DestinE Platform

DESTINE TRAINING SESSION

DARMSTADT, 16 OCTOBER 2024

Destination Earth
Funded by the European Union
Implemented by ECMWF esa EUMETSAT

Join at

slido.com

#TrainingSession

https://app.sli.do/event/emgz48pQrhy7qyx5YWz2ho

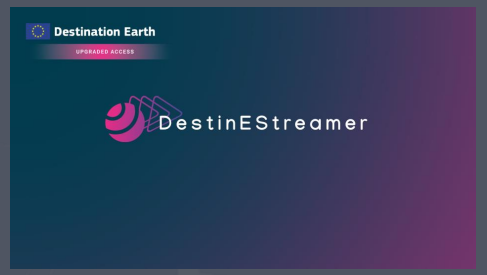
REGISTER ON DESTINE PLATFORM

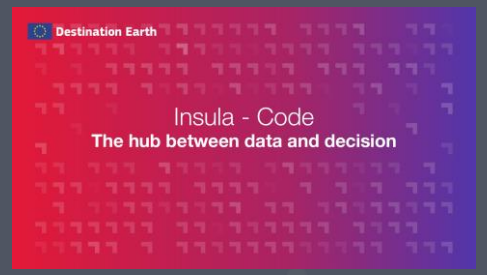
PLATFORM.DESTINE.EU

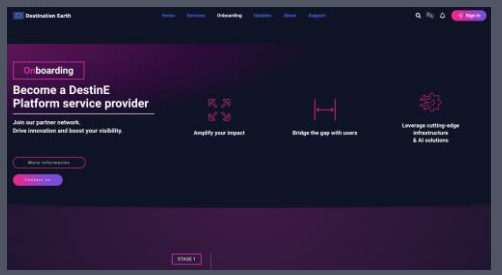
AGENDA

TRAINING SESSION

- Insula Code & Insula Processing – *Cesare ROSSI, CGI*
- SesamEO, DeltaTwin – *Christophe DEMANGE, GAEL Systems*
- DestinE Streamer – *Wolfgang KAPFERER, Geoville*
- DestinE Platform – Service onboarding – *Elisabetta GIULIANI, Serco*





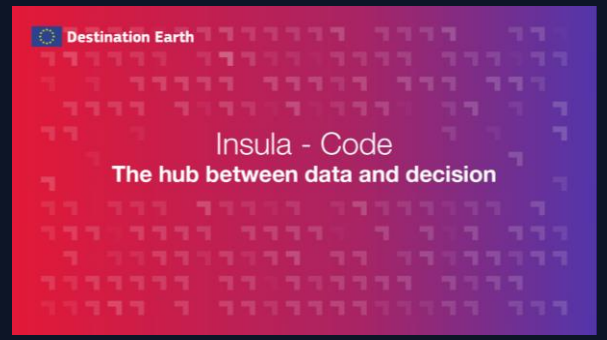


INSULA CODE & PROCESSING

C. ROSSI

Destination Earth

THE HUB BETWEEN DATA AND DECISIONS



CGI

DestinE Platform

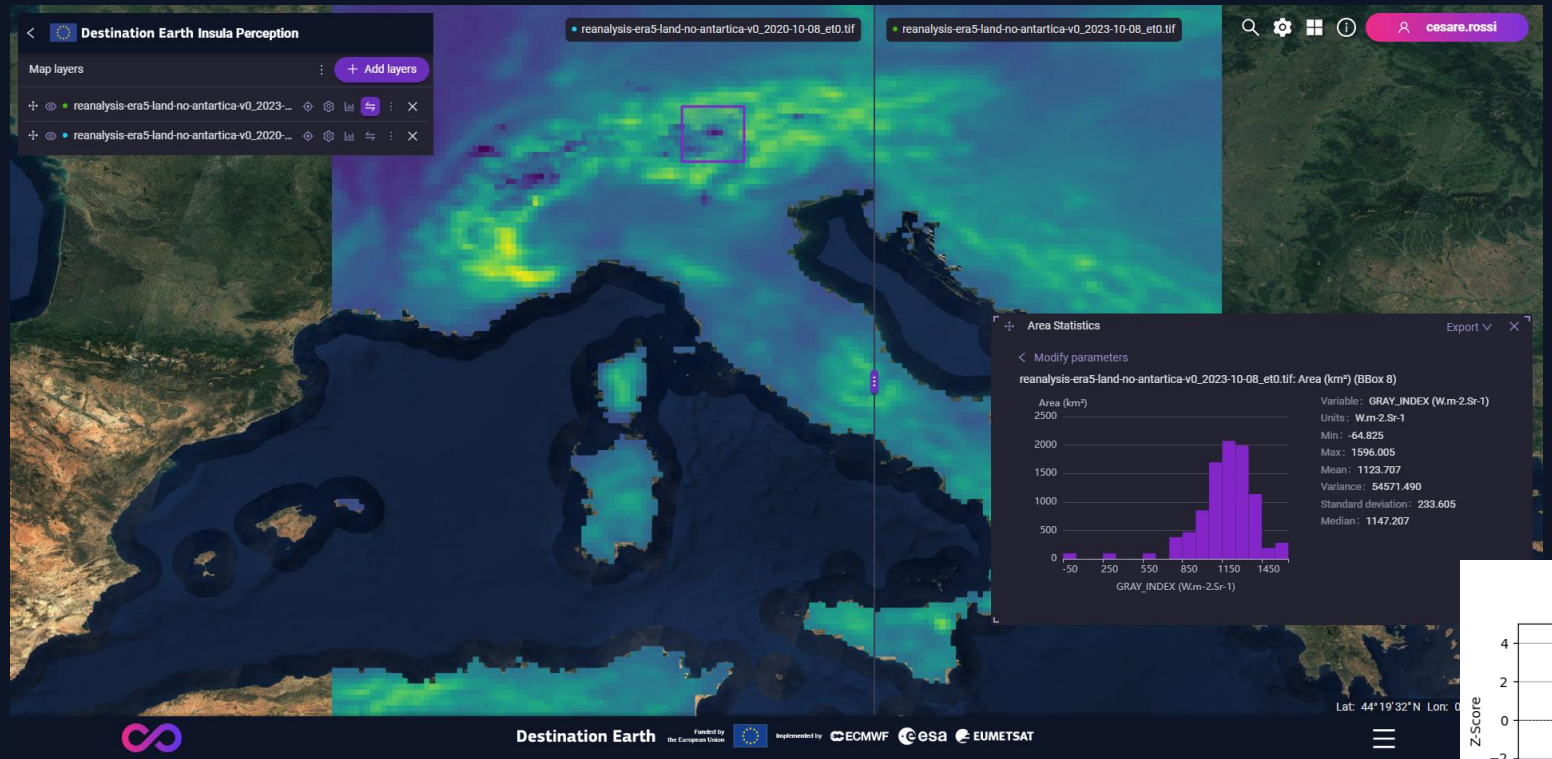
THE HUB BETWEEN DATA AND DECISIONS

Collaborate and share your findings with ease, fostering a data-driven approach to Earth Observation.

- Experiment & test your algorithms and datasets
- Run your own code in production, or services shared by the community and partners
- Gain deeper insights with advanced analytics
- Scale your processing capabilities to handle large-scale campaigns

