ClimSA Climate Station Applications

16th EUMETSAT User Forum in Africa 2024,
Cotonou, Benin, 16-20 September 2024.
Session #4: Climate, Air quality and GHG Monitoring

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September 19th 2024

Presentation overview and objective

1. CS for Climate Monitoring

   Work done with AGRHYMET and ACMAD

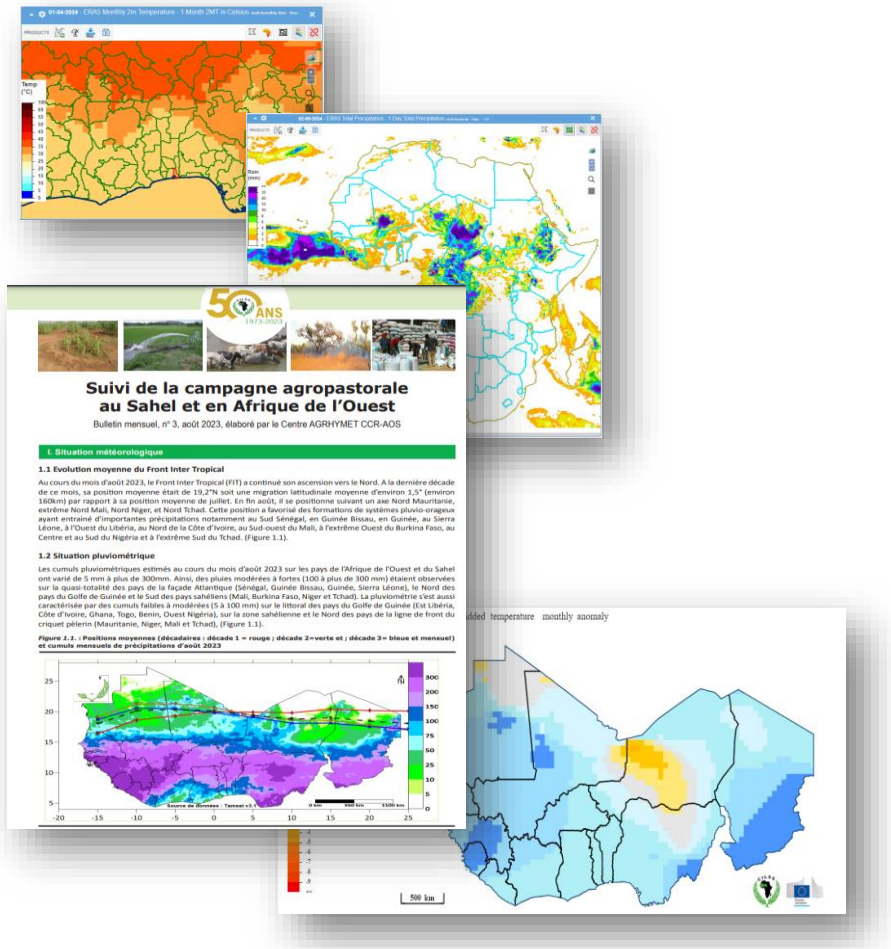
2. Take ways

   What you should know after this presentation

How is the ClimSA Station supporting climate monitoring operations in Africa?

Our goal is to enhance regional and national capabilities in **climate monitoring and data management**

Supporting AGRHYMET on Climate Monitoring



- **Including the AGRHYMET Climate Monitoring operational scripts** in ClimSA station acquisition module to produce specific graphs for monthly bulletins.
  - **Adding new products** like Monthly Temperature & Anomalies and Daily Temperature max and min from IRI data libraries.
- **Integration of script to generate ERA5 re-analysis** in Jupyter notebook and integration for later integration into the analysis module.
- Development of **draft Jupyter notebook** for preparing the bulletins

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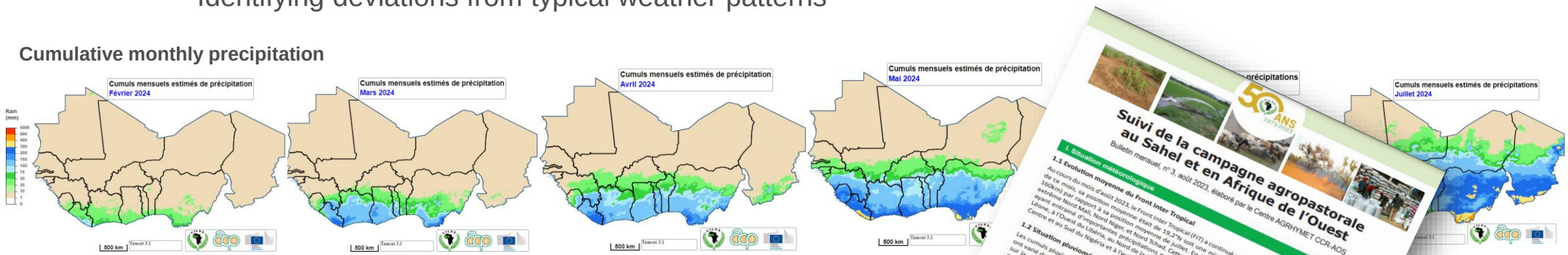
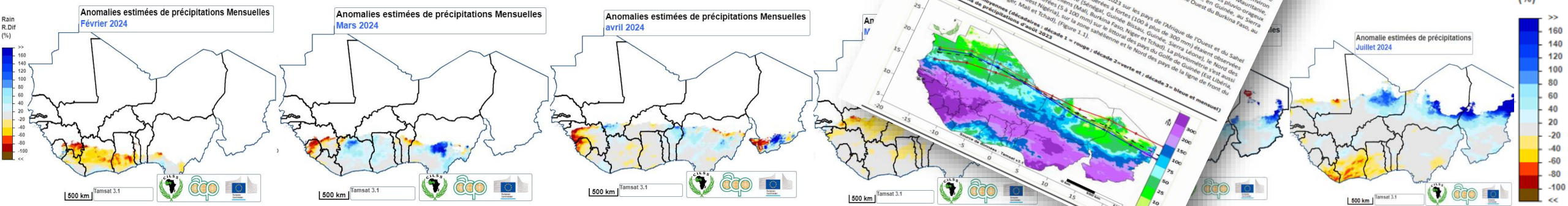
- Monitoring of the agricultural season
  - Assessing regional meteorological situation
  - Identifying deviations from typical weather patterns

Cumulative monthly precipitation



Precipitation anomaly estimates



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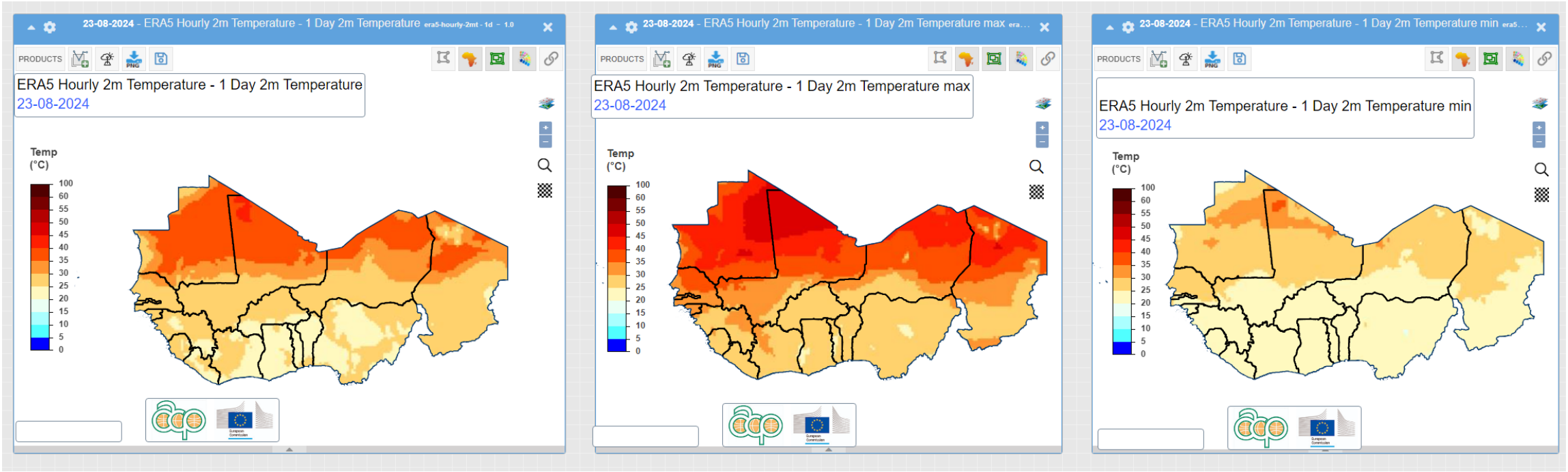
- ERA5 2 metre temperature **daily** temperature average, maximun, minimum
- Daily agregation from hourly data



