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Enabling applications in Disaster Management: the EU Space Programme

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EUSPA
European Union Agency for the Space Programme

Agenda

1. Introduction: EUSPA and EU Space Programme
2. EUSPA and Emergency Management segment
3. EU Space Programme for Disaster management
4. EU Space Programme: examples and applications for disaster management
5. Summary: key points

Introduction: EUSPA and EU Space Programme

The EU Space Programme

EU space activities **under one umbrella**

EGNOS

EGNOS "Makes navigation signals more accurate and trustable for Safety-critical applications"

Operational in **400+ airports** & helipads in 23 countries

Galileo

Global satellite navigation and positioning system (GNSS)

More than **3 billion Galileo receivers** worldwide

Copernicus

Earth Observation (EO) and monitoring based on satellite & non-space data

Nr.1 world provider of space data and information (>20TB/day)

GOVSATCOM

Secure satellite communications for EU governmental actors

Rapid support over crisis areas

Space Situational Awareness (SSA)

Space Surveillance and Tracking (SST)

Space Weather Events (SWE)

Near-Earth Objects (NEO)

Others

Access to Space

Research & Innovation

Entrepreneurship

Certification & standardisation

Capacity Building

EUSPA role: linking space to user needs

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EUSPA's mission is to be the user-oriented operational Agency of the EU Space Programme, contributing to **sustainable growth, security and safety** of the European Union. Its goal is to:

- **Provide long-term, state-of-the-art safe and** secure GALILEO and EGNOS positioning, navigation and timing services and cost-effective satellite communications services for GOVSATCOM, whilst ensuring **service continuity and robustness**
- **Promotes and maximises the use of data** and services offered by EU Space Programme across a broad range of domains.
- **Fosters the development** of a vibrant European space ecosystem by providing market intelligence, and technical know-how to innovators, academia, start-ups, and SMEs. The agency leverages **Horizon Europe**, other EU funding, and innovative procurement mechanisms
- Working closely with industrial ecosystems to **identify needs and gaps**
- Raising **awareness** in downstream markets, especially for commercial users (other users)
- Fostering **synergies** between program components

EGNOS

GALILEO

Copernicus
Europe's eyes on Earth

GOVSATCOM

EUSPA Horizon Europe call of 2023
(HORIZON-EUSPA-2023-SPACE)

Deadline: **14 February 2024**

CASSINI and Entrepreneurship

Foster EU's innovative spirit to deliver **applications and services**

Stimulate **innovation and entrepreneurship** in the **aerospace ecosystem**

Horizon Europe

Foster adoption of Galileo, EGNOS and Copernicus via **application development**

Support the integration of services into devices and their **commercialisation**

Galileo/EGNOS research (Fundamental Elements)

Foster the development of innovative Galileo and EGNOS-enabled **receivers, antennas and chipsets**

Increase **EU industry competitiveness**

CASSINI and Entrepreneurship | Horizon Europe | Galileo/EGNOS research (Fundamental Elements)

Visit https://www.euspa.europa.eu/

OPPORTUNITIES

Type of Action	Topic	Indicative budget (EUR mln)
IA	**EGNSS - Transition towards a green, smart and more secure post-pandemic society**	**3.5**
IA	**EGNSS - Closing the gaps in mature, regulated and long lead markets**	**8**
RIA	**Copernicus-based applications for businesses and policy-making**	**7**
RIA	**Designing space-based downstream applications with international partners**	**6**
IA	**EU GOVSATCOM for a safer and more secure EU**	**10**
	Total budget:	**34,5**

Activities to produce plans and arrangements or **designs for new,** altered **or improved products**, processes or services.

Research and innovation action (RIA)

Innovation action (IA)

The information presented is only indicative, for the full description of the call please see the Funding & Tenders portal.

EUSPA and Emergency Management segment

Connecting with user communities
EUSPA User Consultation Platform

https://www.euspa.europa.eu/newsroom/news/euspa-releases-user-consultation-platform-2022-reports

Sessions on Emergency Management & Humanitarian Aid

UCP 2022 -> 500 participants

EU SPACE WEEK 2023

Registration open
7 - 9 November - Sevilla, Spain

https://www.euspaceweek.eu/

Cruz Roja Española

European Commission
DEFIS

Joint Research Centre
JRC

EUCENTRE
FOR YOUR SAFETY.

