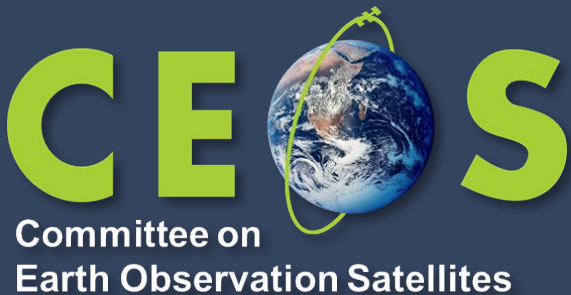


IEEC

Satellite-based services for disaster risk management



Albert Nicolás López
Institute of Space Studies of Catalonia-IEEC
Session 2.6
WGISS-61 and WGDisaster-25
16-20 March, 2026
Dehradun, India

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

Catalonia Space 2030 strategy*

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

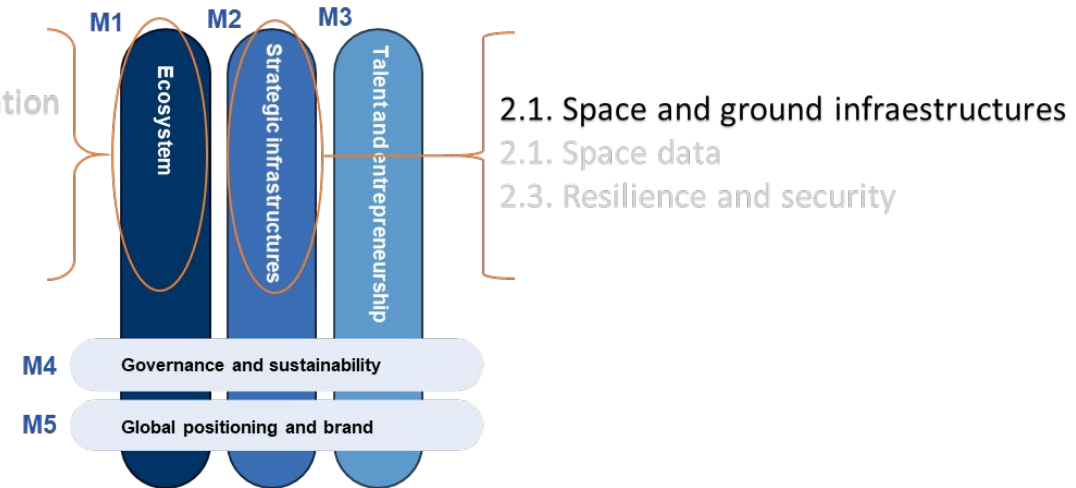
Mission 4

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^R
Institut d'Estudis
Espacials de Catalunya

i2cat^R

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)

