Data Access Services

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Earth Observation Data Engineers

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Agenda

EUMETSAT Pull Data Access Services

- A bit about EUMETSAT
- What can you do with EUMETSAT Data
- This course
- Tricky words
- Data Access Services:
  - Data Store
  - Data Tailor
- EUMETSAT Data Access Client
- Material

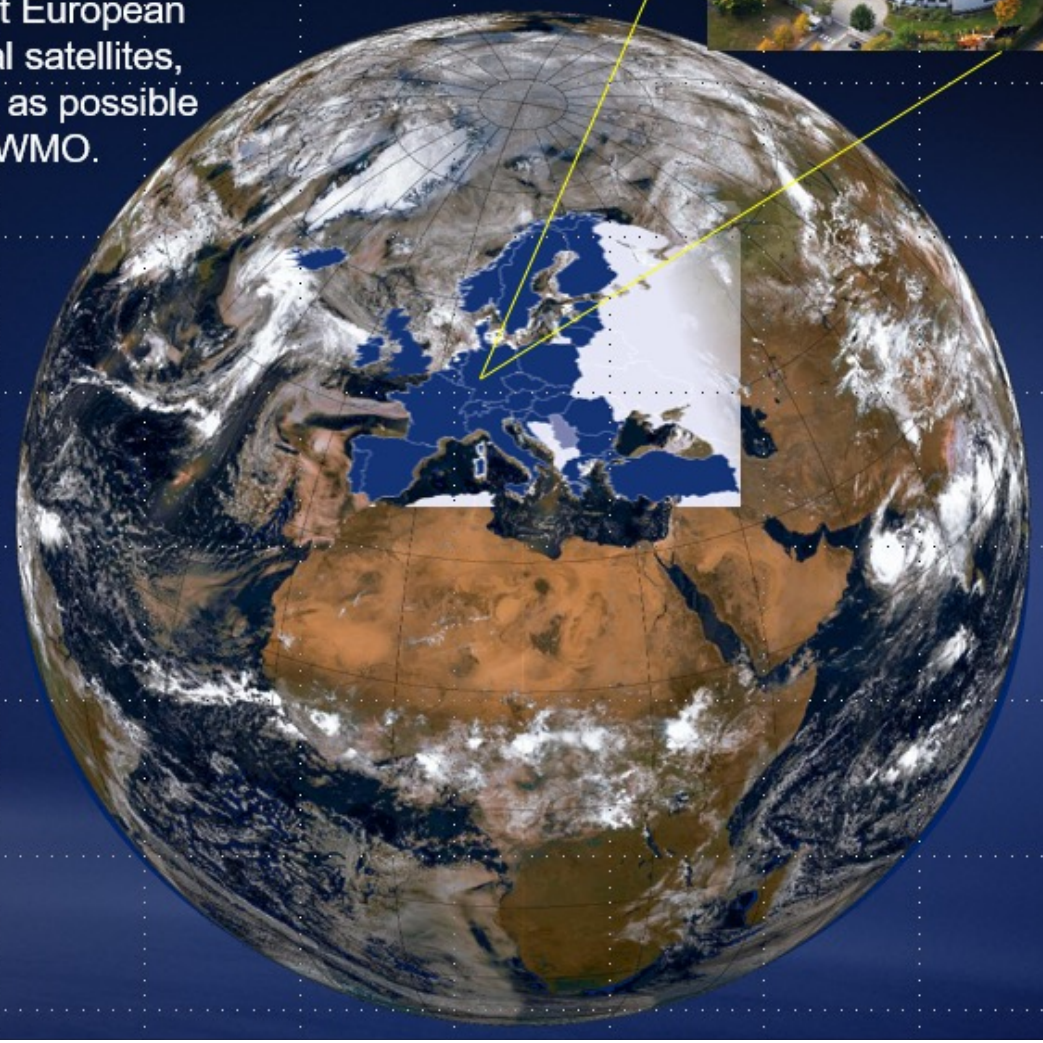
EUMETSAT is an intergovernmental Organization

Member States

AUSTRIA
BELGIUM
BULGARIA
CROATIA
CZECH REPUBLIC
DENMARK
ESTONIA
FINLAND
FRANCE
GERMANY
GREECE
HUNGARY
ICELAND
IRELAND
ITALY
LATVIA
LITHUANIA
LUXEMBOURG
THE NETHERLANDS
NORWAY
POLAND
PORTUGAL
ROMANIA
SLOVAK REPUBLIC
SLOVENIA
SPAIN
SWEDEN
SWITZERLAND
TURKEY
UNITED KINGDOM

Tasks

- Develop, maintain, exploit European systems of meteorological satellites, taking into account as far as possible the recommendations of WMO.
- Contribute to operational climate monitoring and the detection of global climatic changes.



What do we do?

- planning and developing satellite systems required to deliver and further improve observational inputs to forecasting and climate monitoring. This is carried out in cooperation with the European Space Agency (ESA).
- operating a fleet of satellites in geostationary and polar orbit. The EUMETSAT Mission Control Centre (MCC) is responsible for the safe operation of all satellites. It provides the necessary monitoring and control of all operational satellites and the associated ground infrastructure.
- delivering satellite data and products in real-time to users worldwide
- monitoring weather, oceans, atmosphere and climate
- training users in various data applications

CURRENT EUMETSAT SATELLITES

SENTINEL-3A & -3B (98.65° incl.)
Low Earth, sun-synchronous orbit
Copernicus satellites delivering marine and land observations

JASON-3 (63° incl.)
Low Earth, non-synchronous orbit
Copernicus ocean surface topography mission (shared with CNES, NOAA, NASA and Copernicus)

