

Linking space to user needs

EU Space Security and Maritime

Dr. Christina Giannopapa Head of Office of the Executive Director



EU Space Security and Maritime





- Navigating responders on the field (e.g. UAV)
- Enable asset management applications for more efficient response
- Receivers accurately detect earthquakes, landslides, land deformations & tsunamis
- Galileo Services: Services: Search-And-Rescue Service (SAR) and Early-Warning Satellite Service (EWSS)



- Free, open and access data to assess, detect and monitor hazards
- Supporting downstream development with cloud-based infrastructure – see DIAS
- Operational Copernicus Services

 -> Emergency
 Management
 Service, Security etc.



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



- Coordination with civil protection for uncontrolled reentries
- Risk assessment of collision between spacecraft or between spacecraft and space debris

EGNOS services perspectives



#EUSpace

Agriculture since 2009



Aviation since 2011



Maritime since 2024



Rail in preparation



Extensions and new capabilities

- Increased robustness against solar activity
- Extension to neighbourhood and Africa
- Authentication

Aviation: Primary means of navigation in 2030+

Better availability, more resilience, towards EU autonomy New Airspace users (helicopters, small aerodromes, drones, ...)

Maritime

- New service declared for maritime users
- Towards autonomous vessels navigation and zero-emissions shipping

Rail

•

- Making ERTMS accessible on all lines
- New services under preparation, facing the challenge of Rail safety standards



Galileo services perspectives



GALILEO

Galileo Services provided today

Open Service (OS)	Freely accessible service for positioning and timing
Public Regulated Service (PRS) – Governmental Service	Encrypted service designed for greater robustness and higher availability
Search and Rescue Service (SAR)	Locates people in distress and acknowledges that the distress signal has been received
High Accuracy Service (HAS)	Delivers high accuracy services, freely accessible, available since 2023
Commercial Service Authentication (CS)	Delivers authentication services for commercial applications (under preparation)



Coming next:

- OS Navigation Message Authentication (OSNMA)
- Further upgrades of Public Regulated Service (PRS) and Open Service (OS)
- Emergency Warning Satellite Service (EWSS)
- Commercial Service Authentication (CS)





#EUSpace 🔝









From MEOSAR

- Global coverage
- (near) Real time detection and location including single burst
- Higher availability and reliability due to redundant Ground and Space Segment
- New functionalities (RLS)

Galileo SAR: Programme Overview





2 Forward Link Service Coverage Areas as a contribution to Cospas-Sarsat MEOSAR Programme with:

- **4 European MEOLUTs** acting as one deployed in: Maspalomas (Spain), Spitzbergen (Norway), Larnaca (Cyprus), Reunion (France).
- 24 SAR L-Band SAR repeaters onboard the Constellation
- **1 Coordination and Monitoring Facility** deployed in in Toulouse
- **7 Reference Beacons** spread over the Service Areas for Service Monitoring purposes.

• Return Link Service a global service enabling a communication link back to the originating emergency beacon through the Galileo Navigation Signal in Space (I/NAV E1) sending a confirmation message (RLM) to the user that the distress signal has been localized by the System

European Coverage Area



Indian Ocean Coverage Area



7 🛛 #EUSpace 🚺

Galileo services saving lives









112

Galileo Services: High Accuracy Service (HAS)





- Typical accuracy in the decimeter level (after convergence), with Precise Point Positioning (PPP) receivers
- □ (Almost*) global coverage and free

Standard horizontal accuracy 95%: 1.925 m HAS horizontal accuracy 95%: 0.094 m



Galileo HAS Users and Applications





- Farm machinery positioning,
- Site-specific data analysis applications.
- Guidance, VRA-low applications,



- Door control supervision.
 - Cold movement detection.
 - Infrastructure and gauging surveying.
- Odometer calibration.

•



- Autonomous driving,
- infrastructure survey.



