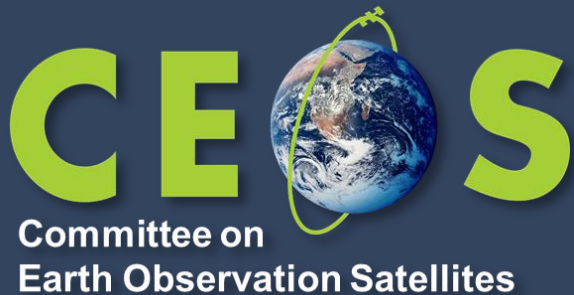


# Working Group on Disasters 26 (WGD-26)

## The Role of EO Small Satellites in Strengthening DRM: Catalonia's Strategy and Use Cases



**Institute of Space Studies of Catalonia-IEEC**

**Davoud Omarzadeh**

**CEOS WGD and DRM**

**WGDDisasters 2026**

**ASI, Rome, Italy**

**16 September 2026**

# Table of contents

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- Institute of Space Studies of Catalonia (IEEC)
- Catalonia Space Strategy 2030
- Space assets
- Adoption of EO space-based services for DRM
- Conclusions

# Institute of Space Studies of Catalonia (IEEC)



Established in 1996 to develop activities related to space in Catalonia in the fields of research, innovation, training and knowledge and technology transfer

- *Total members: ~300*
- *Productivity: ~450 peer-review articles per year*

Area for the Promotion of the Space Sector of Catalonia (APEC):

- Support the development of space technologies
- Adoption of space-based services



Universitat Politècnica de Catalunya



Universitat Autònoma de Barcelona



Institute of Space Sciences

Universitat Politècnica de Catalunya



UNIVERSITAT DE BARCELONA

Barcelona

Universitat de Barcelona



IEEC

Institut d'Estudis Espacials de Catalunya

# Catalonia Space Strategy 2030

## Mission 1

Catalonia, a hub of origin and connection for space economy

## Mission 2

Contributing to the strengthening of Europe's space technology capabilities

## Mission 3

Fostering constellations of talent with Catalan DNA

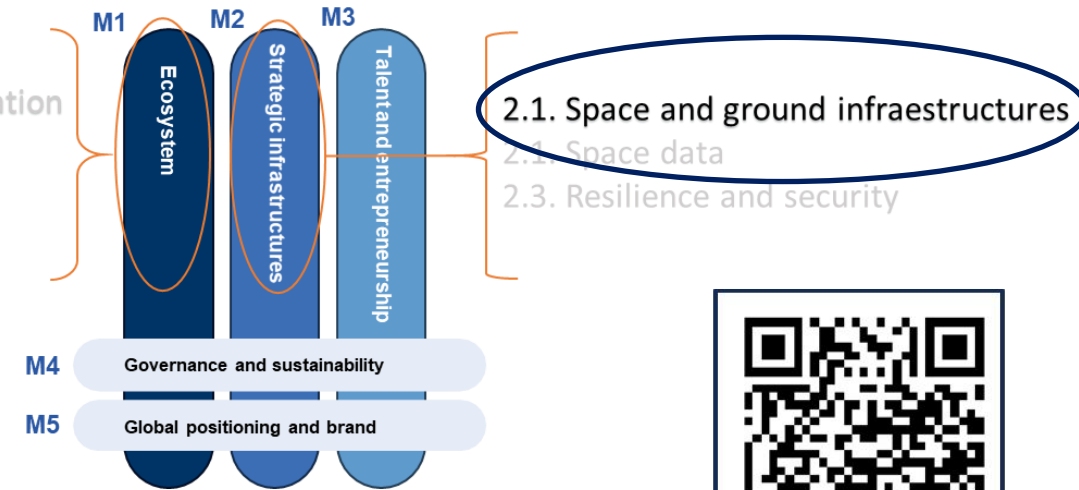
## Mission 4

A solid system that drives the sector and the country forward

## Mission 5

Catalonia Space 2030: a global brand, a shared pride

1.1. Ecosystem dinamization  
1.2. Innovation transfer  
1.3. Service adoption



\*Space strategy being promoted by the Catalan Government since October 2020



**Generalitat de Catalunya**  
Government of Catalonia

**IEEC<sup>R</sup>**  
Institut d'Estudis  
Espacials de Catalunya

**i2cat<sup>R</sup>**

**ICGC**  
Institut  
Cartogràfic i Geològic  
de Catalunya

<https://politiquesdigitals.gencat.cat/ca/economia/espai/>

# Infrastructures: Space Assets

New assets to increase the competitiveness of the sector in Catalonia

## LEO missions:

- [IEEC] GENIOT-01/Enxaneta – IoT/5G (22 March 2021 - deorbited July 2024)
- [IEEC] **GENEO-01/Menut – EO & IOD** (3 January 2023)
- [I2CAT] GENIOT-02/Minairó – IoT/5G (15 April 2023)
- [IEEC] **GENEO-02 – EO & IOD** (launch Q2-2026)