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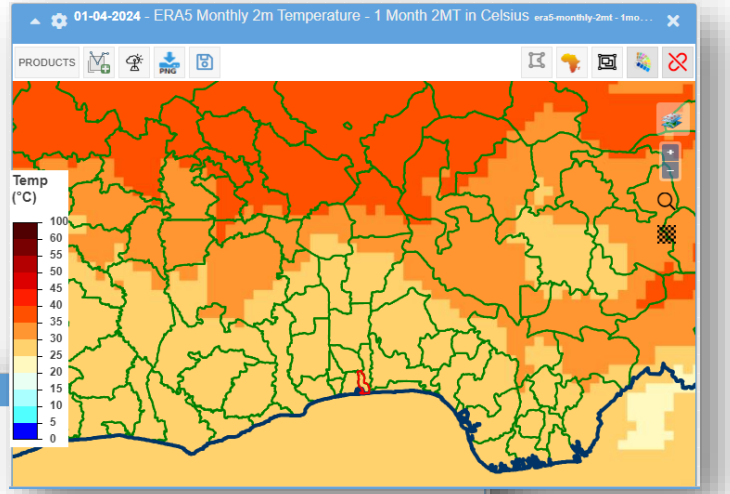
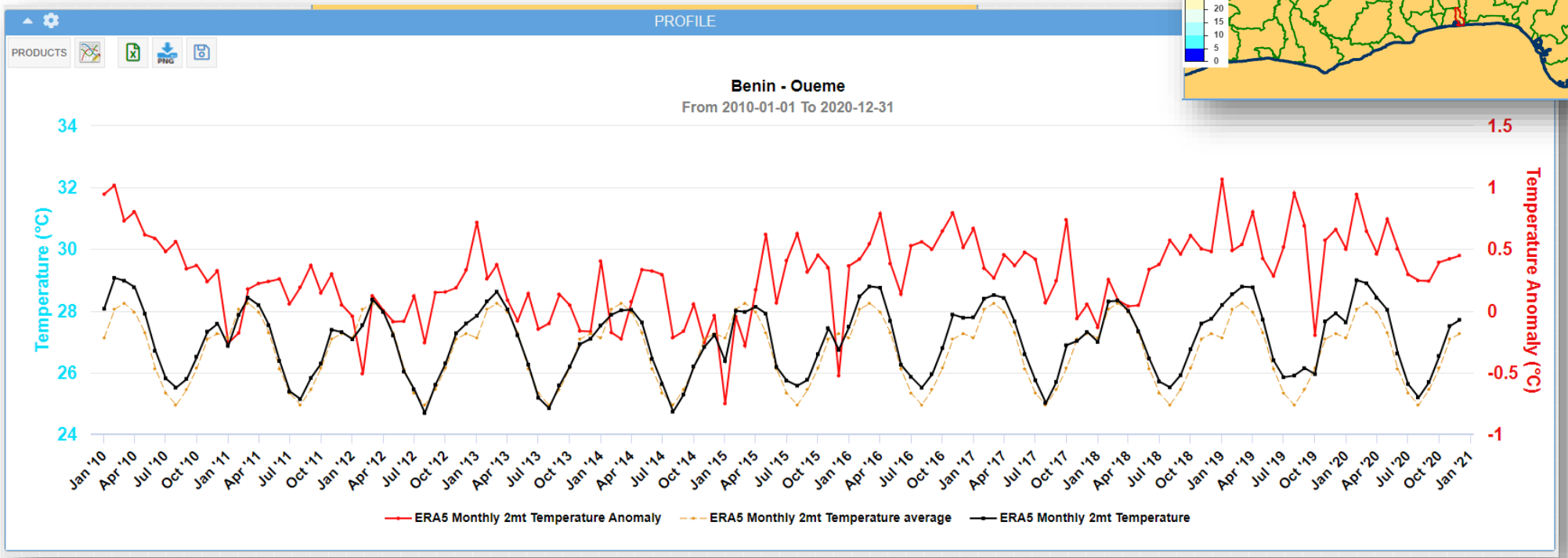
Ouèmè, Benin

- ERA5 2 metre temperature, **monthly** average & its anomaly in Celsius





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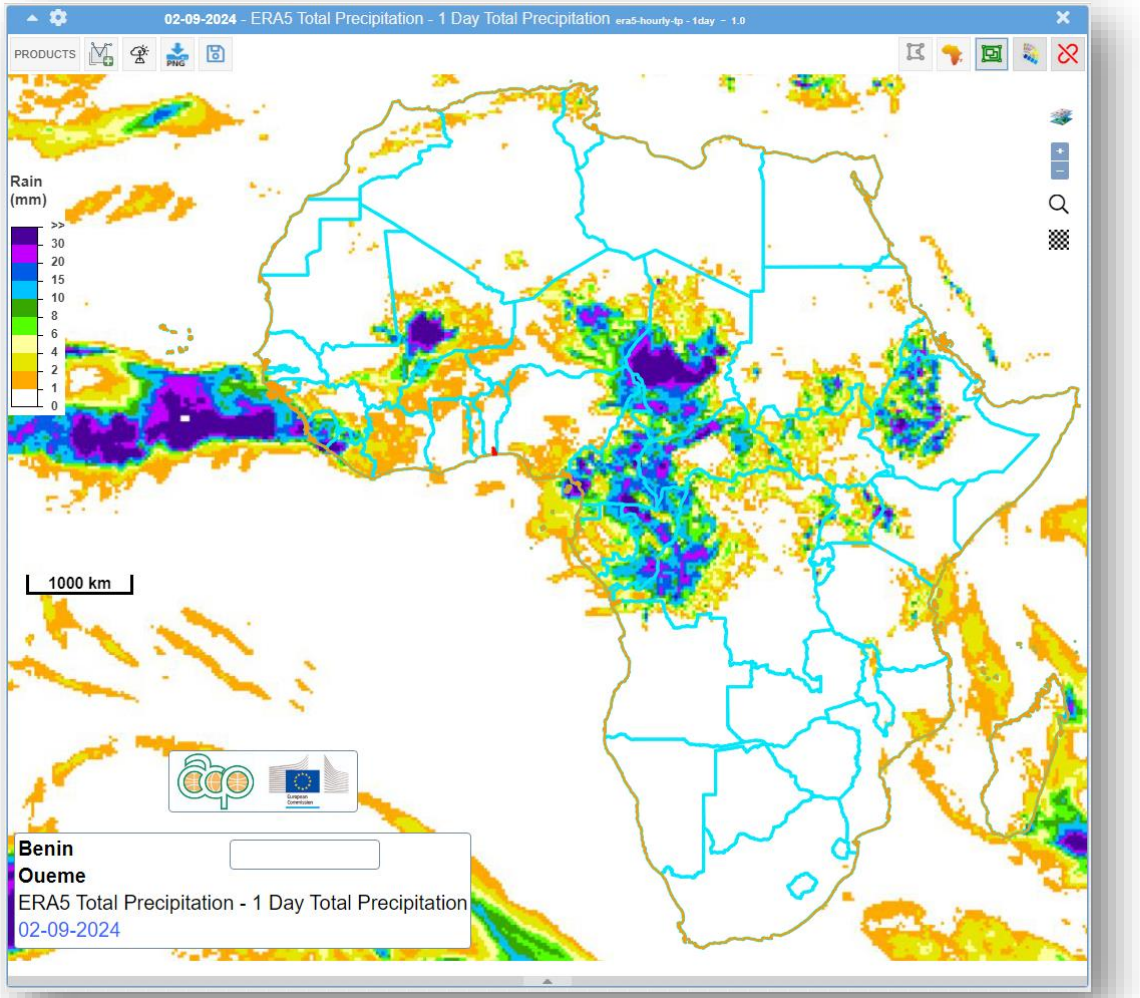
- ERA5 total daily precipitation in mm



