

# Data Access Services

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## 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



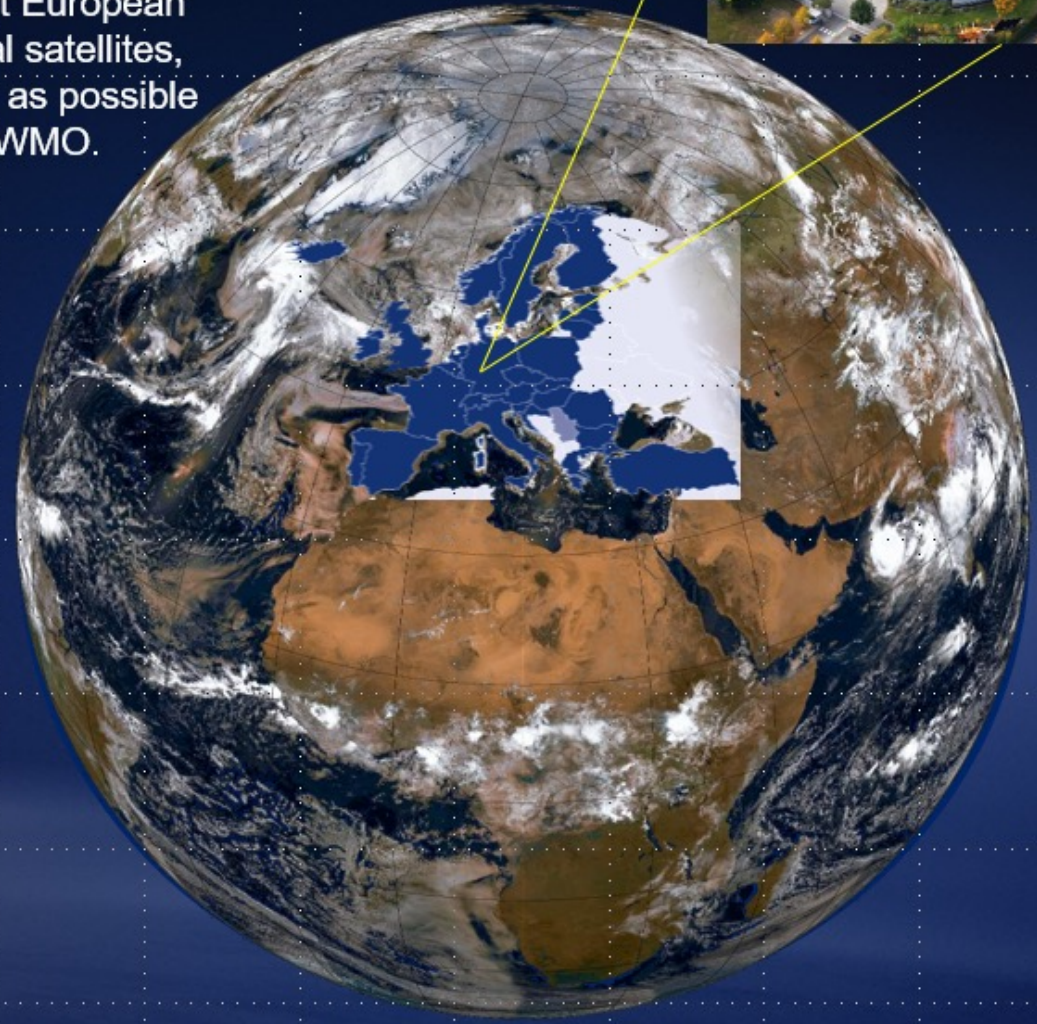
TURKEY



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.





- ➔ **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)

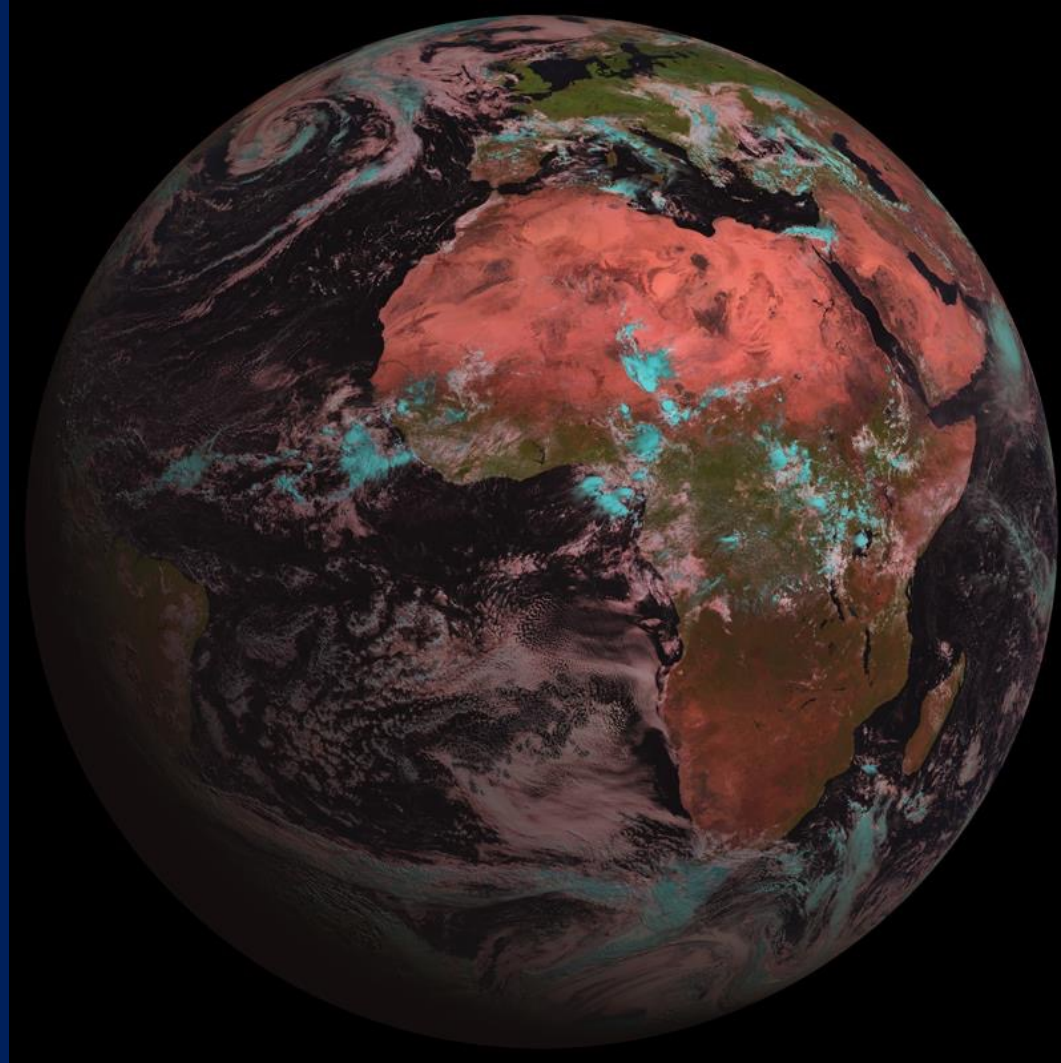
Geostationary orbit  
Indian Ocean Data Coverage (IODC)

