The Importance of VHR Radar & Optical Data in EO

Very High-resolution Radar & Optical Data Assessment workshop
Frascati, 18 November 2019

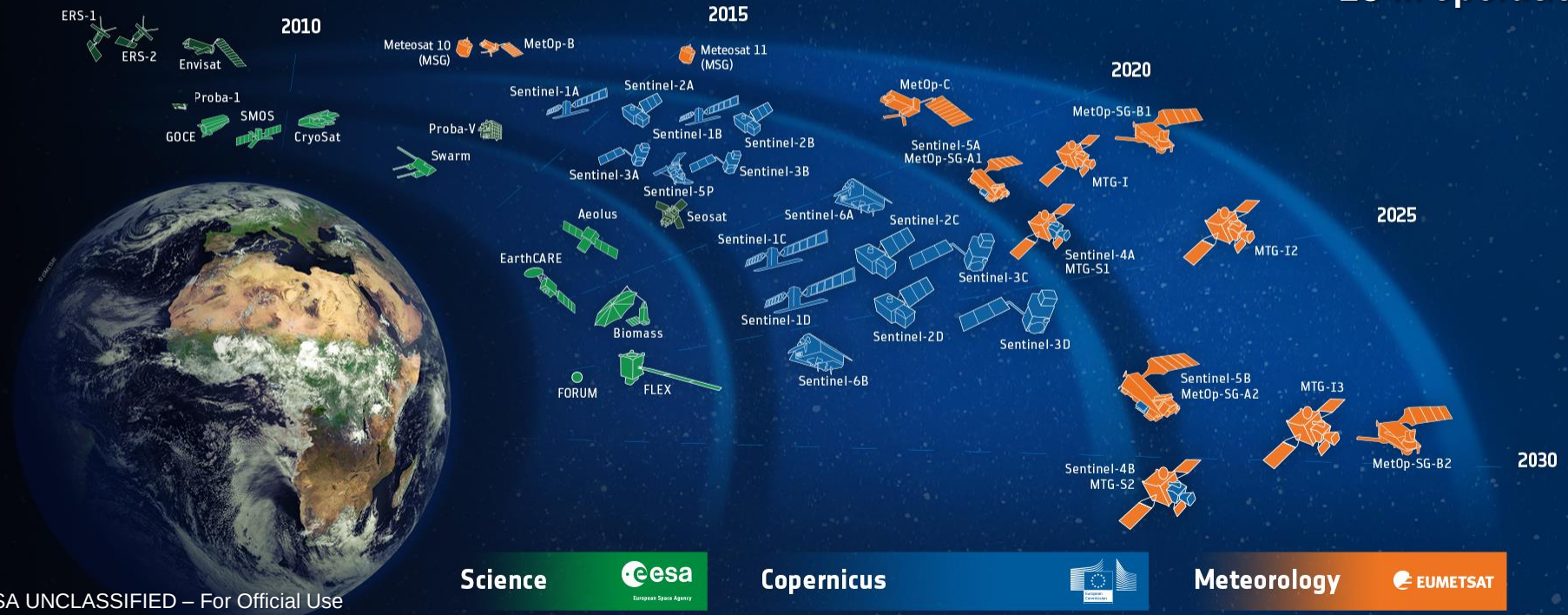
Josef Aschbacher, ESA
Director of Earth Observation Programmes
Head of the ESRIN establishment

ESA EO

Taking the Pulse of our Planet

ESA-Developed Earth Observation Missions

Satellites
25 under development
15 in operation



Science | Copernicus | Meteorology

European Space Agency

Copernicus – EO Excellence through Cooperation

> 275.000
registered users
= tip of the iceberg

6 operational services

Land | Atmosphere | Ocean | Climate | Disaster | Security

250 TB satellite data distributed per day

full, free & open data policy

7 Sentinels flying

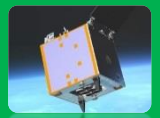
S1 | S2 | S3 | S4 | S5P | S5 | S6

preparing Copernicus 4.0

Contributing Missions are key to Copernicus

Optical High & Very High Resolution

DMC



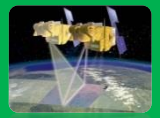
Pléiades

RapidEye

WorldView

Deimos-2

SPOT (HRS)