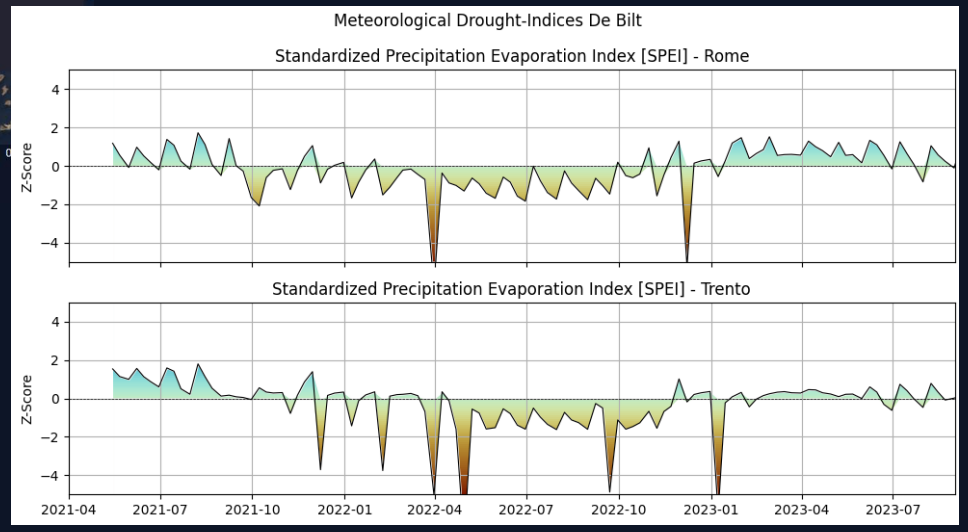
INSULA

Destination Earth



Tutorial

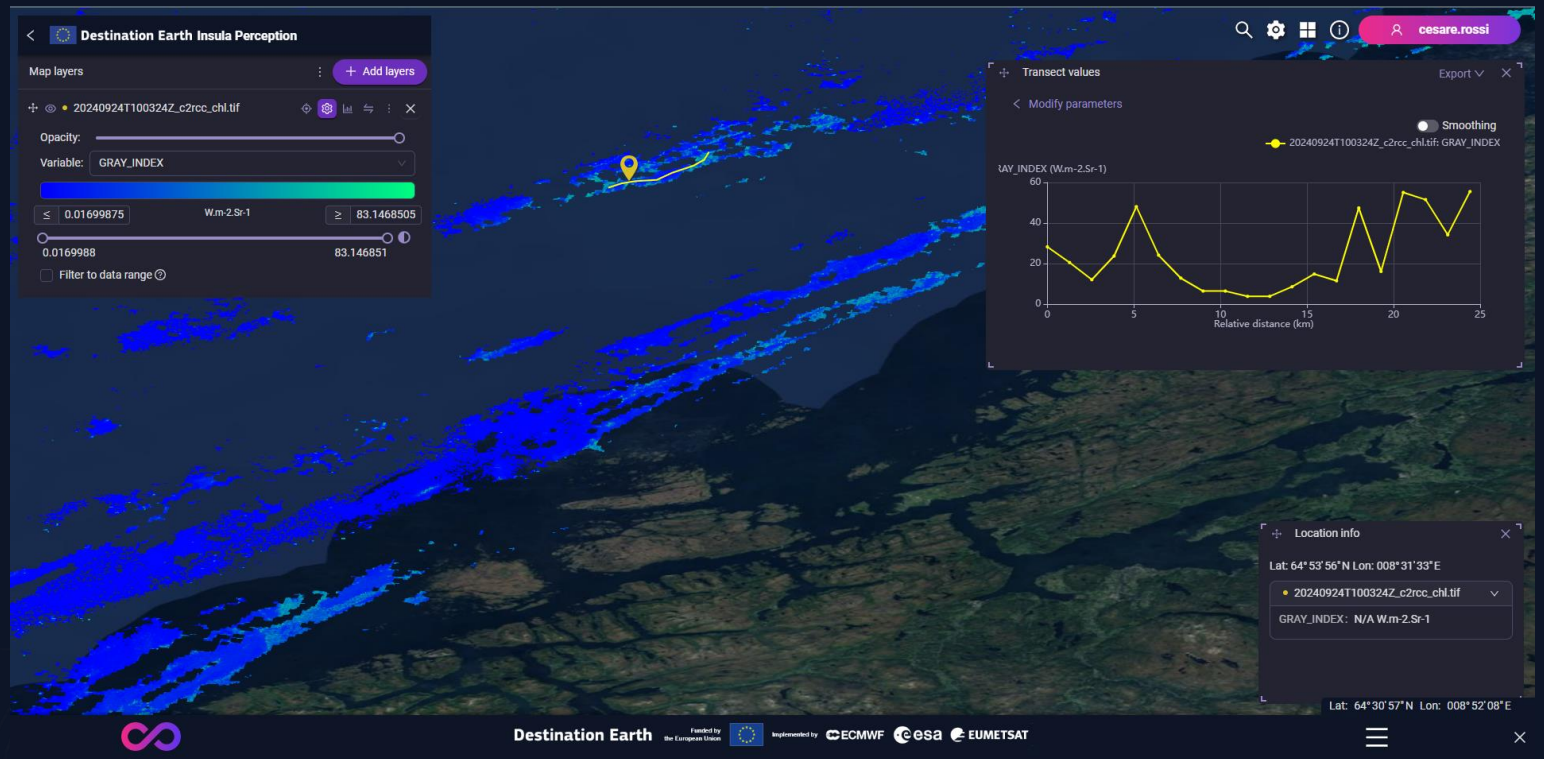
Compute the Penman-Monteith Evapotranspiration index with ERA5 and perform historical analysis



DestinE Platform

INSULA

Destination Earth



Year

Tutorial

Develop and run a service based on ESA SNAP 10 using the CR2CC and IdePix plugins with Sentinel-3 OLCI

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Join at

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#TrainingSession

https://app.sli.do/event/emgz48pQrhy7qyx5YWz2ho

SESAMEO

C. DEMANGE

Destination Earth

SesamEO

DATA ACCESS

Gael Systems | Data access | Earth Observation | CDSE | DestinEData Lake | GUI

SesamEO makes data from Copernicus and others (statistics, atmospheric or climate) accessible via themes and collections from the catalogues. Collections can be browsed and searched by keyword. Products can be viewed, filtered and downloaded according to the provider's capabilities.

GAEL SYSTEMS

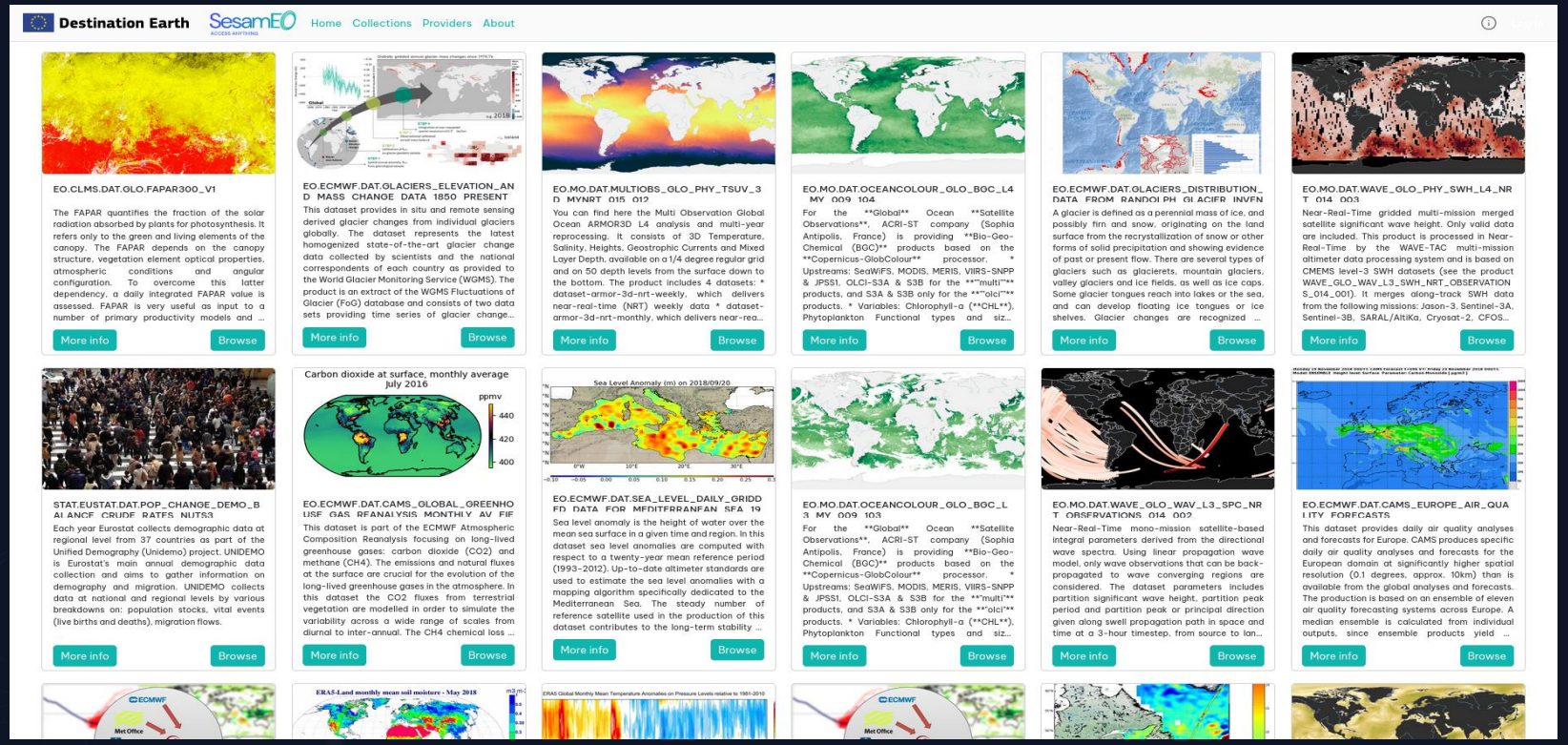
DestinE Platform

SesamEO® offers easy access to a wide range of datasets from different sources.

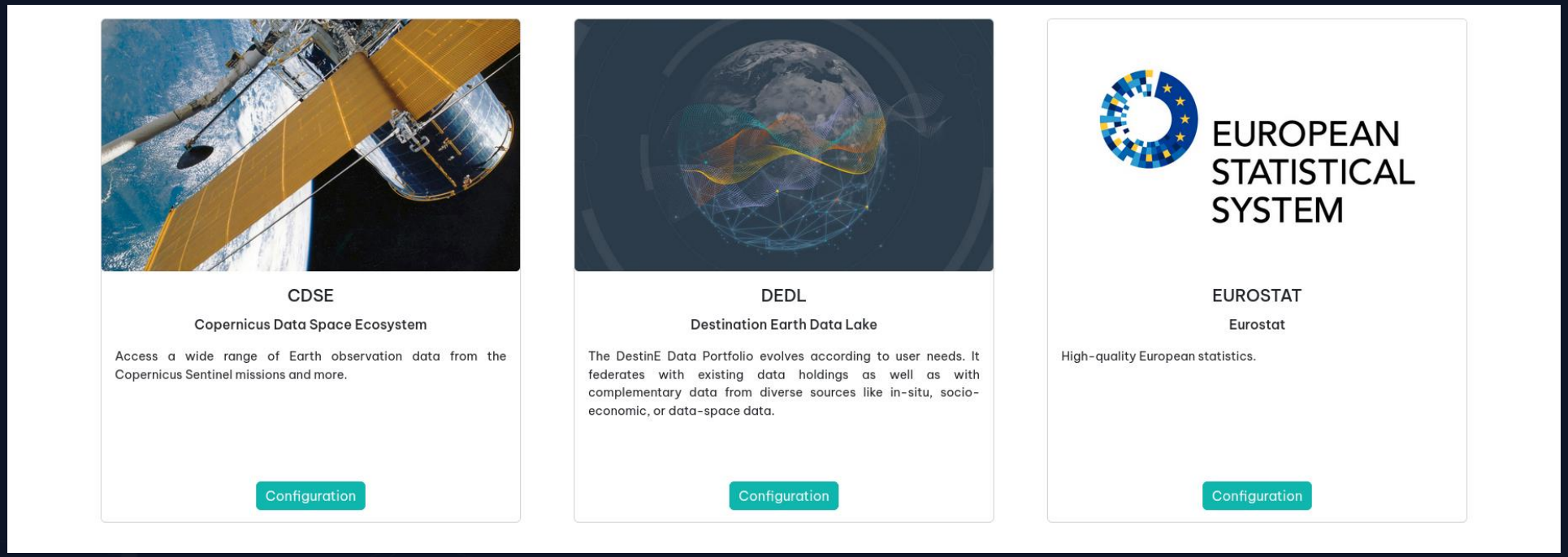
It acts as a bridge to the various Providers' interfaces.

Data products are organised by Collections.

Data types can be images, JSON, XML, CSV, and metadata.