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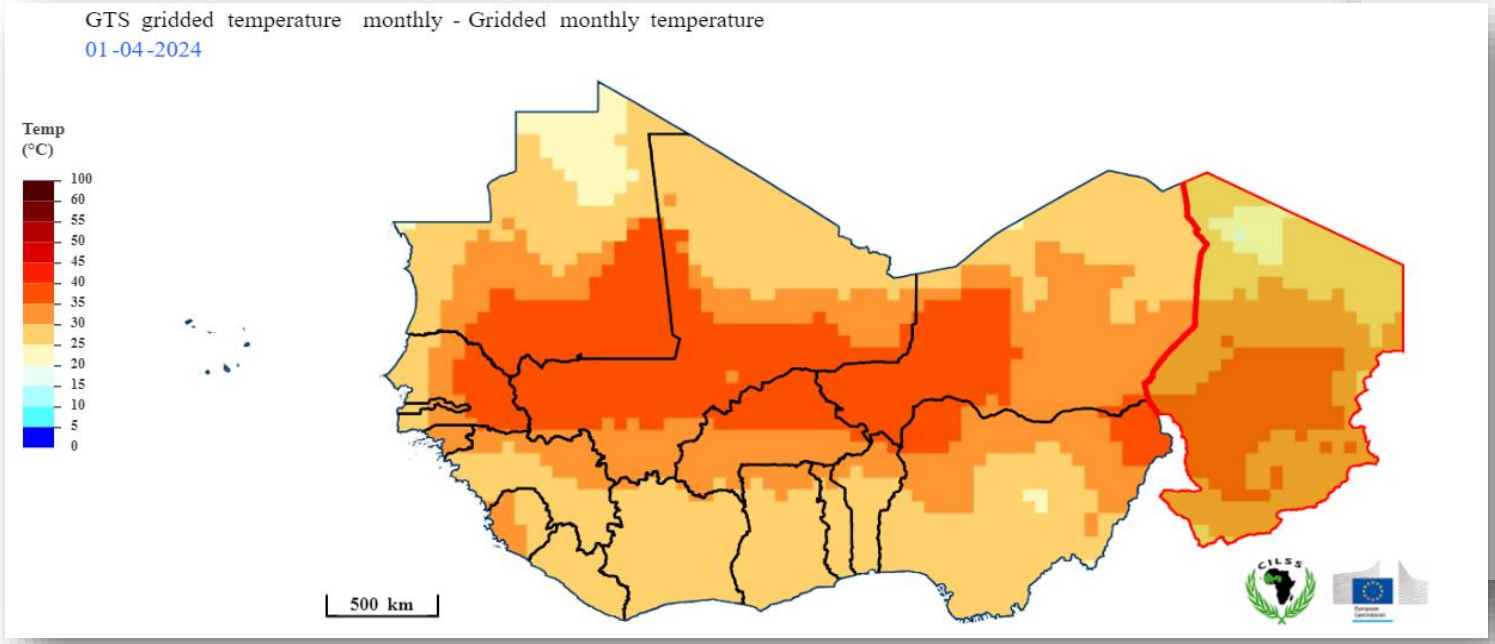
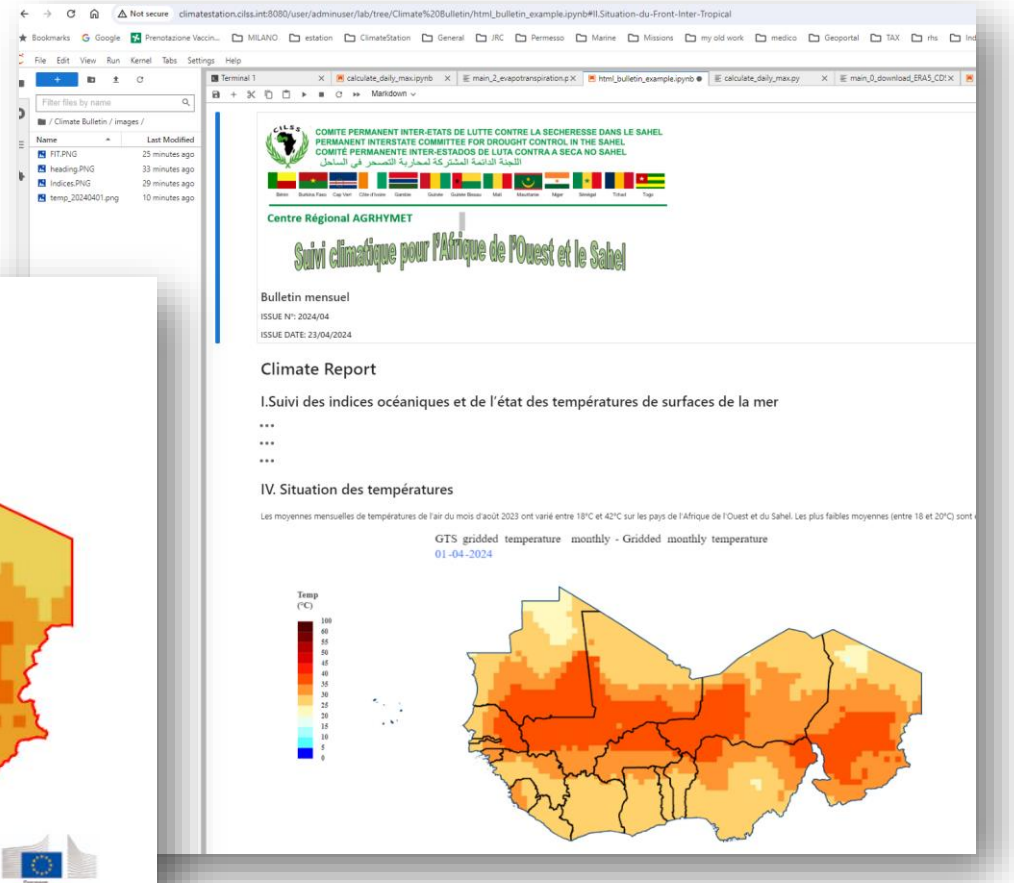
- GTS gridded monthly temperature





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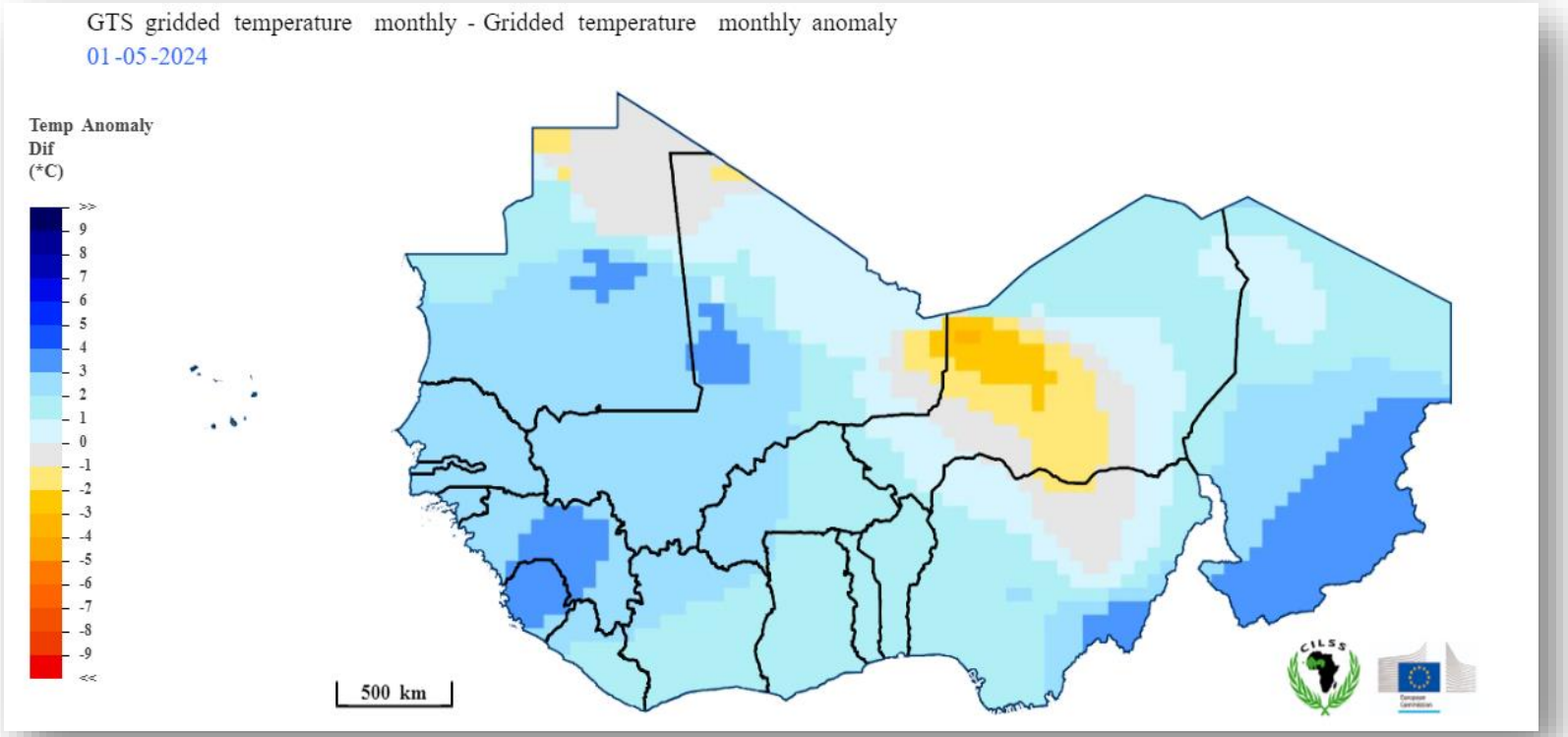
- GTS gridded monthly temperature anomaly



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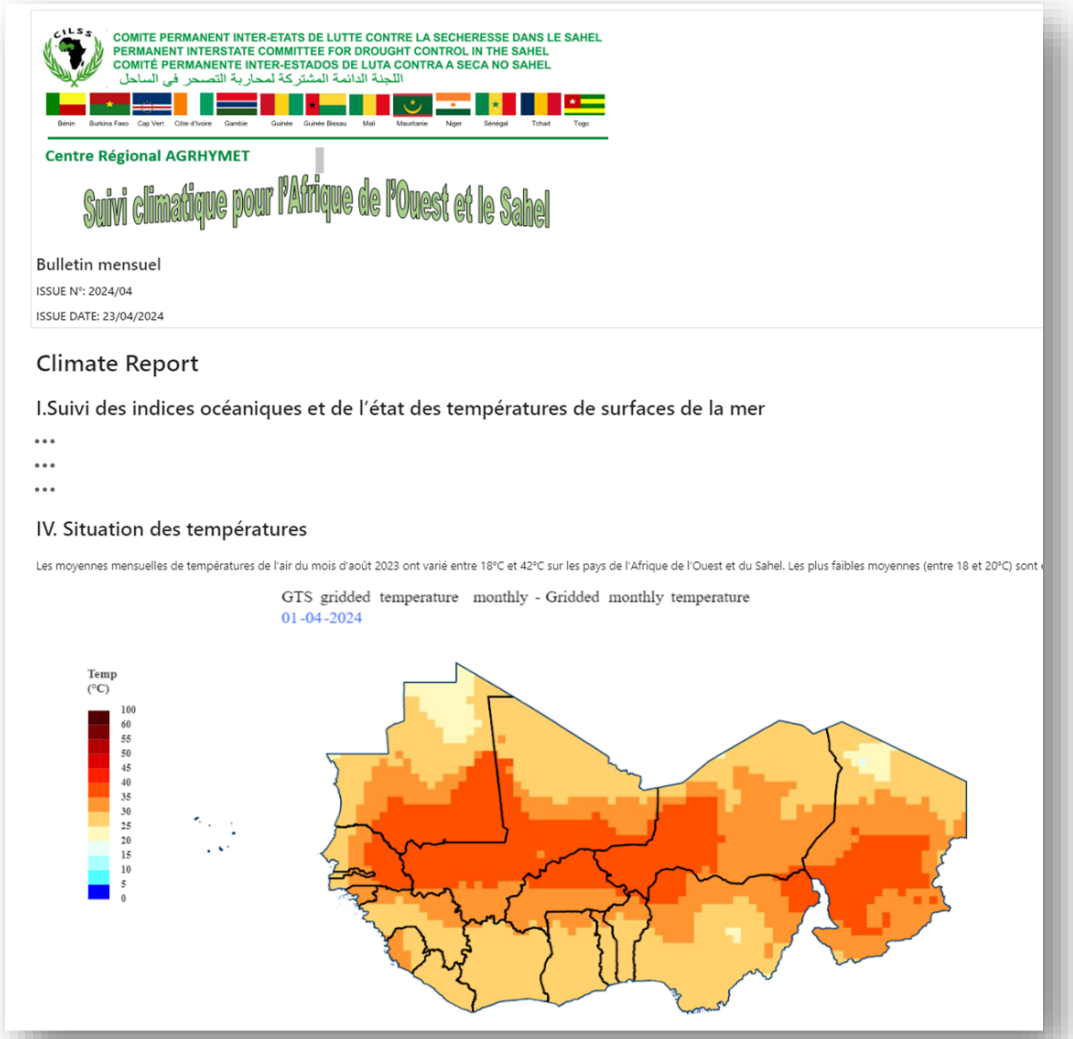