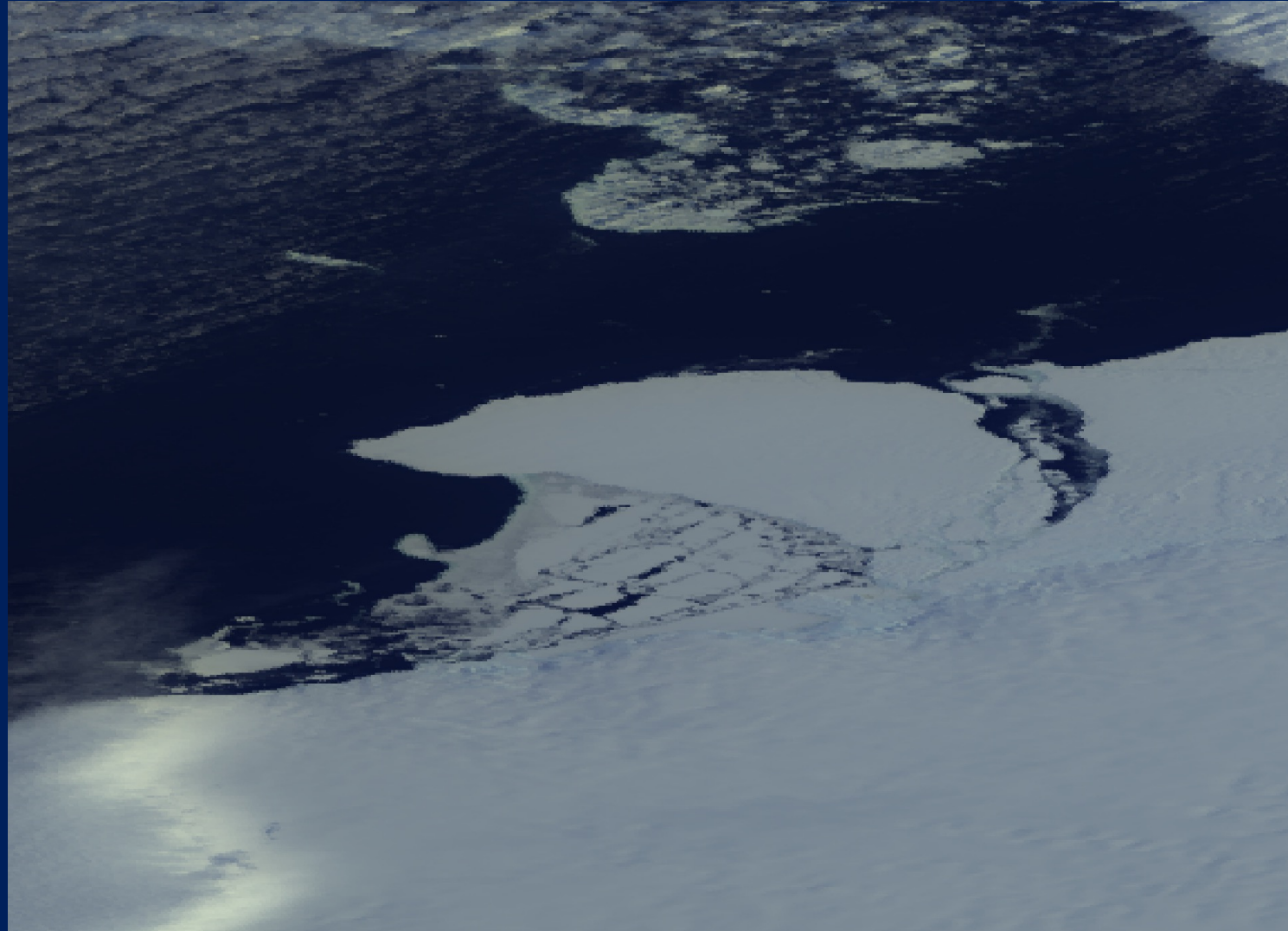
## METOP- B & -C (98.7° incl.)

