EUMETSAT's new Data Services

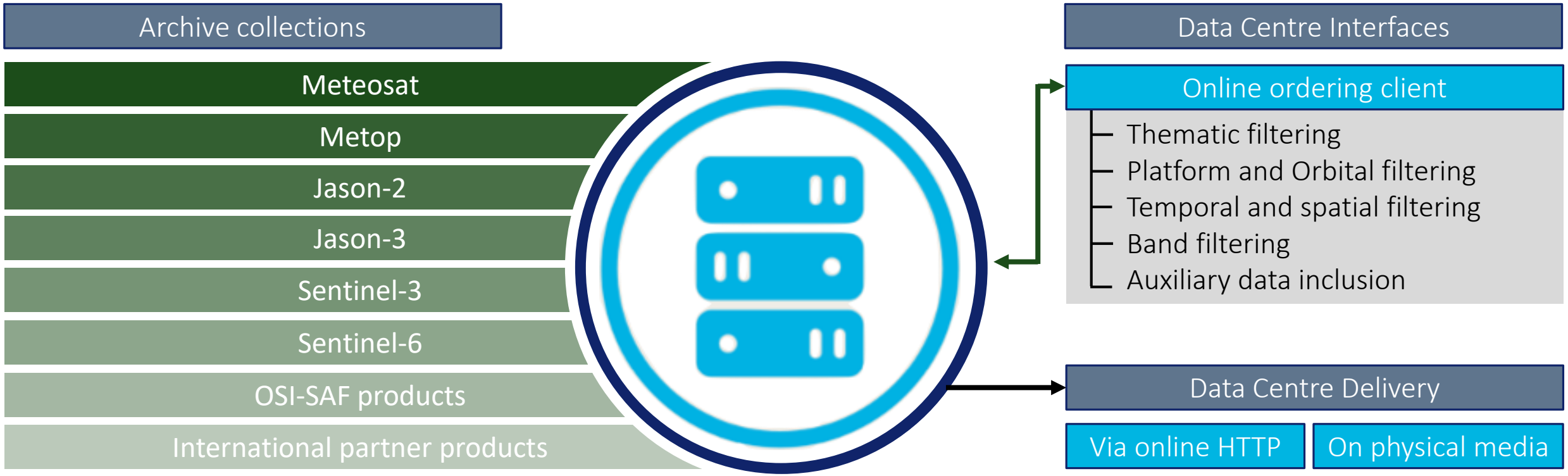
Presenter: Elena Nikolaeva

9 February 2021

EUMeTrain SNOW Event Week

EUMETView | EUMETSAT Data store | Data Tailor | EUMETCast Terrestrial | European Weather Cloud

The **EUMETSAT Data Centre** provides a state-of-the-art, long-term archive of EUMETSAT data, guaranteeing its preservation. It supports all EUMETSAT satellites, including Meteosat, Metop, Jason-2, Jason-3, and Copernicus missions, and data from the Ocean and Sea Ice Satellite Application Facility (OSI-SAF) and international partners.



New data services

Pull services

Push services

Shared services

ECMWF

Viewing your data…

EUMETView

Improving data access…

EUMETSAT Data store

Customising your data…

Data Tailor

Near-real time data delivery via terrestrial networks.

EUMETCast Terrestrial

Hosted data processing…

European Weather Cloud

Existing services

EUMETCast Satellite

Data Centre

GTS

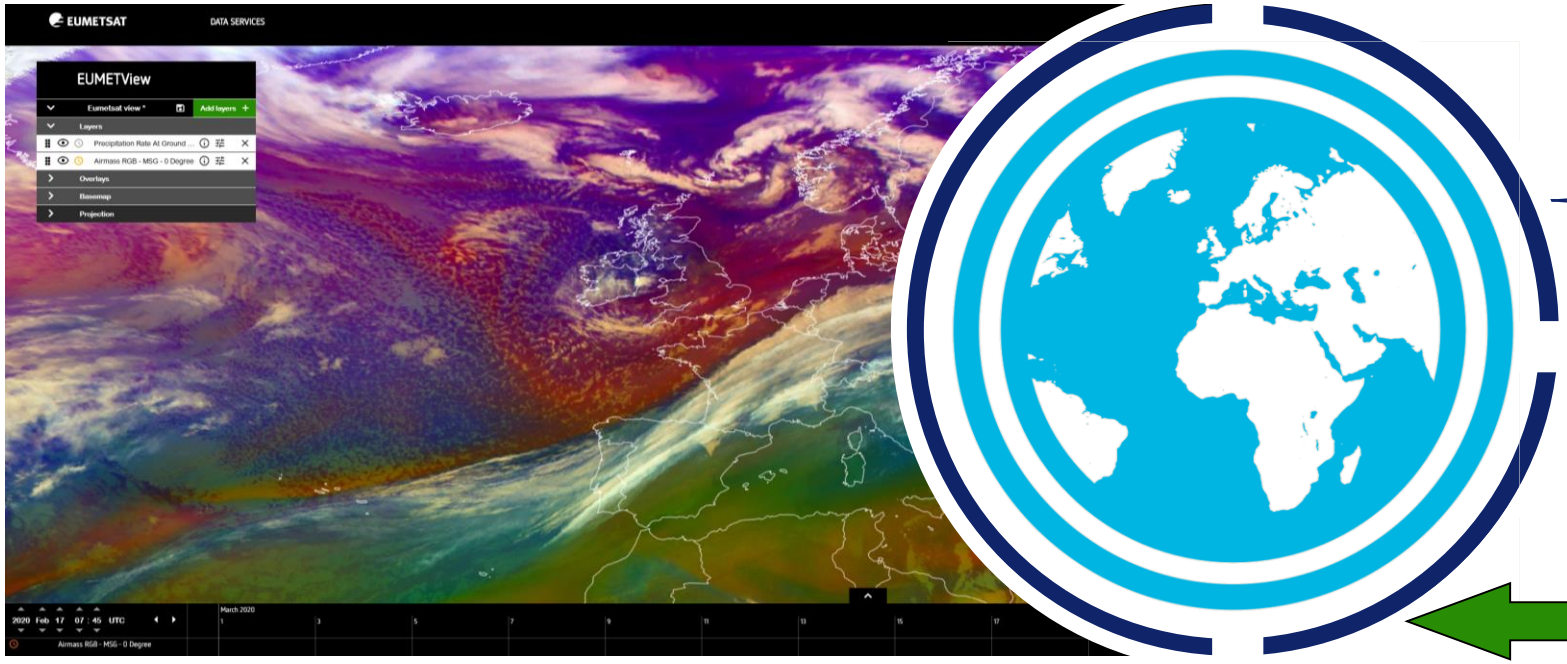
CODA

Direct Dissem.

