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Institut d'Estudis
Espacials de Catalunya

Satellite-based services for disaster risk management

Presentation Session 2:

Better Data for Timely Action: The Building Blocks of Satellite-Enabled Early Warning

Daniel Sors Raurell (sors@ieec.cat)
Head of Services and Industrial Promotion Office
Institute of Space Studies of Catalonia (IEEC), Spain

Centre de:
CERCA
Centres de Recerca de Catalunya

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TARRAGONA
TOTS SOM COLLA VELLA

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

Barcelona

Universitat Politècnica de Catalunya

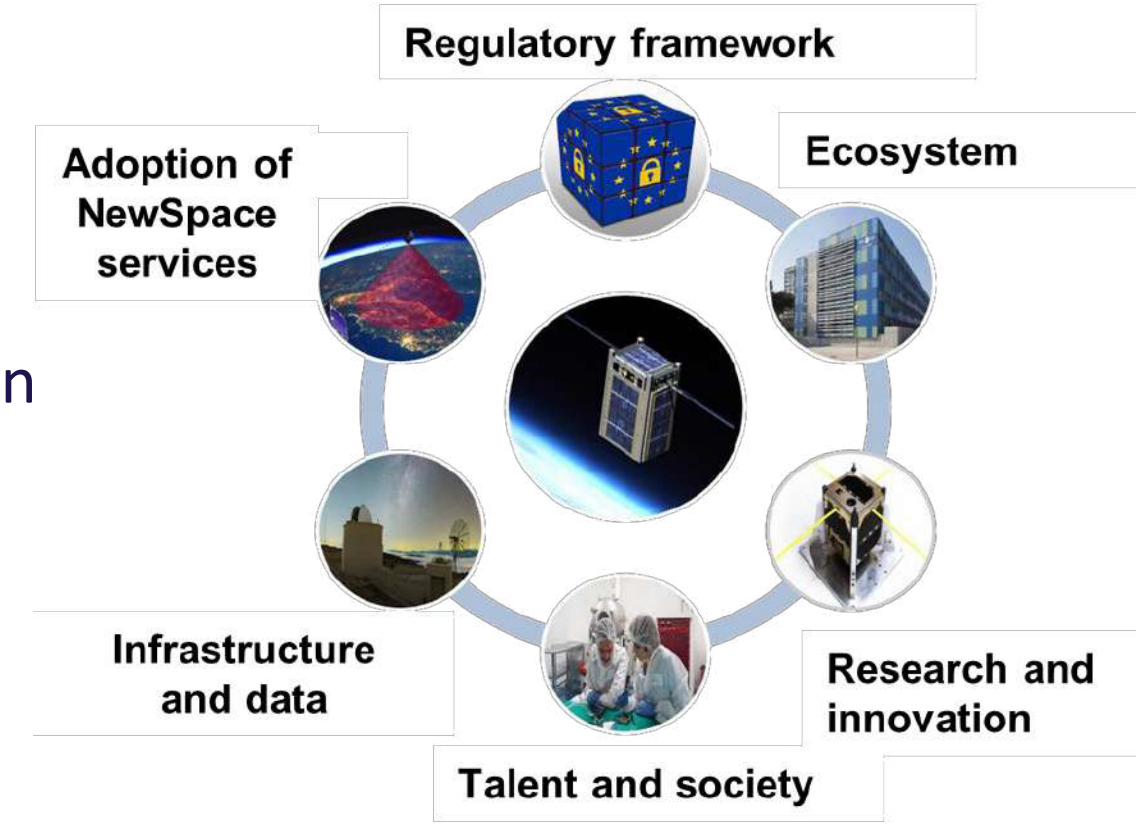
Universitat de Barcelona

Institut d'Estudis Espacials de Catalunya

NewSpace Strategy of Catalonia

Program* with specific actions to:

- Strengthen the Catalan NewSpace ecosystem
- Lead the generation of knowledge
- Promote social and business applications
- Create new solutions based on data that can be obtained from space technologies
- Promote economic growth and improve people's lives



Generalitat de Catalunya Government of Catalonia

*Approved by the Catalan government in October 2020

New strategy Catalonia Space 2030 in 2026

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i2cat

ICGC Institut Cartogràfic i Geològic de Catalunya

newspace.gencat.cat (EN)

