



**Climate Services for Building the
Resilience of the Agriculture Sector :
Improving and Modernizing the Drought
Monitoring and Advisory System in
Africa**

**Presented by
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October 9-11, 2023, CROSSROADS
Hotel, Lilongwe – Malawi

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Presentation Outline

- 1. Agriculture Selected Facts.**
- 2. What is drought and in which form?**
- 3. Climate Change and Agriculture**
- 4. Process and dissemination of the current monthly drought monitoring bulletin.**
- 5. Modernising drought monitoring and advisory services across Africa**

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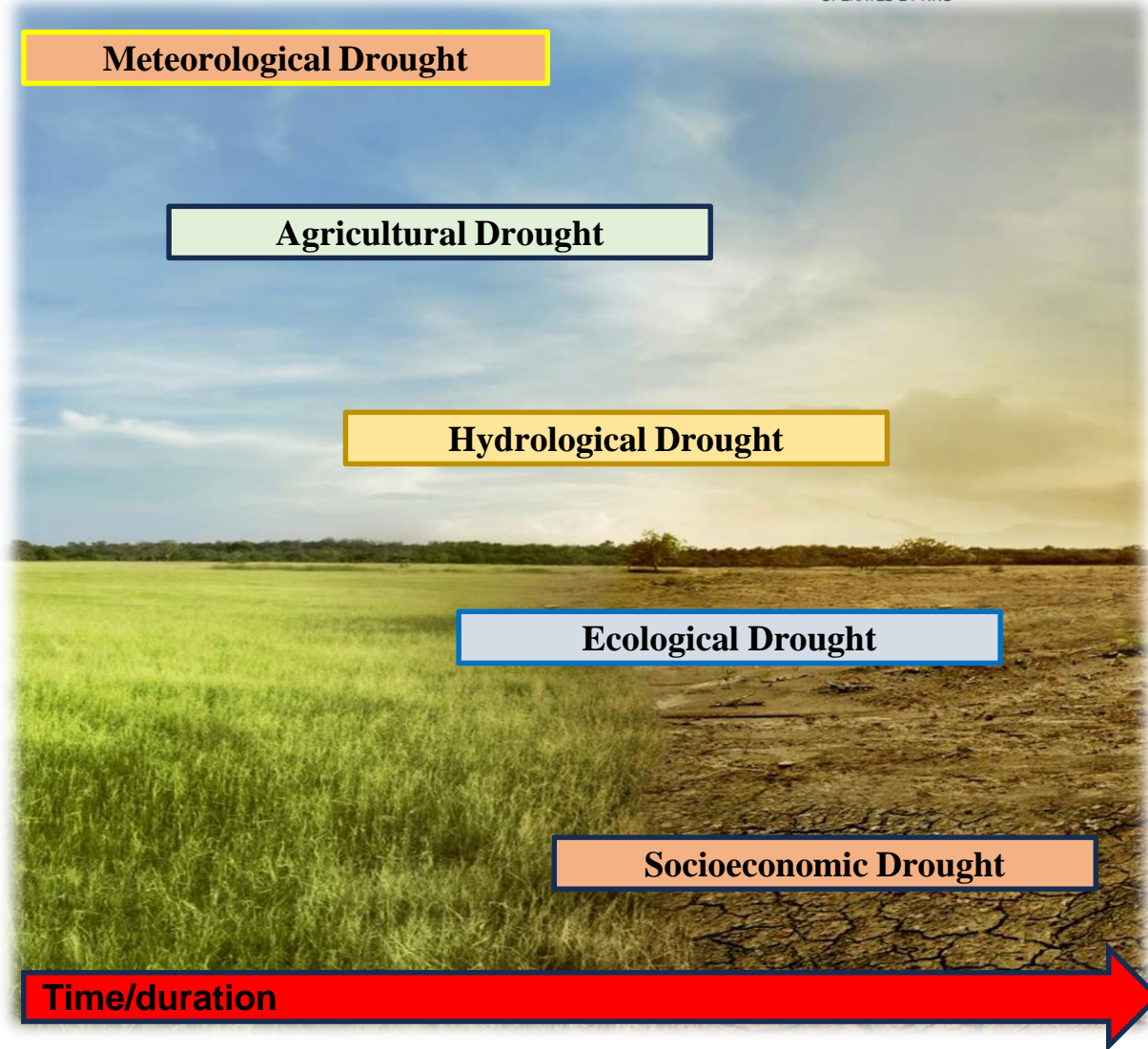
Agriculture Selected Factsheet