- Airport integrated surface management systems.
- Flight validation.
- Drones positioning and navigation system (urban), and geo-awareness system.

Galileo Services: Emergency Warning Satellite Service (EWSS)



- Dissemination of an alert message, including associated instructions to follow
- □ Time to disseminate ~ minutes
- □ Global coverage and free
- □ Alert message is authenticated



Civil Protection Authorities

Galileo infrastructure

End users



Galileo Future Services: Enhancing the Galileo Emergency Solutions Porfolio





#EUSpace 🔘











Satellite Communications and GOVSATCOM use case families







- Law Enforcement Interventions
 - EU External Action
 - Forces Deployment





Indicative Users:

✓ Civil Protection

Boarder Control

Forces



SURVEILLANCE

✓ EU Member States Military

✓ Police and Homeland Security

SATCOM support critical governmental operations:

- ✓ Security
- ✓ Safety
- ✓ Disaster management

- ✓ Humanitarian Aid Responders,
- ✓ Search and Resque
- ✓ Diplomatic Networks

Key Infrastruct.

- Transport Infrastructures
- Space infrastructures
- Institutional
 Communications
- Other Critical Infrastructures



KEY INFRASTRUCTURE

#EUSpace



The Govsatcom HUB and the role of CGAs



EUSPA is launching a new network of users

- Thematic groups (Emergency Management, Critical Infrastructure, Surveillance...)
- Gain access to opportunities and promote share of experience across the communities
- Identify, discuss and assess further use cases and requirements, challenges and opportunities for the use of secure SATCOM
- Launch pilot activities
- Discuss and prioritise technological gaps to be filled
- Workshops, Demo events, Training needs ...
 - ... and much more ..













Emergency Management & Humanitarian Aid Market Segment

Safeguard communities and the environment by better understanding the risks and mitigating the impact of hazards.

Humanitarian Aid: Anticipate crises, make informed decisions and better manage available resources and funding.

Prioritise and monitor post-disaster actions.



Save crucial time – and lives – by enabling efficient early-warning systems.

Search & Rescue: Save lives using Galileo-powered beacons.

Improve the situational awareness, safety, efficiency and coordination of an emergency response mission.





Climate Change and disaster management



Copernicus EU @CopernicusEU

A low-pressure system named Boris brought heavy rain to central Europe between 11 and 15 September, causing widespread flooding from Poland to Romania.

The flooded areas along the Polish-Czech border are visible in this image acquired by the Sentinel-1A radar satellite yesterday.



👗 EU Civil Protection & Humanitarian Aid 🌅 and 5 others



10:19 AM - Sep 16, 2024 - 12.6K Views

A EU Civil Protection & Humanitarian Aid M and 5 others

Code	Title	Date	Туре	Country
EMSR762	Flood in Emilia-Romagna, Italy	2024-09-18	Flood	Italy
EMSR761	Flood in Dresden, Germany	2024-09-18	Flood	German
EMSR760	Wildfire in Portugal	2024-09-16	Wildfire	Portugal
EMSR759	Flood on the Danube in Hungary, Austria, and Slovakia	2024-09-14	Flood	Hungary Austria, Slovakia
EMSR758	Flood in Galati and Vaslui counties, Romania	2024-09-14	Flood	Romania
EMSR757	Flood in March, Morava Basins, Slovakia	2024-09-13	Flood	Slovakia
EMSR756	Flood in South West Poland	2024-09-13	Flood	Poland, Czechia
EMSR755	Flood in Brandenbourg, Germany	2024-09-13	Flood	German





#EUSpace

mrcobace

Demo Day

20th Sep

Lublin,

PO

Pilot with the Ukrainian Red Cross: #EUSpace4Ukraine





Tailored operational solution, based on actual needs of **Red Cross Ukraine**



- Validated and Demonstrated on the field, in Poland
- Currently in-use by the Red Cross Ukraine in their operations



