

Presentation of ESA Earthnet Data Assessment Pilot

Clement Albinet - *ESA / Ground Segment and Mission Management Department*

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ESA and non-ESA missions

(Third Party Missions – TPM)

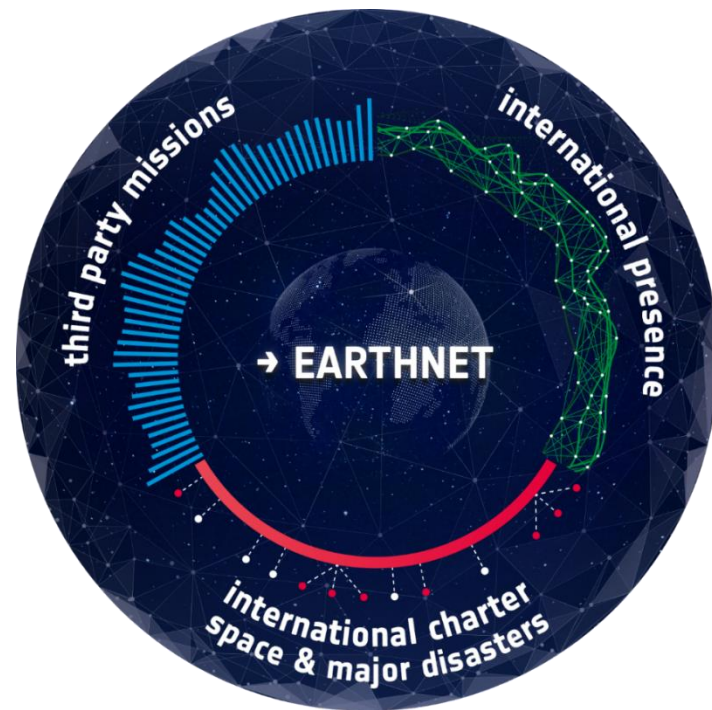
4 types of activities with Third Party Missions (TPM)	New Space	“Old Space”	Funding
Early development support of TPM (New Space)	X		<i>ESA Incubed</i>
1 - TPM data supply to science and research purposes	X	X	<i>ESA Earthnet</i>
2 - TPM data quality assessment and support to Cal/Val	X	x	<i>ESA Earthnet</i>
3 - TPM data supply for operational services (Copernicus Contributing Missions)	X	X	<i>EU Copernicus</i>

1 - TPM data supply to science and research purposes

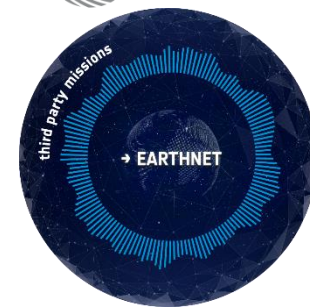
→ *ESA EO Space Component
Third Party Missions*

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



ESA - Earthnet TPM



- a) Fully support the operations for the extension of National missions beyond their nominal life time to ensure continuity of key Earth science observations.

The mission basically becomes an ESA mission. **Open and Free data policy.**
Examples: Proba-1, CASSIOPE/ePOP.

- b) Partially support the operations for the extension of National missions beyond their nominal life time to ensure continuity of key Earth science observations.

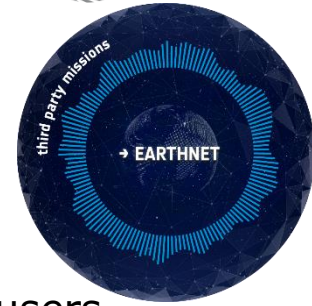
Often the management of the mission is coordinated by the operator in coordination with ESA. e.g. via a joint working committee. **Open and Free data policy.** Examples: ODIN, GRACE.

- c) ESA supports the provision of on-demand data following user requests for science and research, including start-ups.

ESA-approved requests are subsequently sent to the operator who then provides the data to the user. **Commercial data.** Examples: Pleiades, TerrasarX, CosmoSkyMed, Deimos-2.

The selected option depends on many factors (e.g. data policy needs, scientific communities requests, international collaborations, etc).

ESA - Earthnet TPM integration process



Possible integration steps:

- **Data Familiarization**: pre-defined dataset provided open and free to the users
- **Data Evaluation**: data provided on-requests to evaluate quality and usability (e.g. Earthnet Data Assessment Pilot, assessment of suitability with user feedback)
- **Candidate mission report approval** by ESA Member States (e.g. on-demand, operations supports)
- The data quality assessment via **EDAP paves the way towards the utilization of the data for operational services** such as in the Copernicus context (i.e. Contributing Mission).

