Data Tailor:
Integrate EUMETSAT's data into your datacube

Data Tailor

EUMETSAT Data store

EUMETView

EUMETCast Terrestrial

The Current State

- EUMETSAT's operational Earth observation data catalogue:
  - Spans over 35 years of meteorological satellite data, as well as climate and Copernicus marine products.
  - Adds new products 24/7/365; with consistency ensured by inter-calibration and reprocessing campaigns.
  - Offers 26% of Global Climate Observing System (GCOS) Essential Climate Variables (ECVs).
  - Is distributed to users through "push" (EUMETCAST) and "pull" (Long Term Archive/EUMETView) services.

The Challenge

- The data catalogue continues to grow:
  - Ingesting new satellite programmes and missions that increase complexity of the generated data products.
  - Making traditional workflows, where data holdings are present at user's premises, increasingly infeasible.

The Solution:

- EUMETSAT is reshaping its data services portfolio by:
  - Leveraging big data and on-premises cloud computing technologies.
  - Phasing in four new Data Services during 2020 to facilitate near real-time data access, data visualization, data transformation and customisation and cloud processing adjacent to the archive.

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This means:

- More data & observation types
- Wider user communities

And creates the need for:

- Greater interoperability
- Compatibility with generic workflows

The Data Tailor is one of several New Data Services preparing for launch at EUMETSAT

For more information see the overview presentation (discussion 2020-05-08 14:00-15:15 CEST)

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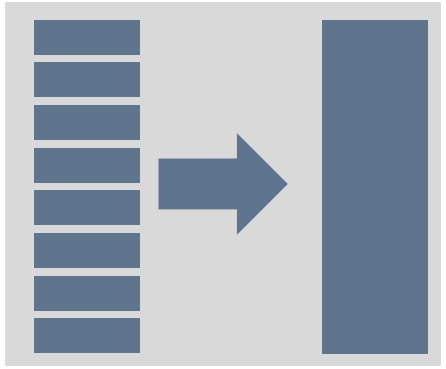
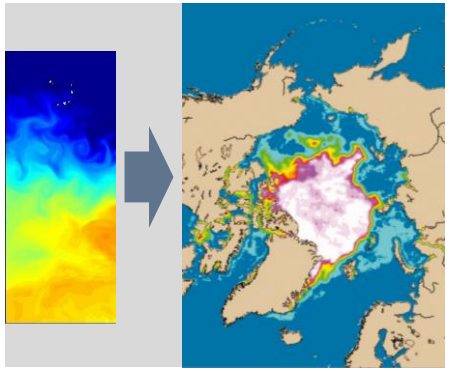
The **EUMETSAT Data Tailor** software makes it possible for users to subset and aggregate our data products in space and time, filter layers, generate quicklooks, project onto new coordinate reference systems, and reformat into common GIS formats (netCDF, GeoTIFF, etc.). It offers a uniform way to transform both historical and near real time satellite data provided by EUMETSAT.

For the first time, EUMETSAT data products can be easily integrated into generic geospatial toolkits