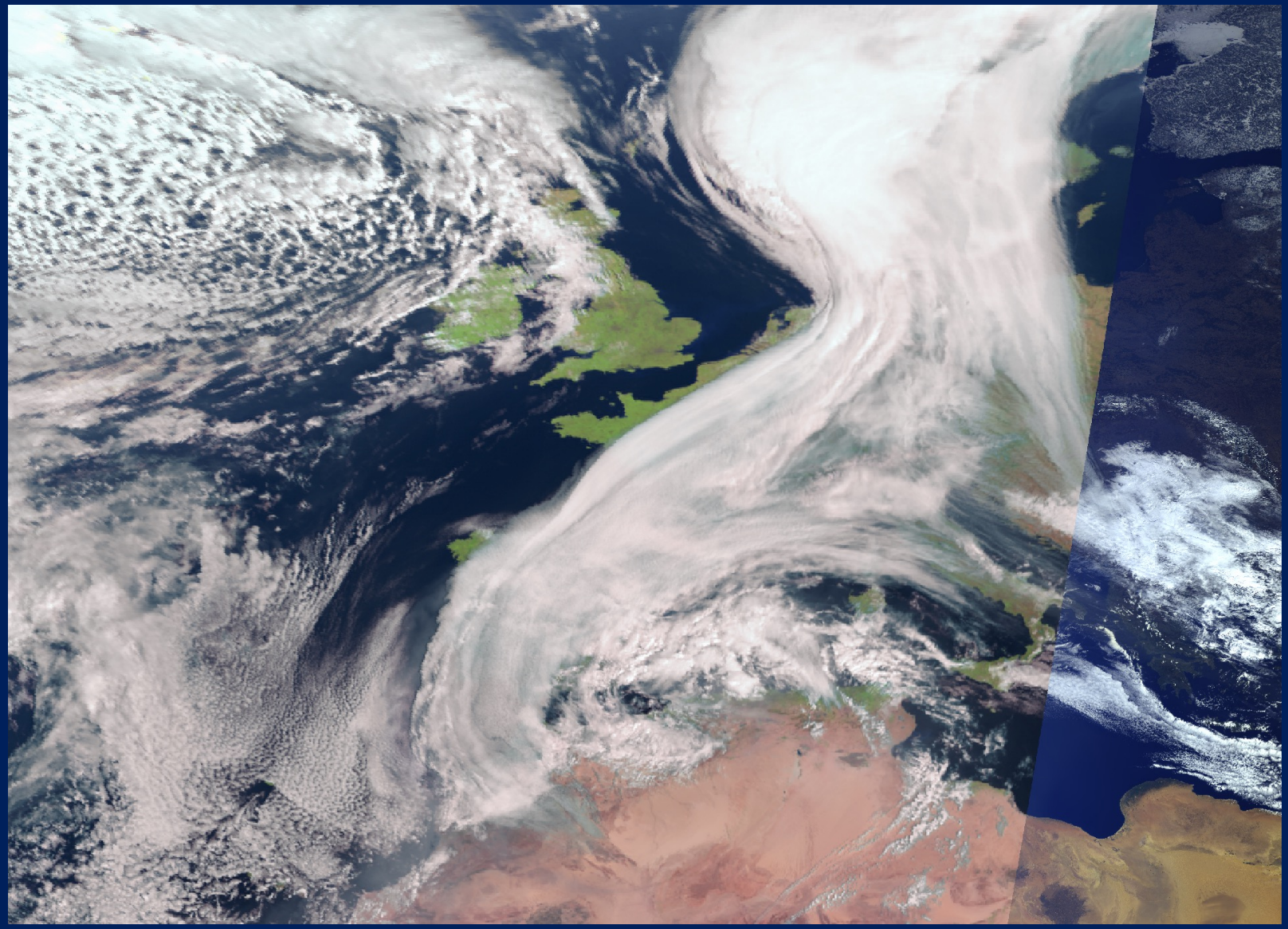
Sentinel-6 Micheal Freilich (66° incl.)
Low Earth, drifting orbit
Copernicus ocean surface topography mission (shared with CNES, NOAA, NASA and Copernicus)

METEOSAT -10, -11
Geostationary orbit
Meteosat Second Generation

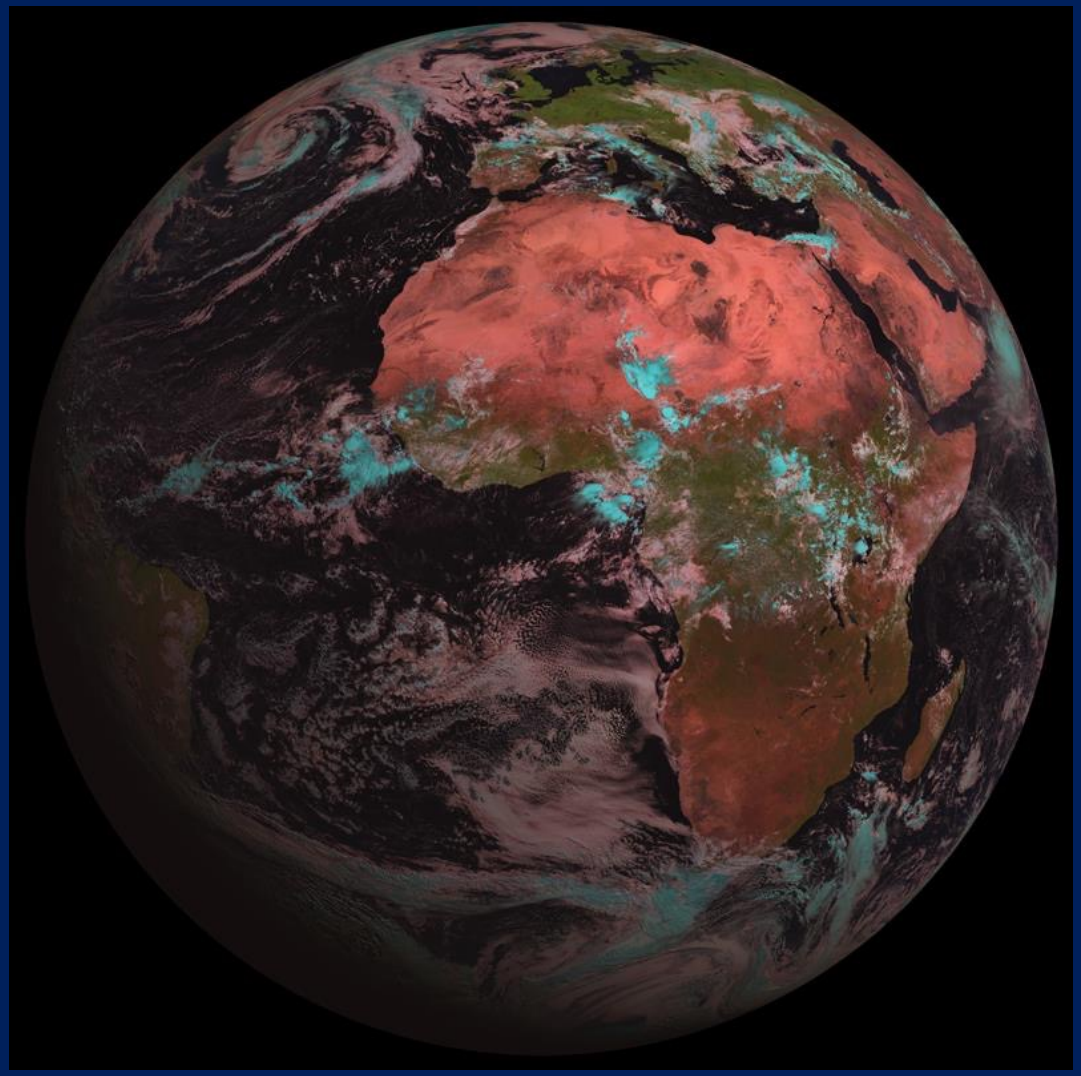
Two-satellite system
Full disc imagery mission (15 mins)
(Meteosat-10 (0°))
Rapid scan service over Europe (5 mins)
(Meteosat-11 (9.5° E))

