#EUSpace

SUNSHINE Webinar 1

SUNSHINE

Leveraging EU Space data and services for disaster resilience

20/01/2026

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Agenda

Morning Session

- 9h30 — **Welcome & Introduction to SUNSHINE opportunities**
- **Copernicus EMS drought & exposure mapping for disaster resilience**
- 12h00 — **Quiz and Q&A**

Afternoon Session

- 13h30 — **Welcome & Introduction to SUNSHINE opportunities**
- **Galileo Emergency Warning Satellite Service**
- **Galileo for robustness and resilience (OSNMA, SAR, HAS)**
- 17h00 — **Quiz and Q&A**

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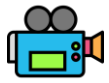
Some rules to consider



- This webinar is being **recorded**
  (recording of the webinar will be available on the SUNSHINE page of the UCPKN website)

- **Stay muted** when not speaking to avoid disruptions and background noise.

- Use the "**Raise Hand**" function or the Chat during the Q&A sessions.

- **Be respectful and concise** when sharing comments or questions.

- You may activate the option for automatically translated captions by clicking on "**Live Transcript**".

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Meet the Speakers

Annita Elissaiou
Project Officer
EENA

Gabriel Lazazzara
Manager
ALSO Space

Caroline Morisot-Pagnon
EWSS expert
Telespazio

Vincent Campagne
GNSS expert
FDC

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The SUNSHINE Project

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The SUNSHINE Project

Europe in the face of disasters…

- Climate change, natural hazards, safety threats increasing in frequency and intensity.
- Pressing need for stronger civil protection and international cooperation
- The need to be well-prepared to handle disasters is more important than ever.

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The SUNSHINE Project

Background

- **Request** made by the **European Parliament & the Member States of the European Union**:
  - *How to better understand the EU space services?*
  - *What is the potential of EU space services to support national civil protection authorities?*

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The SUNSHINE Project

Satellites at the service of disaster management

EU Space Programme

- EU is developing and operating space infrastructures with great potential for civil protection community
- Space data and services for observation, monitoring, mapping, public warning…
- Applications for safety and security expanding fast.

How to make best use of space capabilities in times of crisis?

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The SUNSHINE Project

What is the SUNSHINE project about?

- Present and demonstrate the EU space services
- Help the civil protection community understand what they can do & how to use them
- Support operational integration in national systems and procedures

The project will strengthen resilience of EU Member States through dedicated trainings and exercises on the use of EU Space services.

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The SUNSHINE project consortium

TELESPAZIO
a LEONARDO and THALES company

ALSO Space
CONSULTING

cnes
CENTRE NATIONAL
D'ÉTUDES SPATIALES

Edelweiss
Resilience

Université
de Strasbourg

FDC

IABG

eena | 112

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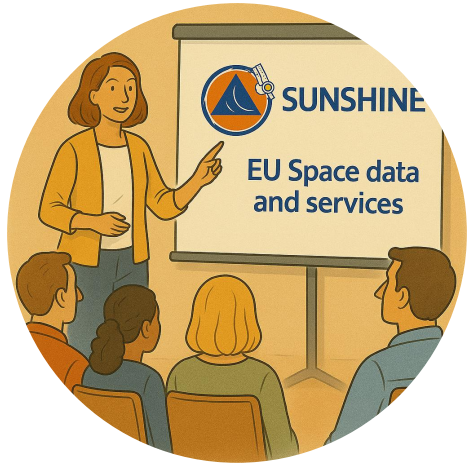
Seminars



Webinars

SUNSHINE

Trainings

Bilaterals

Exercises

SUNSHINE Trainings

4 Seminars

5 Webinars

2 communication webinars

3 training webinars

1 Bilateral

per Member State

2 Exercises

Who are the SUNSHINE trainings for?

Operational & Strategic Actors

Civil protection authorities, emergency services & first responders, crisis & disaster management team leads, technical emergency teams, ministries responsible for civil protection.

High-Level Technical Knowledge Actors

Technical experts, training coordinators, technological institutes, national scientific bodies & research centres, members of the Union Civil Protection Knowledge Network

Political & Coordination Actors

Policymakers on a national and local level, EU institutions, international & European organisations, NGOs, EU Coordination bodies

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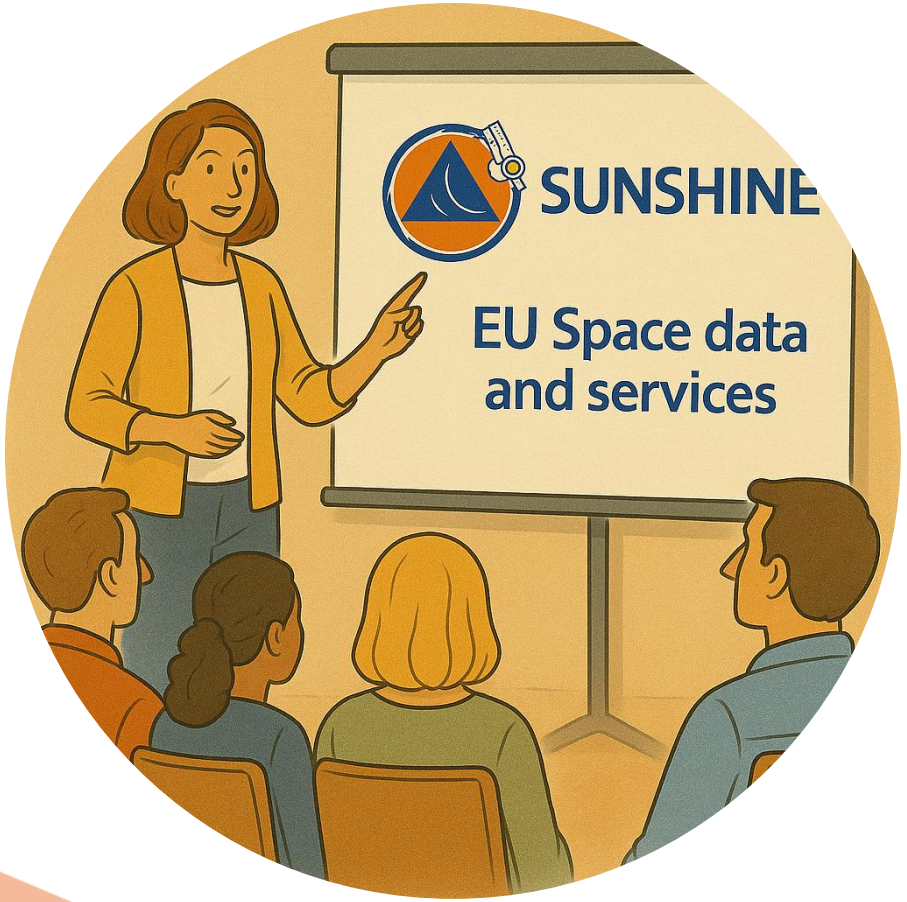
The SUNSHINE seminars



- Taking place over 4-days
- In-depth training on EU Space components and applications for crisis management
- “Train-the-trainer” approach ensures accuracy, relevance, and replicability
- Practical demonstrations on the use of EU space data and services

The SUNSHINE seminars

REGISTER HERE

https://ec.europa.eu/eusurvey/runner/SUNSHINE_TrainingSeminars_ExpressionOfInterest

- Registrations are open for next events
  - 3rd to 6th of March 2026 in Strasbourg, France
  - 5th to 8th of May 2026 in Timișoara, Romania
  - 23rd to 26th of June 2026 in Zagreb, Croatia
- Registration is free (financed by EC) but travel & accommodation costs are not covered
- Selection of profiles based on Expression of Interest form

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09h00

10h00

11h00

12h00

13h00

14h00

15h00

16h00

17h00

18h00

Registration and installation

Inspirational Speech

Welcome and presentation

Ice breaker

EU Space components

Reference disasters presentation

Quiz

ECHO module
- Emergency Rescue Coordination Centre portal
- Union Civil Protection Knowledge Network
- Aristotle

Quiz

Space Situtional Awareness (SSA)

Close up speech

Time Buffer

BEFORE CRISIS

Welcome and warm up

Quiz

CEMS
- European Drought Observatory (EDO)
- Global Human Settlement Layer (GHSL)

Coffee Break

CEMS
- European Forest Fire Information System (EFFIS)

Quiz

Galileo EWSS
- Introduction and live demonstration

Lunch Break

DURING CRISIS

Quiz

Galileo EWSS
- EWSS technical concepts
- EWSS operational platform

Coffee Break

CEMS
- European Flood Awareness System (EFAS)
- Rapid Mapping (RM)

Quiz

Close up speech

Time Buffer

AFTER CRISIS

Welcome and warm up

Table Top Exercise:
When CEMS meets EWSS

Coffee Break

Quiz

CEMS
- Risk and Recovery Mapping

Lunch Break

GOVSATCOM and IRIS²

Coffee Break

Galileo Navigation

Quiz

Your time to SHINE

Close up speech

Time Buffer

Welcome and warm up

Rotating Workshops: Bee a satellite
- OSNMA live demo
- Play with Galileo EWSS
- Play with EFFIS
- Play with EFAS

Coffee Break

Seminar evaluation

Final Speech

Time Buffer

- Context and guidance
- Lectures
- Interactive sessions
- Breaks and buffers

Subject to change

The SUNSHINE webinars

3 Training Webinars

- Online sessions focused & targeted learning on specific EU space components
- Presentations by experts of the SUNSHINE consortium
- Detailed sessions on the purpose, functions, use and real-world applications of EU space assets
- **Next dates**:
  - 4th June – CEMS EFAS and Rapid Mapping
    CEMS EFFIS and Risk and Recovery Mapping
  - 10th September – GovSatCom & IRIS^2 (final agenda TBC)

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SUNSHINE Training Webinars: EU space components in focus

2 Communication Webinars

- Online sessions to boost project visibility
- Promote training opportunities
- Communicate on project's results
- Next date:
  - 2nd April 2026

Recording and slides from 1st communication Webinar available on UCPKN SUNSHINE page

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SUNSHINE Exercises

Putting theory into practice again with immersive simulations

- **SIMEX:**
  - **Transform theory into practice** using EU space assets and tools in a realistic crisis situation
  - **Collaborate and make decisions** in real time, transform your knowledge in skills

- **How to participate?**
  - 2 sessions in DG DEFIS headquarters (Brussels)
    - 24-25 March
    - 6-7 October
  - Pre-requisite*: Participation to a training seminar*
  - **1 and ½ days format** with preparation, ice-breaker, engaging warm-ups and finally a **6-hours SIMEX**

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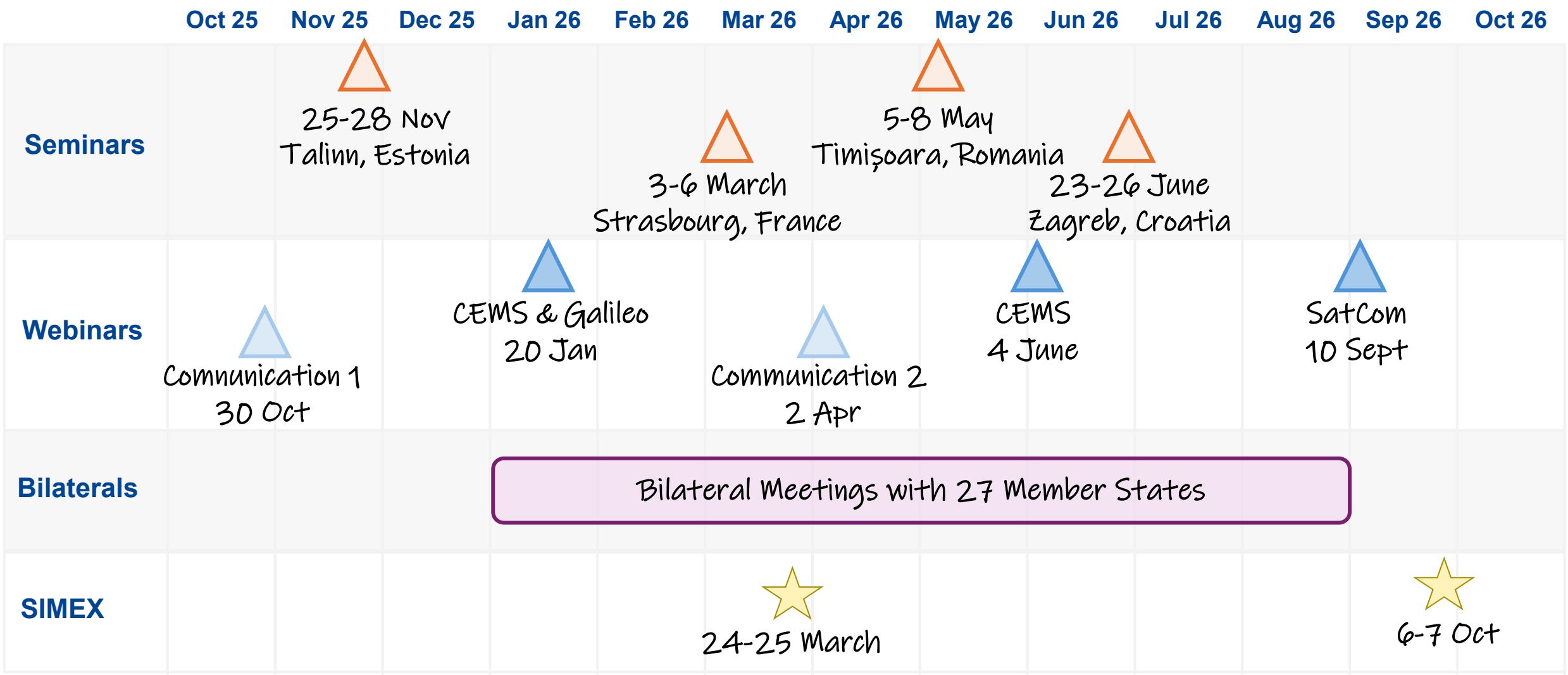
Mark your calendar!



From Space to Safety:

Copernicus and its Emergency Management Service

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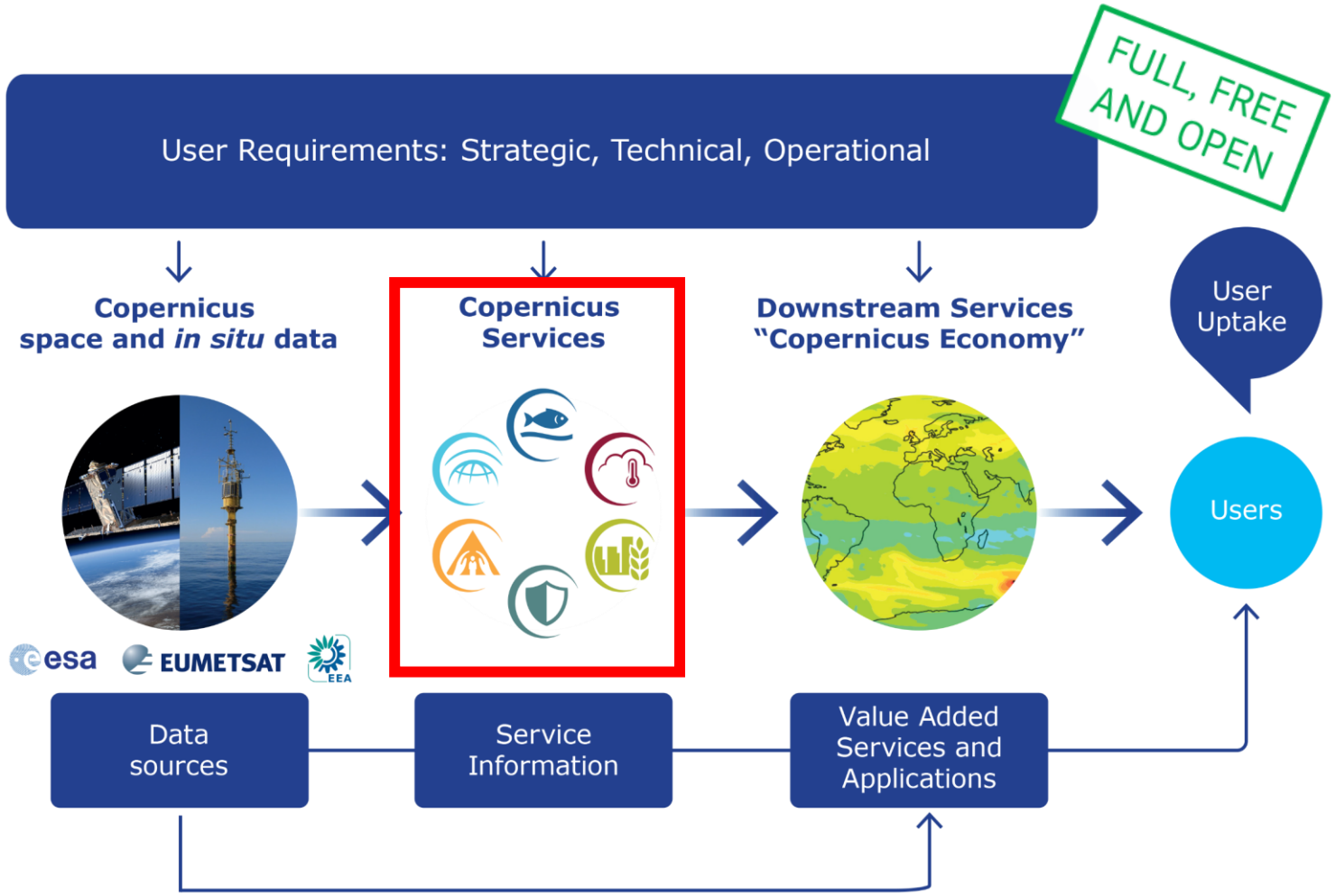
Copernicus in a nutshell

PROGRAMME OF THE EUROPEAN UNION

What is Copernicus?

Copernicus is the Earth Observation component of the EU Space Programme. It monitors the Earth, its environment and ecosystem, supports preparation for crises and disasters, is an economic development tool and a driver of the digital economy.



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Copernicus Services

Together, these services support a wide range of applications, from monitoring **air quality** and **soil properties** to tracking **ocean pollution**, mapping **wildfires**, supporting **agriculture**, and assessing **climate risks**.

Monitoring the State of the Earth System Environment ...

... Six cross-cutting Thematic Services

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Copernicus Emergency Management Service

6 Things You Need To Know About CEMS

Emergency Management

1. One of the six services of Copernicus
2. Started its operations in 2012
3. It supports all phases of disaster management, providing products tailored to support early warning, emergency response, and recovery activities
4. It integrates satellite data, in situ observations, models, and aerial data to support disaster risk management for natural and man-made hazards.
5. The service operates 24/7 and is accessible to EU Member States and the global community.
6. It is implemented by the European Commission's Joint Research Centre.

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Copernicus Emergency Management Service

CEMS has 3 components

Early Warning & Monitoring

1 It provides early warning, risk and impact assessment, and monitoring of specific natural hazards.

Currently, it addresses forest fires, droughts, and floods at European and global level.

On-Demand Mapping

2 It provides a wealth of mapping products for emergencies through its activation services. It supports all phases of the disaster management cycle, before, during, and after event take place.

Exposure Mapping

3 It provides information derived from satellite and census data on the presence of settlements and population.

The data from this component are used in all the CEMS products.

