International Spatial Data Workshop 2026

Fostering policy cooperation and leveraging shared European expertise to establish Hungary's National Spatial Data Ecosystem (NSDE).

ESA Earth Observation Data Management, Platforms and AI



Dr. Nicolaus Hanowski

Head of ESA EO
Mission Management
& Ground Segments

9-October-2026

EUROPEAN SPACE AGENCY

EUROPEAN SPACE AGENCY

ELEVATING THE FUTURE OF EUROPE IN SPACE

THROUGH EUROPEAN COOPERATION AND WITH INTERNATIONAL PARTNERS

23 MEMBER STATES
4 associate members
1 cooperating state

6500 ESA WORKFORCE

IMPLEMENTS
60%
OF THE EUROPEAN SPACE BUDGET

150+
missions delivered
30+
missions upcoming

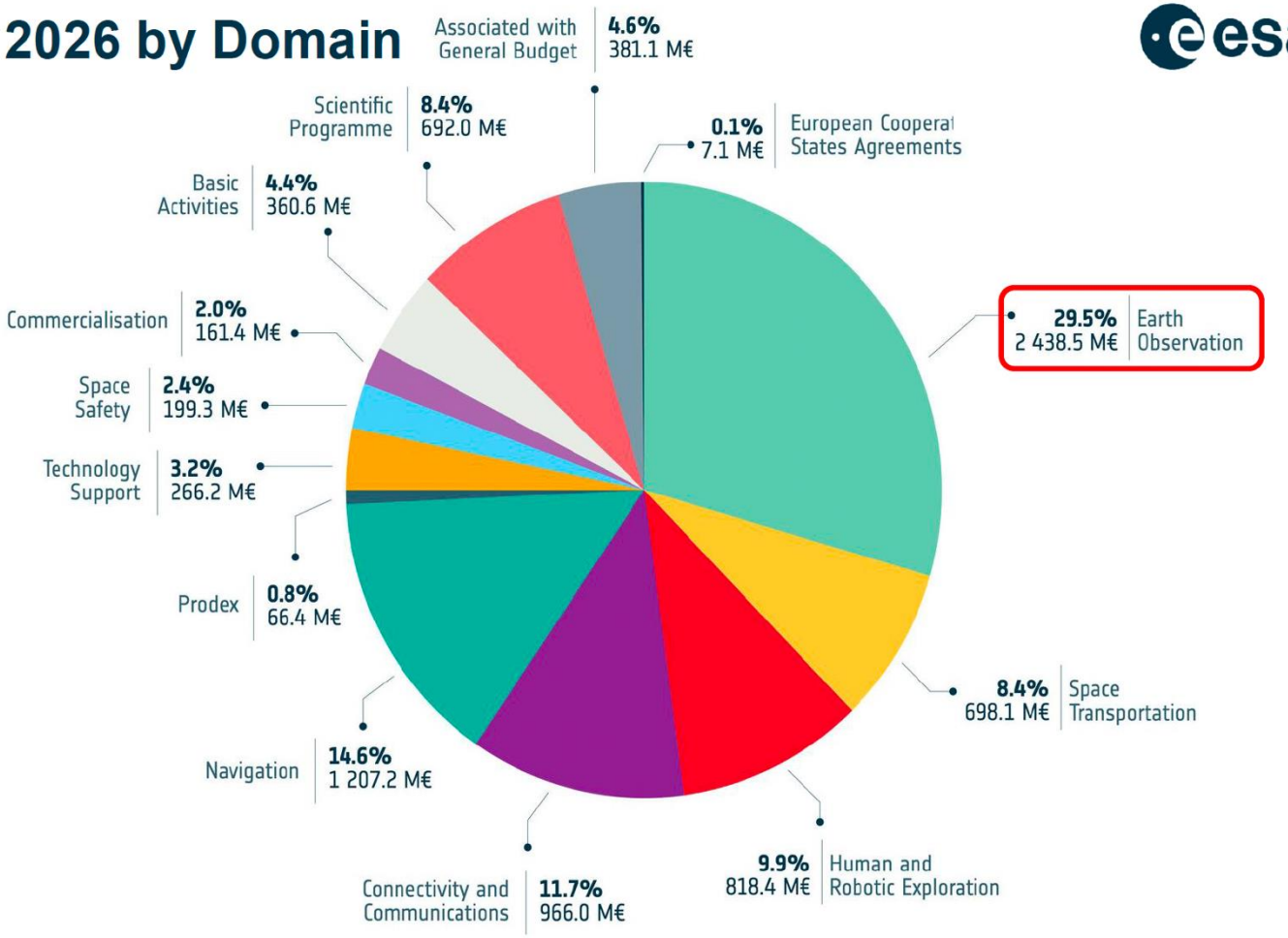
2026 BUDGET
€8.26B

€15
per European



ESA Budget for 2026 by Domain

(~30% for EOP)