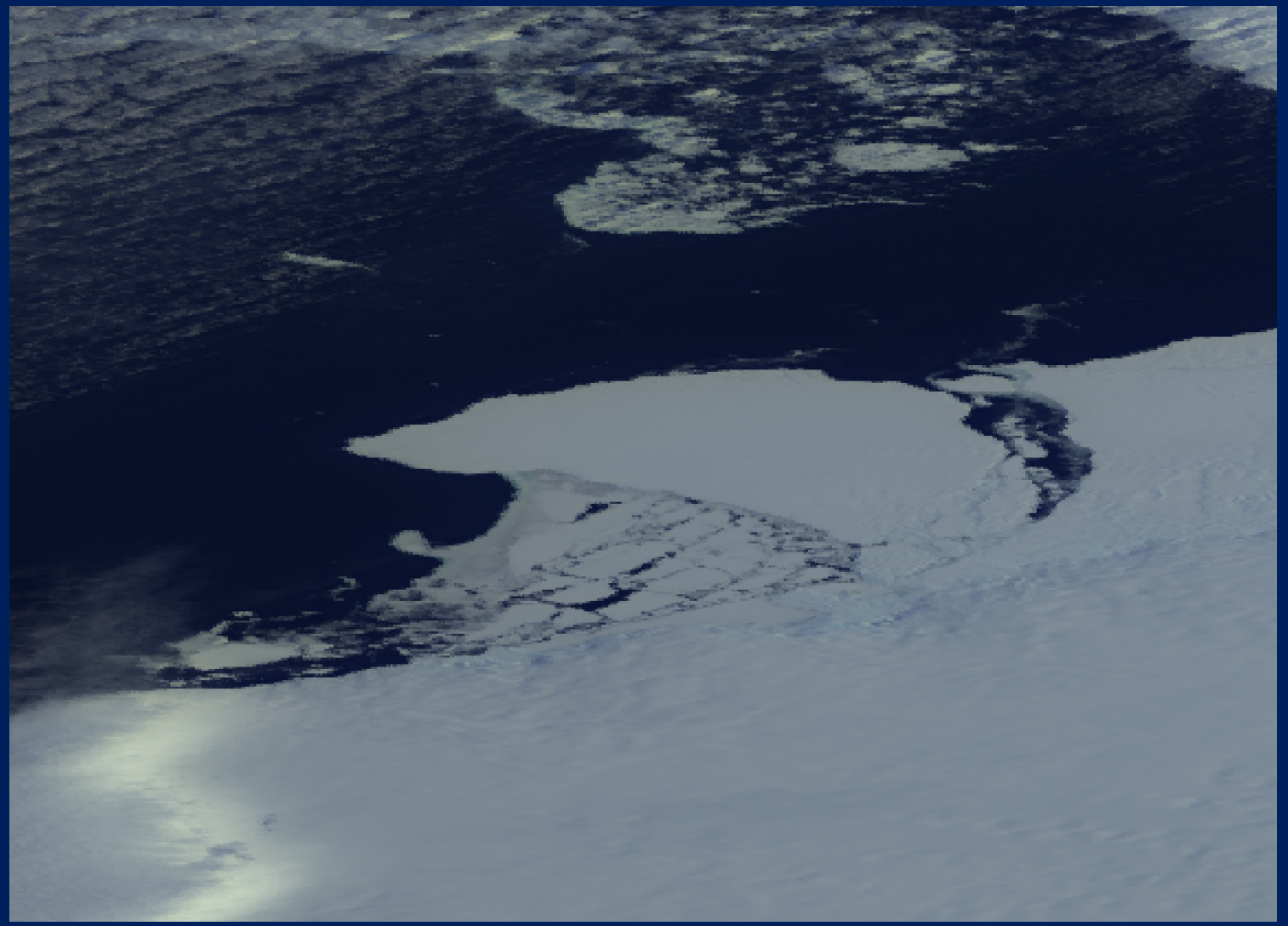
METEOSAT-9 (45.8° E)
Geostationary orbit
Indian Ocean Data Coverage (IODC)

METOP- B & -C (98.7° incl.)
Low Earth, sun-synchronous orbit
EUMETSAT Polar System (EPS)/
Initial Joint Polar System

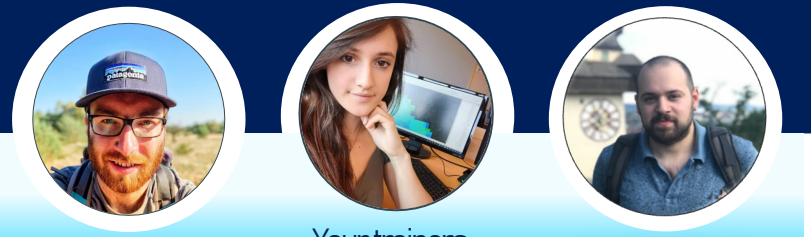


What can you see from satellites?





This course



Your trainers

Introduction to EUMETSAT Services

basics

Basics of EUMDAC Hands-on

Using EUMDAC CLI

Advanced

Using EUMDAC through Jupyter Notebook

Advanced

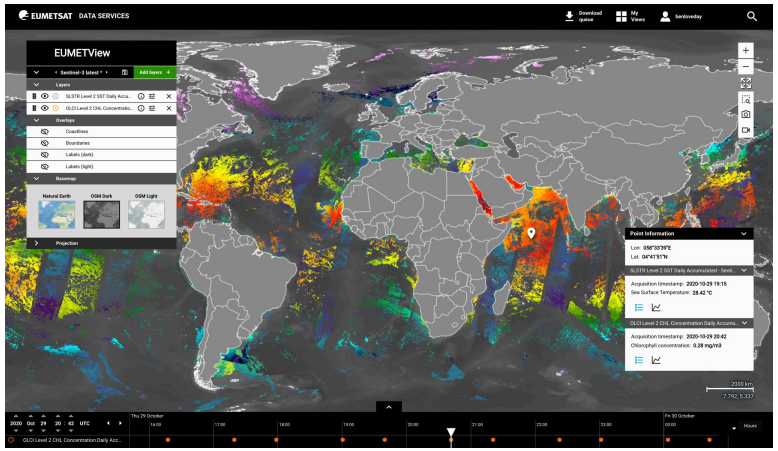
Marine Perspectives

Important words

GUI

Graphical user interface

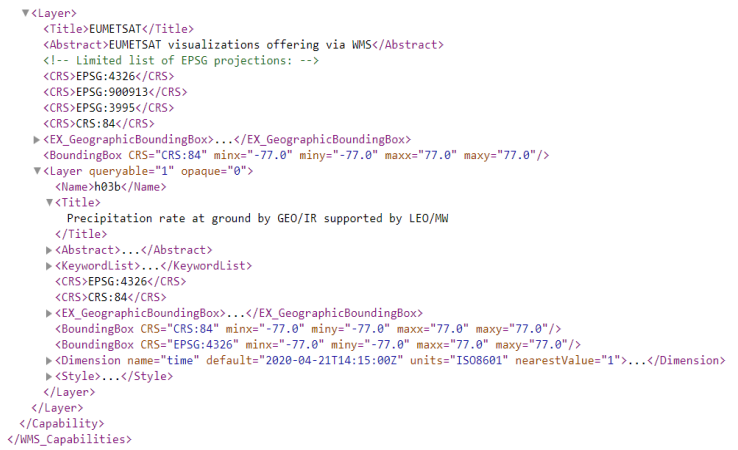
A graphical user interface (GUI) is a digital interface in which a user interacts with graphical components such as icons, buttons, and menus.



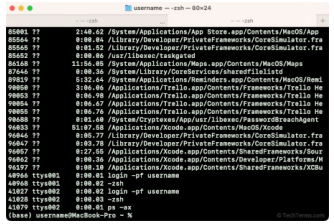
API

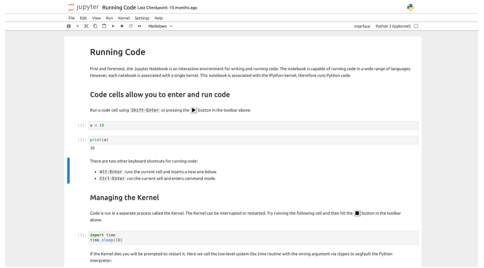
Application Programming Interface

An application programming interface is a way for two or more computer programs to communicate with each other. It is a type of software interface, offering a service to other pieces of software.