#EUSpace

EUSpace4Ukraine: demonstrating the impact of the war on Ukrainian agriculture

Practical use of open & free satellite imagery served through the EUSpace4Ukraine tool The platform is validated operationally by **Red Cross Ukraine to retrieve information before visiting sites on the ground to understand damages and navigate more**



The bridge on April 20, 2022, without any visible damage

Funded by EUSPA and developed by Cloudferro



The bridge on June 10, 2024, showing signs of breakage

Examples of synergies for governmental applications





Border Surveillance

Effective monitoring of cross-border displacements at the EU border in the case of armed conflicts in EU neighboring country



Humanitarian Aid

Deployment of troops and police for security enforcement and civilian protection missions while ensuring the observance of ceasefires



Disaster Management

- Implementation of preventive measures to anticipate a forecasted natural disasters
- Emergency response in case of a natural disaster. Providing support to civil protection stakeholders



Galileo: Secure navigation of intervention forces **GOVSATCOM**: Secure communication between intervention forces

Copernicus: Provision of key information on status on the ground via detailed mapping of the impacted area

Galileo: Secure navigation, positioning and timing for governmental authority vehicles and assets GOVSATCOM: Secure and reliable communication between governmental authorities and control centres Copernicus: Identification and mapping of possible risk/dangers at borders

Galileo: Secure positioning/ navigation in potent. hostile areas **GOVSATCOM**: Secure communication in potentially hostile areas with unreliable infrastructure

Copernicus: geospatial information such as detailed mapping of the area or surveillance of human activities



Space and Maritime





EGNSS and Copernicus support optimized routing and traffic management for safer and greener navigation











Route optimisation, to reduce fuel consumption and emissions



New Vessel Traffic Services with Digital Ship Twin



Ice navigation



EGNOS adoption in maritime and inland waterways



#EUSpace



- ¹IALA Guidelines on SBAS retransmission via shore/river bank infrastructure published.
- Implementated in **France**.
- IWETT Project: EGNOS integration in river infrastructure in Hungary (Danube), Germany (Spree-Oder Waterway), Spain (Guadalquivir) (ongoing, Sep 2022- Sept 2024)
- Tailored Cost Benefit analysis by EUSPA upon request
- No impact in receivers

¹IALA: International Association of Marine Aids to Navigation and Lighthouse Authorities
²SOLAS: Safety Of Life At Sea (merchant vessels)
³ MSI: Maritime Safety Information
⁴ IEC: International Electrotechnical Commission





Most maritime receivers implement SBAS (SBAS not certified):

- 97% SOLAS devices
- 88% non SOLAS devices



- ESMAS MSI³ integrated in operations of all IHO Navarea Coordinators in the service area
- IEC⁴ 61108-7 Standard for SBAS receivers (May 2024)
- Updated Regulation on Maritime Equipment Directive (MED) includes new IEC SBAS standard, in force since Sept 2024
- Prototyping and testing of IEC SBAS Standard compatible receivers ongoing. Laboratories and notified bodies preparing for certification

Space supports safe and Green Autonomous navigation at sea and inland waterways



#EUSpace

EGNSS accuracy and integrity and EO benefit a range of applications:

- MASS navigation
- Operation of Locks, Tugs and Pushers
- Hull to hull
- Port operations: local VTS
- Docking assistance for leisure boats
- Marine Engineering: cable and pipe laying;







New European Parliament Pilot Project on Space for autonomous vessels: AVIS, with EC DG MOVE

Started January



Duration: 37 months Aim: Use of EGNSS, including EGNOS, and Copernicus to improve navigation of autonomous vessels along Europe's inland waterways. Tests: Germany, Hungary and Romania

Oil spill monitoring

The Copernicus Sentinel-1 mission captured its first images of the oil spill from a collision between two ships that had occurred the day before in the Mediterranean Sea, north of the French island of Corsica.