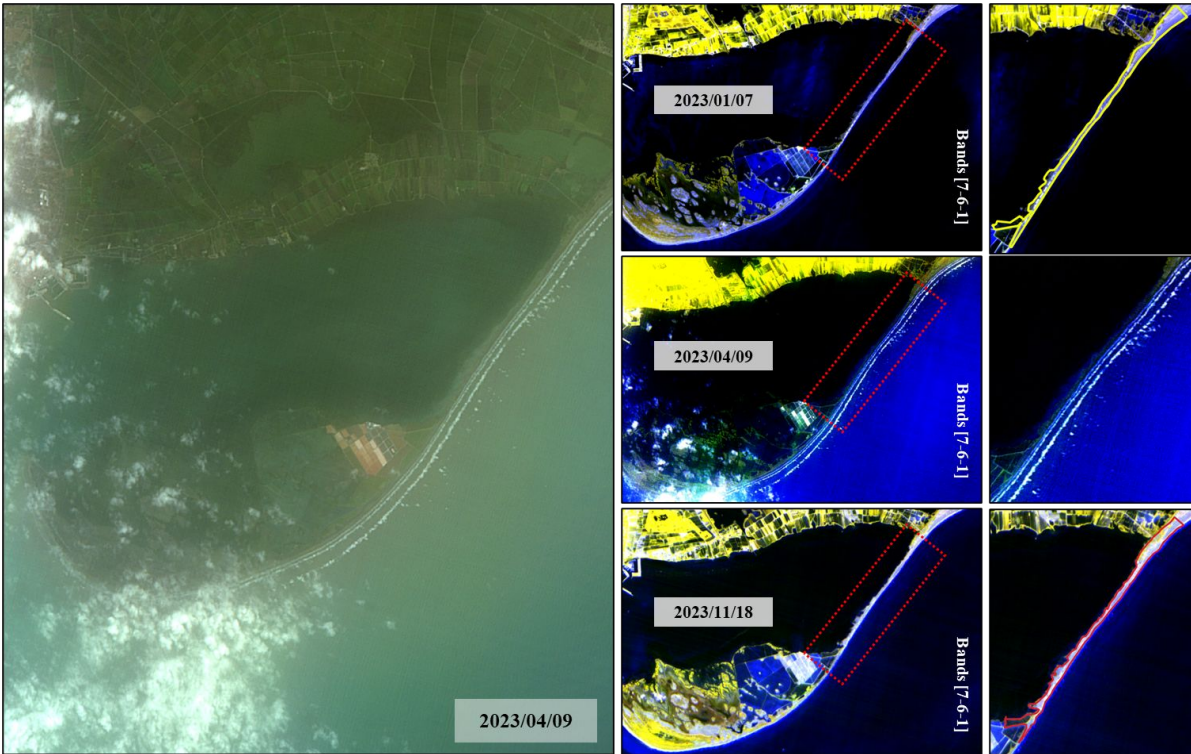
IOD opportunities

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

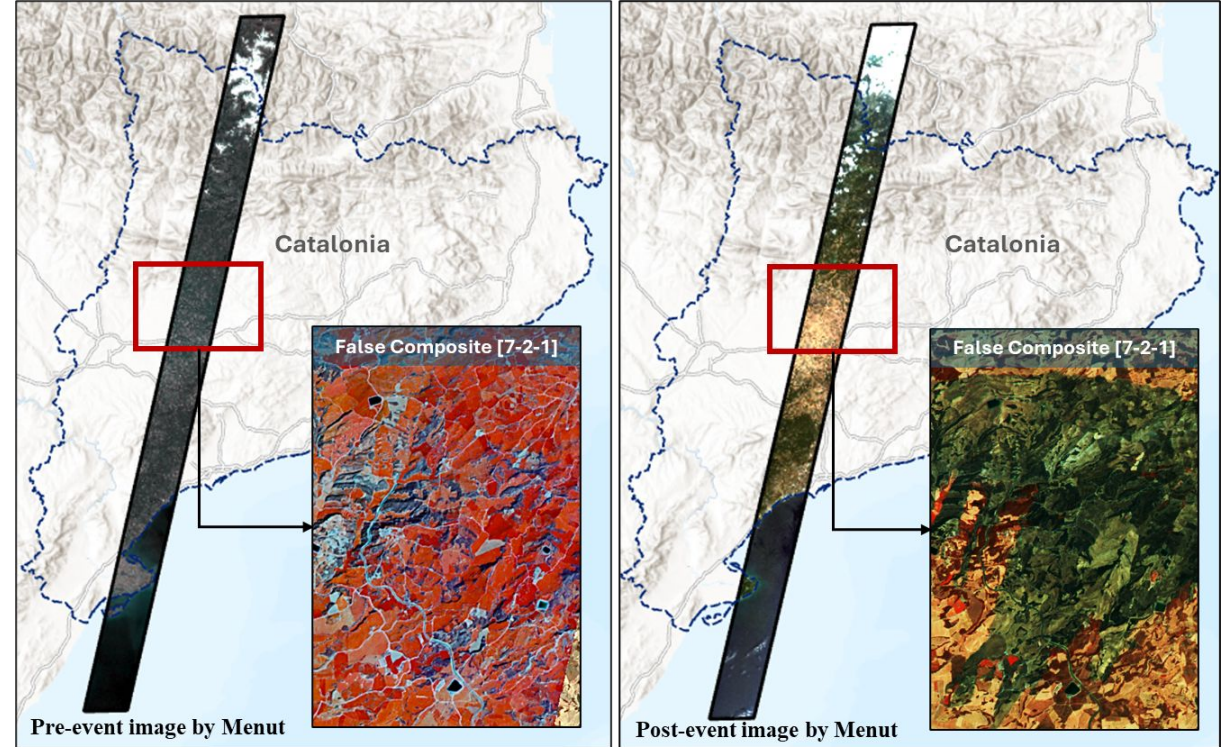


GENEO-01- Menut. Risk management

- 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

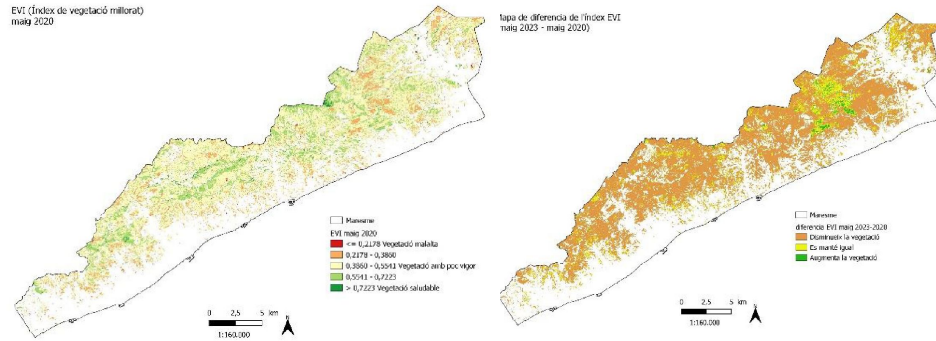
Adoption of EO space-based services for public users

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.

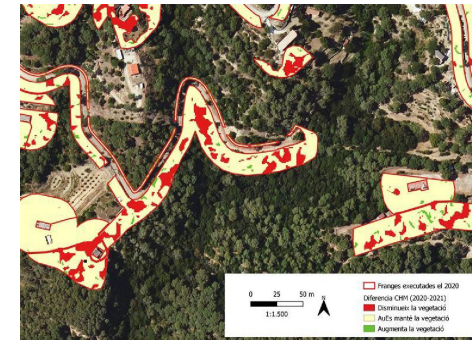
Satellite Technologies: Sentinel-2 and Menut

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^R 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^R by:
Institut d'Estudis Espacials de Catalunya

Generalitat de Catalunya
Government of Catalonia

End user: energy transfer operator

l'electra
ENERGIA

Asociación Española para la Sostenibilidad Forestal
PEFC
PERCITA 3.1



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

Workshops and tests in Catalonia

Key events and activities:

1. Satellite-based Services for Disaster Risk Management Workshop (26 February 2025)
2. Advancing in Space and Safety: Innovative Solutions for Emergency Response Workshop (3 July 2025)
3. Pilot tests with Civil Protection: emergency alerts via satellite to mobile phones (7 July 2025)

Workshops and tests in Catalonia

1. Satellite-based Services for Disaster Risk Management Workshop



Organized as part of a series of national workshops, the event brought together public administrations, emergency services, research institutions, and private companies to address disaster risk management challenges in Catalonia and Spain.