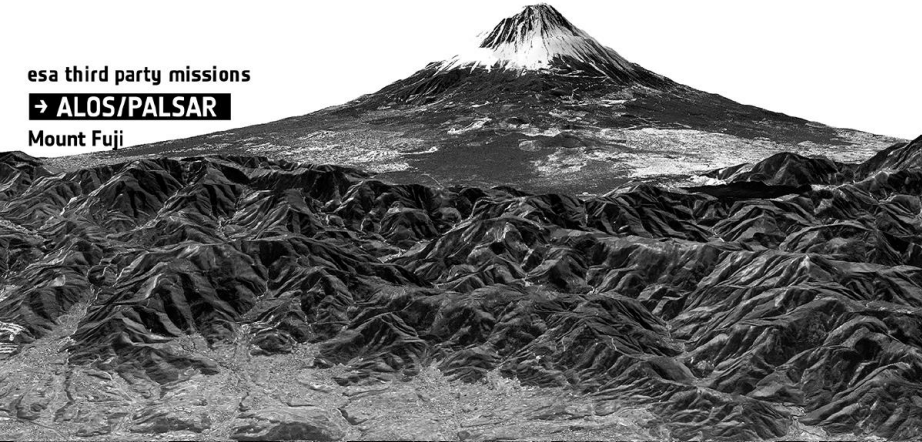
Examples of SAR Missions



esa third party missions

→ **ALOS/PALSAR**

Mount Fuji



esa third party missions

→ **COSMO-SKYMED**

Italy - Lombardia



esa third party missions

→ **RADARSAT-2**

Vancouver



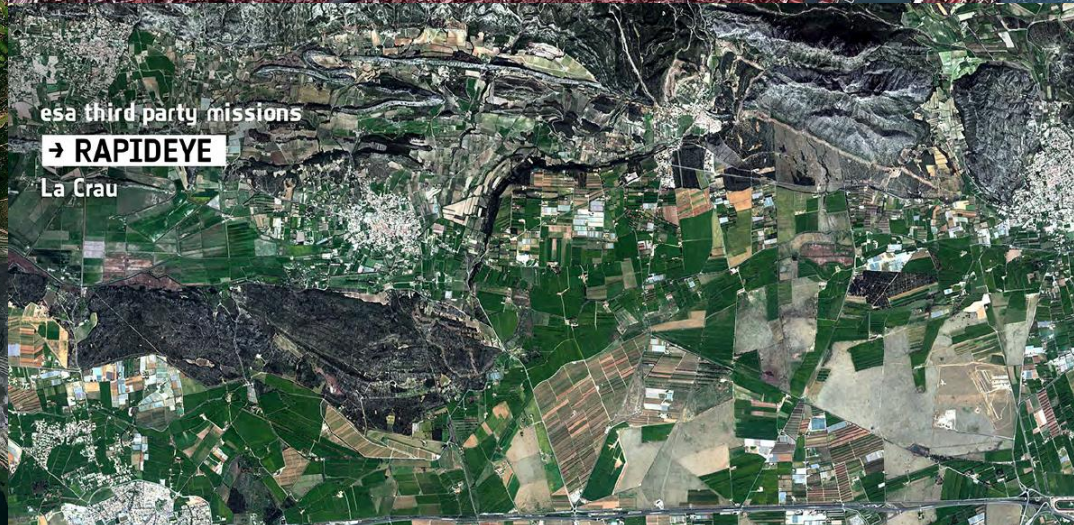
esa third party missions

→ **TERRASAR-X**

Doha



Examples of Optical Missions



TPM Scientific Highlights (past and present)



