Space for Urban Green

08 September 2021

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Agenda

- **ESA introduction**
- **“Space for Urban Green” Invitation to Tender**
  - Objectives
  - Examples of applications
- **An example of use-case**
  - Jan Schäfer (City of Essen)
- **EO Platforms**
  - Marc Paganini (ESA)
- **How to apply: funding and tender information**
- **Open Questions & Answers session**

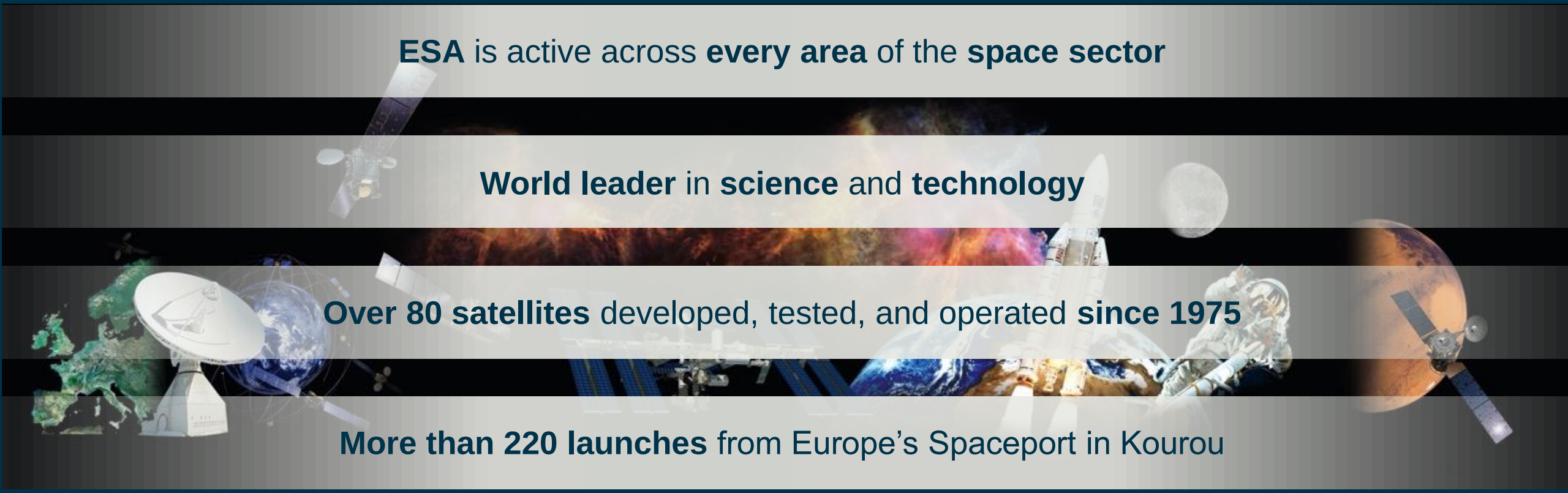
We Are ESA

EUROPE'S GATEWAY TO SPACE

WHAT	22 Member States, 5000 employees
WHY	Exploration and use of space for exclusively peaceful purposes
WHERE	HQ in Paris, 7 sites across Europe and a spaceport in French Guiana
HOW MUCH	€6.68 billion = €12 per European per year

What Does ESA Do?

THIS IS POSSIBLE THANKS TO THE COLLABORATION OF MEMBER STATES



ESA is active across **every area** of the **space sector**

World leader in **science** and **technology**

Over 80 satellites developed, tested, and operated **since 1975**

More than 220 launches from Europe's Spaceport in Kourou

ADDRESSING EVERY AREA

APPLICATIONS

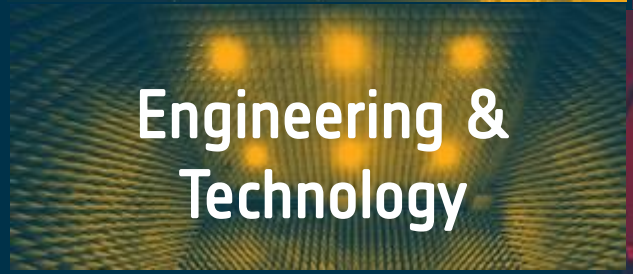
Telecommunications & Integrated Applications

Navigation

Earth Observation

ENABLING & SUPPORT

Space Transportation



Engineering & Technology

Operations

SCIENCE & EXPLORATION

Space Science

Human & Robotic Exploration

ESA SPACE SOLUTIONS

The largest space innovation network in the world

- The go-to place for great business involving space to improve everyday life.
- Supporting European start-ups and SMEs to develop businesses using space technology and data.
- Offering funding, business and technical support to help to generate successful business, and create positive socio-economic impacts.

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ESA-funded invitation to tender on Urban Green

Invitation To Tender

open

from 1 October 2021

until 12 November 2021

Funding up to € 200K per activity

(100% ESA funded)

Duration 9 months

ESA-STAR reference number AO10973

Planned ESA-funded invitation to tender on Urban Green

- Cities are going digital: the natural capital upon which cities rely risks being left behind by the digital revolution.
- There has been an increase of mobility into green spaces and public gardens for physical exercise and mental calming.
- UN estimates every week, 3Mio people move to cities
- Green infrastructure such as urban parks are critical components of urban sustainability and resilience.
- Need to consider to what extent urban green spaces can be effectively be integrated into smart city planning, to maximize benefits for all citizens.
- Aligned with EU Green Deal

Objectives of Urban Green Call

Call for tenders

Define innovative space-based applications in support of the development Urban Green Services

- technical feasibility & economic viability assessment
- roadmap for services implementation definition
- follow-on demonstration project preparation

€ 200K per study (100% funded) - duration 9 months

Tender open on 1 October 2021

Areas of Applications:

Design & Planning of Urban Green Spaces

Management of Urban Green Spaces

Urban Green Indicators

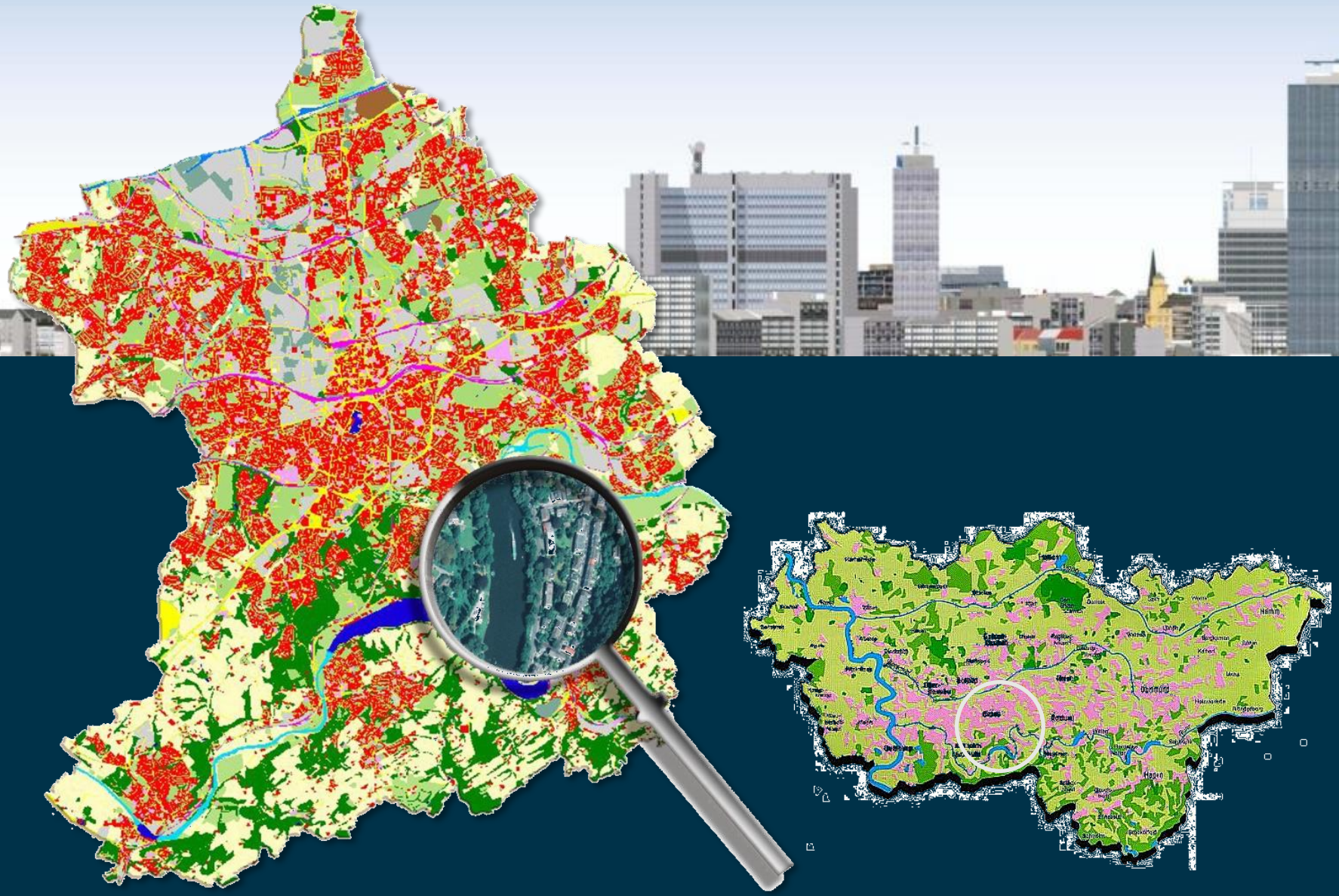
Use case of the Ruhr Area District

Presented by representative of the Essen City-Mr Jan Schäfer

STADT ESSEN

Data collection and processing at the Metropolregion Ruhr & City of Essen

RUHR GEBIET



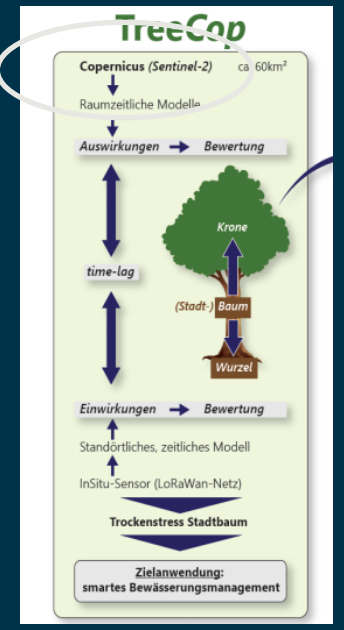
City of Essen

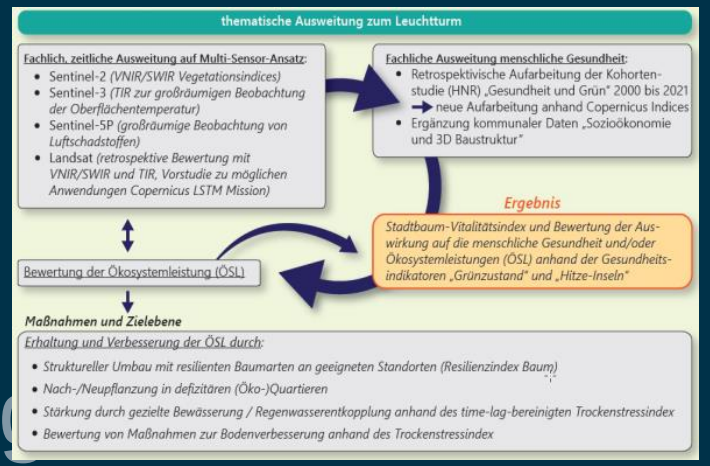
Area size	210 km²
Population	575.000
Buildings	93.000
Parcels	135.000

activities

development of **sustainable** space-based services which can contribute to the **monitoring**, **protection** and **integration** of green spaces into **smart city planning** and **urban green management**