EUMETView | EUMETSAT Data store | Data Tailor | EUMETCast Terrestrial | European Weather Cloud

EUMETView is an Online Map Service that provides visualisations of EUMETSAT products through a customisable web user interface and an enhanced set of Open Geospatial Consortium (OGC) standard Application Program Interfaces (APIs). EUMETView makes it is possible to create and save maps using the user interface, or integrates with user's personal service, via the API.

EUMETView Web User Interface



OGC API interfaces

- Web mapping service (WMS)
- Web coverage service (WCS)
- Web feature service (WFS)

Planned Integrations

- **Data Tailor** generates GeoTIFF of EUMETView products
- **Data Store** previews EUMETView visualisations

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

EUMETSAT

EUMETView: Current catalogue

EUMETView | EUMETSAT Data store | Data Tailor | EUMETCast Terrestrial | European Weather Cloud

Current data collections

METOP

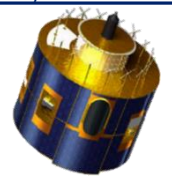
AVHRR RADIOMETRY PRODUCTS

EUMETSAT OSI SAF OCEAN AND SEA ICE

SST PRODUCTS

WIND PRODUCTS

MFG/MSG



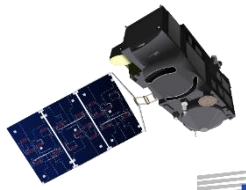
MSG SEVIRI RADIOMETRY PRODUCTS

MSG CLOUD MASK PRODUCTS

EUMETSAT H SAF SUPPORT TO OPERATIONAL HYDROLOGY AND WATER MANAGEMENT

PRECIP. PRODUCTS

SENTINEL-3A / 3B



SLSTR RADIOMETRY PRODUCTS

OLCI RADIOMETRY PRODUCTS

European Commission

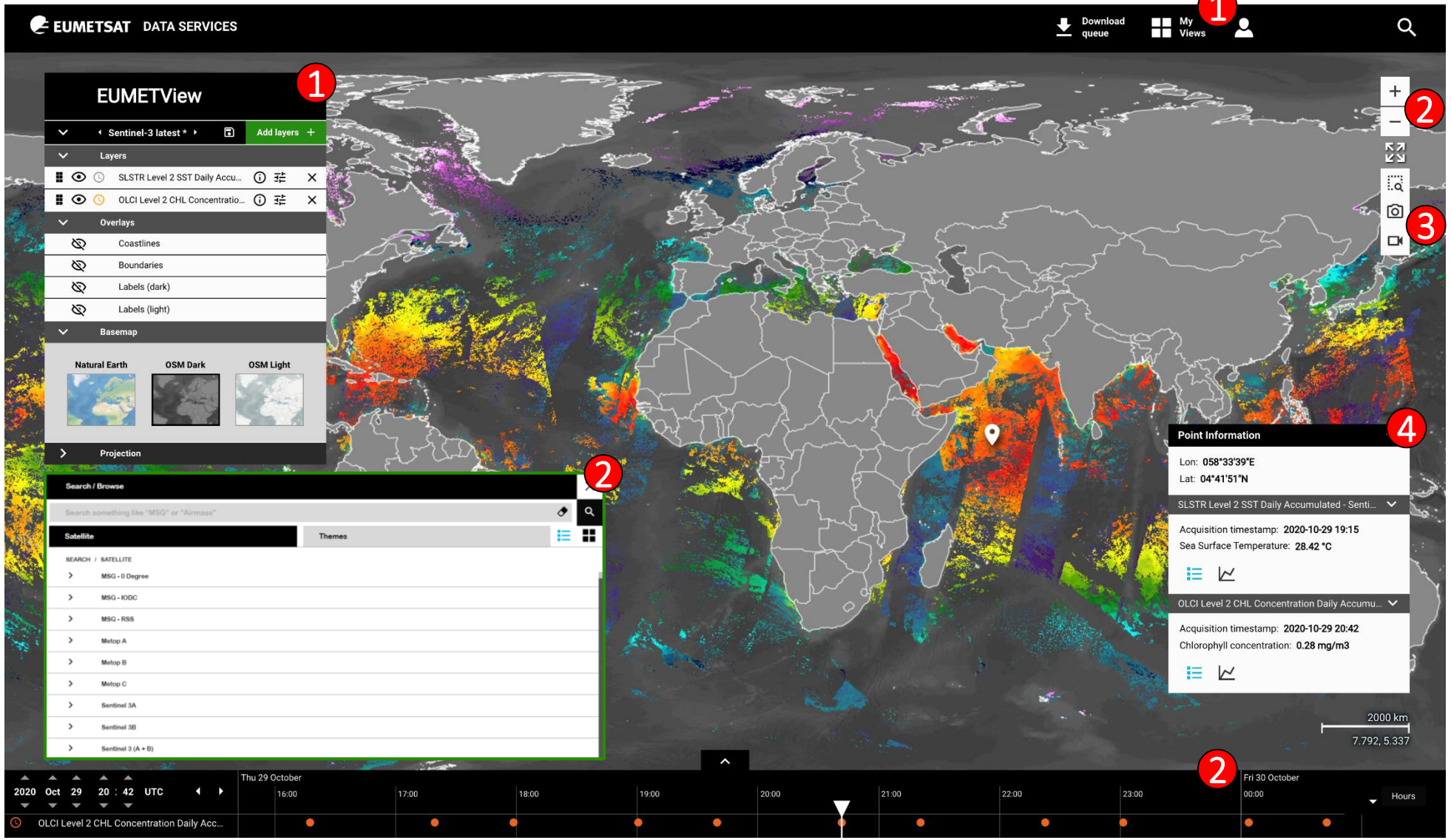
opernicus Europe's eyes on Earth

Product	Platform	OGC Service
Metop AVHRR RGB Clouds (accumulated orbits)	Metop A, B, C	WMS
Metop AVHRR Natural Colour + Fog (accumulated orbits)	Metop A, B, C	WMS
Metop AVHRR IR 10.8	Metop A, B, C	WMS
Global AVHRR SST	Metop B	WMS, WCS
ASCAT L2 Coastal Winds at 12.5 km	Metop A, B, C	WMS, WFS
Meteosat single channel imagery (10.8, 3.9, 0.6, 6.2), RGB Day Microphysics; Ash; Dust; E-View, Fog, Convection, Natural Colour, Snow, Nat. Colour Enhanced, Airmass, Tropical Airmass.	0 deg., IODC	WMS
Meteosat single channel imagery (3.9), RGB Day Microphysics; Natural Colour, Nat. Colour Enhanced, Airmass, Tropical Airmass.	RSS	WMS
Visualised products; CTH, CLM, Active Fire	0 deg., IODC	WMS
Precipitation (MPE)	IODC	WMS
Precipitation (H03B)	0 deg.	WMS
Sentinel 3 OLCI L1 RGB orbits	Sentinel 3A & B	WMS
Sentinel 3 OLCL L2 CHL Concentration orbits	Sentinel 3A & B	WMS, WCS
Sentinel 3 SLSTR L2 SST orbits	Sentinel 3A & B	WMS, WCS
Sentinel 3 OLCI L1 RGB accumulated orbits over a day orbits	Sentinel 3A + B	WMS
Sentinel 3 OLCL L2 CHL Concentration accumulated orbits / day	Sentinel 3A + B	WMS, WCS
Sentinel 3 SLSTR L2 SST accumulated orbits / day	Sentinel 3A + B	WMS, WCS