<https://www.eurisy.eu/event/satellite-based-services-for-disaster-risk-management-spain>

Workshops and tests in Catalonia

1. Satellite-based Services for Disaster Risk Management Workshop

Two live demonstrations:

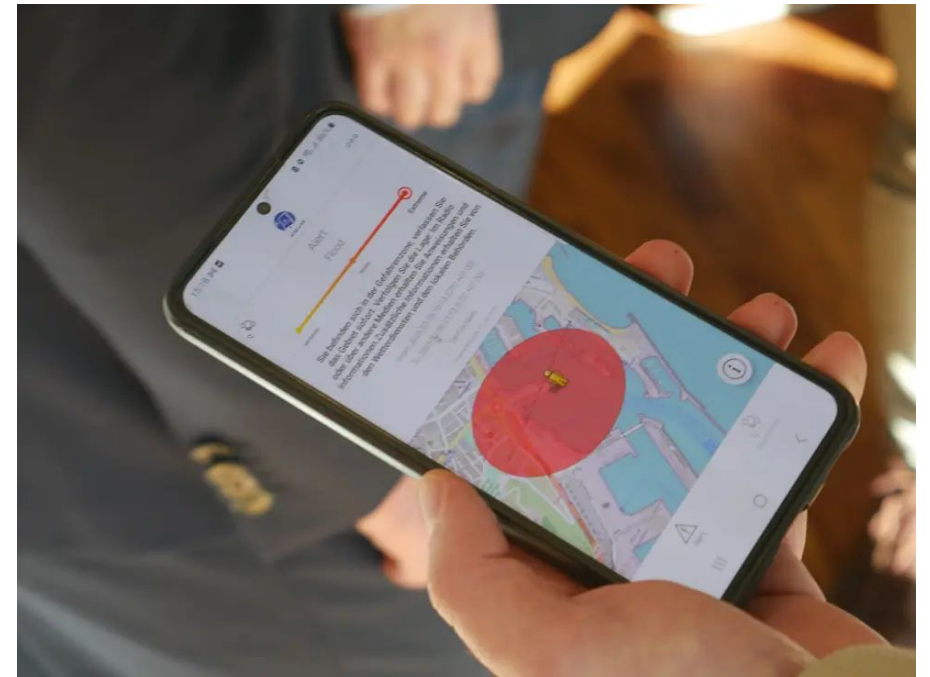
- **First demo:** Search and Rescue (SAR) exercise coordinated with Spain's sea rescue agency, police and fire brigade.
- Assets used: 2 boats and a rescue helicopter.
- Purpose: simulation of a real-time maritime rescue operation.
- Highlighted the Galileo SAR Return Link Service as fast and effective tools for maritime rescue.