COMITE PERMANENT INTER-ETATS DE LUTTE CONTRE LA SECHERESSE DANS LE SAHEL
PERMANENT INTERSTATE COMMITTEE FOR DROUGHT CONTROL IN THE SAHEL
COMITÉ PERMANENTE INTER-ESTADOS DE LUTA CONTRA A SECA NO SAHEL
اللجنة الدائمة المشتركة لمحاربة التصحر في الساحل

Centre Régional AGRHYMET

Suivi climatique pour l'Afrique de l'Ouest et le Sahel

Bulletin mensuel

ISSUE N°: 2024/04

ISSUE DATE: 23/04/2024

Climate Report

I.Suivi des indices océaniques et de l'état des températures de surfaces de la mer

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IV. Situation des températures

Les moyennes mensuelles de températures de l'air du mois d'août 2023 ont varié entre 18°C et 42°C sur les pays de l'Afrique de l'Ouest et du Sahel. Les plus faibles moyennes (entre 18 et 20°C) sont

GTS gridded temperature monthly - Gridded monthly temperature

01-04-2024

- Climate monitoring report in Jupyter notebook
- This template can be customized and can be published to the website

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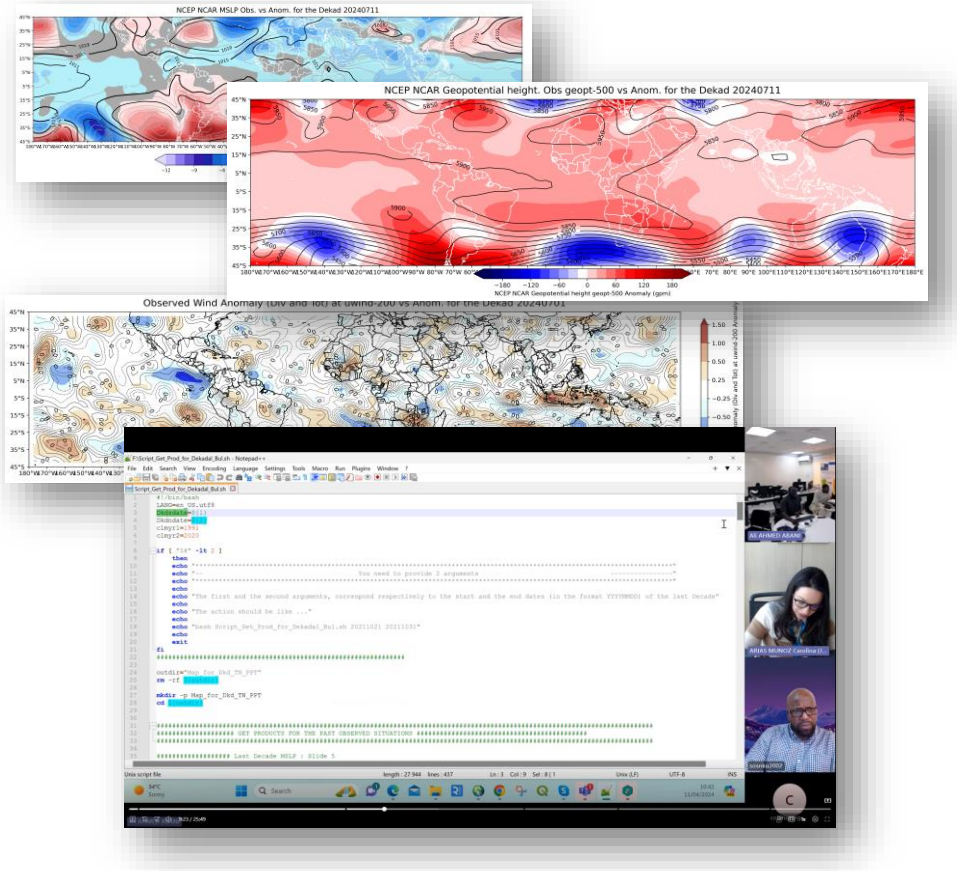

- Development of **draft Jupyter notebook** for preparing the bulletins
- Operationalizing the **10 day Climate diagnostic bulletins**
- Acquisition of all requested **NCEP NCAR products** from IRI & processing its Climatology and acquisition of the same ERA5 products from Climate Data Store
- **Generation of Anomaly plots** with contours for MSLP, RHUM, GEOPT. U&V component

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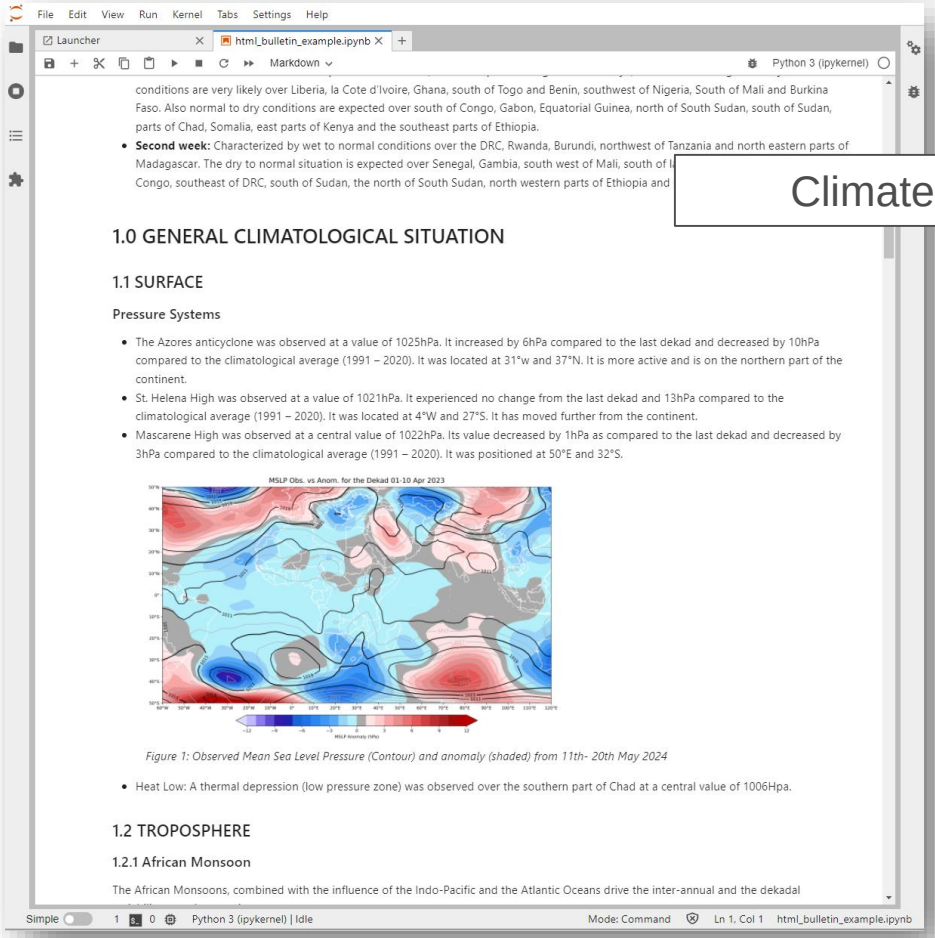