EUMETView | EUMETSAT Data store | Data Tailor | EUMETCast Terrestrial | European Weather Cloud

The EUMETView web interface

1. > Customisable and collaborative data viewing
2. > Layer, time and ROI manipulation
3. > Image and animation export
4. > Feature information (WFS), point information (WCS; shown) and timeliness



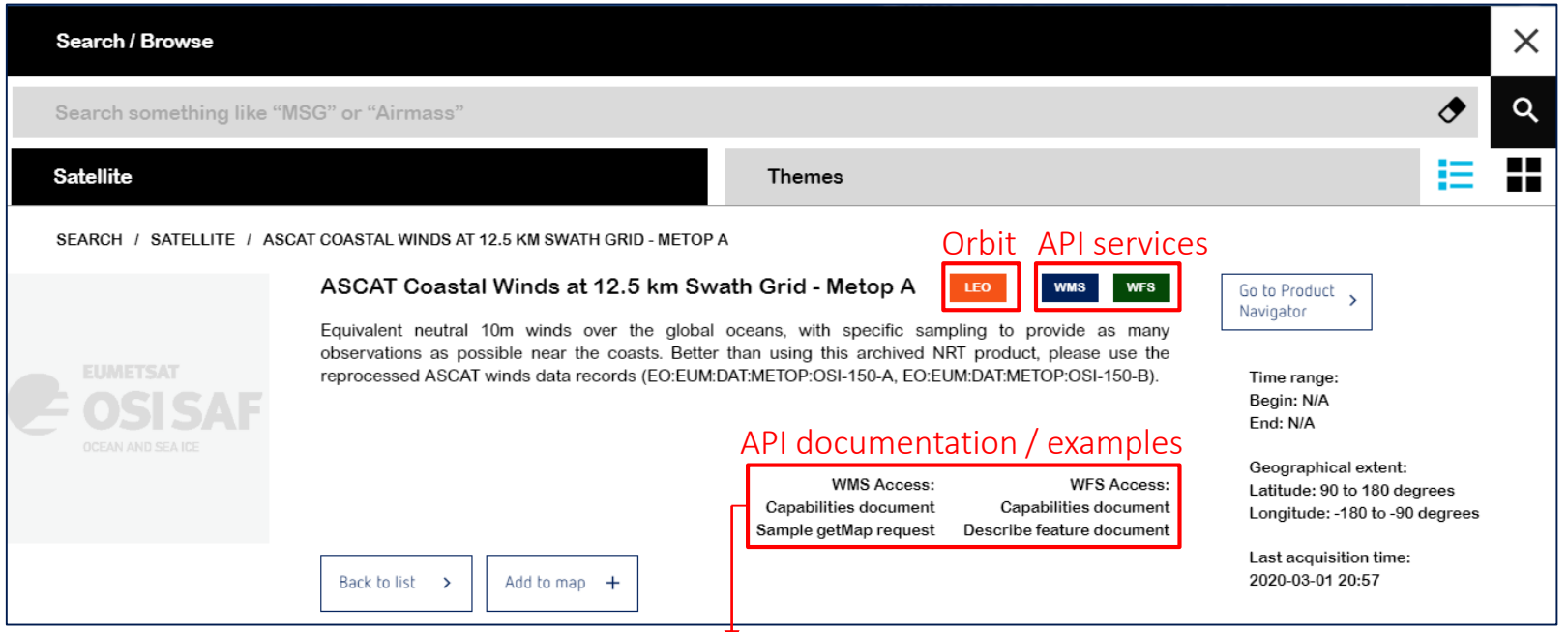
EUMETView | EUMETSAT Data store | Data Tailor | EUMETCast Terrestrial | European Weather Cloud

Open Geospatial Consortium API interfaces

- Each product has its available API services listed.
- API access determined by user specific license.
- Full API capability documents provided.
- Example OGC requests provided.

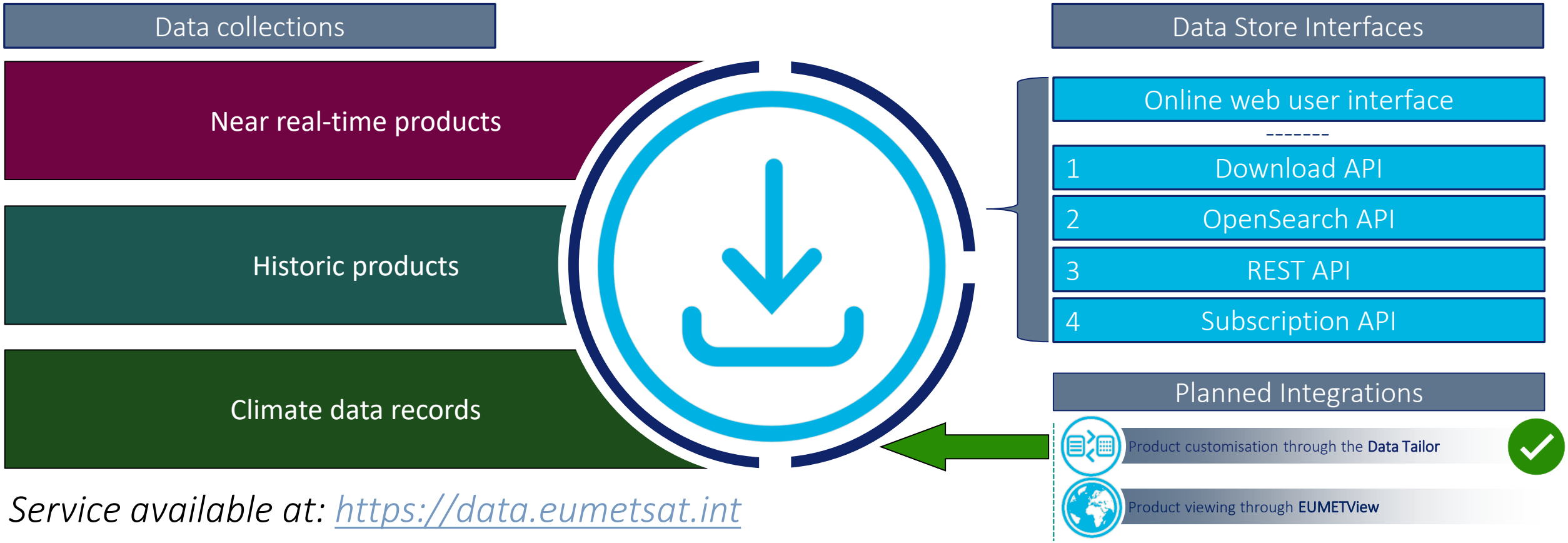
Python and Jupyter notebook examples snippets available for each API

GeoServer



EUMETView | **EUMETSAT Data store** | Data Tailor | EUMETCast Terrestrial | European Weather Cloud

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.