Three providers are currently supported



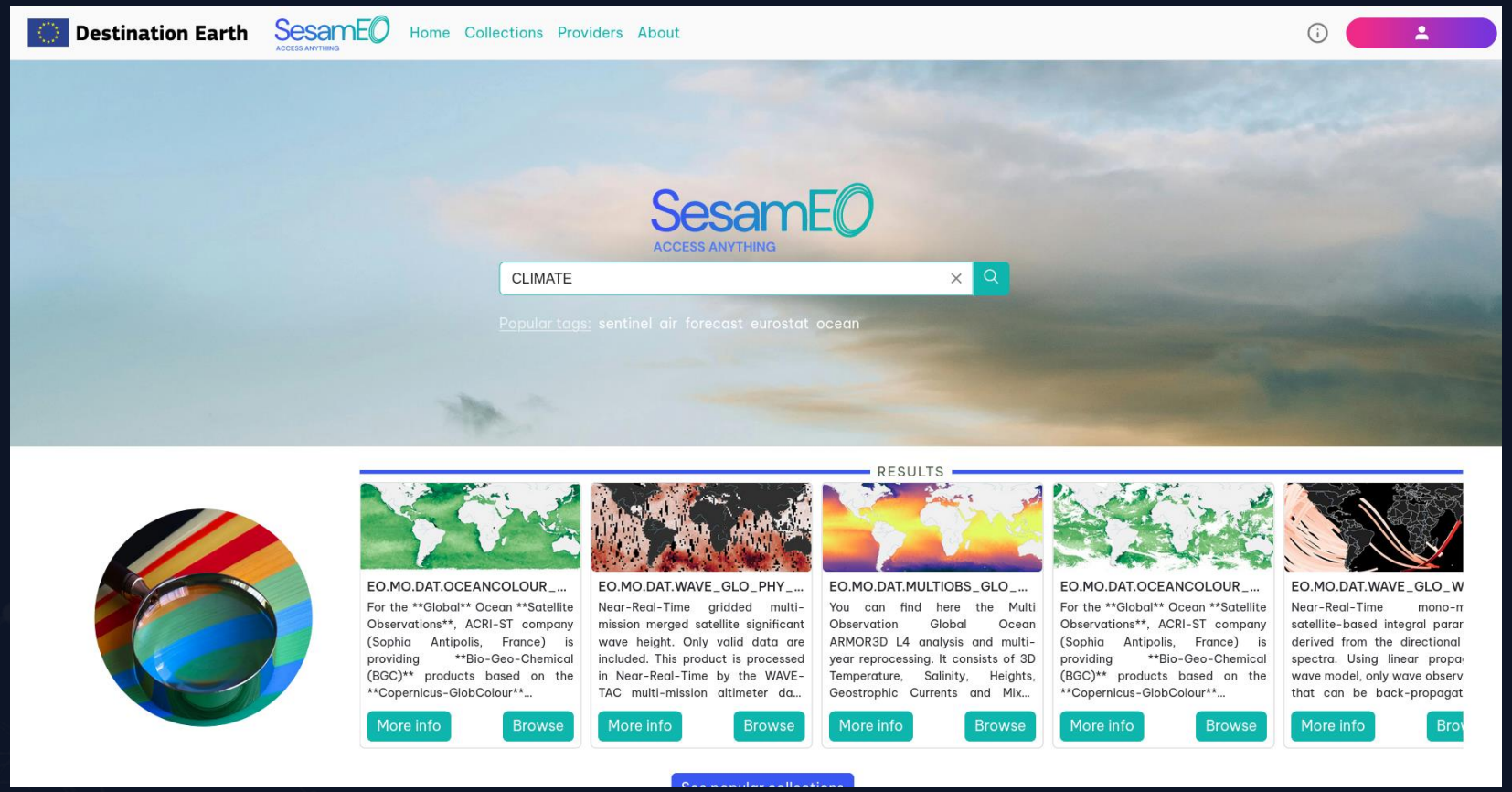
Adding new providers with OData, STAC or SDMX interface can be easy

A search box enables finding collections by keywords

Collections are defined by the data providers,

or via the SesamEO configuration.

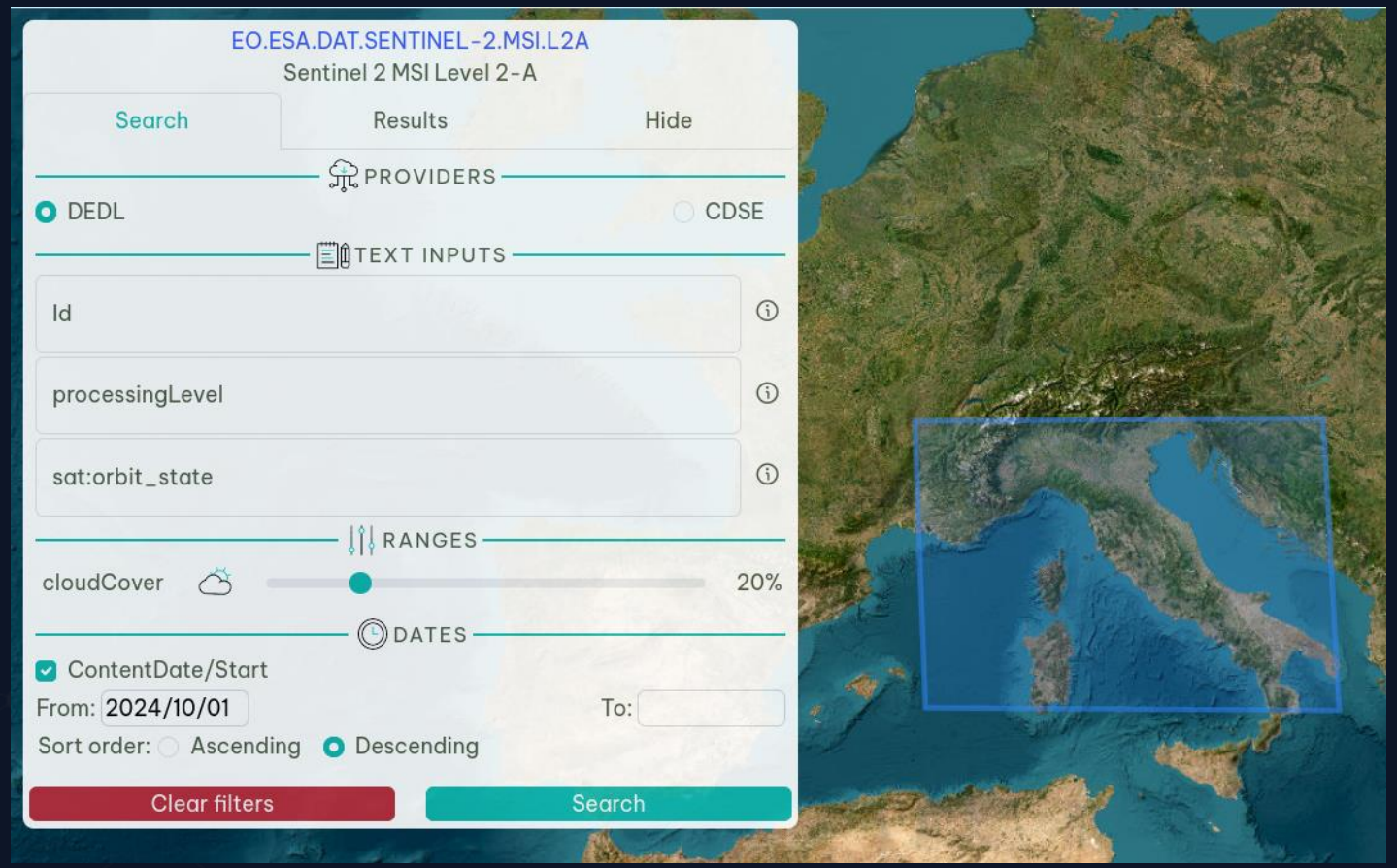
Custom collections can be created by filtering for specific data types or fields.



The filtering capabilities of the Collection/Provider are automatically discovered

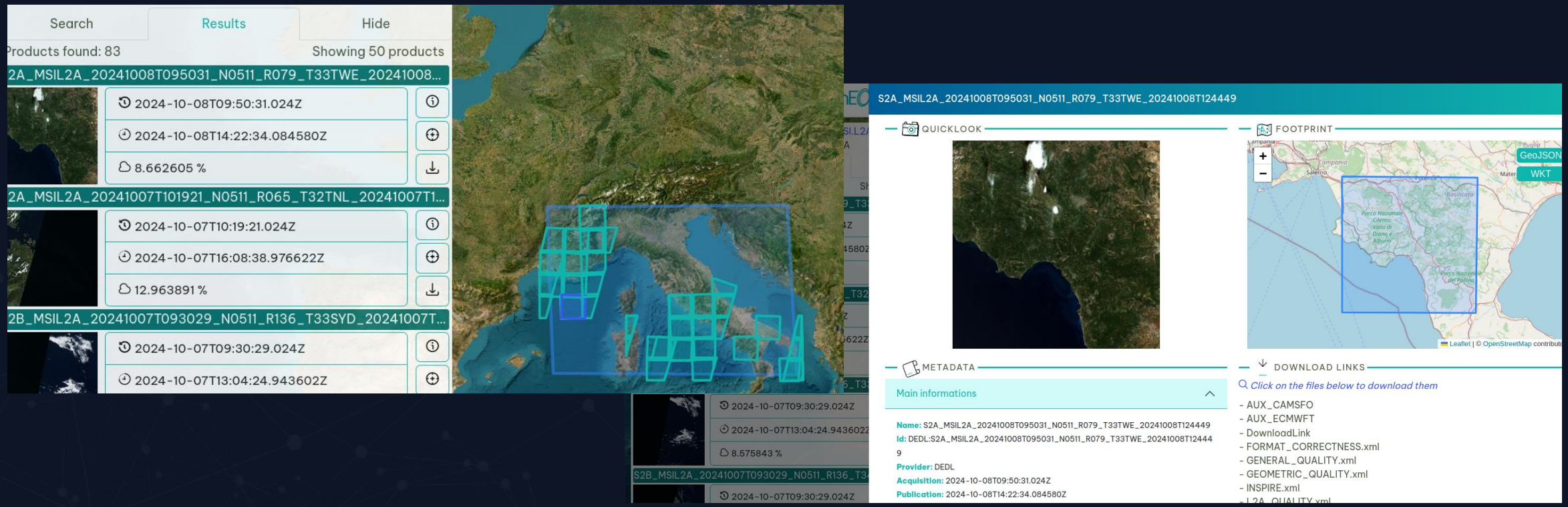
Select preferred provider.

Harmonisation effort on similar filters from different providers with different names to simplify the user experience.



PRODUCT LIST AND INFORMATION PANEL

Paginated result list with thumbnails and footprints
Information panel with product's metadata, attributes, download links and licensing information related to the collection.



DELTATWIN

C. DEMANGE

Destination Earth

DeltaTwin

BETA TESTING, MODELLING

Earth observation data products | Cloud infrastructures | Gael Systems

The DeltaTwin® service offers a collaborative toolbox to build and share your digital twin components. The UI is organized into sections facilitating seamless data representation and organization based on specific analysis topics. The Command line provides the same features as the UI in a CLI mode in order to enable developers to seamlessly script Delta command.