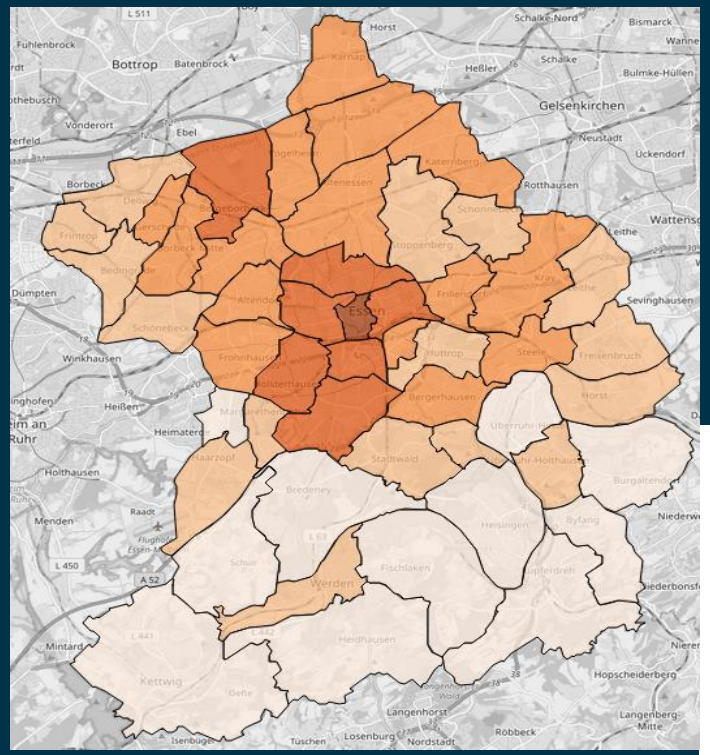
monitoring their **health status** and **air quality** in the surrounding to maximize their benefit for the **citizens**

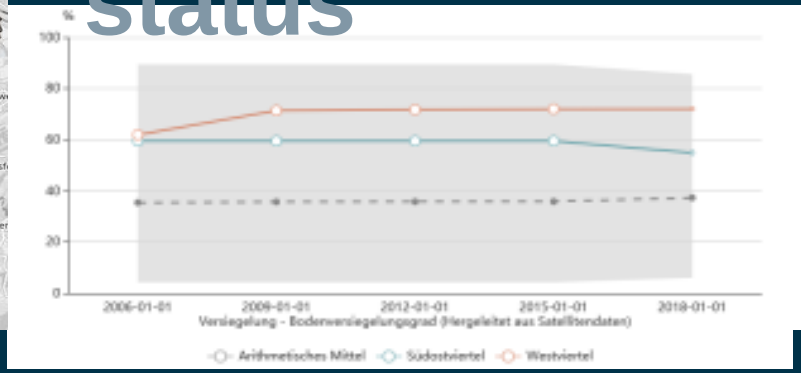




activities

description of **changes** in **spatial** and **temporal** speed (dynamics) by building up **time series** for content of **land consumption**, **ground sealing**, **air quality** and **health status**