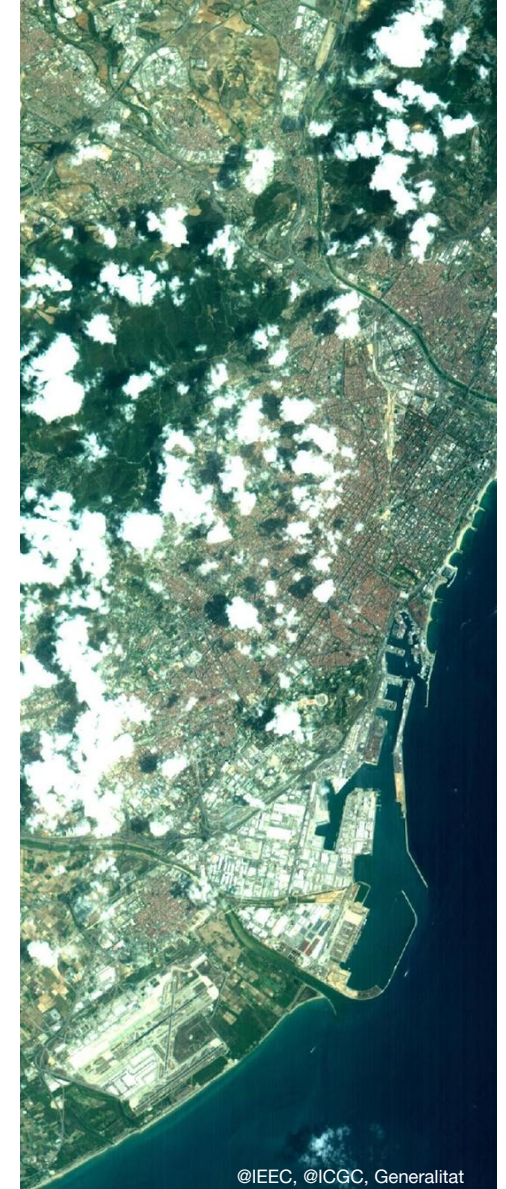
## IOD opportunities

- GENEO-1/Menut – Payload for on-board AI processing (C3SATP)
- GENEO-02 – Payload for In-orbit LISA Diagnostics Demonstrator (ILIADA)



# Mission as a Service

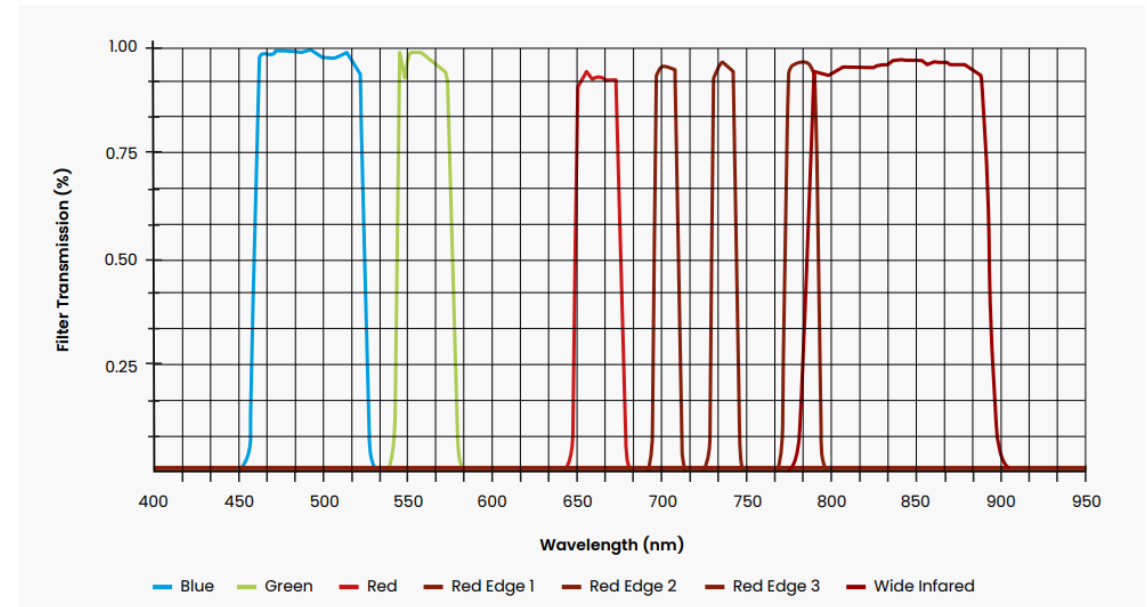
- What is Mission as a Service?
  - IEEC designs and contracts a mission through a service provision framework
  - IEEC has exclusive satellite (or satellites) EO data over Catalonia
  - The Contractor retains the ability to commercialize the remaining satellite capacity
- Why this approach?
  - Cost efficiency: shared investment reduces the overall mission cost
  - Focused data: tailored EO data to our specific needs
  - Industry boost: enabling commercialization of data and risk sharing
- Additional advantages:
  - IEEC is involved in all aspects of the project, from definition to operations
  - Defining the platform allows IEEC to enable and In-Orbit Demonstration and Validation program for hosted payloads