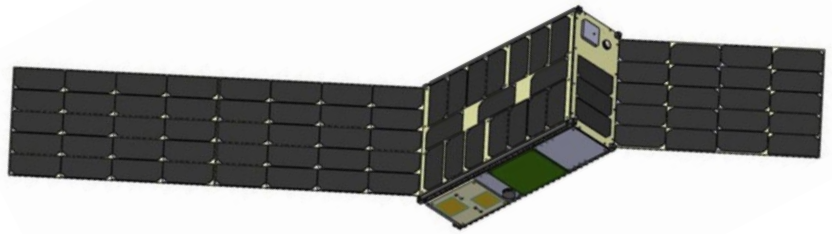
Disaster risk management space technologies:

Earth Observation

GENEO-1 / Menut

https://visors.icgc.cat/menut

Visor



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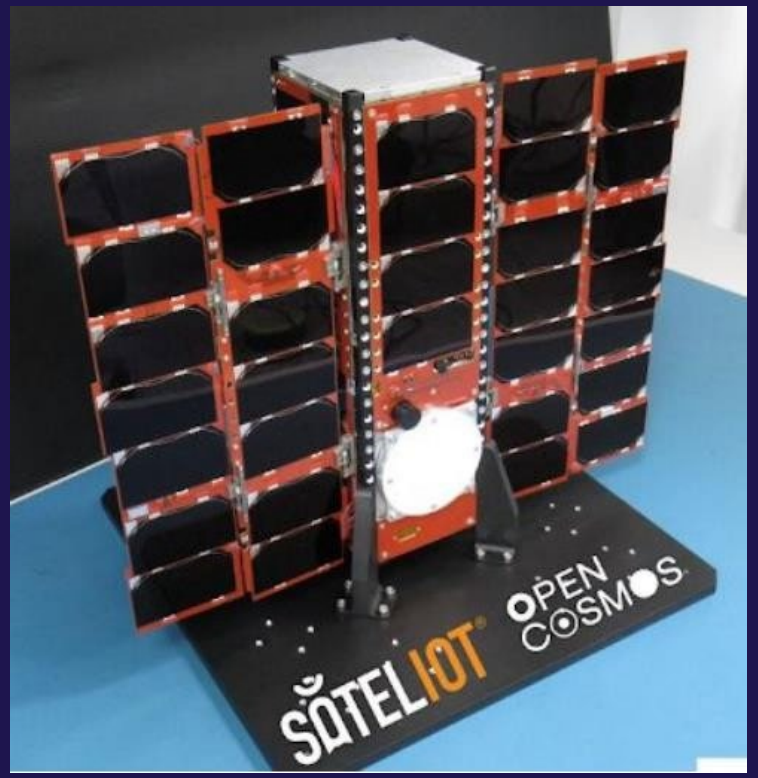
Disaster risk management space technologies:

Communications



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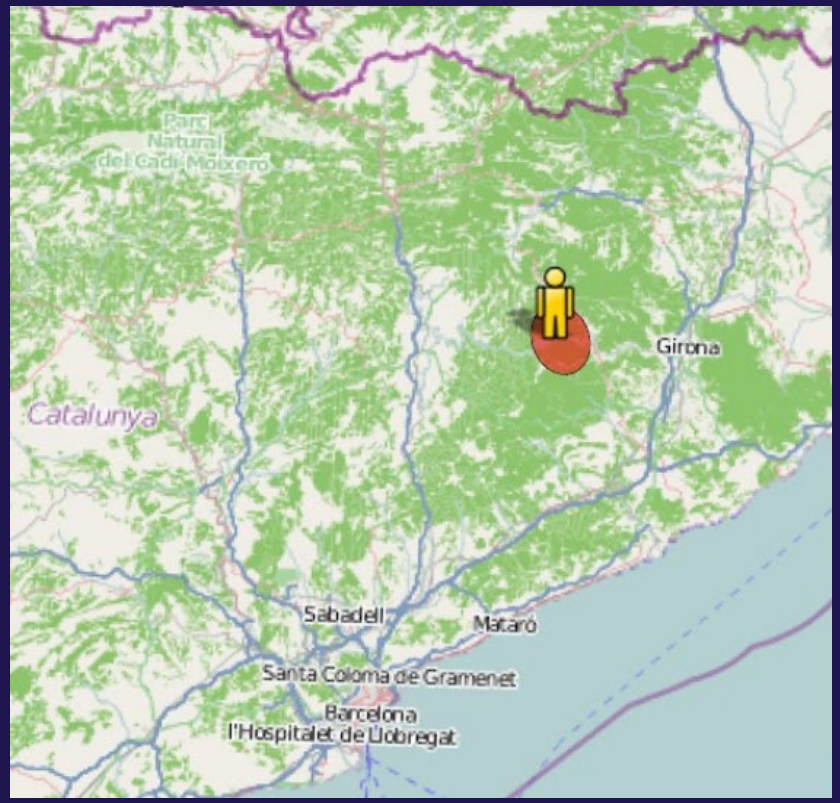
Disaster risk management space technologies:

Positioning and Navigation



Galileo Emergency Warning Satellite Service (EWSS)

Galileo SAR - Return Link Service

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Workshops and tests in Catalonia

Key events and activities:

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

Workshops and tests in Catalonia

1. Satellite-based Services for Disaster Risk Management Workshop - 26 February 2025, Barcelona

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 - 26 February 2025, Barcelona

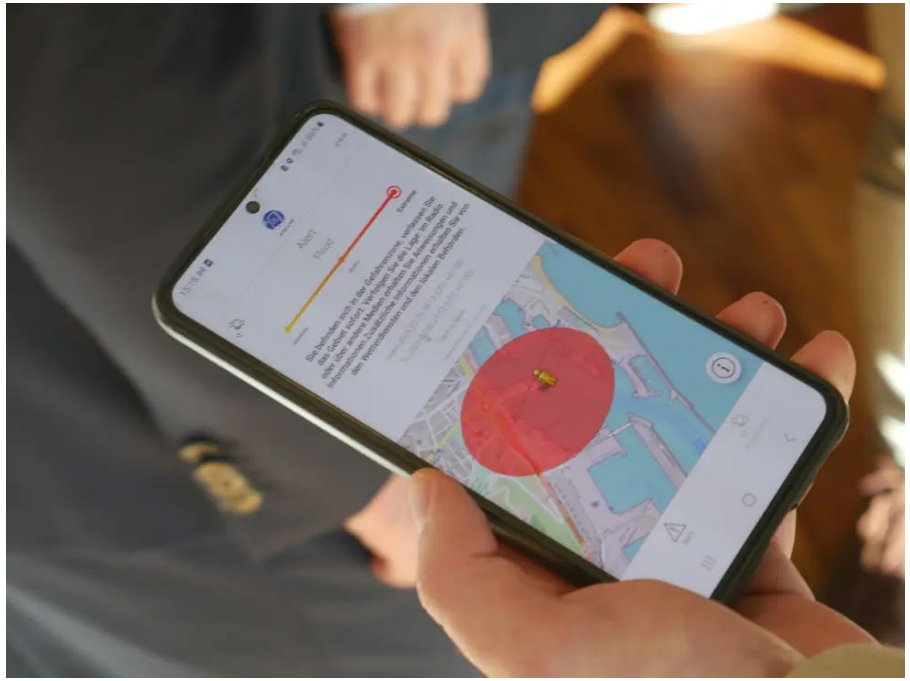
- ➔ Two live demonstrations.
- ➔ First demo: Search and Rescue (SAR) exercise coordinated with Spain's sea rescue agency, police and fire brigade.
- ➔ Assets used: 2 boats and a rescue helicopter.
- ➔ Purpose: simulation of a real-time maritime rescue operation.
- ➔ Highlighted the Galileo SAR Service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