Université de Strasbourg

WFP

Awareness and accessibility of EO data

Needs for **frequent** satellite observations

Needs for **timely** EO data delivery and **shorter cut-off** times

Complexity of "EO language"

Real-time status and position reporting

Jamming and spoofing of GNSS signals affecting **safety and security**

Reducing GNSS **power consumption**

EUSPA and Emergency Management: Market Report

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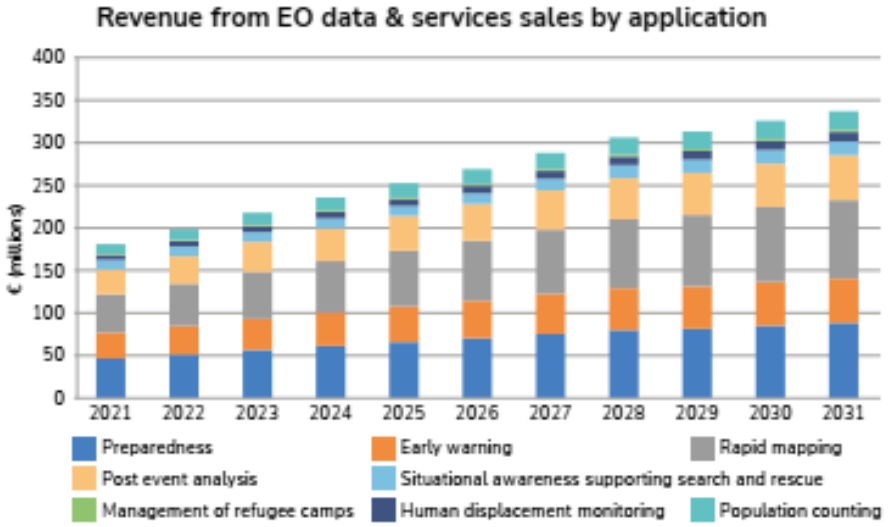
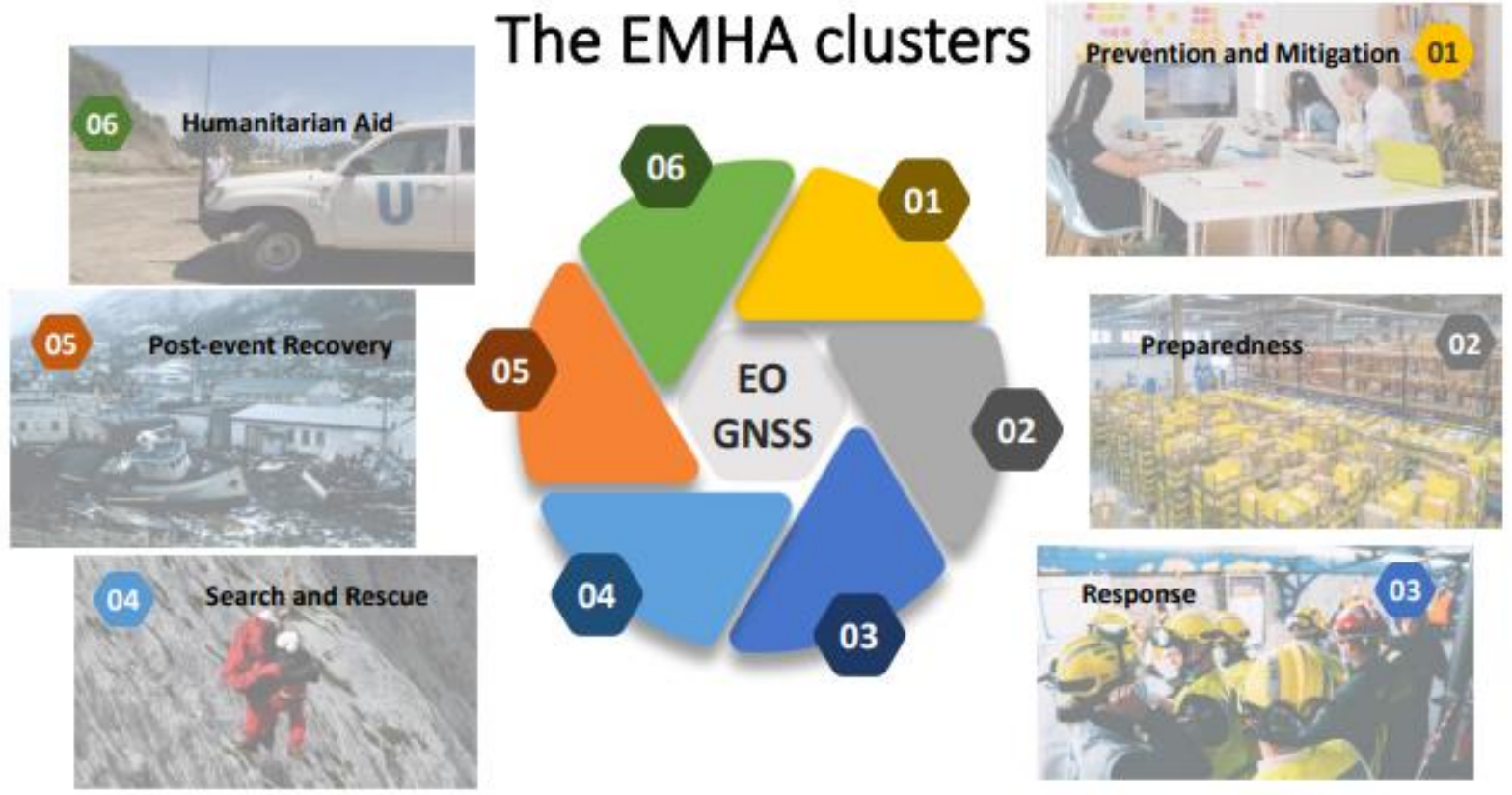
Download it for free here:
https://www.euspa.europa.eu/2022-market-report