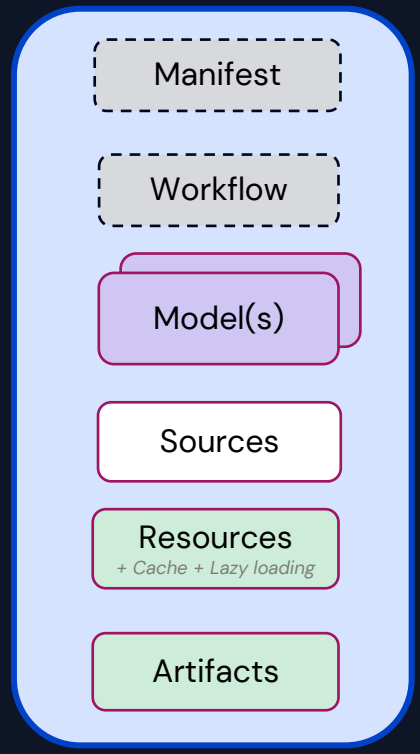
GAEL SYSTEMS

DELTATWIN COMPONENT

CONCEPT

The inner organization of the DeltaTwin® component includes:

- *Manifest* file is the core configuration item describing the DeltaTwin® component.
- *Workflow file* describes the orchestration step to complete the entire process.
- *Models* folder contains the runnable models configured for execution.
- *Sources* folder contains the source code of the models, when relevant.
- *Resources* describes static embedded resources resulting from execution or from other DeltaTwin® component dependency.
- *Artifacts* are DeltaTwin special outputs that can be published or reused by user. It is documented with a list of metadata indicating its characteristics and generation context.



DELTATWIN JOURNEY

CONCEPT

Destination Earth

1. Configure

Defines your models, ressources , dependencies and workflow

2. Deploy

Upload your component in DeltaTwin Drive in public or private mode

3. Run

Run and monitor your models

4. Share

Download generated outputs or publish them in your personal space.

DestinE Platform

CONTRIBUTE TO DIGITAL TWINS

CONCEPT

Destination Earth

New data available

Link your models with datasources and benefit from connectors.

Trigger job

Schedule your runs regularly or link them to data-driven events.

Publish & share

Publish your artifacts and share them with your colleagues.

New valuable data

Get your generated outputs

Monitor

View your runs and their live progress

Run

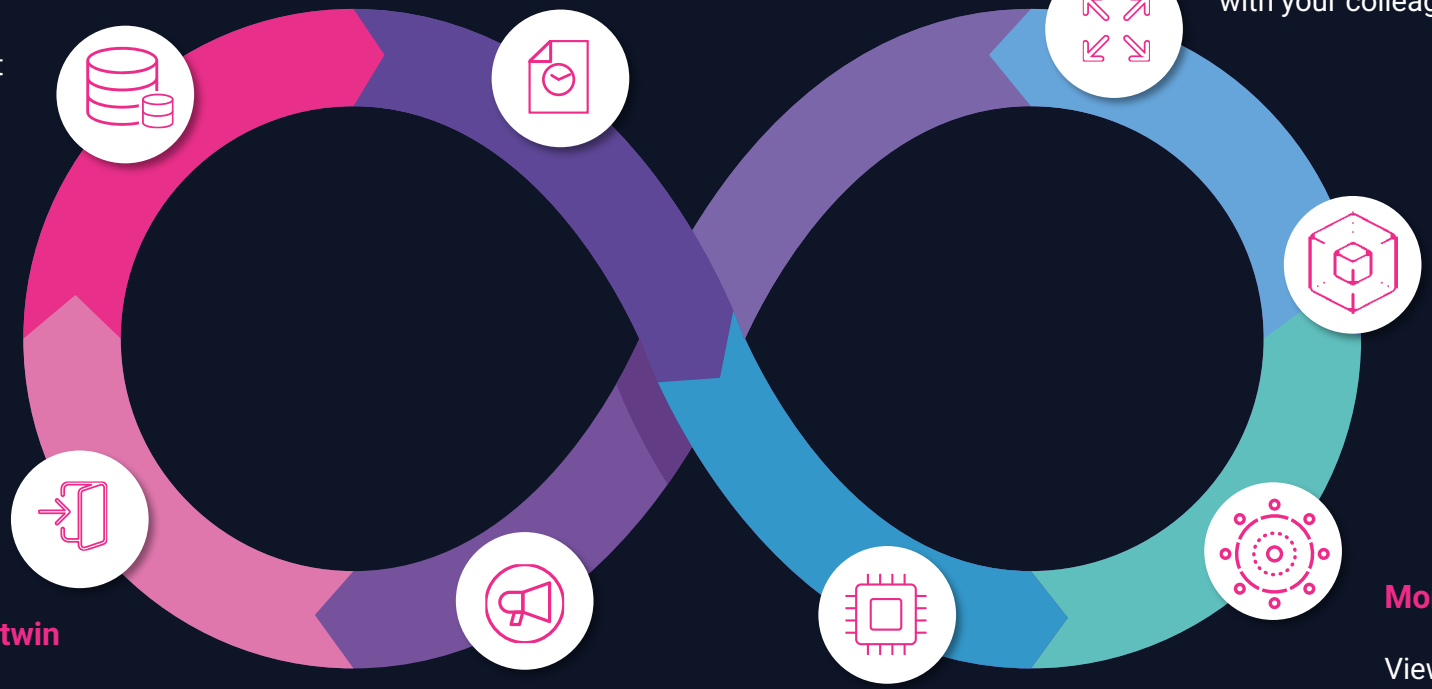
Orchestrate your workflow and benefit from scalability solutions

Notification

Inform your listeners and leverage from interoperability mechanisms like MIMs standard in urban digital twins ecosystems

Update your digital twin

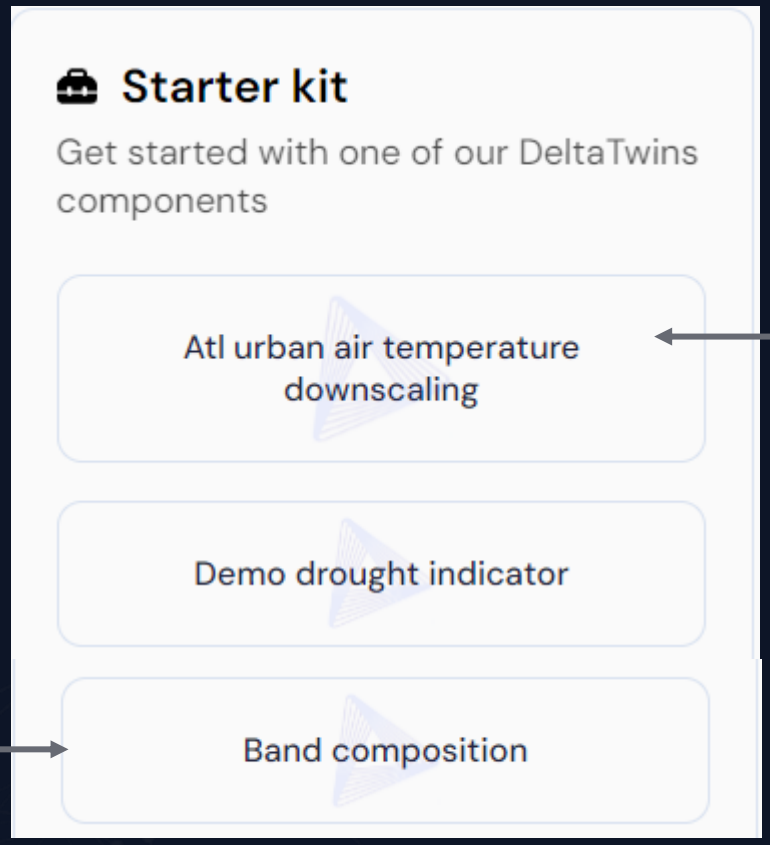
Integrate your data into digital twins



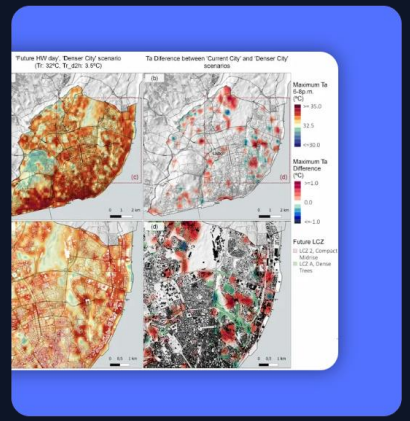
DestinE Platform

Starter kit

A gallery of public DeltaTwin components that can be re-used or run depending on their usage policy.



Advanced DeltaTwin component *more dedicated to non-developer users, like decision-makers, by providing quick insights into key indicators.*
Our urban air temperature downscaling model, developed by our partner Colab+Atlantic, is designed in this way.



Basic components to perform common operations*. These act as building blocks for more complex DeltaTwin components.*

DELTATWIN

ACCESS

Destination Earth

- DeltaTwin web application https://app.deltatwin.destine.eu/

- DeltaTwin Command Line Interface (CLI): `pip install deltatwin-cli`

The Command line interface is the developer dedicated tool, ideal for scripting and building your own DeltaTwin® component before publishing them in your online catalogues.

Its documentation is available on the Web Portal Documentation service:
https://platform.destine.eu/services/documents-and-api/doc/?service_name=deltatwin

DELTATWIN

TRY IT - RUN AND CREATE ARTIFACT

Destination Earth

- Our first partner **+Atlantic CoLAB**

Using weather forecast (AROME), the model aims to pinpoint the locations where people are relatively more exposed to excessive heat in Lisbon city

DeltaTwins / atl-urban-air-temperature-downscaling Public

CoLAB +ATLANTIC

Inputs

Input	Type	Default Value	Description
runHour	string		00 or 12, corresponding the hour of data loaded from IPMA's prediction model (AROME)

DestinE Platform

TRY IT - RUN AND CREATE ARTIFACT

- Our first partner **+Atlantic CoLAB**

Outputs

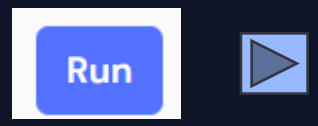
Output	Type	Default Value	Description
uhi_gif	Data		Animated GIF containing hourly map representation of uhi (Urban Heat Island) indicators
downscaled_temperature	Data		Hourly map representation of downscaled air temperature
uhi_indicator	Data		Hourly map representation of uhi (Urban Heat Island) indicators
downscaled_gif	Data		Animated GIF containing hourly map representation of downscaled air temperature