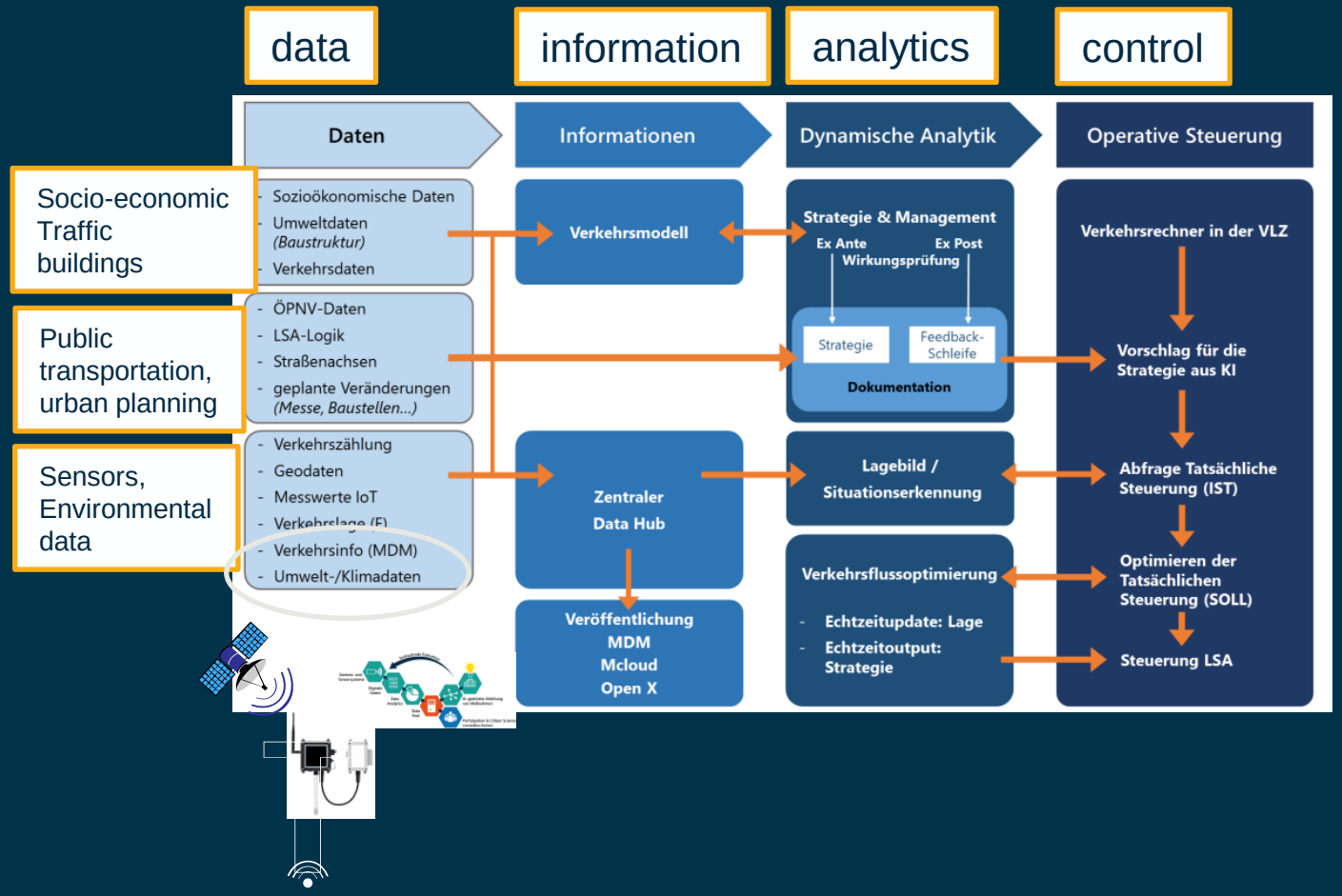




activities

Solutions supporting **sustainable urban transport** and **Mobility as a Service** (MaaS) combining public, private and multiple modes for transport users

Solutions to assess the **reduction of carbon emissions** and **particulate matter** in the urban and suburban areas

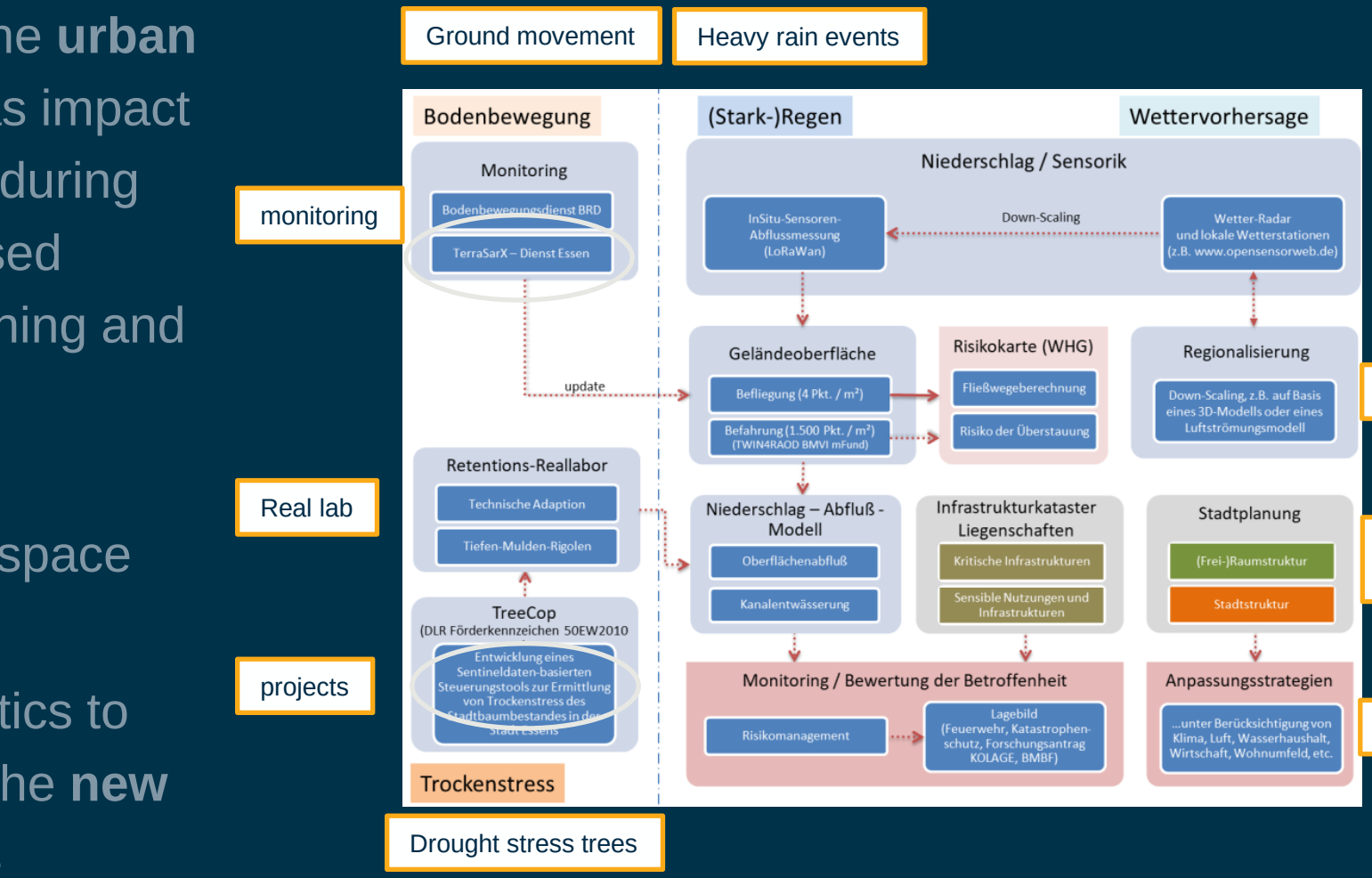


activities

Support the strengthening of the **urban disaster resilience**, such as impact from **floods** and protection during **heatwaves**, with space-based solution for a land-use planning and infrastructure

Support initiatives to enhance **biodiversity** by leveraging space and terrestrial technologies

Support the collection of analytics to build the evidence base of the **new services** and their **impacts**



You want more information?

