

Breaking the bounds of Earth Observation



CDSE

COPERNICUS
DATA SPACE
ECOSYSTEM

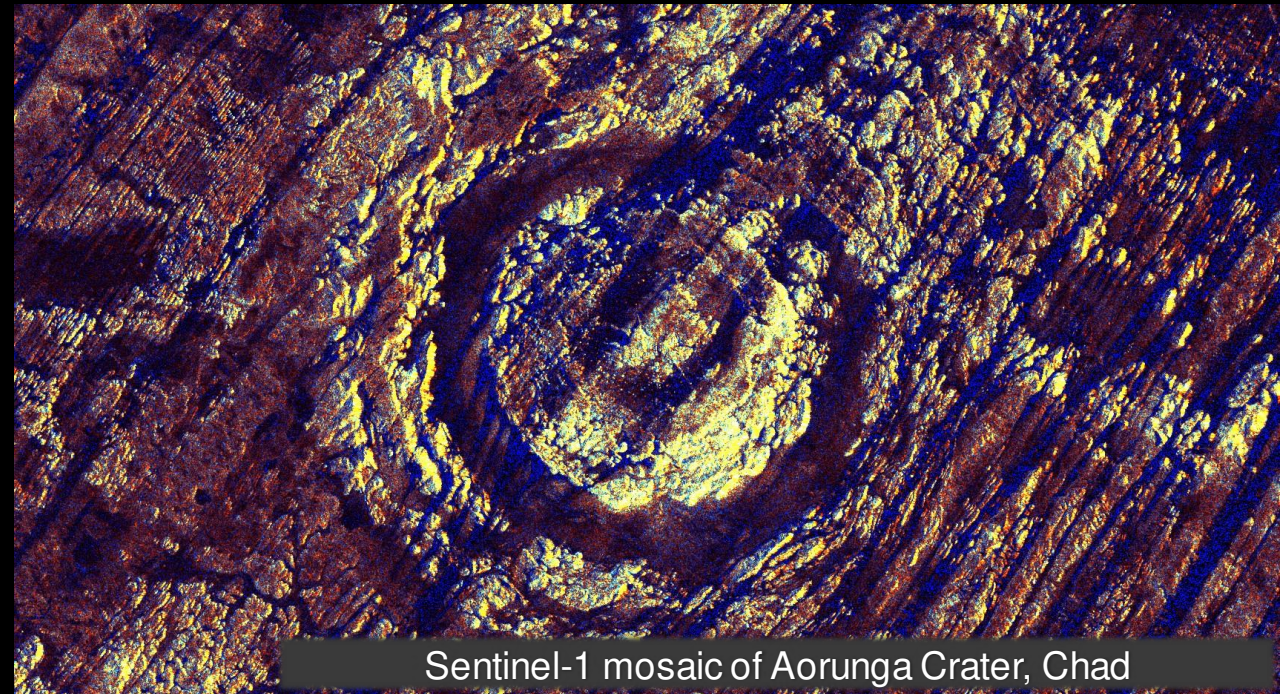
and the cloud computing paradigm

dataspace.copernicus.eu

“The main limitation now is not if EO data exists but where it can be stored, accessed and in a format ready to be used”

