EOCLOUD

Earth Observation Data

We bring EO Data to user

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CloudFerro

creo TECH Instruments S.A.

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esa

EO CLOUD
Earth Observation Data

Objective

EO CLOUD platform operates a cloud infrastructure
designed to provide and process significant amounts of EO data.

esa

European Space Agency operates the Earth Observation (EO) satellites that generate a **large stream of image data**. They have become **powerful tools** to enable better understanding of environment and improved management of any business issues.

The images of our planet are acquired continuously and the amount of EO data is rapidly increasing.

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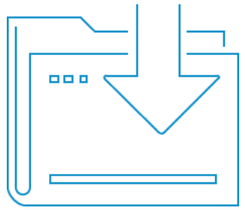

Traditional approach

Users who needed to access and process the EO data used to download, store and process it locally.

It became inefficient when the volume of data was too large to be downloaded in reasonable time or too large to be stored and processed by users' infrastructure.

Our approach

- EO Cloud is a scalable cloud infrastructure adapted to process big amounts of Earth Observation data
- It enables a broadband local access to one of the largest EO data repository (archive and up-to-date)
- EO Cloud offers 10 PB of Earth Observation data combined with customer accessible big processing power

Who needs EO Cloud

EO Cloud
Earth Observation Data

EO Cloud services are designed for the users who need to exploit and process EO data for scientific and business areas, such as:.

ENVIRONMENT

AGRICULTURE

ENERGY

TRANSPORT

MARINE

SECURITY

... and many others

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What we have

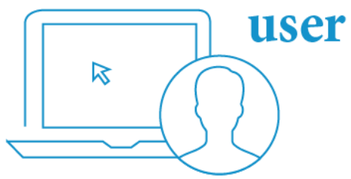
SATELLITE	Launched On - End of Service	Observation period at equator (average). (*)	Satellite Sensor Data Source	Resolution	Data Source	Size of EO Data Products	Remarks
SENTINEL 1	Ap. 03, 2014 - till now.	12 days(**)	C-SAR (C-band Synthetic Aperture Radar)	5m - 40m (depending on sensor mode)	ESA (Copernicus Science Hub)	L1. Starting from 2015. 1 PB/year.	Selected data on request.
SENTINEL 2	Jun. 23, 2014 - till now.	9 days(**)	MSI (Multi Spectral Instrument). Optical: 443nm - 2190nm.	10m - 60m (depending on wavelength)	ESA (Copernicus Science Hub)	L1. Starting from 2016. 0.7 PB/year.	Complete archive. L2 level planned.
SENTINEL 3	Feb. 16, 2016 - till now.	4 days (OLCI).(**) 2 days (SLSTR).(**)	OLCI (Ocean and Land Colour Instrument) optical med-res: 400nm - 1200nm. SLSTR (Sea and Land Surface Temperature Radiometer) thermal SRAL (SAR Altimeter) Auxiliary Instruments	500m (OLCI) 1000m (SLSTR)	ESA (Copernicus Science Hub)	L1, L2 Layer. Starting from 2016 to 0.7 PB - end of 2017.	Complete archive when operational.
LANDSAT 8	Feb. 11, 2013 - till now.	15 days	OLI (Operational Land Imager) optical 430nm - 1380nm. TIRS (Thermal Infrared Sensor)	15m – multispectral 30m – optical 60m – thermal	ESA Landsat 8 Portal	L1, L2 . App. 30 TB/year (starting from 2014).	Complete ESA Archive (Europe+ North Africa) + Selected regions from USGS archive.
LANDSAT: 1-7	LS 1 - Jul. 23, 1972 - Jan. 6, 1978. LS 2 - Jan. 22, 1973 - Feb. 5, 1982. LS 3 - Mar. 5, 1978 - Mar. 31, 1983.	15 days	MSS (Multispectral Scanner) optical+thermal	30m -120m (depending on wavelength)	ESA Landsat Archives	Landsat 1-7 historical data.L1, L2. App. 250 TB.	Complete ESA archive, selected data from USGS archive.
	LS 4 - Jul. 16, 1982 - Jun. 1, 2001. LS 5 - Mar. 1, 1984 - till now. LS 7 - Ap. 15, 1999 - till now.		LS 4, LS 5: MSS (Multispectral Scanner) DCS (Data Collection System) LS 7: ETM (Enhanced Thematic Mapper)				
ENVISAT	Mar. 1, 2002-2012.	3 days	MERIS (Medium Resolution Imaging Spectrometer) optical	300m	ESA Archives	Historical data. L2 Layer. App. 155 TB.	Complete ESA archive.