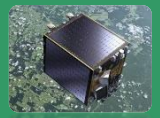
SkySat

Doves

Optical Medium & Low Resolution

SPOT

PROBA-V



and many more …

Altimetry

Cryosat

Jason

Atmosphere

MetOp

MSG

Synthetic Aperture Radar

Cosmo SkyMed

Radarsat

TerraSAR-X Tandem-X

ESA buys large volumes of non-ESA EO data

But no operational services without initial assessment of data quality and suitability

esa

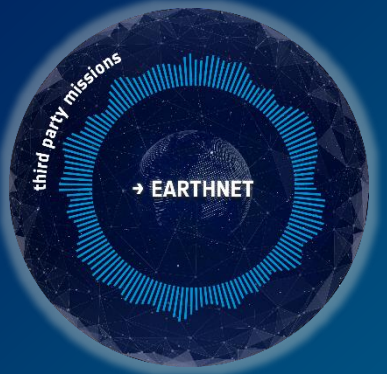
esa

Earthnet → Copernicus

R&D → Operations

Third Party Missions → Copernicus Contributing Missions

Innovation → Services



esa

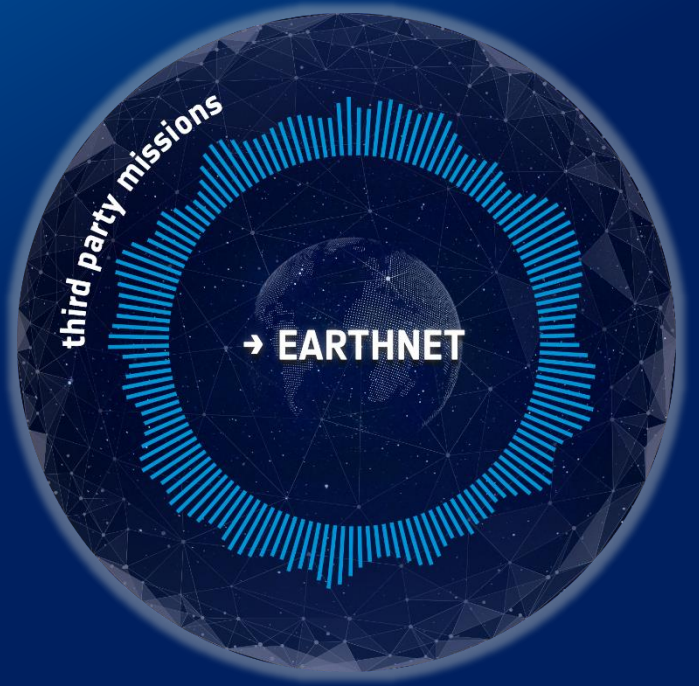
opernicus
Europe's eyes on Earth

EUMETSAT

ESA – Earthnet Programme since 1975

International cooperation to share resources & foster their interoperability

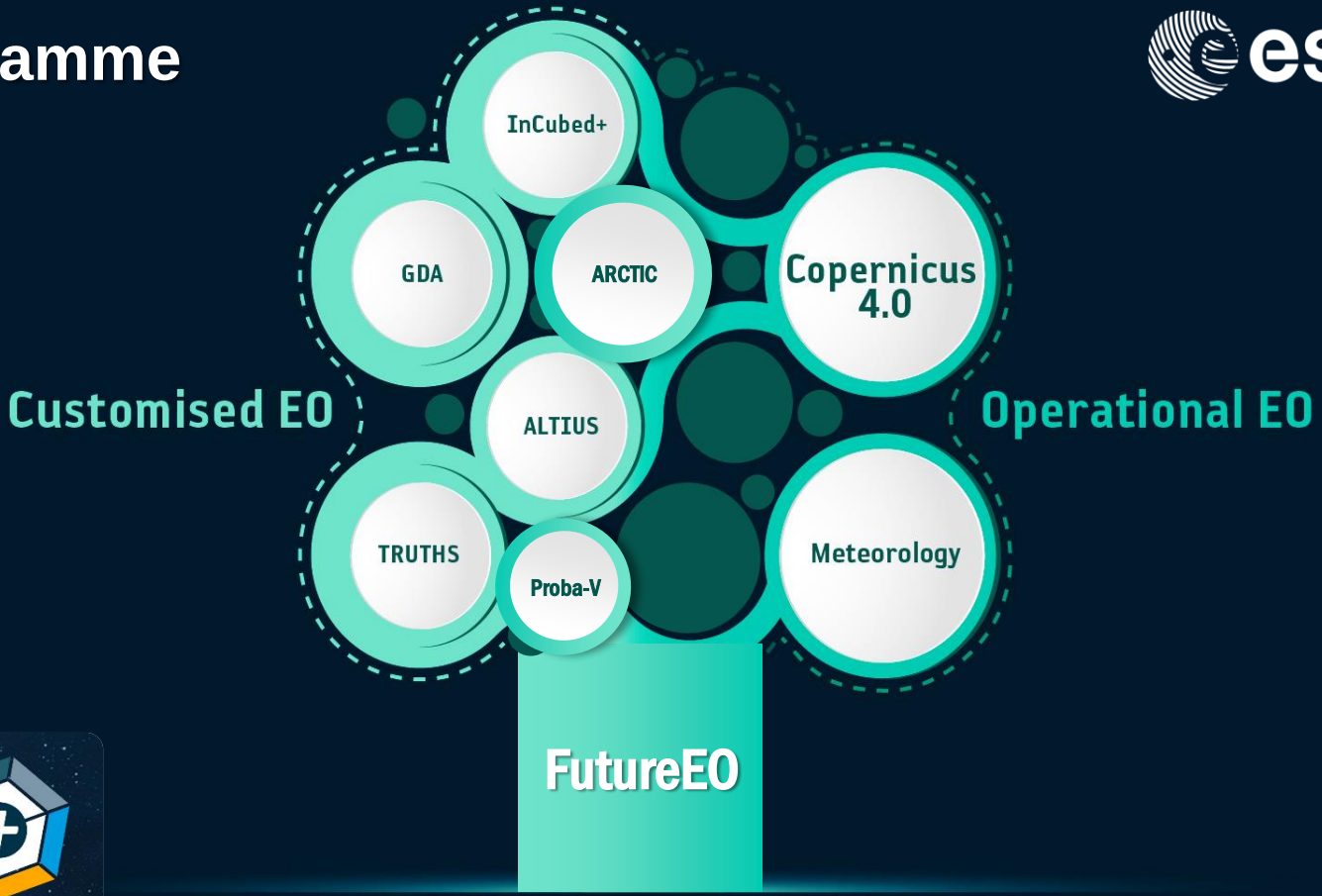
1. Support access to data from national and international Third Party Missions (TPM) for scientific, research and pre-operational applications
2. Data intrinsic quality assessment and data harmonization activities (e.g. Earthnet Data Assessment Pilot - EDAP)
3. Coordinate ground segment standardisation and harmonization activities
4. Ensure coordination in international organisations and committees (e.g. CEOS, GEO) and promotes collaborative initiatives (e.g. Tiger, Dragon) for the use of EO data
5. Support the International Charter operations



The Importance of Cal/Val and Cooperation