# GENEO-01- Menut - Mission Overview

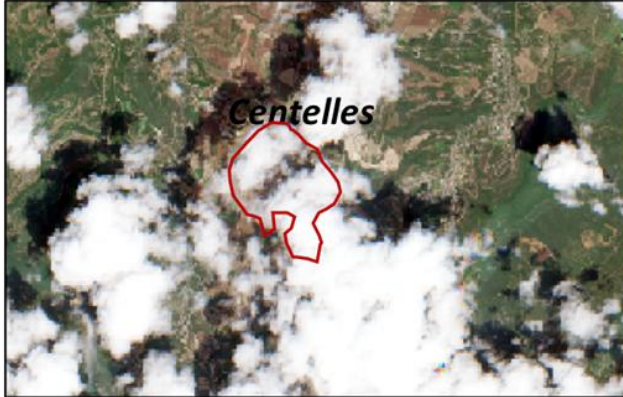
- **Name:** “Menut” (NORAD ID: 55010)
- **Platform:** 6U CubeSat (30 x 20 x 10 cm), mass: ~10 kg
- **Launch:** 3 January 2023
- **Orbit:** LEO SSO
- **Primary payload:** multispectral camera, 7 spectral bands 400–1000 nm (VNIR)
- **Secondary payload:** C3SatP multi-purpose high-performance computer - developed by IEEC
- **Services provision:**
  - Earth Observation (EO) data acquisition service
  - In-Orbit Demonstration (IOD) service for the C3SatP
- **Provider:** Open Cosmos Europe
- **Technical Support:** Cartographic and Geological Institute of Catalonia (ICGC)