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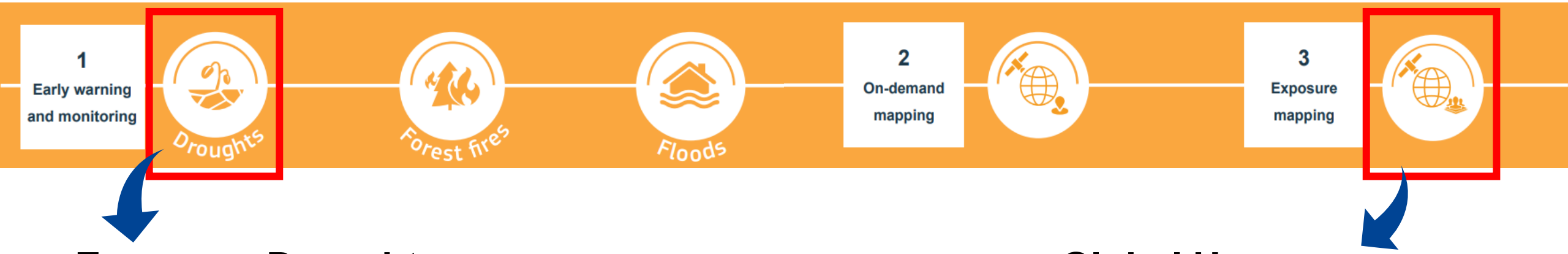
Copernicus Emergency Management Service

CEMS has 3 components



European Drought Observatory (EDO)

Global Human Settlement Layer (GHSL)

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From Dry Spell to Decisions

How to leverage the Copernicus Emergency Management Service (CEMS) European Drought Observatory (EDO)

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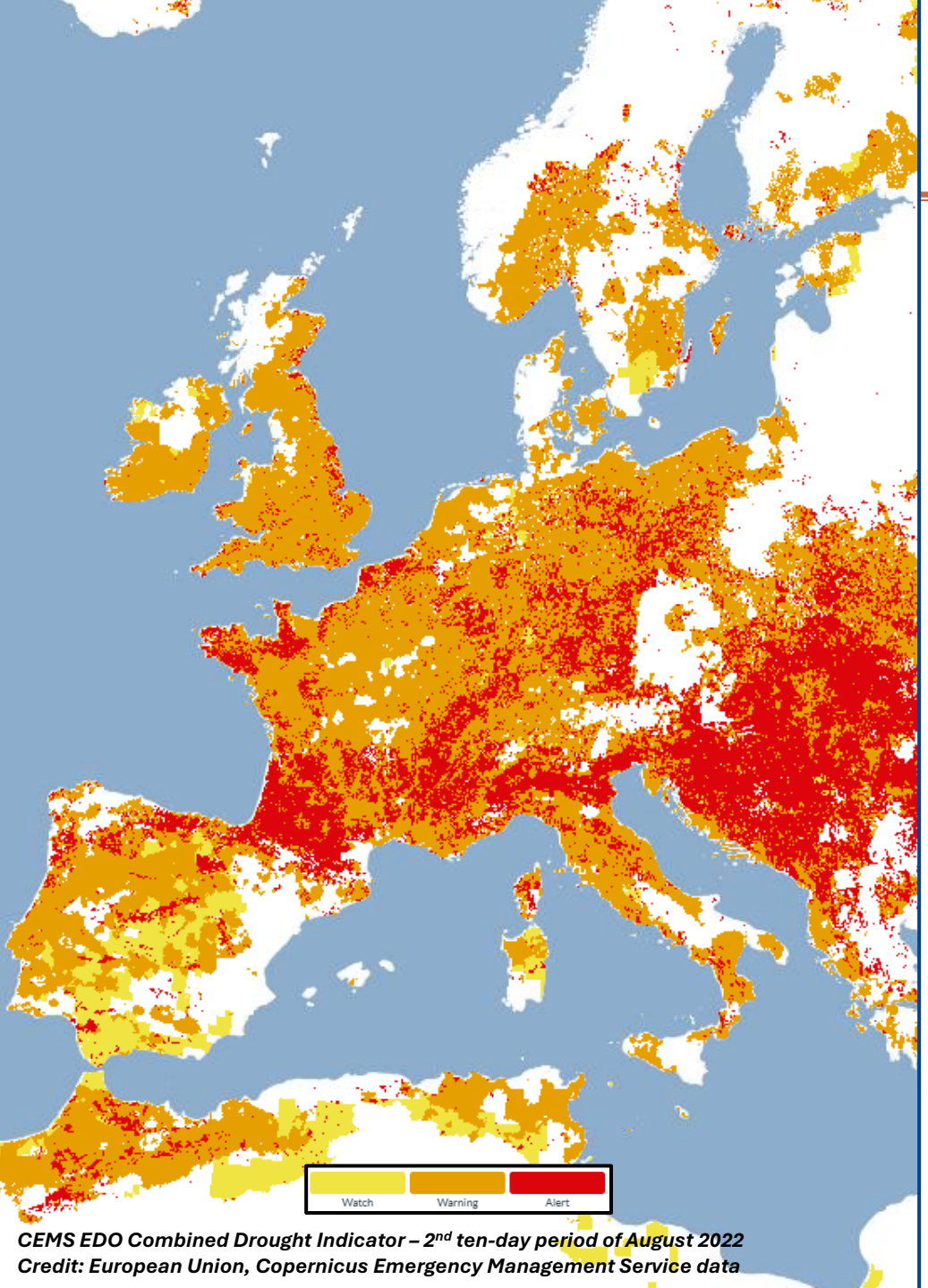
You will be able to

- Explain how EU Space Programme data are used to provide insights on drought in Europe
- Access and interpret key indicators provided by the Copernicus Emergency Management Service (CEMS) European Drought Observatory (EDO)



CEMS EDO Combined Drought Indicator – 2nd ten-day period of August 2022
Credit: European Union, Copernicus Emergency Management Service data

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Why Monitoring Drought?

Monitoring drought conditions is essential for several reasons, including:

- **Increasing food and water insecurity.**
- **Increase the risk, intensity, and extent of wildfires.**
- **Prolonged drought can lead to increased flood risk.**

The cracked riverbed of the La Viñuela reservoir, Spain, in 2023.
Credit: European Union, 2023

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Why Monitoring Drought?

Credit: *Rob Thompson, University of Reading, 2022*

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Monitoring Drought in Europe

What is EDO?

The European Drought Observatory (EDO) is part of the Copernicus Emergency Management Service (CEMS) and provides drought-relevant information and early warning tools across Europe.

It supports decision-makers in monitoring, assessing, and responding to drought events. It computes key indicators based on a combination of satellite observations, hydro-meteorological models and in situ data.

Key Features:

- Interactive Portal
- Reports
- Data Download

Applications:

- Early Warning
- Risk Assessment
- Policy Support

https://drought.emergency.copernicus.eu/

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EU Space Data for Drought

- Copernicus Satellite Data
- Hydrometeorological Models
- In Situ Data

CEMS Drought Observatories

- Drought Monitoring Indicators
- Drought Forecasting Indicators

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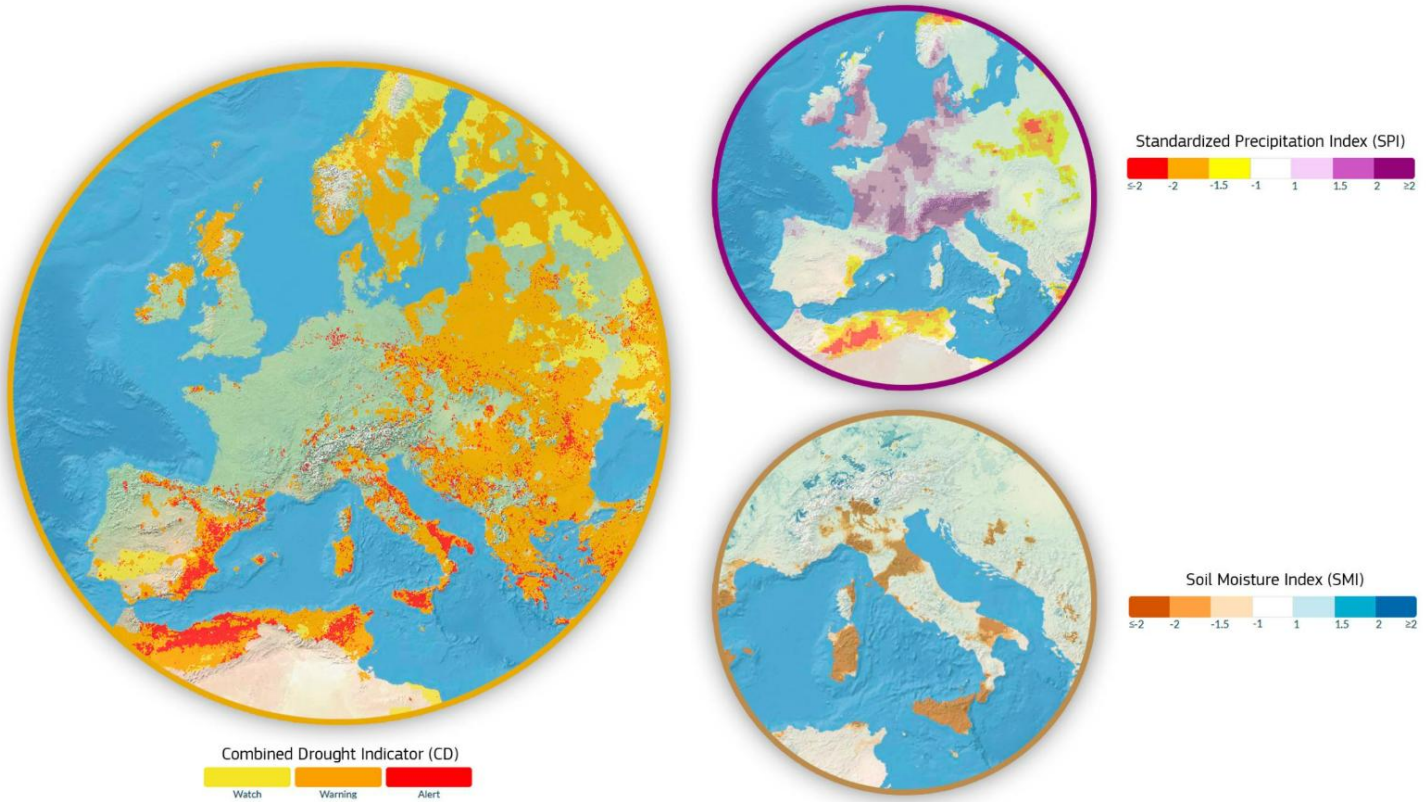
What are the different types of drought?

Meteorological drought:
Assessed based on precipitation deficit over 1, 3, 12, 24 months
→ Standardised Precipitation Index (SPI)

Agricultural drought:
When a meteorological drought leads to soil moisture and vegetation greenness deficits
→ Soil Moisture Anomaly (SMA) Index

Hydrological drought:
Assessed based on groundwater deficit.
→ Low flow Index and Total Water Storage (TWS) anomaly



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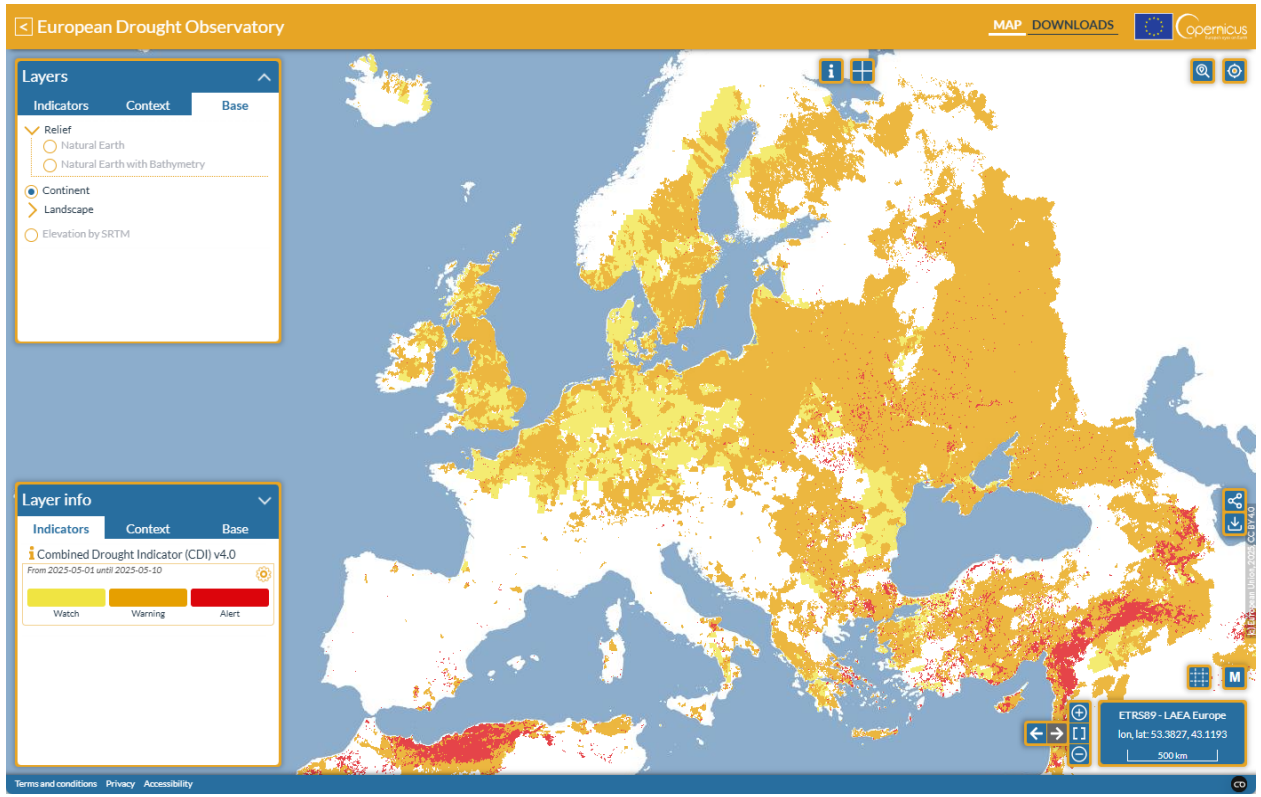
Key Indicators

IN FOCUS:
Combined Drought Indicator (CDI)

- It monitors drought impacts on vegetation and crops in Europe.
- It is computed every 10 days.
- It classifies conditions into three primary drought classes (Watch, Warning and Alert)



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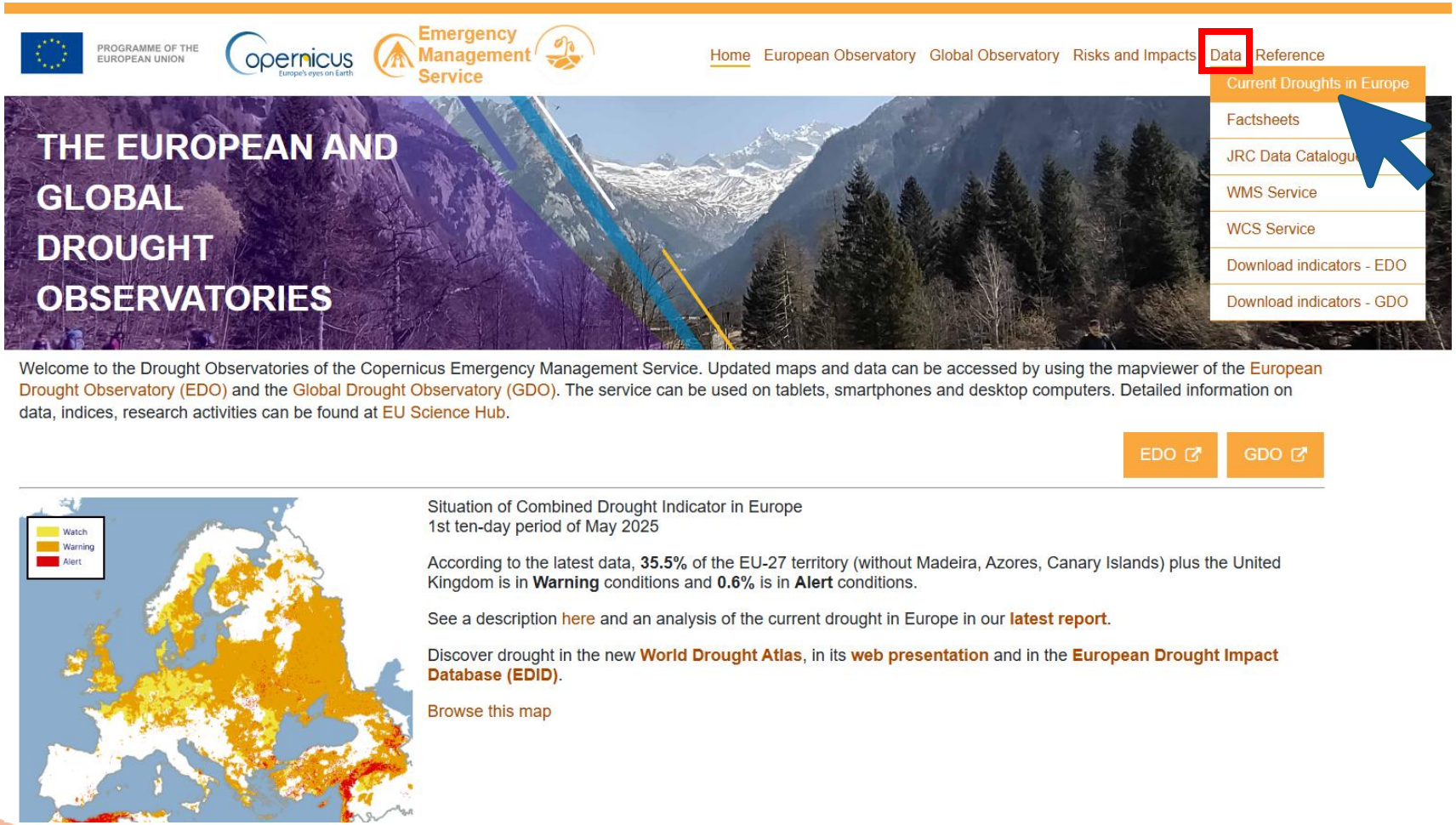
How to access pre-analysed information?



How to access the pre-analysed information on the current drought in Europe from the EDO website?

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How to access pre-analysed information?

Current drought situation in Europe

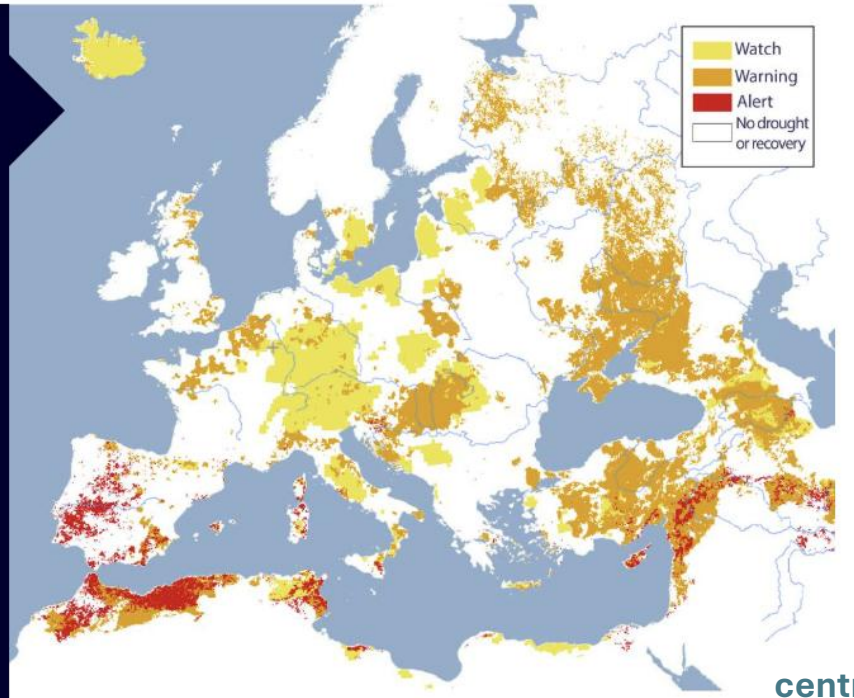
The latest status of drought in Europe using a combined drought indicator.