- Growing number of both public and commercial high res. EO data providers
- Interoperability and understanding of data characteristics is key
- Coordinated Cal/Val facilitates interoperability which can vastly extend opportunities for global and climate applications
- GEOSS (System of System) can only work in quality standards and reference are in place!
- Public agencies can set standards used by NewSpace EO companies (e.g. RadCalNet)
- For science & operational systems

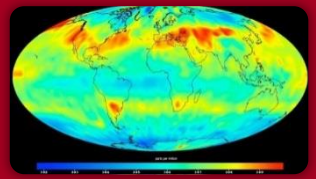
ESA EO Programme Cornerstones



Space19+

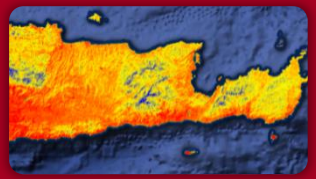
Copernicus new missions

CO2M - Anthropogenic CO_2 Monitoring



Causes of
Climate Change

LST – Land Surface Temperature Mission

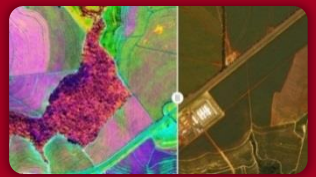


Agriculture & Water
Productivity

CRISTAL – Polar Ice & Snow Topography

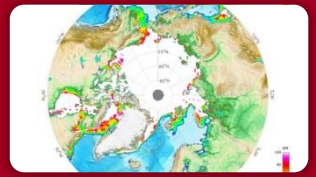
Effects of
Climate Change

CHIME – Hyperspectral Imaging Mission



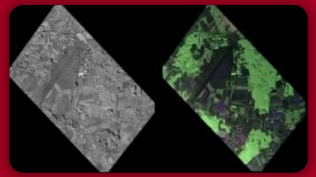
Food Security, Soil,
Minerals, Biodiversity

CIMR – Passive Microwave Radiometer



Sea: Surface Temp.
& Ice Concentration

Rose-L – L-band SAR Mission



Vegetation & Ground
Motion & Moisture

Return on European EO Investments

Copernicus

€ 93-191billion (2017-35)

€1 → €10

Meteorology (MetOp-SG)

€ 16-63 billion (2020-40)

For every

€1 invested

up to €4 return in FutureEO

Thank you for your attention!

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