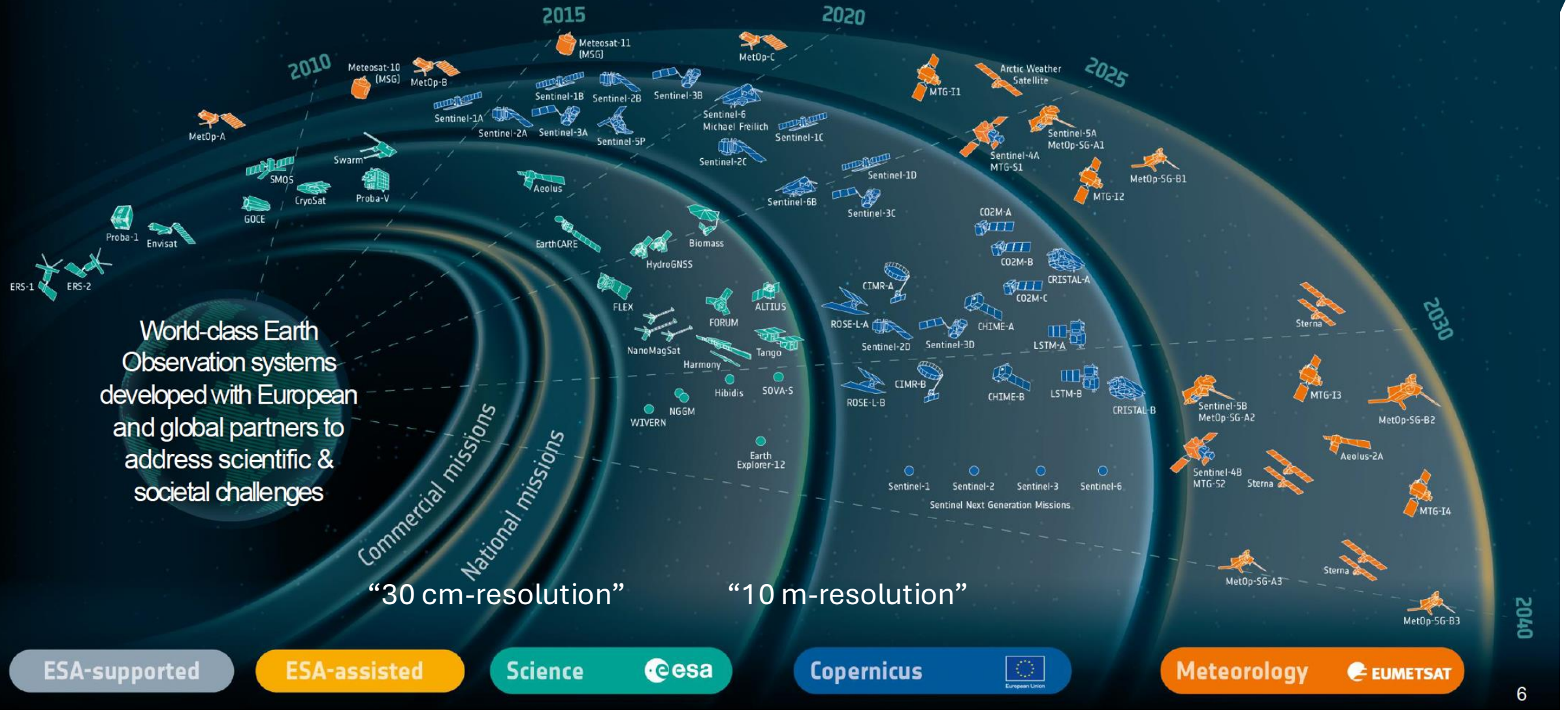


TOTAL
8.26 B€

* Includes activities implemented for other institutional partners

ESA's EO Missions

Satellites**: Heritage **08** / Operational **24** / Developing **38** / Preparing **39** / Total **109



ESA EO Mission and Data Management

Europe spends more on Earth Observation than the US !