Applications (MR 2023)

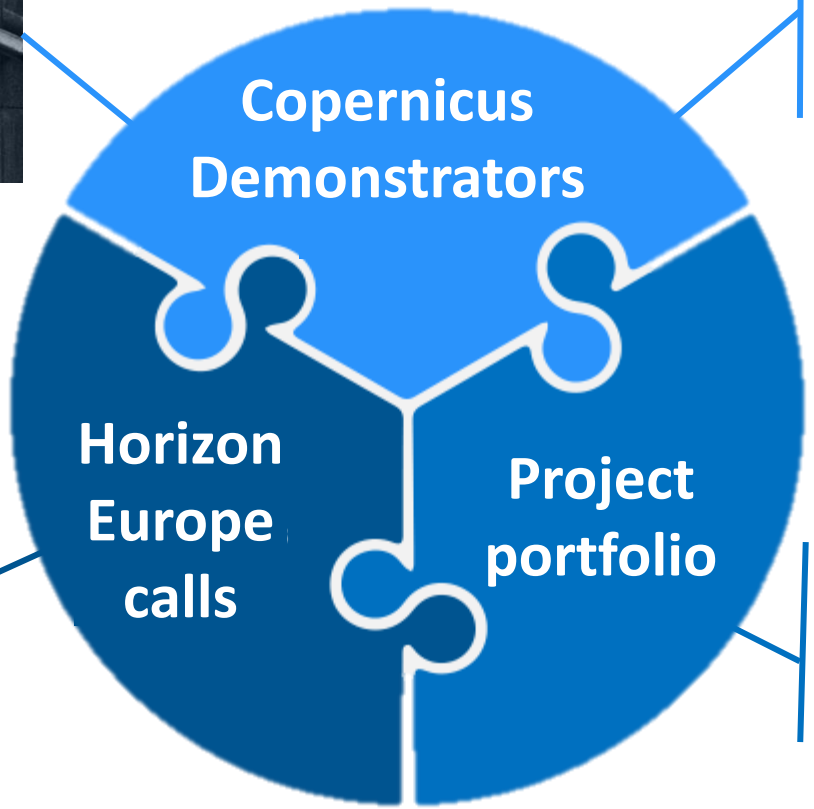
NEW MARKET REPORT (MR) 2024 VERY SOON!!