EUMDAC

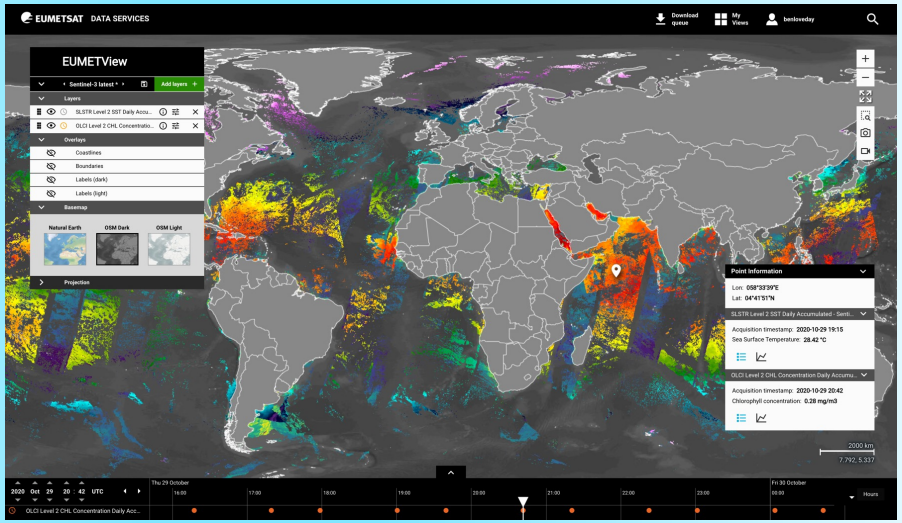




EUMETSAT Pull Data Access Services

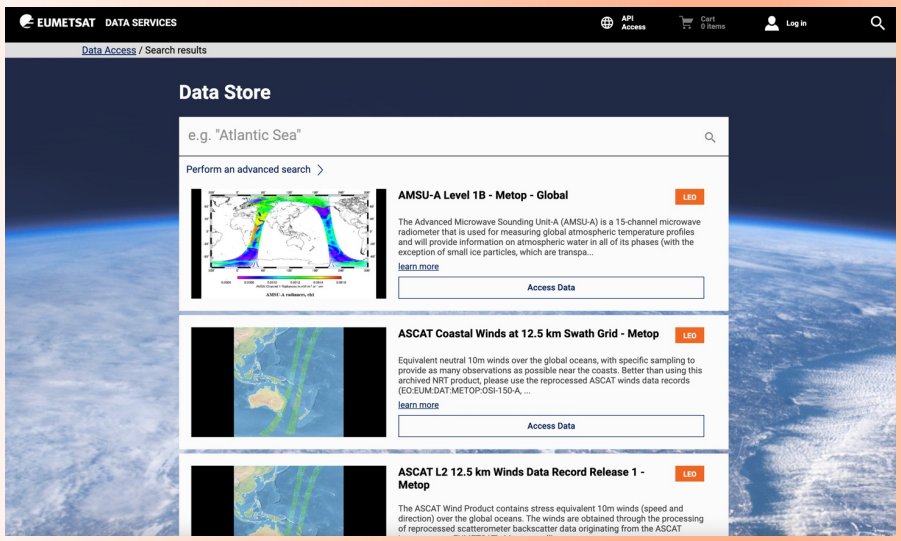
www.eumetsat.int

EUMETView



https://view.eumetsat.int/

Data Store



https://data.eumetsat.int/

Data Tailor

https://tailor.eumetsat.int/

Data Store

Data Store Data Tailor

The **EUMETSAT Data Store** provides users with a download and linked data tailoring service for online data; providing access through an online web user interface and via a suite of APIs.