Climate Bulletin Generation

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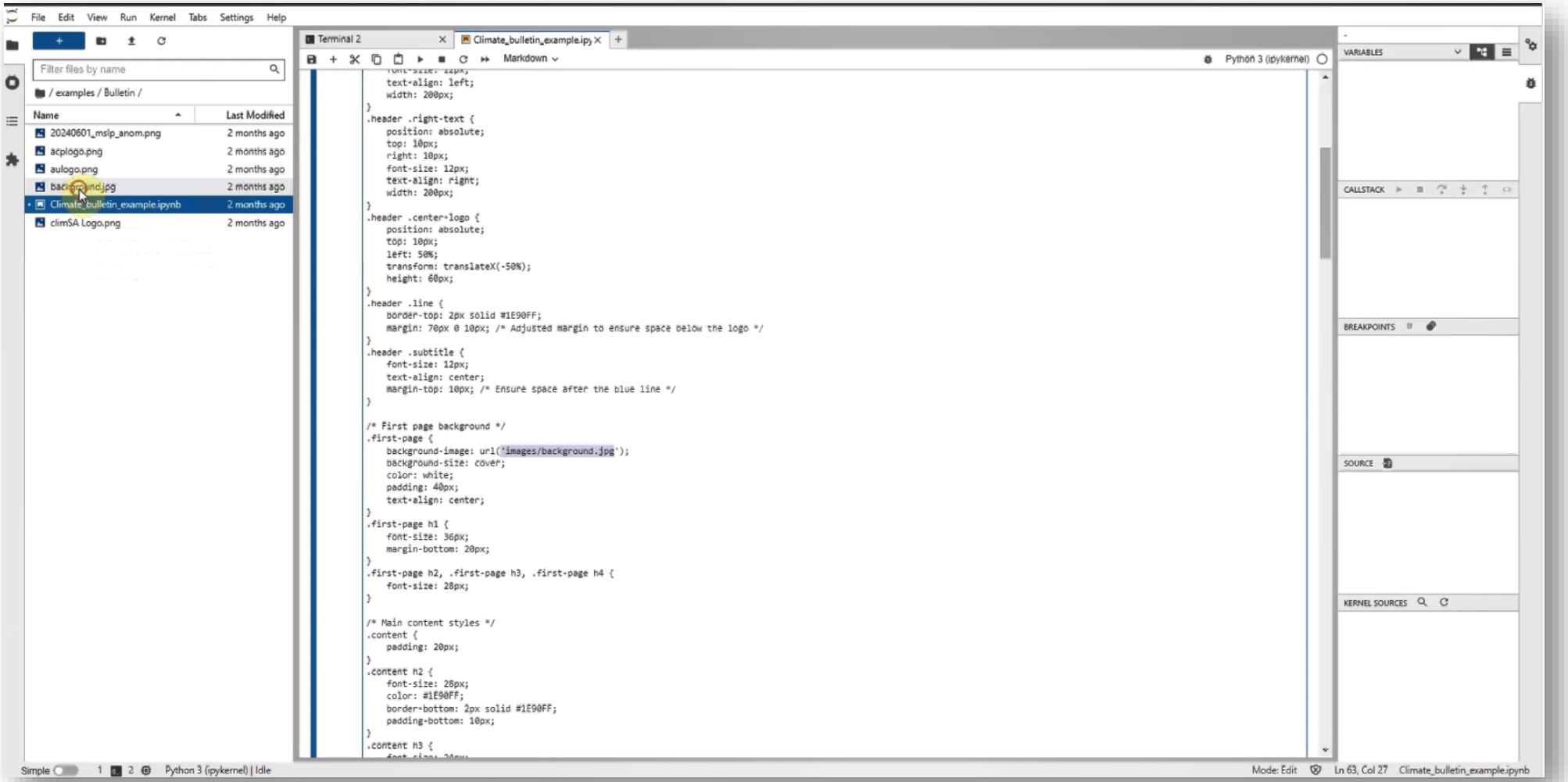

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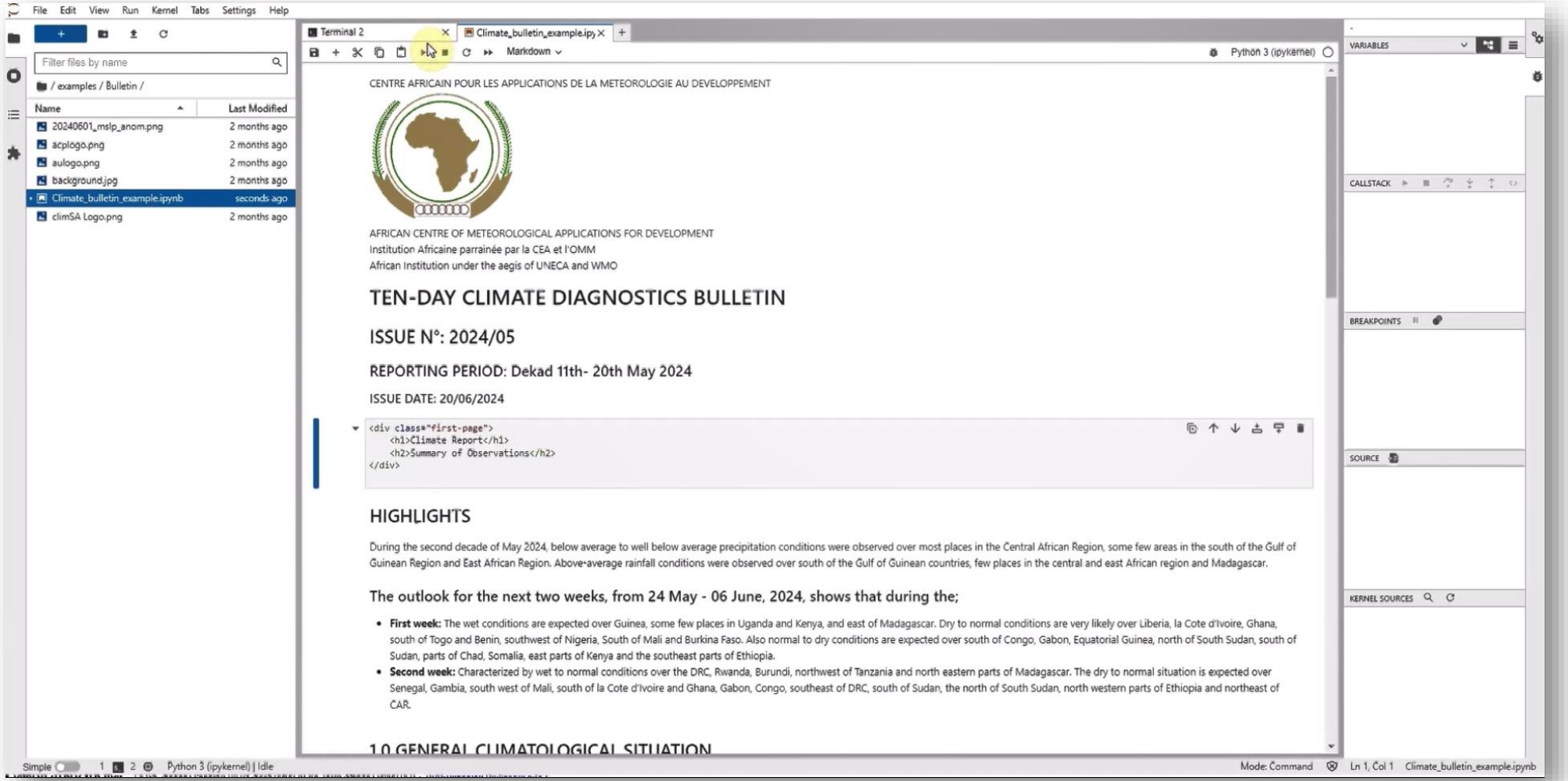

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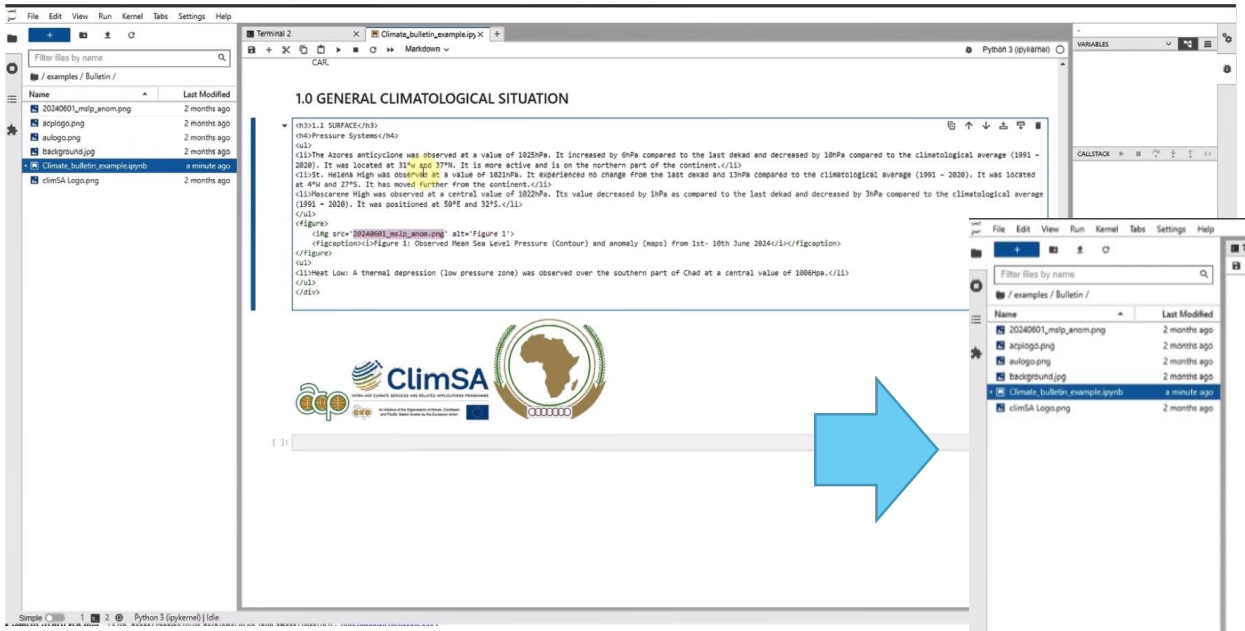