Feel free to contact us.

We can also provide datasets from the mentioned activities.

The power of Space

Satellite Navigation

- Provide geo-tagging services for data collected by smartphones and IOT
- support the collection of crowd-sourced data

Earth Observation data

- provide diverse geospatial, environmental, weather, mapping information
- Support planning, monitoring, identification and maintenance of Urban Green

Satellite Communications

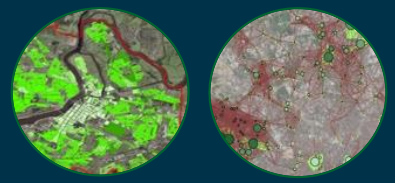
- will safely and securely provide connectivity in the absence of terrestrial communications or in case of terrestrial network failures
- will transmit data collected by in-situ sensors
- 5G convergence between SatCom and terrestrial communications

EO Platform

Presented by ESA representative- Marc Paganini

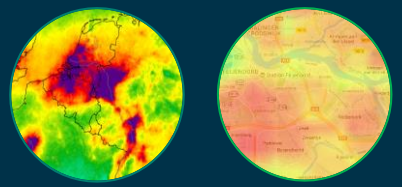
EO for sustainable and resilient cities

Green Areas/Networks



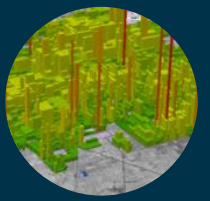
Urban Extent and Change

Urban Climate

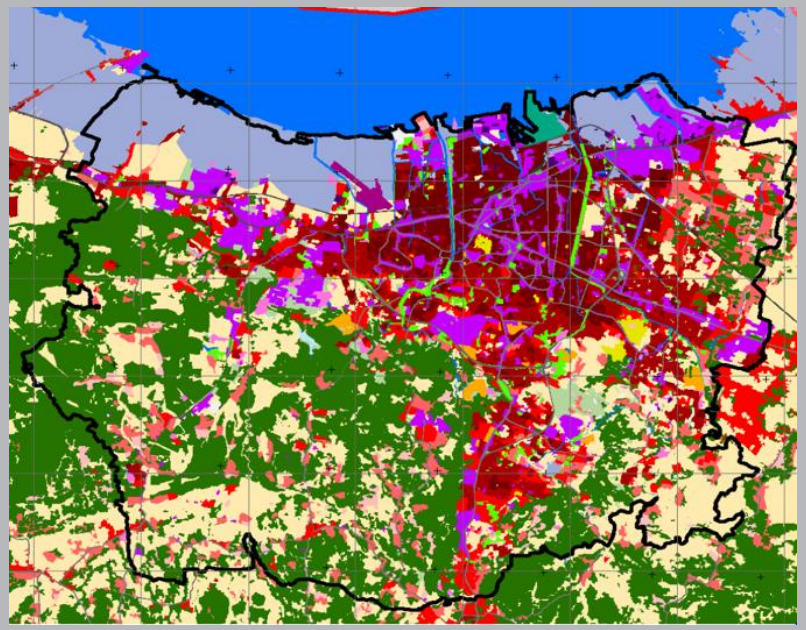


Building Footprint

Population Density



Baseline Products: Urban and Peri-Urban LU /LC

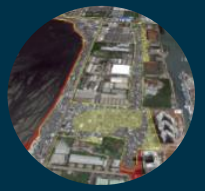


Detailed

Change

Transport Infrastructure

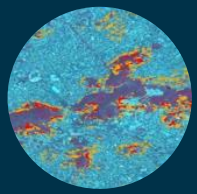
Informal Settlements



Waste Sites

Flood Risk

Landslide Risk



Terrain Motion

Big Data Era

Advent of steady satellite data streams

Sentinels Fleet

>20 TB per day

Mobilise the data revolution

Data are the foundation of urban development policies and program implementation

High Performance Computing Infrastructures

Building on ICT advances

The emergence of "big data" exploitation platforms

The power of the Cloud
The power of Partnerships

"Bringing the users to the data"

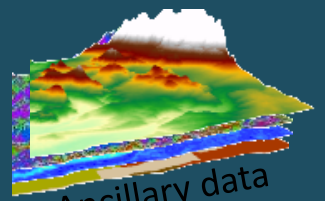
Platforms as enabling technology

Service providers

knowledge & algorithms

tools

Satellite data



Ancillary data
(land use, DEM, …)