https://youtu.be/7W3m9hv5PoA

Workshops and tests in Catalonia

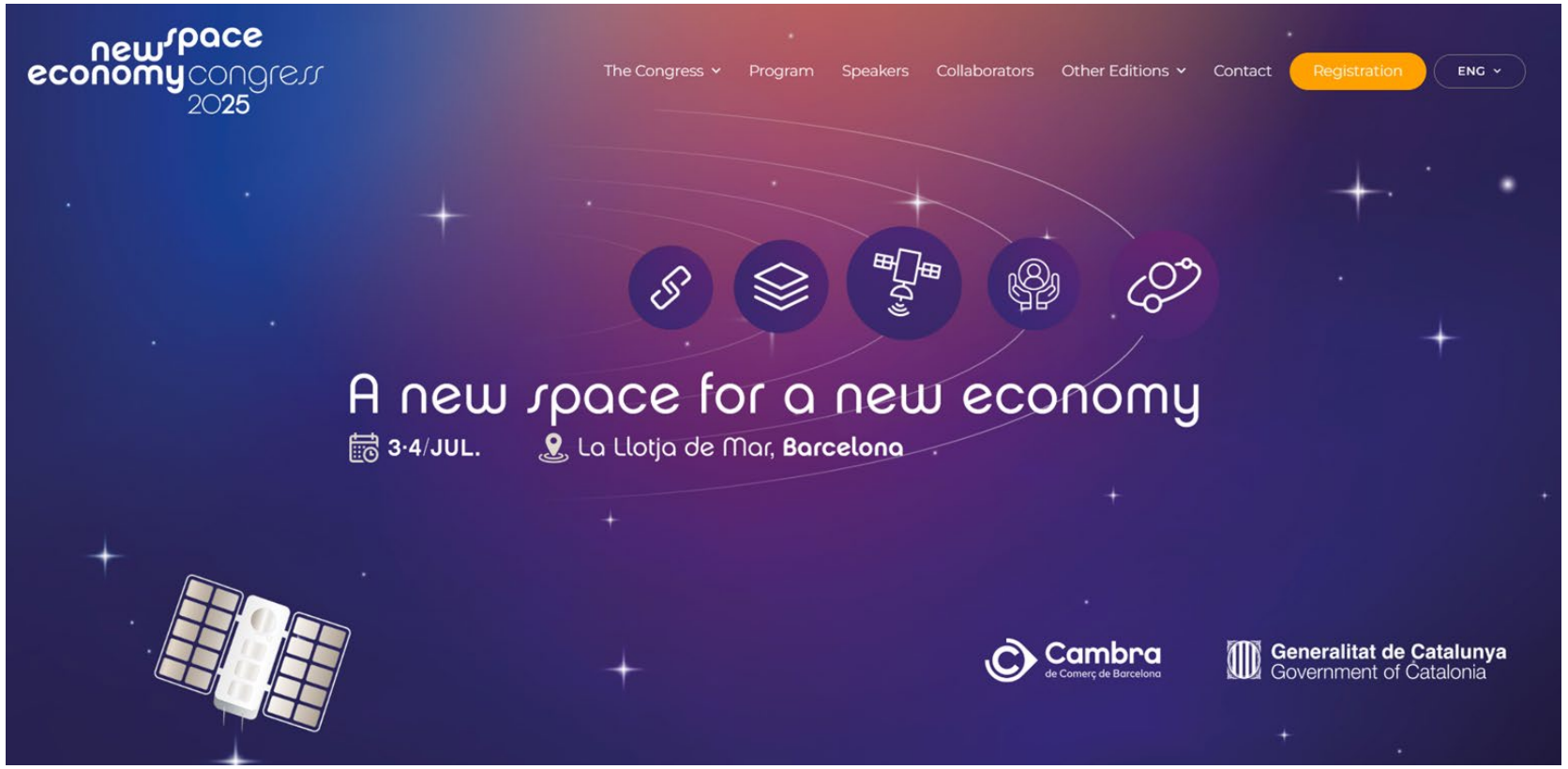
1. Satellite-based Services for Disaster Risk Management Workshop - 26 February 2025, Barcelona

- ➔ 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

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

➔ Increasing interest in space missions using Long-Wave Infrared (LWIR) eg. thermal behaviour urban ecosystems.

➔ Application - wildfires in three phases:

- Prevention: Analyze factors like fuel load or forestland decay.
- Detection-Alert: New satellites capable of detecting fires as small as 5x5 meters.
- Post-event: Assessing impact of fires, such as CO2 emissions and vegetation recovery.

➔ Demonstration of Galileo Emergency Warning Satellite Service (EWSS).

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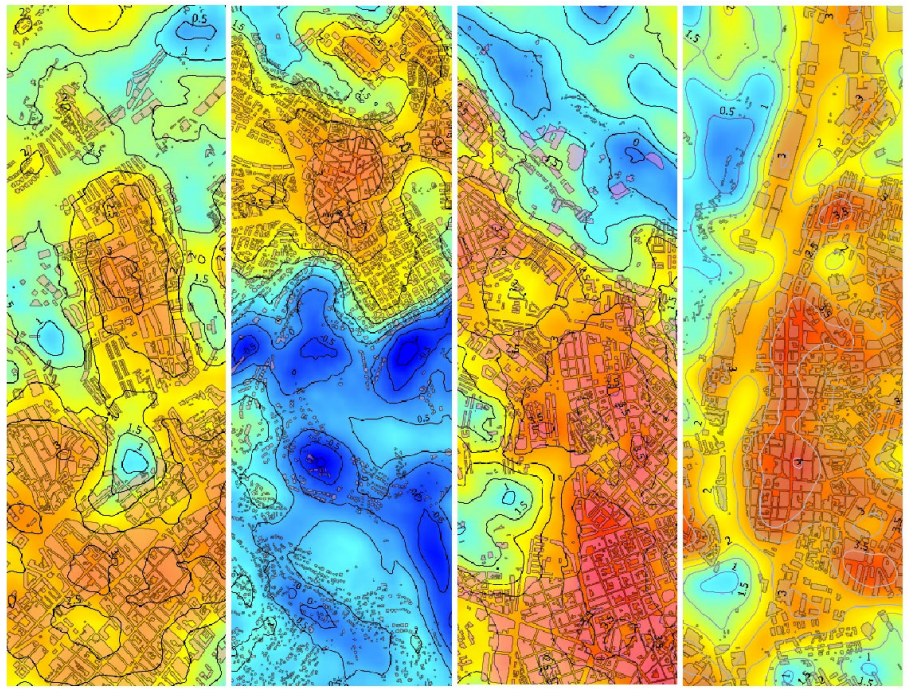