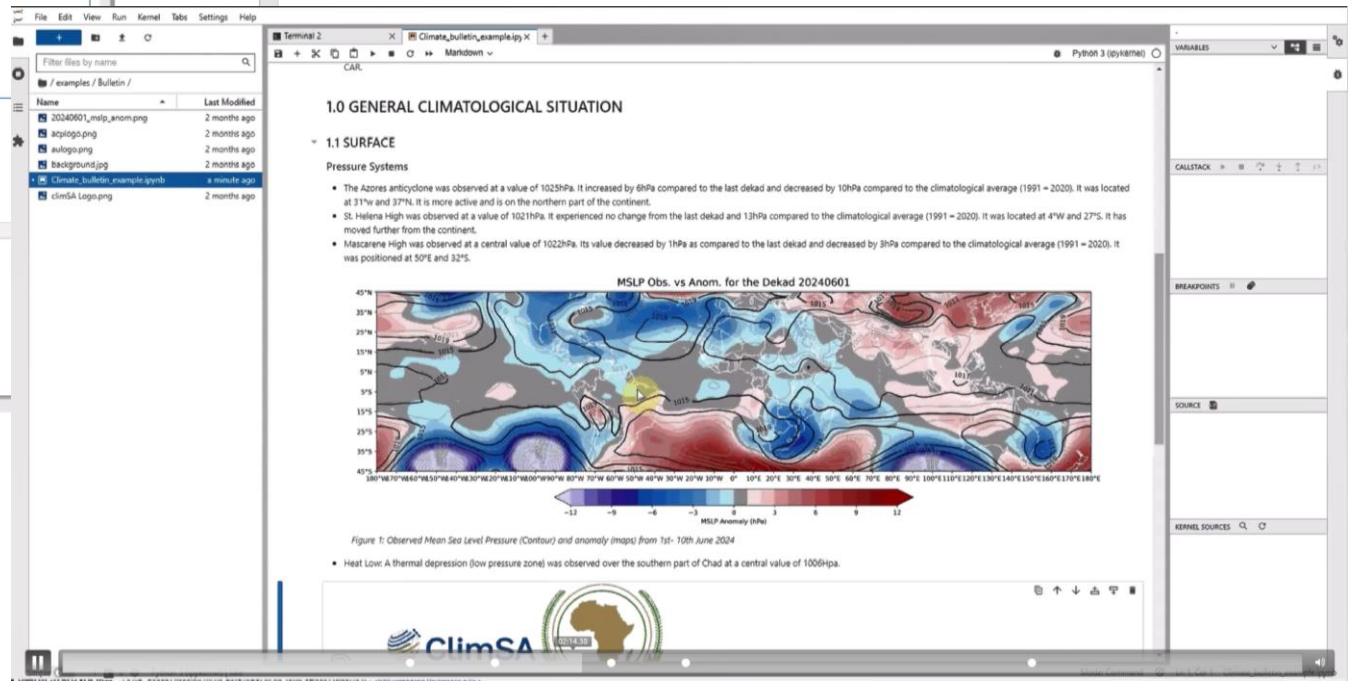

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TEN-DAY CLIMATE DIAGNOSTICS BULLETIN
ISSUE N°: 2024/11
REPORTING PERIOD: Dekad 11th- 20th May 2024
ISSUE DATE: 23/05/2024

Climate Report

Summary of Observations

HIGHLIGHTS

During the second decade of May 2024, below average to well below average precipitation conditions were observed over most places in the Central African Region, some few areas in the south of the Gulf of Guinean Region and East African Region. Above-average rainfall conditions were observed over south of the Gulf of Guinean countries, few places in the central and east African region and Madagascar.

The outlook for the next two weeks, from 24 May - 06 June, 2024, shows that during the;

- **First week:** The wet conditions are expected over Guinea, some few places in Uganda and Kenya, and east of Madagascar. Dry to normal conditions are very likely over Liberia, Ia Cote d'Ivoire, Ghana, south of Togo and Benin, southwest of Nigeria, South of Mali and Burkina Faso. Also normal to dry conditions are expected over south of Congo, Gabon, Equatorial Guinea, north of South Sudan, south of Sudan, parts of Chad, Somalia, east parts of Kenya and the southeast parts of Ethiopia.
- **Second week:** Characterized by wet to normal conditions over the DRC, Rwanda, Burundi, northwest of Tanzania and north eastern parts of Madagascar. The dry to normal situation is expected over Senegal, Gambia, south west of Mali, south of Ia Cote d'Ivoire and Ghana, Gabon, Congo, southeast of DRC, south of Sudan, the north of South Sudan, north western parts of Ethiopia and northeast of CAR.

1.0 GENERAL CLIMATOLOGICAL SITUATION

1.1 SURFACE

Pressure Systems

- The Azores anticyclone was observed at a value of 1025hPa. It increased by 6hPa compared to the last dekad and decreased by 10hPa compared to the climatological average (1991 – 2020). It was located at 31°W and 37°N. It is more active and is on the northern part of the continent.
- St. Helena High was observed at a value of 1021hPa. It experienced no change from the last dekad and 13hPa compared to the climatological average (1991 – 2020). It was located at 4°W and 27°S. It has moved further from the continent.
- Mascarene High was observed at a central value of 1022hPa. Its value decreased by 1hPa as compared to the last dekad and decreased by 3hPa compared to the climatological average (1991 – 2020). It was positioned at 50°E and 32°S.

Figure 1: Observed Mean Sea Level Pressure (Contour) and anomaly (shaded) from 11th- 20th May 2024

- Heat Low: A thermal depression (low pressure zone) was observed over the southern part of Chad at a central value of 1006Hpa.

1.2 TROPOSPHERE

1.2.1 African Monsoon

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

- Final result

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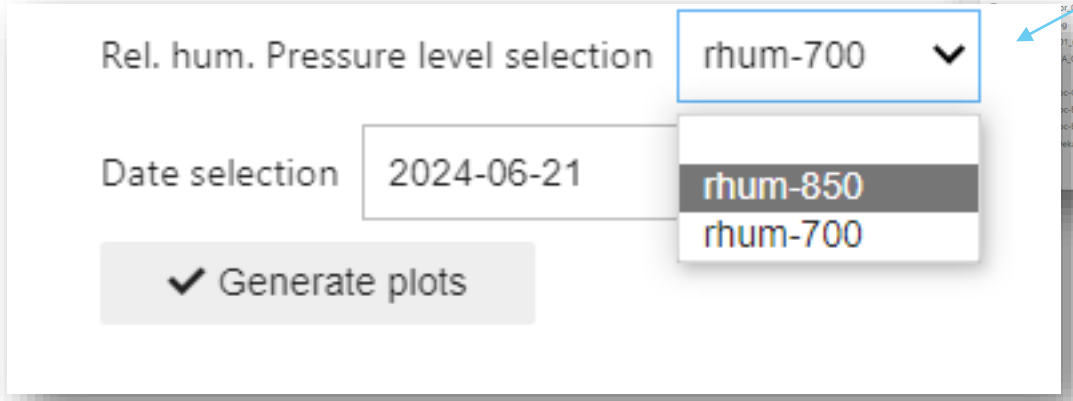
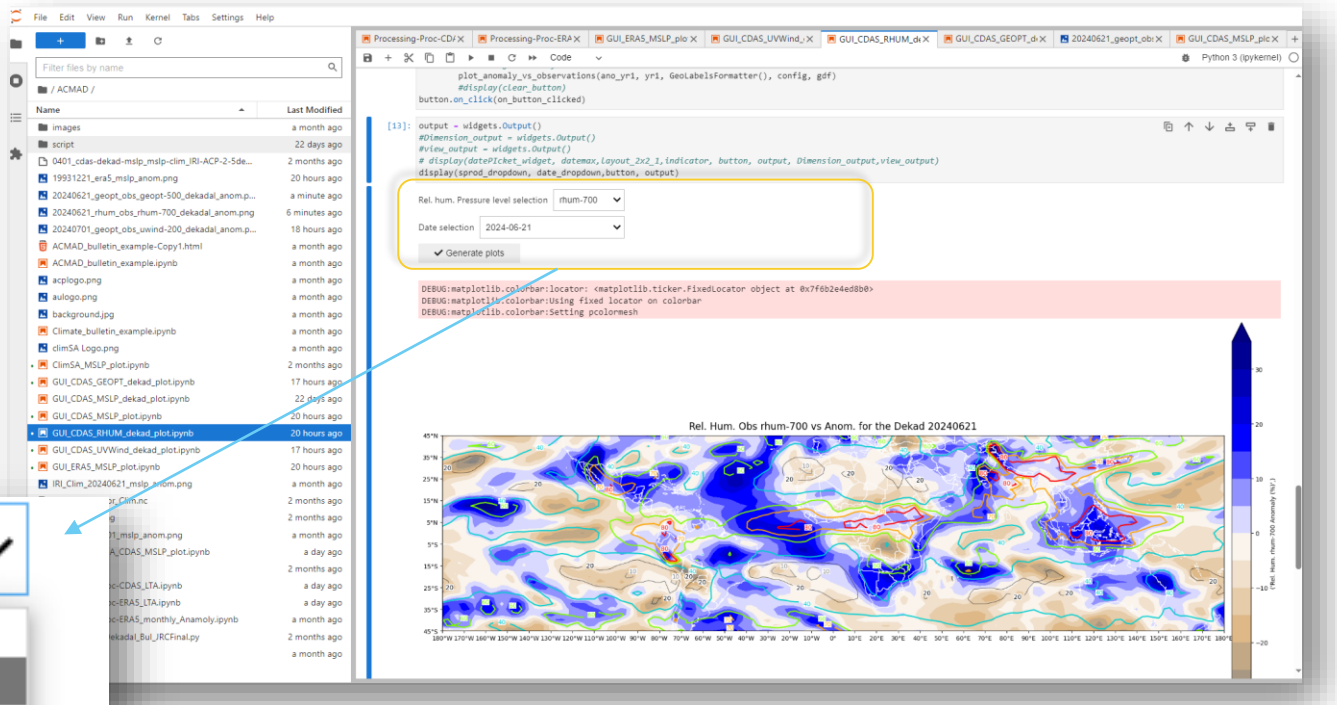
- New Jupyter notebook graphical user interface