(*)Period shortens with latitude.
(**)Per single satellite (Sen1, Sen-2, and Sen-3 have planned twin constellations).
All satellites are placed on SSO (Solar Synchronise Orbit). Orbital Altitude: 680 - 920 km.

How it works

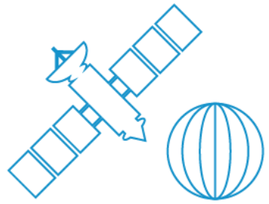
WE BRING EO DATA TO USER

EOCLOUD Earth Observation Data



user

script



satellite

Dashboard | Customer Portal | Command Line

REST API

Cloud Services

Compute

Virtual Machines | Bare Metal Machines | Batch Processing

Network

Virtual Network | Virtual Router | Floating IP

VPNaaS | FWaaS | LBaaS

ORCHESTRATION

Storage

Volume Storage SSD | Volume Storage HDD | Object Storage

Image Service | Data Imp./Export | Backup

EO Repository

Search Tool | EO Data Catalogue

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Our tools

Due to the large amounts of data stored in the repository, EO platform
is equipped with an efficient tool to help select needed data for further processing.

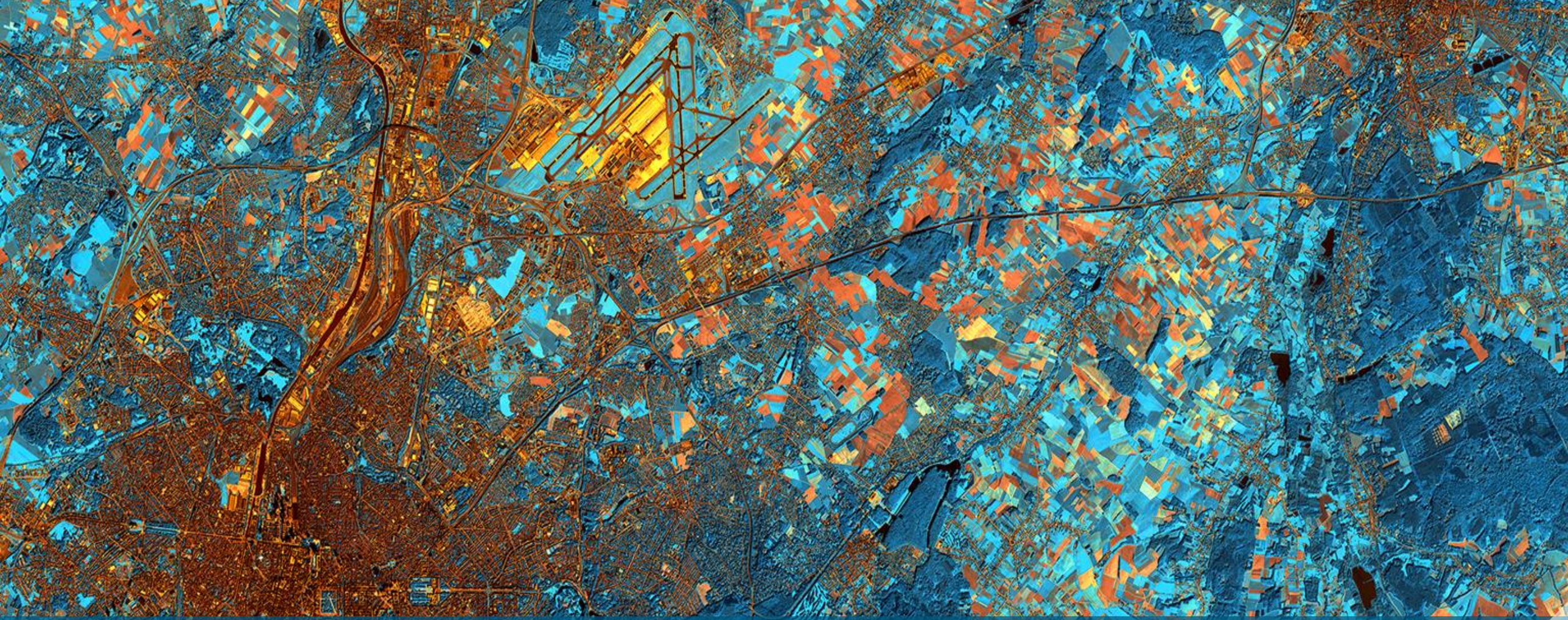
The tool allows for searching by:


DATASET


GEOGRAPHY


TIME


standard attributes such as:
cloud cover and metadata
specific to the selected dataset