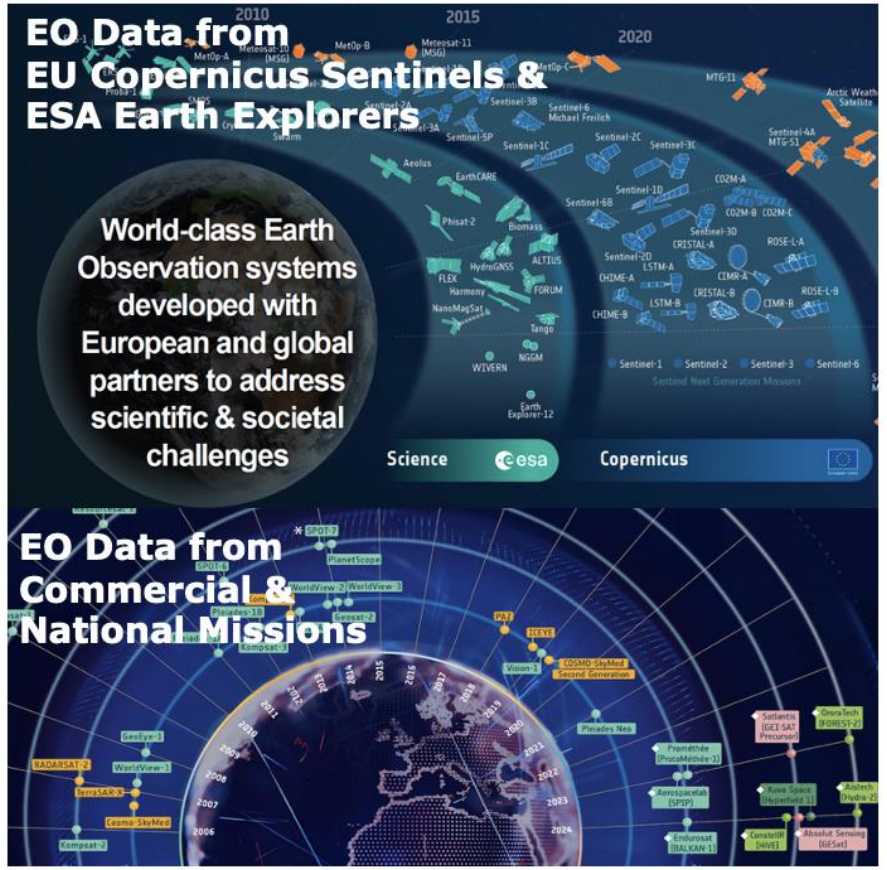
ESA EO Data Management → largest system in the World

- Acquisition
- Production/Processing
- Access & Access Services
- Dissemination
- Archiving
- Authentication
- Calibration
- Quality
- Security
- etc.

Daily Dissemination:
~ 500 Tbyte

Registered users:
~ 1.000.000

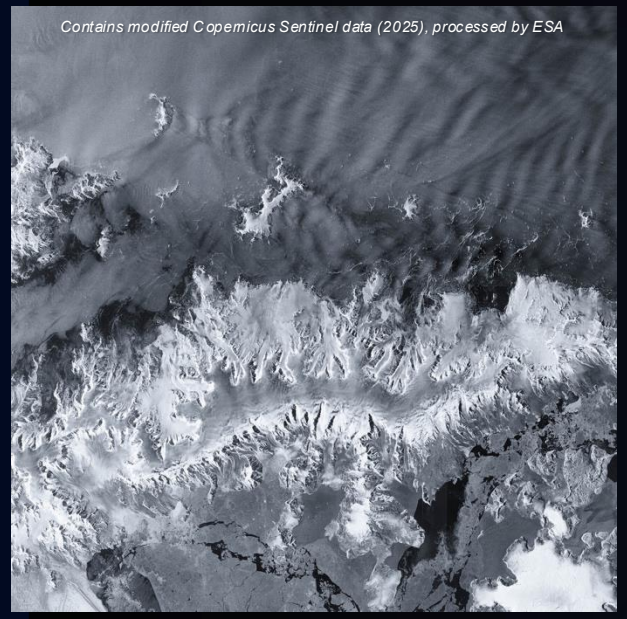




- **ESA EO Data is free on open**
- **ESA EO Data are used for: Operating Systems – Commercial Services – Science**
- **AI boosts ESA EO data use**

