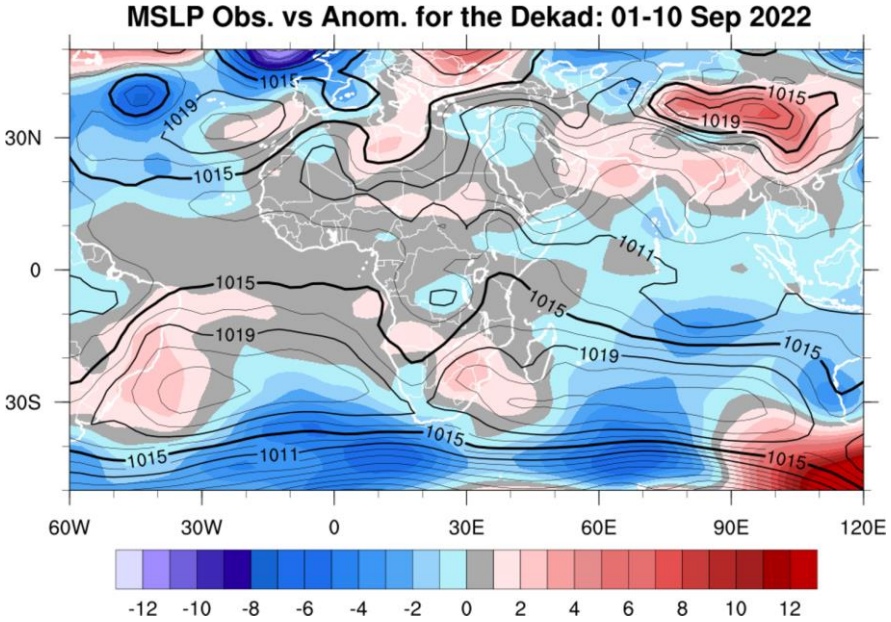

***Figure 1**. Observed Mean Sea Level Pressure (Contour) and anomaly (shaded) from 1st to 10th September 2022*

- **Heat Low:** Thermal low was observed with the value of 1007hPa over southern parts of Algeria, Morocco and northern Mali, located at 4°W/24°N stable to previous dekad and its climatological mean.

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.

This figure *2.a* shows the dekad average wind at 850hPa. Positive wind from north to south easterly and southerly anomalies observed over Angola, Zambia, Botswana, South Africa, Cameroon, Sudan and Algeria. Negative wind anomalies were observed over Chad, Nigeria, Namibia, Libya, southwest South Africa and DRC.
At the 700hpa level (see *Fig.2b*), the vortex wind anomaly was observed over northern parts of North Africa and Sahel region, in the central parts of the Continent neutral easterlies were observed.
At the 200hpa level (see *Fig.2c*), the vortex wind anomaly was observed over north-western parts of North Africa. Very strong easterly wind vector anomalies at 200hPa observed mainly over Southern Africa region.