/EO for SDG-s Compendium, 2020/

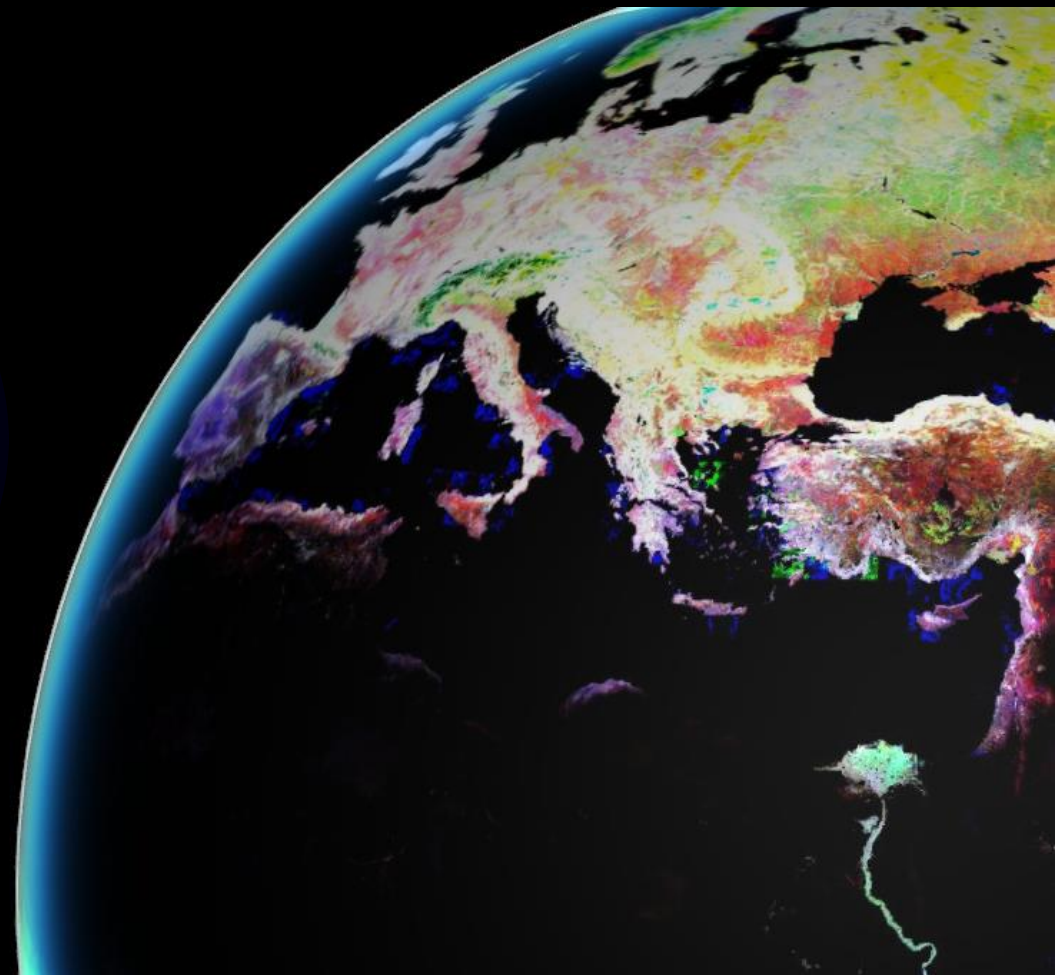
- How can I get started with satellite imagery analysis?
- How can I apply tools developed by someone else?