Download Menut data from: <https://visors.icgc.cat/menut>

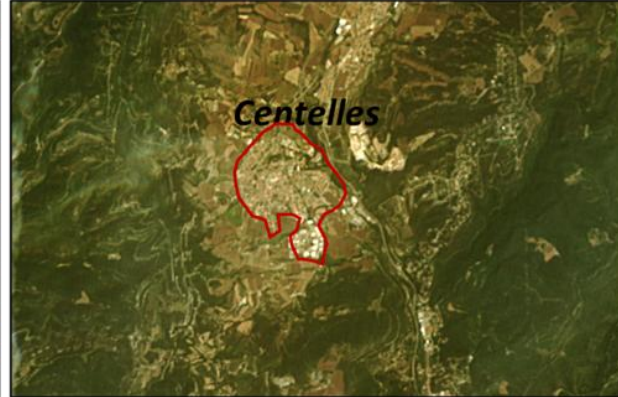


# GENEO-01- Menut. Complementarity

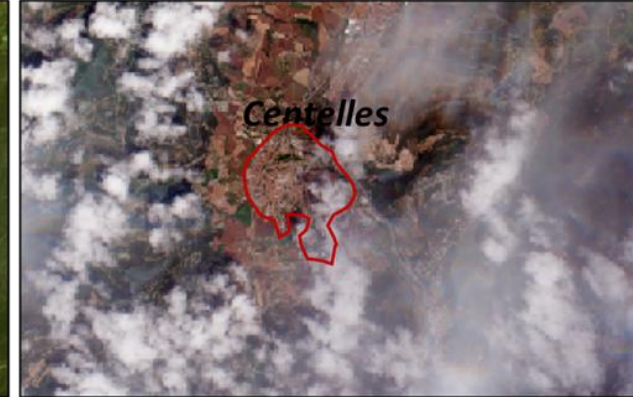
Sentinel-2, 2025-06-25



Menut, 2025-06-28



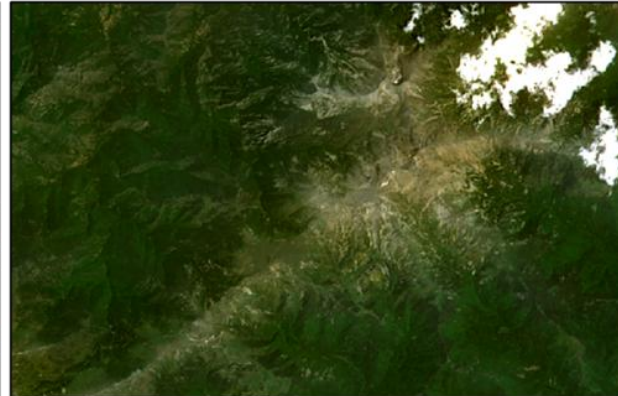
Sentinel-2, 2025-06-30



Sentinel-2, 2025-06-25



Menut, 2025-06-28



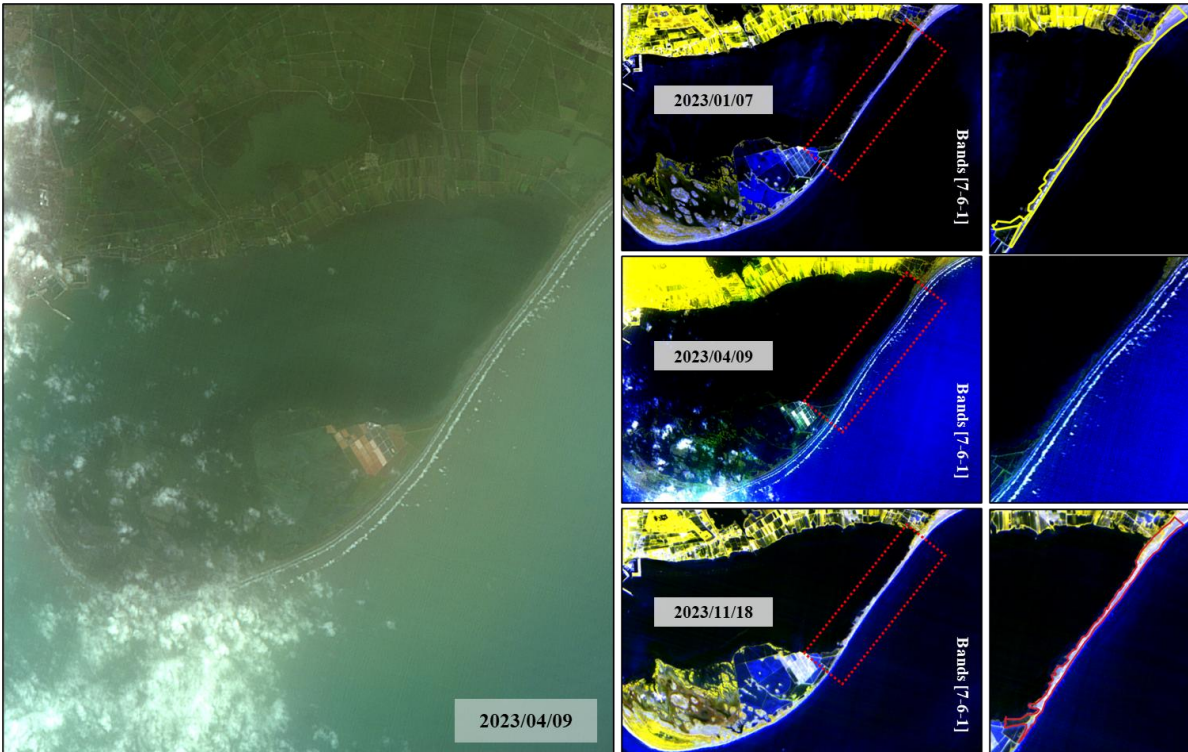
Sentinel-2, 2025-06-30



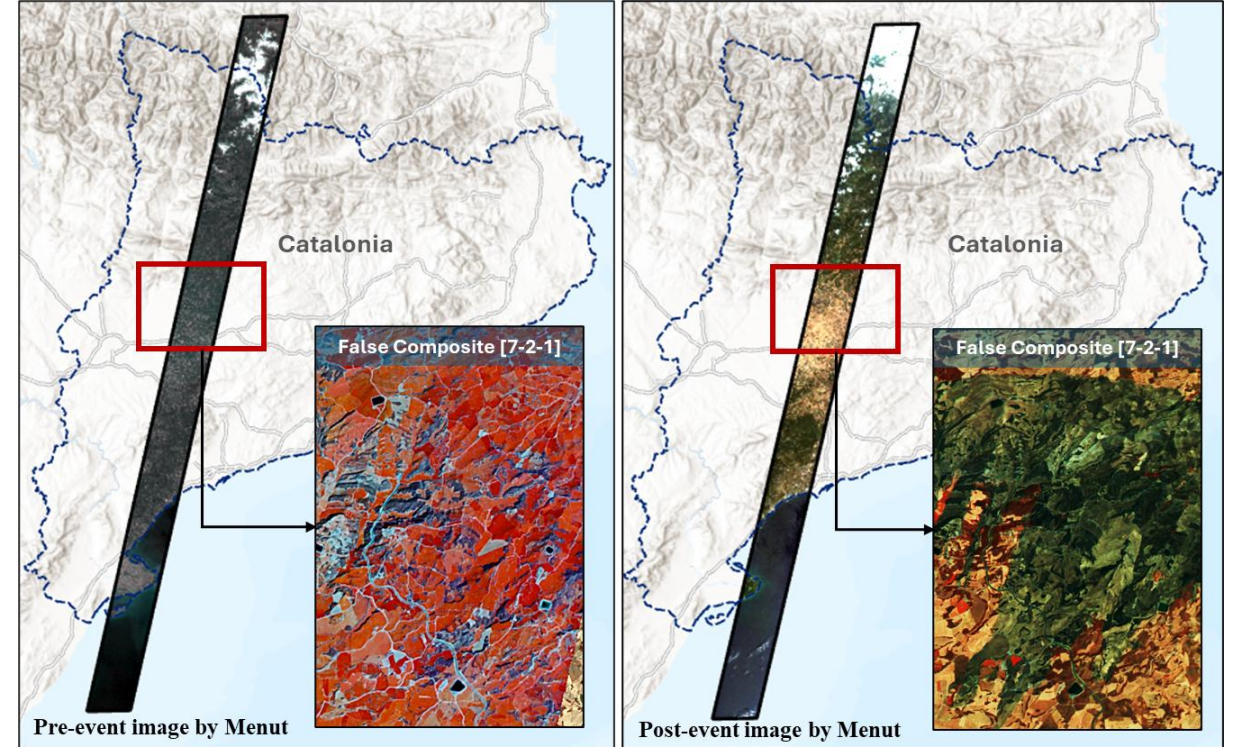
Menut's complementarity with Sentinel-2 in overcoming the cloud cover challenge