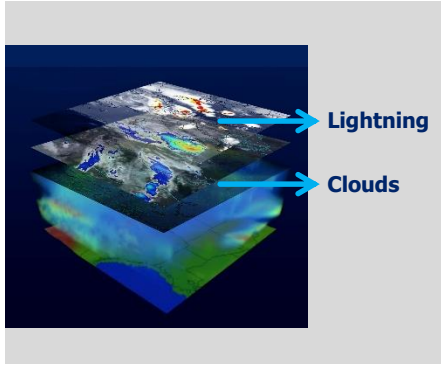
A function for every day of the week…



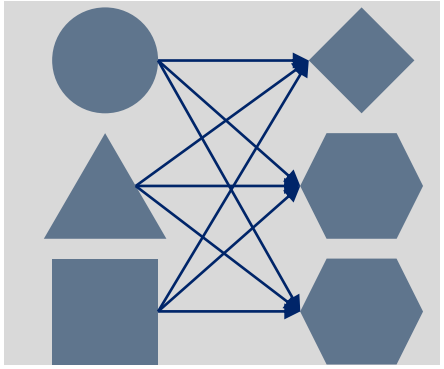
Aggregation



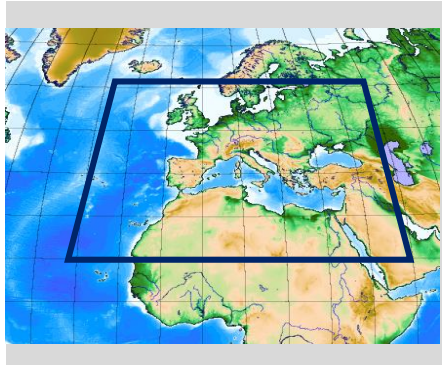
Reprojection & resampling



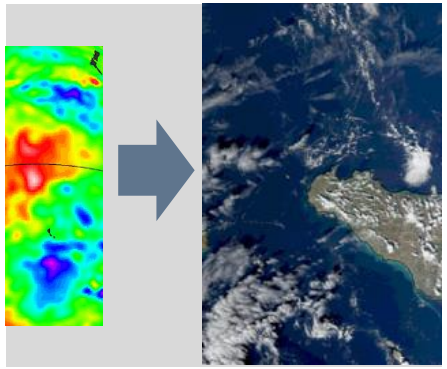
Layer filtering



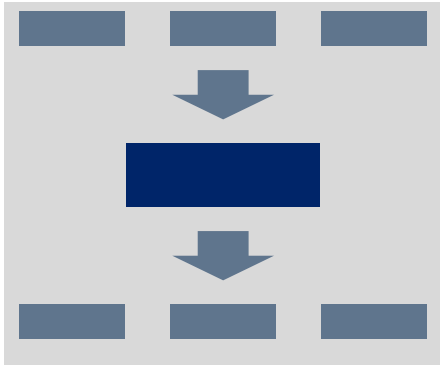
Re-formatting



Region of interest extraction



Quicklooks



Compression & decompression

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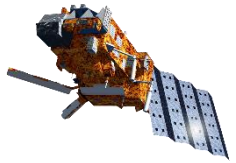
For data at rest or in motion

The EUMETSAT Data Tailor: Overview

Data Tailor | EUMETSAT Data store | EUMETView | EUMETCast Terrestrial

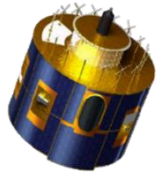
Data collections (*pilot service)

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

Transformation processes:

- SUBSET ROI
- AGGREGATE
- LAYER FILTERING
- REPROJECT
- REFORMAT
- QUICK LOOK

Interfaces

- Web UI interface
- CLI interface
- API interface
- Web service interface

Planned Integrations

- Apply transforms to the **EUMETSAT Data Store** cart
- Generation of GeoTIFFs for **EUMETView**

* V1.0 pilot service now available

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The EUMETSAT Data Tailor: Pilot catalogue

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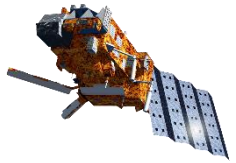
Data collections (*pilot service)

METOP



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MFG/MSG

MSG SEVIRI RADIOMETRY PRODUCTS
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Downstream products:

EUMETSAT OSI SAF OCEAN AND SEA ICE

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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

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Using the WebUI

Access to the Data Tailor, and further information on its installation and use, including "how to" videos can be found through this link.