- How can I work with terabytes of data if I don't own a server?



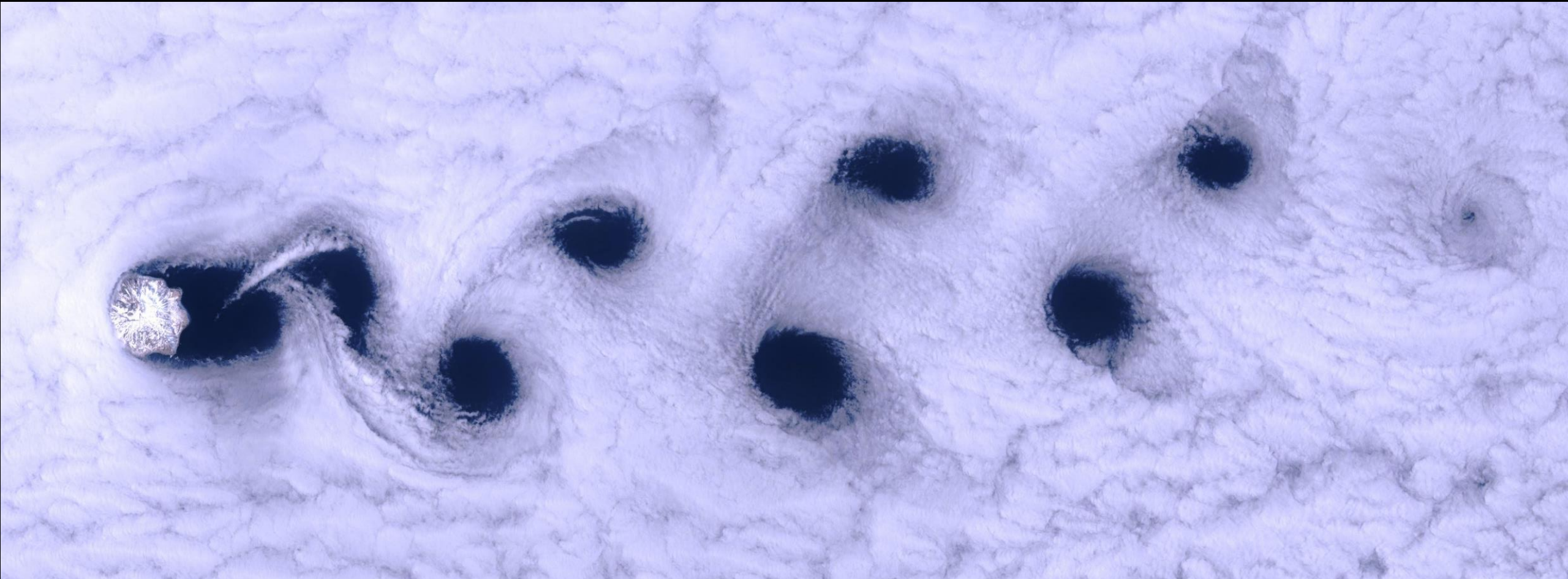
Sentinel-1 mosaic of Aorunga Crater, Chad