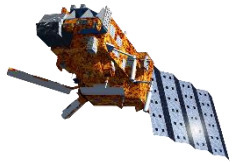
Service available at: https://data.eumetsat.int

The EUMETSAT Data Store: Current catalogue

EUMETView | EUMETSAT Data store | Data Tailor | EUMETCast Terrestrial | European Weather Cloud

Current data collections

METOP

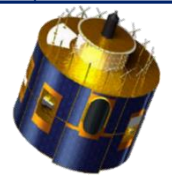


AVHRR RADIOMETRY PRODUCTS
IASI INTERFEROMETRY PRODUCTS
ASCAT SCATTEROMETRY PRODUCTS

EUMETSAT OSI SAF OCEAN AND SEA ICE

SST PRODUCTS
WINS PRODUCTS

MFG/MSG

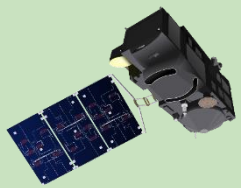


MSG SEVIRI RADIOMETRY PRODUCTS
MSG CLOUD MASK PRODUCTS
MFG MVIRI RADIOMETRY PRODUCTS

Product	Platform	Format (s)	Historic	NRT*	CDR**
AVHRR Global Data Service L1b	Metop A, B, C	Native	2019	2020	
IASI Global Data Service L1c	Metop A, B, C	Native & PDU	2019	2020	
IASI Combined Sounding Products	Metop A, B, C	Native	2019	2020	
ASCAT Soil Moisture at 12.5 km	Metop A, B, C	Native	2019	2020	
ASCAT Soil Moisture at 25 km	Metop A, B, C	Native	2019	2020	
Global AVHRR SST	Metop B	netCDF	2019	2020	
ASCAT L2 Coastal Winds at 12.5 km	Metop A, B	netCDF	2019	2020	
ASCAT L2 25 km winds record rel. 1	Metop A	netCDF			7 years
ASCAT L2 12.5 km winds record rel. 1	Metop A	netCDF			7 years
MSG L1.5 SEVIRI Image Data	0 deg., IODC, RSS	Native	2019	2020	
MFG L1.5 MVIRI CDR	0 deg., 57 deg., 63 deg.	netCDF			63 years
MSG L2 Cloud Mask	0 deg., IODC, RSS	GRIB2	2019	2020	

The Data Store provides access to historic and near real-time (NRT*) data, as well as climate data records (CDRs**). Product access is licence dependent.