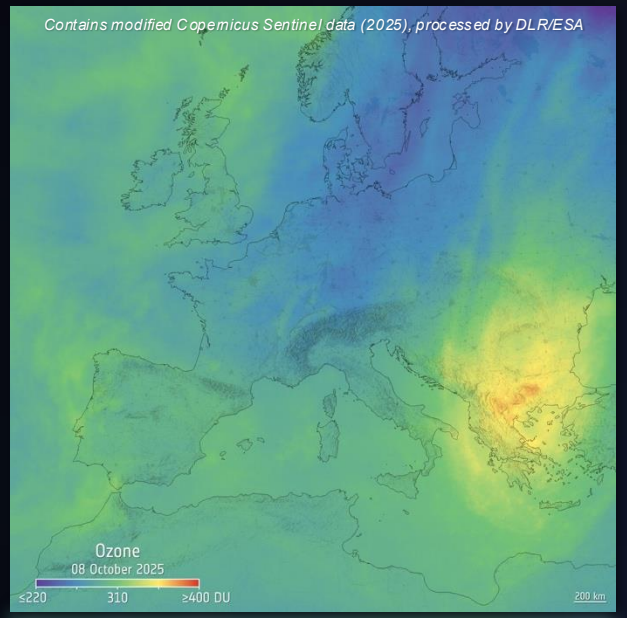
Sentinel First Generation – Excellent First data of S1D, -4A & -5A -6B

Sentinel-1D



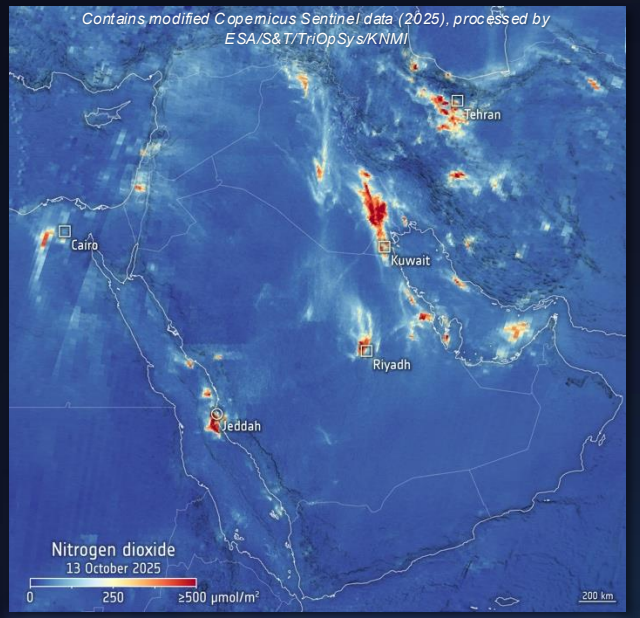
Black and White radar image of Antarctic Peninsula captured on 6 November 2025

Sentinel-4A



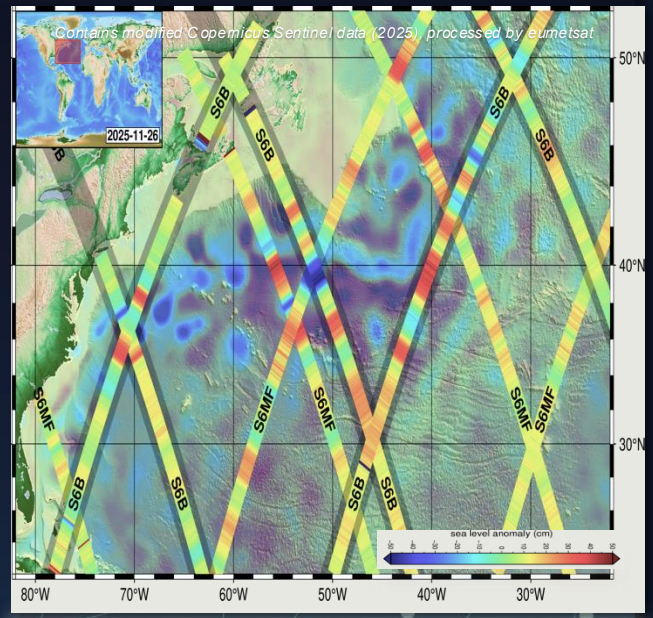
Vertical column of ozone over Europe, captured on 8 October 2025