Copernicus Data Space Ecosystem is

- The official data gateway, cloud processing platform and codebase of the Sentinel satellites
- CDSE aims to change the paradigm in remote sensing from downloading and local processing to direct processing in the cloud



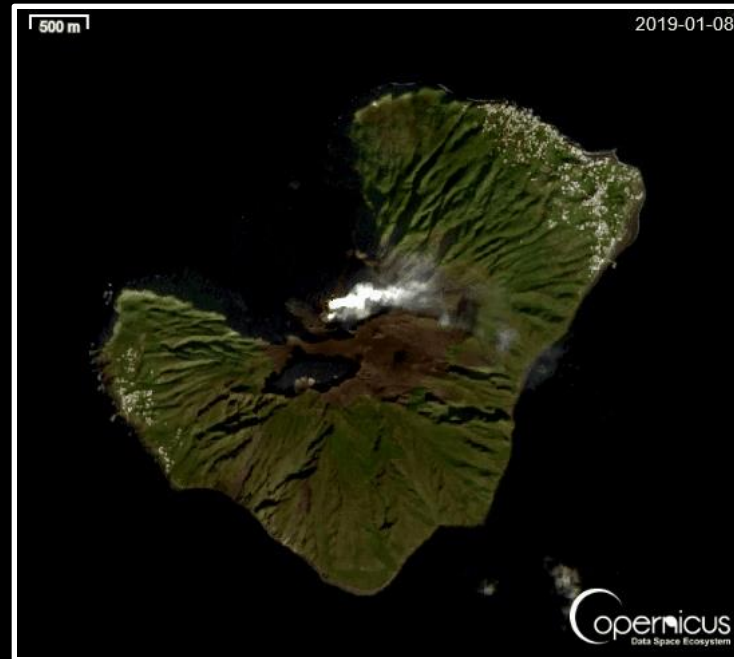
The cloud processing paradigm



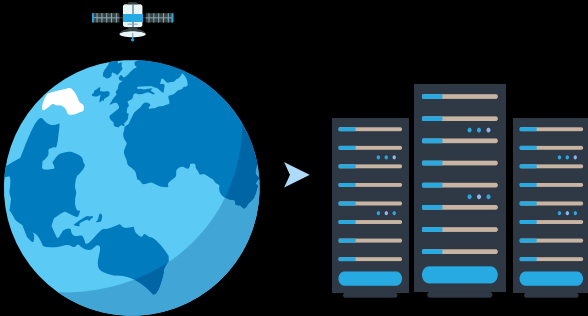
Data Access



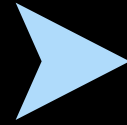
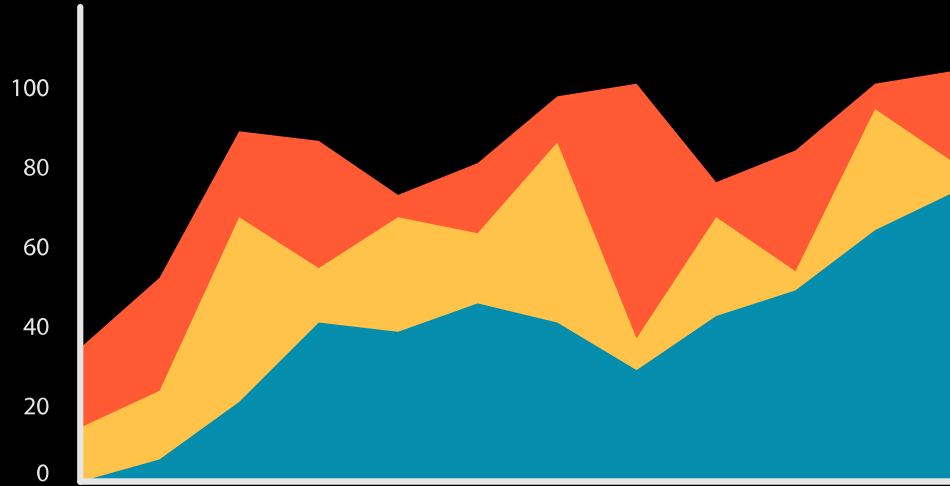
Data Processing