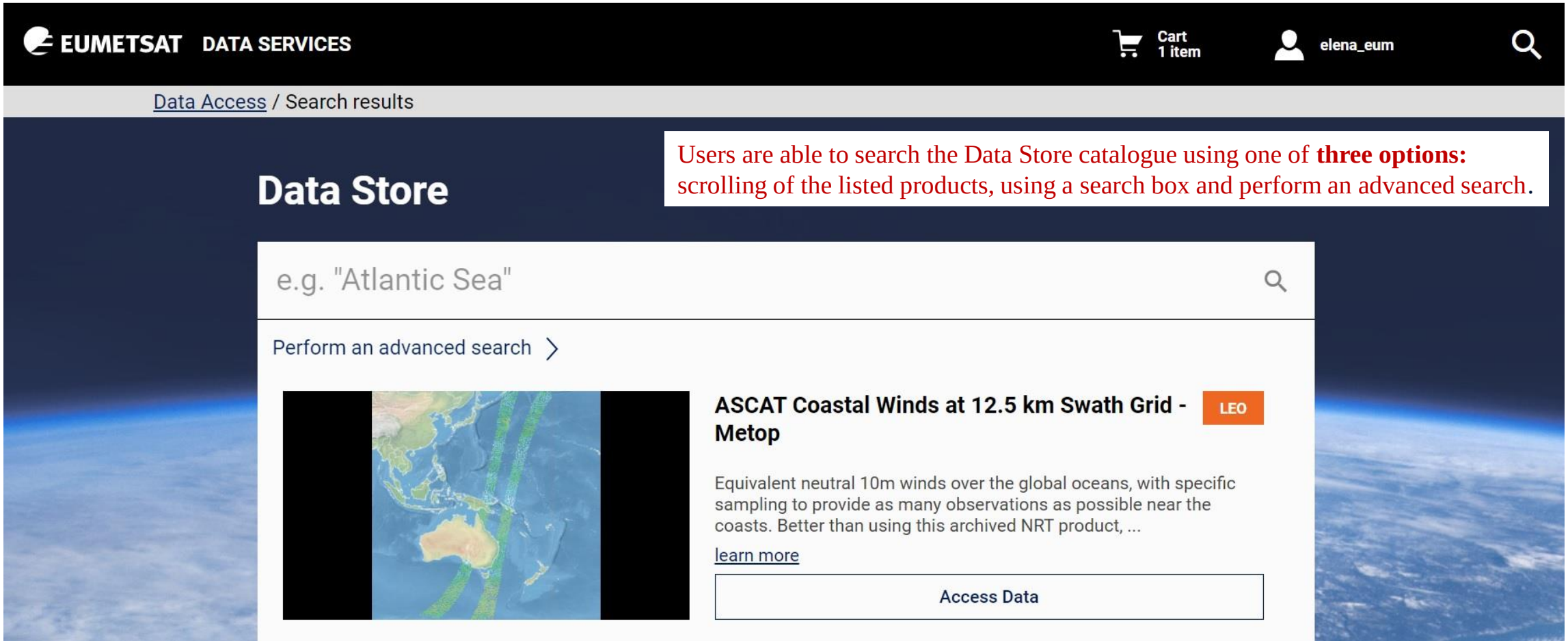
Planned future collections



European Commission

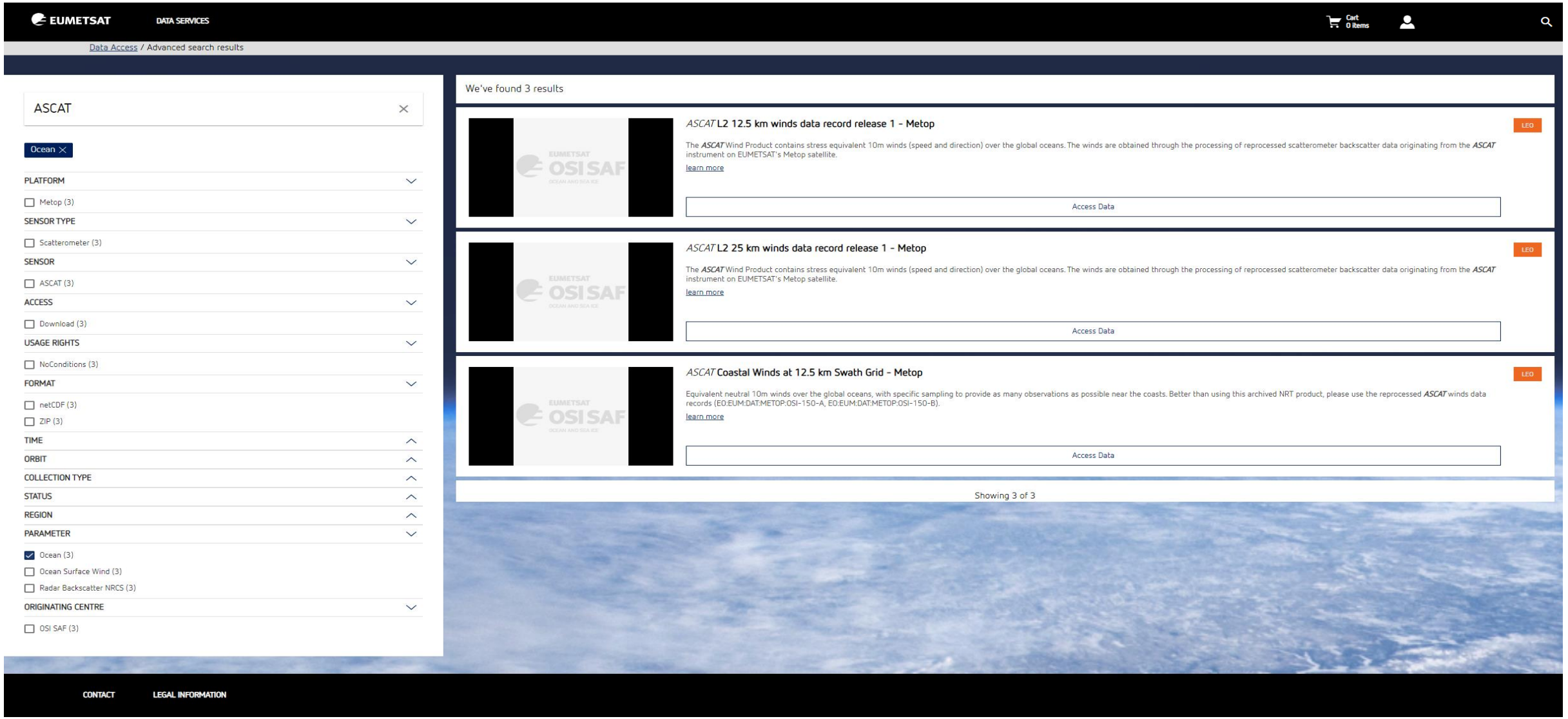
Copernicus Europe's eyes on Earth

MSG L1.5 SEVIRI full catalogue	Estimated mid-2021
EPS L1B, L1C, L2	Estimated end-2021
Sentinel-3A / 3B products	
Further Satellite Application Facility products	
Full EUMETSAT product catalogue	


EUMETSAT DATA SERVICES
Cart
1 item
elena_eum
Data Access / Search results
Data Store
Users are able to search the Data Store catalogue using one of three options: scrolling of the listed products, using a search box and perform an advanced search.
e.g. "Atlantic Sea"
Perform an advanced search
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, ...
learn more
Access Data

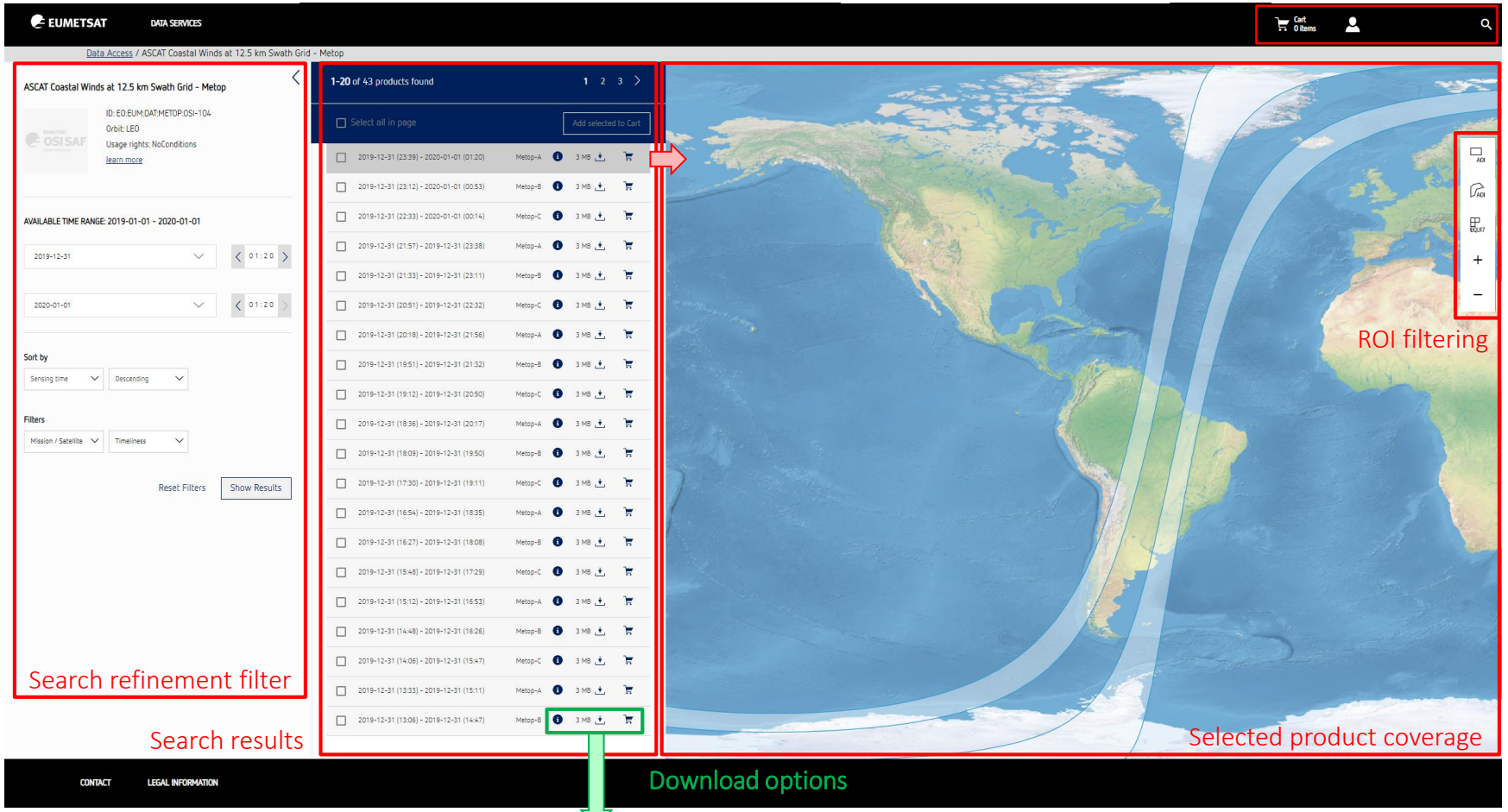
The EUMETSAT Data Store: Web UI use and access I