Billing Modes

EO Data – Billing Modes

The services can be billed in the two main modes:

Per Usage Mode

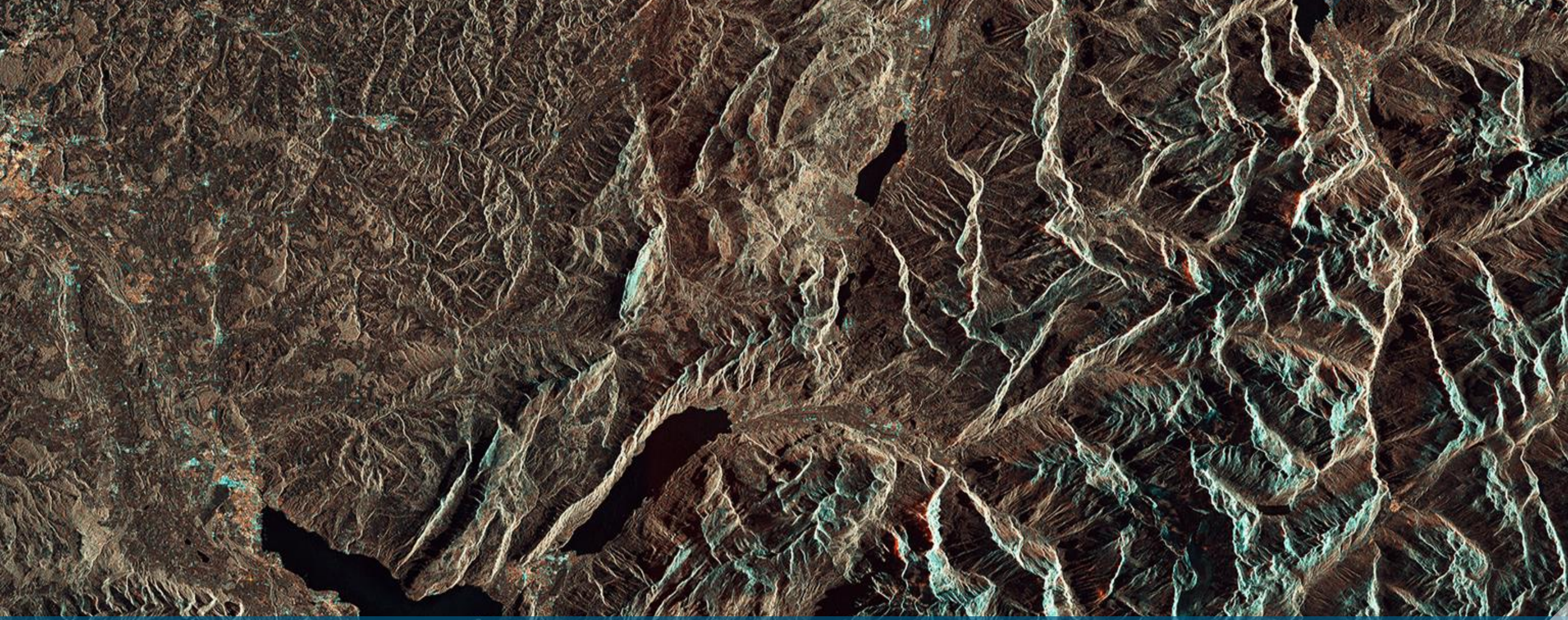
(for flexible use: prototyping, testing)

The user pays an predefined sum of money (credit). Later on the user can start required services like: VMs or Volume Storage or VPNaaS, FWaas, etc. Cost of appropriate services decreases the initial Credit.

Fixed Term Mode

(for feasible budgets)

The user buys a service for a fixed time period. The service price can be paid via a separate invoice or can be paid with the same credit mechanism as in case of Per Usage Mode.