Drought in Europe in late December 2025

Drought conditions over Europe remained generally stable or showed signs of improvement in the last ten days of December, except for a wide region recently affected by meteorological drought, covering the Alpine area, most of central southern Germany and part of central Italy.

Temperatures in late December were close to average, with only a few short warm spells in northern Scandinavia.

European Drought Observatory's map viewer



Drought in Europe - December 2025 - 3rd ten-day period

https://joint-research-centre.ec.europa.eu/european-and-global-drought-observatories/current-drought-situation-europe_en

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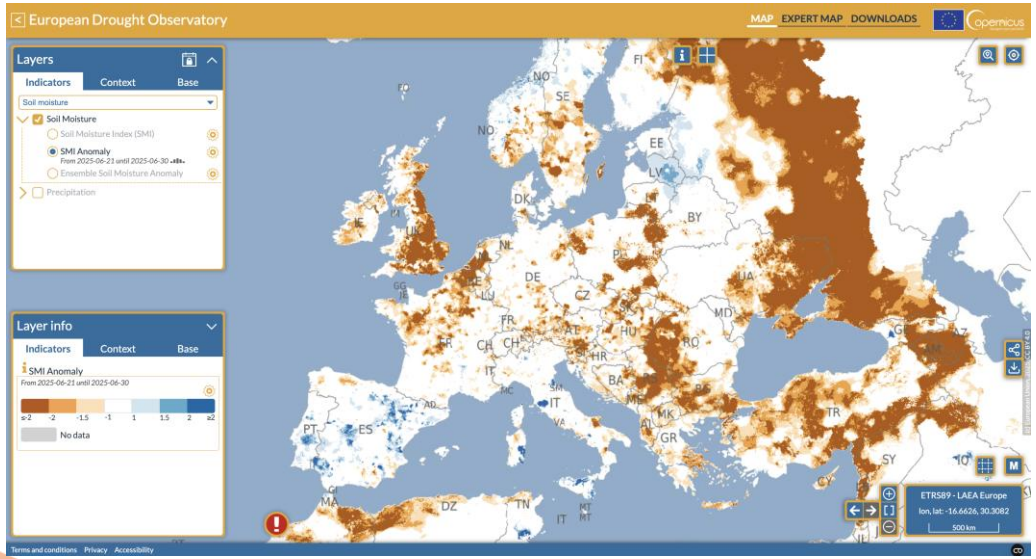
Other Key Indicators

Soil Moisture Anomaly Index (SMA)

The SMA indicator is used to monitor **agricultural drought** by measuring how current soil moisture levels differ from long-term averages. It is computed every 10 days.

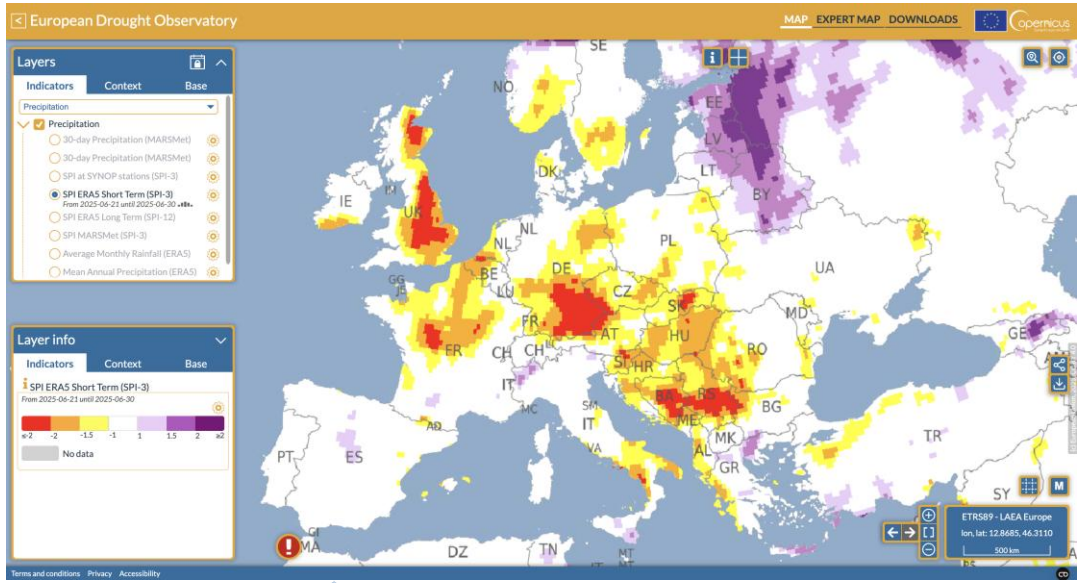
It helps identify drought severity by highlighting when soil moisture is unusually low (shown in **brown**).



Standardised Precipitation Index (SPI)

The SPI indicator is used to monitor **meteorological drought** and compares recent rainfall to long-term averages to detect unusually dry or wet periods.

It uses different time scales (1, 3, 6, 9, 12, 24, or 48 months) to show short- or long-term droughts. Negative SPI values (shown in **red** and **orange**) indicate drier conditions.



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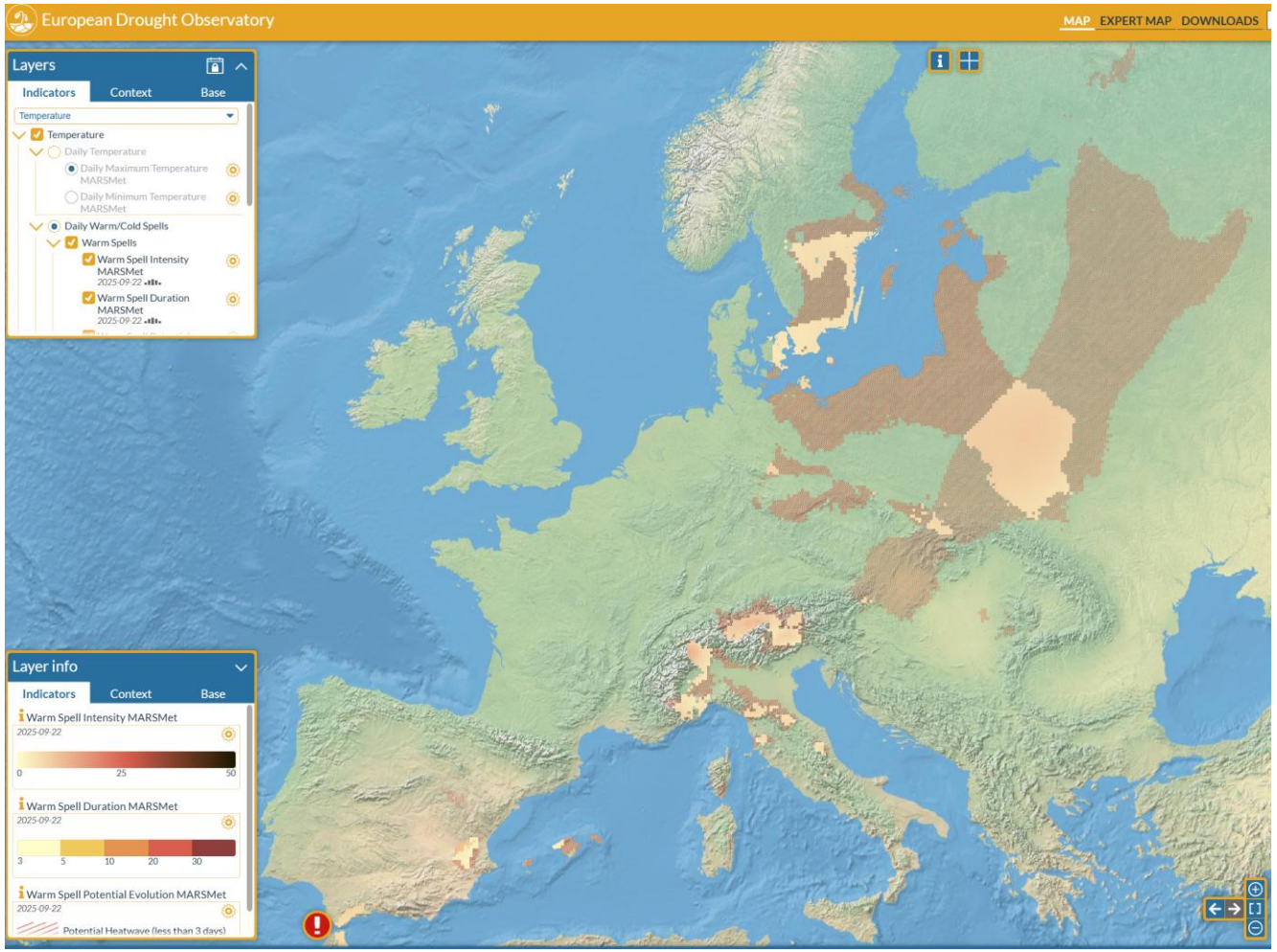
Other Key Indicators

Extreme Temperatures

EDO provides data on "warm spell intensity" by tracking the total temperature deviations throughout the duration of an event, measured in degrees Celsius. This intensity is computed daily to assess the strength of a warm spell.

The calculation of severity involves accumulating the differences between each day's temperature and a set reference temperature threshold.



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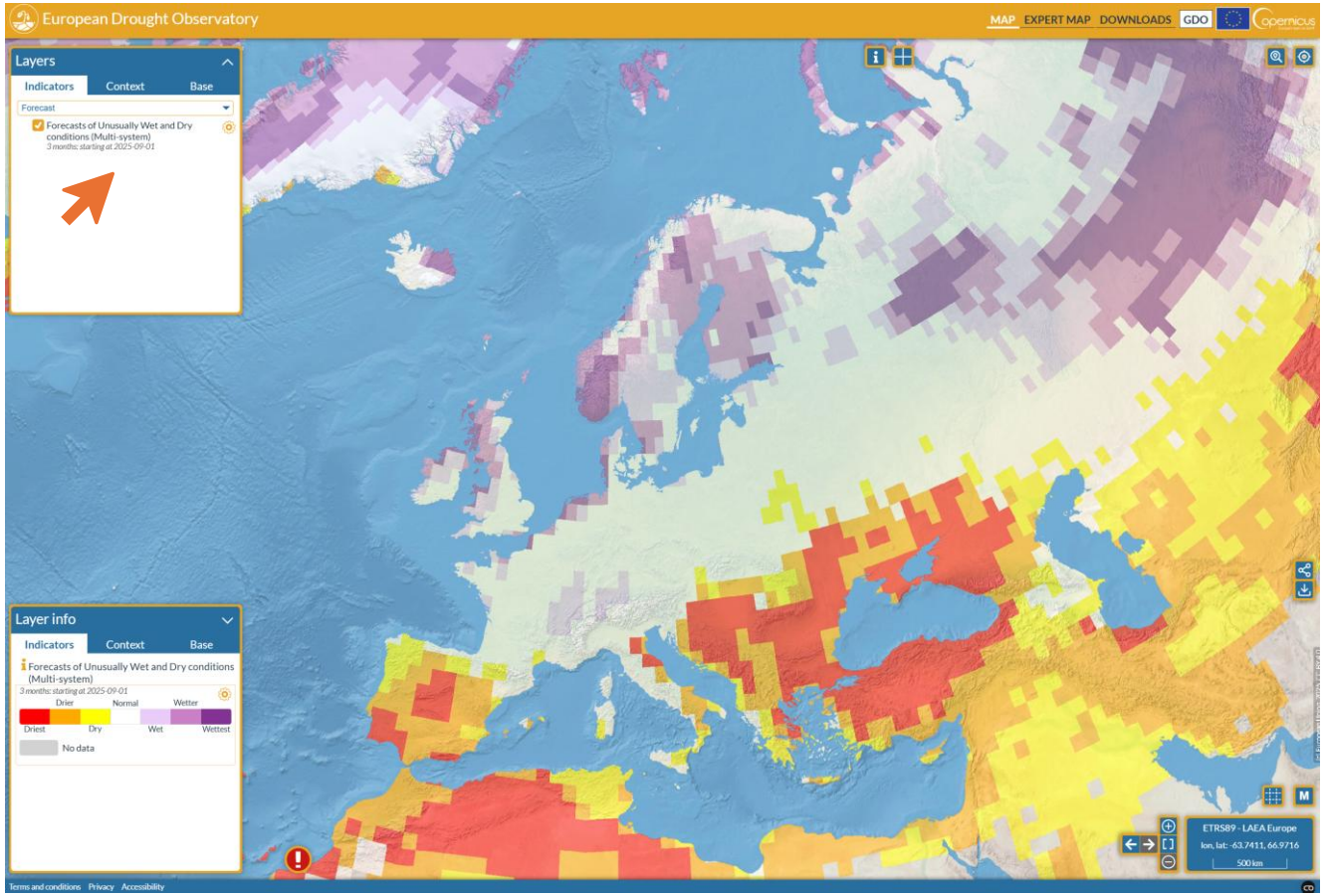
Other Key Indicators

Forecasting of Unusually Dry and Wet Conditions

It combines data from multiple forecast models to create a single multi-system indicator which highlights areas in which unusually wet or dry periods are expected in the coming 1, 3 or 6 months.

This indicator helps provide an early warning of potential drought or flood events.



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Let’s now access the EDO portal and review together how to navigate the information and indicators displayed.

https://drought.emergency.copernicus.eu/

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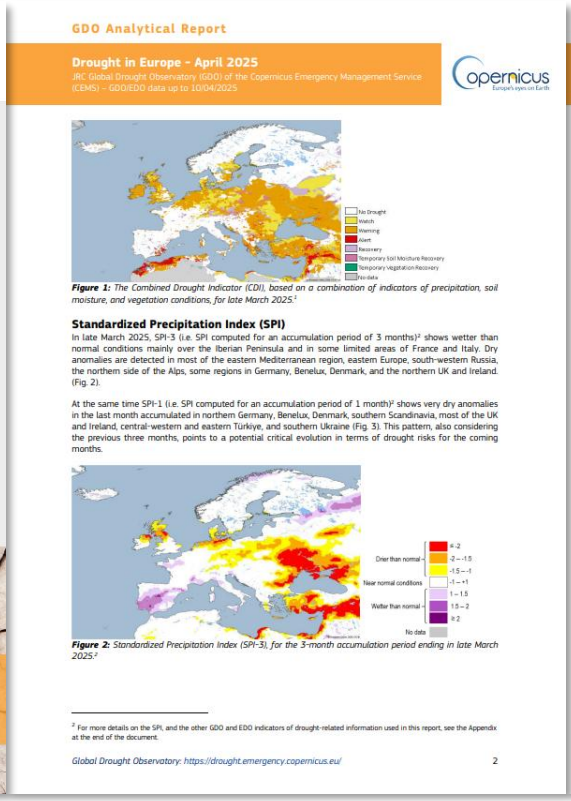
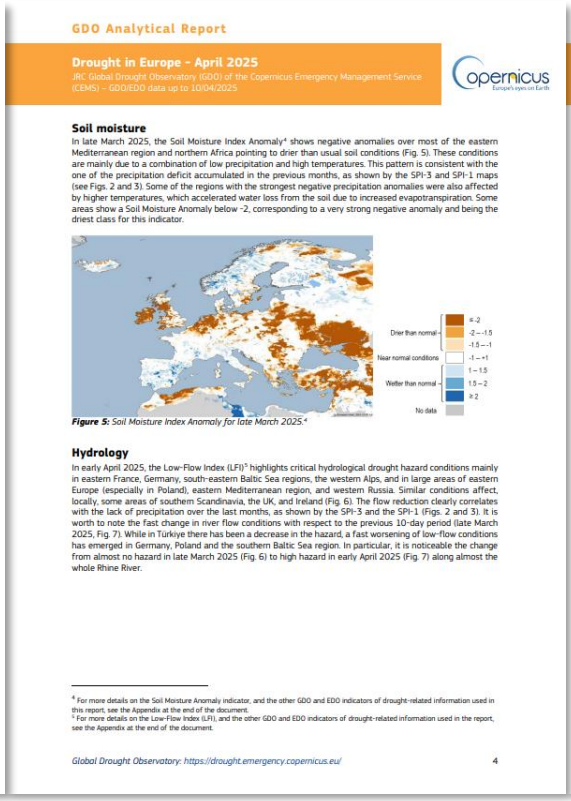
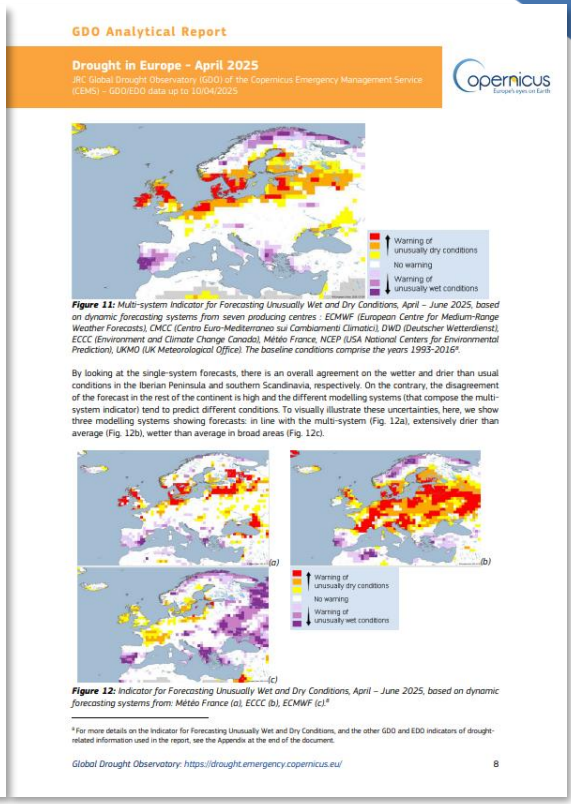
EDO resources

EDO Publications







https://joint-research-centre.ec.europa.eu/european-and-global-drought-observatories/drought-reports_en

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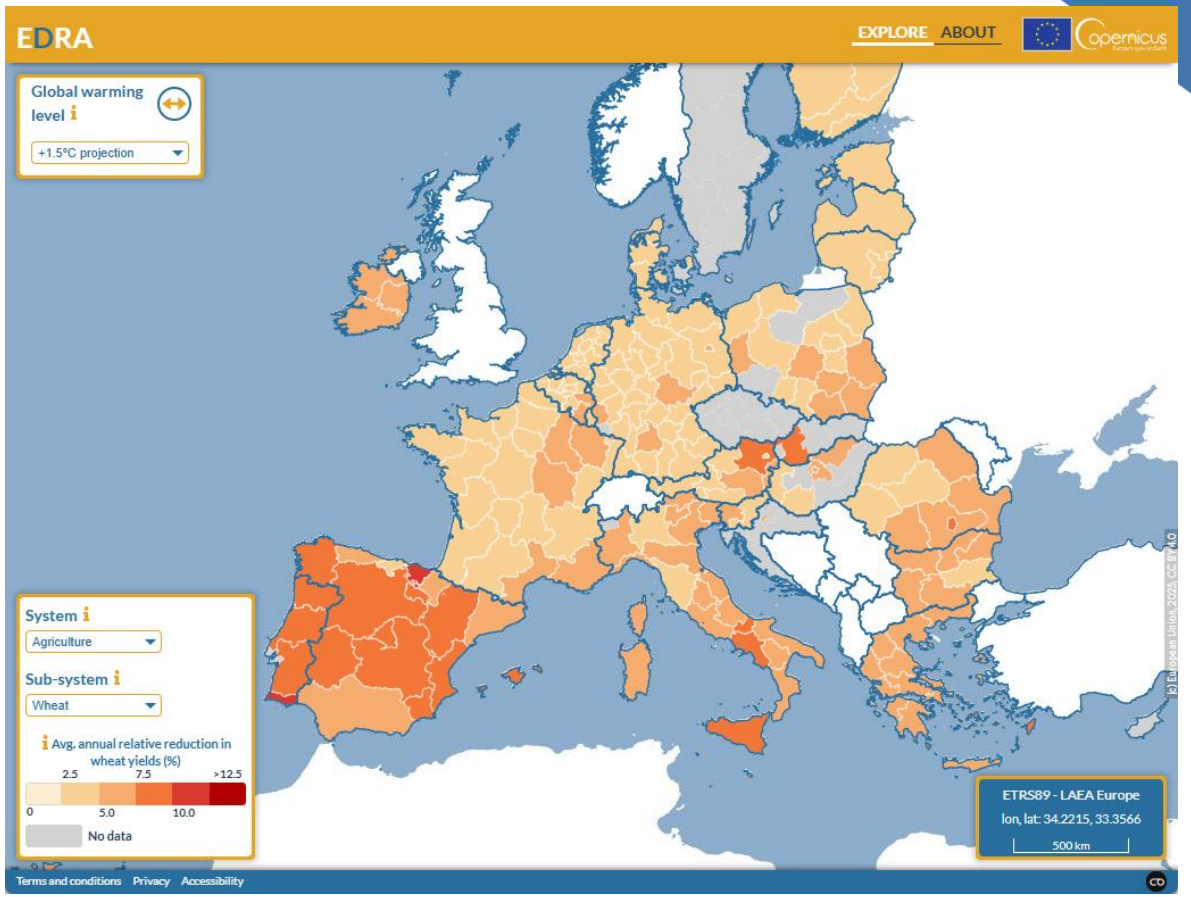
EDO resources

EDDRA – European Digital Drought Risk Atlas

It characterises **how drought hazard, exposure and vulnerability interact** and affect different but interconnected systems.