EUMETView | EUMETSAT Data store | Data Tailor | EUMETCast Terrestrial | European Weather Cloud



The EUMETSAT Data Store: Web UI use and access II

EUMETView | EUMETSAT Data store | Data Tailor | EUMETCast Terrestrial | European Weather Cloud



Account and Cart options

ROI filtering

Search refinement filter

Search results

Selected product coverage

Download options

Direct download | Command line | Cart

>> Interface with APIs

Data Tailor integration
>> product customisation

EUMETSAT

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Data Store Interfaces

Online interface

1. Download API
2. OpenSearch API
3. REST API
4. 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. Notification service for new product availability

Python and Jupyter notebook examples snippets available for each API

Swagger™

Discovery

POST	/csw/record/_search
OPTIONS	/csw/record/_search
GET	/csw/record/_search
GET	/csw/_search
POST	/csw/_search
GET	/csw/record/*

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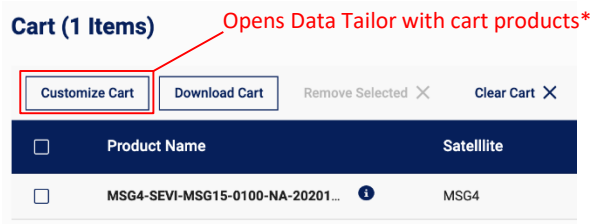
*this works ONLY if the cart contains one TYPE of product

1. Add product to Cart

2. 'Customise' Cart



via WebUI

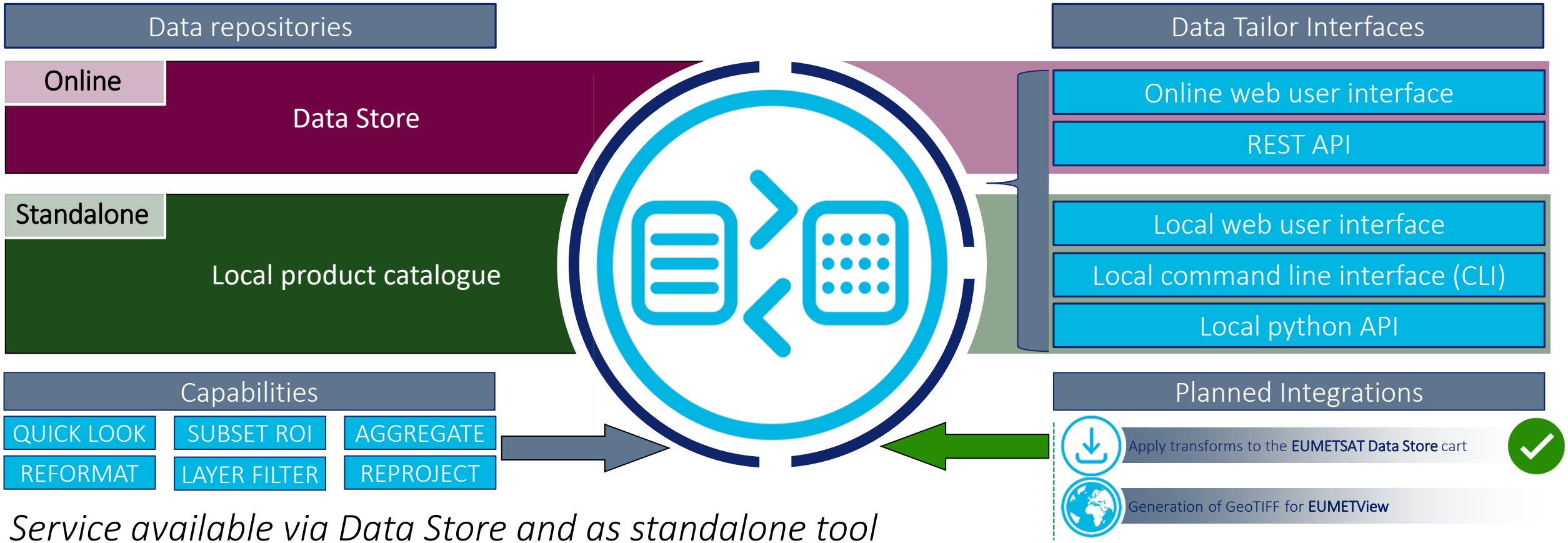
via API

1. Find products; with Data Store OpenSearch API >> remote product URL

2. Call Data Tailor REST API with remote product URL from OpenSearch

EUMETView | EUMETSAT Data store | **Data Tailor** | EUMETCast Terrestrial | European Weather Cloud

The **EUMETSAT Data Tailor** allows users to subset and aggregate 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.