EU Space Programme is a big contributor for **Emergency Management cycle**

Acting on the user needs for Disaster Risk Management

- GOVSATCOM topics
- Internationalizing Copernicus solutions
- Further develop the downstream



Proof of Concept on
Emergency Preparedness and Early warning of Floods

Kick-off this year

Past portfolio: e.g. Gims

Current projects: e.g. Overwatch

EU Space Programme for Disaster management

EU Space Programme for disaster management applications

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Copernicus

- Delivering a treasure of **free, open and accessible Copernicus data to understand and quantify risk - detect and monitor hazards**
- **Operational** Copernicus Services -> **Emergency Management Service**, C3S etc.
- **Supporting downstream development** with cloud-based infrastructure

Galileo/EGNOS

- **Navigating** responders (and vehicles/drones) on the field
- Enable crowdsourcing applications (geo-tagged images)
- **Receivers** accurately detect earthquakes, landslides, land deformations etc.

GOVSATCOM/IRIS^2

- **Connectivity** to first responders and humanitarian aid actors, enabling secure and resilient communication and data transmission services

EU Space Programme for Disaster Management: Copernicus

Earth **O**bservation system led by the EU for global monitoring of the Earth

European response to global needs:

- to manage the environment
- to mitigate the effects of climate change
- to ensure civil security

Copernicus delivers **20 TB of free geodata daily**

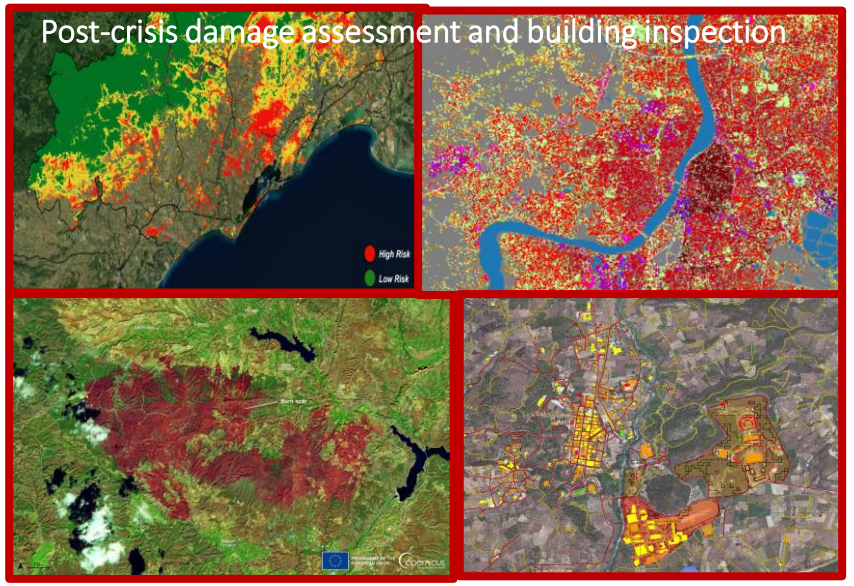
Copernicus is the **3rd biggest data provider** in the world

Sentinel satellites have already delivered 11.8 million products

Added-value information

✓ Copernicus gives us **global, free and open access** to its data and information **from seven Sentinel satellites** in orbit and numerous **in situ sources** around the world.

EU Space Programme for Disaster Management: Copernicus



Emergency Management Service

- Preparedness: forecasts
- Response: rapid maps & monitoring of events
- Recovery & prevention: risk assessment for specific hazards and post-disaster recovery maps

Joint Research Centre JRC

Climate Change Service

- High-quality climate data through Climate Data Store (CDS)
- Observations – forecasts - projections

For further information:
climate.copernicus.eu

ECMWF

Land Monitoring Service

- Priority Area Monitoring
- Land Cover & Land Use mapping
- Biophysical Parameters
- European Ground Motion Service
- Image mosaics, In-situ, Ref.data

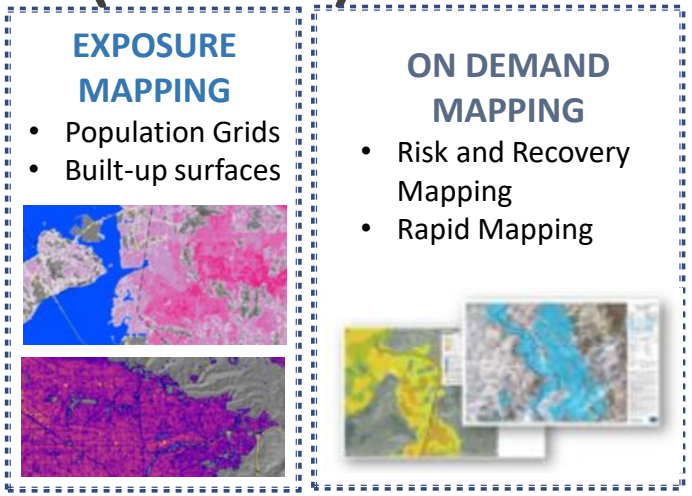
European Environment Agency

For further information:
copernicus@eea.europa.eu

EU Space Programme for Disaster Management: Copernicus

Copernicus Emergency Management Service (CEMS)