It **maps drought risk at national and sub-national level** in terms of annual average loss and probable maximum losses at specific return periods, both for current climate conditions, and for projections under different levels of global warming (+1.5 °C, +2 °C, +3 °C).

https://drought.emergency.copernicus.eu/tumbo/edra



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EDO resources

If you are interested in learning more about EDO, explore these resources:

- Use Case: Extreme Drought in the EU in 2022
- EDO Indicators Factsheets

If you are interested in accessing EDO data, you can download the datasets here: EDO Indicators Download

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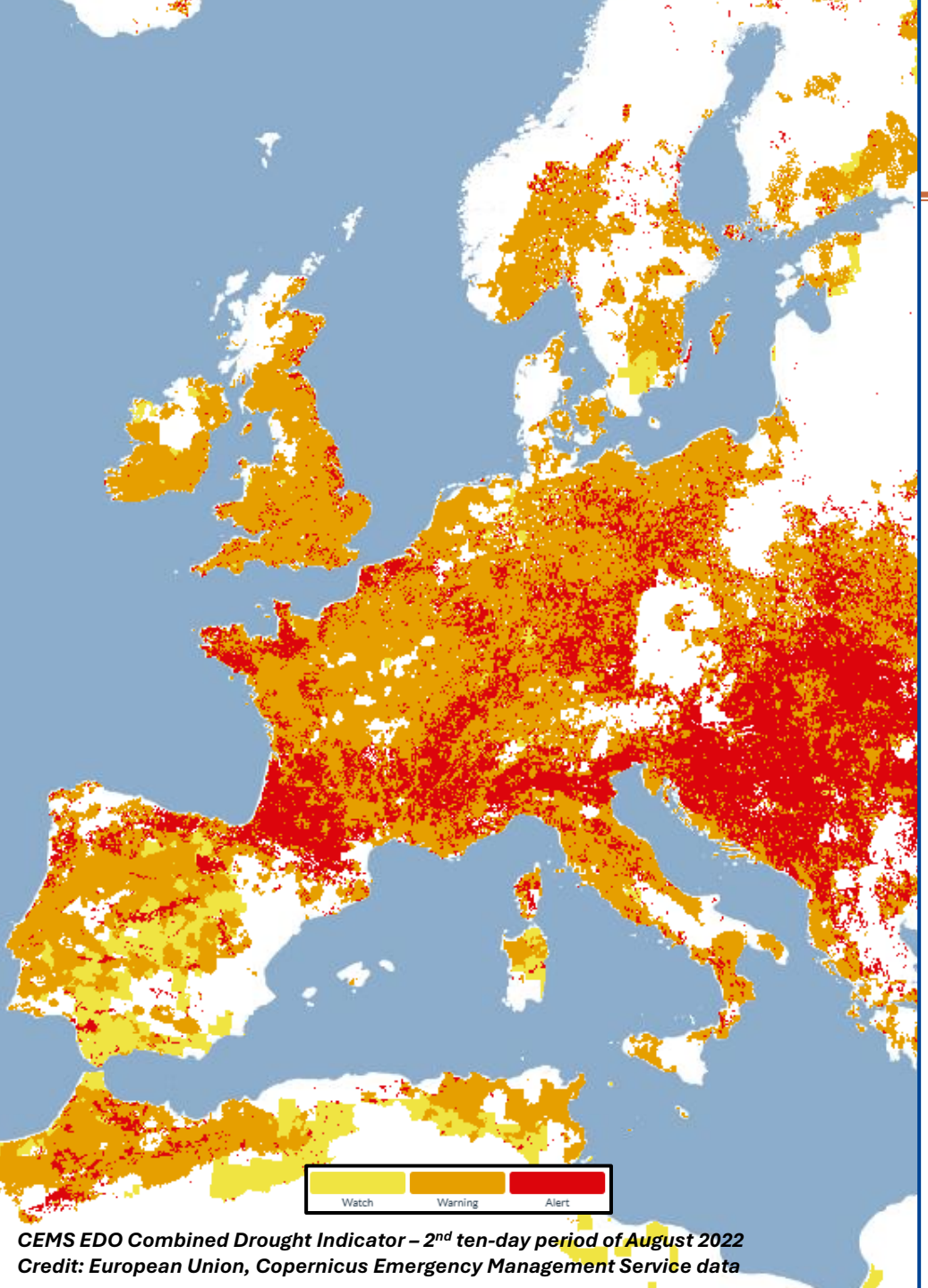

CEMS EDO Combined Drought Indicator – 2nd ten-day period of August 2022
Credit: European Union, Copernicus Emergency Management Service data

Key takeaways

Now you know:

- How monitoring drought conditions supports disaster management operations
- What is the CEMS European Drought Observatory and why it is useful
- How to access pre-analysed information on the drought in Europe

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Thank you for your attention

Any questions?

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People, Settlement, Exposure

Introducing the Copernicus Emergency Management Service (CEMS) Global Human Settlement Layer (GHSL)

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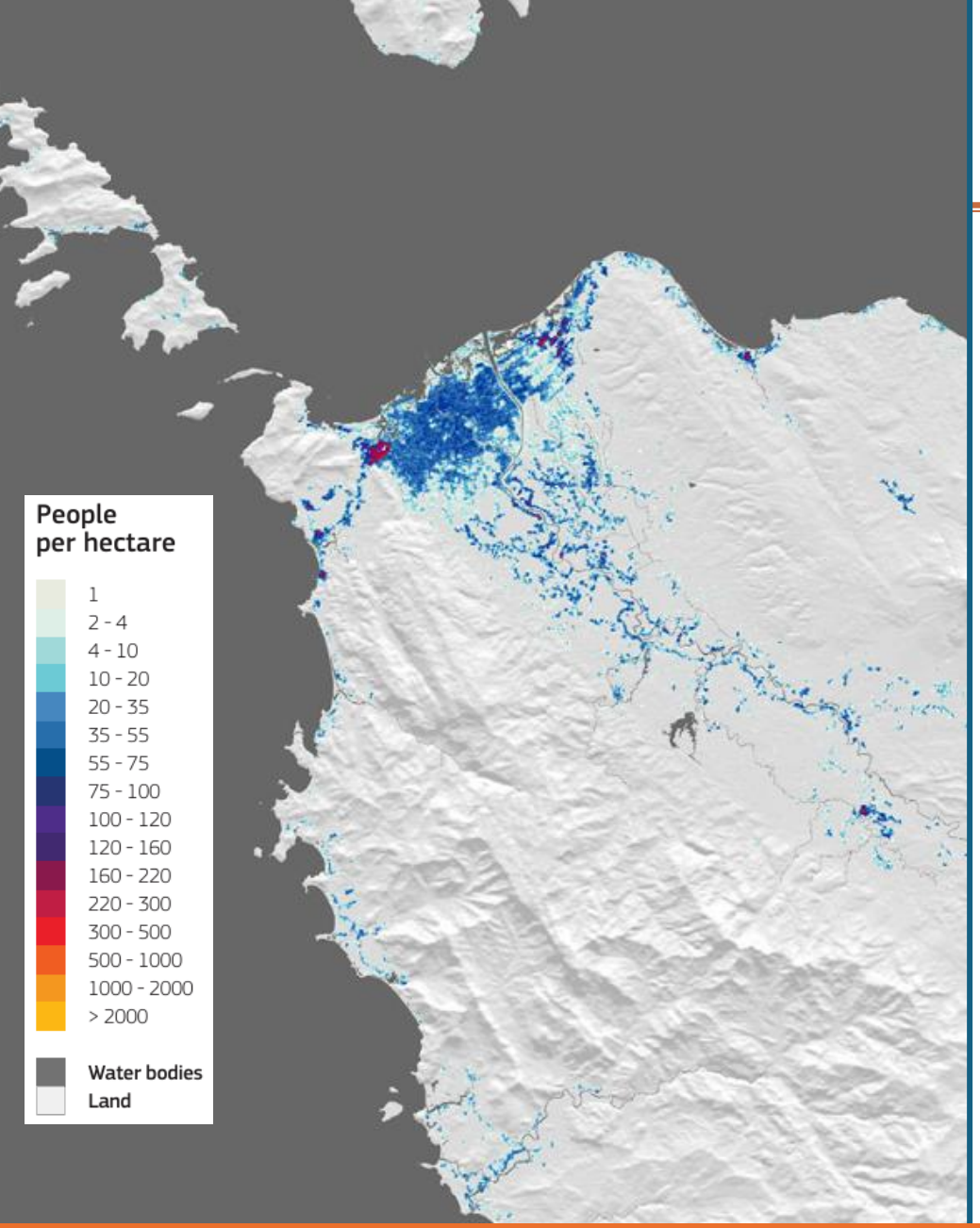
You will be able to

- Explain how EU Space Programme data are used to provide insights on exposure mapping
- Describe the core function of the Global Human Settlement Layer (GHSL) within the Copernicus Emergency Management Service (CEMS) products and interpret its data



Population map based on GHSL data over the northern Sumatra Island. Credit: European Union, Copernicus Emergency Management Service data

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Why Mapping Exposure?

One important aspect for all Early Warning Systems is the number of people impacted and their spatial distribution.

- **Exposure mapping identifies people, infrastructure, and assets at risk,** supporting better emergency planning and response.
- It enables **better preparedness** activities and risk assessments.
- Satellite data improves exposure mapping by providing **timely, large-scale, and accurate observations.**

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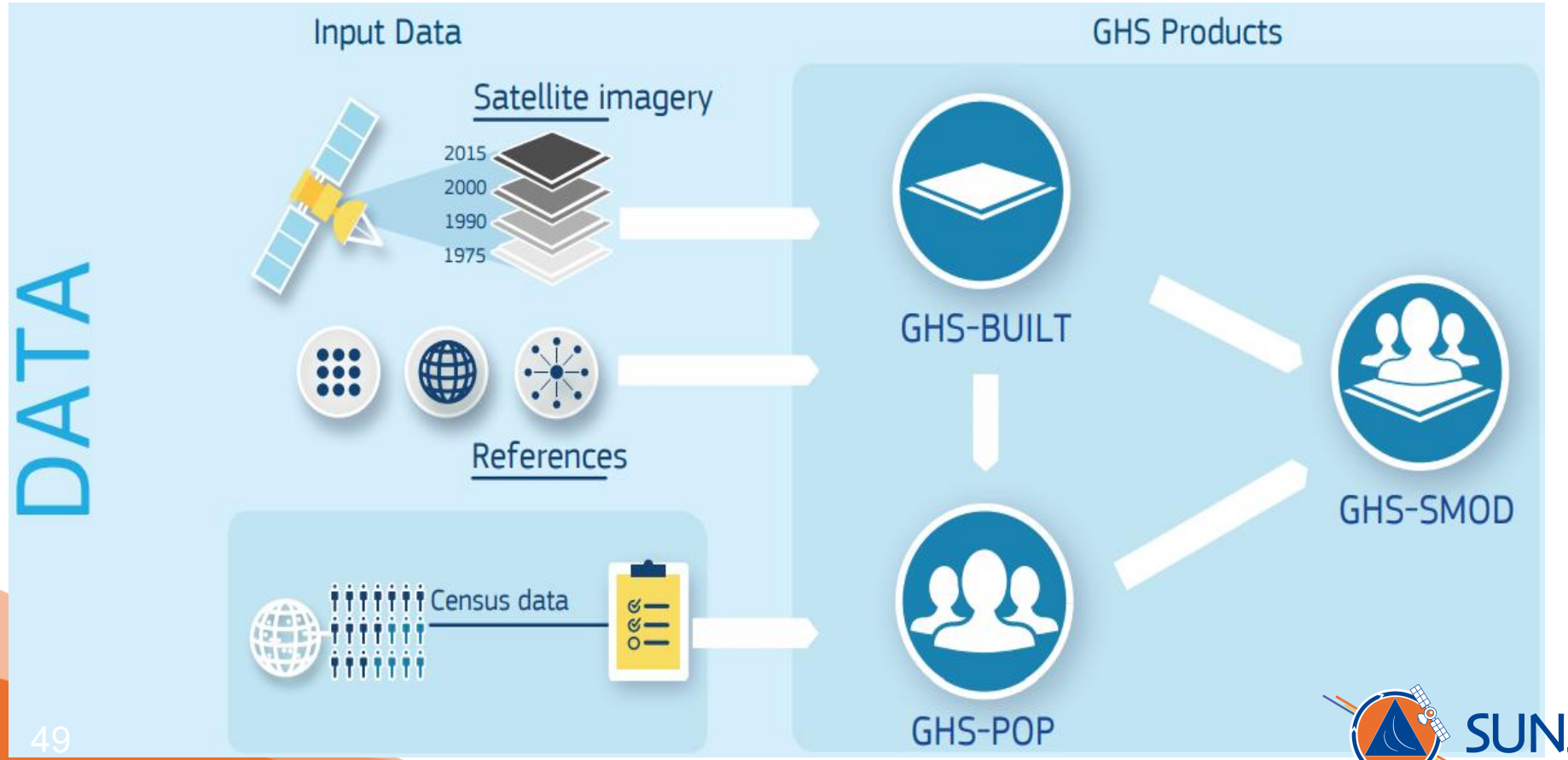
GHSL in a Nutshell

What is the Global Human Settlement Layer?

It provides accurate and updated information on the presence of **human settlements and population**, derived from satellite and census data. This data is used in all the Copernicus Emergency Management Service (CEMS) products and services.



https://human-settlement.emergency.copernicus.eu/

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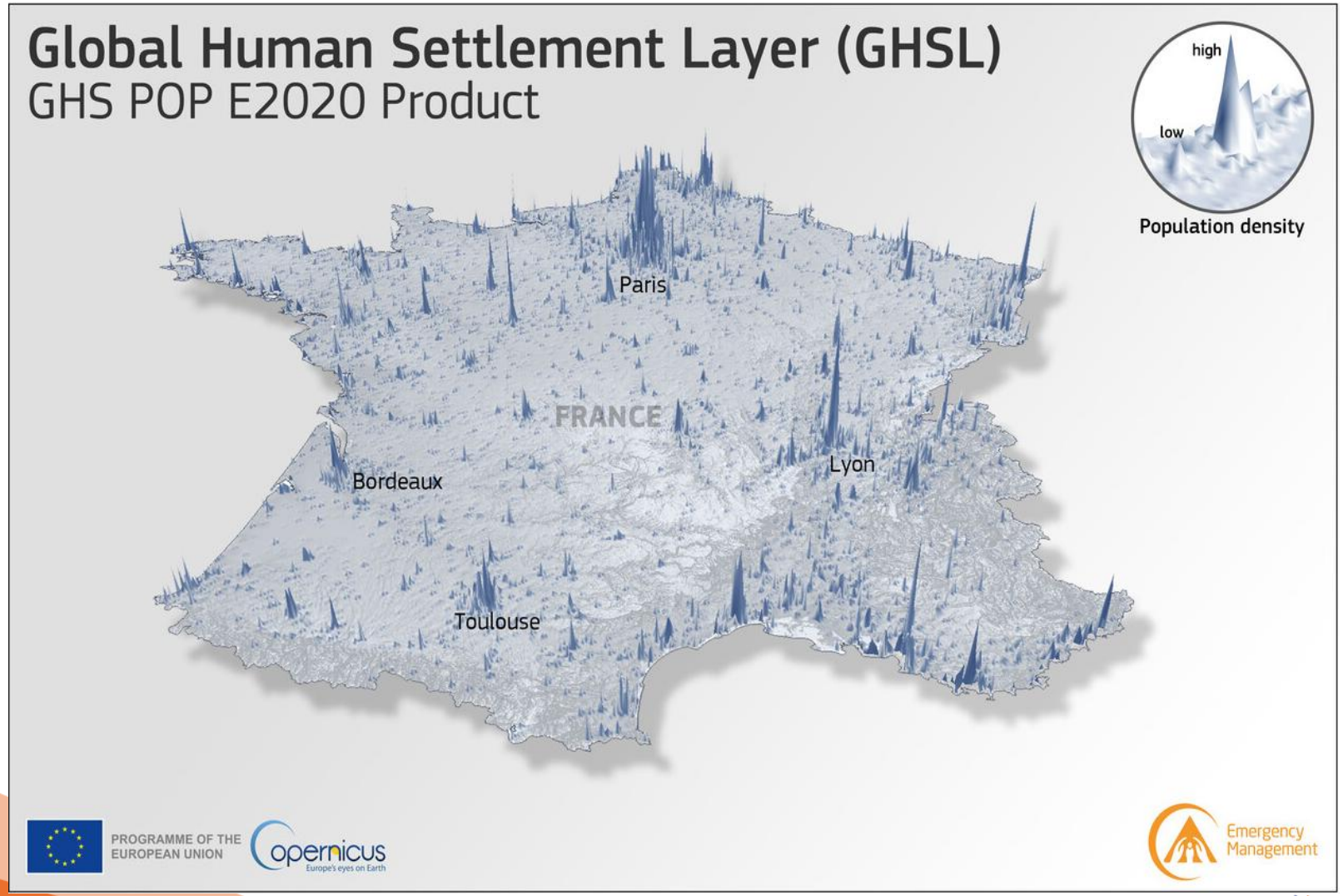
GHSL Benefits



With GHSL it is possible to extract population density and identify highly populated areas

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GHSL Benefits

GHSL data is integrated into CEMS On-Demand Mapping products.

When Rapid Mapping is activated, GHSL data is included to support the **estimation of populations potentially affected by a disaster event**, anywhere in the world.