# GENEO-01- Menut. Risk management

- Menut is able to offer quick tasking adjustment to target specific areas after an emergency occurs

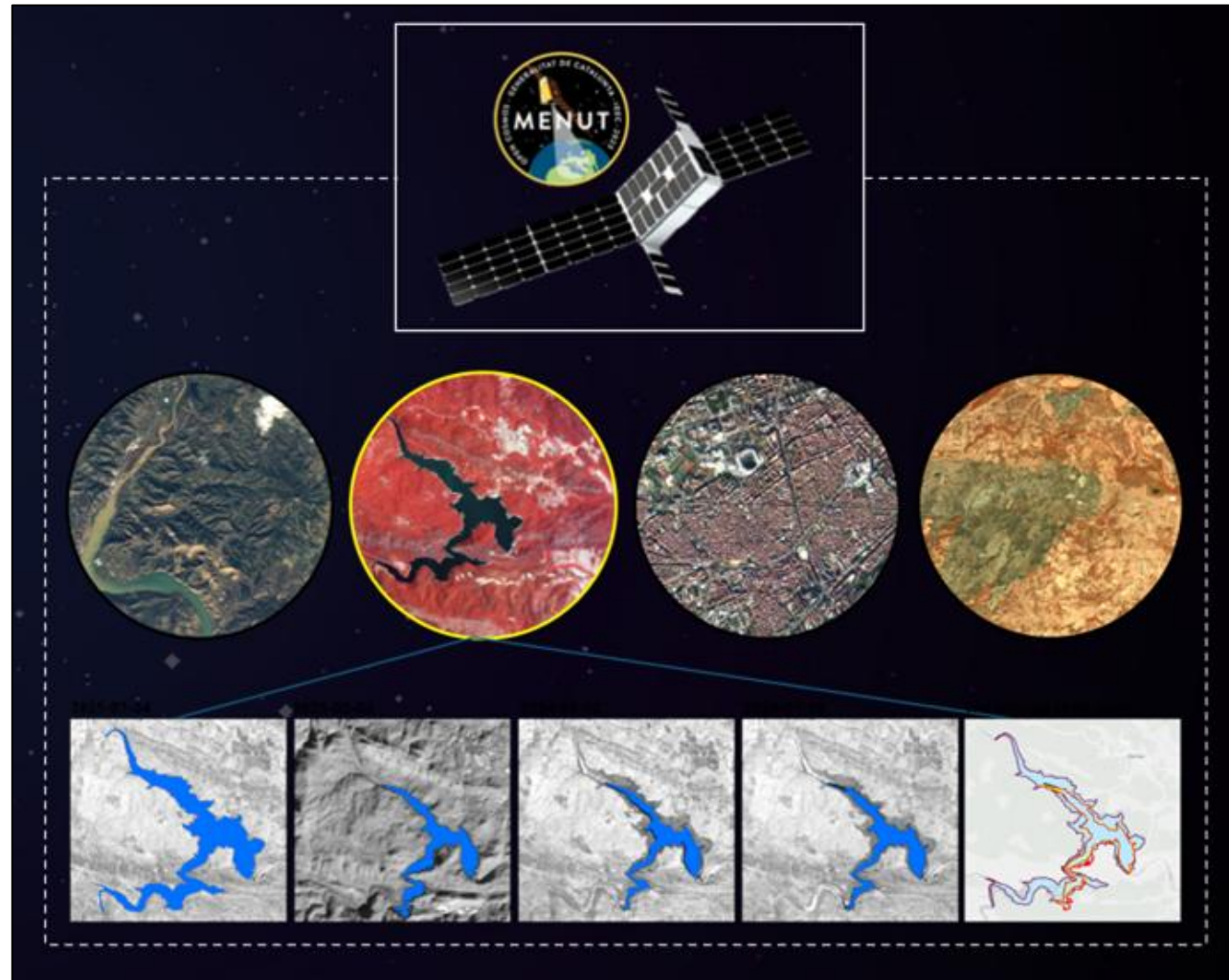


**Coastline monitoring:** evaluation of damaged area after a cold drop that caused floods in Delta de l'Ebre - 4th September 2023