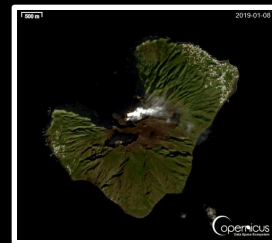
Data Access



Data Visualization



Data Access

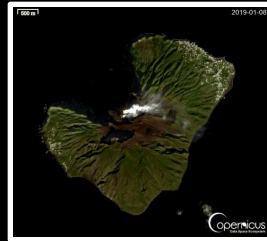


Copernicus Data Space Ecosystem

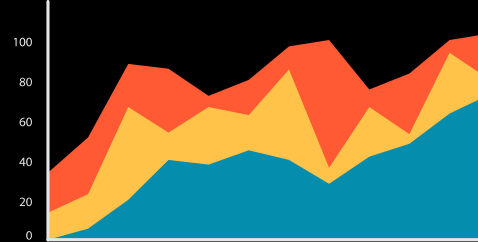
Data Access



Data Processing



Data Visualization

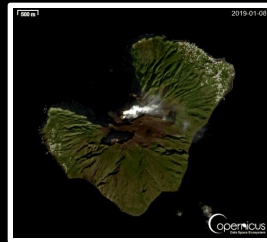


Copernicus Data Space Ecosystem

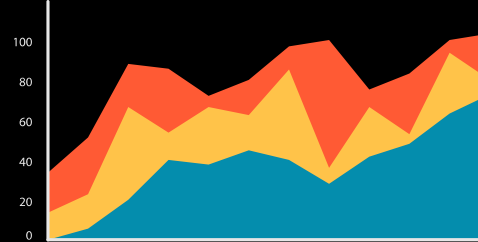
Data Access



Data Processing



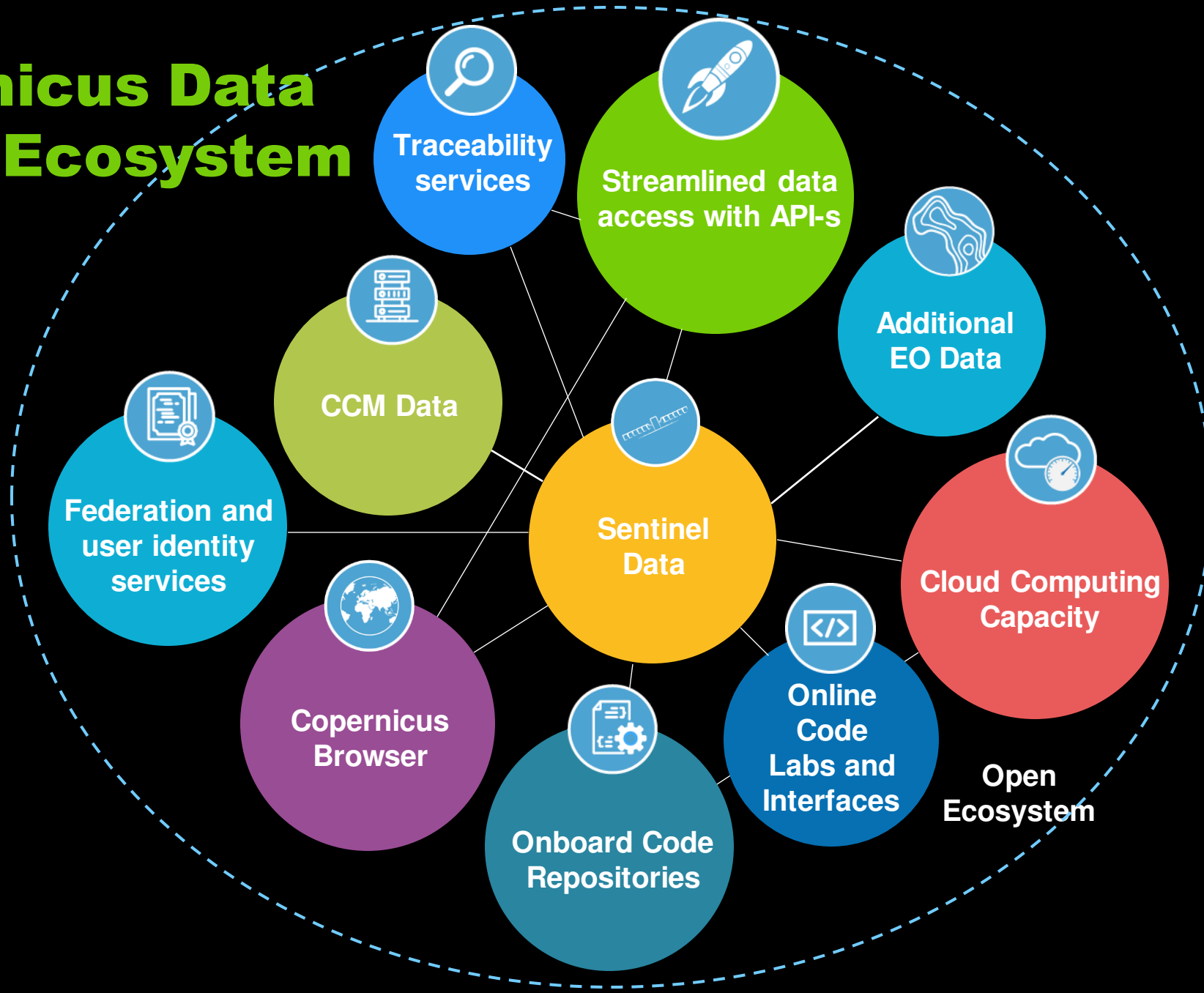
Data Visualization



In the public cloud

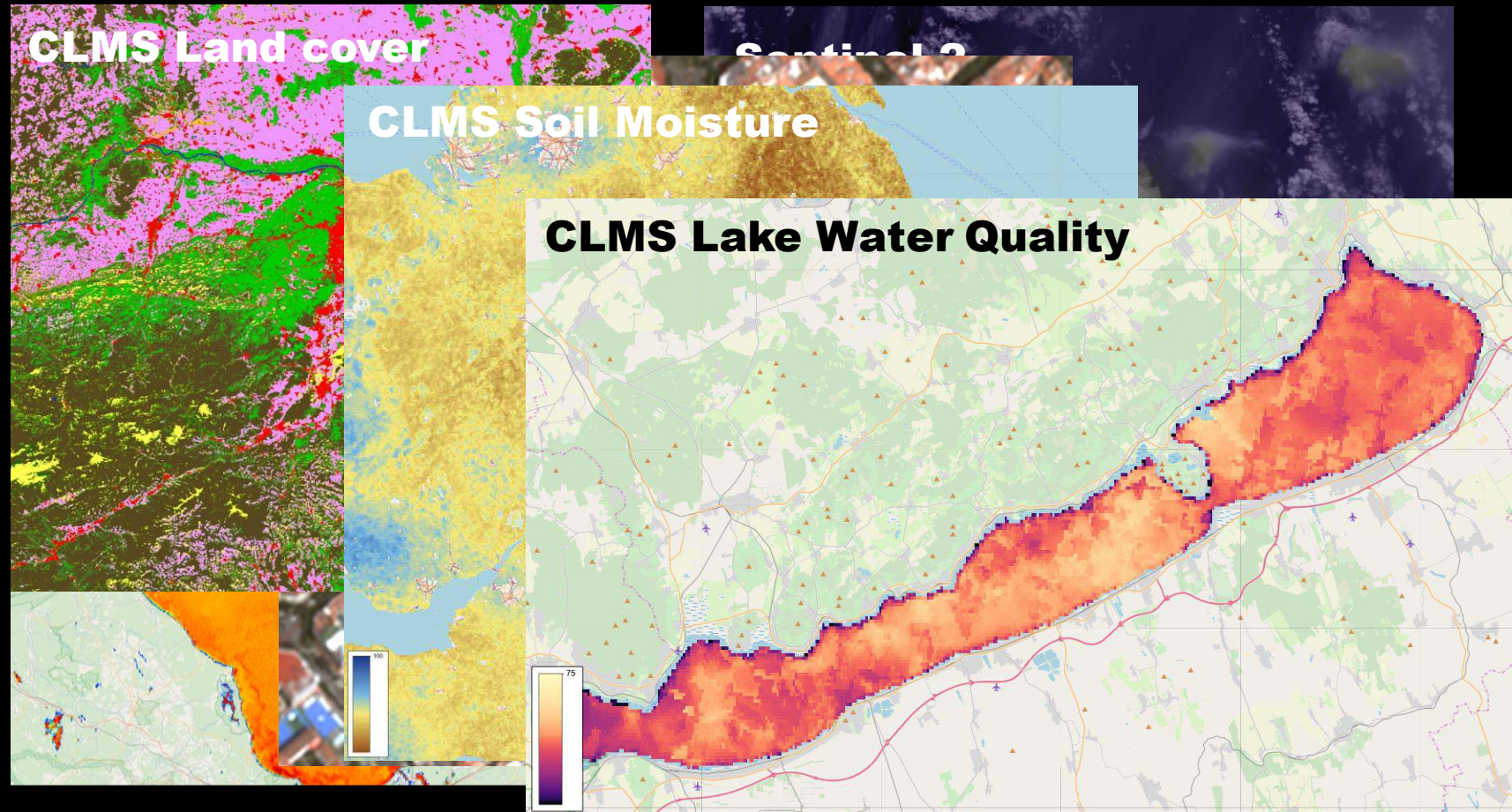
On your computer

Copernicus Data Space Ecosystem



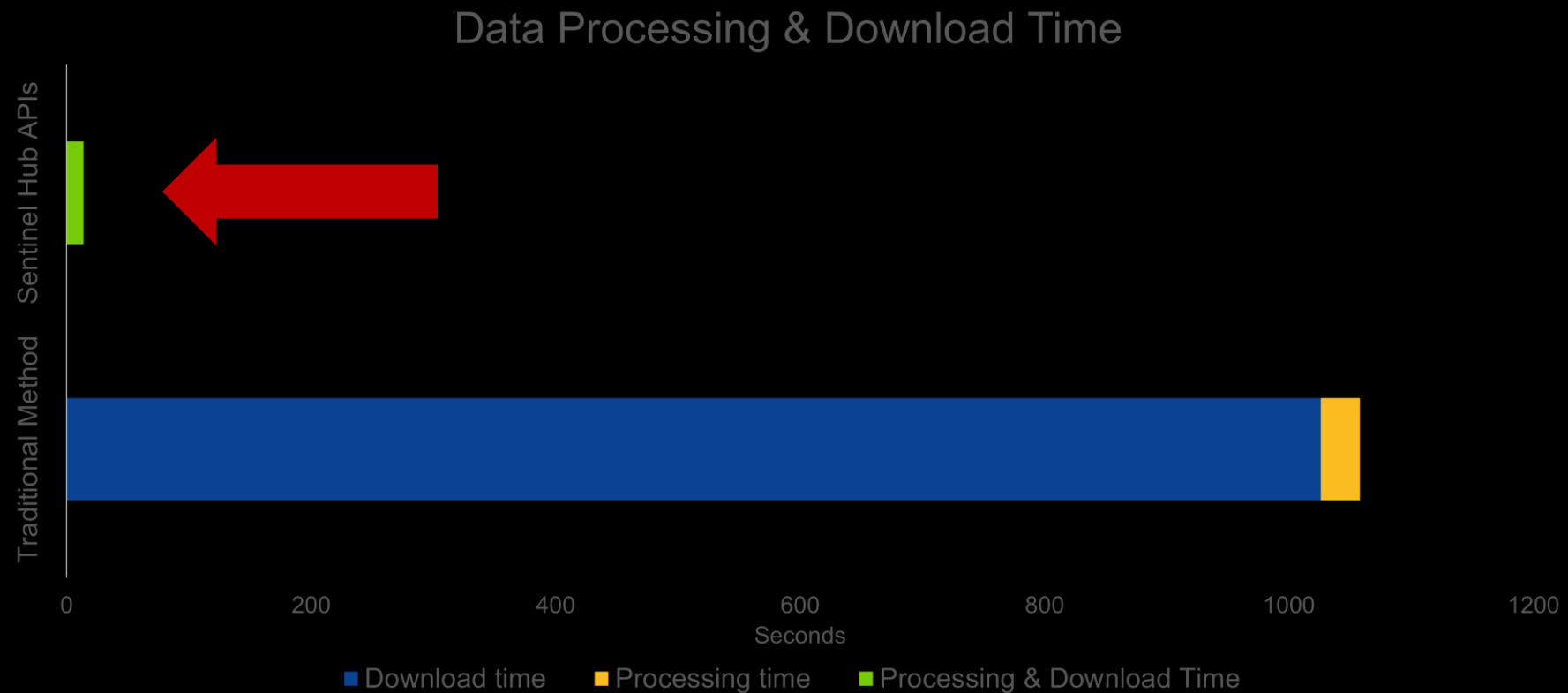
Does CDSE have the data I need?

- All Sentinel 1/2/3/5P land/coastal data
 - Plus Sentinel 1-2 mosaics
- Copernicus Contributing Missions high resolution products
- Copernicus Land Monitoring Services
- Complementary Copernicus Data



Is Copernicus Data Space Ecosystem fast?

- Benchmark test, Ray 2024 EGU
- Compared to tile selection, individual download and local processing, CDSE is more efficient by at least an order of magnitude



Is CDSE free?

- Free data and processing quota available to all users
- Additional quota available to Copernicus Service Providers and eligible government entities
- Commercial processing and data storage available on ecosystem providers (CREODIAS, OTC ...)

Process	Available quota
Sentinel Hub API Processing units	10 000/month, 300/minute
OpenEO credits	10 000/month
S3, OData, STAC transfer limit	12 TB/month
Direct Http access to COG-s, requests	50 000/month
Bandwidth limit/connection	20 MB/s

How can I learn coding for EO data?

- Instant prototyping in Copernicus Browser
- Graphical coding interfaces and open Jupyter Lab
- API-s handle data access and backend management, code focuses on the actual processing
- Time series analysis, data fusion, pre-trained classification
- User-defined processes, ONNX machine learning in openEO