- Agriculture irrigation accounts for 70% of water use worldwide ([OECD, 2023](#)), three times more than 50 years ago ([globalagriculture.org/report, 2023](#))
- By 2050, the global water demand for agriculture is estimated to increase by a further 19% due to irrigational needs ([globalagriculture.org/report, 2023](#))
- In sub-Saharan Africa, irrigated areas are expected to more than double by 2050, benefiting millions of small-scale farmers. However, it has been estimated that 41% of current global irrigation water use occurs at the expense of environmental flow requirements ([FAO, 2020](#))
- Intensive groundwater pumping for irrigation depletes aquifers and can lead to negative environmental externalities, causing a significant economic impact on the sector and beyond ([OECD, 2023](#)).

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What is drought and in which form?

- Occurs when the amount of precipitation received in a specific area is less than the average for an extended period.
- A drought that impacts crop production during an agricultural growing season following a prolonged Meteorological Drought
- Happens when reduced precipitation impacts on water supply, e.g., there is decreased streamflow, soil moisture, reservoir and lake levels, and groundwater. This often follows an extended period of meteorological drought
- Ecological drought: is the most recently defined type of drought and refers to widespread ecological damage caused by a decrease in the availability of water or even the moisture of the soil.
- Socioeconomic drought: occurs when a water shortage is caused by an imbalance between the supply and demand of water resources in natural and human socioeconomic systems.



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Climate Change and Agriculture

Rainfall and drought ([IPCC's AR6](#)) :

1.5 °C

At 1.5°C global warming: the frequency and length of droughts are projected to increase over large parts of southern Africa.

2.0 °C

At 2°C global warming: unprecedented extreme droughts are projected to emerge.

>3.0 °C

Above 3°C global warming: average annual rainfall is projected to decrease by 10–20% in the summer rainfall region, particularly in the western parts.

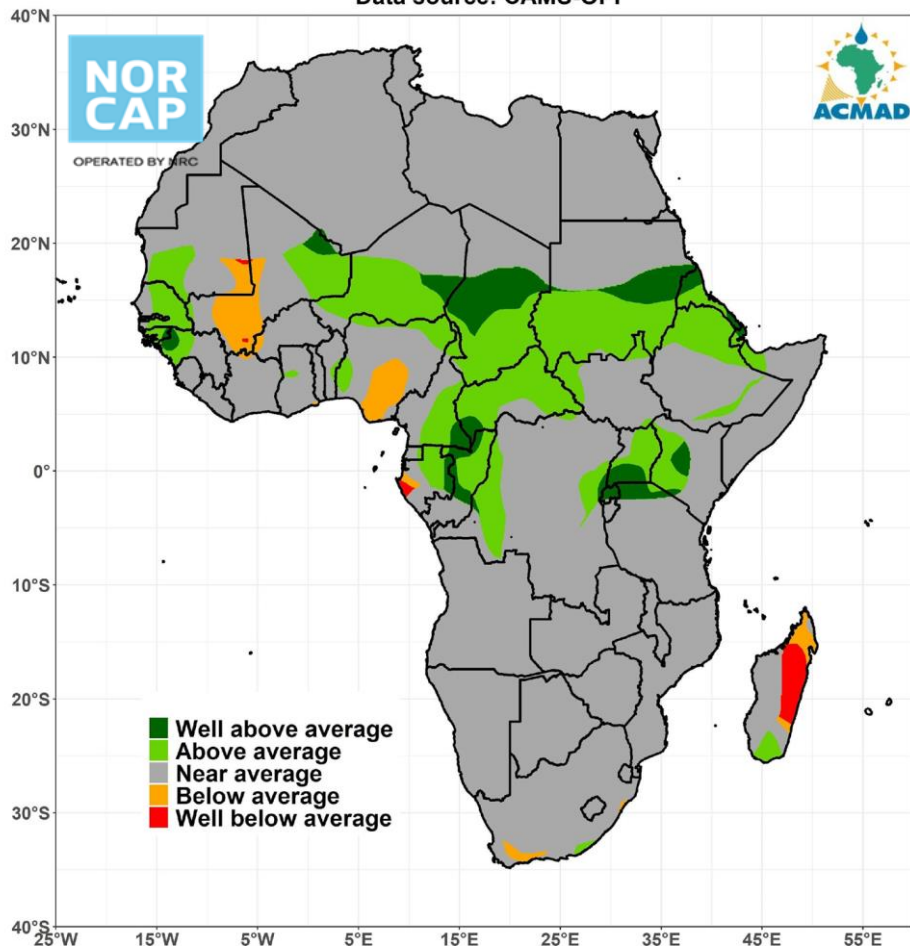
The length of meteorological droughts is also projected to double from 2 to 4 months