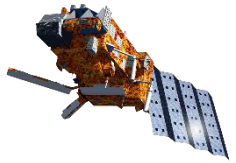
Service available via Data Store and as standalone tool

The EUMETSAT Data Tailor: current supported products

EUMETView | EUMETSAT Data store | **Data Tailor** | EUMETCast Terrestrial | European Weather Cloud

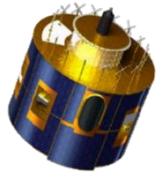
Currently supported collections

METOP



- AVHRR RADIOMETRY PRODUCTS
- IASI INTERFEROMETRY PRODUCTS
- ASCAT SCATTEROMETRY PRODUCTS
- GOME SPETROMETRY PRODUCTS
- AMSU SOUNDING PRODUCTS
- MHS SOUNDING PRODUCTS
- HIRS SOUNDING PRODUCTS

MFG/MSG



- MSG SEVIRI RADIOMETRY PRODUCTS
- MFG MVIRI RADIOMETRY PRODUCTS
- MSG CLOUD MASK PRODUCTS

Downstream products:

EUMETSAT OSI SAF – OCEAN AND SEA ICE

- SST PRODUCTS
- WIND PRODUCTS

EUMETSAT LSA SAF – LAND SURFACE ANALYSIS

- LST PRODUCTS
- EVAPOTRANS. PRODUCTS
- PAR PRODUCTS

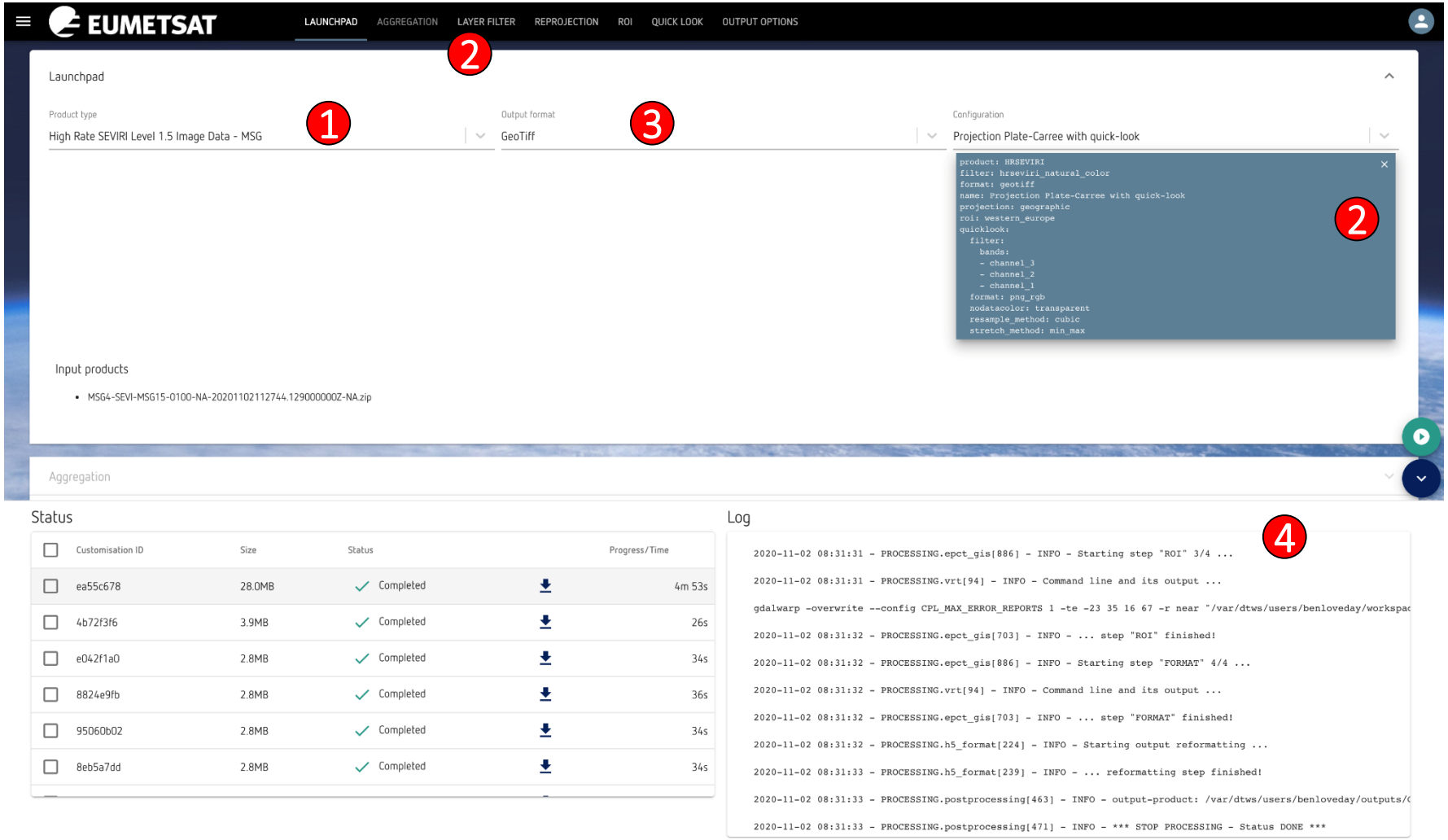
Product	Platform	Format(s)	Data Layer Filter	Aggregate	ROI Extract	Reformat	Re-project	Sub-sample	Generate Quicklook
AVHRR Global Data Service L1b	Metop A, B, C	Native	x	x	x	x	x	x	RGB
GOME L1b	Metop A, B, C	Native	x	x	x	x	x	x	G
IASI L1c	Metop A, B, C	Native	x	x	x	x	x	x	G
ASCAT L1b	Metop A, B, C	Native	x	x	x	x	x	x	G
AMSU-A L1b	Metop A, B, C	Native	x	x	x	x	x	x	G
MHS L1b	Metop A, B, C	Native	x	x	x	x	x	x	G
HIRS L1b	Metop A, B, C	Native	x	x	x	x	x	x	G
Polar Multi Sensor Aerosol Optical Properties	Metop A, B, C	Native	x	x	x	x	x	x	G
IASI L2 Sounding Products	Metop A, B, C	Native	x	x	x	x	x	x	G
ASCAT Soil Moisture 12.5km & 25km (Native)	Metop A, B, C	Native	x	x	x	x	x	x	G
MSG L1.5 SEVIRI	0 deg., IODC, RSS	Native, HRIT	x	x	x	x	x	x	x
MSG L2 Cloud Mask	0 deg., IODC, RSS	HRIT, GRIB2			x	x	x	x	x
MSG L2 Optimal Cloud Analysis	0 deg., IODC, RSS	GRIB2			x	x	x	x	x
MSG L2 Multi-Sensor Precipitation Estimate	0 deg., IODC, RSS	GRIB2			x	x	x	x	x
MSG L2 Active Fire Monitoring	0 deg., IODC, RSS	GRIB2			x	x	x	x	x
MSG L2 Cloud Analysis	0 deg., IODC, RSS	BUFR			x	x	x	x	x
MSG L2 Atmospheric Motion Vectors	0 deg., IODC, RSS	BUFR			x	x	x	x	x
Global L3C AVHRR SST	Metop B	netCDF, GRIB2	x	x	x	x	x	x	
ASCAT L2 Coastal Winds 12.5 km	Metop A, B	netCDF	x	x	x	x	x	x	
ASCAT L2 25 km winds record rel. 1	Metop A	netCDF, BUFR	x	x	x	x	x	x	
ASCAT L2 12.5 km winds record rel. 1	Metop A	netCDF, BUFR							
ERS L2 25 km winds record rel. 1	ERS-1, ERS-2	netCDF, BUFR	x	x	x	x	x	x	
SeaWinds L2 25 km winds record rel. 1	QuikSCAT	netCDF, BUFR							
10-day composites of MSG Land Surface Temperature	0 deg.	HDF5			x	x	x	x	x
Evapotranspiration	0 deg.	HDF5			x	x	x	x	x
Reference Evapotranspiration	0 deg.	HDF5			x	x	x	x	x
Daily Fraction of Absorbed PAR	0 deg.	HDF5			x	x	x	x	x