Low Earth, sun-synchronous orbit  
EUMETSAT Polar System (EPS)/  
Initial Joint Polar System



# What can you see from satellites?



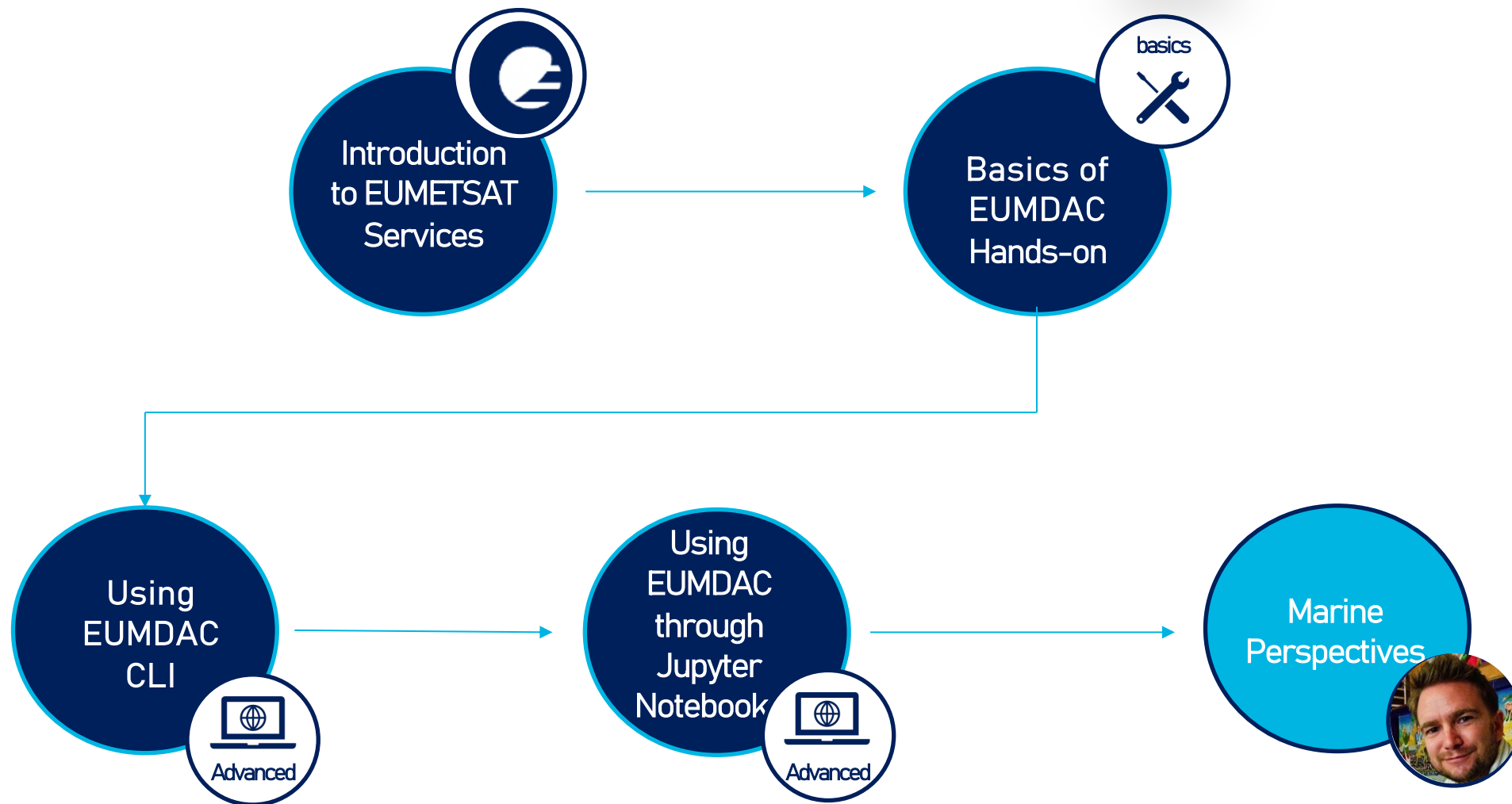








Your trainers

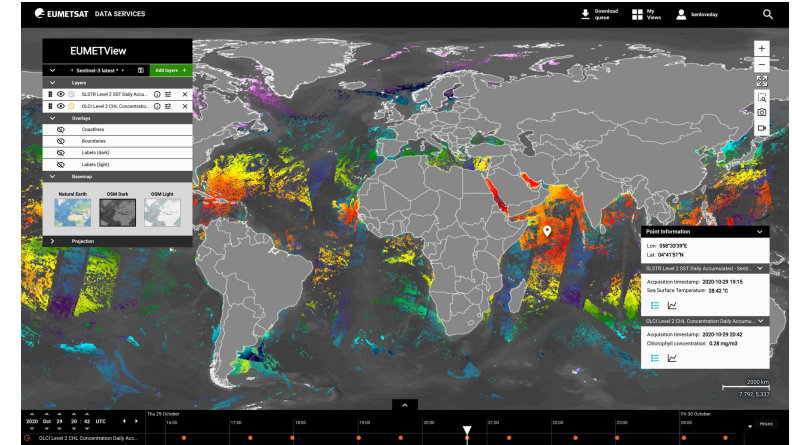




GUI

## 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

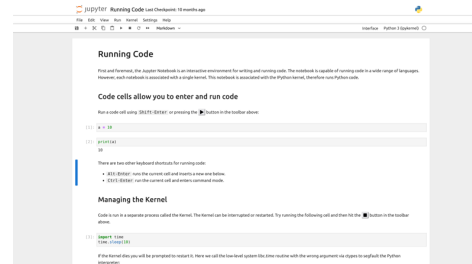
## Application Programming Interface

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.

```
<Layer>
<Title>EUMETSAT</Title>
<Abstract>EUMETSAT visualizations offering via WMS</Abstract>
<!-- Limited list of EPSG projections: -->
<CRS>EPSG:4326</CRS>
<CRS>EPSG:900913</CRS>
<CRS>EPSG:3995</CRS>
<CRS>CRS:84</CRS>
<EX_GeographicBoundingBox>...</EX_GeographicBoundingBox>
<BoundingBox CRS="CRS:84" minx="-77.0" miny="-77.0" maxx="77.0" maxy="77.0"/>
<Layer queryable="1" opaque="0">
<Name>h03b</Name>
<Title>
Precipitation rate at ground by GEO/IR supported by LEO/NW
</Title>
<Abstract>...</Abstract>
<KeywordList>...</KeywordList>
<CRS>EPSG:4326</CRS>
<CRS>CRS:84</CRS>
<EX_GeographicBoundingBox>...</EX_GeographicBoundingBox>
<BoundingBox CRS="EPSG:4326" minx="-77.0" miny="-77.0" maxx="77.0" maxy="77.0"/>
<Dimension name="time" default="2020-04-21T14:15:00Z" units="ISO8601" nearestValue="1">...</Dimension>
</Layer>
</Layer>
</Capability>
</WMS_Capabilities>
```