- 24/7/365 operational service. Operational since 2012
- **u**ses satellite imagery and other geospatial data to provide free of charge mapping service in cases of natural disasters
- Supports all actors involved in the management of natural or manmade disasters. Addresses all phases of the disaster management cycle from preparedness, response to recovery and prevention/mitigation
- Rapid information on hard-to-reach locations
- Image acquisition independent of time of day and weather conditions
- Rapid assessment of large areas for damage (e.g. transport and infrastructure)
- Unique overview of ongoing activities and forecasted events



Emergency

EU Space Programme: examples and applications for Disaster Response

EU Space Programme: examples of GNSS and SatCom for Disaster Response

RESPONSE sets targets for various response capacities, including transport, logistics, flood response, search and rescue, wildfire response, and emergency health needs

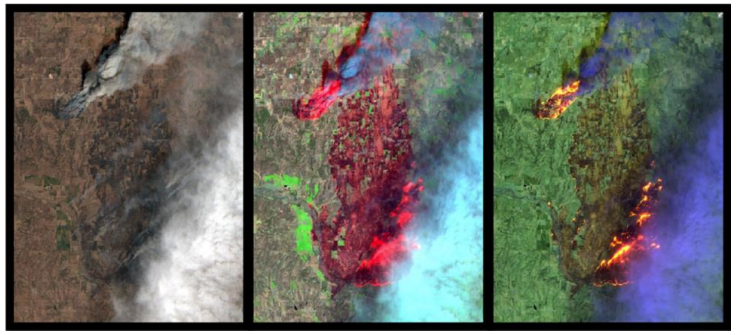
GNSS contribution

- GNSS **geo-tagged information** collected in the field (pictures, videos, text reports, routes and itineraries) about the positioning of assets (e.g. hospitals, warehouses) or most affected areas, or information obtained from social media
- GNSS **positioning to locate firefighters** in the assigned spots, i.e. in the dispersion model of firefighting
- Galileo Search and rescue (SAR): Return Link Service (RLS) allows people in distress to receive an automatic acknowledgement that their signal has been received and their location is known
- EGNOS allows landing on hospitals heliports even in adverse meteorological conditions

SatCom contribution

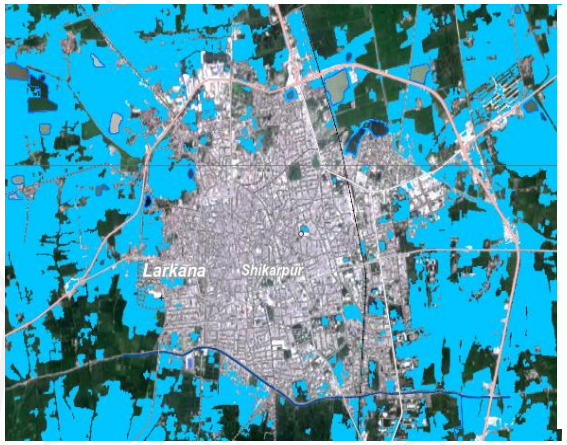
- SATCOM to establish seamless **connectivity** for emergency response vehicles.
- SATCOM **becomes imperative** when terrestrial networks are unavailable
- SATCOM technology enables **real-time** monitoring of emergency operations