DELTATWIN

TRY IT - RUN AND CREATE ARTIFACT

Destination Earth

- Our first partner **+Atlantic CoLAB**



4 generated outputs — success

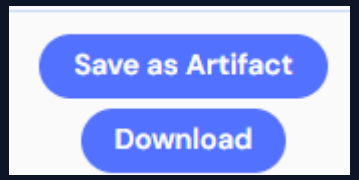
Name	Type	Value	Size	Checksum	Options
uhi_indicator	Data	uhi_indicator_2024-10-11.zip	6.90Mo	md5@d1c2e41a4b28fbe289255643d8a30e49	Save as Artifact / Download
downscaled_gif	Data	downscaled.gif	1.80Mo	md5@c973cd8a92bc97c7045d4f6ff41a245a	Save as Artifact / Download
downscaled_temperature	Data	downscaled_map_2024-10-11.zip	14.81Mo	md5@c203e582cde45f757b9c1ffb1443435a	Save as Artifact / Download
uhi_gif	Data	uhi.gif	879.28Ko	md5@5ad4a373a7e2206dd13a8467a41b2fc3	Save as Artifact / Download

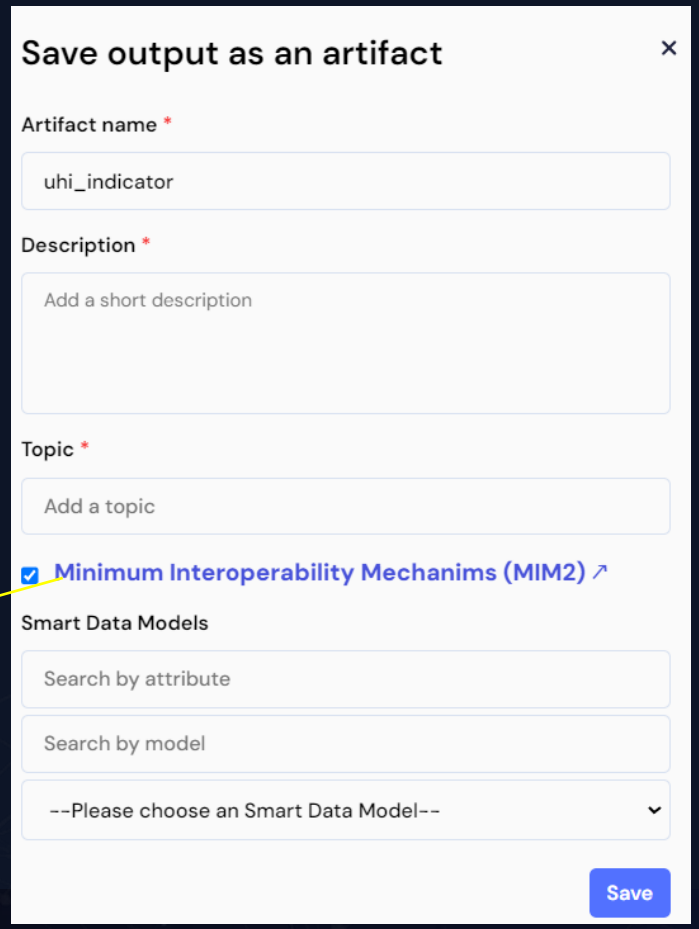
DELTATWIN

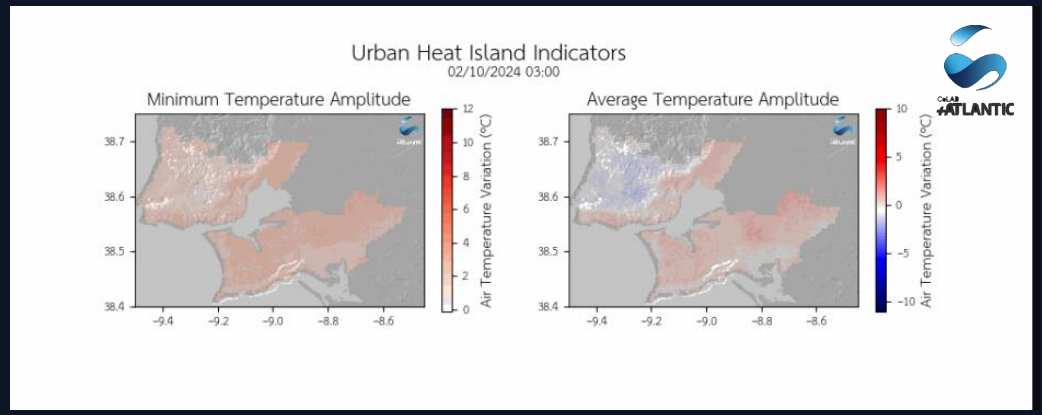
TRY IT - RUN AND CREATE ARTIFACT

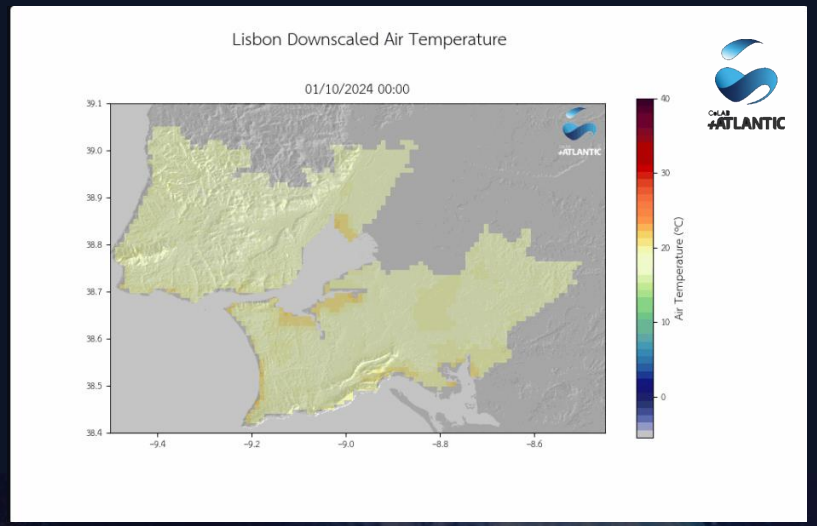
Destination Earth

- Our first partner **+Atlantic CoLAB**









Smart Data Models

Interoperability

Smart Data Models is a collaborative program to provide models for urban digital twins based on actual use cases and open standards

DestinE Platform

DELTATWIN

COMING SOON

Destination Earth

- Scheduler: *program recurrent jobs*
- New model from Colab+Atlantic: *Climate Model based on DEDL data sources*
- Sharing: *share your artifacts or DeltaTwin components with the user community*
- Search bar: *find easily your artefacts or DeltaTwins by search criteria*
- Infrastructure affinities: *define your computing resources to run your models*
- Interoperability with other DESP Services: *Data Cache Management, DEA story telling*

Join at

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#TrainingSession

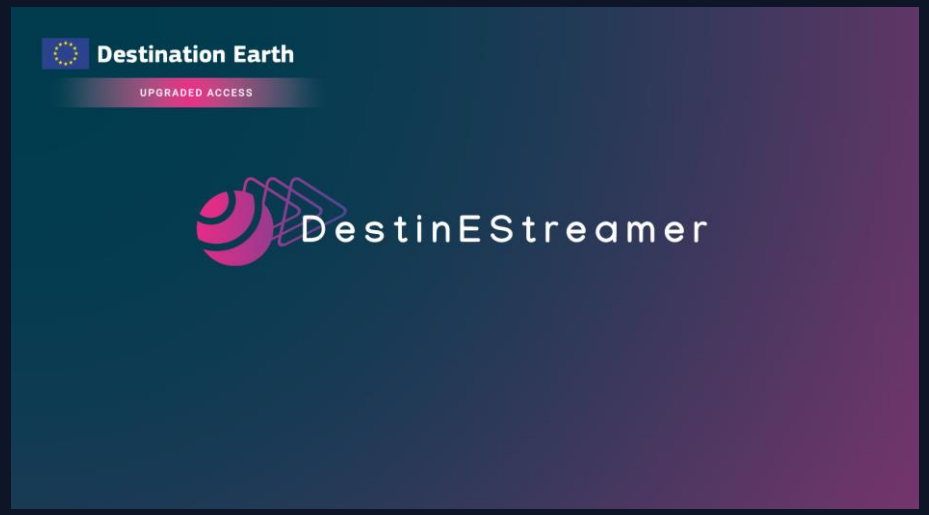
https://app.sli.do/event/emgz48pQrhy7qyx5YWz2ho

DESTINE STREAMER

W. KAPFERER

Destination Earth

EFFICIENT DATA ACCESS MADE SIMPLE



GeoVille

NOVEL HIGH PERFORMANT ACCESS TO CLIMATE AND EARTH OBSERVATION DATA

Enhanced Streaming technology from OTT Streaming (e.g., VOD Service Providers, Broadcasters) – extended and adapated for Earth Observation and Climate data.

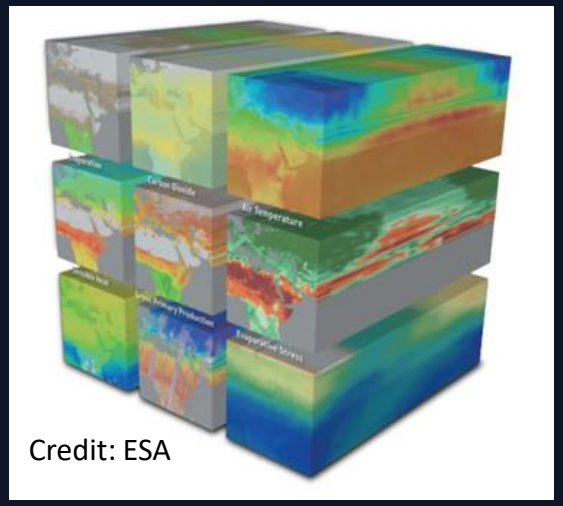
- Proven high compressions with best quality – reducing costs, enabling more insights
- Fast access to huge datasets, locally in the platform, for non-experts and experts
- Full timeseries and analysis-ready data-cubes in seconds for enhanced analysis