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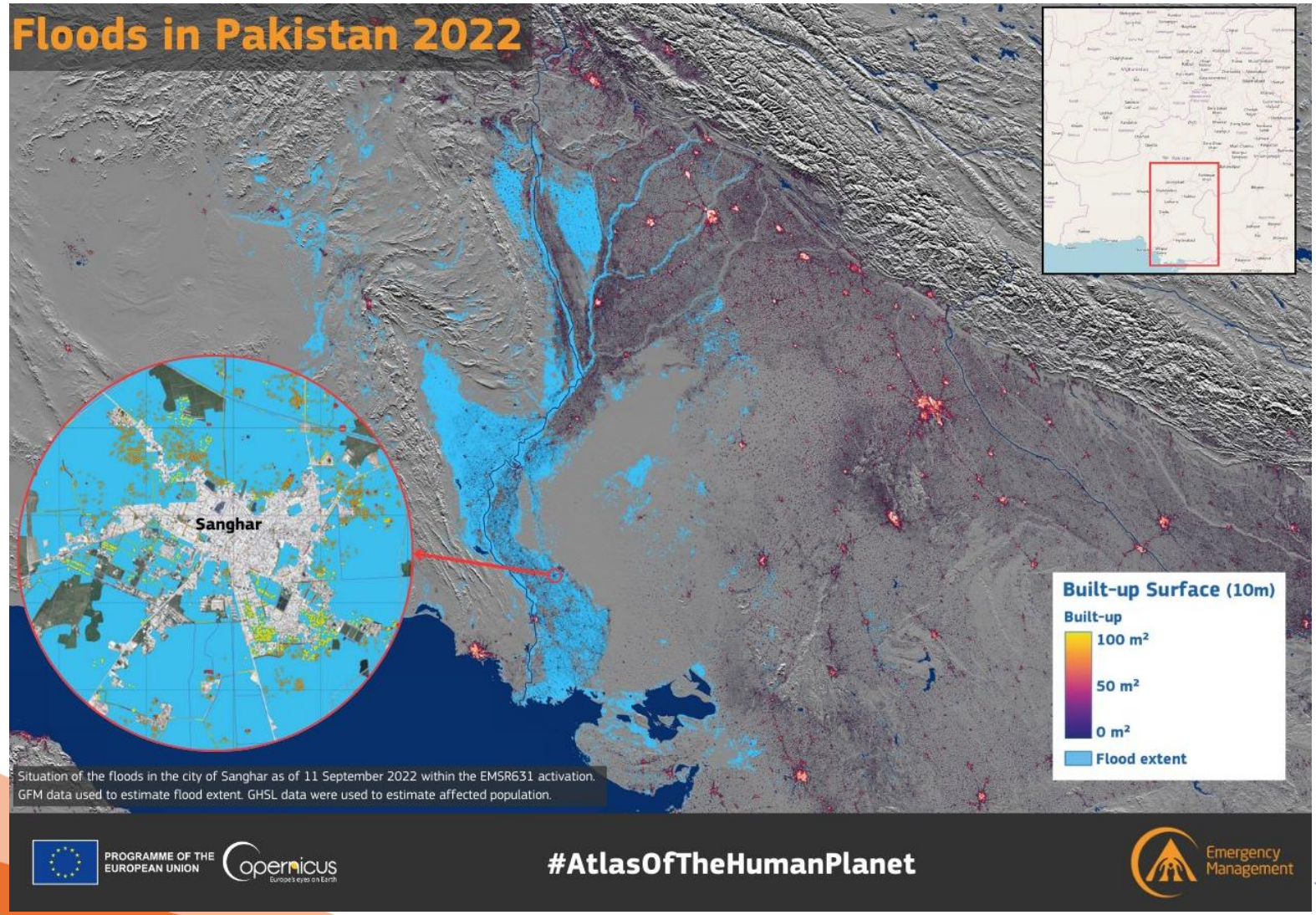
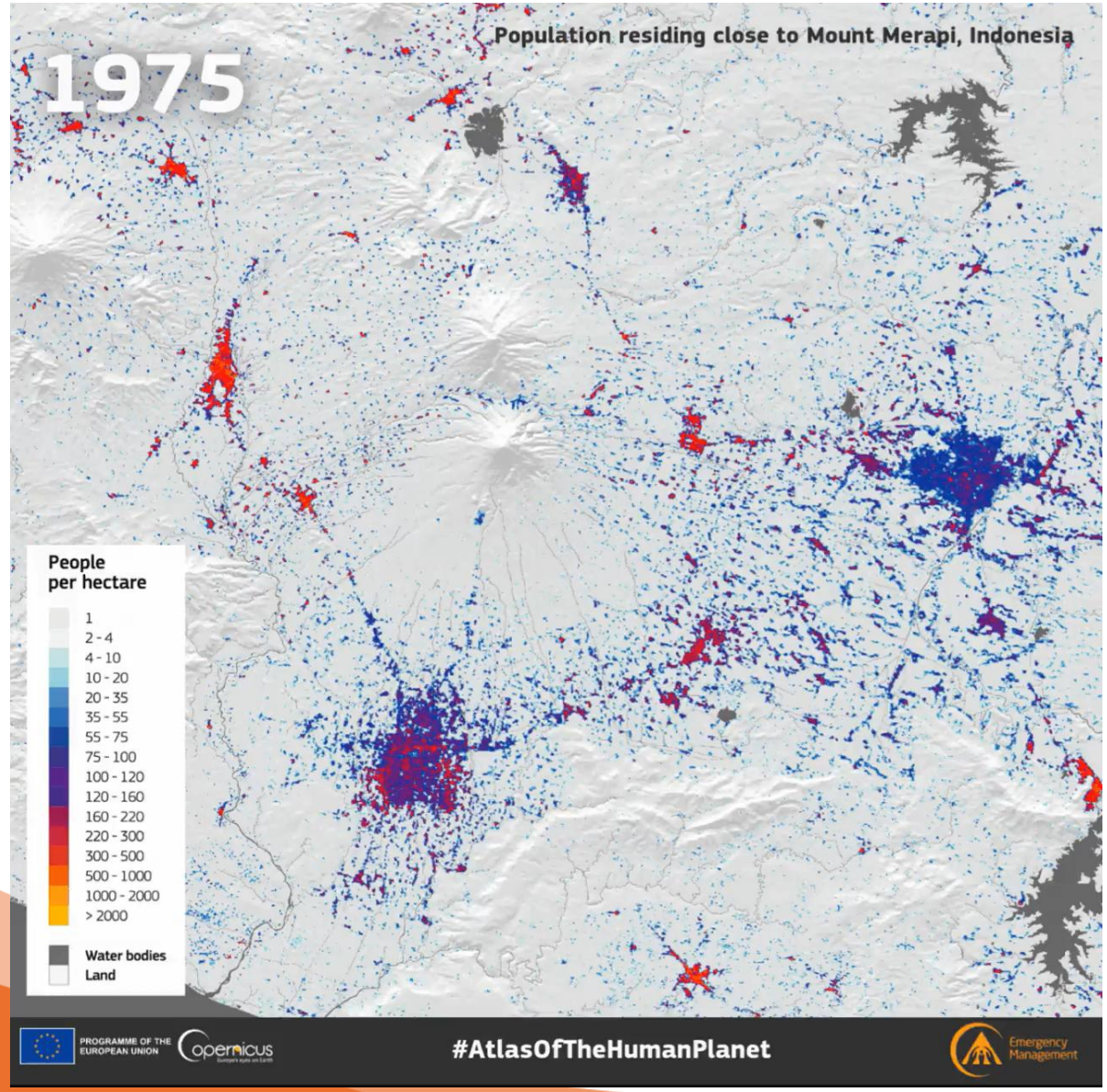
GHSL Benefits



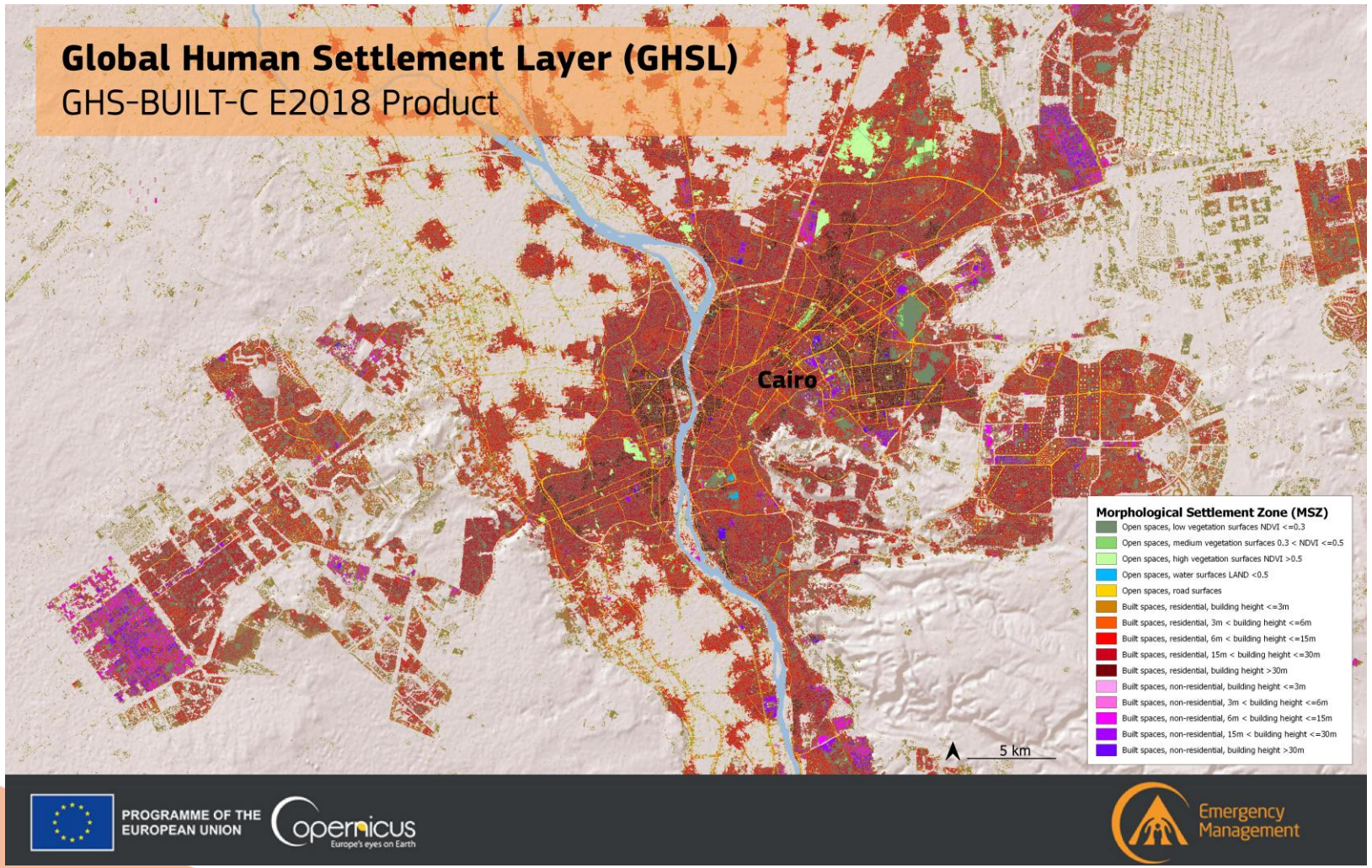
With GHSL it is possible to estimate population potentially affected by disaster events also on extremely large and cross-border areas

GHSL Benefits



GHSL allows to compare 50 years of data and highlight changes over time, including in disaster prone areas

GHSL Benefits



With GHSL you can also analyse in detail the characteristics and extent of the built environment affected by disaster events

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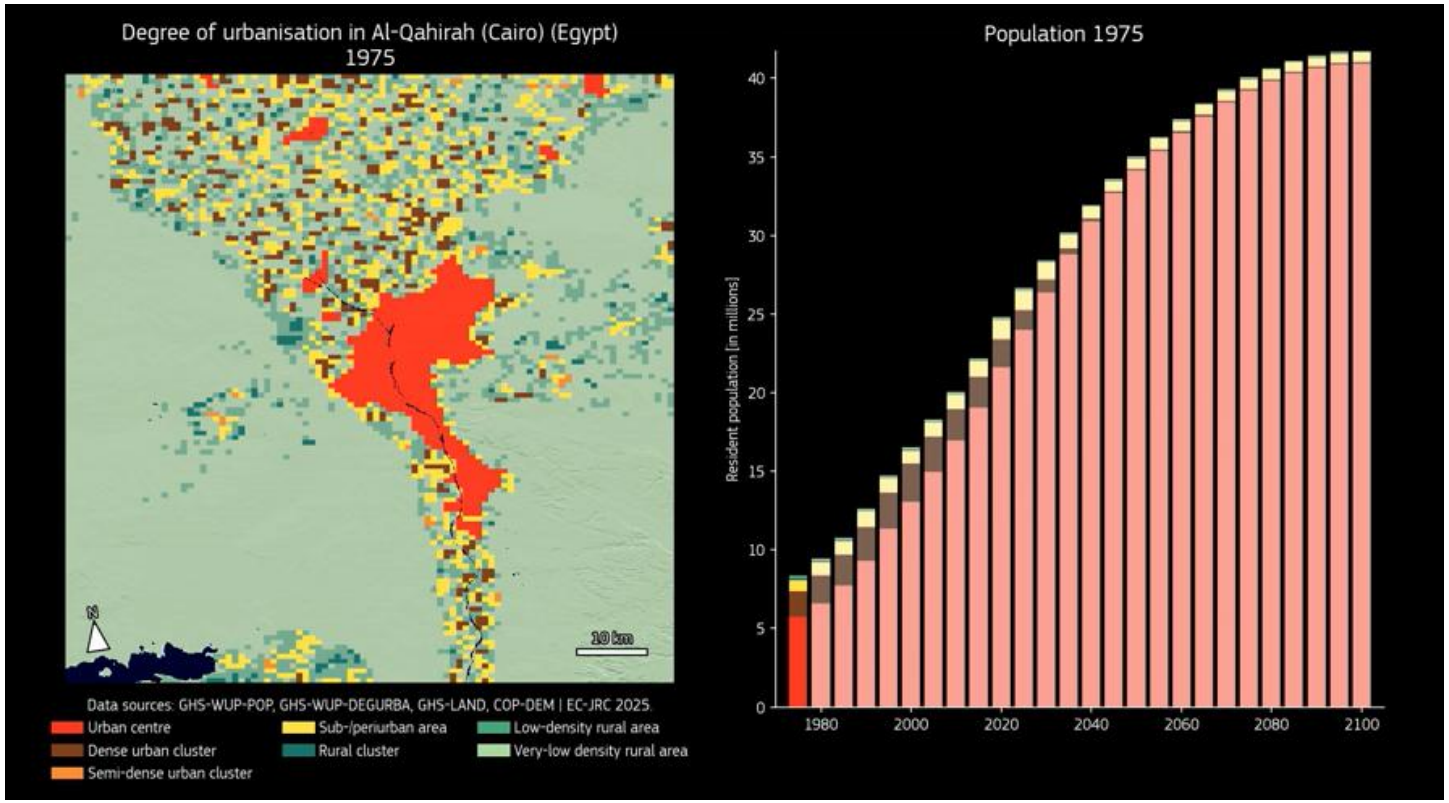
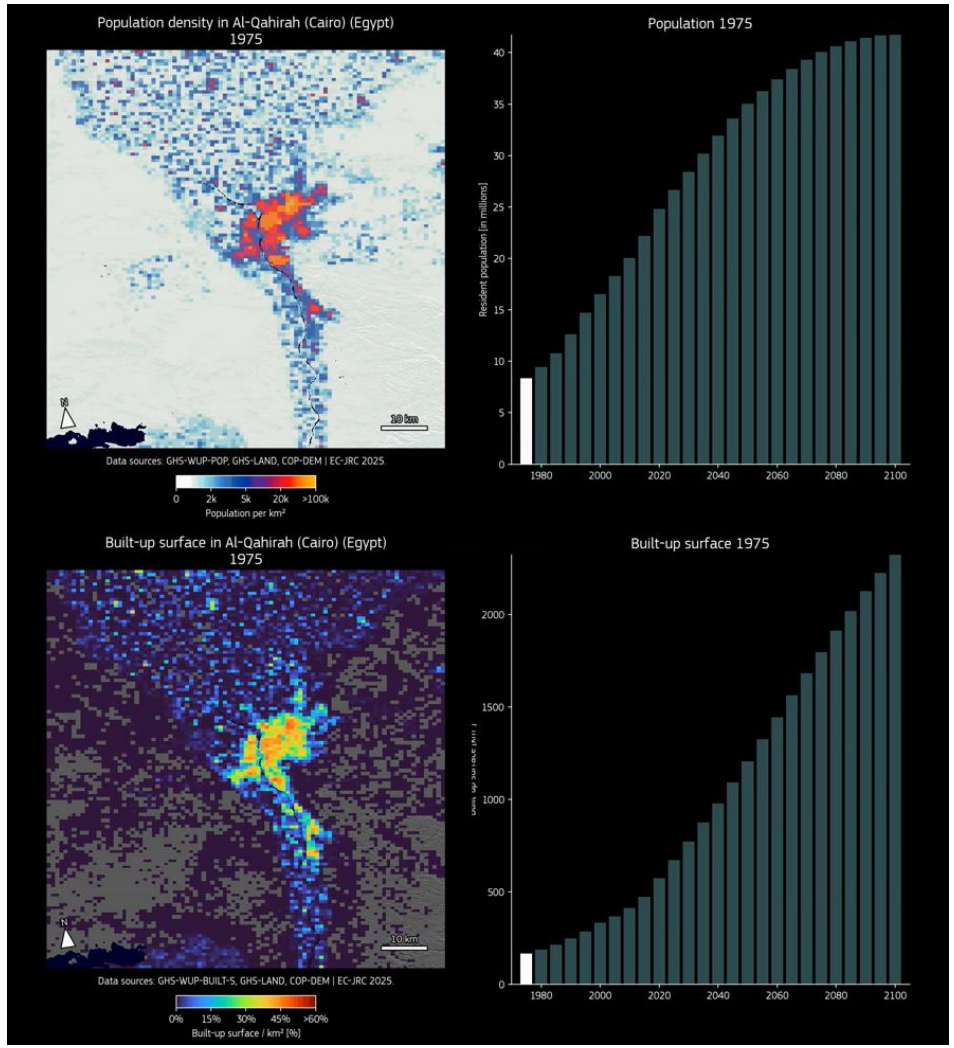
GHSL Benefits

Evolution of cities: Long-term projections (1975-2100)





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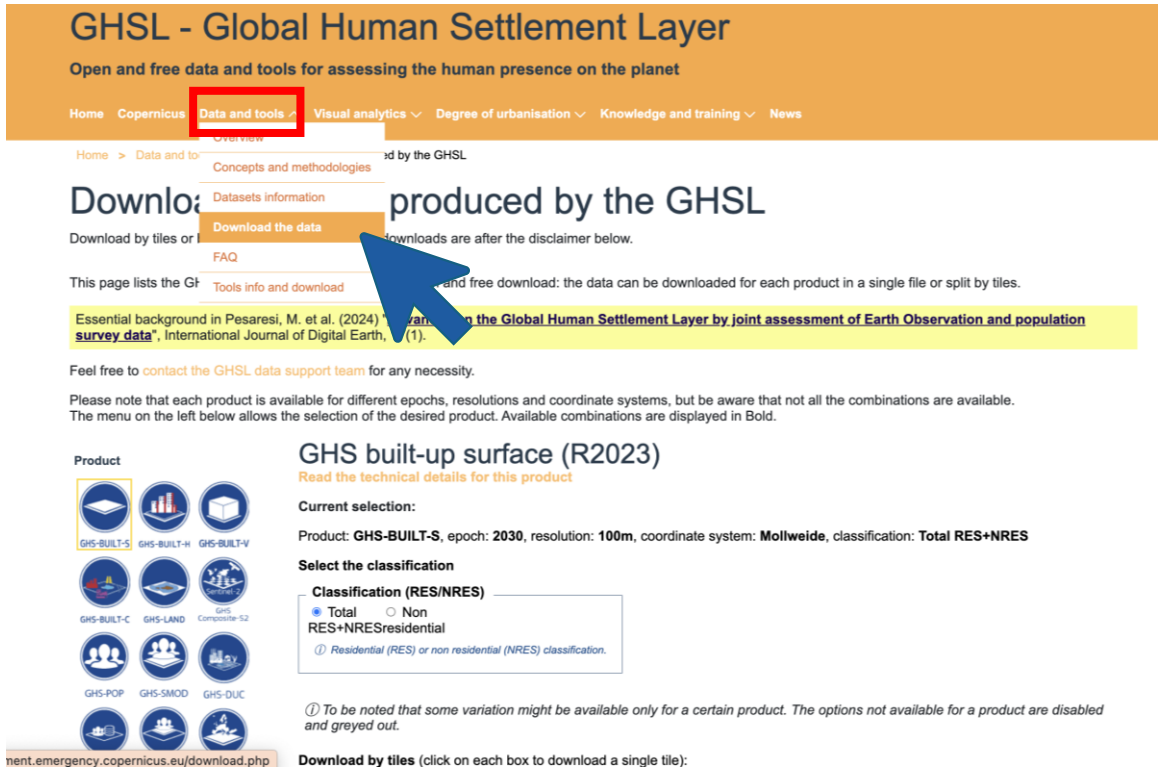
How to Download GHSL Information



Copernicus EMS integrates GHSL data directly into its products.