Sentinel-5A



Vertical column density of nitrogen dioxide over the Middle East, captured on 13 October 2025

Sentinel-6B



Altimeter ground tracks of Sentinel-6B and MF showing the Gulf Stream current in the North Atlantic Ocean

Copernicus BROWSER

EN | Log in

VISUALISE | SEARCH

2026-07-24 | 30%

CONFIGURATION:

Default

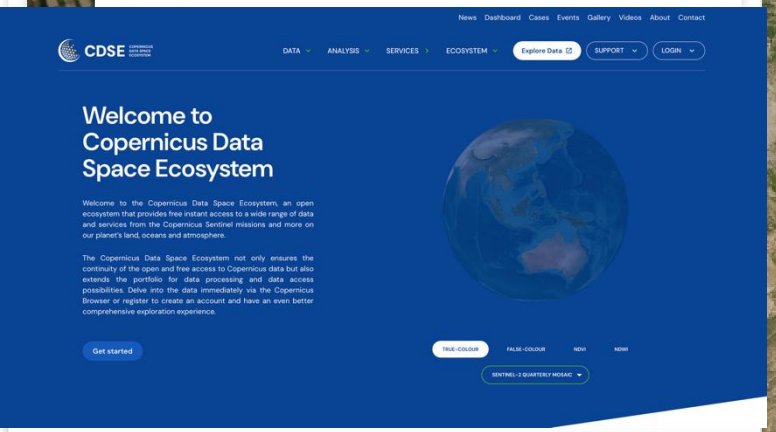
Sentinel-2 L2A

LAYERS:

True color
Based on bands B4, B3, B2
+ Add to </>

False color
Based on bands B8, B4, B3

Highlight Optimized Natural Color
Enhanced natural color visualisation



About | Support

v1.51.0

Go to Place

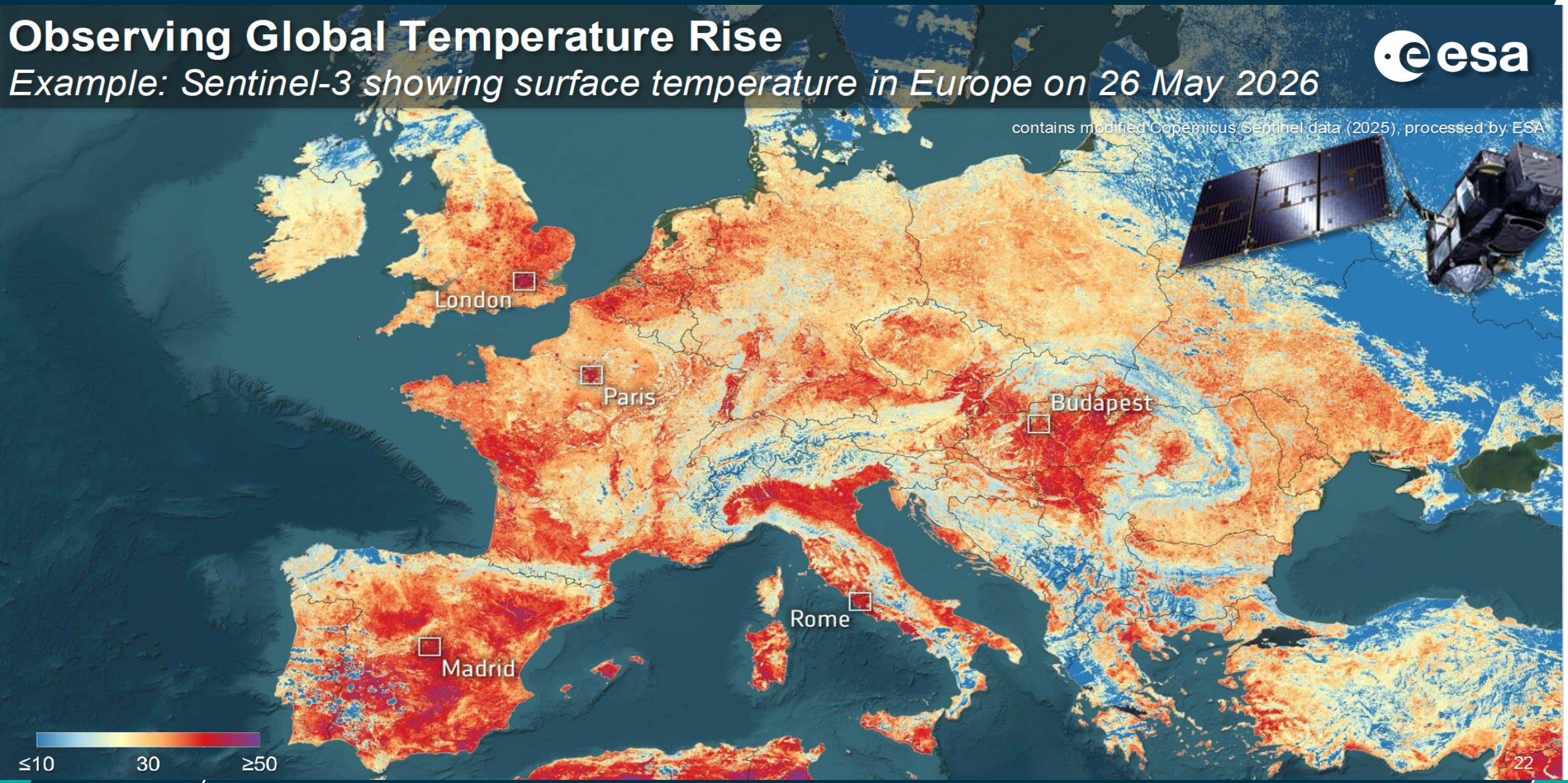
Leaflet | © OpenStreetMap contributors - Disclaimer, © Sentinel Hub