Advantages

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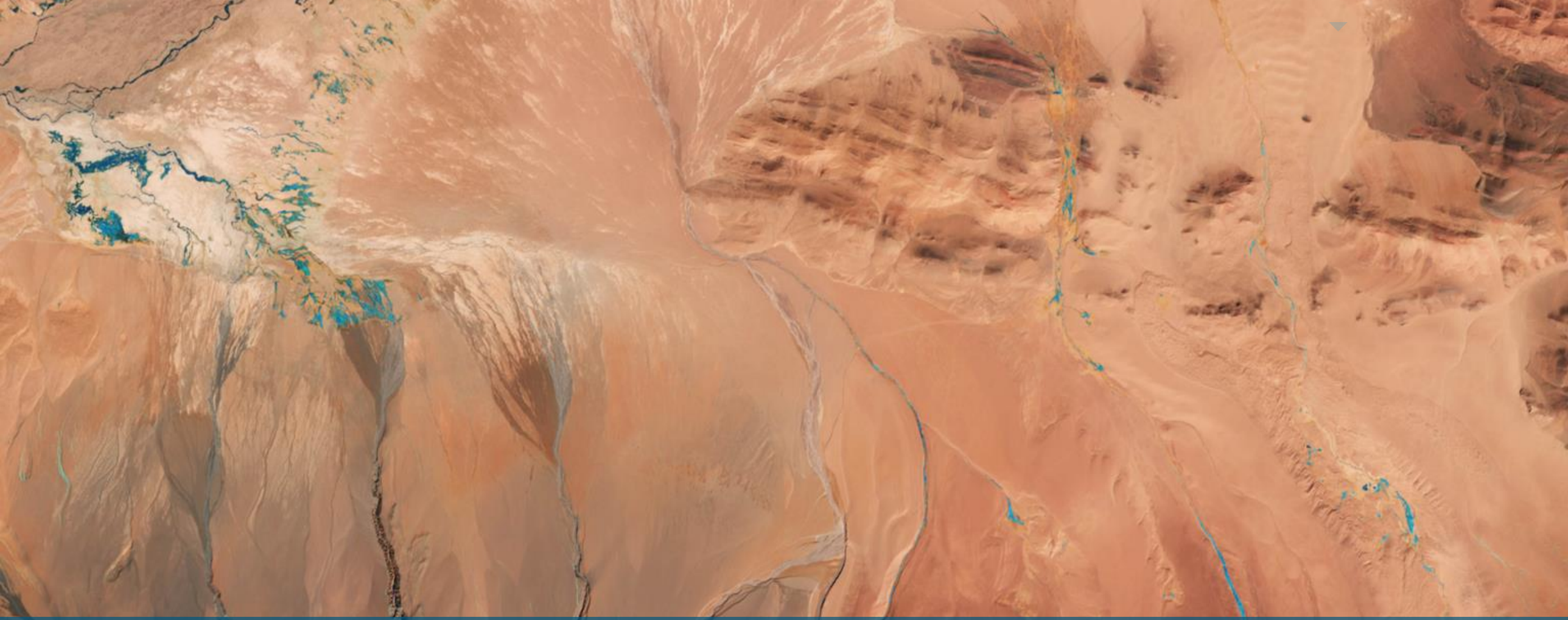
Key Advantages

Unique Opportunity to operate a cloud scalable infrastructure adapted for:

- broadband local access to 10 PB of Earth Observation data
- efficient searching engoine to achieve selected products
- bringing processing to data.

Efficient and easy access to the: up-to-date and archive EO data base.

Low operational costs of offered services (no need to invest for: ICT infrastructure and transfer of big data volume).