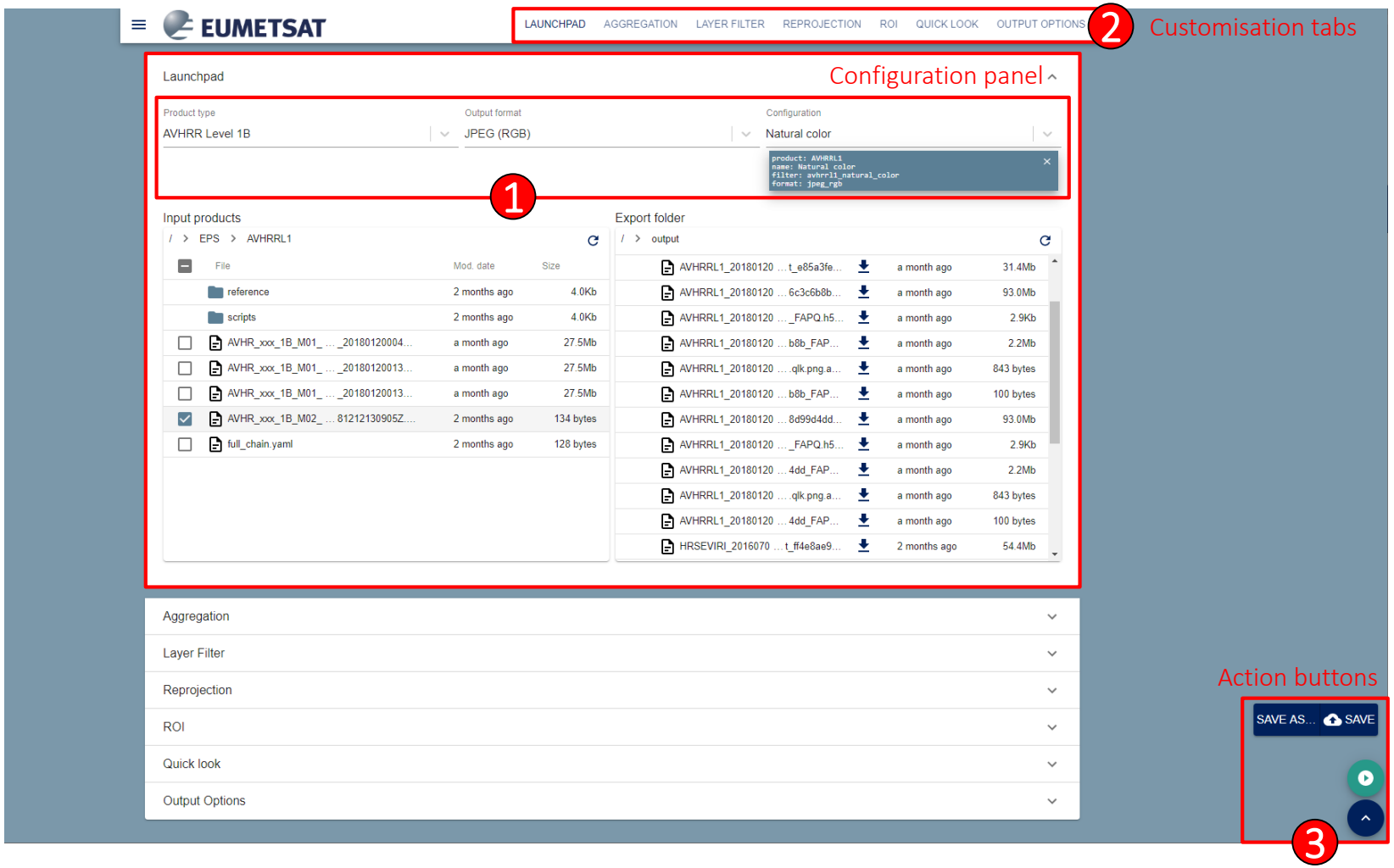
1 Drop down menus allow users to select input product type, output format type, or to load an existing configuration.

Supported output formats

BUFR	Binary Universal Form for the Representation of Meteorological Data
GeoTIFF	Geospatial Tagged Image File Format
HDF4/HDF5	Hierarchical Data Format – version 4/5
JPEG	Joint Photographic Experts Group
netCDF-4	Network Common Data Form
PNG	Portable Network Graphics
xarray Dataset	In-memory xarray library object of a netCDF file
Source format	The format of valid input data