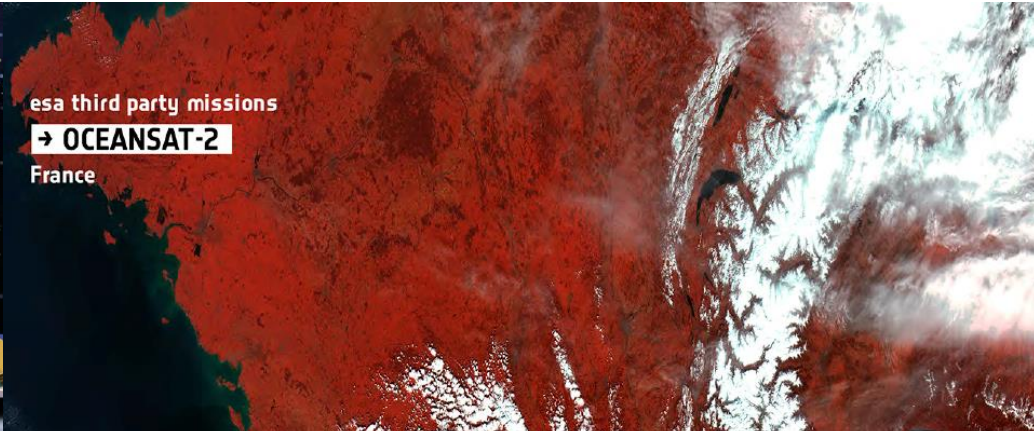
→ Grace



esa third party missions

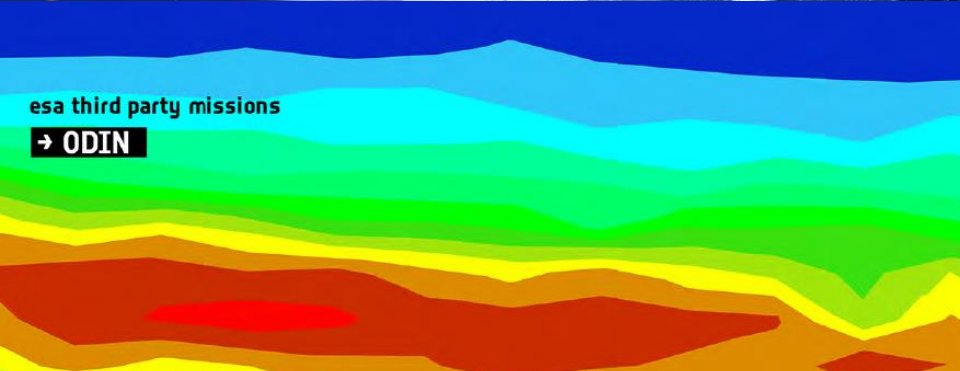
→ OCEANSAT-2

France



esa third party missions

→ ODIN



esa third party missions

→ GOSAT



Information on TPMs:

Intro:

<https://earth.esa.int/web/guest/missions/3rd-party-missions/overview>

ESA TPMs Terms & Conditions for R&D and start-ups

<https://earth.esa.int/pi/esa?type=file&table=aotarget&cmd=image&alias=TPMterms>

2 - TPM data quality assessment and support to Cal/Val

→ *Earthnet Data Assessment Pilot*



What is EDAP?



- The main objective of this activity is to perform **early data quality assessment of existing or future missions**, with specific focus on **NewSpace** and **multi-mission activities**.
- It is achieved through provision of **clusters of expertise in various domains**. Specific focus is also be put on **capacity building** in the relevant data provider with the set up and evolution of documentations, tools and procedures to allow to efficiently perform data quality assessments in the domains of expertise defined within this activity.



Four domains of expertise:

1. Very High, High and Medium Resolution optical sensor
2. Low Resolution optical sensor
3. SAR sensor
4. Atmospheric Missions

Specific tasks:

5. Multi-mission studies (e.g. DEM impact on geometric quality)
6. Organising workshops related to data quality

A flexible approach



- The cluster of expertise provides technical reports on data quality from various missions.
- Some missions and studies were already identified; some other missions and studies will be identified in the course of the project.
- It could be a recurrent process if for example a constellation sends new type of payloads.



Summary of the missions addressed



VHR, HR, MR Optical	LR Optical	SAR	Atmospheric
Skysat	OceanSat-2	ICEYE	GHGSat-D
Planet Scope	OceanSat-3	PAZ	GCOM-C
TripleSat	OceanSat 3A	SAOCOM	GOSAT
Kompsat-3 / 3A	MOS	<i>NovaSAR</i>	GOSAT-2
Vivid-i / Carbonite	<i>HuanJing-1A/-1B</i>	<i>GaoFen-3</i>	Tansat
Landsat 1-7	<i>GaoFen-4/-5</i>		Spire
Landsat 8			
Proba-1			
Dove-R			
<i>Blacksky</i>			
<i>Superview</i>			
<i>Vision-1</i>			
<i>Superdove</i>			
<i>GaoFen-6</i>			

Legend:
Activities started
Activities under definition/agreement



Common framework for mission quality assessments



- To ensure, where applicable, community **best practice** is followed.
- To ensure **consistency** of approach across project missions.