EUMDAC

```
05081 17 2148.03 /System/Applications/App_Store.app/Contents/MacOS/App
05084 17 0100.04 /Library/Developer/Privately/Frameworks/CoreSimulator.Fra
05085 17 0141.02 /Library/Developer/Privately/Frameworks/CoreSimulator.Fra
05082 17 0100.06 /usr/libexec/taskguard
05088 17 0100.06 /System/Applications/Maps.app/Contents/MacOS/Maps
07646 17 0100.34 /System/Library/CoreServices/SharedFrameworks
09019 17 0122.04 /System/Applications/Maps.app/Contents/MacOS/Maps
09020 17 0100.04 /Applications/Traila.app/Contents/Frameworks/Traila He
09021 17 0100.04 /Applications/Traila.app/Contents/Frameworks/Traila He
09024 17 0100.07 /Applications/Traila.app/Contents/Frameworks/Traila He
09025 17 0100.02 /Applications/Traila.app/Contents/Frameworks/Traila He
09088 17 0101.08 /System/Cryptexes/App/User/Library/PasswordCredential
09089 17 0102.04 /Applications/Code.app/Contents/MacOS/Code
09046 17 0105.77 /Library/Developer/Privately/Frameworks/CoreSimulator.Fra
09047 17 0105.74 /Library/Developer/Privately/Frameworks/CoreSimulator.Fra
09067 17 0122.56 /Applications/Code.app/Contents/SharedFrameworks/Sou
09062 17 0100.26 /Applications/Code.app/Contents/Developer/Platform
01377 17 0100.18 /Applications/Code.app/Contents/SharedFrameworks/XCUI
09066 17 0100.01 /usr/bin/ls
09068 17 0100.02 /usr/bin/ls
01027 17 0100.02 /usr/bin/ls
01028 17 0100.03 /usr/bin/ls
01029 17 0100.02 /usr/bin/ls
(base) username@MacBook-Pro:~$
```