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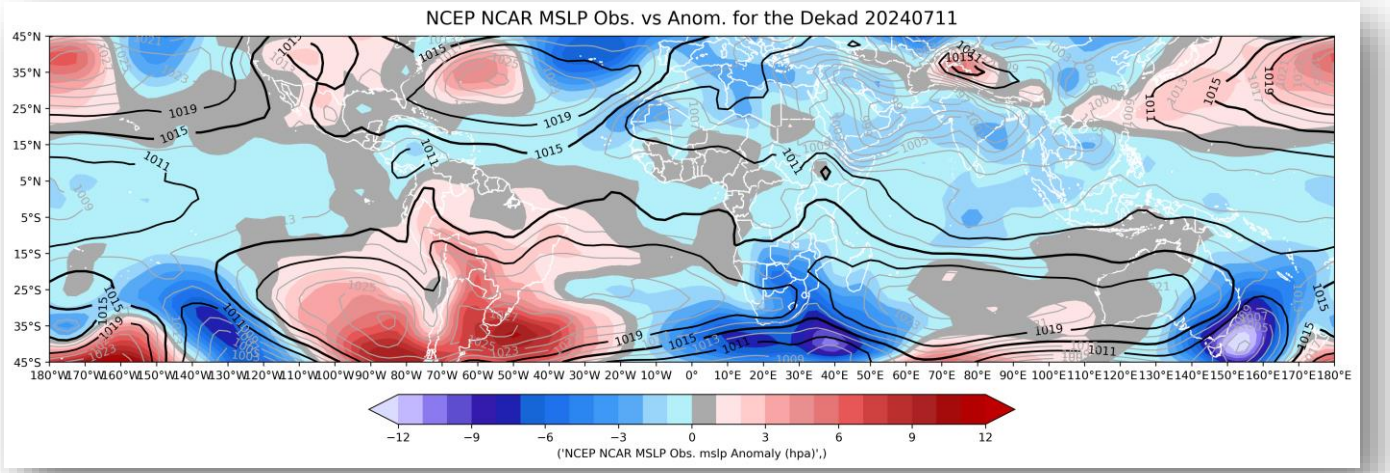
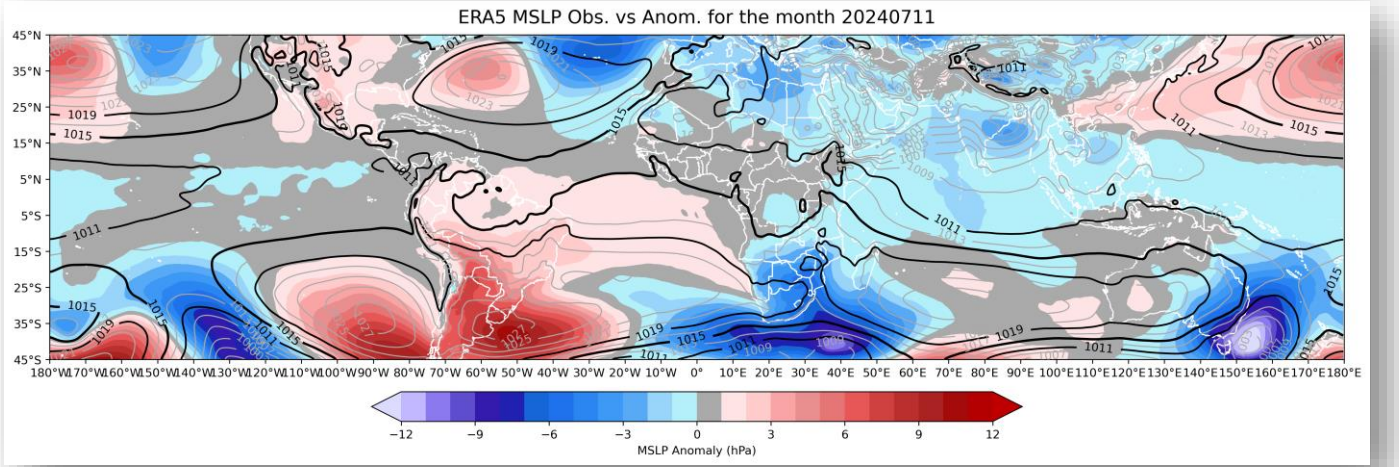
- NCEP NCAR MSLP *(climatology 1991-2020)*



- ERA5 MSLP *(climatology 1991-2020)*



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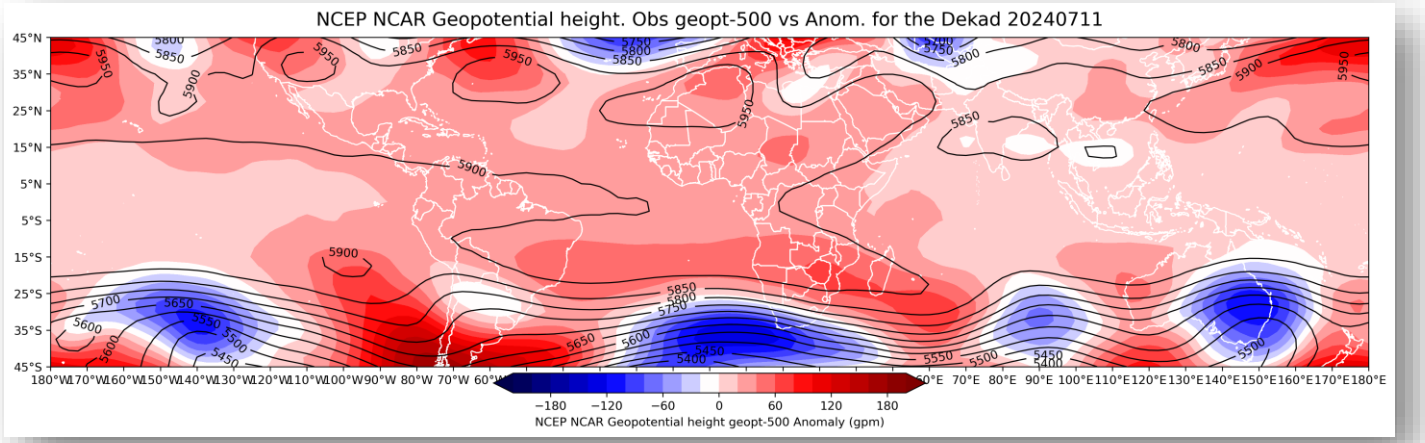
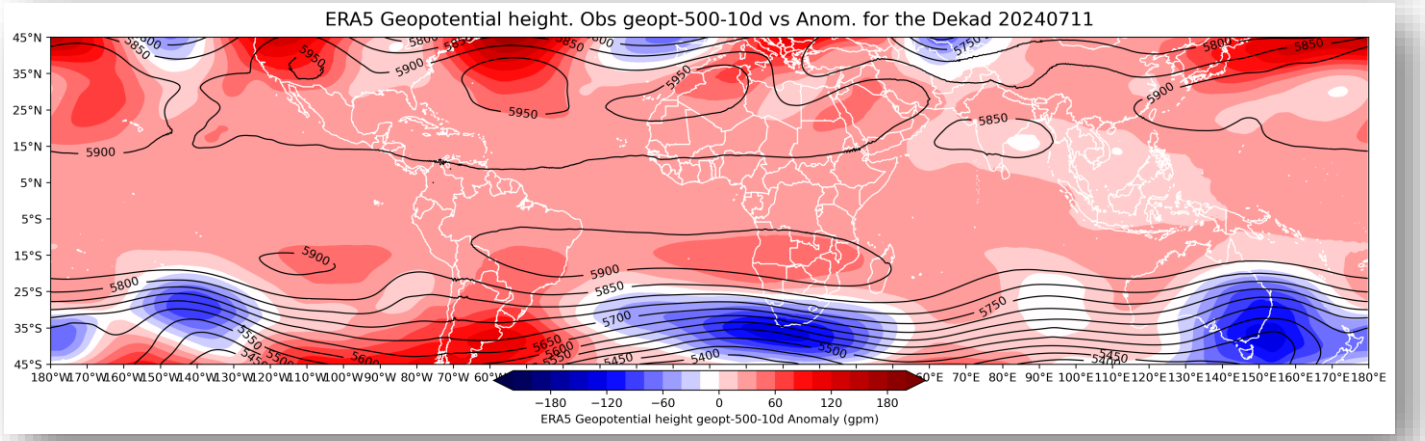
- NCEP NCAR GEOPT *(climatology 1991-2020)*



