



WEkEO Atmosphere Monitoring 2025

Post-event report



WEkEO

Implemented by



EUMETSAT



**MERCATOR
OCEAN
INTERNATIONAL**



ECMWF



**European
Environment
Agency**

Funded by



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Introduction

Here you will find the unanswered questions of the training « WEkEO 4 Atmosphere Monitoring » held the 24th and 26th March 2025. More than 1450 people took part of the event, hence this post-event report.

Please keep in mind that some of the questions asked were very similar, as a result we've summarized the different topics you covered in the Q&A.

We thank you again for your presence and hope to see you again !

General questions

The [Copernicus WEkEO data](#) are free of charge to access, download and visualize. There is data for all around the globe at low and mid-resolution. There is also data in Europe at higher resolution ([Copernicus](#) is a program funded by the European Union).

You can find data from all of the 6 Copernicus Services, for all type of use :

- Copernicus Atmosphere : [Atmosphere | Copernicus](#)
- Copernicus Marine : [Marine | Copernicus](#)
- Copernicus Land : [Land | Copernicus](#)
- Copernicus Climate Change : [Climate change | Copernicus](#)
- Copernicus Security : [Security | Copernicus](#)
- Copernicus Emergency : [Emergency | Copernicus](#)

Data & products

Concerning the data and products available : [Data viewer | WEkEO](#)

- Here you can check the full catalogue of available data
- You can see the exact description of each product
- You can visualize them on a map
- And download them if you wish to

Download the data

How to download the data (wms, api, etc.) : [WEkEO Data Download | WEkEO Help Center](#)

- You will find several articles with the different ways to download the data
 - With the Viewer
 - Via HDA – API

- And the errors you might encounter

Virtual machines and Jupyter Notebooks Catalogue

WEkEO paid subscription & virtual machines : [Computing | WEkEO](#)

Jupyter Notebooks catalogue : [Jupyter Catalog \(wekeo2.eu\)](#)

Calculation and specific parameters

We also had plenty of questions about the different ways of calculating certain parameters, the impact of a phenomenon on the environment and so on for your projects. We invite you to look for research papers that will provide you with a full description of their working methods and the calculations/models/data they use. You can look on [ResearchGate](#), [Connected Papers](#), [Google Scholar](#) and many others.

DAY 1 – 24 March 2025

Copernicus Atmosphere Monitoring Service – Chris Stewart (ECMWF)

Link to the CAMS website : [Home | Copernicus](#)

CAMS Catalogue : [Data | Copernicus](#)

- On CAMS data : can we obtain real-time data in GeoTIFF format and visualize it anywhere if possible ?

CAMS data is mainly provided in GRIB and NetCDF formats. These include geographic coordinates which would allow them to be converted into GeoTIFF. We provide Jupyter notebook tutorials on how to handle and visualize the data in their original formats, see <https://atmosphere.copernicus.eu/training>.

- Are you working with the IPCC ?

Relevant CAMS products are extensively cited and used in IPCC Assessment Reports. Examples include estimates of climate forcing (see <https://atmosphere.copernicus.eu/climate-forcing-ipcc>), CO2 emissions, air quality and other inputs.

- Would you do some specific modeling or animation (news organization for instance) that might not have in-house capacity (in addition to your existing events) ?

While CAMS offers freely available data products, custom processing is out of scope, given that such value-adding is the responsibility of service providers further down the data value chain. However, as an operational service, CAMS provides user support and training on its data products, including to data journalists and media outlets. CAMS also collects requirements from users to better tailor its service offer to meet user needs.

WEkEO EOCanvas – Peter Albert (EUMETSAT)

Link to the WEkEO EOCanvas : [WEkEO EOCanvas - Serverless Functions for Copernicus Data | WEkEO Help Center](#) (more links in Anna-Lena PDF presentation)

- Is Acolite integrated ?

No. At the moment there is only SNAP and the EUMETSAT Data Tailor implemented. We are open for user requests for specific software. Please send your request to the WEkEO User Support. We will collect requests and decide on software evolutions based on these requests.

- Is your API suited for large scale downloading of Sentinel Data ?

The WEkEO HDA API is well suited for downloading large volumes of Sentinel data. You might want to ask for a quota increase with the user support for a limited amount of time (current quota is ~100 / hour). If you want to process Sentinel data before downloading using eocanvas, you can do so. Be aware that there is a quota of 3 processes/hour in place at the moment, so large scale data processing will take some time.

- Can I perform the InSAR process on WEkEO? Does the WEkEO catalog provide Sentinel-1 SLC data ?

According to the documentation, the InSAR processing is part of the SNAP toolbox, so it should be possible to process Sentinel-1 SLC data with the EOCanvas. We haven't tested it yet, though, so we would also appreciate your feedback and report. (<https://step.esa.int/main/toolboxes/microwave-toolbox/microwave-toolbox-features/>)

- As a meteorologist, can EOCanvas help me improve my satellite imagery models ?

I don't understand what is meant with "satellite imagery models". But in general terms, EOCanvas provides the tools and functions available through the EUMETSAT Data Tailor and ESA's SNAP toolbox. The user can analyse whether any of those tools can support their use case, and if so, can use EOCanvas to support the data processing. But the usefulness of the tools for the specific use case does not depend on EOCanvas.

Data Tailor: <https://user.eumetsat.int/resources/user-guides/data-tailor-standalone-guide>

SNAP: <https://step.esa.int/main/toolboxes/snap/>

- Does EUMETSAT have any program that partners with universities to give them access to satellite images as a mini ground receiving station ?