Workshops and tests in Catalonia

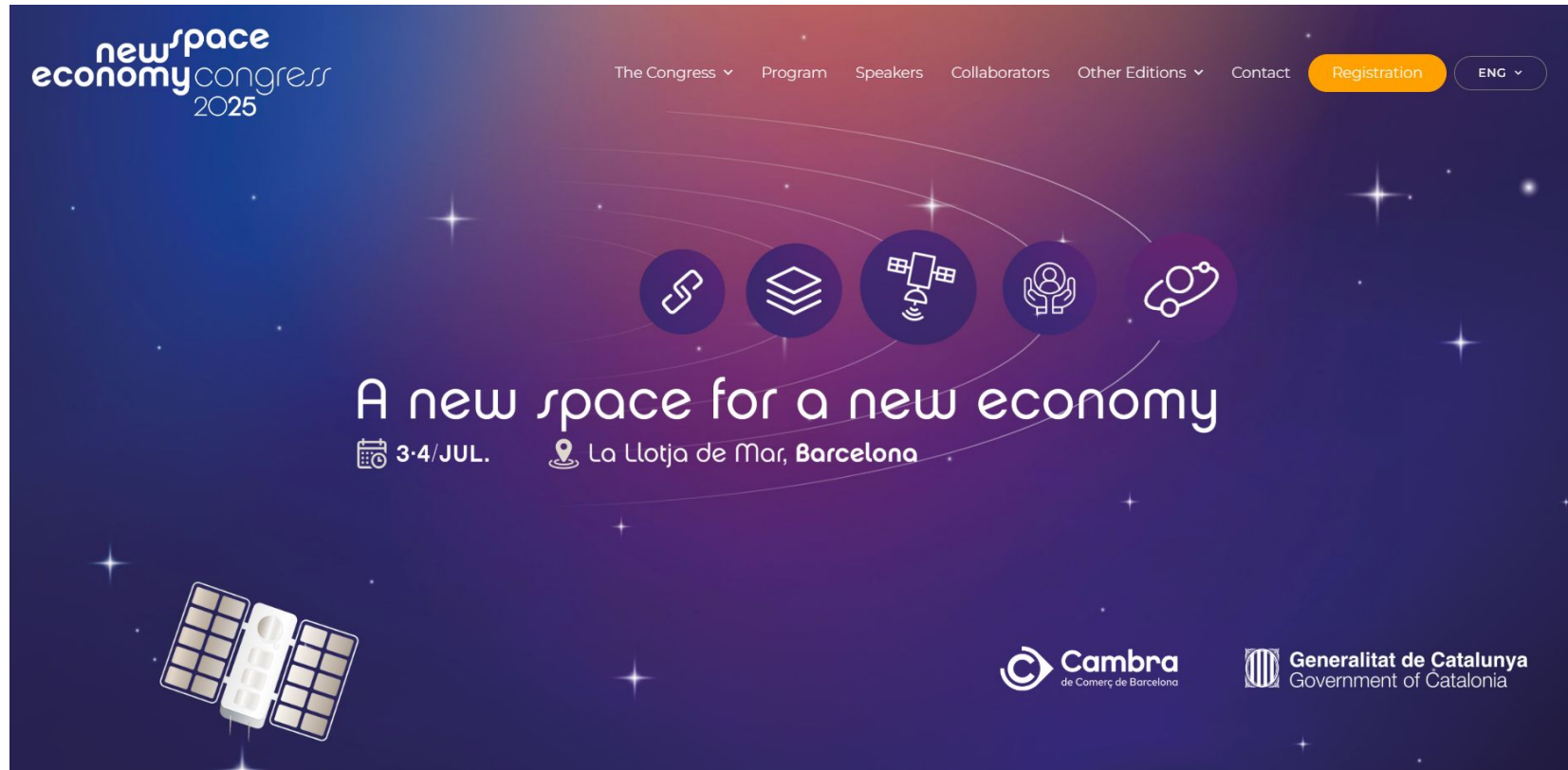
1. Satellite-based Services for Disaster Risk Management Workshop

- **Second demo:** Upcoming Galileo Emergency Warning Satellite Service (EWSS).
- Currently in testing phase, planned as the future system for mass alert messaging.
- Satellite-based service using Galileo, improves over current terrestrial phone networks.
- Can deliver alerts and safety instructions in areas without mobile coverage.
- Improves rescue capabilities.



Workshops and tests in Catalonia

2. Advancing in Space and Safety: Innovative Solutions for Emergency Response Workshop - 3 July 2025, Barcelona



[NewSpace Economy Congress 2025](#)

Workshops and tests in Catalonia

3. Pilot tests with Civil Protection: emergency alerts via satellite to mobile phones

The actors involved in the pilot

- Local Government – Mayor of the municipality
- Regional Government – Civil Protection Directorate. Responsible of the warnings
- Institute of Space Studies of Catalonia (IEEC)



Early warning systems for enhancing resilience> Piloting the Galileo EWSS in Catalonia



Image Credit: <https://tinyurl.com/imgcredOsor>

Why in this area?

Flood zone due to a dam:

- No cell phone coverage.
- No possibility of sending alerts to cell phones and area difficult to access
- Population scattered throughout the area



Institut d'Estudis
Espacials de Catalunya

Thank you very much

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Centre de:

