

ERATOSTHENES Centre of
Excellence (ECoE)



ERATOSTHENES:
Excellence Research Centre for Earth Surveillance
& Space-Based Monitoring of the Environment

1st virtual EXCELSIOR International Technical Workshop

15 July 2020

**The Copernicus Space Segment –
current and future Sentinels**

@excelsior2020eu



Simon Jutz, ESA

Head of the Copernicus Space Office



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 857510



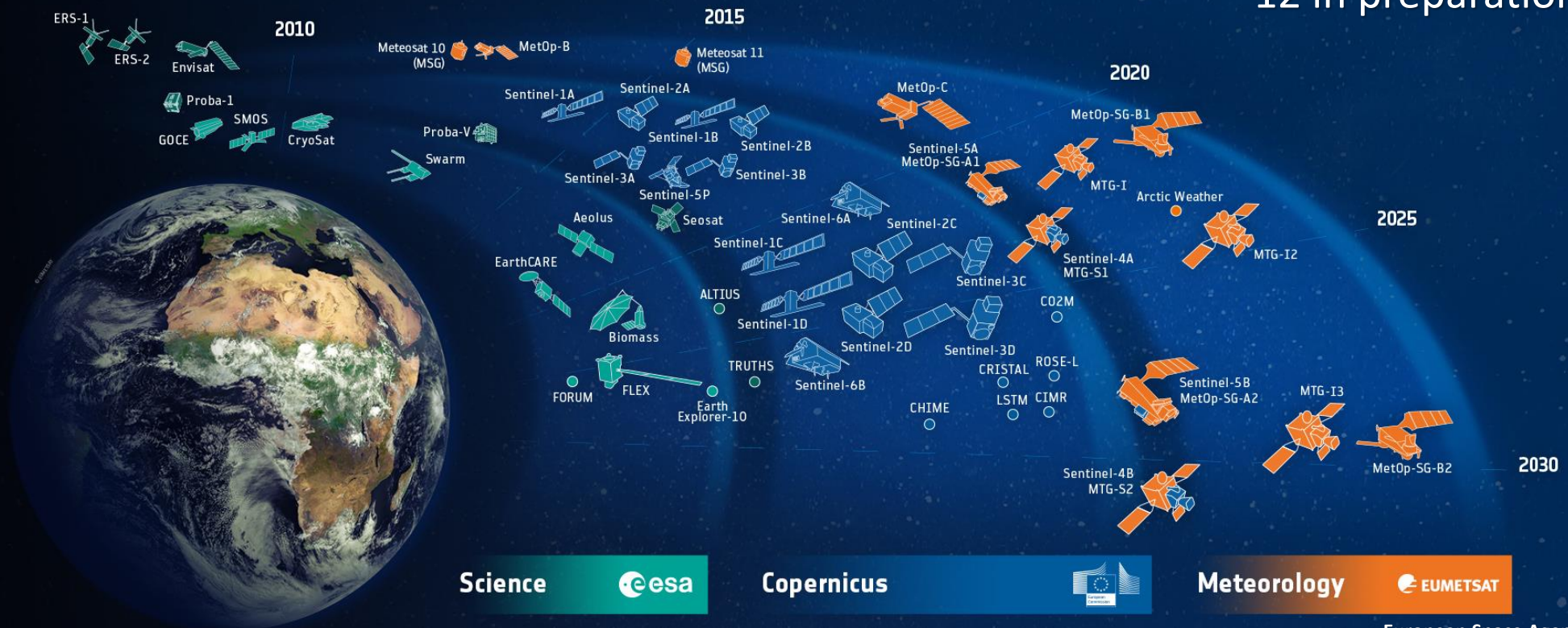
This project has received funding from the Government of the Republic of Cyprus through the Directorate General of the European's Programmes, Coordination and Development

CONSORTIUM

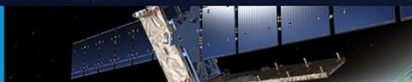


ESA-Developed Earth Observation Satellites

15 in operation
28 under development
12 in preparation



Copernicus Sentinels (First Generation)



sentinel-1

→ RADAR VISION



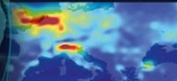
sentinel-2

→ COLOUR VISION



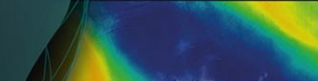
sentinel-3

→ A BIGGER PICTURE



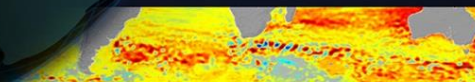
sentinel-4

→ EUROPEAN AIR MONITORING



sentinel-5p | sentinel-5

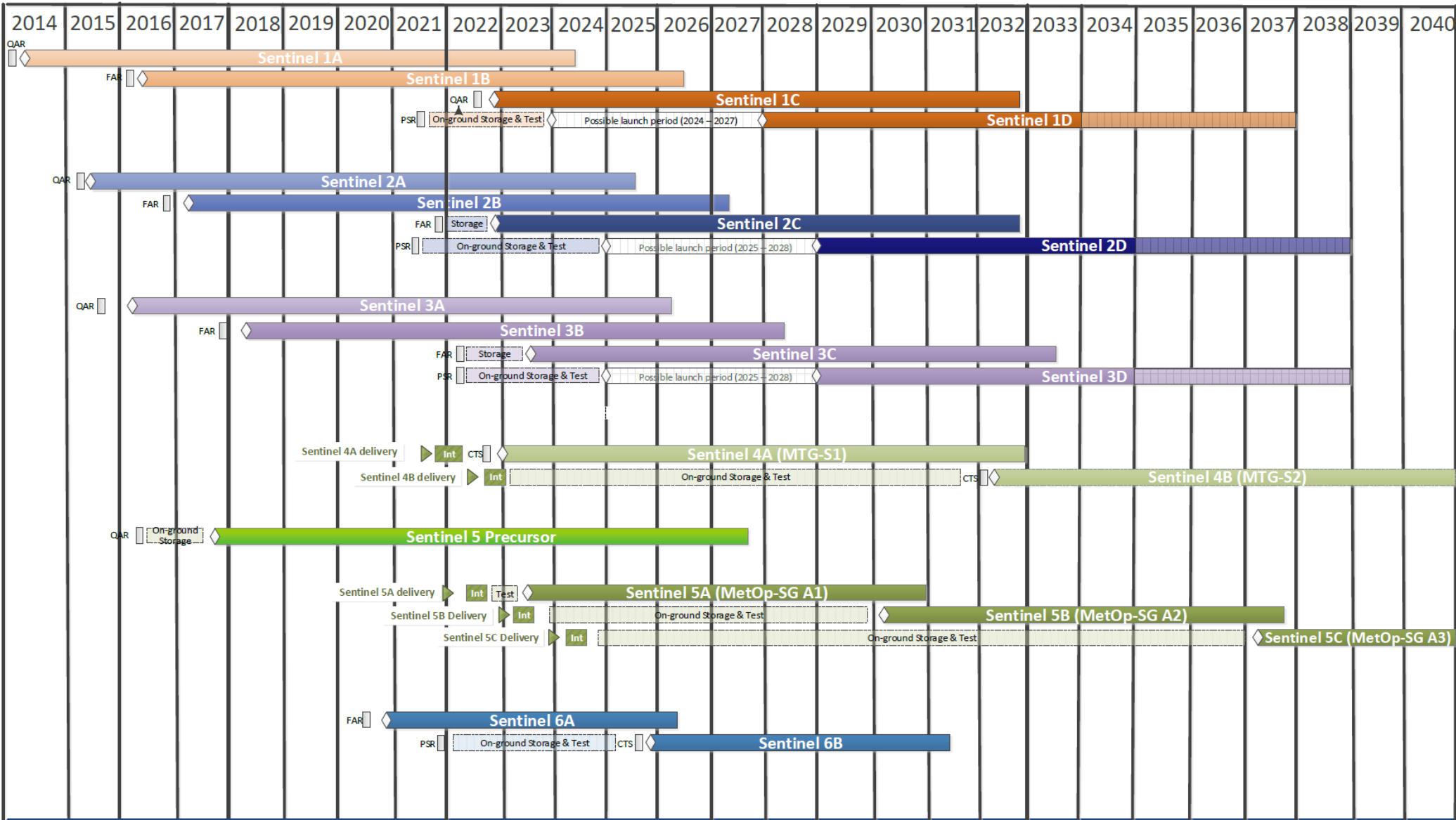
→ GLOBAL AIR MONITORING



sentinel-6

→ CHARTING SEA LEVEL





Legend:

Qualification Acceptance Review (QAR)
 Flight Acceptance Review (FAR)
 PreStorage Review (PSR)
 Consent to Ship (CTS)

On-ground Storage & Test Satellite On-ground Storage & Test
 Satellite Test Satellite Assembly, Integration & Test

Int Integration
 Tentative Launch Date

Launch 10 November 2020, Falcon 9 from Vandenberg



European Union



sentinel-6 michael freilich

CHARTING SEA LEVEL



European Space Agency

Space Component Evolution of Copernicus 2.0

2021 to 2027

- Building on the Success of Copernicus



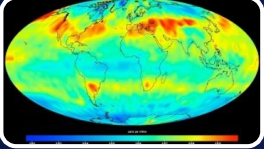
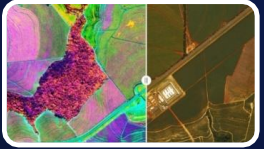
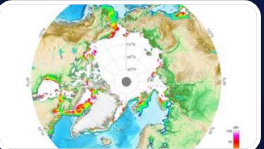
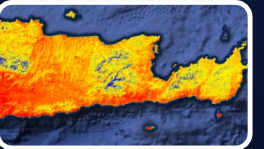

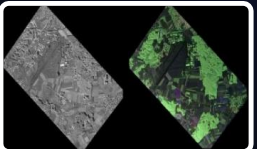
Next Generation Sentinels
= Continue current observations
(Sentinel 1-6)

High Priority Candidate Missions
= Satisfy emerging policy & user needs
(Sentinel 7+)

→ **Copernicus Long Term Scenario**

- Generated in close coordination of EC – ESA – EUMETSAT

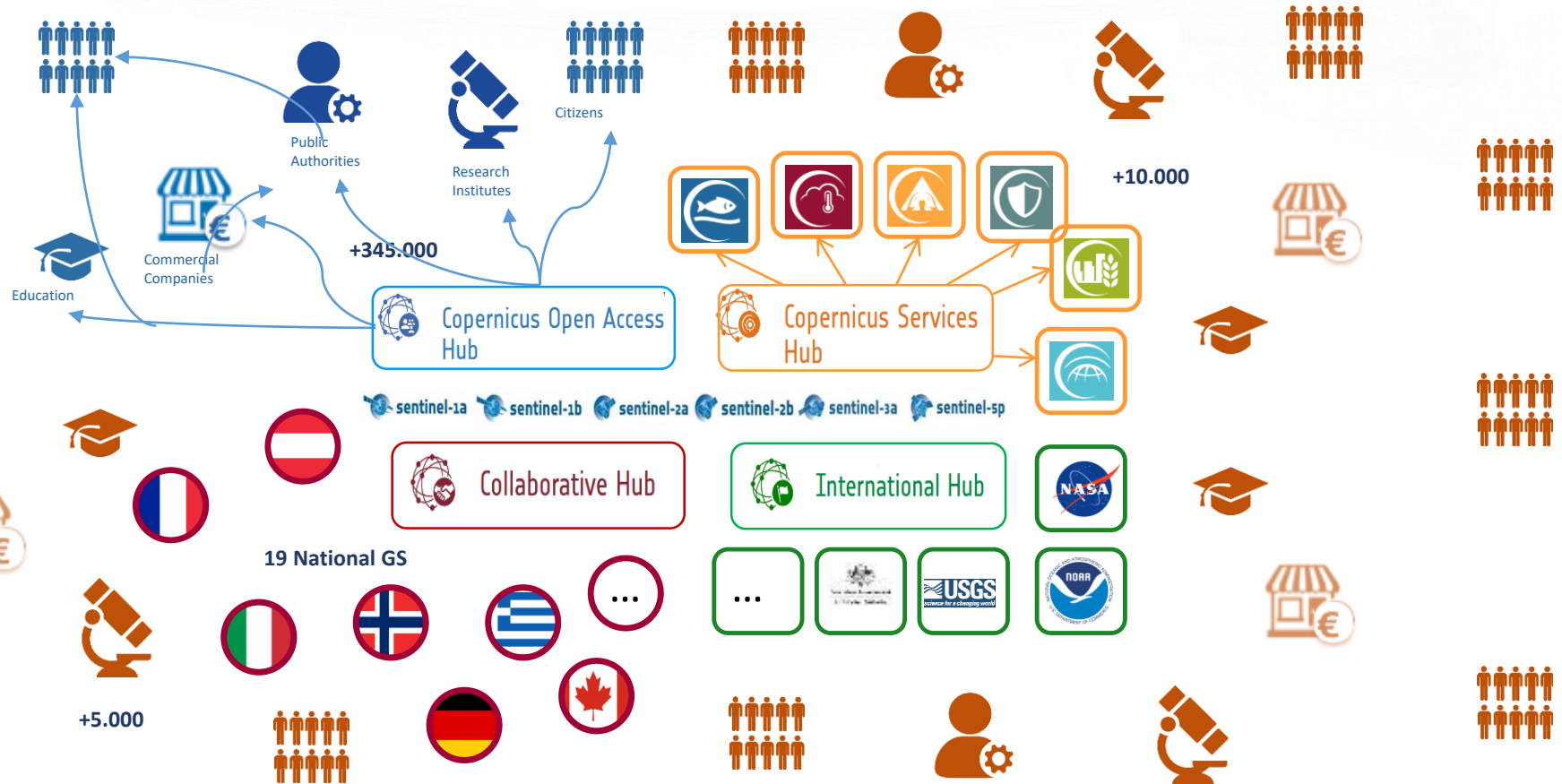
→ **Joint Operations Concept of ESA & EUMETSAT**

High Priority Candidate Missions		Measurements
	CO2M: Anthropogenic CO ₂ Monitoring	Climate change (causes)
	CHIME: Copernicus Hyperspectral Imaging Mission for the Environment	Services for food security, agriculture management, food security, soil and mineral resources
	CIMR: Copernicus Imaging Microwave Radiometer	Sea surface temperature, sea ice concentration & extent, sea surface salinity, soil moisture
	LSTM: Copernicus Land Surface Temperature Monitoring	Thermal Infrared observations over land & coastal regions for Agriculture & Urban management services
	CRISTAL: Copernicus polar Ice & Snow Topographic Altimeter	Climate change (effects), i.e. Sea-ice thickness and snow depth, ocean surface elevation and changes of glaciers
	ROSE-L: Radar Observing System for Europe L-band SAR	Forests, Agriculture and high-resolution monitoring of Arctic & Cryosphere, services in Disasters & Geohazards monitoring



To be updated according to funding availability & EU policy priorities

Copernicus Sentinels Data Reach-Out



dashboard.copernicus.eu



Copernicus Open Access Hub



LATEST NEWS



343,927 Self registered Users



160,402,389 Products Downloaded
86.97 PB Volume Downloaded



S1, S2, S3 NTC: 1 year
S3 NRT/STC: 1 month
S5P NRT: 1 month
S5P OFFL: 2 years



LTA Yes



Sentinel-1 NTC
Sentinel-2
Sentinel-3 OLCI
Sentinel-3 SLSTR
Sentinel-3 SRAL
Sentinel-3 SYN
Sentinel-5P (preops)



Max 2 concurrent Downloads



Collaborative Hub



LATEST NEWS



19 Collaborative GS
7 Data Hub Relays



115,562,506 Products Downloaded
79.68 PB Volume Downloaded



Node1: S1, S2, S3 NTC 1 year
S1 NRT 1 month
S3 NRT/STC 1month

Node2: 2 weeks
Node3 3 weeks



LTA Yes



Sentinel-1 NRT & NTC
Sentinel-2
Sentinel-3 OLCI
Sentinel-3 SLSTR
Sentinel-3 SRAL
Sentinel-3 SYN



Max 10 concurrent downloads



International Hub



LATEST NEWS



9 International Agreements



24,602,312 Products Downloaded
17.13 PB Volume Downloaded



3 weeks



LTA No



Sentinel-1 NTC
Sentinel-2
Sentinel-3 OLCI
Sentinel-3 SLSTR
Sentinel-3 SRAL



Max 10 concurrent downloads



Copernicus Services Hub



LATEST NEWS



288 Registered Users



123,111,885 Products Downloaded
74.69 PB Volume Downloaded



S1, S2, S3 NTC: 1 year
S1 NRT: 1 month
S3 NRT/STC: 1 month



LTA Yes for S1



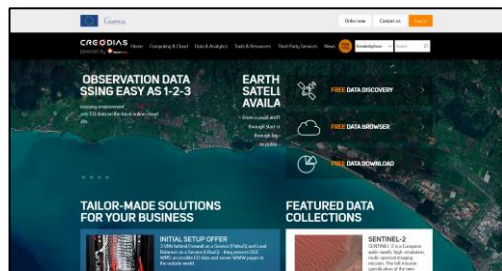
Sentinel-1 NRT & NTC
Sentinel-2
Sentinel-3 OLCI
Sentinel-3 SLSTR
Sentinel-3 SRAL
Sentinel-3 SYN



Max 10 concurrent downloads

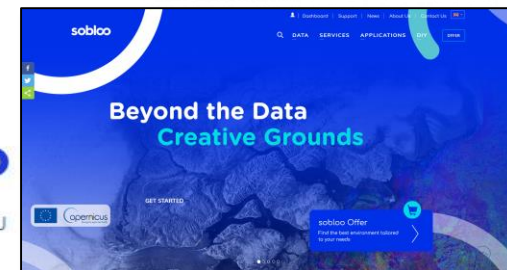
copernicus.eu/en/access-data/dias

THE DIAS & WHERE TO REACH THEM



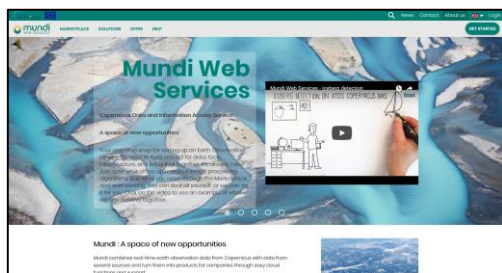
CREODIAS

WWW.CREODIAS.EU



sobloo

WWW.SOBLOO.EU



mundi
WEB SERVICES

WWW.MUNDIWEBSERVICES.COM

ONDA

WWW.ONDA-DIAS.EU



WEKEO
BY EUMETSAT

WWW.WEKEO.EU



Copernicus Dashboard

> 345.000
registered users

~2 billion
downstream users



Land



Atmosphere



Ocean



Climate



Disaster



Security

6 operational services



250 TB satellite data
distributed per day



full, free & open
data policy

7 Copernicus Sentinel flying

S1

S2

S3

S4

S5P

S5

S6



preparing Copernicus 2.0

EU and the Commission

Commission
published MFF
2021-2027
proposal on 27
May 2020 –

driven by
Covid-19 crisis >>
incl. Recovery
Fund:
2049 Billion €
(c.e.c.)



General ESA EOP Actions on COVID-19

Rapid Action on COVID and EO

ESA-EC Task Force to monitor & analyse changes over Europe (see details next slide)

Online Dashboard launched online on 5 June

ESA EO Science for Society Permanently Open Call, new topic:

“How can EO data help with monitoring Covid-19 impacts on the society?”



International Cooperation

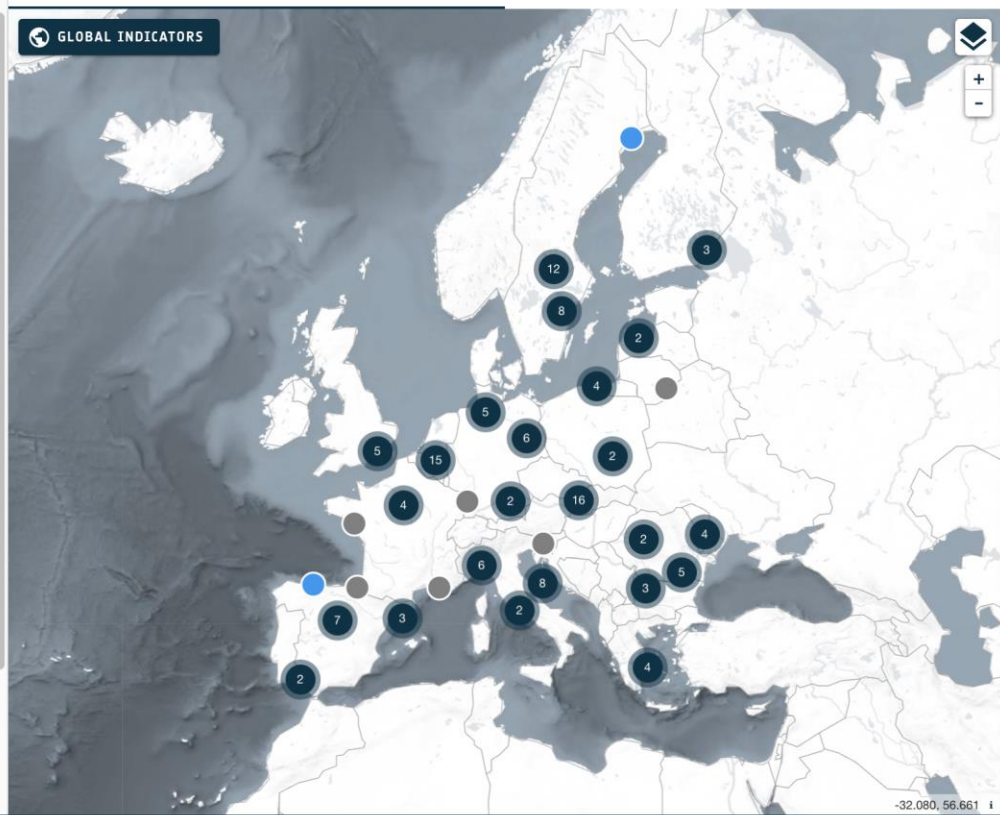
With **JAXA** and **NASA** on data exchange & joint capabilities

Programmatic measures

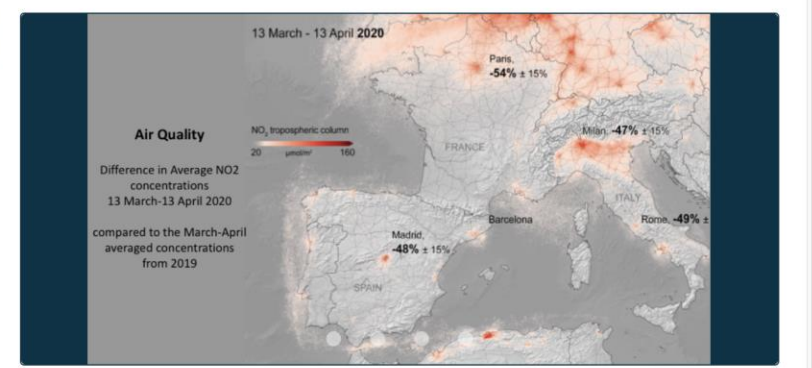
On ESA and EOP level to ensure **business continuity** and **support to industry**

<https://race.esa.int/>

- 🇪🇺 All countries
- 🇦🇹 Austria
- 🇧🇪 Belgium
- 🇧🇬 Bulgaria
- 🇦🇷 Croatia
- 🇨🇪 Czechia
- 🇫🇮 Finland
- 🇫🇷 France
- 🇩🇪 Germany
- 🇬🇷 Greece
- 🇭🇺 Hungary
- 🇮🇹 Italy
- 🇱🇻 Latvia
- 🇱🇮 Lithuania
- 🇱🇺 Luxembourg
- 🇲🇩 Moldova
- 🇳🇱 Netherlands
- 🇵🇱 Poland
- 🇷🇴 Romania
- 🇸🇰 Slovakia



COVID-19 Impact seen by Satellite



€ 65
Economic Indicators

8
Agriculture Indicators

4
Environment Indicators

How to use the Dashboard

- Select **INDICATORS** and **COUNTRIES** from the lists
- Click on available data on the **MAP**, and in the **TABLE**
- Interact with the **CHARTS**, inspect the **EO Data**, learn more from the narratives and external resources
- To reset the map view, click on **ALL COUNTRIES**, **ALL INDICATORS**

Color Legend

- Better than baseline
- As baseline
- Worse than baseline
- Upcoming data
- Global data



*Lena delta (Russia)
(30 July 2017)*



- Copernicus Programme: copernicus.eu
- Sentinel Online: sentinels.copernicus.eu
- ESA Sentinel app (iOS and Android)