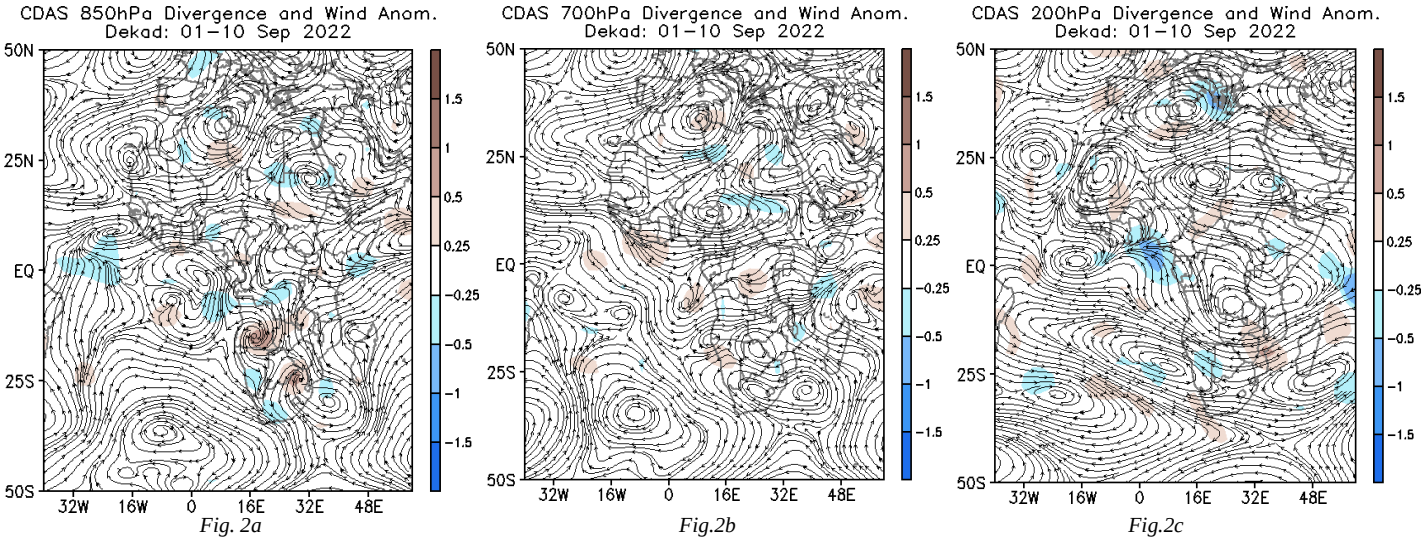

Fig. 2a *Fig.2b* *Fig.2c*

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 first dekad of September 2022 (from 1st to 10th Sep). Source: NOAA/NCEP

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

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

At 850hPa (*see Fig.3a*), wet atmospheric conditions (relative humidity ≥ 60%) were observed over Western Africa countries, most of Central Africa and most parts of the East African region. The rest of the continent observed RH values ≤ 60%. Negative anomalies were observed during the first dekad of September 2022 over most of DRC, Gabon, Congo, Angola, southern South Africa, Algeria, eastern Mauritania and Mali, whilst positive anomalies were recorded over the rest of the continent.

At 700hPa (Fig.3b), high relative humidity (≥ 60%) were observed over Western Africa countries, most of Central Africa and East African regions. Relative humidity anomalies for the first dekad of September 2022 were negative over Angola, Zambia, Zimbabwe, Mozambique, Congo, Gabon, DRC, Ivory Coast, Ghana, Togo, Benin, Egypt, Libya south eastern parts of South Africa, Eswatini, and north Madagascar. While the rest of the continent received a surplus of moisture.