- ERA5 GEOPT *(climatology 1991-2020)*



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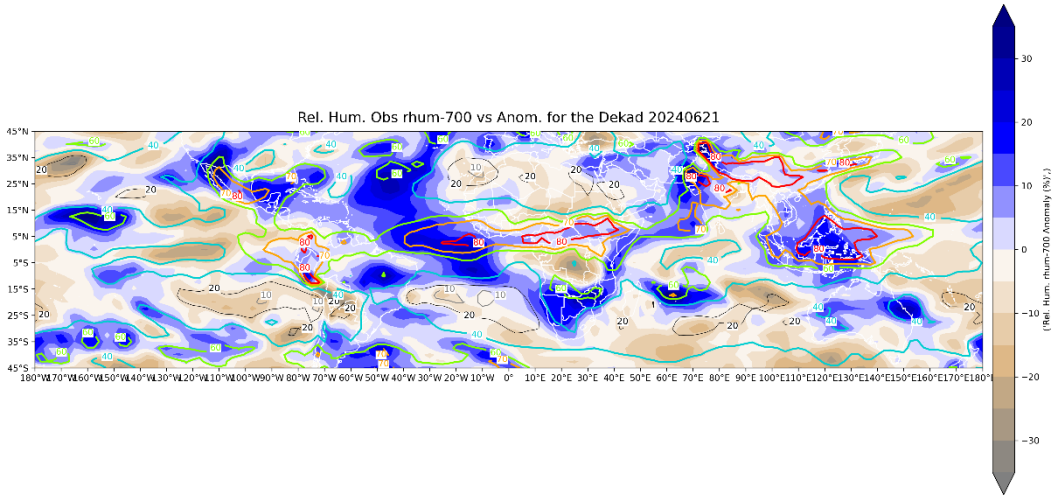
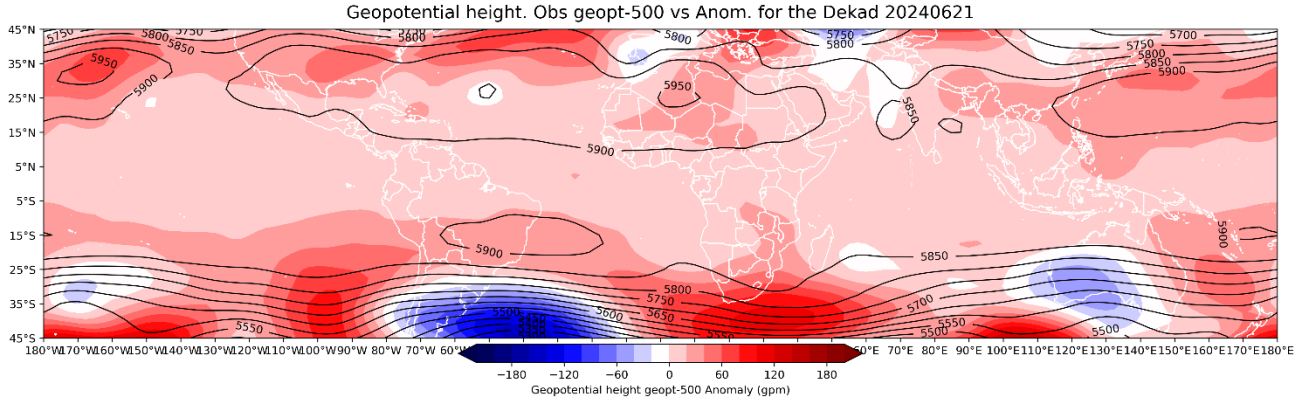
- NCEP NCAR Relative humidity @700*(climatology 2000-2020)*



- NCEP NCAR Geopotential height @ 500



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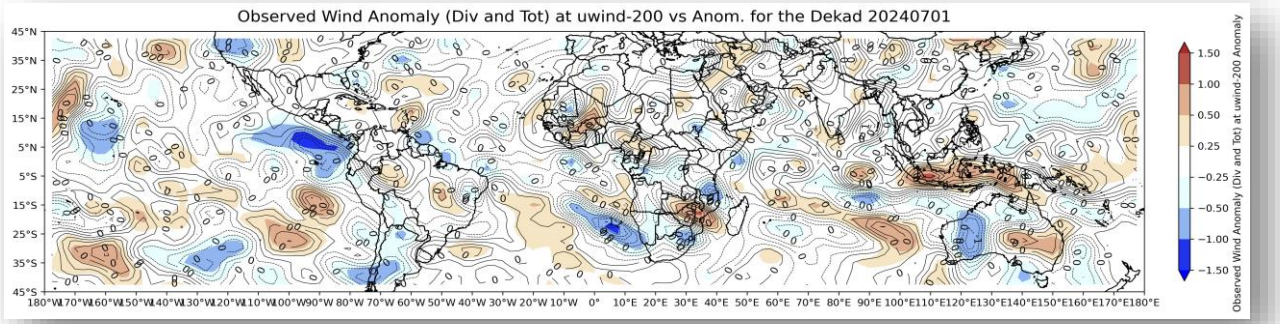
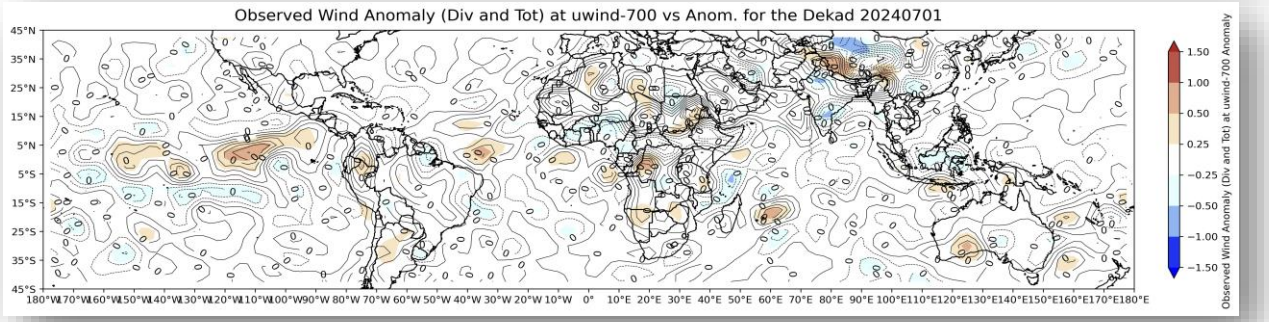
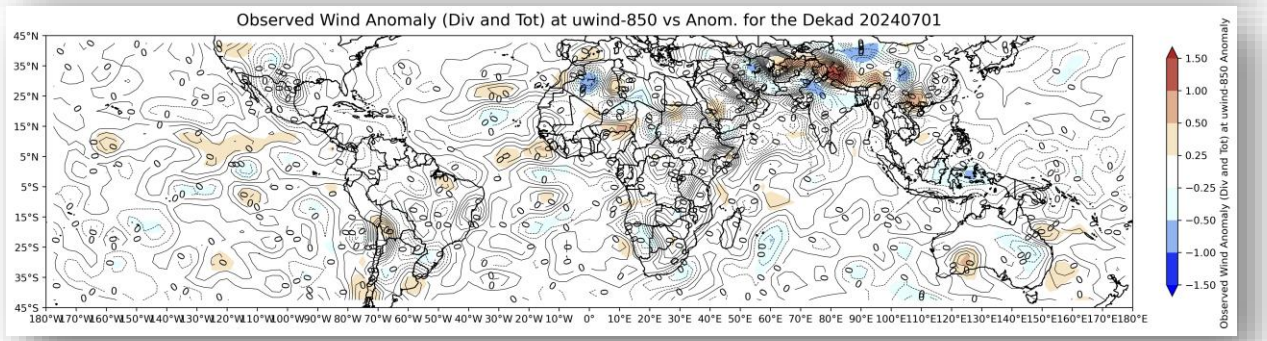
- NCEP NCAR Wind divergence @200



- NCEP NCAR Wind divergence @700



- NCEP NCAR Wind divergence @850



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Please take away this message with you…

- We are **actively seeking to expand our collaboration** with RCCs and NMHSs to co-develop tailored solutions that address specific regional **climate monitoring** needs.
- Key features of the Climate Station include its **ability to deliver tailored climate services** through a user-friendly web client, the integration of **Jupyter Notebooks for customizable analysis**, and the **seamless combination of** different data sources
- To effectively manage and utilize climate data, **you require tools that allow you to use, reuse, adapt, and compile** information for regional and national reporting. - This is precisely the function of the Climsa station we are currently developing. –
- We have already integrated numerous exceptional products from data providers in the ClimSA Station facilitating **in-depth analysis and reporting.**

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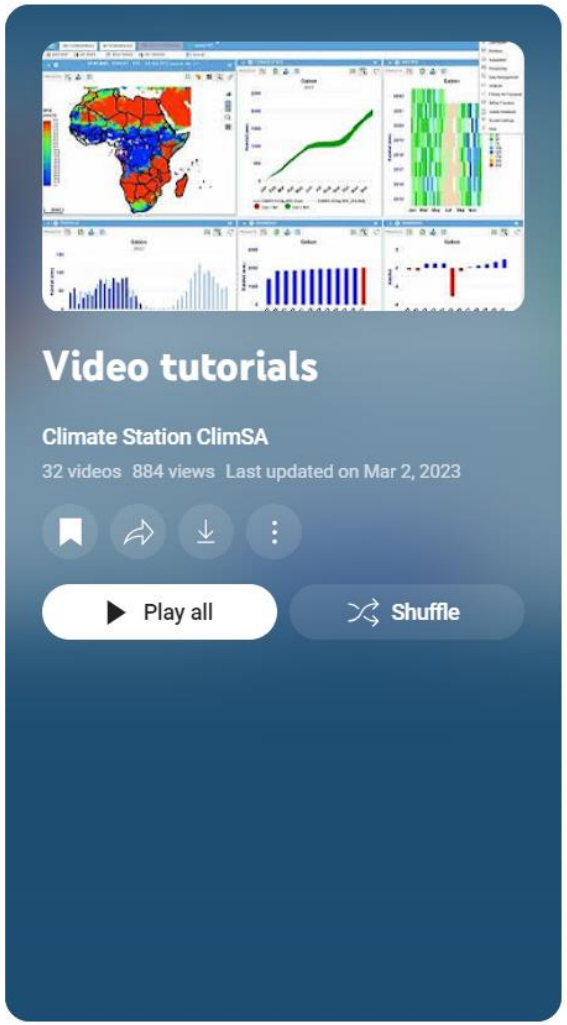
Online version,

https://estation.jrc.ec.europa.eu/eStation3/
https://europa.eu/!Wvp7QJ

Try it!!!



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Video tutorial 3.2.3 - Acquisition CDS user creation

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Thank you

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