In addition, GHSL **free and open-access datasets** can be **downloaded directly** from the **GHSL website** for each specific product.

https://human-settlement.emergency.copernicus.eu/

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Let’s now access the GHSL portal and review together how to find the information displayed.

https://human-settlement.emergency.copernicus.eu/

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Additional Resources

If you want to know more about GHSL, you can explore these links:

1. Human Settlement Atlas 2024 – provides 50 years of insights into urbanisation trends, human settlements, megacities, and populations living in hazardous areas.

2. Stats in the City **(Urban Centre Database)** – further information about the 'Stats in the City' database which provides information for over 11,000 urban centres (typically cities & large towns).

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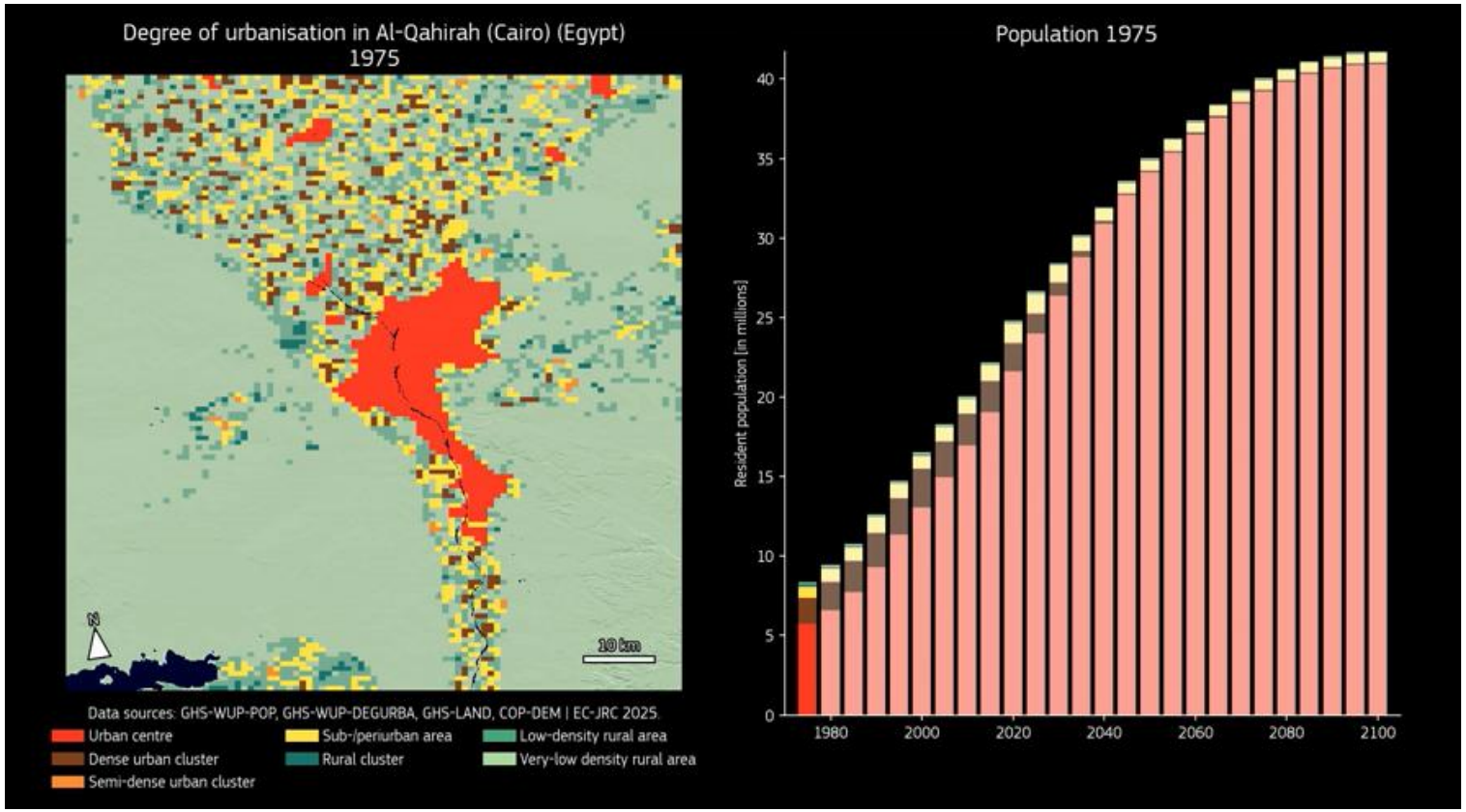
Additional Resources

3. [Course on the Degree of Urbanisation] – A training course providing the background to apply the Degree of Urbanisation method.



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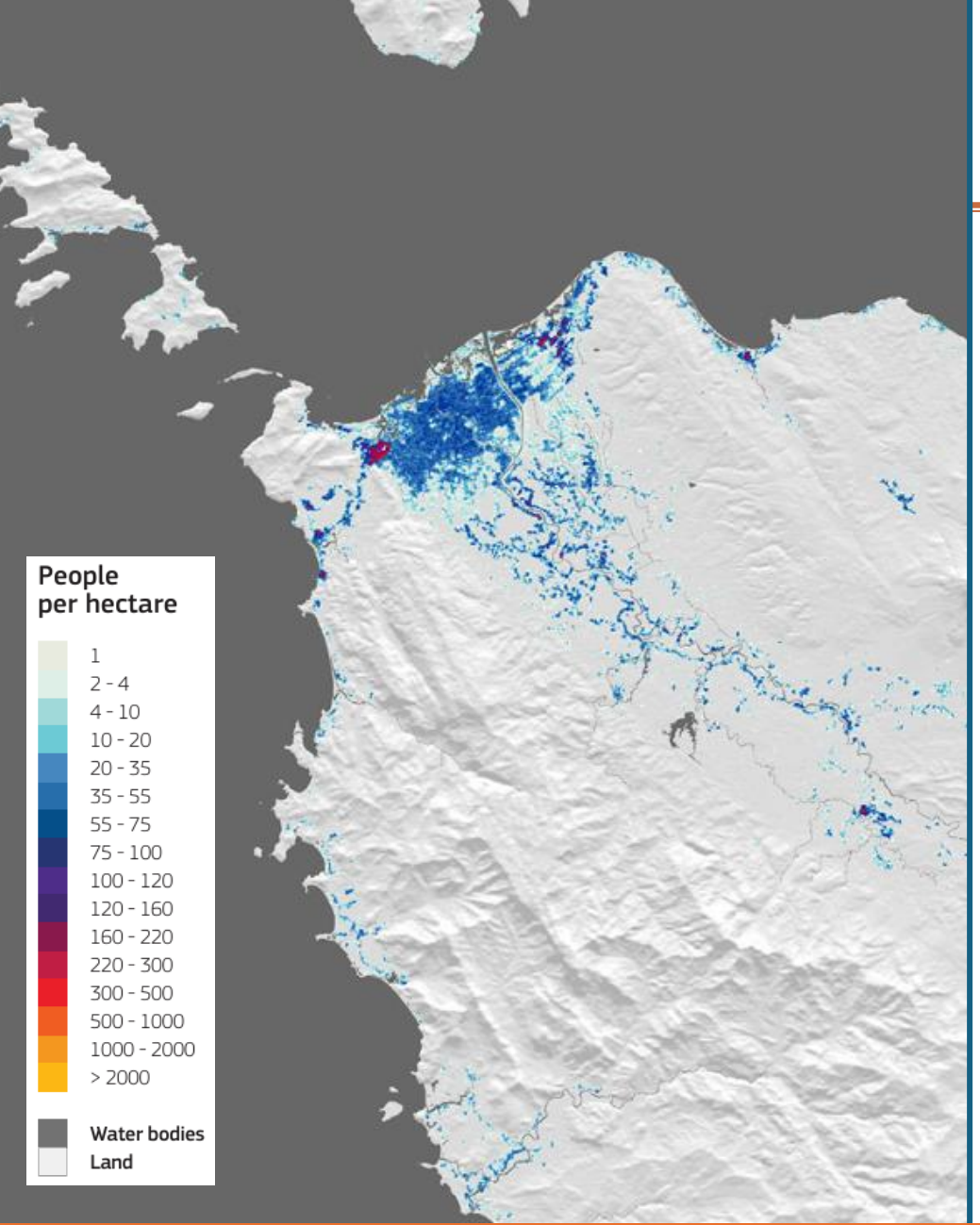
Key takeaways



Population map based on GHSL data over the northern Sumatra Island. Credit: European Union, Copernicus Emergency Management Service data

Now you know:

- What GHSL data is and the role it plays within CEMS products and services
- Where to find additional resources

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Thank you for your attention

Any questions?

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What comes next?

Upcoming Training Opportunities

Seminars

- 3rd to 6th of March 2026 in Strasbourg, France
- 5th to 8th of May 2026 in Timișoara, Romania
- 23rd to 26th of June 2026 in Zagreb, Croatia

REGISTER HERE

Simulation Exercises

- 24th to 25th of March 2026 in Brussels, DG DEFIS
- 6th to 7th of October 2026 in Brussels, DG DEFIS

Interested to participate? **Scan the QR code** to fill in the Expression of Interest form!

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Want to watch the webinar again?

The **recording** of the webinar and **slides** presented will be available on the SUNSHINE page of the Union Civil Protection Knowledge Network platform.

Follow this page *for more updates and news from the SUNSHINE project!*

SCAN ME

SUNSHINE page on UCPKN platform

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Webinar Evaluation

SCAN HERE

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SUNSHINE

Contacts

Reach out to us for any further questions!

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ae@eena.org & sunshine@telespazio.com

For the SUNSHINE Exercises: Simon Taillefer

simon.taillefer@telespazio.com & sunshine@telespazio.com

General questions on SUNSHINE:

ec-sunshine-seminars@ec.europa.eu

sunshine@telespazio.com

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Thank you for joining!

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Agenda

Morning Session

9h30

Welcome & Introduction to SUNSHINE opportunities

Copernicus EMS drought & exposure mapping for disaster resilience

Quiz and Q&A

12h00

Afternoon Session

13h30

Welcome & Introduction to SUNSHINE opportunities

Galileo Emergency Warning Satellite Service

Galileo for robustness and resilience (OSNMA, SAR, HAS)

Quiz and Q&A

17h00

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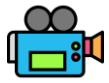
Some rules to consider



- This webinar is being **recorded**
  (recording of the webinar will be available on the SUNSHINE page of the UCPKN website)

- **Stay muted** when not speaking to avoid disruptions and background noise.

- Use the "**Raise Hand**" function or the Chat during the Q&A sessions.

- **Be respectful and concise** when sharing comments or questions.

- You may activate the option for automatically translated captions by clicking on "**Live Transcript**".

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Meet the Speakers

Annita Elissaiou
Project Officer
EENA

Gabriel Lazazzara
Manager
ALSO Space

Caroline Morisot
EWSS expert
Telespazio

Vincent Campagne
GNSS expert
FDC

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The SUNSHINE Project

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The SUNSHINE Project

Europe in the face of disasters…

- Climate change, natural hazards, safety threats increasing in frequency and intensity.
- Pressing need for stronger civil protection and international cooperation
- The need to be well-prepared to handle disasters is more important than ever.

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The SUNSHINE Project

Background

- **Request** made by the **European Parliament & the Member States of the European Union**:
  - *How to better understand the EU space services?*
  - *What is the potential of EU space services to support national civil protection authorities?*

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The SUNSHINE Project

Satellites at the service of disaster management

EU Space Programme

- EU is developing and operating space infrastructures with great potential for civil protection community
- Space data and services for observation, monitoring, mapping, public warning…
- Applications for safety and security expanding fast.

How to make best use of space capabilities in times of crisis?

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The SUNSHINE Project

What is the SUNSHINE project about?

- Present and demonstrate the EU space services
- Help the civil protection community understand what they can do & how to use them
- Support operational integration in national systems and procedures

The project will strengthen resilience of EU Member States through dedicated trainings and exercises on the use of EU Space services.

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The SUNSHINE project consortium

TELESPAZIO
a LEONARDO and THALES company

ALSO Space
CONSULTING

cnes
CENTRE NATIONAL
D'ÉTUDES SPATIALES

Edelweiss
Resilience

Université
de Strasbourg

FDC

IABG

eena | 112

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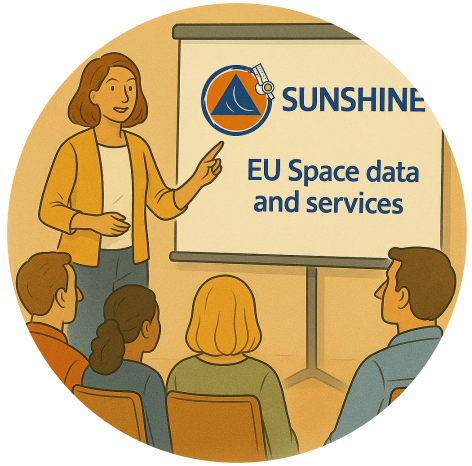
Seminars



Webinars

SUNSHINE

Trainings

Bilaterals

Exercises

4 Seminars

5 Webinars

2 communication webinars

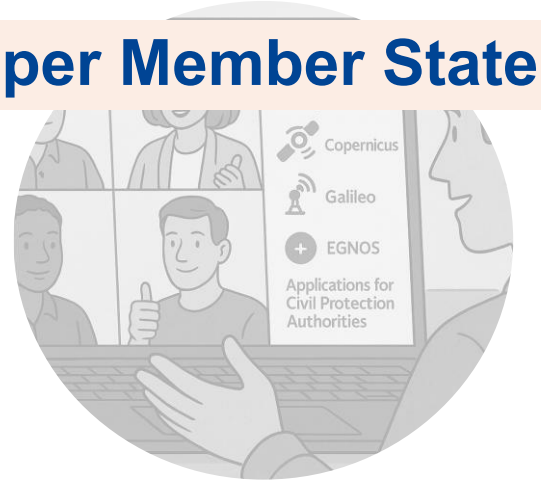
3 training webinars

SUNSHINE

Trainings

1 Bilateral

per Member State



2 Exercises

Who are the SUNSHINE trainings for?

Operational & Strategic Actors

Civil protection authorities, emergency services & first responders, crisis & disaster management team leads, technical emergency teams, ministries responsible for civil protection.

High-Level Technical Knowledge Actors

Technical experts, training coordinators, technological institutes, national scientific bodies & research centres, members of the Union Civil Protection Knowledge Network

Political & Coordination Actors

Policymakers on a national and local level, EU institutions, international & European organisations, NGOs, EU Coordination bodies

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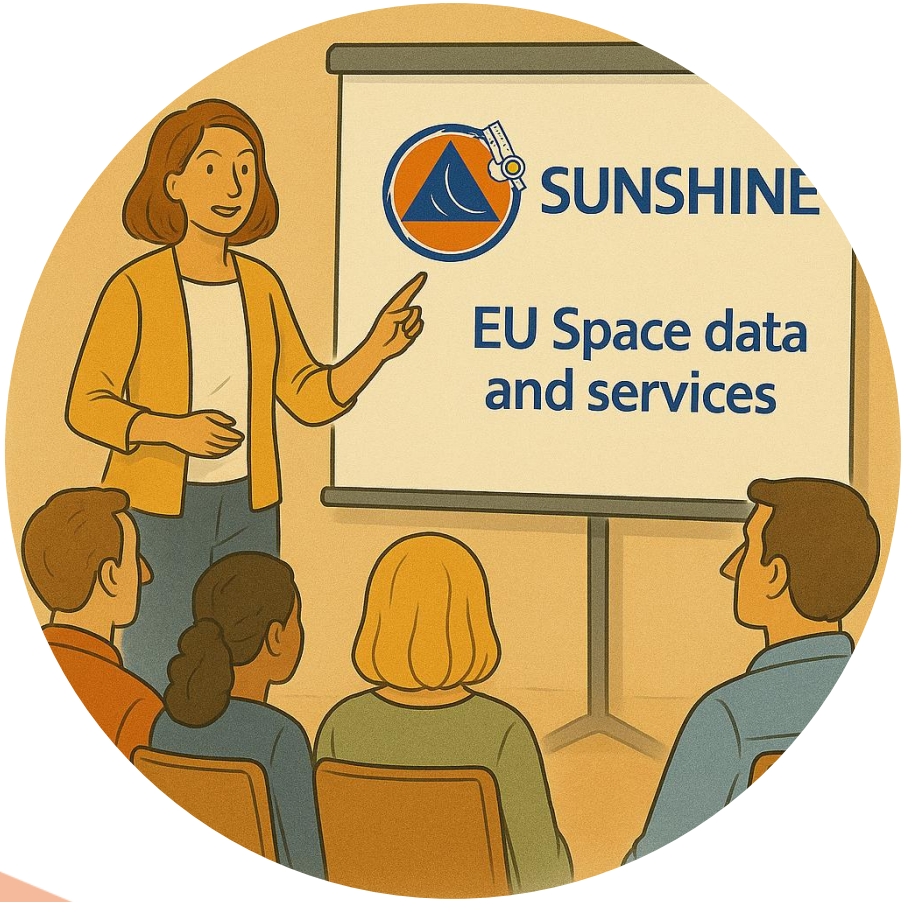
The SUNSHINE seminars



- Taking place over 4-days
- In-depth training on EU Space components and applications for crisis management
- “Train-the-trainer” approach ensures accuracy, relevance, and replicability
- Practical demonstrations on the use of EU space data and services

The SUNSHINE seminars

REGISTER HERE

https://ec.europa.eu/eusurvey/runner/SUNSHINE_TrainingSeminars_ExpressionOfInterest

- Registrations are open for next events
  - 3rd to 6th of March 2026 in Strasbourg, France
  - 5th to 8th of May 2026 in Timișoara, Romania
  - 23rd to 26th of June 2026 in Zagreb, Croatia
- Registration is free (financed by EC) but travel & accommodation costs are not covered
- Selection of profiles based on Expression of Interest form

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09h00

10h00

11h00

12h00

13h00

14h00

15h00

16h00

17h00

18h00

Registration and installation

Inspirational Speech

Welcome and presentation

Ice breaker

EU Space components

Reference disasters presentation

Quiz

ECHO module
- Emergency Rescue Coordination Centre portal
- Union Civil Protection Knowledge Network
- Aristotle

Quiz

Space Situtional Awareness (SSA)