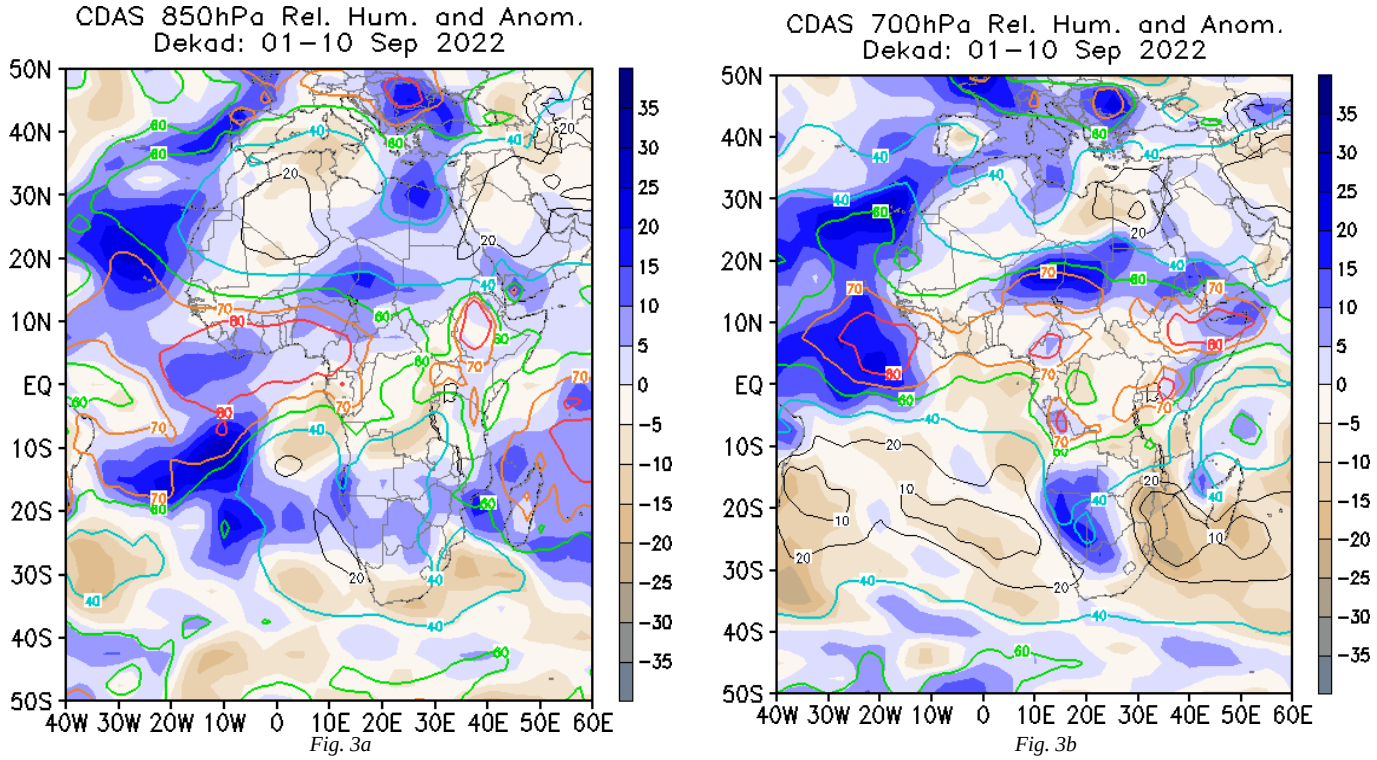

Fig. 3a *Fig. 3b*

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

2.0 PRECIPITATION

Figure 8 shows the observed precipitation as a percentage of average for the first dekad of September 2022.

During the first dekad of September 2022, rainfall activities were observed over most of subtropical and tropical bands of the Continent, with above-average to well above-average rainfall conditions observed over most of Western Africa, most of Central Africa and some western parts of Eastern Africa regions. Below-average to well below-average rainfall was recorded over southern and central parts of West Africa and eastern parts of Central Africa and northern side of East Africa.

Details:

- **North Africa**: This region experienced mostly near average rainfall conditions.
- **Sahel:** Above to well above average rainfall conditions were experienced over south eastern parts of Mauritania, Mali, Niger, Chad and Sudan, during the same dekad below to well below average precipitation over some areas in Niger and Sudan.
- **Gulf of Guinea countries**: Some parts of the region received above to well above-average precipitation over Nigeria Gabon and Cameroon, below to well below average rainfall over Ivory Coast, Ghana, Togo, Benin, and Nigeria
- **Central Africa countries**: experienced below to well above normal precipitation except for over eastern DRC and Equatorial Guinea.
- **East African countries:** most of eastern parts observed above to well above average rainfall conditions over south-western parts of Sudan, South-Sudan, Uganda, Burundi, Rwanda and west Kenya, below to well below average rainfall were observed in the north and western parts of Ethiopia, northern Tanzania, southern and eastern Uganda.
- **Southern Africa countries:** most parts of the region are still off-season.