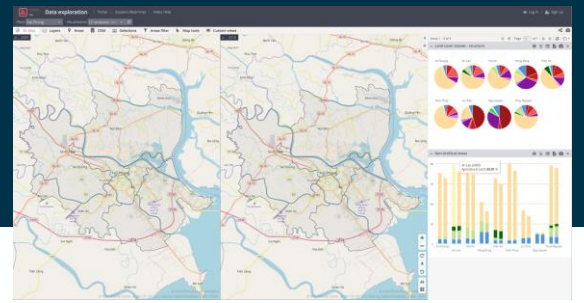
Processing & Storage Capacities

Toolboxes

Data Analytics

User knowledge & algorithms

User data

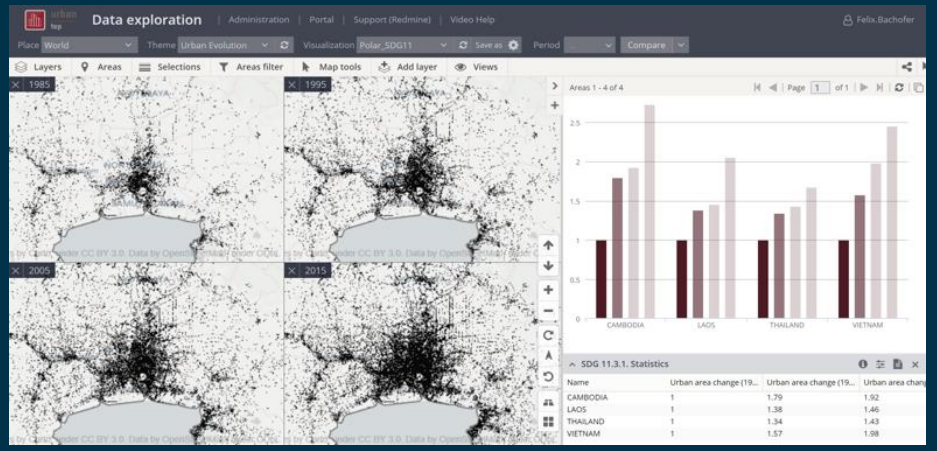


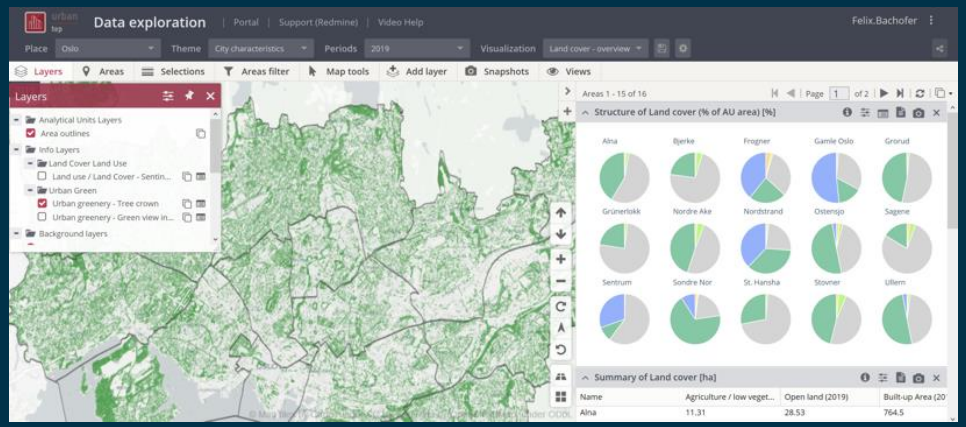
User generated results

Urban Thematic Exploitation Platform

Urban TEP (U-TEP)

a collaborative on-line infrastructure with multi-source data processing and data analytics for urban applications





… all **data** and **tools** needed to

… to access or generate **actionable information**

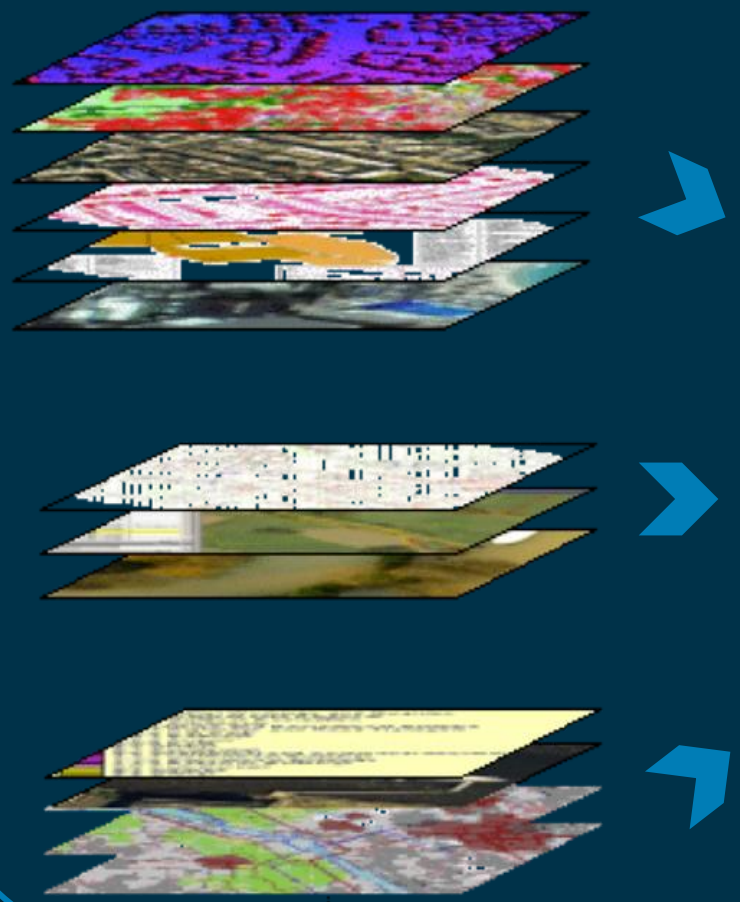
… in support of **sustainable** and **livable cities**…