# EUMETSAT Pull Data Access Services

www.eumetsat.int

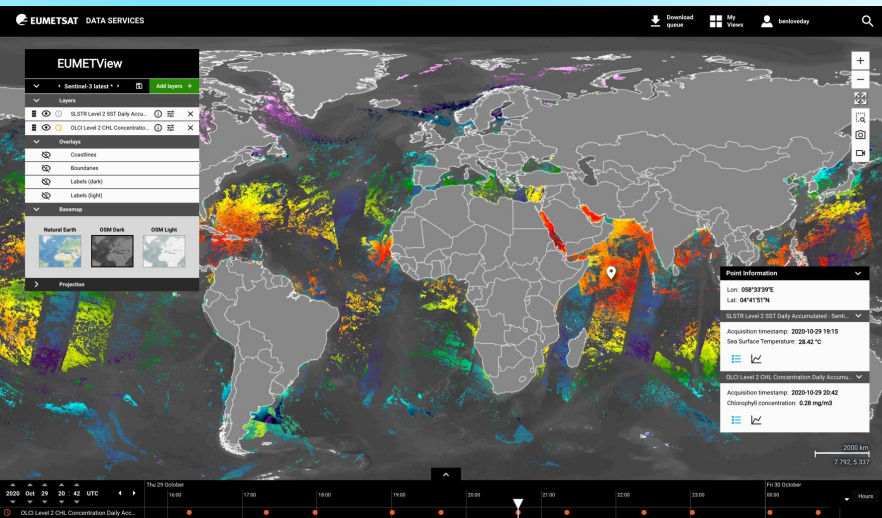
## EUMETView



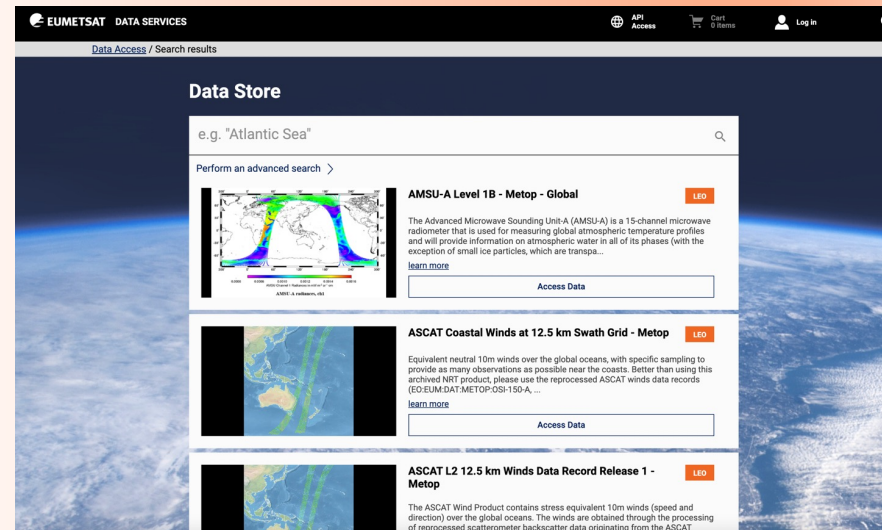
## Data Store



## Data Tailor



<https://view.eumetsat.int/>



<https://data.eumetsat.int/>

<https://tailor.eumetsat.int/>

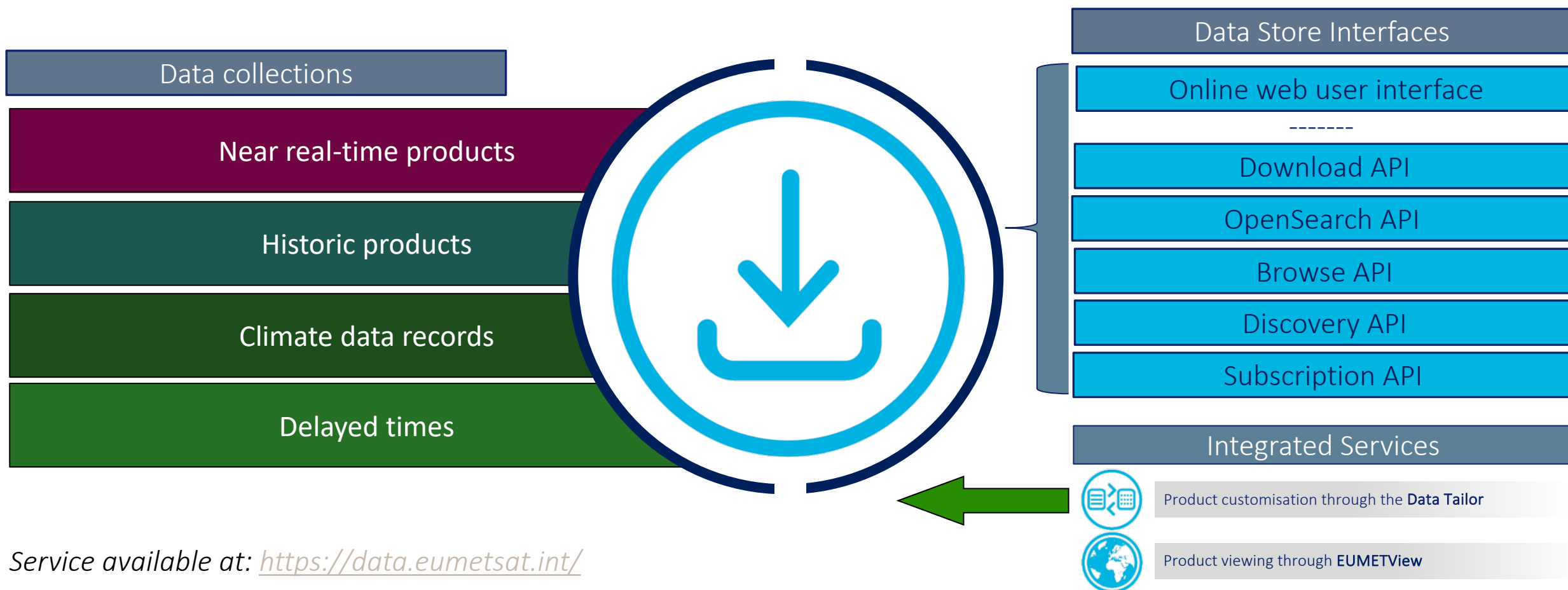


Data Store



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



Data Tailor

Data Store Interfaces

Online web user interface

Web UI based catalogue navigation

Download API

OpenSearch API

REST API

Subscription API

**EUMETSAT DATA SERVICES** APIs, Cart options & Account API Access Cart 0 Items Log in

[Data Access](#) / Advanced search results

Search results

We've found 60 results

Search terms and filters

e.g. "Atlantic Sea"

**PLATFORM**

- Sentinel-3 (25)
- Metop (21)
- Sentinel-6 (6)
- MSG (5)
- MFG (3)

**SENSOR TYPE**

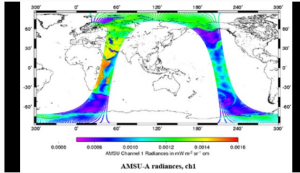
- Altimetric (13)
- Interferometer (3)
- Microwave Radiometer (1)
- Optical (25)
- Radiometer (2)

Show remaining sensor types (3)

**SENSOR**

- AMR-C (1)
- AMSU-A (1)
- ASCAT (11)
- AVHRR (2)
- GOME-2 (2)

**AMSU-A Level 1B - Metop - Global** LEO



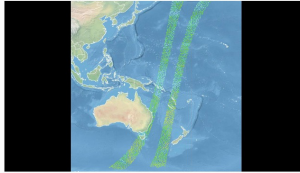
The Advanced Microwave Sounding Unit-A (AMSU-A) is a 15-channel microwave radiometer that is used for measuring global atmospheric temperature profiles and will provide information on atmospheric water in all of its phases (with the exception of small ice particles, which are transparent at microwave frequencies). AMSU-A will provide information even in cloudy conditions. AMSU-A measures Earth radiance at frequenci...

[learn more](#)

[Access Data](#)

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**ASCAT Coastal Winds at 12.5 km Swath Grid - Metop** LEO



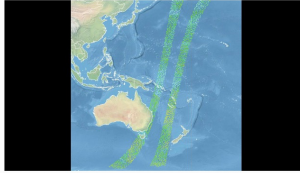
Equivalent neutral 10m winds over the global oceans, with specific sampling to provide as many observations as possible near the coasts. Better than using this archived NRT product, please use the reprocessed ASCAT winds data records (EO:EUM:DAT:METOP:OSI-150-A, EO:EUM:DAT:METOP:OSI-150-B). Metop-A data are available in the Data Centre up to 15/11/2021.

[learn more](#)

[Access Data](#)

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**ASCAT L2 12.5 km Winds Data Record Release 1 - Metop** LEO



The ASCAT Wind Product contains stress equivalent 10m winds (speed and direction) over the global oceans. The winds are obtained through the processing of reprocessed scatterometer backscatter data originating from the ASCAT instrument on EUMETSAT's Metop satellite.

[learn more](#)

[Access Data](#)



# Data Store



Data Store



Data Tailor

Data Store Interfaces

Online web user interface

Web UI based catalogue navigation

Download API

OpenSearch API

REST API

Subscription API

The screenshot shows the EUMETSAT Data Services interface for AMSU-A Level 1B - Metop - Global. It includes a search refinement filter on the left, a table of search results in the center, and a map of product coverage on the right. The search refinement filter includes options for available time range, filename, sort by (Sensing time, Descending), filters (Mission/Satellite, Product Type, Orbit Number), and area of interest. The search results table lists products with columns for date, mission, size, and download options. The map shows a selected area of interest (AOI) over the Indian Ocean region, with a red box highlighting the AOI filtering options.