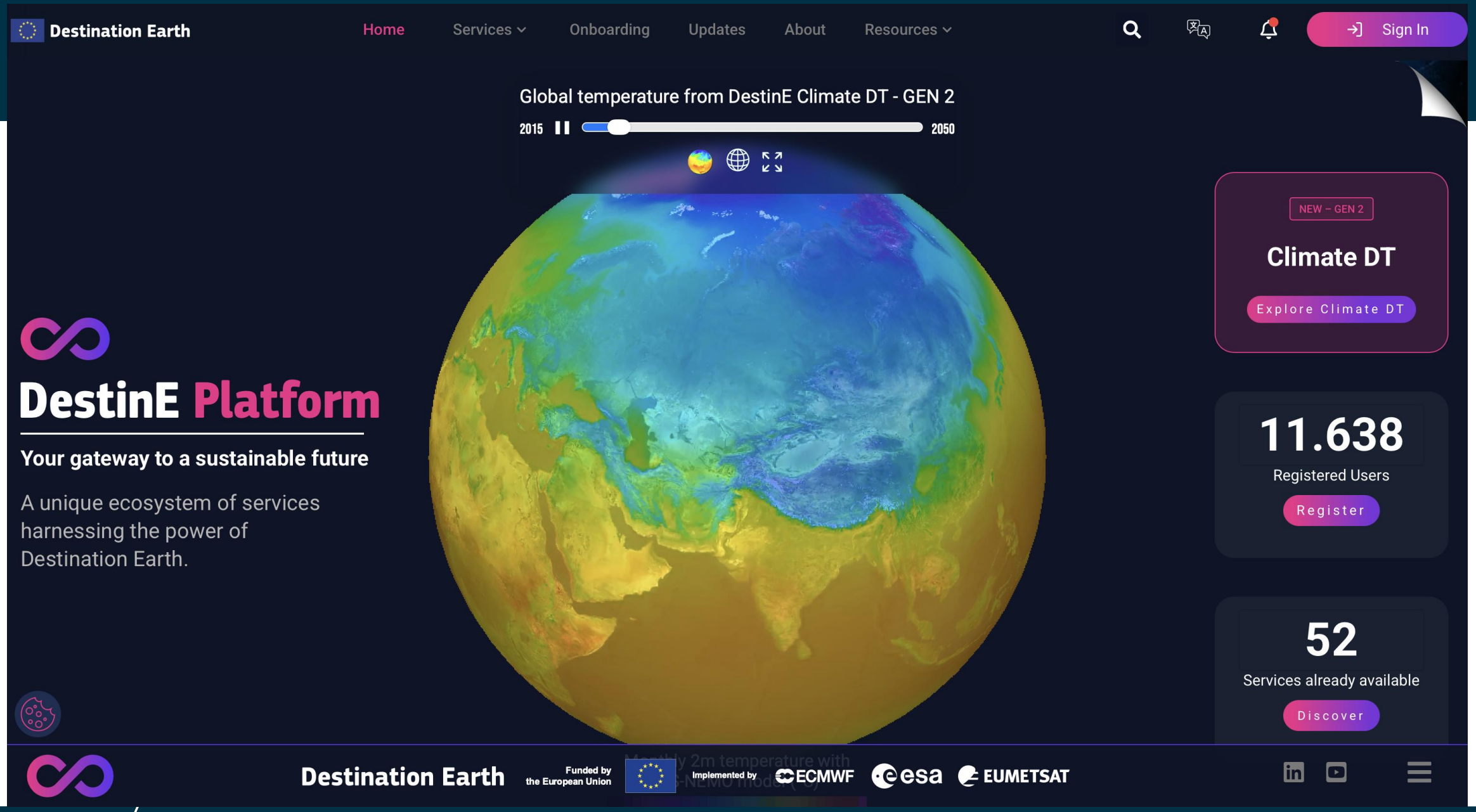
Lat: 40.3581, Lng: -4.8903

10 km

Observing Global Temperature Rise

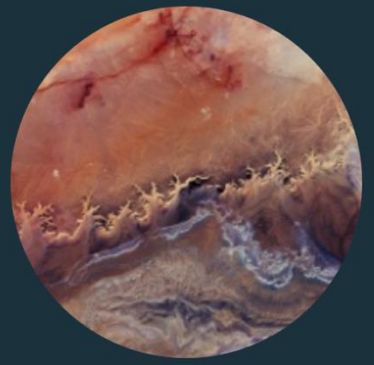
Example: Sentinel-3 showing surface temperature in Europe on 26 May 2026




Destination Earth
Home
Services
Onboarding
Updates
About
Resources
Sign In
Global temperature from DestinE Climate DT - GEN 2
2015
2050
DestinE Platform
Your gateway to a sustainable future
A unique ecosystem of services harnessing the power of Destination Earth.
NEW – GEN 2
Climate DT
Explore Climate DT
11.638
Registered Users
Register
52
Services already available
Discover
Destination Earth
Funded by the European Union
Implemented by
ECMWF
esa
EUMETSAT

EARTH ONLINE

Earth Online presents news and information on European Space Agency activities in the field of Earth observation. The website offers information about ESA's Earth Observation data, and the satellite missions and instruments that acquire this data.



MISSIONS



DATA



TOOLS



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Discover the latest news on the European Space Agency's Earth Observation activities. Learn all about new data availability and how ESA's missions are performing.

ESA (EO) Information System - EIS

AI ready !



Integrated (EO) Data Access Solution

→ Moving from Peta-Bytes to Exa-Bytes

→ 25 Mio. contract awarded to OVH et al.

→ First instances will be rolled-out in 6 months

→ EIS will have ESA-Identity web-portal

→ An advanced European data management solution !

EIS

Data Base Managament replaces file-based Data Management

Processor development and processing become mostly obsolete

AI Ready Extraction of Information through embeddings

Reference environment for:

Copernicus Space Component EO data processing algorithms development, processor prototyping, evolution and maintenance;

ESA Digital Twin Components prototyping, development, evolution and maintenance;

Access to reference data sets for data processing and Artificial Intelligence (AI) modelling and training;

Development of innovative EO data management workflows with AI/ML technologies;

Efficient exploitation of very large EO data sets.

Key Considerations for EO Platforms and AI

- Trade-off openness and vulnerability
- Destributed systems are more resilient
- Key challenges are governance and liability (not technical)
- Re-produceable and traceable workflows are mandatory
- Input data integrity needs to be assured
- Flexibility to integrate into user-information environment



- Sustainability, completeness, timeliness, quality and integrity of data & information (commercial !)
- Institutional alignement (EU, ESA, EUMETSAT, ECMWF, etc.)
- Information too critical for exclusive AI-based management