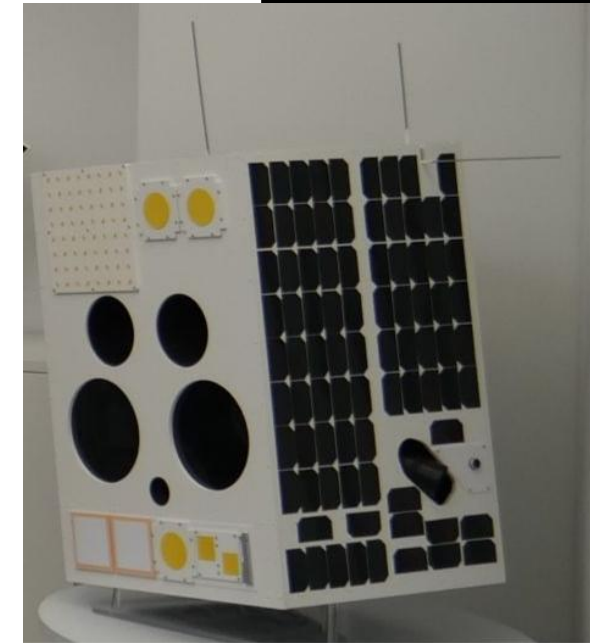
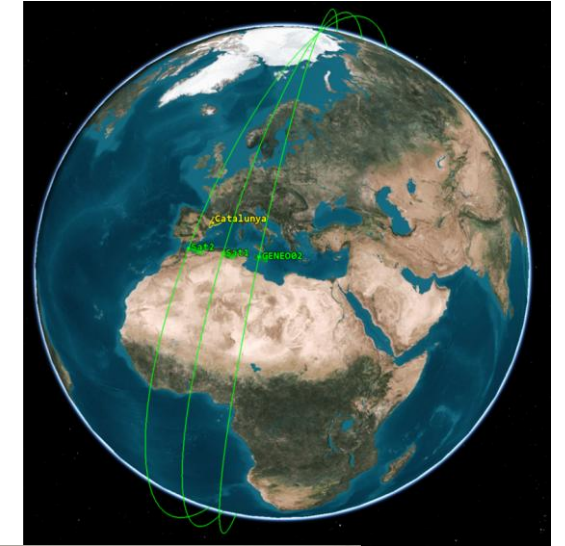
**Wildfire damage evaluation:** Detection of burnt area in the Segarra region 7th July 2025

# GENEO-01- Menut. Complementarity



# GENEO-02 - Mission Overview

- **Overall mission configuration:** 1 IEEC-tailored satellite + at least 2 complementary satellites to meet data recurrency targets
- **Platform:** Microsat (~50 kg)
- **Launch:** mid 2026
- **Orbit:** LEO SSO
- **Primary payload:** 2 optical payloads - VNIR 7 spectral bands 400–1000 nm + SWIR
- **Secondary payload:** IoT communications system
- **Hosted payload:** In-orbit LISA Diagnostics Demonstrator – ILIADA (~2U)
- **Services provision:**
  - Provision of recurrent high-resolution (~2.5 m GSD) EO data of Catalonia every 30–50 hours, covering the whole Catalan region in 20–30 days
  - Provision of IoT data sensed to combine it with the EO data and complement its information
  - In-Orbit Demonstration (IOD) service for the ILIADA system
- **Provider:** Open Cosmos Europe
- **Technical Support:** Cartographic and Geological Institute of Catalonia (ICGC)



# Data Processing Levels

| Level    | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | GENEO-01 - Menut                                                | GENEO-02               |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|------------------------|
| RAW      | Payload data with embedded information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Provided by contractor                                          | Provided by contractor |
| L0       | Data corrected for telemetry errors, communication or other artifacts.<br>Tagged in time and with the necessary <b>metadata</b> for subsequent processes.                                                                                                                                                                                                                                                                                                                                                             |                                                                 |                        |
| L1A      | Reconstructed instrument data, <b>time-referenced and accompanied by auxiliary information</b> .<br>Geometric and radiometric calibration coefficients of the sensor applied. <ul style="list-style-type: none"><li>- Single multiband file</li></ul>                                                                                                                                                                                                                                                                 | Provided by ICGC - Institut Cartogràfic i Geològic de Catalunya |                        |
| L1C      | Based on the L1A level data, the sensor pointing model has been refined to the desired accuracy and this correction has been applied to the image pixels so that the <b>resulting image can now be overlaid on a map</b> . <ul style="list-style-type: none"><li>- <b>Reference system WGS84</b></li><li>- <b>Projection UTM31 North</b></li></ul>                                                                                                                                                                    |                                                                 |                        |
| L2A      | Data generated from the L1 level (Top-Of-Atmosphere or TOA) over Catalonia and transformed to generate derived geophysical variables.<br>Using the usual conventions of the remote sensing data processing industry, the product defined in the framework of this document is analogous to L2A, where a process of <b>atmospheric correction</b> has been applied to the L1C level image to obtain reflectance values (Bottom-Of-Atmosphere or BOA). <ul style="list-style-type: none"><li>- <b>GEOTIFF</b></li></ul> |                                                                 |                        |
| Datasets | Depending on application / use case                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ICGC<br><br>Free access (data soon to be published)             | Free access            |