Search refinement filter

Search results

Selected product coverage

Download options

Direct download

Command line

Cart

>> Interface with APIs

Data Tailor integration

>> product customisation



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



Python and Jupyter notebook examples snippets available for each API



Swagger™

### Download Download EUMETSAT Online EO Data.

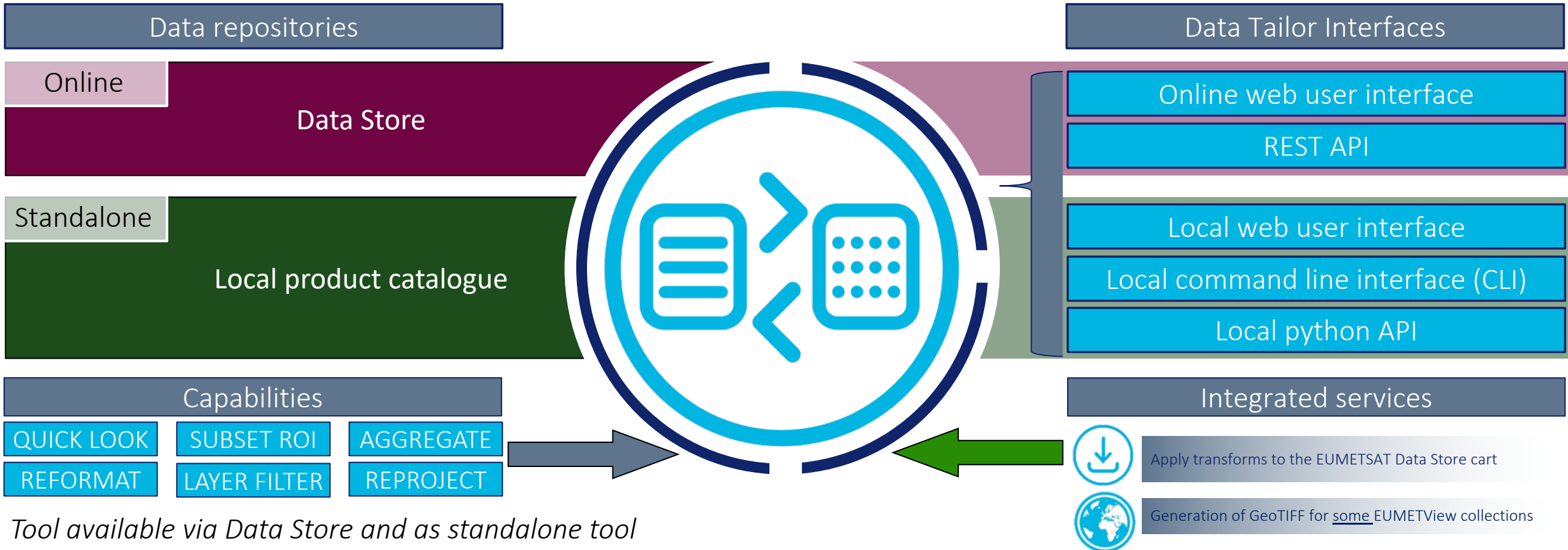
[Find out more](#) ^

GET	/collections/{collID}/products/{prodID}	Download product as compressed SIP	⌵	🔒
GET	/collections/{collID}/products/{prodID}/browse	Download products browse graphic	⌵	🔒
GET	/collections/{collID}/products/{prodID}/metadata	Download product's metadata	⌵	🔒
GET	/collections/{collID}/products/{prodID}/entry	Downloads a specific file of the product	⌵	🔒
GET	/collections/{collID}/dates/{year}/{month}/{day}/times/{hour}/{minute}/platforms/{platform}	Download product	⌵	🔒
GET	/collections/{collID}/dates/{year}/{month}/{day}/times/{hour}/{minute}	Downloads the product	⌵	🔒
GET	/collections/{collID}/dates/{year}/{month}/{day}/times/{hour}/{minute}/platforms/{platform}/browse	Download product's browse image	⌵	🔒





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*



The screenshot shows the EUMETSAT Data Tailor web interface. At the top, there's a navigation bar with the EUMETSAT logo and menu items: LAUNCHPAD, AGGREGATION, LAYER FILTER, REPROJECTION, ROI, QUICK LOOK, and OUTPUT OPTIONS. Below the navigation bar, the 'Launchpad' section is visible, containing a 'Product type' dropdown menu set to 'OLCI Level 1B Full Resolution (NRT, NTC or versi...)' and an 'Output format' dropdown menu with a search field. To the right of the 'Output format' menu is a 'Configuration' dropdown menu showing 'No items'. Below these are 'Input products' listed as 'S3B\_OL\_1\_EFR\_\_\_20191029T102635\_20191029T102935\_20200113T222330\_0179\_031\_279\_1980\_MR1\_R\_NT\_002.SEN3.zip'. At the bottom, a list of processing steps is shown: Aggregation, Layer Filter, Reprojection, ROI, Quick look, and Output Options, each with a dropdown arrow. A red box highlights the 'Output format' dropdown and the list of processing steps.

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.