Service available at: https://data.eumetsat.int/

Data Store

www.eumetsat.int

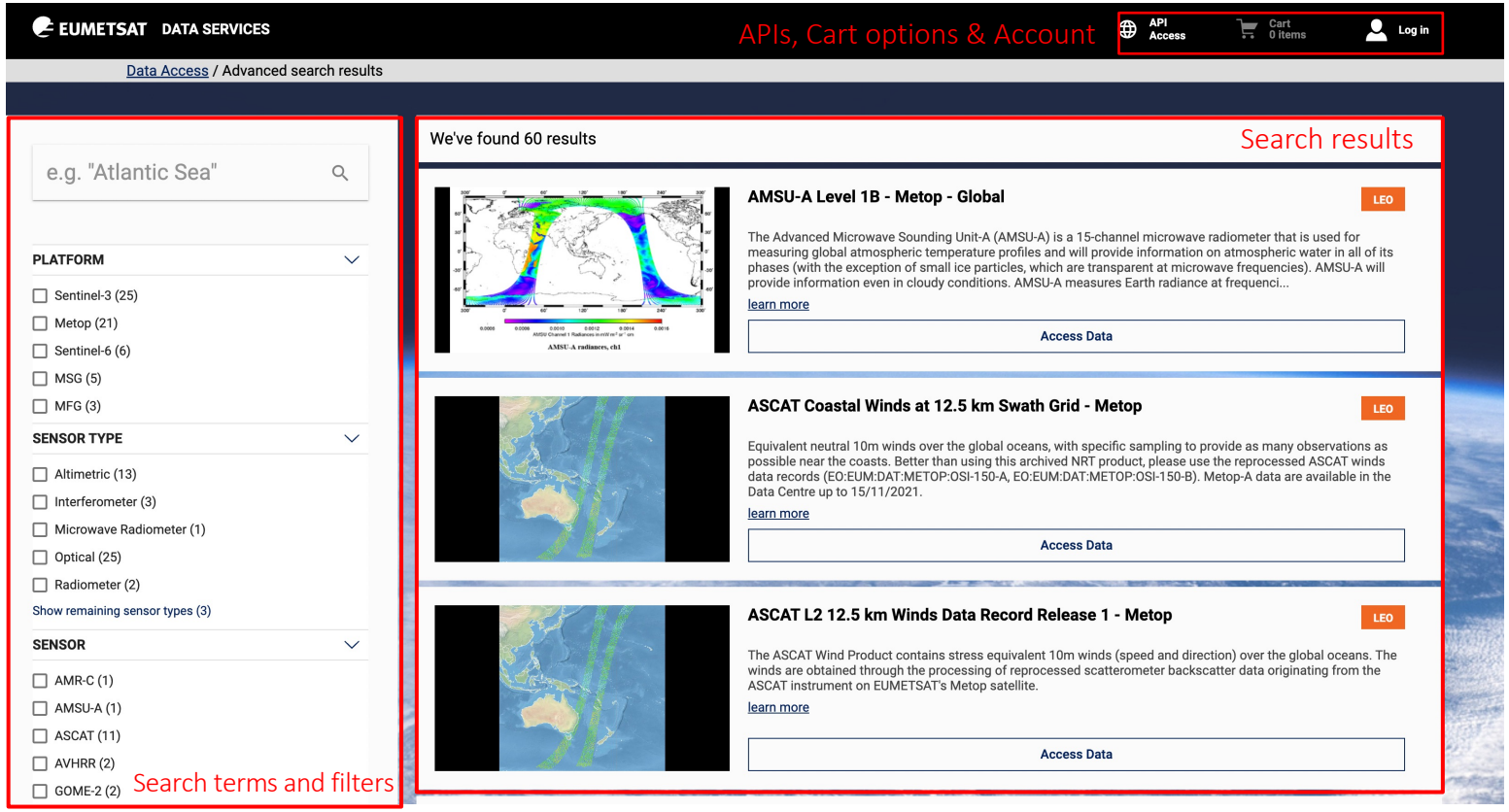
Data Store | Data Tailor

Data Store Interfaces

Online web user interface

Web UI based catalogue navigation

- Download API
- OpenSearch API
- REST API
- Subscription API



Data Store

Data Store | Data Tailor

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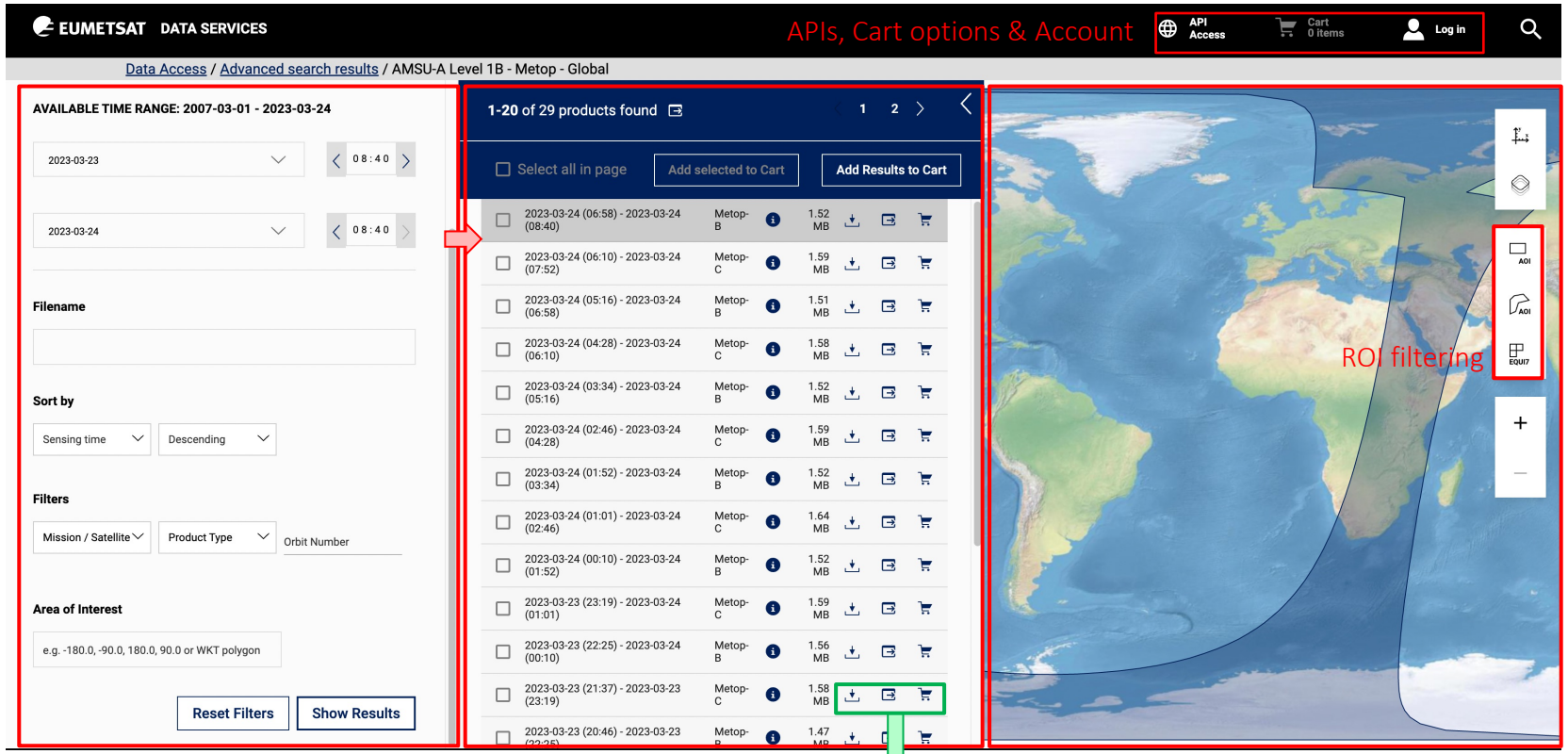


Download options

Direct download | Command line | Cart

>> Interface with APIs

Data Tailor integration
>> product customisation

Data Store

Data Store | Data Tailor

Data Store Interfaces

Online interface

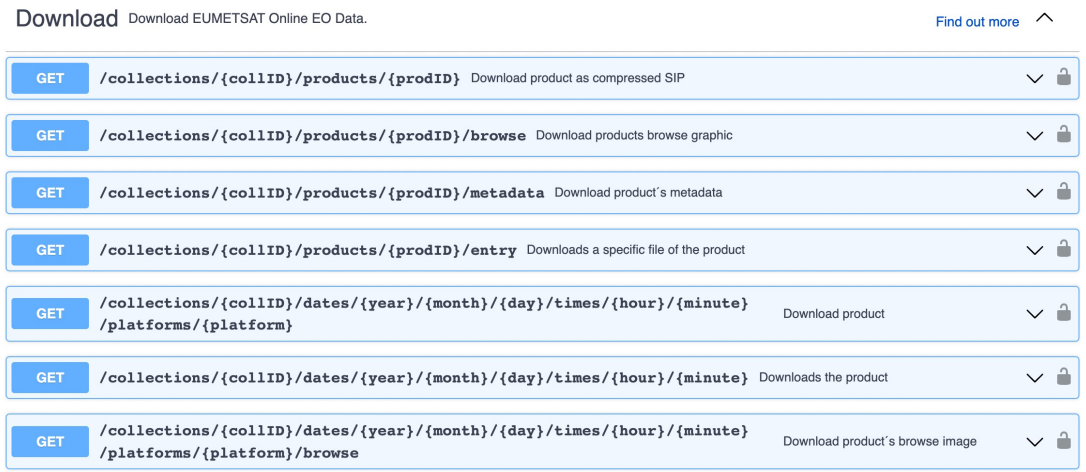
- Download API
- OpenSearch API
- Browse API
- Discovery API
- Subscription API (coming soon)

1. Download data using URL, command line and Python based options using ID or collection and sensing time
2. Search Data Store at product and collection levels. Filter selections by time, ROI, satellite, timeliness
3. Navigate/Browse products and collections by date and spatial coverage / footprint
4. Discover the items at the collection level
5. Notification service for new product availability

jupyter

Python and Jupyter notebook examples snippets available for each API

Swagger™



Data Tailor

Data Store Data Tailor

The **EUMETSAT Data Tailor** allows users to subset and aggregate our data products in space and time, filter layers, generate quicklooks, re-project, and reformat into common GIS formats (netCDF, GeoTIFF, etc.). It offers a uniform way to transform both historical and near real-time satellite data provided by EUMETSAT.