➔ **Facilitates comparison**

Framework Heritage: QA4E  Principle

*"It is critical that data and derived products are easily accessible in an open manner and have associated with them an indicator of their quality traceable to reference standards (preferably SI) to enable users to assess its suitability for their application i.e. its **fitness for purpose**."*

Example of Product Quality Evaluation Matrix

Product Information	Product Generation	Ancillary Information	Uncertainty Characterisation	Validation
Product Details	Sensor Calibration & Characterisation Pre-Flight	Product Flags	Uncertainty Characterisation Method	Reference Data Representativeness
Availability & Accessibility	Sensor Calibration & Characterisation Post-Launch	Additional Information	Uncertainty Sources Included	Reference Data Quality
Product Format	Additional Processing		Uncertainty Values Provided	Validation Method
User Documentation			Geolocation Uncertainty	Validation Results
Metrological Traceability Documentation				

Key
Not Assessed
Not Assessable
Basic
Intermediate
Good
Excellent

Information Not Public

➔ Quality Assessment Guidelines document then provides criteria for how to grade each category.

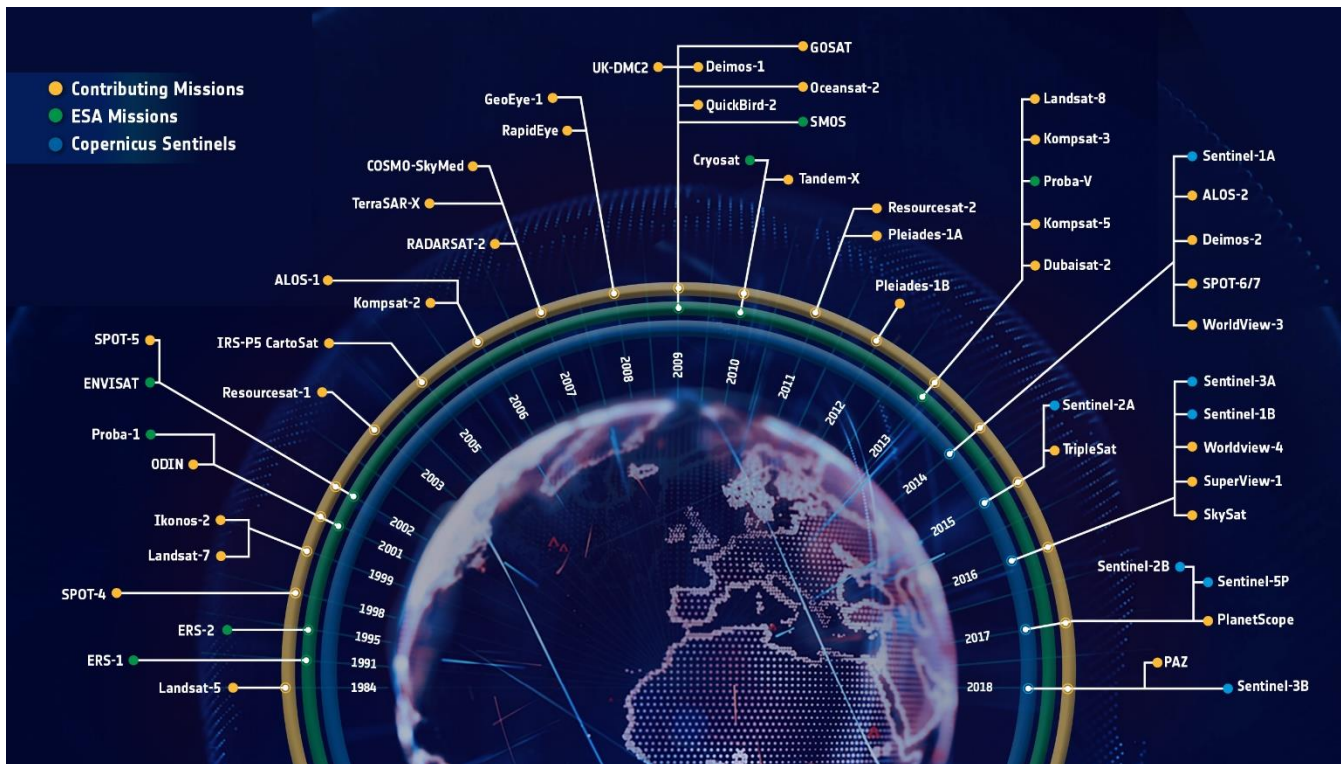
Website:

<https://earth.esa.int/web/sppa/activities/edap>



3 - TPM data supply for operational services

→ *Copernicus Space Component Contributing Missions*



Data complementary to Sentinels for Copernicus Services



1. Data supply (competitive tenders) from Copernicus Contributing Missions to support the operational Copernicus Services:

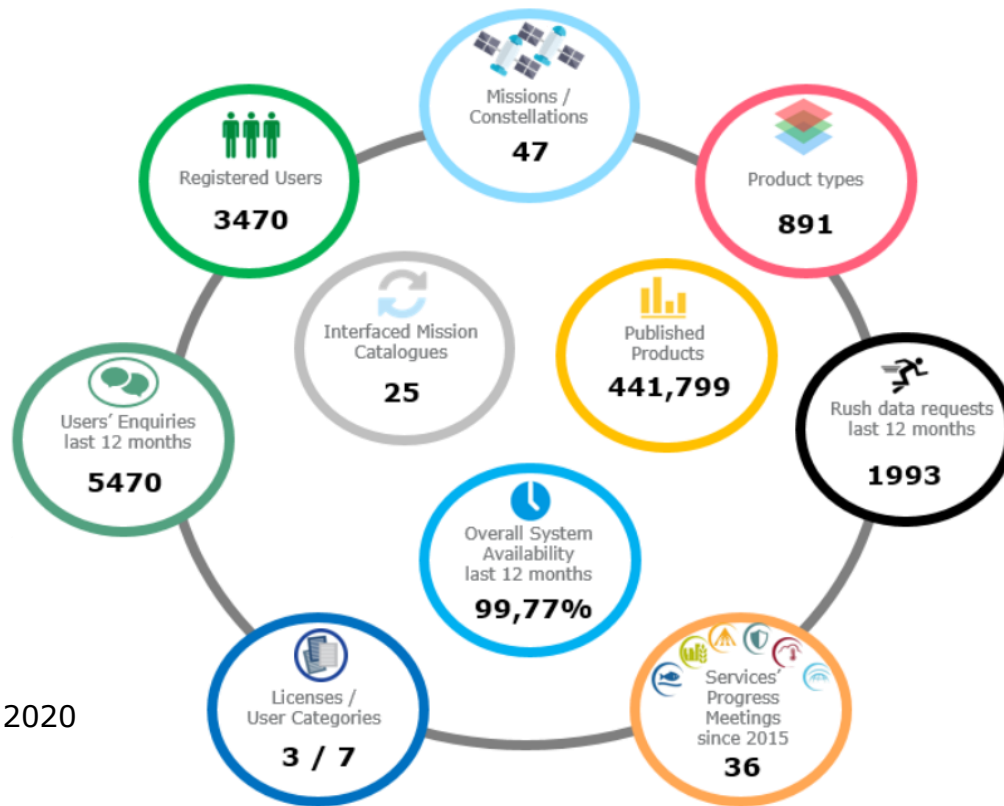
- Atmosphere Monitoring Service
- Marine Environment Monitoring Service
- Land Monitoring Service
- Climate Change Service
- Security Service
- Emergency Management Service

The six Copernicus Services

2. Data also for other H2020 projects
3. User Support, Help desk and investigations of data anomalies raised by the users.



Data from Copernicus **Contributing Missions (CCMs)** & **Data access tools and User support**



DWH phase 2 : Apr 2015 – Dec 2020
Data Access Portfolio version 2.5

Figures updated in October 2019

Info and web sites:

Intro:

<https://spacedata.copernicus.eu/web/cscda/missions>

Data Access Portfolio:

<https://spacedata.copernicus.eu/documents/12833/14545/DAP+Document+-+current/c2449218-3ed9-434a-b32c-edfbb95b9362>

ESA CCM data access rights

<https://spacedata.copernicus.eu/web/cscda/copernicus-users/access-rights>

Presentation of ESA Earthnet Data Assessment Pilot

**Thank you!
Any questions?**