## ➤ 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

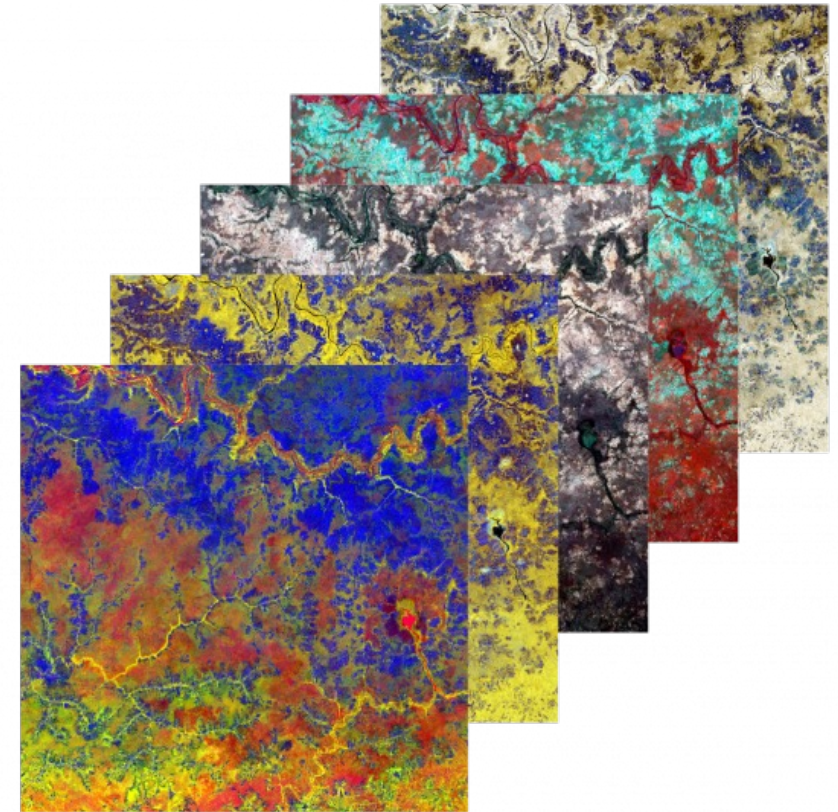
- **Native and specific need data formats.**

- EPS Native
- MSG Native
- BUFR



## ➤ Available Layer filtering options

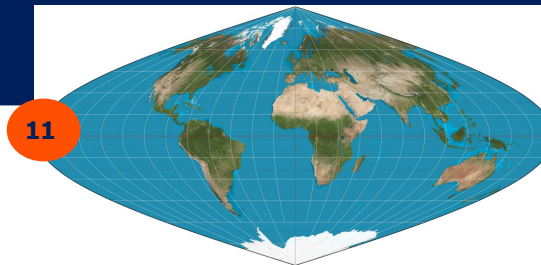
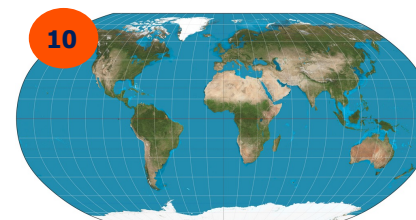
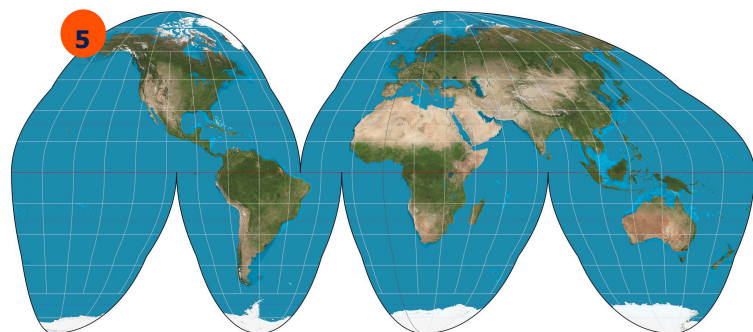
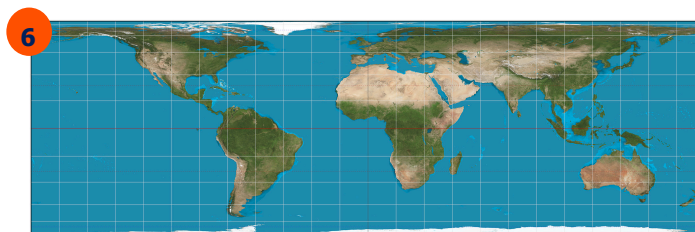
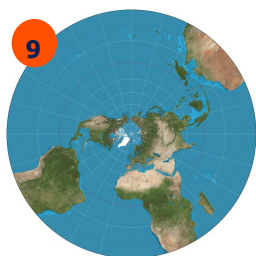
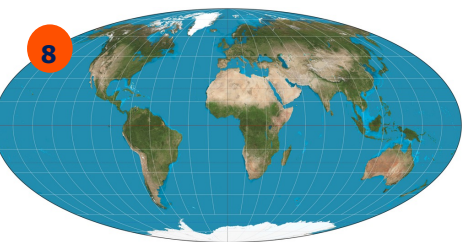
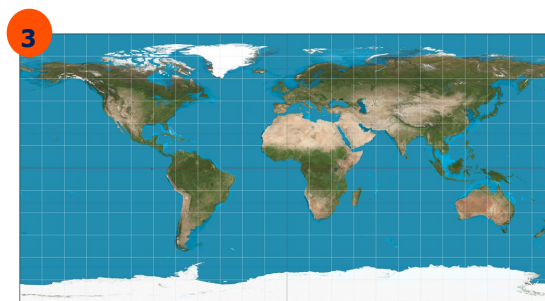
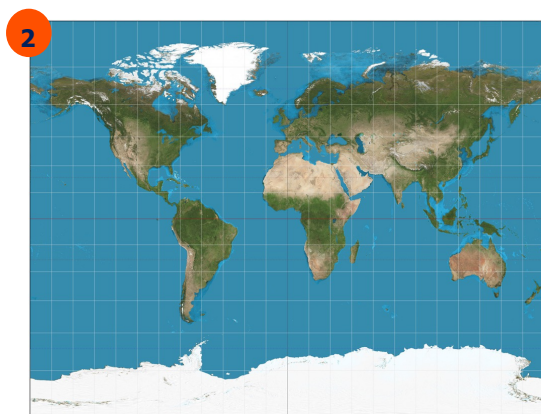
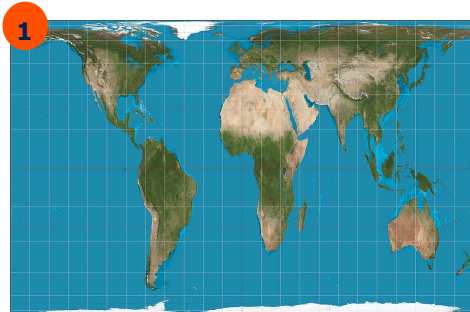
Layer filtering feature in the Data Tailor (DT) enables available layers to be extracted out of products. It comes handy when you only need one or a subset of layers.