EO platform in practice

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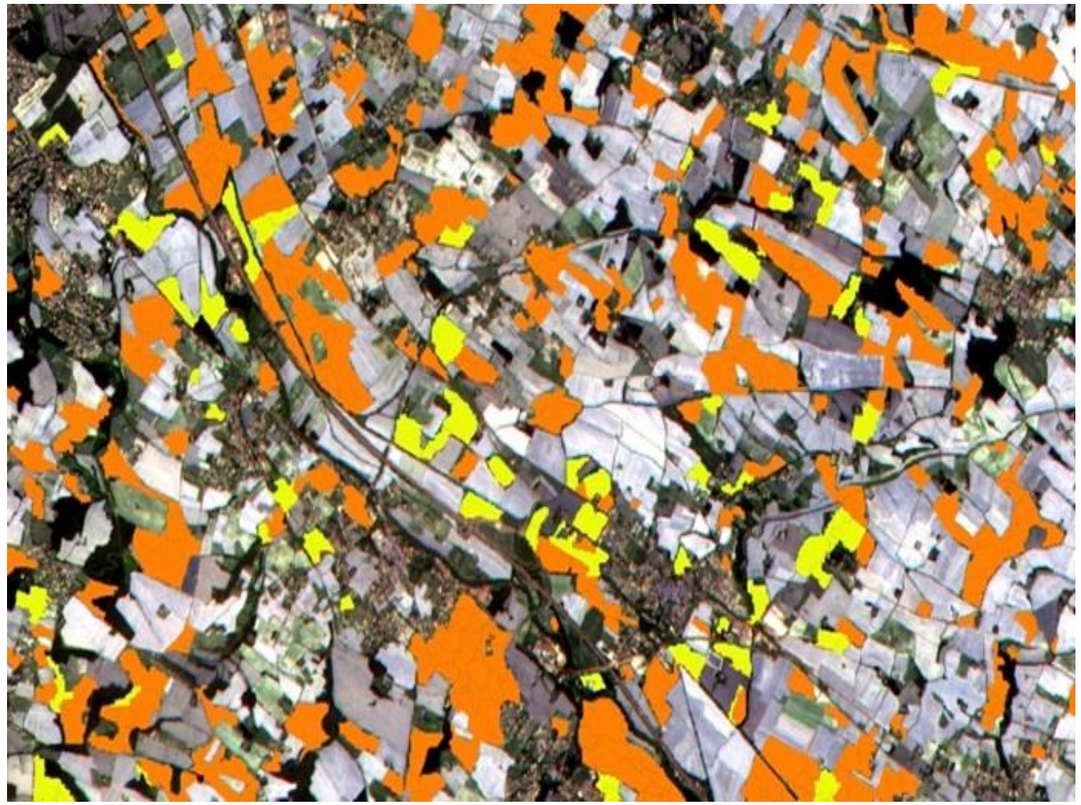
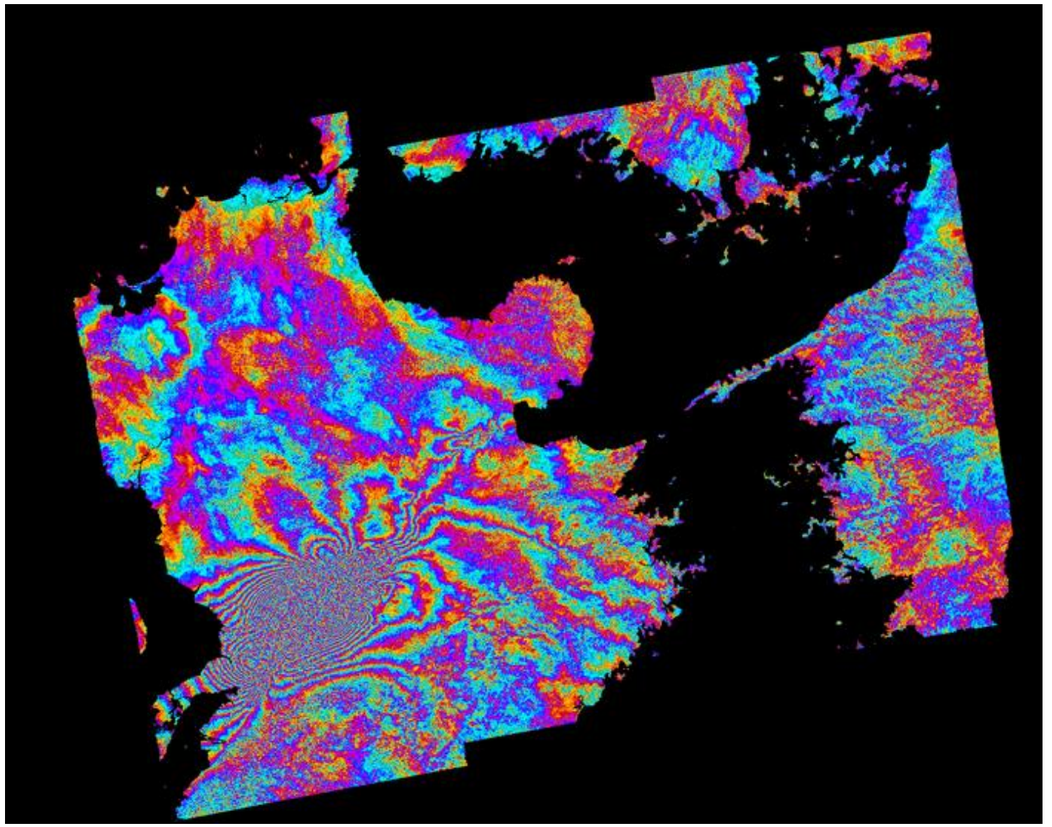
Use Case 1 – Sentinels in the Fields

Sentinel-2 is the first optical Earth observation mission which provide key information on the state of vegetation. In this image from 6 July 2015 acquired near Toulouse, the satellite's multispectral instrument was able to discriminate between two types of crops: sunflower (in orange) and maize (in yellow).