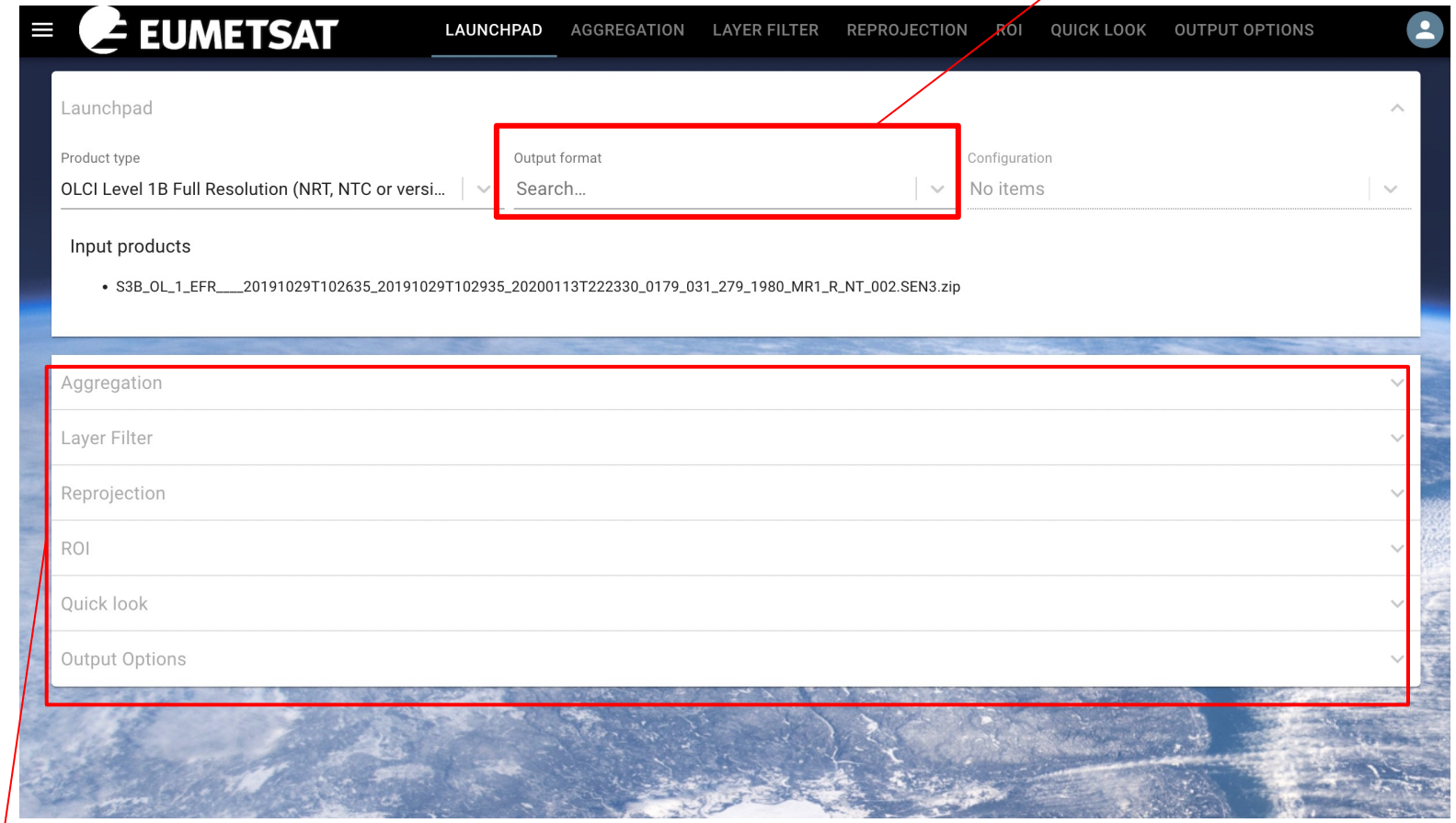
Tool available via Data Store and as standalone tool

Data Tailor

Data Store

Data Tailor

Output format of your product



Capabilities

Data Tailor Interfaces

Online web user interface

REST API

Local web user interface

Local command line interface (CLI)

Local python API

Available **quick look** options

Quicklooks are an effective way of visually inspecting your customisations, accompanying your "main" customised products.

Configuration Parameters	Mandatory/Optional
format	mandatory
filter	optional
stretch_method	optional
x_size	optional
y_size	optional
nodatacolour	optional
resample_method	optional

Available **Region of Interest** options

A Region of Interest is a filtering method in Data Tailor enables you to subset/clip the product.

➢ Available **Aggregation** options

Aggregation feature in the Data Tailor enables certain products to be aggregated both in space and time

Name	Description
Disk	Gather the selected strips of the same image and correctly compose the image.
Orbit	Aggregation of the entire orbit.
Time	Aggregate up to one year of OSI SAF Global SST products.

Let's explore the capabilities

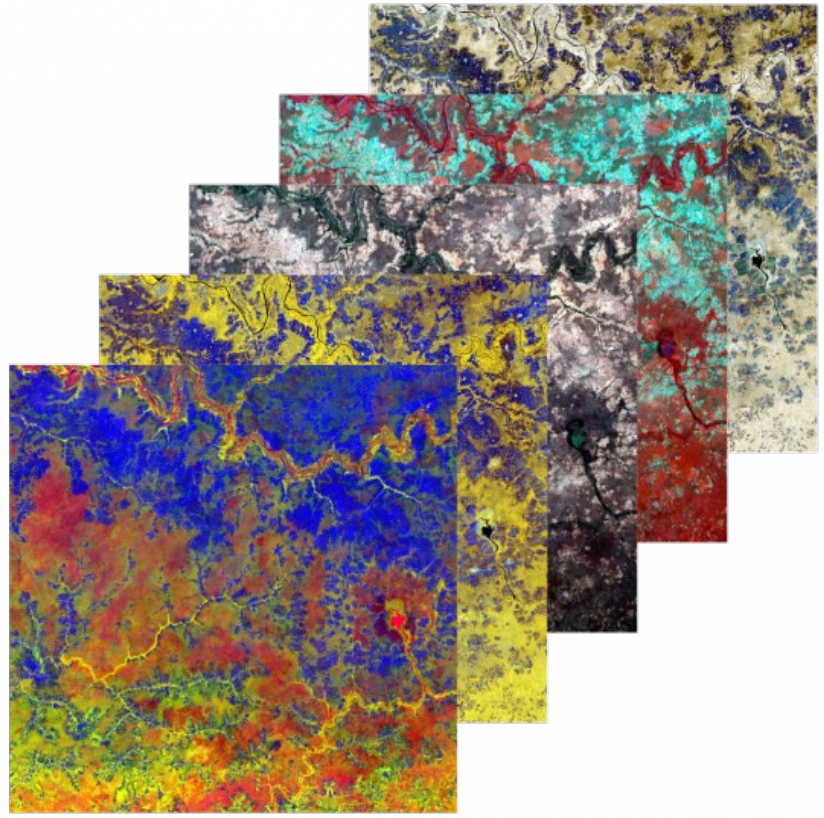
➢ Available **Output formats** options

Reformatting feature in the Data Tailor enables certain products to be formatted into other available file formats

- **Standard**, **GIS (Geographic Information Systems)** friendly raster formats. (e.g., Static map)
  - GeoTIFF
  - PNG
  - JPEG
- **Multitemporal & hierarchical** data formats. (e.g., Time Series)
  - GRIB-2
  - HDF5
  - NetCDF4
- **Native** and **specific need** data formats.
  - EPS Native
  - MSG Native
  - BUFR

Available **Layer filtering** options

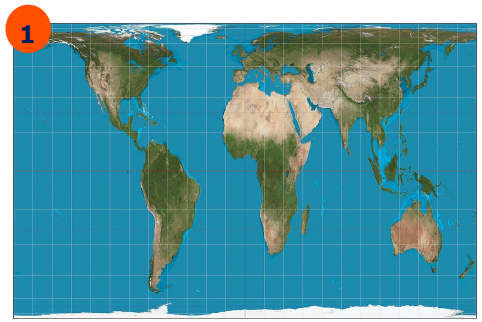
Layer filtering feature in the Data Tailor (DT) enables available layers to be extracted out of products. It comes handy when you only need one or a subset of layers.