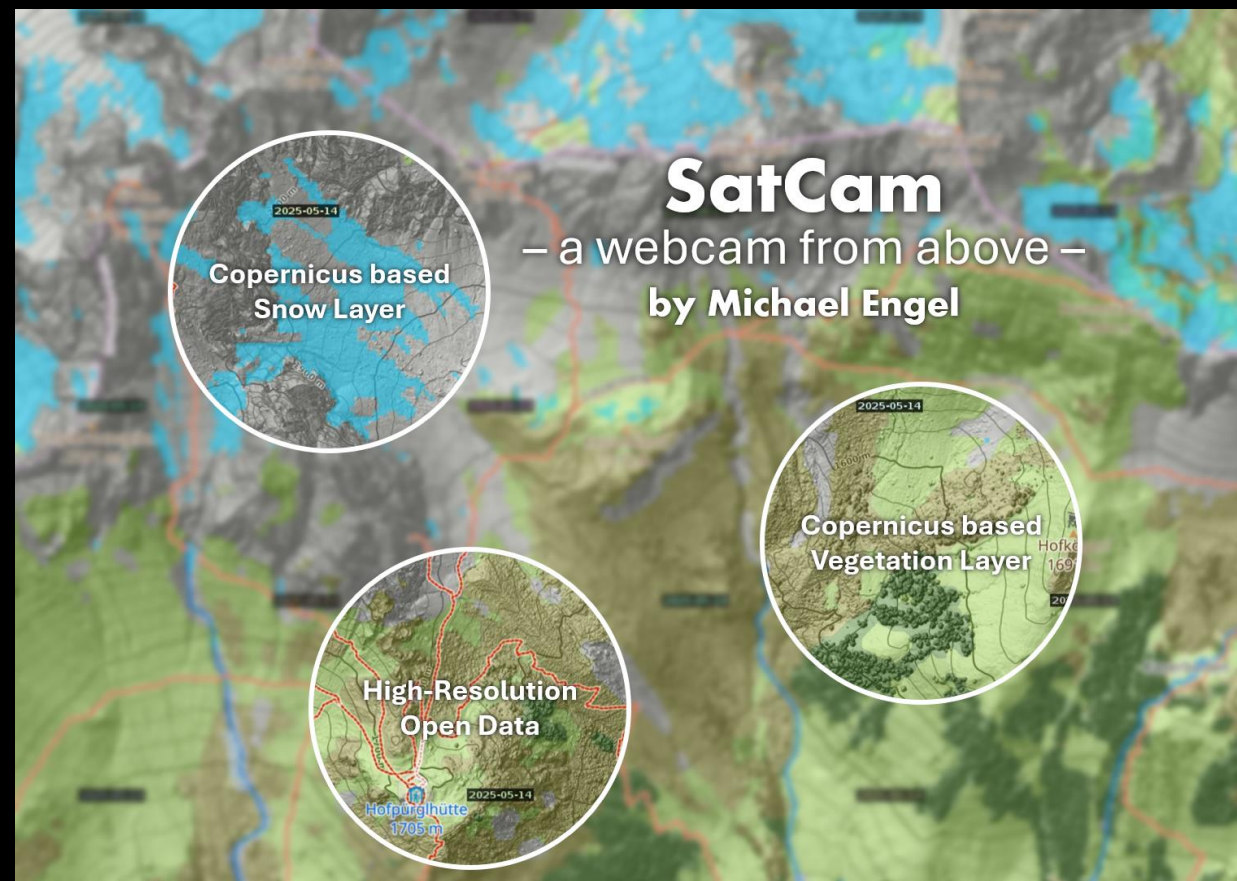
How can I join the ecosystem?

- Open ecosystem for data and service providers
- Unified onboarding for partner services
- Both free and commercial services can be deployed and operated
- Federation with external data spaces possible
 - Identity service available



How is CDSE changing earth observation?

- No more waiting for data to be downloaded
- No more limitations of your local hardware and software
- Federated processing, connecting data from different backends possible
- Build first, scale up as you grow



How is CDSE changing earth observation?

- Data is accessible to everyone with an internet connection
- Learning processing is incremental
- Pre-processed, machine learning ready datasets are available
- Data gravity: widely used platforms attract more users and more data
- Industrial providers are also moving to the API processing paradigm



CDSE is transformative

**Continuous
innovation and evolution
fostering the development of
a European EO Ecosystem**

**Data and Services, onboarding and
federation possibilities**

**Open and free capacity with potential commercial
extension**

**Standard interfaces, advanced data analytics and cloud services to
efficiently access and process EO data**

**The authoritative source for full and up-to-date access to Sentinel data, CLMS and CCM data
with digital authority tracing**