1. Monthly Drought Monitoring Bulletin

PRECIPITATION IN PERCENT OF AVERAGE

MONTHLY PRECIPITATION IN PERCENT OF AVERAGE FOR AUGUST 2022

Data source: CAMS-OPI

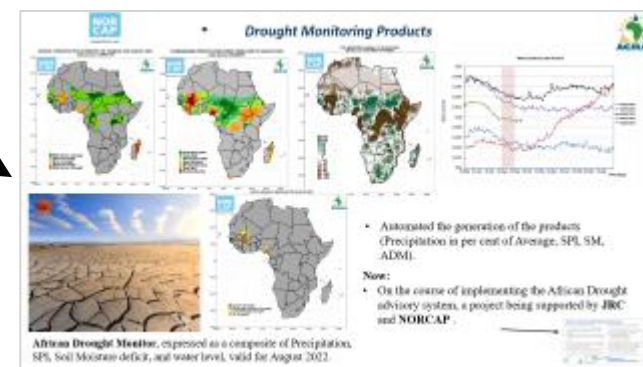
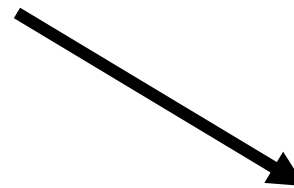


The process to generate the maps for the bulletin:

Before:

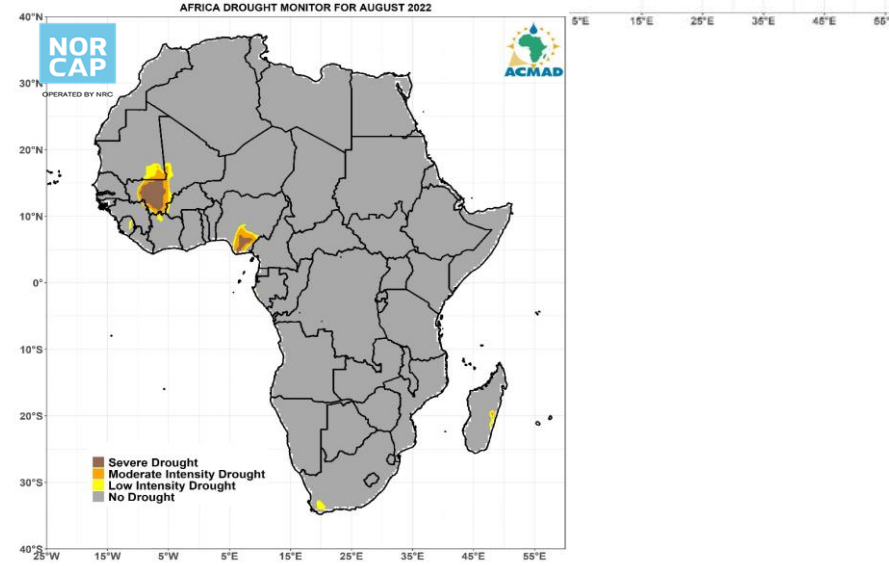
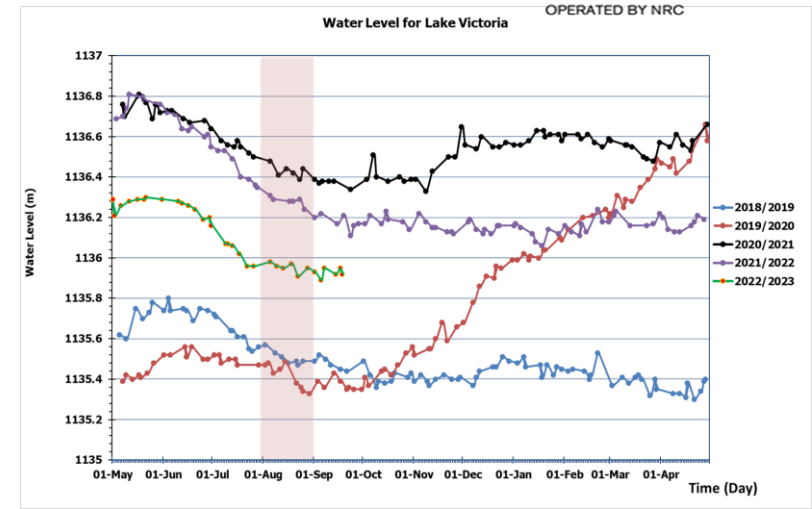
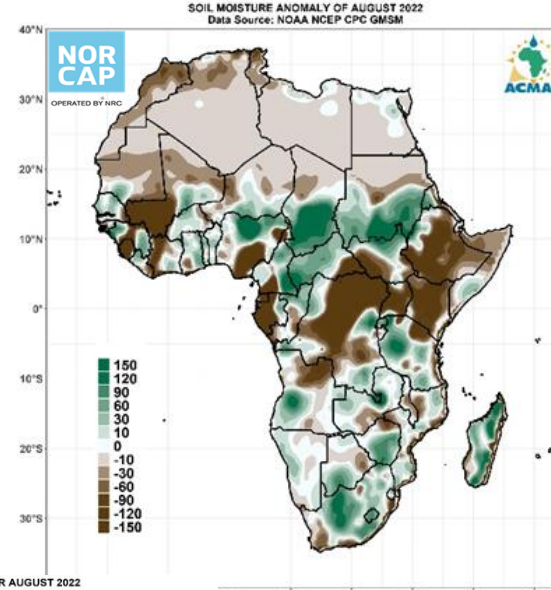
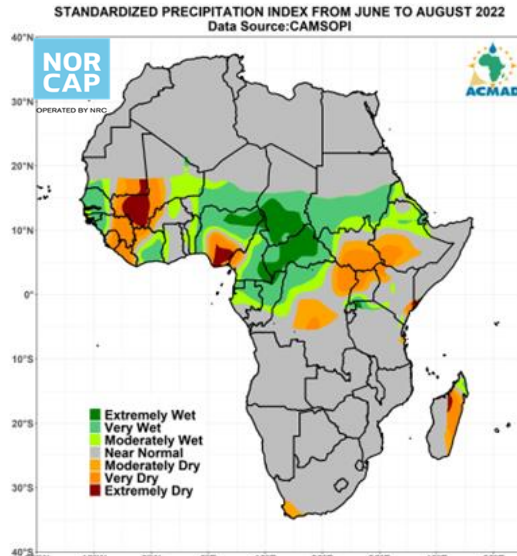
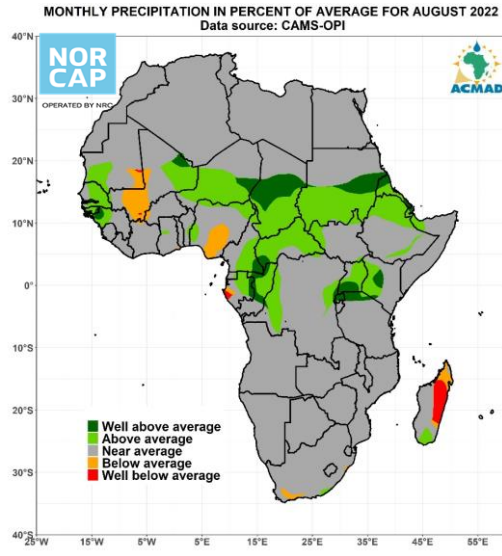
- Data downloaded from a website (https://iridl.ldeo.columbia.edu/SOURCES/.NOAA/.NCEP/.CPC/.CAMS_OPI.v0208/.mean/.prcp) in excel format
- Data was manipulated in **surfer software** for use in **QGIS**
- Map generated using **QGIS**
- This process was repeated for SMA, SPI etc.
- Producing the bulletin was time-consuming and less time to focus on science.