2 Customisation tabs allow users to access and configure their method

3 Action buttons allow users to save configurations for later use, run the process and open the monitoring panel.



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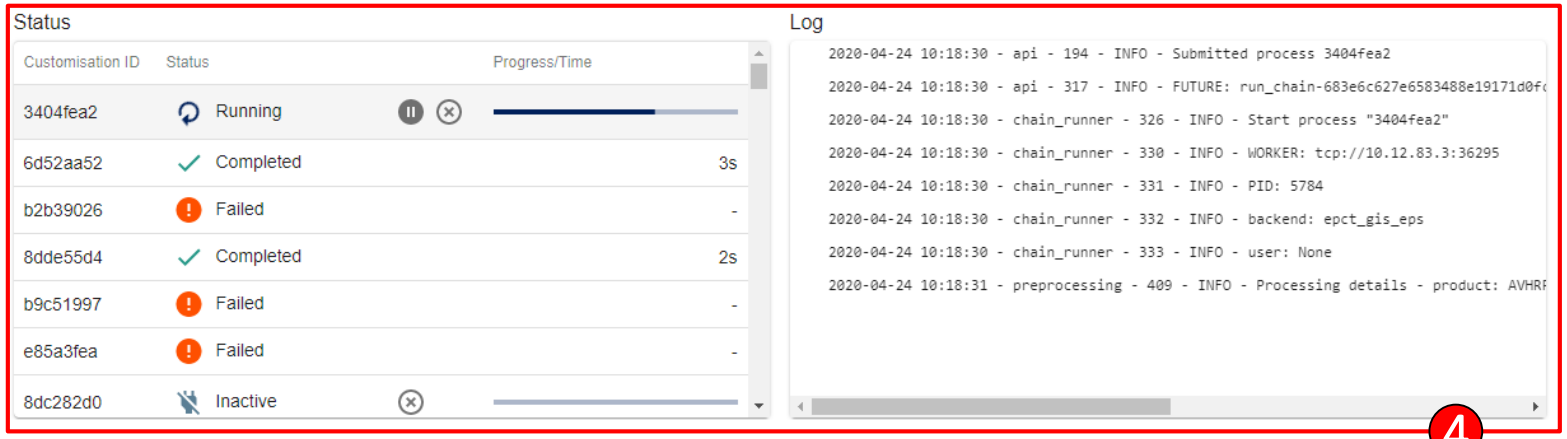
Using the WebUI (cont.)

4 Monitoring panel shows job queue and the current progress and the log for each run



The Data Tailor (v2.4) can be installed on:

- Linux Ubuntu 18.04 LTS 64 bit
- CentOS Linux 6 and 7 64 bit
- RedHat Enterprise Linux 7 64 bit
- Windows 10 (beta stage, feedback welcome)

Using the CLI and API

- The Data Tailor can also be run using a **command line interface** (CLI).
  - This functionality is installed by default and allows the Data Tailor to be exploited for batch processing.
  - More information on using the CLI can be found in the Data User Guide.
- In addition, the Data Tailor features a Python **application programming interface** (API), which
  - allows for external use to Data Tailor capability to be exploited externally
  - supports the use inclusion of the Data Tailor in more complex processing chains (e.g. with PyTroll)

python™ ANACONDA PyTROLL

The Web service

- the **Web Service Interface** provides a REST web interface than can be invoked from other applications

EUMETSAT Data Store

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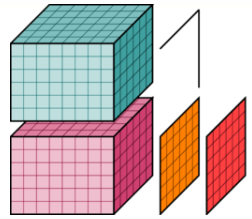
Data Tailor: Works with your tools & workflow

- Customisations can be saved and used across all interfaces
- Configuration can be piped or saved as YAML and moved between deployments
- Plug-in architecture allows for adding and removing functionality dynamically from existing deployments
- Apache v2 license makes it possible to deploy the software in any context.



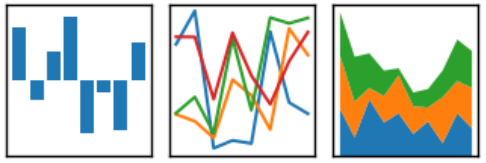
xarray

NumPy

matplotlib

pandas

$$y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$$



PyTROLL

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Download the Data Tailor standalone software on GitLab

Have questions?

Contact ops@eumetsat.int

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