# Catalonia Space Strategy 2030

## Mission 1

Catalonia, a hub of origin and connection for space economy

## Mission 2

Contributing to the strengthening of Europe's space technology capabilities

## Mission 3

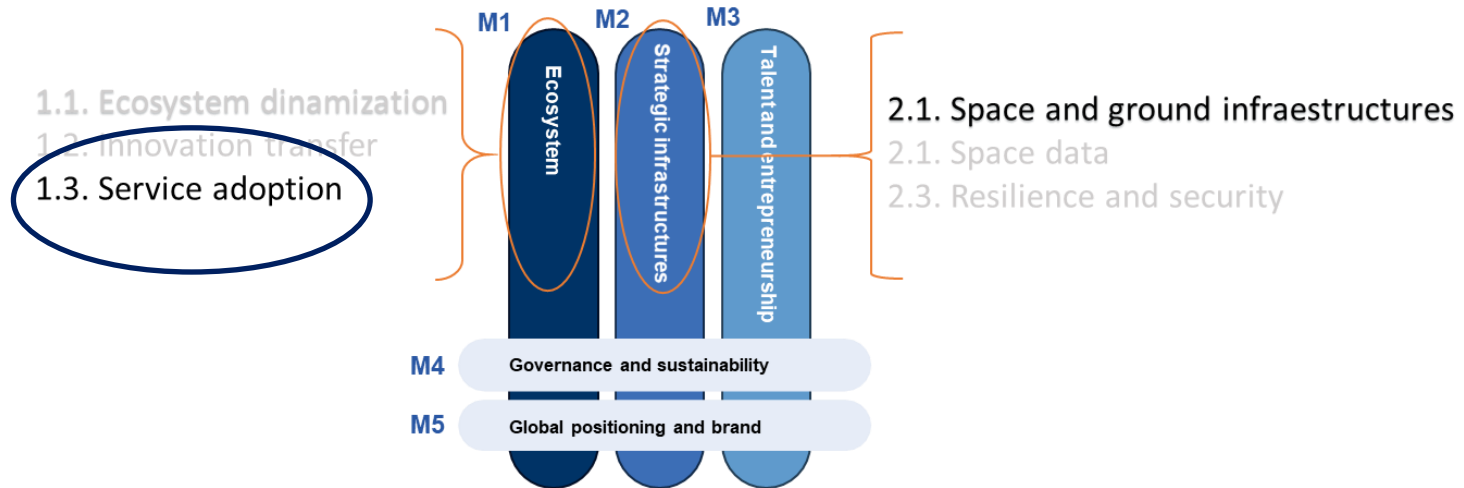
Fostering constellations of talent with Catalan DNA

## Mission 4

A solid system that drives the sector and the country forward

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Catalonia Space 2030: a global brand, a shared pride



\*Space strategy being promoted by the Catalan Government since October 2020



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Cartogràfic i Geològic  
de Catalunya

<https://politiquesdigitals.gencat.cat/ca/economia/espai/>

# Adoption of space-based services

Use cases to promote space-based services; from innovation to service (total budget > 1,2M€, 2022-24):

1. Strategy use cases. Pilot projects
2. Challenges (3 prizes, 15k€/prize) [+info](#)
3. Innovative public procurement (3 contracts, 200k€/contract) [+info](#)
4. Open innovation **EO services** (first and second editions of 5 prizes, 50k€/prize [+info](#)) (third edition 3 prizes 70k€/prize [+info](#))
5. Open innovation IoT-5G service

**Engencat** contact EN

European funds in Catalonia

Home | Next Generation Catalonia | FEDER | ESF+ | FEADER | FEMPA | RIS3CAT

Home > RIS3CAT > RIS3CAT 2030 > Public procurement program for innovation > First edition

### First edition of the RIS3CAT 2030 Public Innovation Procurement Program

 **Cofinancat per la Unió Europea**

Status of projects and tenders (PDF document)  
Date of update: 30 April 2024

The Generalitat de Catalunya buys innovative technological solutions to address 20 challenges with co-financing from the 2021-2027 FEDER operational program of Catalonia. These solutions, which are implemented in a test phase, must improve processes or services and, as far as possible, must have an impact on society (people, companies and the territory).

Although the technological solutions may not be available on the market, they must be sufficiently developed to be implemented in the prototype, test or first commercial deployment phase, in the years 2023 and 2024. During the implementation phase of the projects the solutions are co-developed and adapted to the needs detected by the Administration.

The amount of the tender is 200,000 euros (VAT included) per challenge and solution. This amount is fixed, given that the functionality of the technological solutions is prioritized in the evaluation of the proposals.

As part of the preliminary market consultation, companies have submitted proposals.

The information collected in the preliminary market consultation process is key to adjusting the procurement documents to the solutions that the market can offer. It should be borne in mind, however, that the fact of participating does not generate any obligation or commitment to participate in the tenders, nor any advantage or impediment. Tender procedures will be open to all companies.

## I CONCURS D'IDEES DE CASOS D'ÚS D'OBSERVACIÓ DE LA TERRA PER AL SECTOR PRIVAT

> Convocatòria oberta

> Data límit 04/07/2023

> Financament fins a 50.000 €

Generalitat de Catalunya  
Amb el suport de:  
ICGC  
IEEC<sup>R</sup>  
i2cat<sup>R</sup>

## #ChallengeDCA

### Concurs de projectes de casos d'ús amb comunicacions satel·litàries per al sector privat

Organitzat: DCA

La DCA és una iniciativa de: Generalitat de Catalunya i2cat<sup>R</sup>

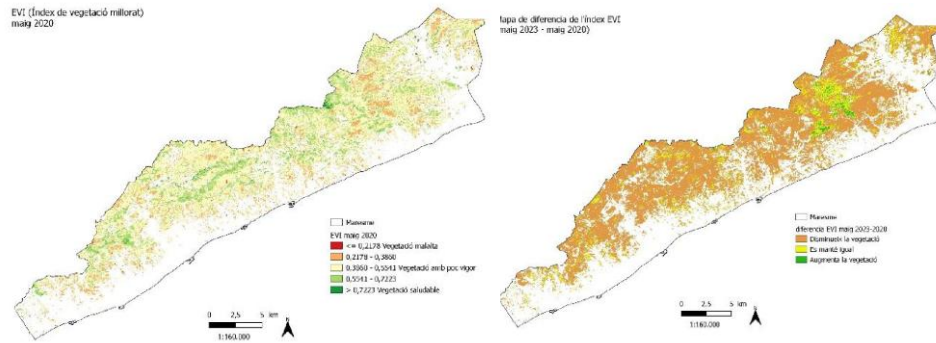
# Adoption of EO space-based services for public users

Use case: Health monitoring of forests

Provider:



End user: Rural Agents  **Generalitat de Catalunya**  
Government of Catalonia



Objective: Looking for more proactive ways to track the decline in forest vigor and recovery, in a so diverse territory.

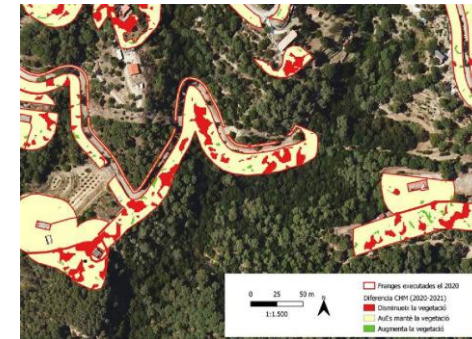
Satellite Technologies: Sentinel-2 and Menut

Use case: Monitoring of sensitive areas

Provider:



End user: Fire Department  **Generalitat de Catalunya**  
Government of Catalonia



Objective: To access information remotely about the state and morphology of vegetation near urbanizations, to establish priorities for action during the emergency and to optimize maintenance protocols.

Satellite Technologies: Sentinel-2 and Menut

# Adoption of EO space-based services for private users

Use case: Automated detection of water leaks in underground and open-air canals

Provider: MOAI

Coordination: IEEC<sup>R</sup> Funded by: Generalitat de Catalunya  
Institut d'Estudis Espacials de Catalunya

End user: large operators and managers of energy supply and generation infrastructures endesa



Objective: Early identification of any signs of leakage in order to prevent water losses, **reduce safety risks** and improve efficiency in water management.

Satellite Technologies: airborne orthophoto, Pléiades Neo and Menut

Use case: advanced fire danger indicator

Provider: Lobelia.

Coordination: IEEC<sup>R</sup> Funded by: Generalitat de Catalunya  
Institut d'Estudis Espacials de Catalunya Government of Catalonia

End user: energy transfer operator



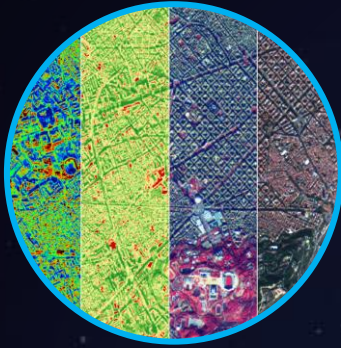
Objective: The SAPIC system addresses the challenge of **detecting points that could start a fire by using Earth observation technologies** combined with high-resolution climate data adapted to each specific location.

Satellite Technologies: Sentinel-2, SMOS and Menut

# Conclusions

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- Future Earth Observation satellites (from GENE0-02 onwards) will provide higher resolution and include additional relevant spectral bands (e.g. SWIR, LWIR) enhancing the ability to assess risks for disasters, monitor agricultural production, evaluate water quality and more.
- New satellite constellations will improve communications also for disaster risk management.
- User-centric approach, including collaboration with frontline responders is key.
- Move from dialogue to action, successful process: Engage, demonstrate and implement.
- Importance of developing new capabilities as technology evolves.
- Regional strategies provide innovative and scalable frameworks for piloting and validating space-based solutions.



# IEEC<sup>R</sup>

Institut d'Estudis  
Espacials de Catalunya

30  
1996-2026



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## THANK YOU FOR YOUR ATTENTION