Workshops and tests in Catalonia

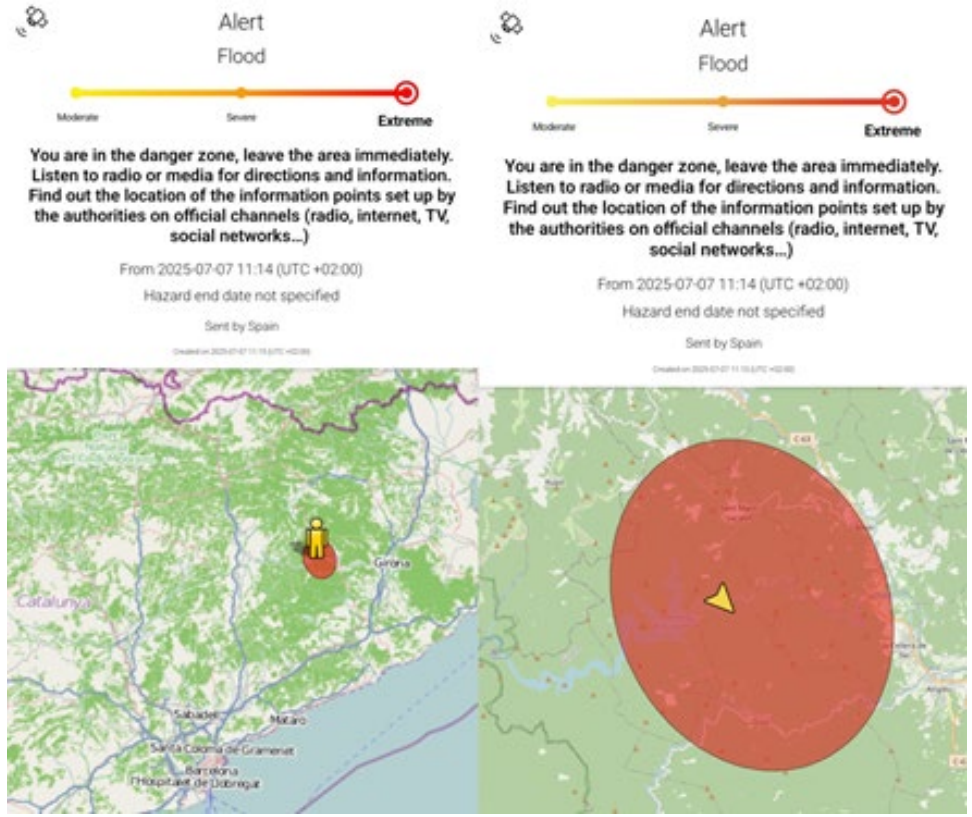
3. Pilot tests with Civil Protection: emergency alerts via satellite to mobile phones

Generalitat de Catalunya

Workshops and tests in Catalonia

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

- ➔ Pilot test held in Osor (Spain), area without mobile network coverage.
- ➔ Goal: Test the new European Emergency Warning Satellite Service (EWSS) in a relevant environment.
- ➔ The test simulated a flood and successfully sent a warning to mobile devices via the Galileo satellite constellation.
- ➔ Feedback from local authorities and Civil Protection was gathered and shared with EUSPA and service developers.



Conclusions

- Future Earth Observation satellites will provide better spatial resolutions in more relevant spectral bands (from NIR to LWIR) to better assess risks and impacts.
- 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.
- Large adoption requires compatibility with standard smartphones.
- Regional strategies provide innovative and scalable frameworks for global adoption of new services.

Conclusions

- Galileo Emergency Warning Satellite Service (EWSS)
  - In development to support civil protection agencies and increase the resilience of their infrastructure.
  - Undergoing pilot tests in several European Union member states.
  - Aims to improve emergency response across Europe with space technologies compatible with standard smartphones.
  - The service is intended to work without mobile network coverage.
  - The prototype tests have shown excellent technical results and received positive feedback from civil protection experts.

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Thank you very much

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