Close up speech

Time Buffer

BEFORE CRISIS

Welcome and warm up

Quiz

CEMS
- European Drought Observatory (EDO)
- Global Human Settlement Layer (GHSL)

Coffee Break

CEMS
- European Forest Fire Information System (EFFIS)

Quiz

Galileo EWSS
- Introduction and live demonstration

Lunch Break

DURING CRISIS

Quiz

Galileo EWSS
- EWSS technical concepts
- EWSS operational platform

Coffee Break

CEMS
- European Flood Awareness System (EFAS)
- Rapid Mapping (RM)

Quiz

Close up speech

Time Buffer

AFTER CRISIS

Welcome and warm up

Table Top Exercise:
When CEMS meets EWSS

Coffee Break

Quiz

CEMS
- Risk and Recovery Mapping

Lunch Break

GOVSATCOM and IRIS²

Coffee Break

Galileo Navigation

Quiz

Your time to SHINE

Close up speech

Time Buffer

Welcome and warm up

Rotating Workshops: Bee a satellite
- OSNMA live demo
- Play with Galileo EWSS
- Play with EFFIS
- Play with EFAS

Coffee Break

Seminar evaluation

Final Speech

Time Buffer

- Context and guidance
- Lectures
- Interactive sessions
- Breaks and buffers

Subject to change

The SUNSHINE webinars

3 Training Webinars

- Online sessions focused & targeted learning on specific EU space components
- Presentations by experts of the SUNSHINE consortium
- Detailed sessions on the purpose, functions, use and real-world applications of EU space assets
- **Next dates**:
  - 4th June – CEMS EFAS and Rapid Mapping
    CEMS EFFIS and Risk and Recovery Mapping
  - 10th September – GovSatCom & IRIS^2 (final agenda tbc)

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SUNSHINE Training Webinars: EU space components in focus

2 Communication Webinars

- Online sessions to boost project visibility
- Promote training opportunities
- Communicate on project's results
- Next date:
  - 2nd April 2026

Recording and slides from 1st communication Webinar available on UCPKN SUNSHINE page

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SUNSHINE Exercises

Putting theory into practice again with immersive simulations

- **SIMEX:**
  - **Transform theory into practice** using EU space assets and tools in a realistic crisis situation
  - **Collaborate and make decisions** in real time, transform your knowledge in skills

- **How to participate?**
  - 2 sessions in DG DEFIS headquarters (Brussels)
    - 24-25 March
    - 6-7 October
  - Pre-requisite*: Participation to a training seminar*
  - **1 and ½ days format** with preparation, ice-breaker, engaging warm-ups and finally a **6-hours SIMEX**

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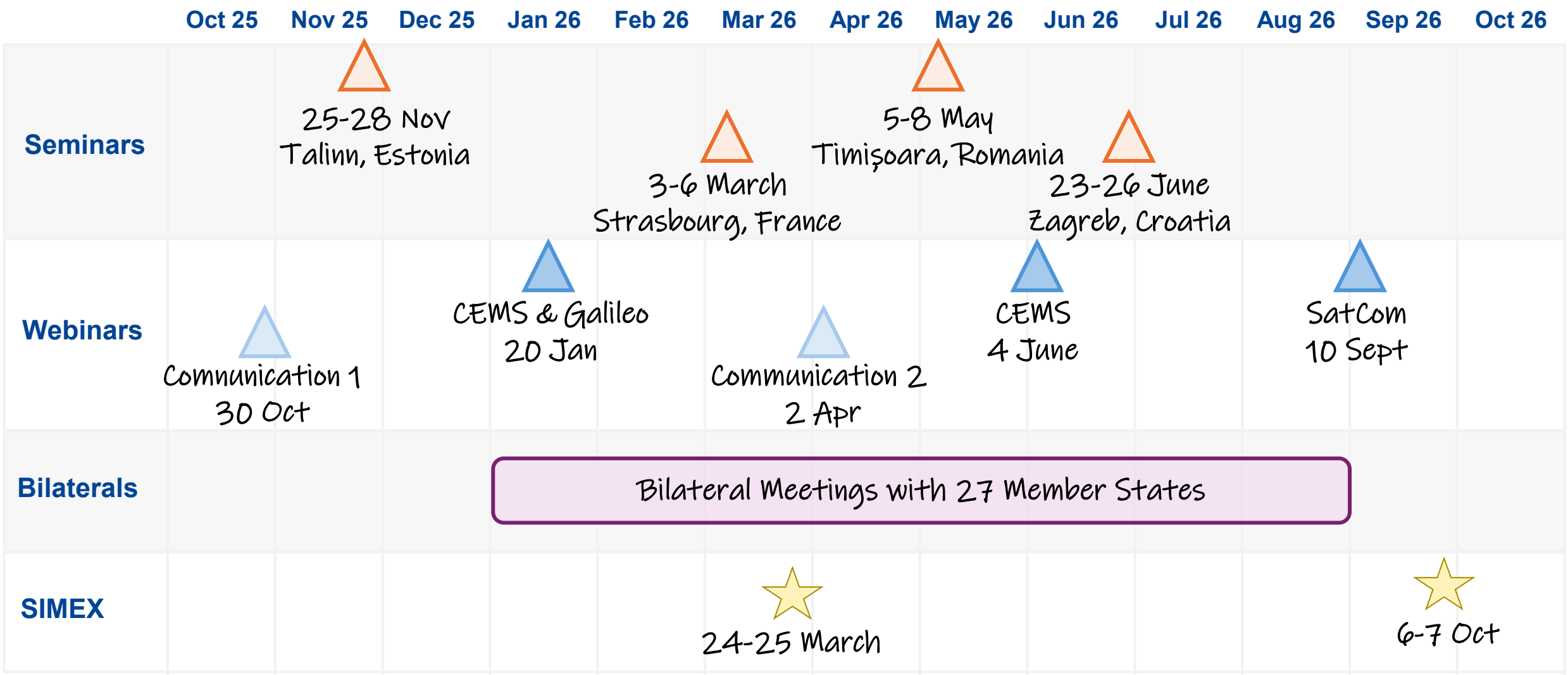
Mark your calendar!



Galileo for civil protection

Galileo services in support to crisis management

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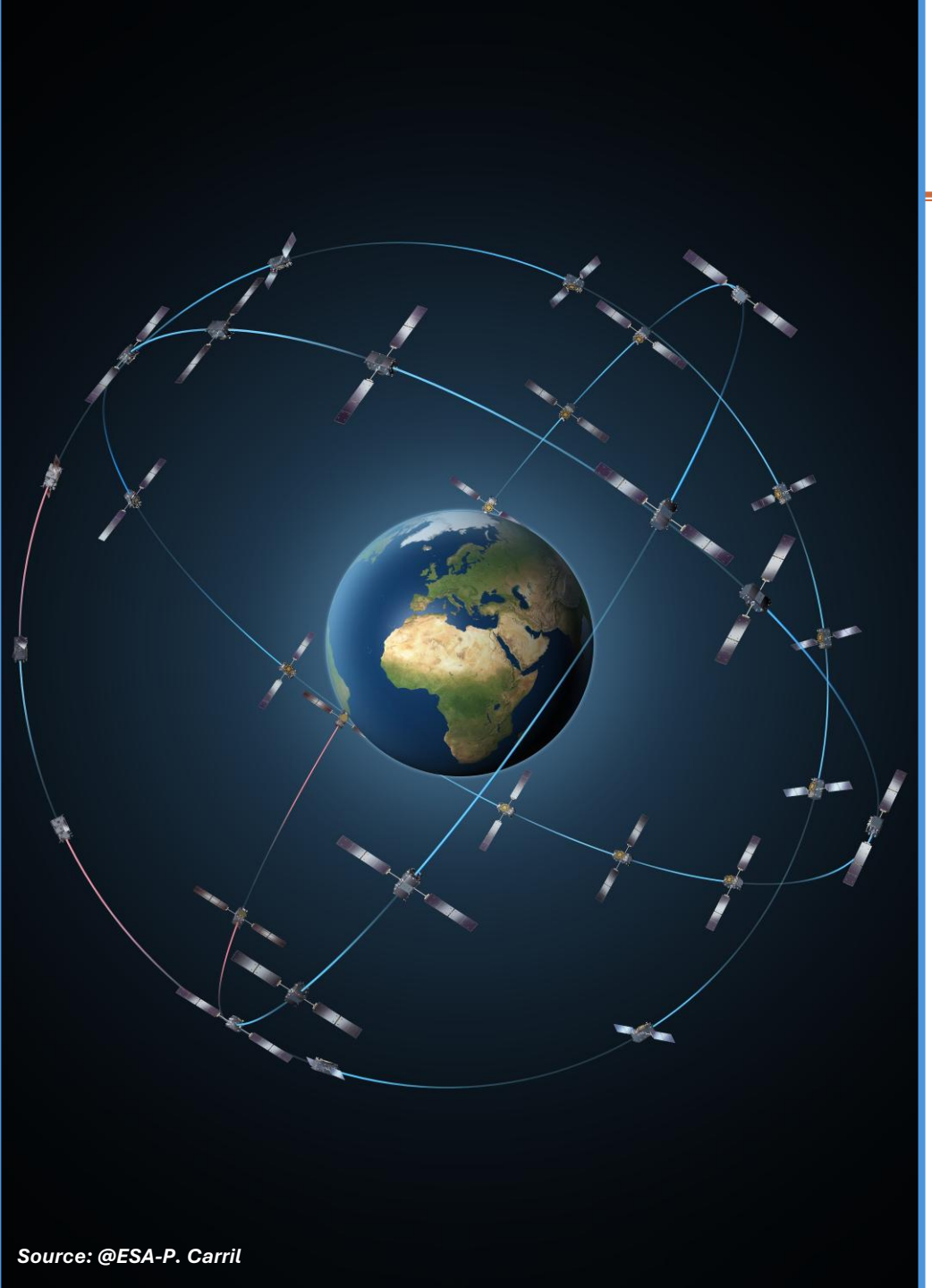

Source: @ESA-P. Carril

You will

- Understand the potential of Galileo in disaster management
- Identify the added values of Galileo services for civil protection use

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Credit: ESA-P. Carril

First, what is Galileo ?

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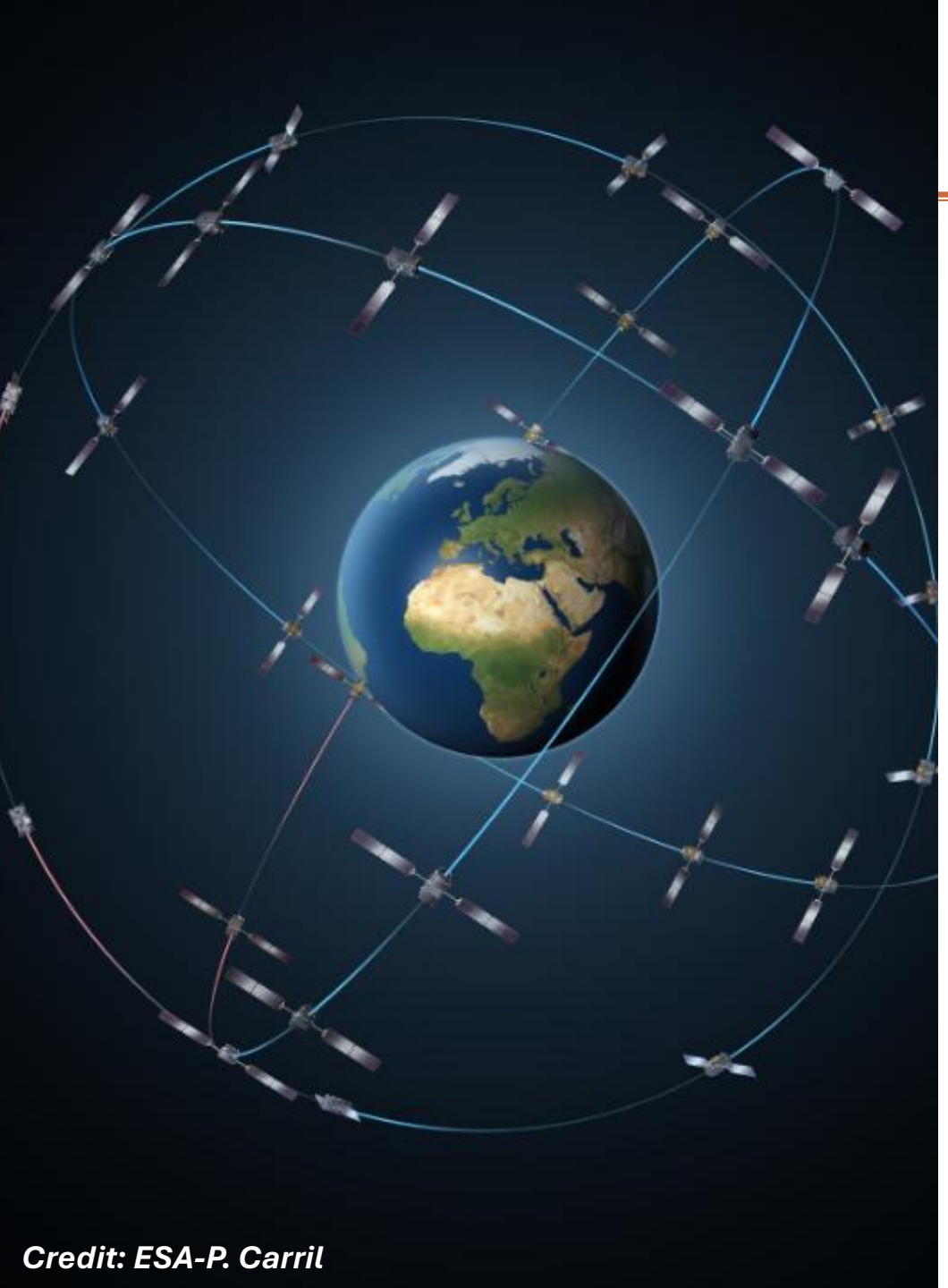
Credit: ESA-P. Carril

What is Galileo?

The European Global Navigation Satellite System (GNSS) providing navigation, positioning and timing information

1998 Start of Galileo Programme by European Union

2005 Launch of first test satellites

… *Deployment of the infrastructure, space and ground*

2016 Galileo in operation

2024+ Development of 2nd generation

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GALILEO

👍 Thumbs alileo daily

👎 Thumbs n’t

SCAN ME

Link to usegalileo.eu website

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Galileo services

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Galileo services

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Credit: The times, Portugal 2024

Galileo to warn the population

A robust link to alert citizens

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Agenda

- General presentation of Galileo EWSS
- How does Galileo EWSS work?
- Application to fire use case
- Galileo: a robust link to warn citizens

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Agenda

- **General presentation of Galileo EWSS**
- How does Galileo EWSS work?
- Application to fire use case
- Galileo: a robust link to warn citizens

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The Galileo Emergency Warning Satellite Service (EWSS)

SCAN ME

Link to EWSS presentation video

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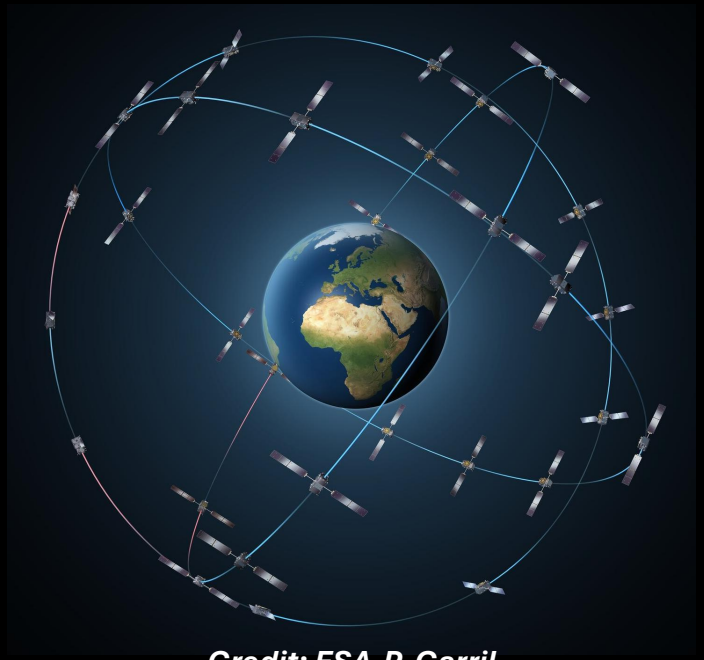
A satellite channel for alerting

29 satellites



Credit: ESA-P. Carril

Always in view

Wide visibility

Credit: Google Earth

Global, Secured, Reliable… Anytime, Anywhere

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EWSS users

EU MS Civil Protection Authorities

- Create and publish Galileo alerts
- Create national libraries of instructions
- Establish service usage

EU Citizens

- Receive and are notified of Galileo alerts impacting them
- Apply guidance to react provided in the alert

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Roadmap to operational service

Pilot phase for national tests

Member States to experiment the service and discover its capabilities
Deployment of operational capabilities

Avril 2026

June 2026

Initial services

Start of operations for the authorised users

Sept. 2027

Fully operational service

Operation of the service for authorised users with full capacity

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Agenda

- General presentation of Galileo EWSS
- **How does Galileo EWSS work?**
- Application to fire use case
- Galileo: a robust link to warn citizens

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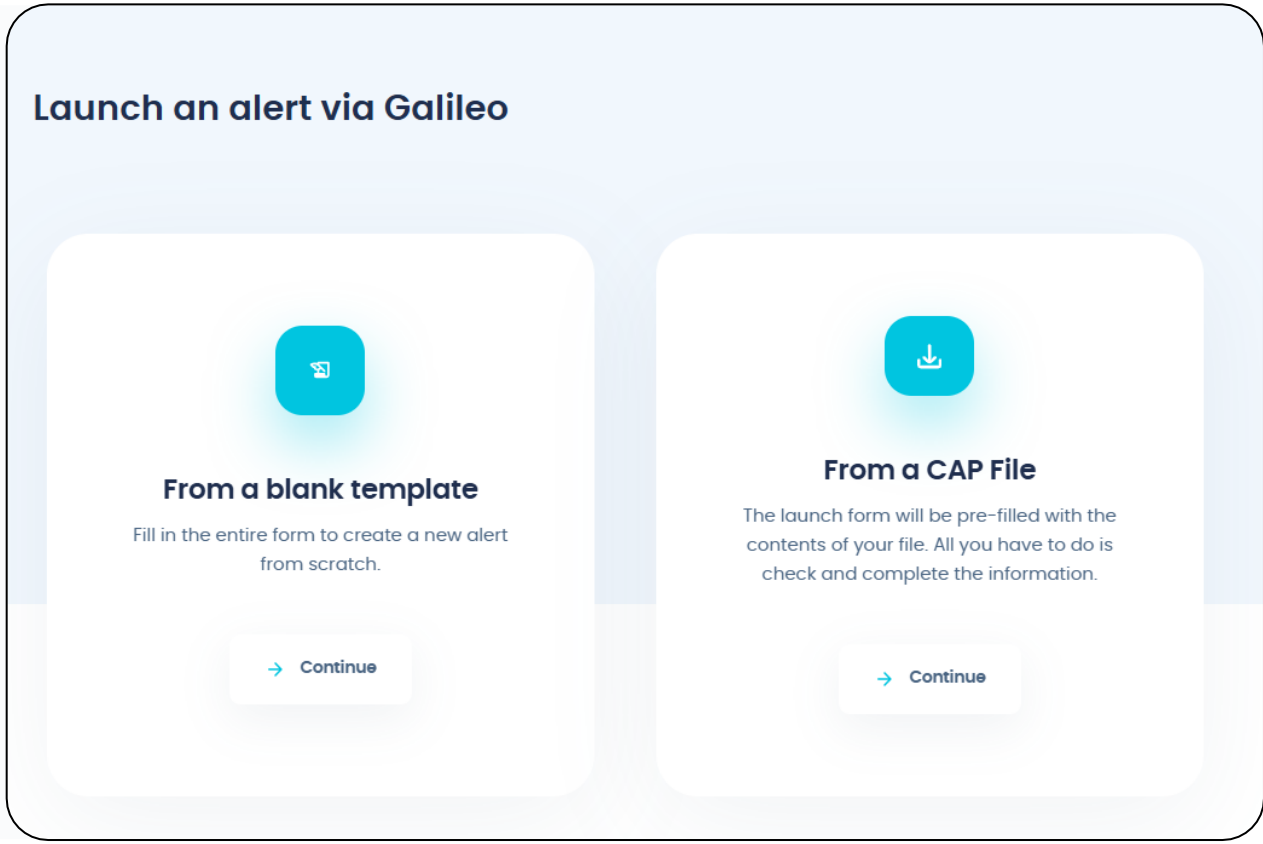
Alert creation

One EU MS Civil Protection Authority is made aware of an incoming danger.