Today:





Drought Monitoring Products



African Drought Monitor, expressed as a composite of Precipitation, SPI, Soil Moisture deficit, and water level.

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Mukau system



- ACMAD is implementing a Drought Monitoring and Advisory system- namely the **Mukau** system- at the continental level.
- The system is being developed by **ACMAD** as part of the **Intra-ACP Climate Services Project** in collaboration with the Drought group of the Natural Disaster Risk Unit at the **Joint Research Centre** of the European Commission (funder) and **NORCAP**.



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Mukau



Mukau will put cash in your pocket and food on the table

Monday, June 29, 2020



Mukau tree: nation.africa.com

It is a medium-sized tree, found in dry bushland, woodland, drier wooded grasslands, and riverine forests from southern Ethiopia to north-eastern Tanzania between 300 and 1700 m. It rarely grows more than 15m tall

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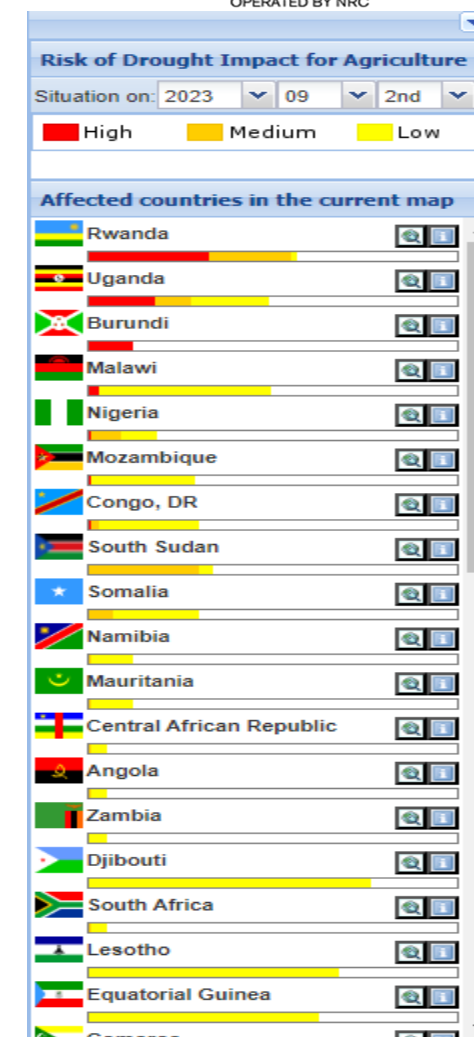
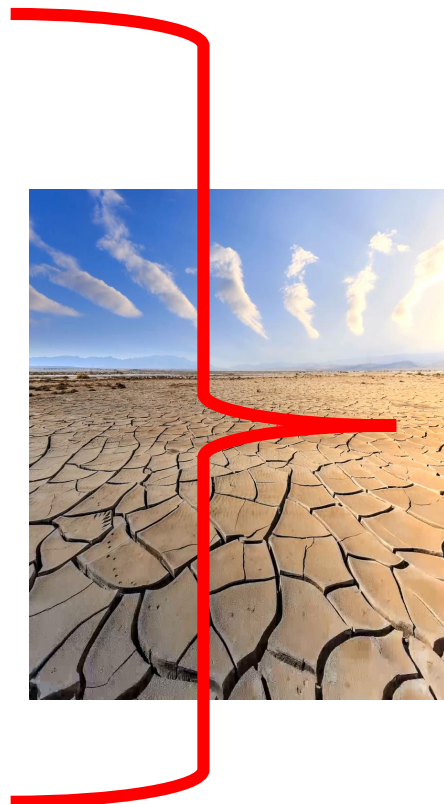