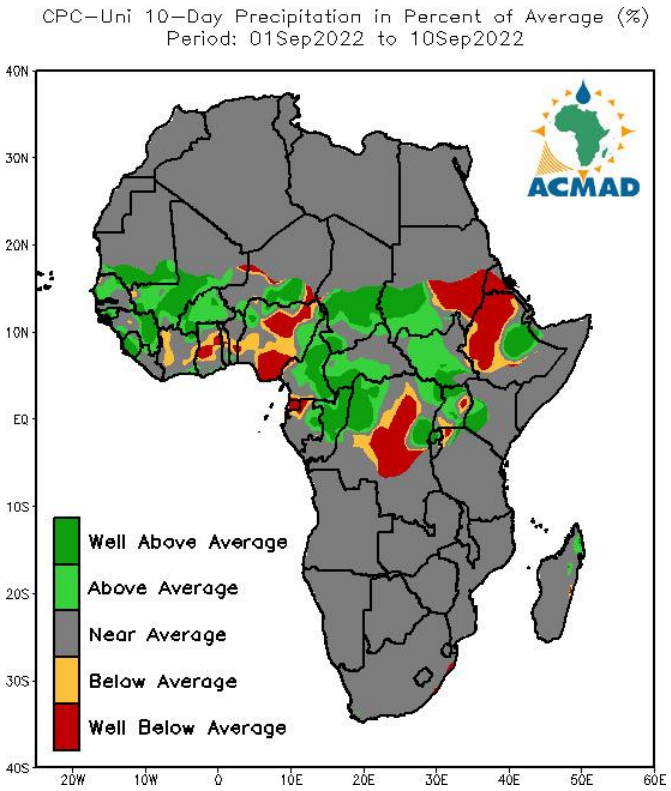

Figure 6: *Precipitation in the percentage of the average for the third dekad 1st to 10th September 2022. The reference period used is 1991-2020. Source: NOAA/. NCEP/. CPC/. UNIFIED/. Africa/. DAILY/)*

3.0 RAINFALL OUTLOOK VALID FOR 14 TO 27 SEPTEMBER 2022

The outlook for August 14 – 20 September 2022 depicts a general tendency for below to normal precipitation over Ivory Coast, Ghana, Cameroon, Gabon and western Republic of Congo. Above average precipitation is expected to be observed over Senegal, Gambia, Guinea Bissau, Guinea, Serra Leone, south of Mali, eastern Benin, Nigeria, northern Cameroon, southern Chad, northern CAR, eastern DRC, southern Sudan, eastern South-Sudan, Uganda and western Ethiopia in the first week. Whereas normal to above precipitation can be expected in Mali, Burkina Faso, Niger, Nigeria, Chad, Cameroon, Sudan, CAR and DRC during the second week with below normal precipitation over Gabon, Equatorial Guinea, southern, Benin, Togo, Ghana, Ivory Coast, Liberia and Guinea.

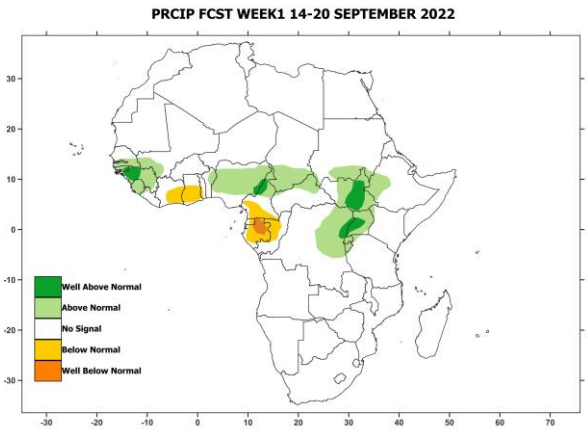

***Figure 9a**: Precipitation forecast for 07 – 13 September 2022*

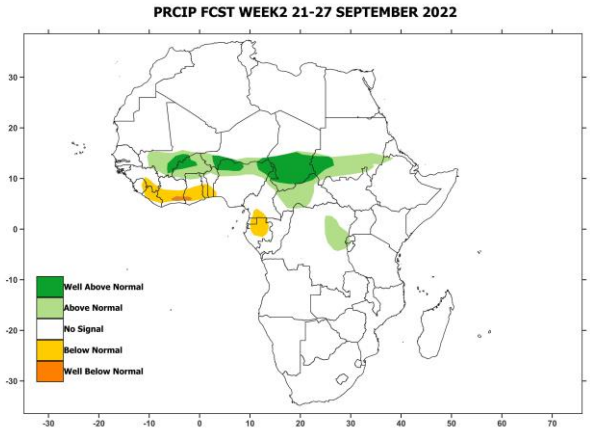

***Figure 9b**: Precipitation forecast for 14 - 20 September 2022*