Credit: ESA



## ➤ 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)



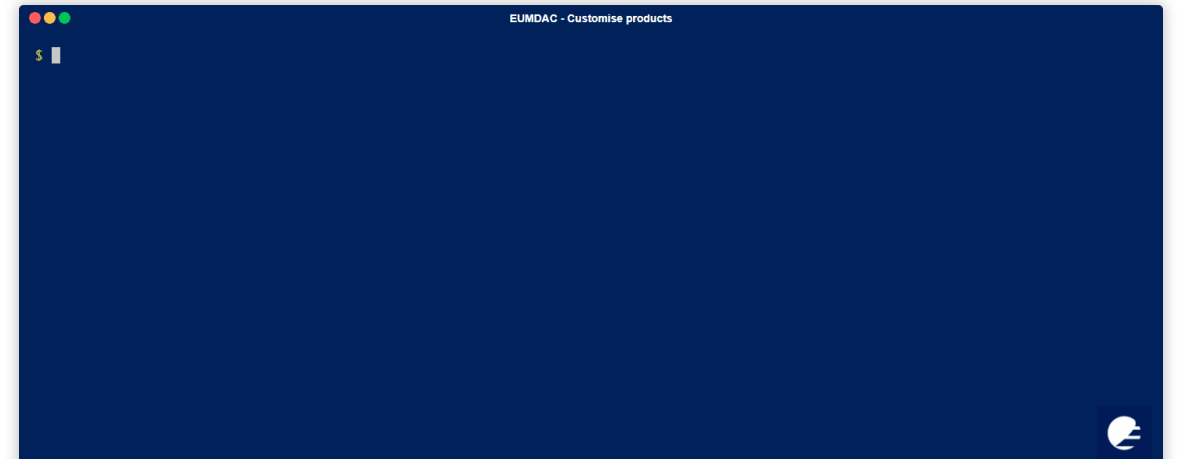
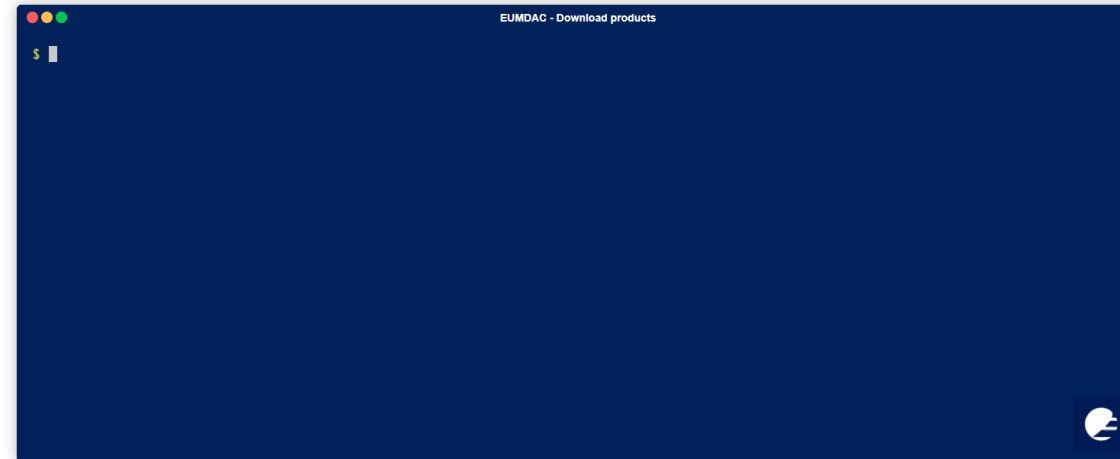
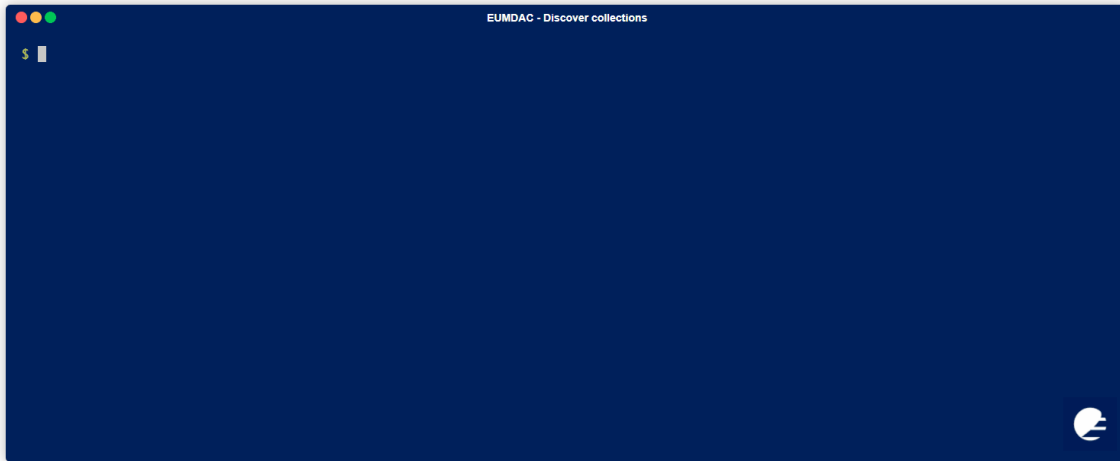
EUMDAC is the EUMETSAT Data Access Client. It provides simple access to the EUMETSAT data from a variety of satellite missions. As a Python library, it comes with many methods and helpers to use EUMETSATs APIs and services, like Data Store and Data Tailor. It also provides a variety of useful command-line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





# EUMETSAT Data Access Client (EUMDAC)

www.eumetsat.int





# 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_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](https://gitlab.eumetsat.int/eumetlab/data-services/eumdac_data_store/-/blob/master/2_Searching_and_filtering_products.ipynb)



*Thank you!!*