Please check <https://www.eumetsat.int/international-cooperation/relationships-partners-europe> and <https://www.eumetsat.int/international-cooperation/regional-collaborations> for the type of support EUMETSAT is providing to user to help getting access to and work with the data.

<https://user.eumetsat.int/data-access/eumetcast-europe> and <https://user.eumetsat.int/data-access/eumetcast-africa> have additional information about setting up a EUMETCast station, with which any user can easily receive near-real-time satellite data and products through a multicast stream, transmitted to users via satellite networks.

User testimony #1 – Augustin Colette (INERIS, France)

Link to Augustin's project : policy.atmosphere.copernicus.eu

User testimony #2 – André Brodtkorb (OsloMet University, Norway)

Link to André's paper here : <https://doi.org/10.5194/gmd-17-1957-2024>

- Can this model be adapted to check for wildfires emissions ?

It would be possible to use the same methodology to estimate wildfire emissions from satellite images. But a major difference is that the emission source changes spatial location as the fire progresses. This, unfortunately makes it a far less well posed problem, which means that in reality it may be very difficult to make such estimates.

- Can we adapt it also for SO₂ ?

Yes! By using satellite data for Sulfur Dioxide (SO₂) total column, you could use the exact same methodology. However, the forward model (advecting the SO₂) needs to be able to model advection of SO₂, which differs from volcanic ash.

User testimony #3 – Konstantinos Politakos (RSLab of FORTH, Greece)

Link to Konstantinos' project : [CoCO₂: Prototype system for a Copernicus CO₂ service](#)

DAY 2 : 26 March 2025

General questions

- How are the datasets served to the frontend? What type of server API is used for WEkEO ?

The datasets are served to the frontend using WMTS (Web Map Tile Service). However, this might vary depending on the dataset.

And WEkEO also provides WMS/WMTS links, enabling users to access data directly via compatible tools or platforms.

- If I want to zoom in to a local scale, which downscaling technique would you recommend for SDII ?

The WEkEO User Support does not cover data processing or analysis aspects. Our support focuses on data access and download.

If you have a specific dataset in mind, I can contact the data producers and ask for their recommendation.

- Is it possible to extract data in netCDF instead of GRIB file format? Thanks!

Yes, it is possible to extract data in NetCDF format instead of GRIB, but it depends on the dataset. You will see the available format options in the subset parameters when requesting the data in the WEkEO Viewer.

You can also refer to this article for an overview of the file formats offered depending on the data producer: <https://help.wekeo.eu/en/articles/6367964-in-which-format-the-wekeo-data-are-delivered>

- How we can access the wekeo API in Continuous data downloading like a cronjob method ?

You can access the WEkEO API for continuous data downloading by using the Harmonised Data Access (HDA) API.

This allows you to automate data requests and downloads using scripts, which can be scheduled via tools like cron on Linux.

We invite you to read the following article for more information about the Harmonized Data Access (HDA) API: <https://help.wekeo.eu/en/articles/9515753-what-is-the-harmonized-data-access-hda-api>

If you have any further questions, feel free to contact us via the chat widget on the website — I'll be happy to help!

- Is there any limitation to access WEkEO datasets and how can i create the credential and access token in API ?

Access to WEkEO datasets is free, but you need to create a WEkEO account to download data or use the API.

Once your account has been created, you can use your credentials to download the data.

We recommend using the Python client, which handles authentication and requests

easily: <https://help.wekeo.eu/en/articles/9515753-what-is-the-harmonized-data-access-hda-api>

Please note: There is a limit of 100 items downloaded per hour via the API.

WEkEO Viewer – Alexandre Baurès (Mercator Ocean International)

- Is it possible to download data products in other projections ?

It is not possible to select another projection in the download process, however, you can use the **eocanvas function to reproject your data before downloading**. This might take a bit more time than the direct download, but you will not have to reproject the data on your local machine.

- Can I work with the data "online" without downloading ?

You can work with the data online on the JupyterHub. This will require "downloading", but only to your JupyterHub environment, nothing will be downloaded to your computer. If you want to process data completely online and only receive the results, the eocanvas service of WEkEO will be interesting for you ([Exploring WEkEO's EOCanvas: A Serverless Solution for Copernicus Data Processing | WEkEO](#)).

- Can we use Shapefile to download data ?

Not for the moment but it could be a nice upgrade to WEkEO. We will keep this in mind 😊

Jupyter Notebooks – Alexandre Homerin (Noveltis)

Link to the tutorial : <https://atlas.mercator-ocean.fr/s/NamyB7SGeLeiQpa>

Link to the video : <https://youtu.be/Cr89RytxiQ>

- Is it possible to import some shapefiles or other vector data types into the used notebooks for a precise geographical analysis?

To read shapefiles or other vector data formats into any Jupyter Notebook, the most common and robust approach is to use the geopandas library, which provides a high-level interface built on top of pandas and shapely, and supports various vector formats via fiona (which in turn leverages GDAL).

geopandas is pre-installed in the “wekeopab” environment on the WEkEO JupyterHub, so users can use geopandas right away.

QGIS – Daria Andrievskaia (Noveltis)

Link to the tutorial : <https://atlas.mercator-ocean.fr/s/rEtaqqij8HGoctY>

Link to the video : <https://youtu.be/OrQpzvEY6mc>

R Studio Tutorial - Simon Millet (Noveltis)

Link to the tutorial : <https://atlas.mercator-ocean.fr/s/MeGYC7KWs2s38cQ>

Link to the video : https://youtu.be/6iQQ9Rz_PBI

Thanks again for your participation 😊