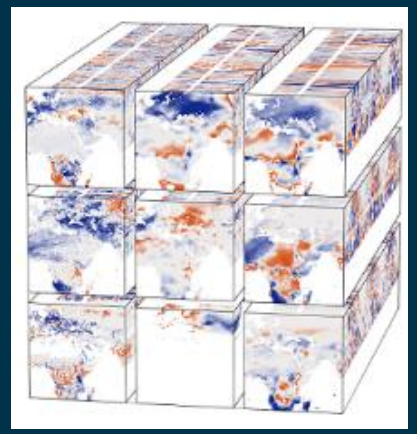
… available at **one place**

https://urban-tep.eu/

City datacubes for informed decision making

EURO DATA CUBE

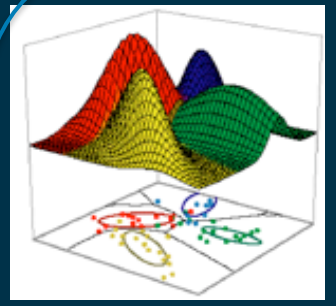


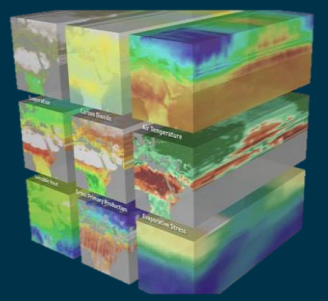


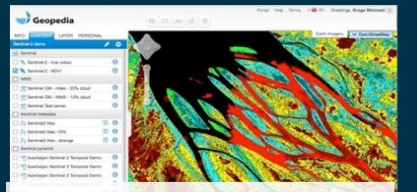
OGC

API

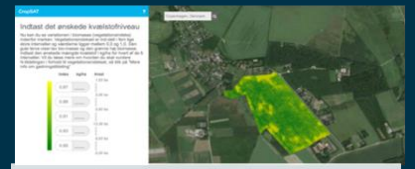
PYTHON



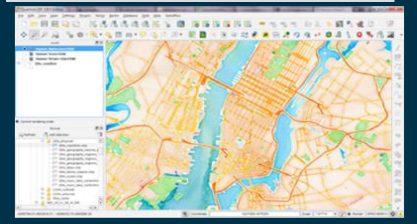




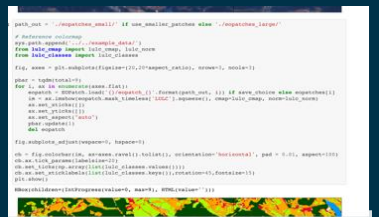
Cloud GIS



Web / Mobile apps

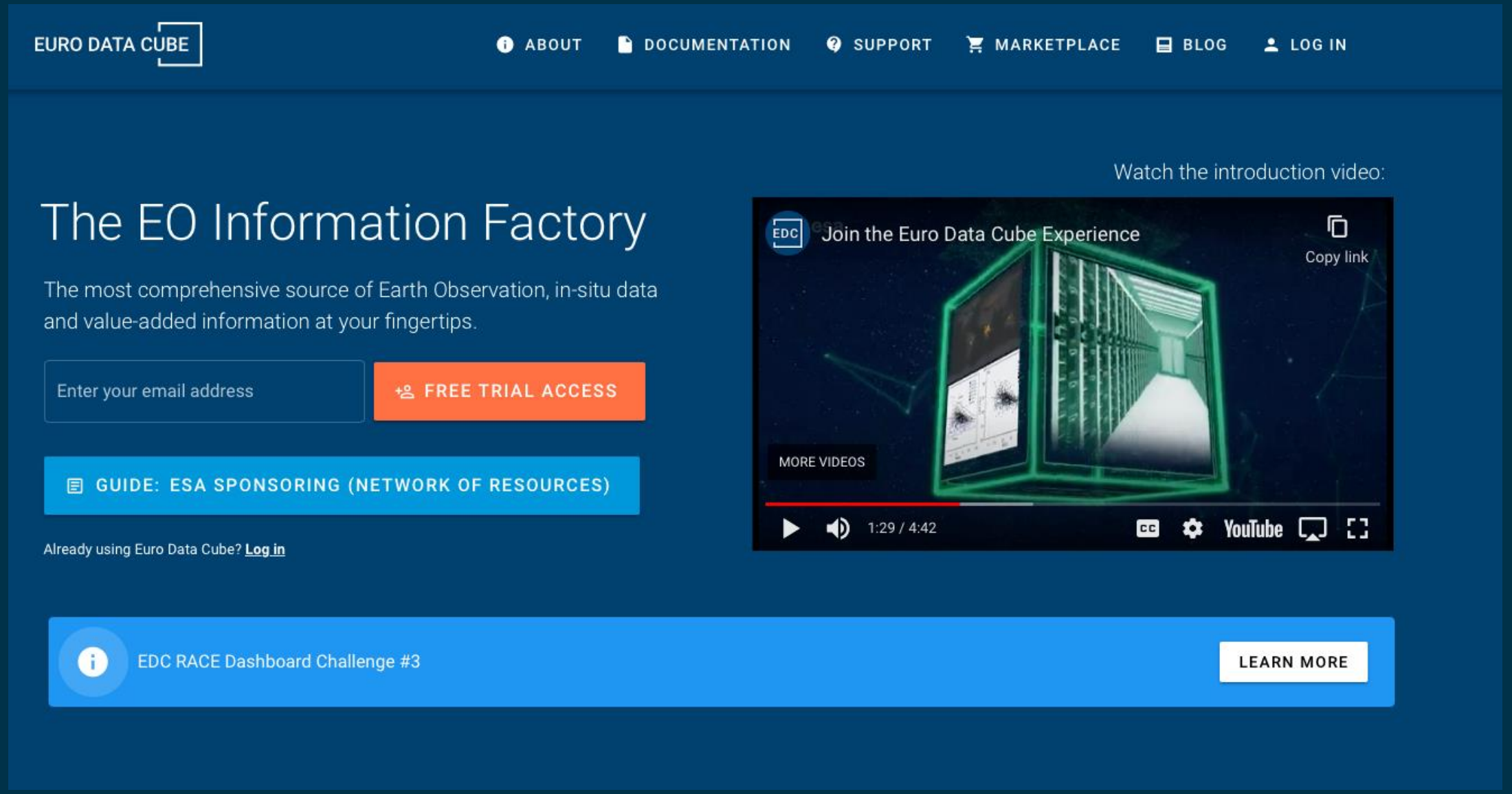


Desktop (QGIS,, ArcGIS…)



Scripting (R, Python, ENVI…)

Euro Data Cube https://eurodatacube.com



Network of Resources (NoR)

NoR Sponsorship

The NoR call aims to support research, development and pre-commercial users to innovate their working practices, moving from a data download paradigm towards a 'bring the user to the data' paradigm, considered essential for maintaining competitiveness of European data exploitation. The NoR Discovery Portal provides an ever increasing portfolio of innovative operational platform and cloud services operated by actors from participating countries[1]. Usage of these resources shall accelerate the achievement of scientific goals and the sharing of the results, or to approach the digital information market quicker and in an easier sustainable way.