DESTINE STREAMER

A NEW APPROACH

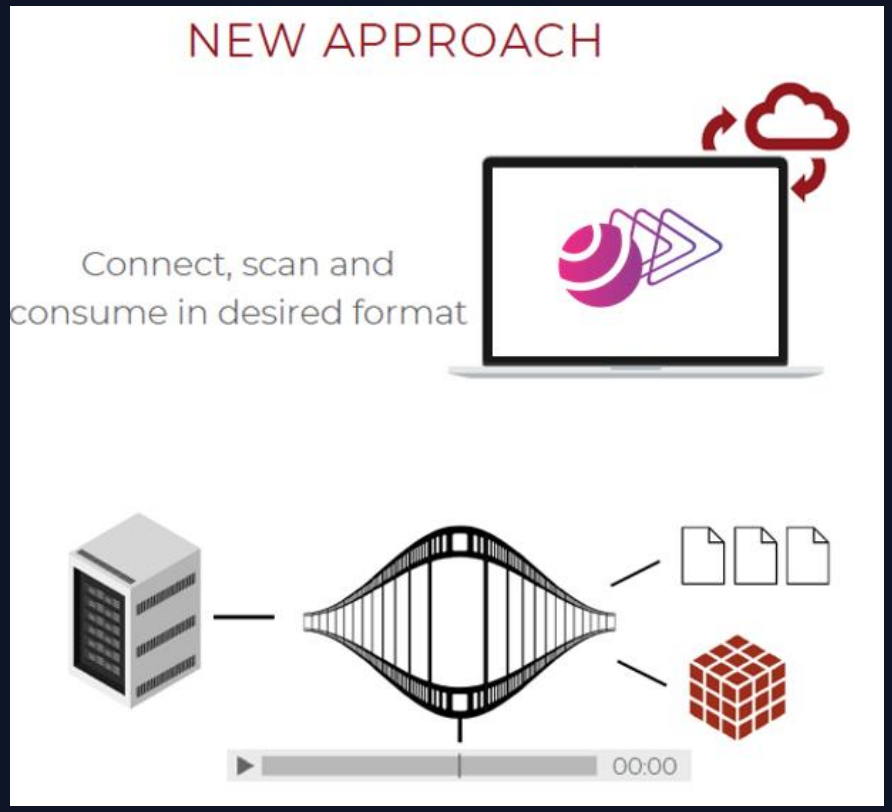
Destination Earth

Compression in 3D



Credit: ESA

Transformation into Bitstream representation



Enhancing data analysis capacities in the DestinE Platform

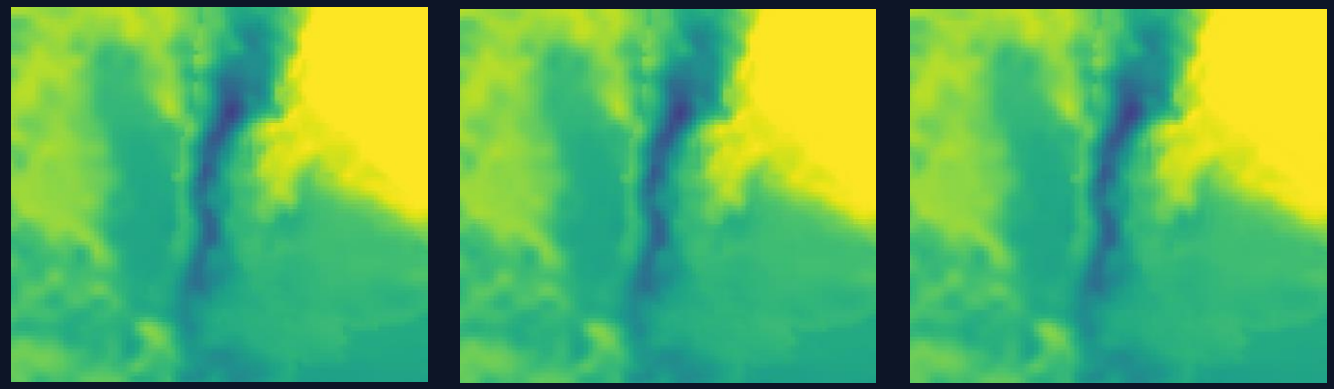
✓ ready for domain applications: earth observation, climate change, situational awareness, defense and security data

QUANTITY AND QUALITY DESTINESTREAMER

THE IMPACT

Destination Earth

Zoom in
ERA5 Dataset
long-wave radiation flux



Original

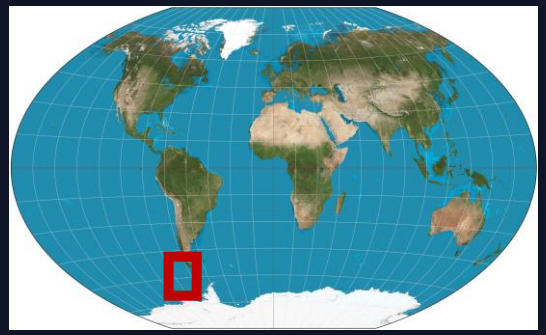
Average SSIM 0.9096
Ratio: 33.82

Average SSIM 0.88
Ratio: 44.64

Original compressed size

DestinEStreamer

Reduction in size of a factor of ~10 to ~30 leads to quality differences in values **< 0.1%**

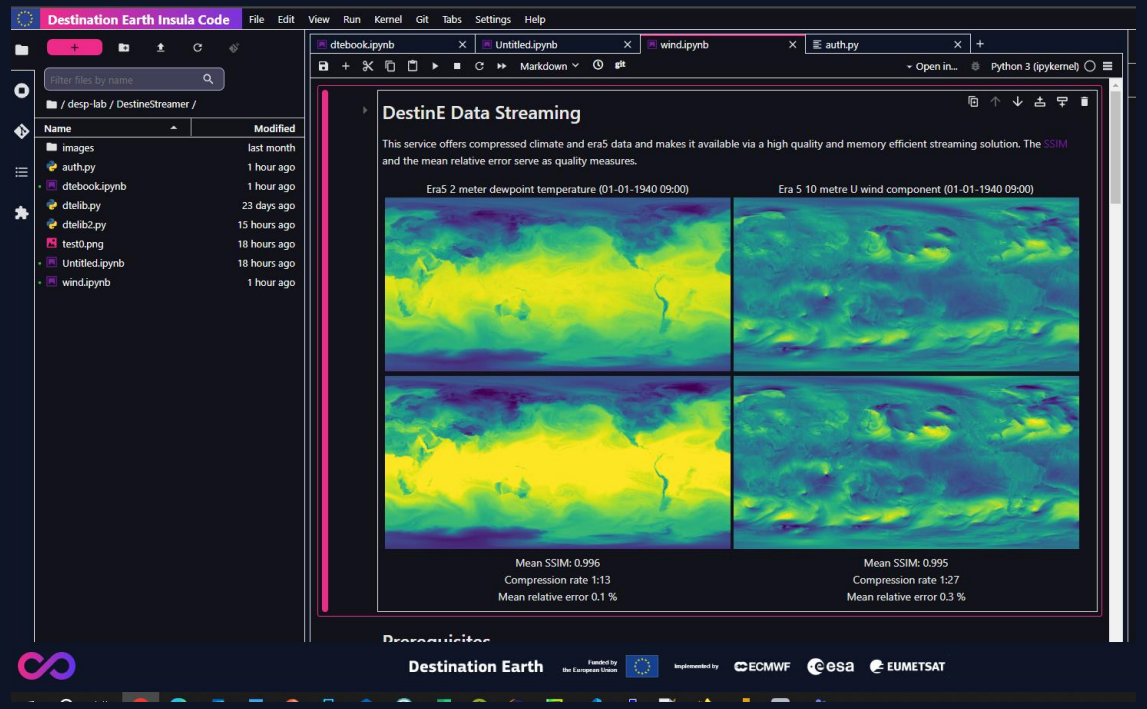


DestinE Platform

ACCESSING DESTINE STREAMER

FASTSCANNER FOR FIRST GLANCE AT THE DATA

Destination Earth

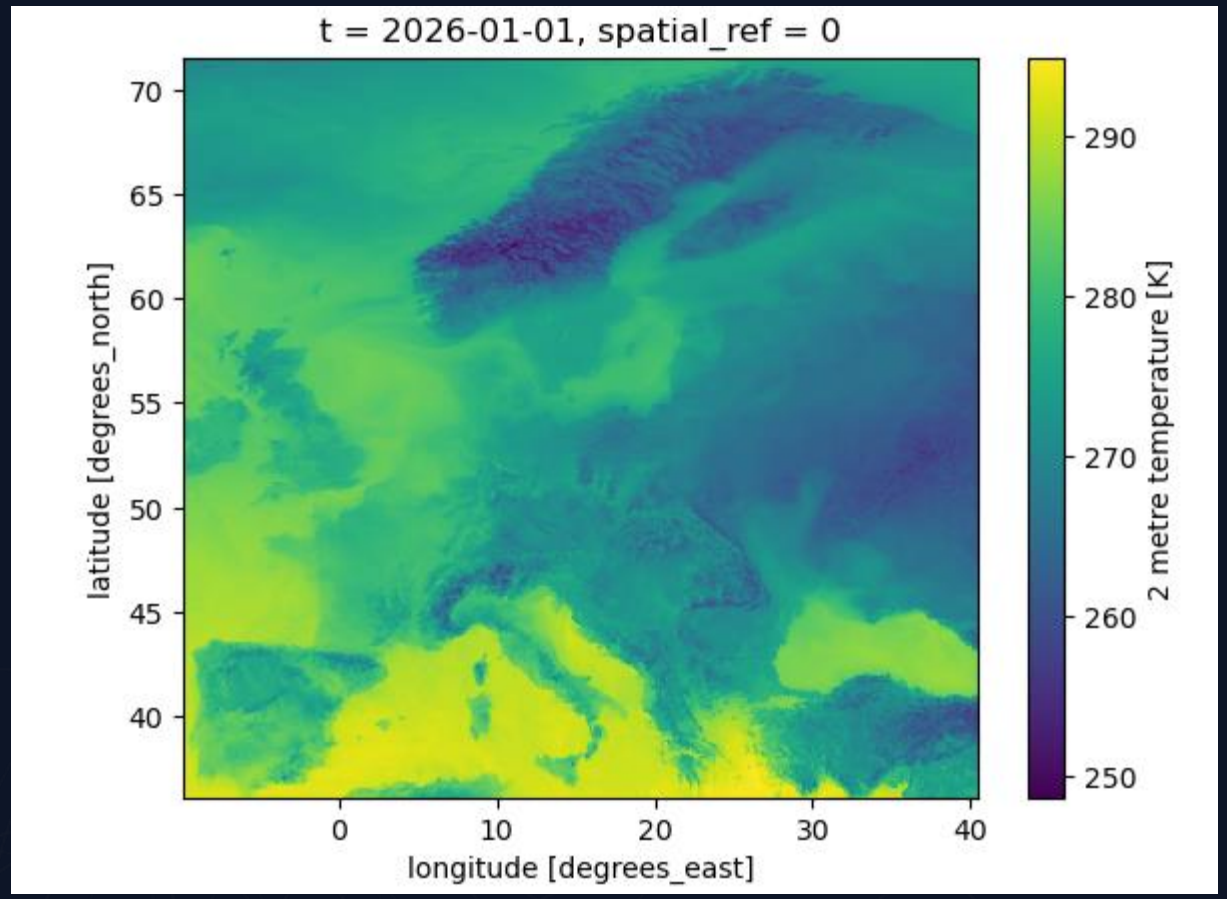


The DestinEStreamer Python module allows users to access DestinE data streams in the Destine Platform Platform in the JupyterLab Insula.