OPERATED BY NRC

Project: Transfer of web-mapping technology for disaster risk and automation of data processing and reporting in Africa

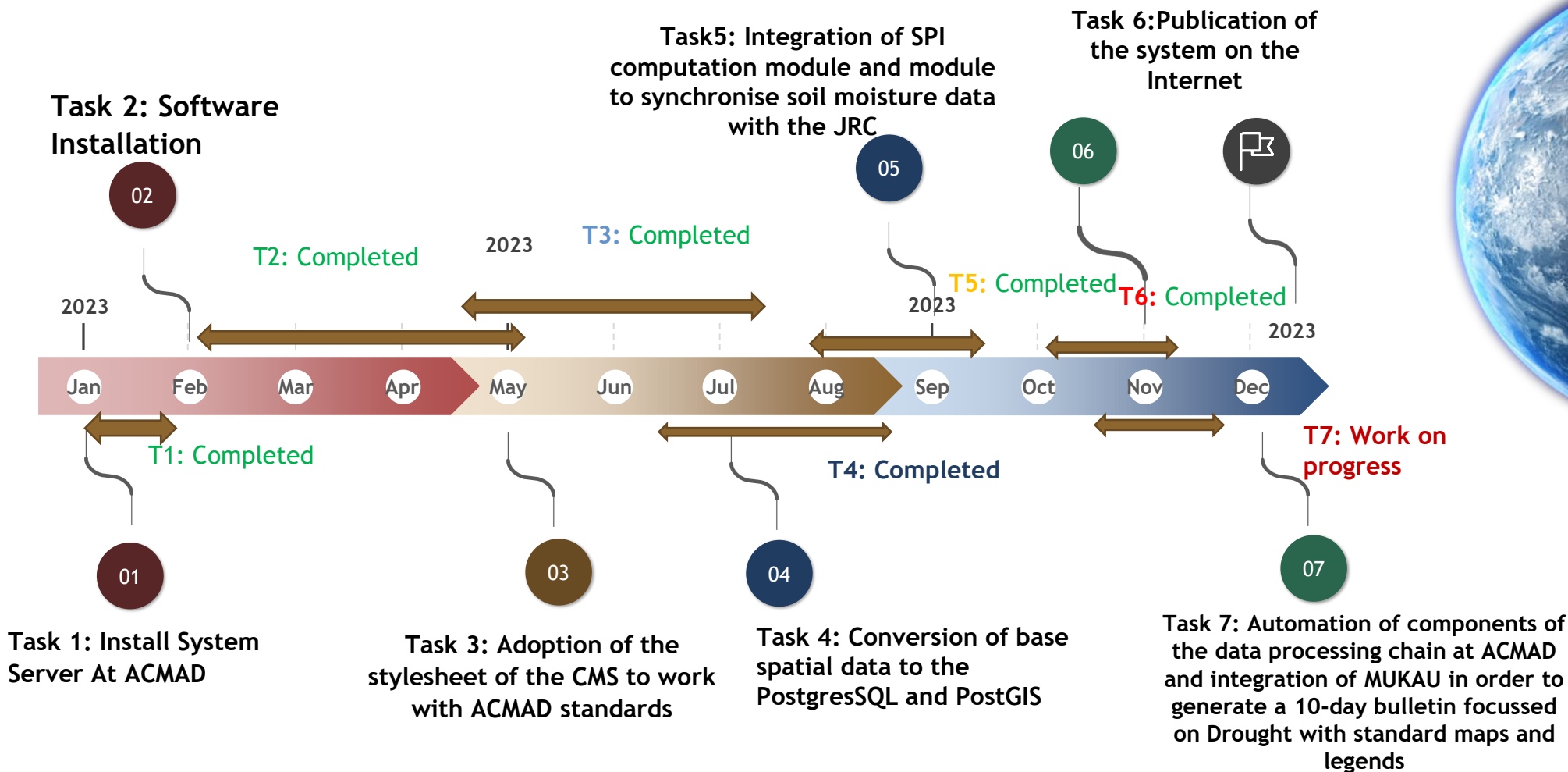
- ❑ Public online near-real-time system that uses **Earth Observation and Weather information to monitor drought conditions in Africa**
- ❑ Provides **automatic 10-day warnings** for:
 - ❑ Developing and actual drought events
 - ❑ Recovery from drought conditions
- ❑ Service developed by **ACMAD** as part of the **Intra-ACP Climate Services Project** in collaboration with the Drought group of the Natural Disaster Risk Unit at the **Joint Research Centre** of the European Commission.
- ❑ An adoption of the **EDO/GDO** system by JRC adapted to the conditions in Africa