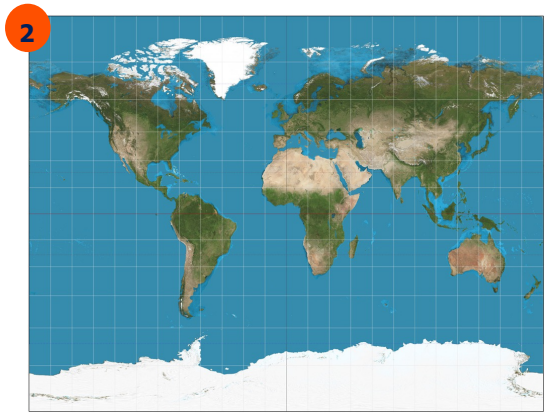


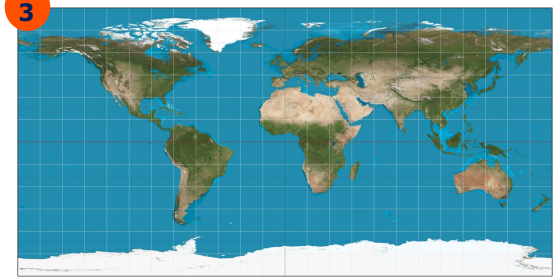
Credit: ESA

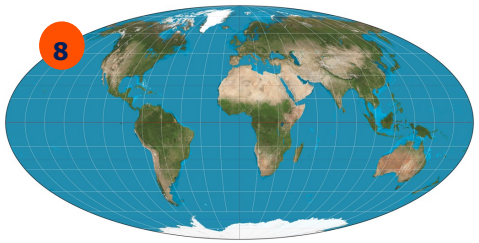
Let's explore the capabilities

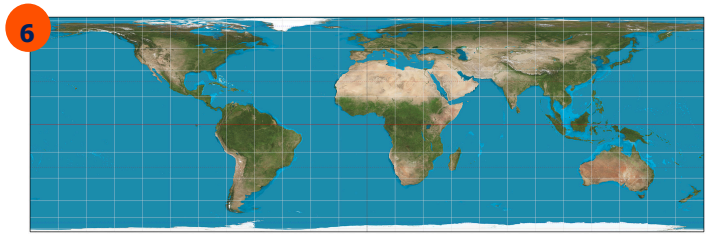
Available **Reprojection** options

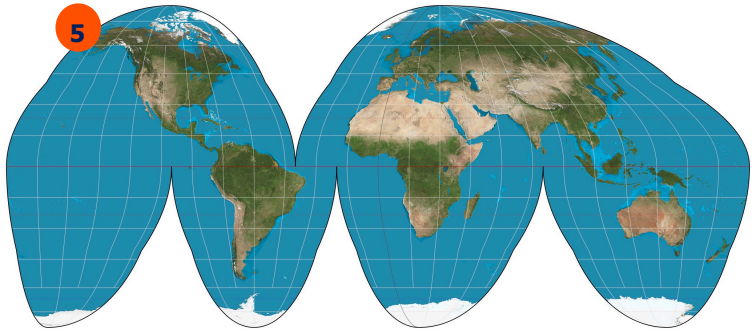


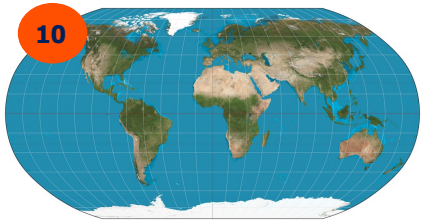


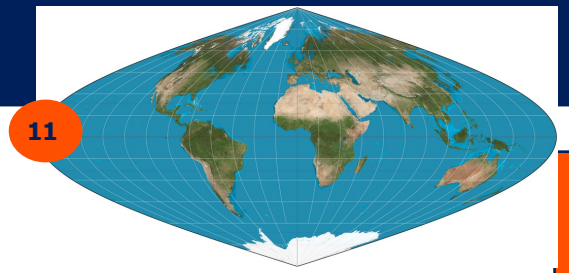












Projections	Projection Unique ID to be used in a chain configuration
1	Gall Peters
2	Gall Stereographic
3	Geographic / Plate-Carree
4	Geostationary view
5	Goode Homolosine
6	Lambert cylindrical equal-area
7	Mercator
8	Mollweide
9	Northern Polar stereographic
10	Robinson
11	Sinusoidal

Available **Compression** options

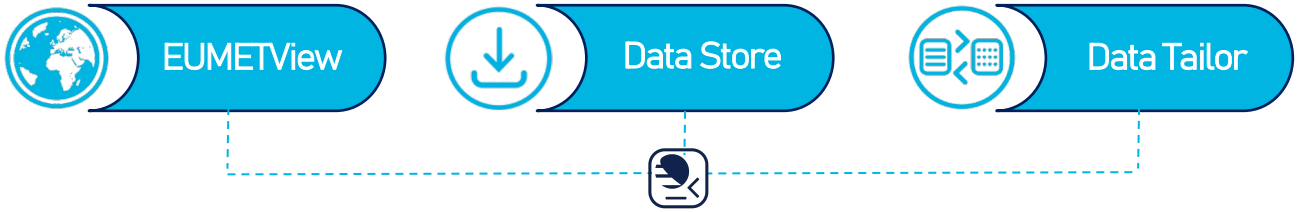
Compression feature in the Data Tailor (DT) enables customised products to be compressed before downloading. With compression option you always get a single file in the end.

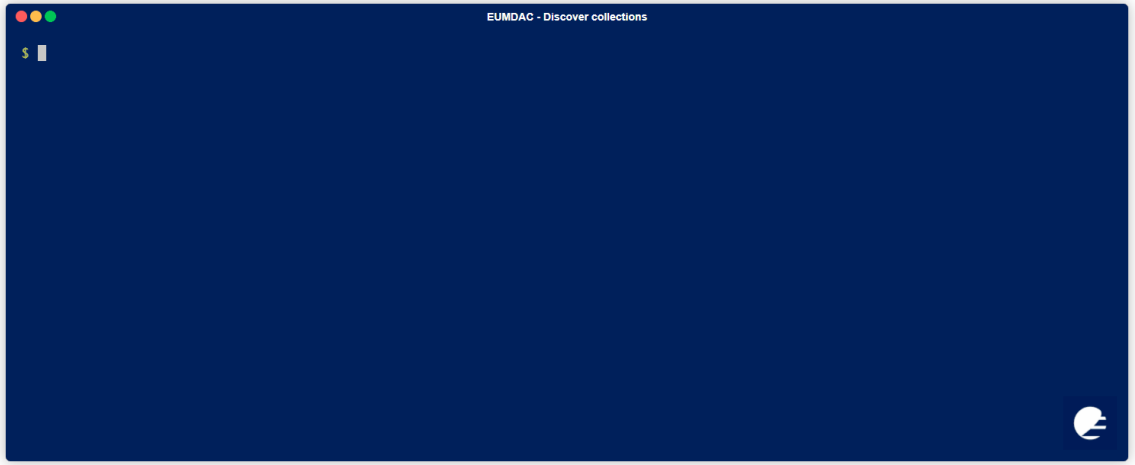
Name	Description + Extension
ZIP	Archive file compressed using zip algorithm. extension: ".zip" archiver: zip
TAR	Uncompressed archive file. extension: ".tar" archiver: tar
BZIP2	Archive file compressed using bzip2 algorithm. extension: ".tar.bz2" archiver: bztar
Internal	Internal compression for HDF5 or NetCDF4 formats using shuffle filter and gzip compression. ext: "" archiver: h5repack
SIP	Uncompressed Submission Information Package. ext: ".zip" archiver: zip
GZIP	Archive file compressed using gzip algorithm. ext: ".tar.gz" archiver: gztar