Use Case 2 – Earth Deformation

This interferogram shows how the ground moved as a result of the earthquakes that struck Kumamoto in Japan on 14–15 April 2016. The image was generated automatically on the Geohazards Exploitation Platform and combines images captured by Sentinel-1A on 8 and 20 April, before and after the quakes.



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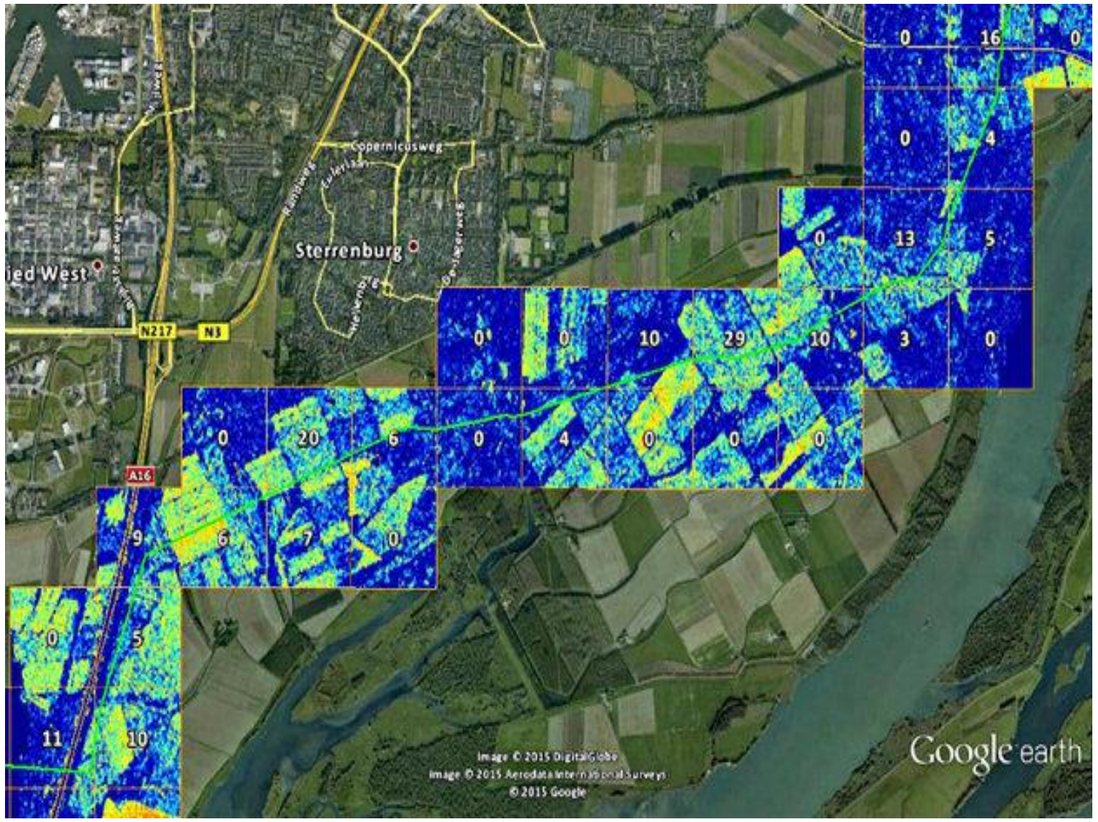
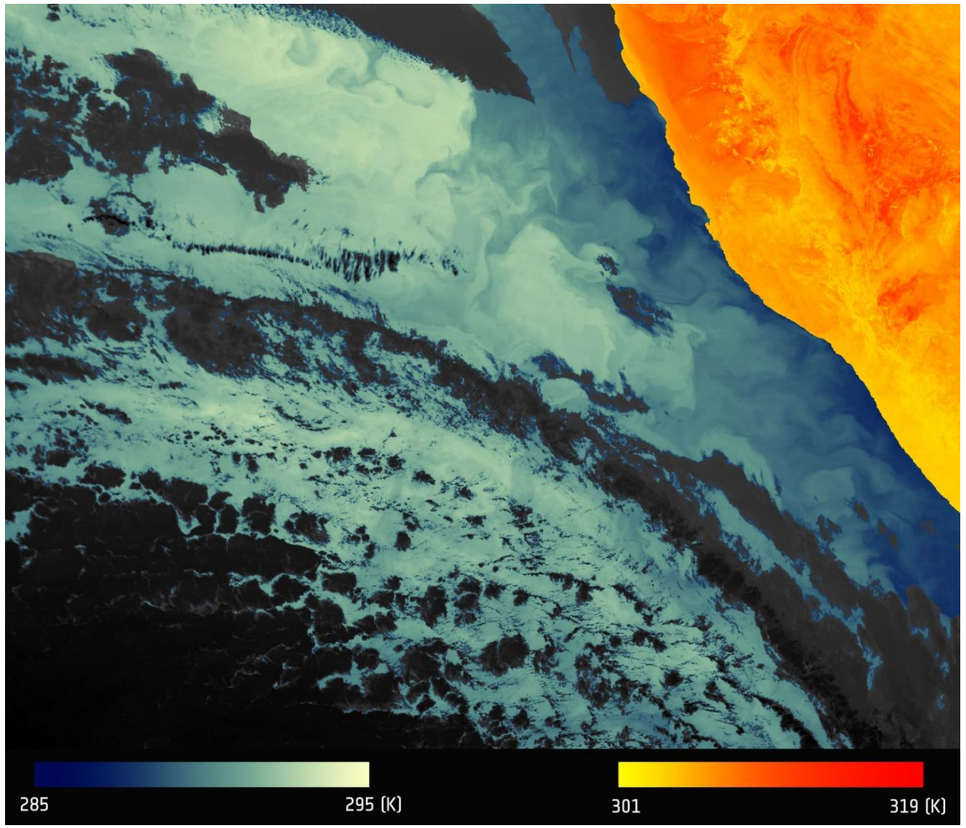
Use Case 2 – Pipelines Monitoring