- This first image shows that the oil slick was about 20 km long.
- By the evening at 19:21 CEST, however, imagery shows that the slick had lengthened to about 35 km.
- And 24 hours later, on 9 October at 19:14 CEST, the slick had grown to about 60 km long.



Fishing cages in Western Mediterranean



Sentile-1A



EUSPA-EFCA Partnership





Sefca 💽

EUROPEAN FISHERIES CONTROL AGENCY

Home About EFCA Activities Work with us Media & News Library

Home / Media & News / News

EFCA and EUSPA formalise inter-agency cooperation related to the maritime domain

The European Fisheries Control Agency (EFCA) and the European Union Agency for the Space Programme (EUSPA) have signed a cooperation agreement in the form of a Memorandum of Understanding (MoU), concluded for an initial duration of two years.

EFCA and EUSPA share common objectives with regards to safer, more sustainable and efficient maritime operations. This cooperation will further strengthen EFCA's capabilities when it comes to modern and emerging technologies and services, which could be made available to Member States fisheries control authorities. This would lead to an improved capacity for detecting, identifying and categorisation of suspected non-compliance fishing activities, providing additional tools for the operational activities coordinated by EFCA.

EFICA, and EU-IPA share common up, cover, with requires to solar, more dust who east whome the interpret operation will further strangthen EFCAs capabilities when it comes to modern and emerging technologies, and services, which could be made available to Member Statist Inserts control authorities. This would be made available to Member Statist Inserts control authorities. This would be available to Member Statist Inserts control authorities. This would be made available to Member Statist Inserts control authorities. This would be available to Member Statist Inserts control authorities. This would be and environed capacity for detecting, identifying and categorisation of suspected non-compliance lishing activities, providing additional tools for the operational activities controlated by EFCA.

European GNSS enable new applications and resilient Maritime Navigation





#EUSpace

Security @ EUSPA

⊢−−−−▶



Security Governance

Operational security (including cryptography and cybersecurity), security risks and threat analysis

Security Operations

24/7 monitoring operations Action regarding **security threats and alerts**

Governmental service provision with competent authorities in EU Member States Security Accreditation Board (SAB)

Security Accreditation Authority for all components of the EU Space Programme

Including tasks assigned under Decision No 1104/2011 (PRS access) and Council Decision 2021/CSFP/698



Key contributor in the implementation of the EU Space Strategy for Security and Defence



---->

Together with EC, EUSPA is spearheading the formation of the **EU Space ISAC**



EU Space Academy #EUSpace

EU Space Surveillance and Tracking





Utilizing the use of space for disaster risk management









Satellite-based Services for Disaster Risk Management

30th November 2023 9:00 – 15:00 CET SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA, Faculty of Informatics and Information Technologies, Ilkovičova 2 Bratislava, Slovakia



A The Almost Annual Almost Annual Almost Alm

SLOVAK SPACE OFFICE

EDUCATION, SCIENCE, EARCH AND SPORT THE SLOVAK REPUBLIC

LOVAK INVESTMENT AND

TRADE DEVELOPMENT AGEN









EUSPA Reports





Synergies of >180 specific applications fully analysed and categorised













#EUSpace 🔘



Linking space to user needs

Get in touch with us

www.euspa.europa.eu





Apply today and help shape the future of #EUSpace!

EU Space Academy Learning Platform



www.euspa.europa.eu/spaceacademy

Free online training open to all individuals, start-ups, entrepreneurs and SMEs

Learn about building space application business on your own device

Completed when and where you want

Broad variety of modules, for example

- EU Space Programme
- Customer support and sales
- Building a successful team
- Resources allocation
- Business plans and models
- Access to funding
- Intellectual Property, copyrights and data policy

EU SSSD: With the support of the EUSPA, the Commission will develop the EU Space Academy Learning Platform to create space development programmes including related to security





Space and disaster management

in natural and man-made disasters



Crisis area assessment

Management of refugee camps etc....



Space for Safety and Security

2 acres