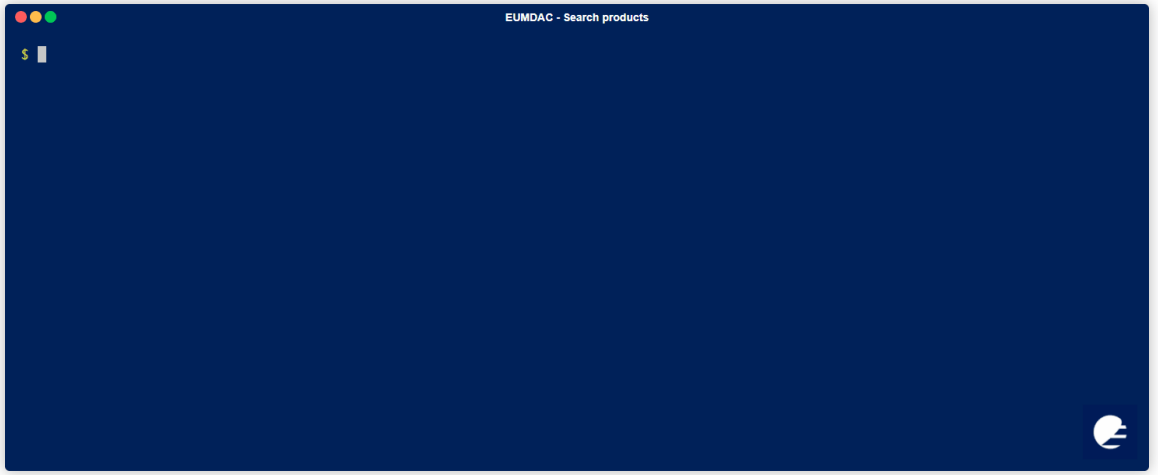
EUMETSAT Data Access Client (EUMDAC)

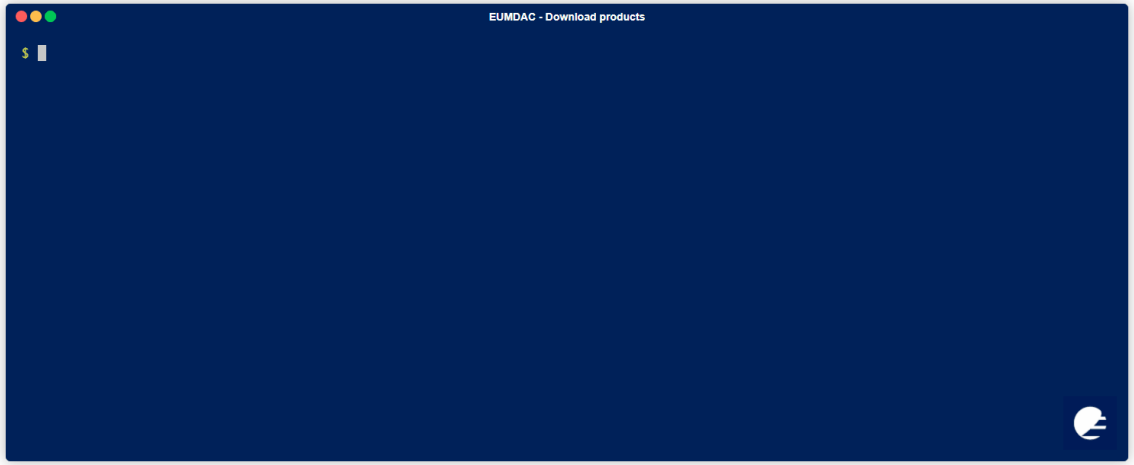
EUMDAC is the **EUMETSAT** **D**ata **A**ccess **C**lient. It provides simple access to the EUMETSAT data from a variety of satellite missions. As a Python library, it comes with many methods and helpers to use EUMETSATs APIs and services, like Data Store and Data Tailor. It also provides a variety of useful command-line utilities for data search, download and processing.

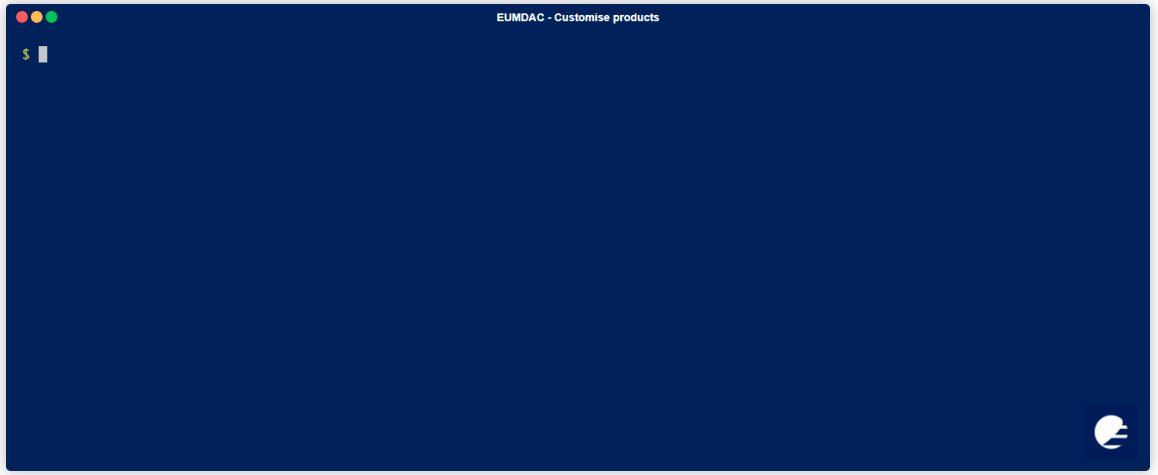
EUMETSAT Data Access Client (EUMDAC)











Important links

User Portal → **https://user.eumetsat.int/dashboard**

Data Store → **https://data.eumetsat.int/**

Data Store/Tailor User Guide (beginners) → **https://user.eumetsat.int/resources/user-guides/introductory-data-store-user-guide**

Data Store/Tailor detailed User Guide → **https://user.eumetsat.int/resources/user-guides/data-store-detailed-guide**

Data Tailor → **https://tailor.eumetsat.int/launchpad**

Data Tailor Standalone User Guide → **https://user.eumetsat.int/resources/user-guides/data-tailor-standalone-guide**

EUMETView → **https://view.eumetsat.int/productviewer?v=default**

Jupyter Notebooks → **https://gitlab.eumetsat.int/eumetlab/data-services/eumdac_data_tailor/-/blob/master/1_Using_the_Data_Tailor_with_EUMDAC.ipynb**

→ **https://gitlab.eumetsat.int/eumetlab/data-services/eumdac_data_store/-/blob/master/2_Searching_and_filtering_products.ipynb**

Agenda

Thank you!!