EUMETView | EUMETSAT Data store | **Data Tailor** | EUMETCast Terrestrial | European Weather Cloud

Using the WebUI

Available as standalone **and** online versions (interface with the Data Store)

1. > Supports a wide array of products (Data Store and local)
2. > Customisable processing chains; full save and recall.
3. > Customisable output formats
4. > Process queuing and logging information.



EUMETView | EUMETSAT Data store | **Data Tailor** | EUMETCast Terrestrial | European Weather Cloud

Using the CLI and API (local)

- The standalone Data Tailor can also be run using a **command line interface** (CLI) or a Python **application programming interface** (API);
  - Allowing for use without GUI
  - Supports more complex processing chains (e.g. with PyTroll)

```
epct run-chain \
    -f test-customisation.yaml \
    AVHR_xxx_1B_M01_20180120003103Z_20180120003403Z_N_O_20180120004248Z \
    --target-dir
```

```
from epct import api

INPUT_FILENAME = 'AVHR_xxx_1B_M01_20180120003103Z_20180120003403Z_N_O_20180120004248Z'
chain_config = {'product': 'AVHRRL1', 'format': 'netcdf4'}

output_files = api.run_chain(
    [INPUT_FILENAME],
    chain_config=chain_config,
    target_dir='results'
)
```

The Web REST API (remote)

- Provides a REST web interface than can be invoked from other applications

Python and Jupyter notebook examples snippets available for each API

GET /customisations

POST /customisations

GET /customisations/{customisationId}

PUT /customisations/{customisationId}

GET /customisations/{customisationId}/log

GET /products

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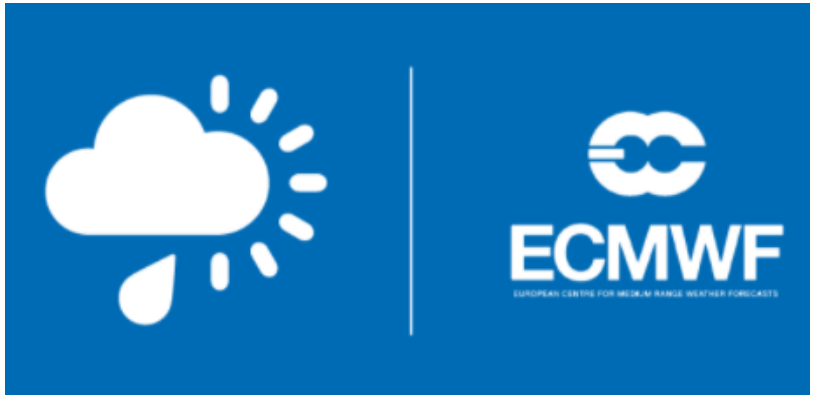
The **European Weather Cloud** provides a federated cloud platform that can be accessed for implementing, testing and demonstrating use cases. The service is jointly operated by **ECMWF** and **EUMETSAT** and focusses on the needs of the meteorological community; building on the expertise and data owned by the two organisations.



The technological progress offers new possibilities to enable harmonized online access to data across large data centers that have been joined together. Working on data in the cloud enables new types of capabilities including running software close to the data, rather than downloading vast amounts of data locally and needing a local infrastructure in support.


EUMETView


EUMETSAT Data store


Data Tailor


EUMETCast Terrestrial


European Weather Cloud

Support

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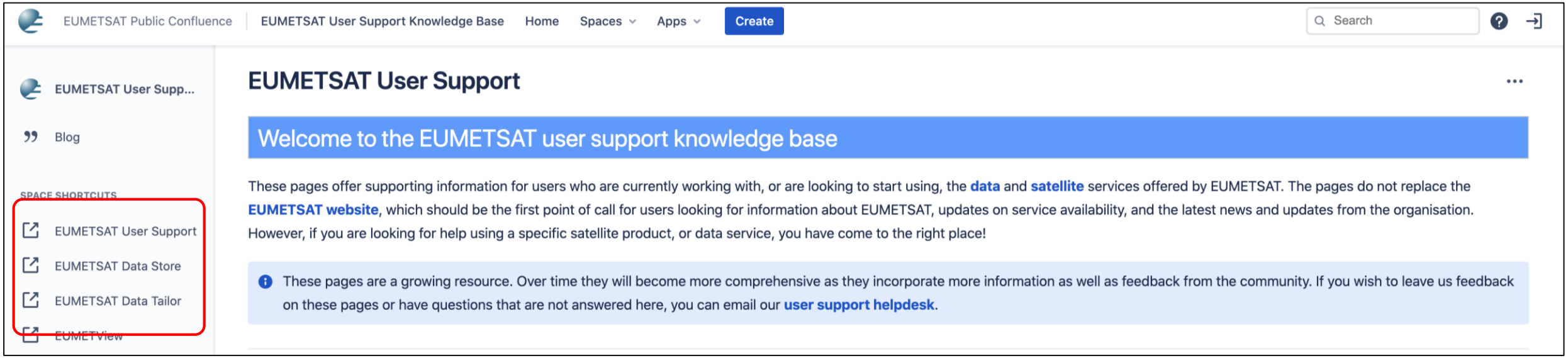
Knowledge base for each service:

https://eumetsatspace.atlassian.net/wiki/spaces/EUM/overview



Registration via the Earth Observation Portal Single Sign On:

https://eoportal.eumetsat.int/

Support available via the EUMETSAT help desk

ops@eumetsat.int


EUMETView


EUMETSAT Data store


Data Tailor


EUMETCast Terrestrial


European Weather Cloud

Summary

EUMETSAT is offering an array of new data services

- They will support an increased ability to receive, access, view and transform satellite data
- They will provide access to the full EUMETSAT product catalogue, including near real-time data, historic products and climate data records.
- The new Data Services are available for use now!

More information

Please follow @eumetsat and @eumetsat_users on Twitter for up to date news or contact our helpdesk via ops@eumetsat.int.