Dutch company Orbital Eye has developed a service that uses satellites to monitor gas and oil pipelines.
The system uses radar images from satellites in combination with smart software to detect potential threats as well as the slightest ground movement.



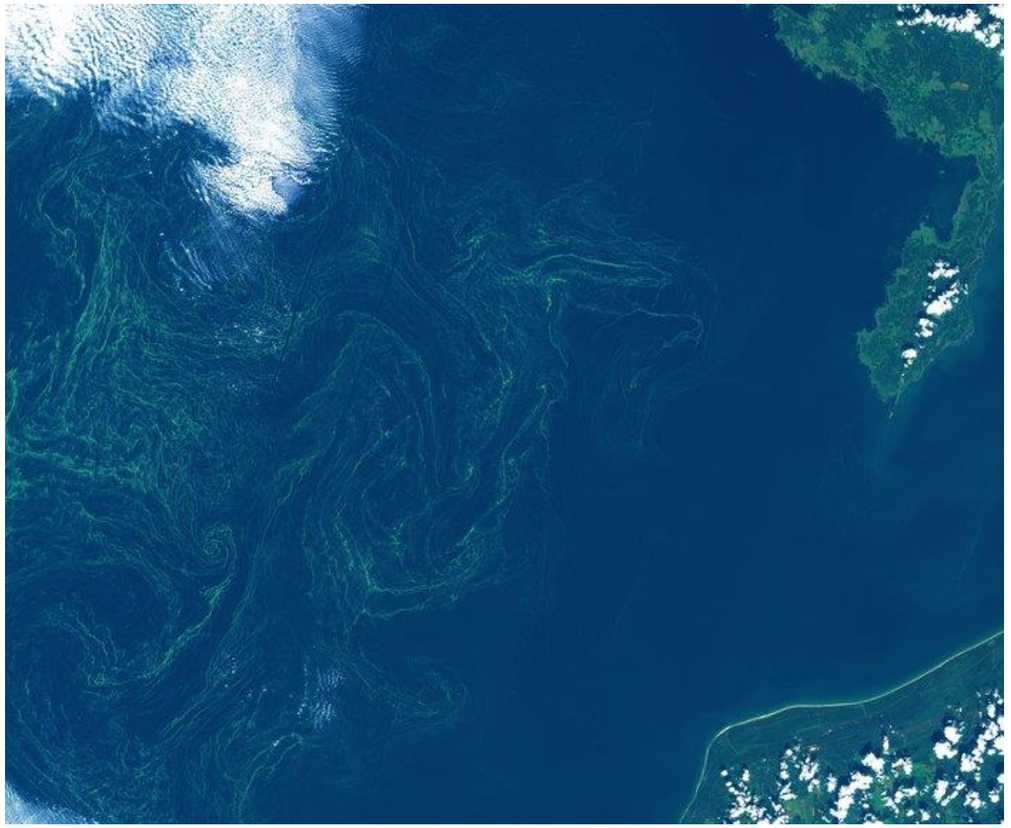
Use Case 4 - Namibian Coastline

Image from the Sentinel-3A Sea and Land Surface Temperature over a part of western Namibia and the South Atlantic Ocean. The Namibian land surface is shown in red – orange colours, corresponding to a temperature range 301–319K. The blue colours over the ocean correspond to a temperature range of 285–295K. The black areas correspond to clouds, which are opaque to thermal-infrared.