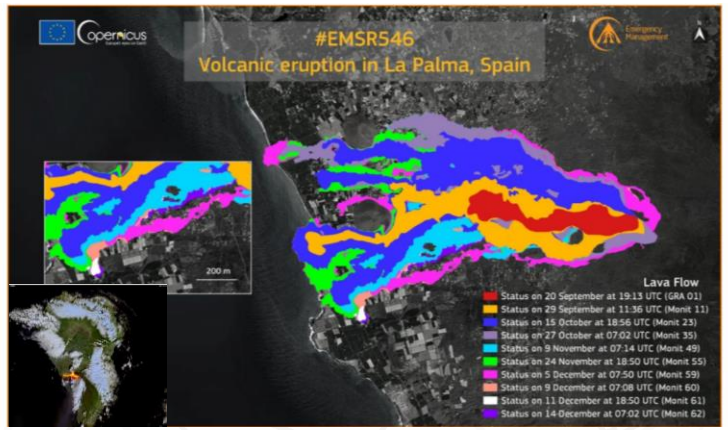
EU Space Programme: examples of Copernicus for Disaster Response:



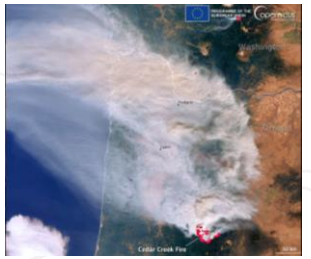
Copernicus contribution

- **Satellite imagery** to detect and monitor catastrophes in near real-time (example: wildfires) allowing for **early identification and tracking**
- Rapid Mapping: **Copernicus Emergency Management Service (CEMS)** provides on-demand and fast provision (hours-days) to understand the **extension of the damage** from the event





- **CAMS and C3S** gives information about the emission of pollutants, air quality, and weather conditions
- **CLMS** can provide benchmarks and reference layers for assessing the impact of disasters in various land cover categories; while its EU Ground Motion Service (EGMS) provides consistent and reliable information regarding natural and anthropogenic ground motion.



EU Space Programme: applications for Disaster Response

Space Programme contributes to ensure a timely, coordinated and effective response to disasters in order to minimize their adverse impacts, by providing

- **early identification and tracking**
- **timely and accurate information**

for **monitoring, detection, hazard assessment, emergency planning, post-incident analysis, situational awareness and planning and coordination**

APPLICATIONs (examples)

Crisis area assessment (EO and GNSS)

Industrial accident in Matanzas, CUBA. Example of rapid mapping from Copernicus EMS.

Operational wildfires modelling (EO)

Satellite-based active fire products have been used to generate **fire spread maps, validate fire spread models and adjust simulations**.

SYNERGIES of SPACE PROGRAMME- APPLICATIONS

Smart emergency response vehicles

Serve as a critical asset for first responders, such as civil protection, ambulance services, and fire & rescue teams.

- **SATCOM** to establish seamless connectivity for emergency response vehicles. Additionally, SATCOM becomes imperative when terrestrial networks are unavailable.
- **EO** plays a crucial role in updating maps of affected areas. EO data provides accurate and up-to-date information for informed decision-making and navigation.
- Advanced **GNSS** technology equips these vehicles with precise positioning and navigation capabilities. GNSS facilitates fleet tracking and management functionalities, optimizing resource allocation

Management of refugee camps

Focuses on the efficient administration of refugee camps, providing essential humanitarian support to displaced populations.

- **SATCOM** technology empowers refugee camps with resilient broadband connectivity. This robust connectivity facilitates access to substantial data volumes, enabling camp administrators to efficiently share information.
- **EO** data is harnessed to optimise camp management. It assists in planning camp layouts and distributing essential resources like wells and medicine. By displaying settlement concentrations and estimating population density across different areas of a camp, EO supports informed decision-making for resource allocation.

Coordination of Health, Medicine Response, and WASH Actions

- **SATCOM** ensures consistent and reliable communication for telemedicine and telehealth services.
- **EO** contributes by providing detailed maps of affected areas, including post-event effects.

Summary: key points

Summary- key points

- EU Space Programmes are big contributors for **Emergency Management cycle**
- Disaster management actors can profit significantly from the **SYNERGISTIC USE** of the EU Space Programme components

Respond
Enhancing the Union Civil Protection Mechanism response capacity

Copernicus
Europe's eyes on Earth

Rapid mapping and SAR activities

Fast provision to understand the **extension and context of the damage** from the event

GALILEO
EGNOS

Precise geolocation information

- Receivers accurately detect earthquakes, landslides
- Navigating responders (and vehicles/drones) on the field
- Geotagged images
- SAR: Return Link Service (RLS)

GOVSATCOM

Connectivity to first responders enabling secure and resilient communication

Real-time monitoring of emergency operations

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Linking space to user needs

Get in touch with us

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