DESTINE STREAMER

READY FOR YOUR ANALYSIS

Destination Earth



Tutorial Example 1

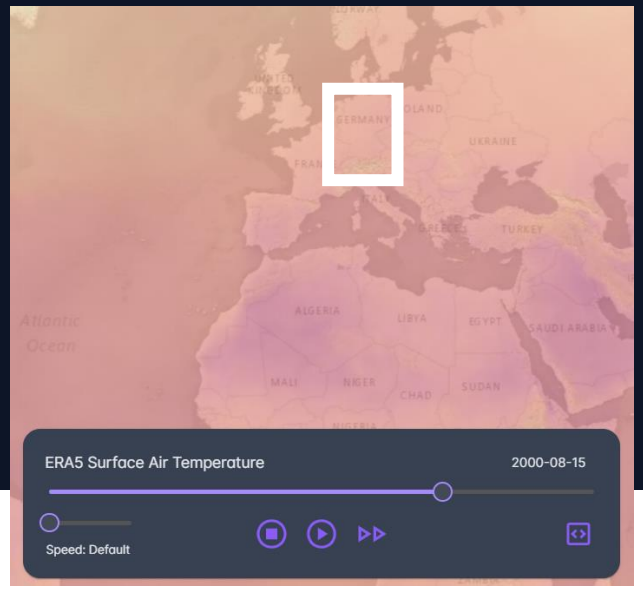
How to access a point in space and time from a datastream and to plot the result georeferrenced.

DestinE Platform

DESTINE STREAMER

READY FOR YOUR ANALYSIS

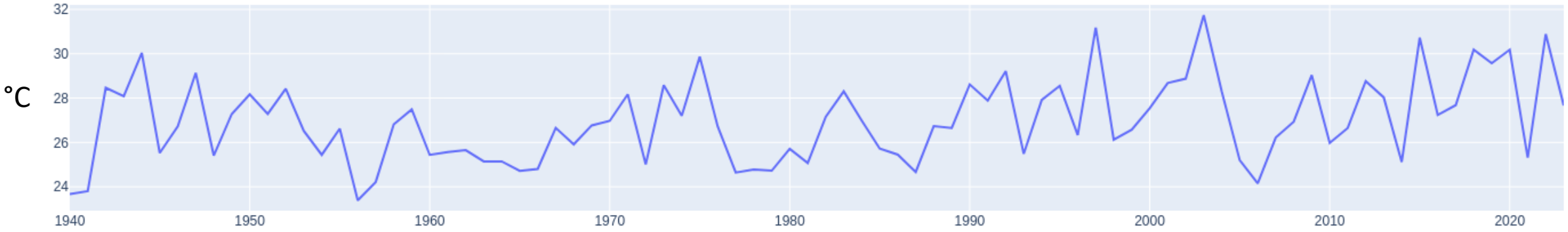
Destination Earth



Tutorial Example 2

How to plot a timeseries, like a average temperature over a region, over time.

Example average temperature from 1940 to 2023 over Germany in August (at 12 a.m.) Source ERA 5 [2t]



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ONBOARDING

E. GIULIANI

Destination Earth

Onboarding

Become a DestinE Platform service provider

Join our partner network.
Drive innovation and boost your visibility.

serco

DestinE Platform

ONBOARDING
PROCESS

Destination Earth

01 REQUEST

DIRECTLY ON THE PLATFORM, FILLING A DEDICATED FORM

- Provide all information and documentation about the service
- Acceptance T&Cs and Code of Conduct
- Compliance with security requirements

02 EVALUATION

GOVERNANCE BOARD SELECTS SERVICES BASED ON DEFINED CRITERION

- Alignment with DestinE objectives
- Innovation, market need
- Long-term sustainability

03 INTEGRATION

SELECTION AND IMPLEMENTATION OF INTEGRATION SCENARIO

- Integration with IAM
- Deployment solution
- Optional integrations

PUBLICATION ON SERVICE REGISTRY

SUPPORT BY DESTINE PLATFORM ONBOARDING TEAM

platform.destine.eu/onboarding

DestinE Platform

FOCUS ON
ONBOARDING REQUEST

Destination Earth

01

Compliance acknowledgement

- Acceptance of Platform T&Cs and Code of Conduct
- Security requirements

02

Service Description & Resources

- Provide Service description
- Provide Service documentation
- Provide required information

03

Communication setup

- Define operational Point of Contact for operation and integration activities
- DestinE Platform Service Desk

SERVICE ONBOARDING REQUEST

PLATFORM.DESTINE.EU/ONBOARDING

Destination Earth

1 — 2 — 3

username:

elisabetta

Technical Contact point name: *

Name

Technical Contact point email: *

Email

Administrative contact point name: *

Name

Administrative contact point email: *

Email

Next

DestinE Platform

SERVICE ONBOARDING REQUEST

PLATFORM.DESTINE.EU/ONBOARDING

Destination Earth

Service name: *

Service name

Service description: *

A description of the service primary purpose, highlighting its anticipated user scenario, benefits, features and technological components.

Service documentation (if available max 5MB):

Choose File No file chosen

Service demonstration:

url

Attachment

Choose File No file chosen

Specify which users typology is targeted by your service: *

ie. policy-makers, scientists, developers, etc.

Provide an example of the foreseen usage of your service, and how it would benefit the DestinE community *

Demonstrate alignment with Destination Earth objectives *

Previous Next

DestinE Platform

SERVICE ONBOARDING REQUEST

PLATFORM.DESTINE.EU/ONBOARDING

Destination Earth

Has the service been selected as part of Destination Earth competitions? *

Yes

Access Policy: *

Public access

Registration Method (Identity and Access Management): *

DestinE Platform IAM

Interface Type:

☐ GUI ☐ API ☐ Other

DestinE Usage Profile: *

☐ A free version of the service will be provided

DATASET(S) USED (FOR EACH DATASET PLEASE SPECIFY):

☐ DestinE data

☐ Earth Observation data

☐ In-situ data

☐ Socio-economic data

☐ Other type

☑ By creating a DestinE Platform account, the requestor has already accepted the following documents:

DestinE Platform Privacy Policy

DestinE Platform Code of Conduct

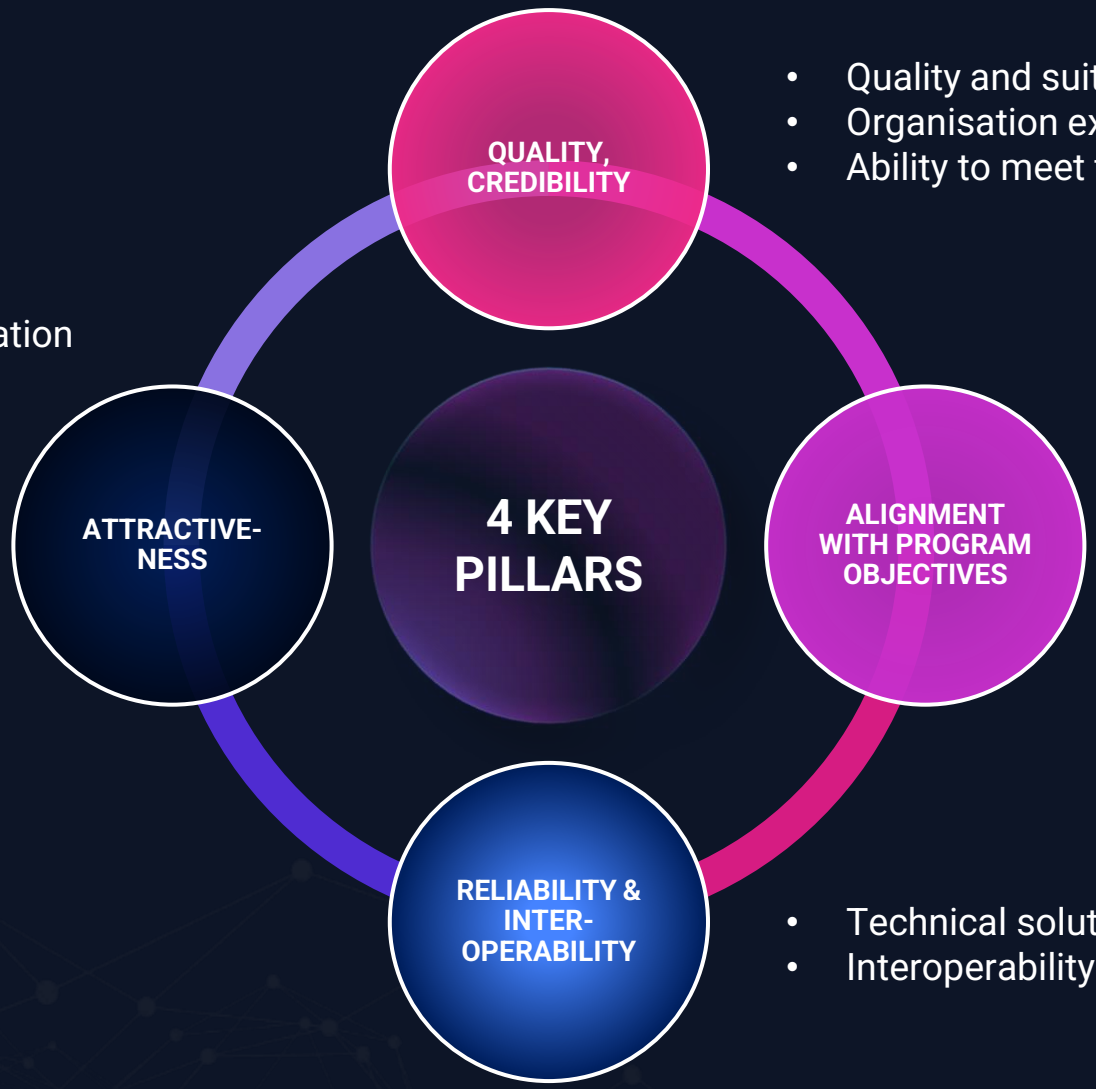
DestinE Platform Terms & Conditions

DestinE Platform

SERVICE EVALUATION

MAIN CRITERION

Destination Earth



- Quality and suitability of proposed solution
- Organisation experience & capacity in providing operational service
- Ability to meet the DestinE Platform Service-Level Agreement

- In line with EU Green Deal objectives
- Exploitation of DestinE resources

- Technical solution maturity, scalability
- Interoperability to ensure high performance level