Use Case 5 – Baltic Blooms

This image of an algal bloom in the central Baltic Sea was captured by Sentinel-2A on 7 August 2015. The image has a spatial resolution of 10 m. The Estonian island of Saaremaa, which is home to the Kura Kurgu Hoiuala conservation area, is visible in the upper right of the image.



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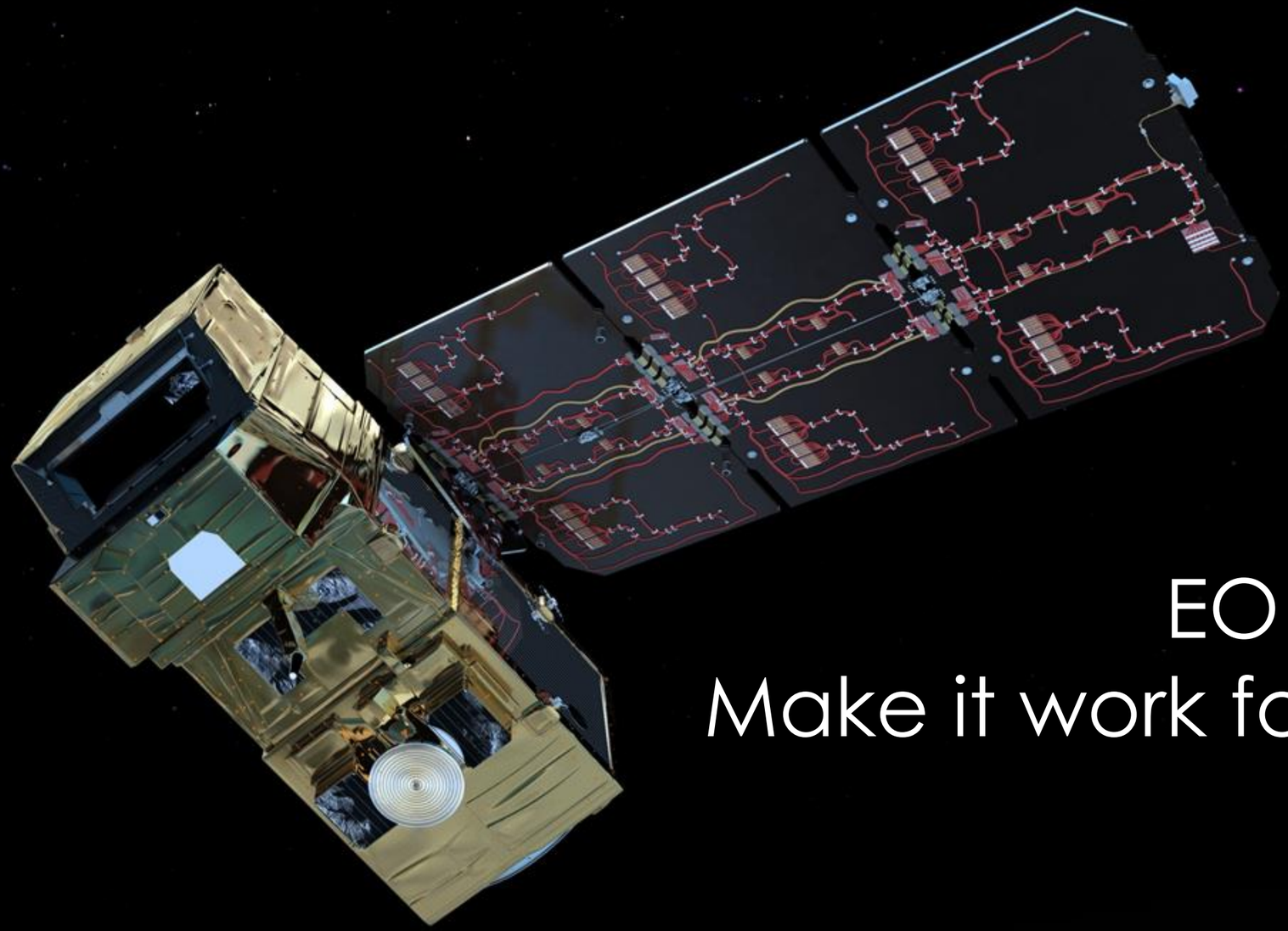

EO Data
Make it work for you

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