The NoR will provide successful applicants with a voucher for the selected services, allowing free-at-point-of-use consumption for research, product development and up to pre-commercial demonstration. Vouchers must not be used to support any commercial revenue flows.

https://eo4society.esa.int/network-of-resources/nor-sponsorship/

User-driven initiative

- **User/Customer engagement is essential to**

  focus on relevant solutions for user & stakeholders communities, addressing their vision, needs, requirements, constraints, etc.,

- **User/Customer engagement is required**

  from the outset of the study and shall be reinforced by the Contractor during the whole study

  Letter(s) of interest/intent from relevant user/customer representative shall be provided with the proposal

ESA has established partnerships with some European Cities who have expressed their interest in being involved in the activity and in providing feedback in relation to the study results.

How to apply:
Funding and Tender Information

ESA TENDER INFORMATION

Funded participation to ESA Space Solutions is open to any company and/or organisation, be it as group of users, public body or non-governmental organisation, residing in the following Member States:

Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden and Switzerland.

HOW TO APPLY

1. **Register** (minimum 'light registration') by completing online questionnaire on ESA-STAR Registration (esastar-emr.sso.esa.int)
2. **Download** the official tender **documentation** (Invitation to Tender), which will be available as soon as the ITT is open via ESA-STAR, ITT number is AO10973
3. Create 'Bidder Restricted Area' in ESA-STAR
4. **Write your Proposal** using the template provided in the Tender documentation and obtain **Letter of Authorization** from your National Delegation (business.esa.int/national-delegations)
5. **Submit** your proposal via 'Bidder Restricted Area' in ESA-STAR Tendering (esastar.sso.esa.int)

More info can be found here:
esa.int/About_Us/Business_with_ESA/How_to_do/esa-star_Registration_Process

BASIC PRINCIPLES - ESA-STAR

ESA-STAR Registration https://esastar-emr.sso.esa.int

- For more information, please visit :

business.esa.int

THANK YOU!

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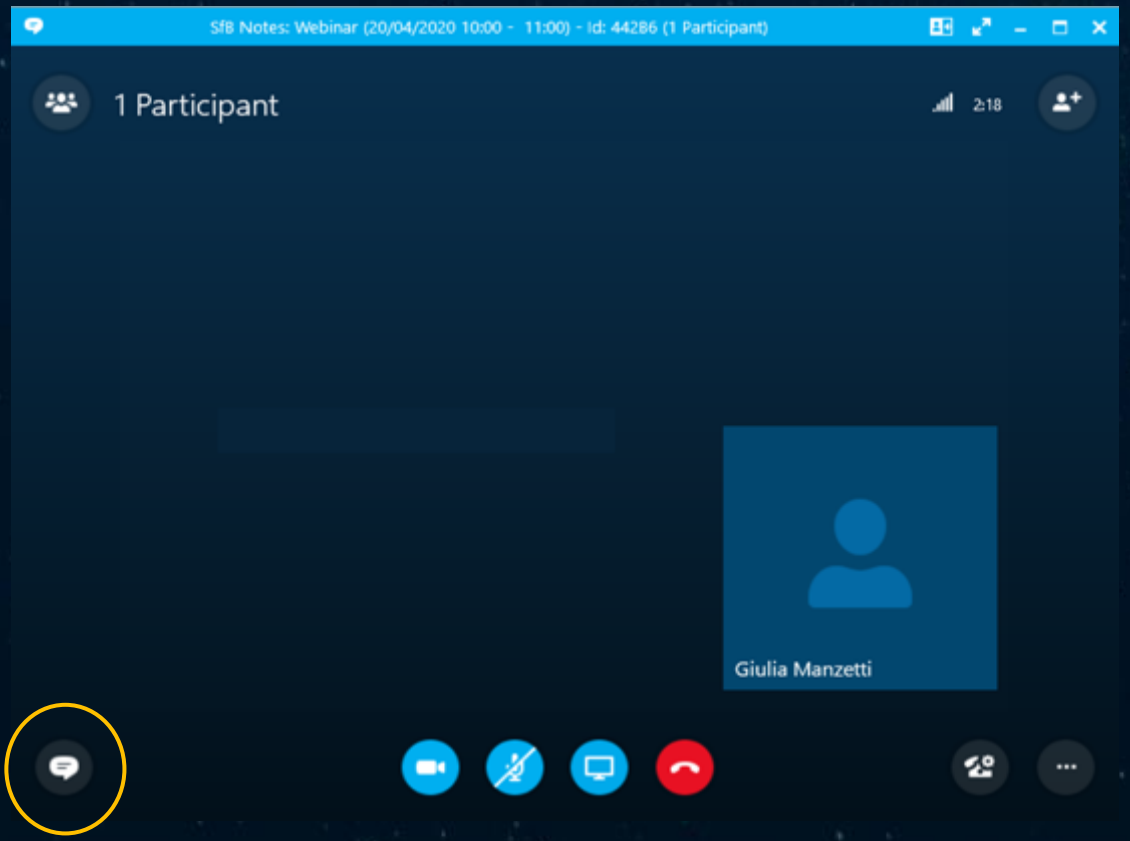
OPEN QUESTION & ANSWER SESSION