- Technological innovation
- Market demand

SERVICE INTEGRATION
OVERVIEW

Destination Earth

LIVE COMMUNICATION | ASYNCHRONOUS COMMUNICATION

TECHNICAL ENGAGEMENT → PLANNING → MANDATORY/ OPTIONAL INTEGRATIONS → SERVICE VERIFICATION → SECURITY ASSESSMENT → PUBLICATION ON SERVICE REGISTRY

Starter Kit

Jira setup

JIRA Kanban Board:

- Dedicated JIRA Project (named DOSI)
- Integration Tasks created by Serco
- Tasks assigned to technical contact point
- Users can update tasks statuses / insert comments / attach files
- Notifications sent for any action
- JIRA Epic for each new Service
- Unique Board (filter possible via Epic)

Regularly review the tasks board for insights/feedback provisioning

Email communication channel for questions/requests

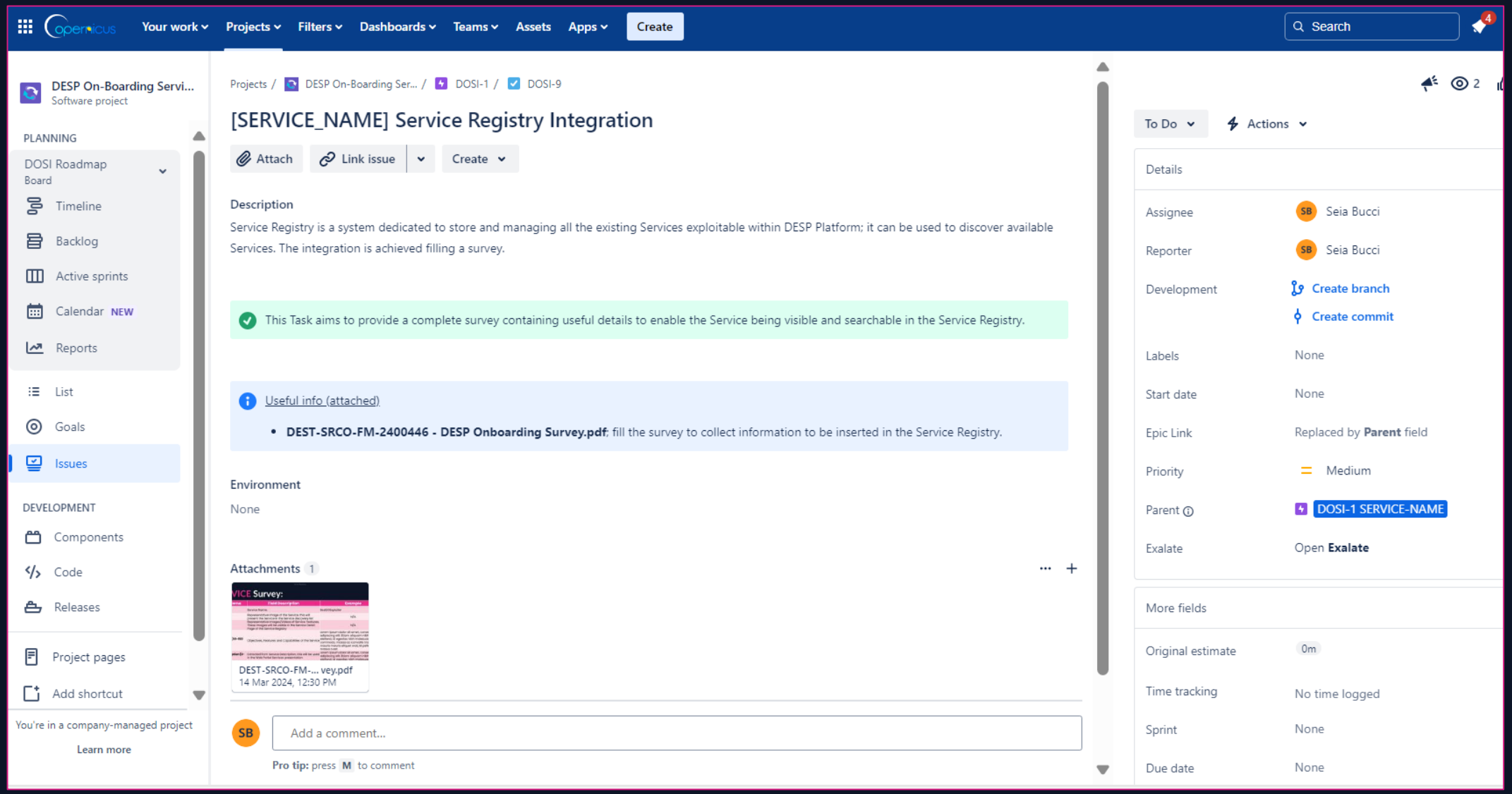
SERVICE INTEGRATION

DOSI-8	[SERVICE_NAME] IAM Service Integration	SERVICE-NAME	TO DO
DOSI-9	[SERVICE_NAME] Service Registry Integration	SERVICE-NAME	TO DO
DOSI-10	[SERVICE_NAME] Web Portal Integration - Documen...	SERVICE-NAME	TO DO
DOSI-11	[SERVICE_NAME] Service Desk Integration	SERVICE-NAME	TO DO
DOSI-12	[SERVICE_NAME] Infrastructure selection and Integr...	SERVICE-NAME	TO DO
DOSI-13	[SERVICE_NAME] Service Verification	SERVICE-NAME	TO DO
DOSI-14	[SERVICE_NAME] Service Security assessment	SERVICE-NAME	TO DO
DOSI-15	[SERVICE_NAME] On-Boarding Plan	SERVICE-NAME	TO DO
DOSI-70	[SERVICE_NAME] IAM Service Federation	SERVICE-NAME	TO DO

Tasks List example

SERVICE INTEGRATION

Destination Earth



Task example

DestinE Platform

SERVICE INTEGRATION

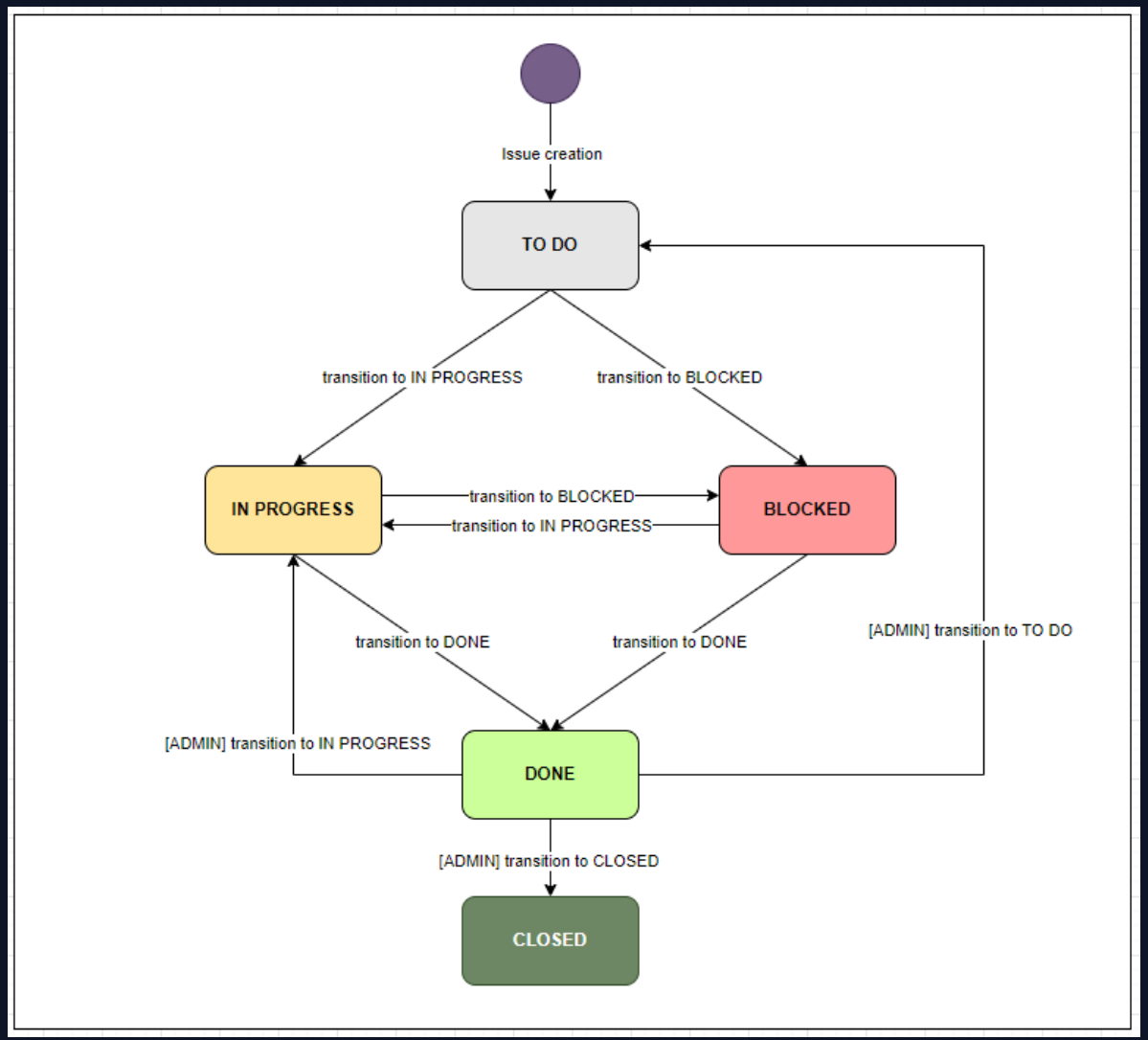
Actions allowed on Tasks for DOSI Project Users:

- View
- Watch
- Comment
- Delete own comments
- Transition (Status update)
- Attach files
- Delete own attachments

Available Statuses

- **TO DO**: Indicates tasks that are planned but not yet started.
- **IN PROGRESS**: Signifies that work is actively being undertaken.
- **BLOCKED**: Designates tasks that cannot proceed due to some impediment or dependency.
- **DONE**: Tasks have completed all necessary steps in the integration process and are considered finished or resolved.
- **CLOSED**: Tasks have been reviewed and no additional actions are needed.

JIRA DOSI Tasks Statuses Workflow



Join at

slido.com

#TrainingSession

https://app.sli.do/event/emgz48pQrhy7qyx5YWz2ho

DestinE Platform

PLATFORM.DESTINE.EU

Destination Earth

Funded by the European Union

Implemented by ECMWF esa EUMETSAT

serco

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GAEL SYSTEMS GeoVille MEEO OVHcloud ThalesAlenia Space