Actionable decision-making information

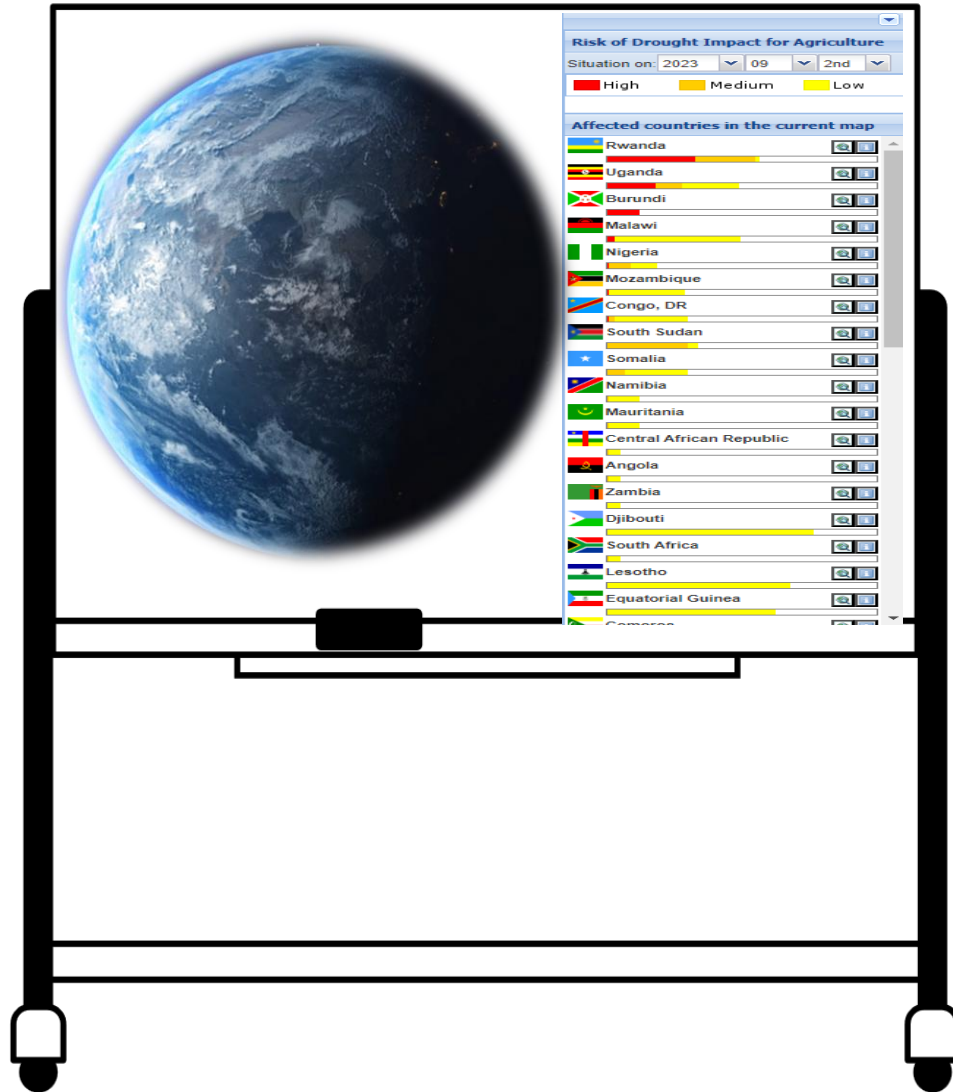


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Continental Drought Advisory Project timeline.



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Thank you for
your attention!
Any
questions?