One authorised operator securely connects to Galileo alert platform to create an alert



View of Pilot Test Platform

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You knew CAP?

```
<?xml version = "1.0" encoding = "UTF-8"?>
<alert xmlns = "urn:oasis:names:tc:emergency:cap:1.2">
  <identifier>KSTO1055887203</identifier>
  <sender>KSTO@NWS.NOAA.GOV</sender>
  <sent>2003-06-17T14:57:00-07:00</sent>
  <status>Actual</status>
  <msgType>Alert</msgType>
  <scope>Public</scope>
  <info>
    <category>Met</category>
    <event>SEVERE THUNDERSTORM</event>
    <responseType>Shelter</responseType>
    <urgency>Immediate</urgency>
    <severity>Severe</severity>
    <certainty>Observed</certainty>
    <eventCode>
      <valueName>SAME</valueName>
      <value>SVR</value>
    </eventCode>
    <expires>2003-06-17T16:00:00-07:00</expires>
    <senderName>NATIONAL WEATHER SERVICE SACRAMENTO CA</senderName>
    <headline>SEVERE THUNDERSTORM WARNING</headline>
    <description> AT 254 PM PDT...NATIONAL WEATHER SERVICE DOPPLER RADAR INDICATED A SEVERE
THUNDERSTORM OVER SOUTH CENTRAL ALPINE COUNTY...OR ABOUT 18 MILES SOUTHEAST OF KIRKWOOD...MOVING
SOUTHWEST AT 5 MPH. HAIL...INTENSE RAIN AND STRONG DAMAGING WINDS ARE LIKELY WITH THIS
STORM.</description>
    <instruction>TAKE COVER IN A SUBSTANTIAL SHELTER UNTIL THE STORM PASSES.</instruction>
    <contact>BARUFFALDI/JUSKIE</contact>
    <area>
      <areaDesc>EXTREME NORTH CENTRAL TUOLUMNE COUNTY IN CALIFORNIA, EXTREME NORTHEASTERN
CALAVERAS COUNTY IN CALIFORNIA, SOUTHWESTERN ALPINE COUNTY IN CALIFORNIA</areaDesc>
      <polygon>38.47,-120.14 38.34,-119.95 38.52,-119.74 38.62,-119.89 38.47,-120.14</polygon>
      <geocode>
        <valueName>SAME</valueName>
        <value>006109</value>
      </geocode>
      <geocode>
        <valueName>SAME</valueName>
        <value>006009</value>
      </geocode>
      <geocode>
        <valueName>SAME</valueName>
        <value>006003</value>
      </geocode>
    </area>
  </info>
</alert>
```

COMMON ALERTING PROTOCOL

Standardized XML format for exchanging all-hazard emergency alerts and public warnings over all kinds of networks.

Link to CAP standard page

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Meet CAMF!

COMMON ALERT MESSAGE FORMAT

122 bits chain to encode:

- Message type
- Country ID / Provider ID
- Hazard details
- Instructions to react
- Alert Area
- Specific settings

Link to CAMF

***Updated**: December 2025*

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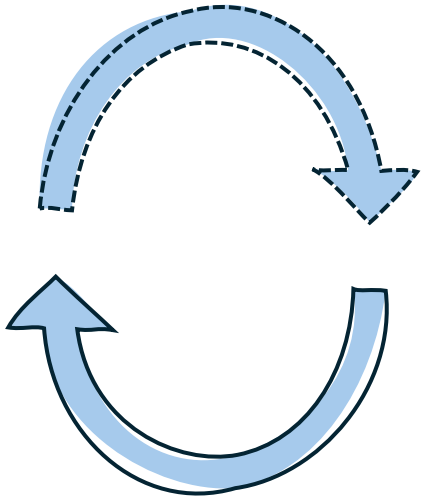
Formats compatibility

CAP

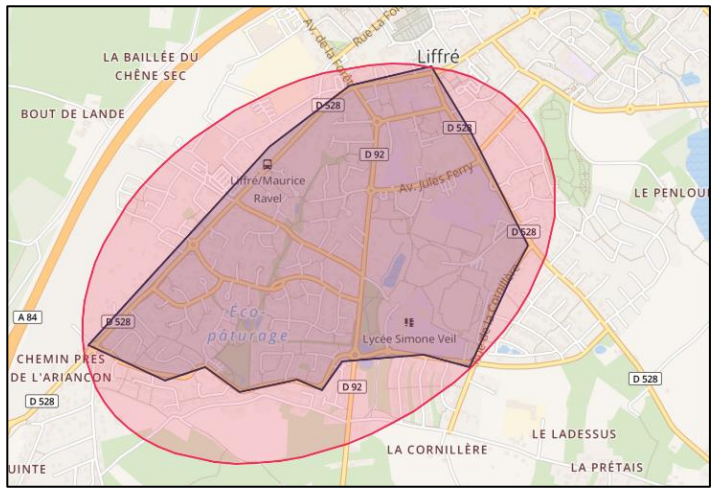
- Mainly free text
- Alert area as polygons, circle or geocode



CAMF

- Only pre-defined values
- Alert area as an ellipse

EXAMPLE 2: Alert area



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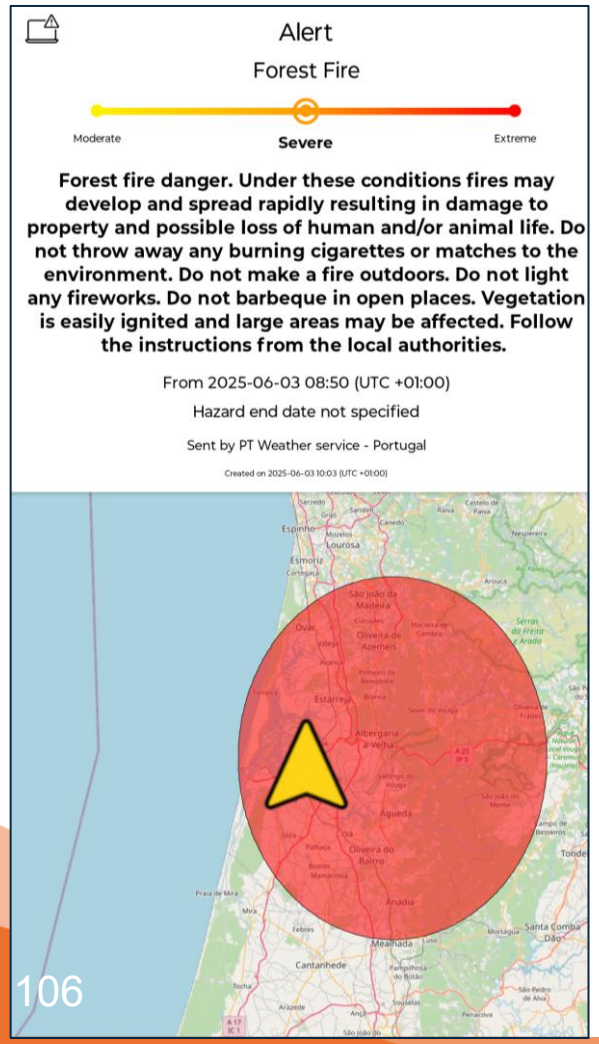
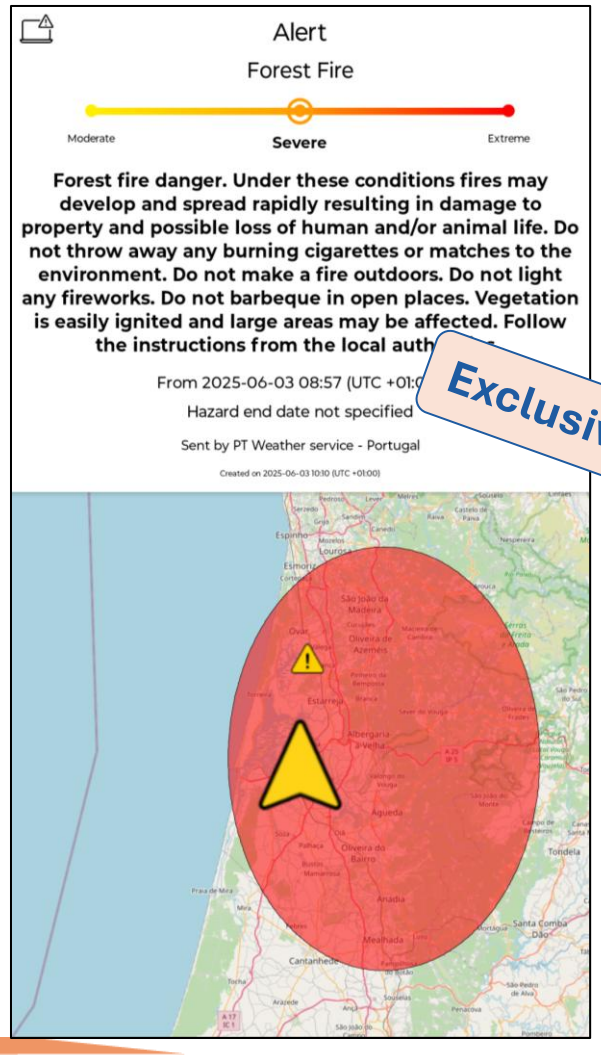
Custom alerts

Main ellipse improved resolution (default)

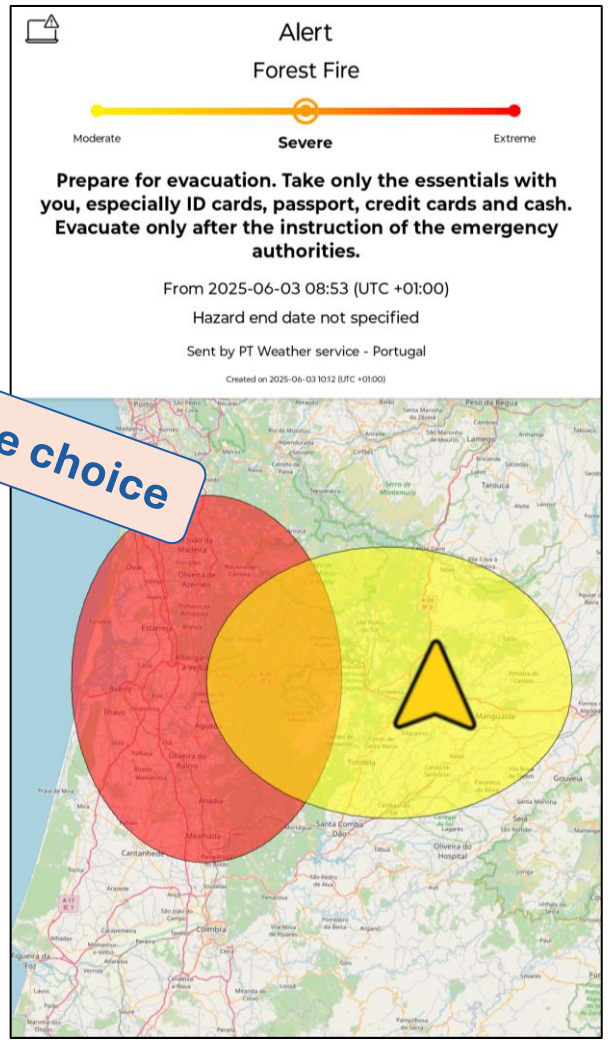


Hazard center

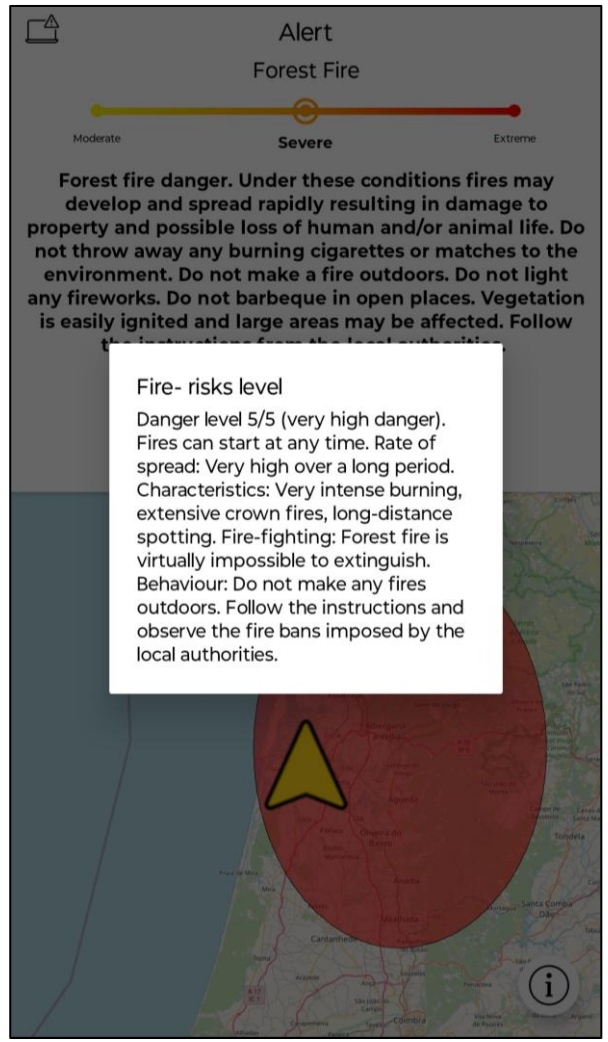


Exclusive choice

Secondary ellipse



Hazard details



Limited bandwidth but rich libraries

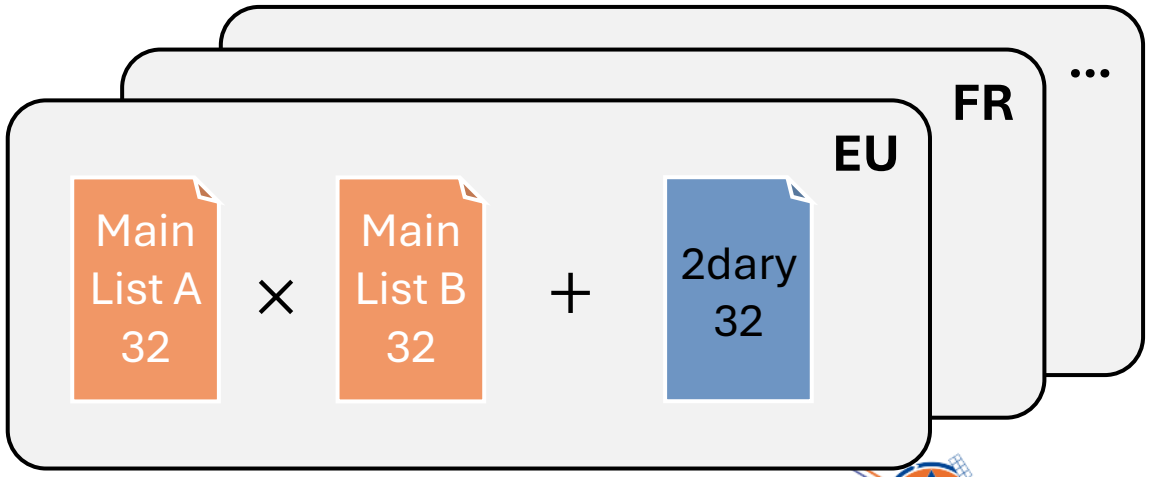
For each Member State:

Maximum 32 alert providers

Types of instruction library: International (EU) or National

Library of predefined instructions:

Main ellipse: 2 lists of 32 instructions to combine + 2ndary ellipse: 1 list of 32 instructions



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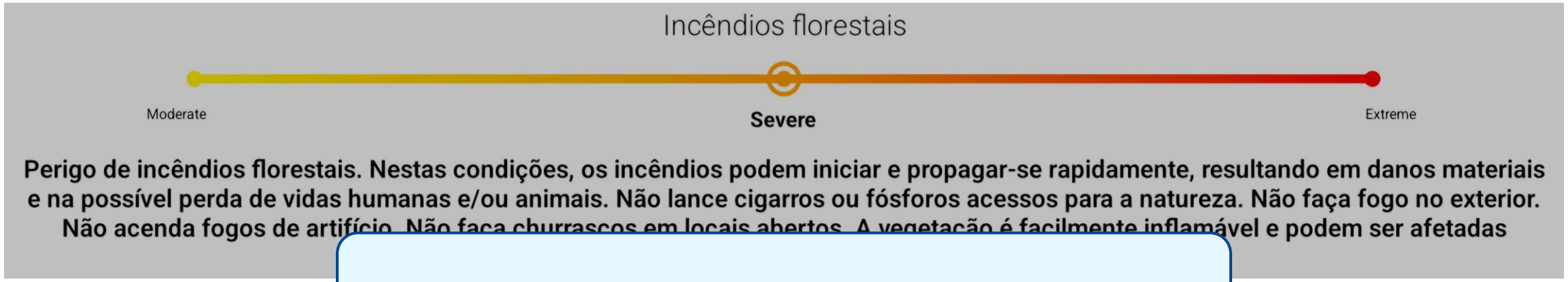
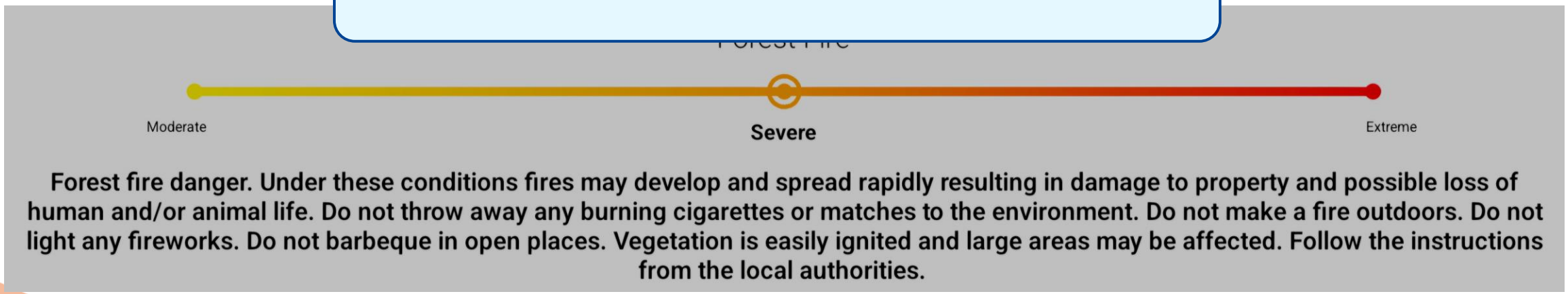
Do you speak Portuguese?



User terminals will **re** for alerts notification in several languages

Language of alert notification can be *configured*.



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The Galileo alert travel

1 **Hazard is detected**

2 **Civil Protection Authority creates the Alert on dedicated platform**

ALERT PLATFORM

Alert

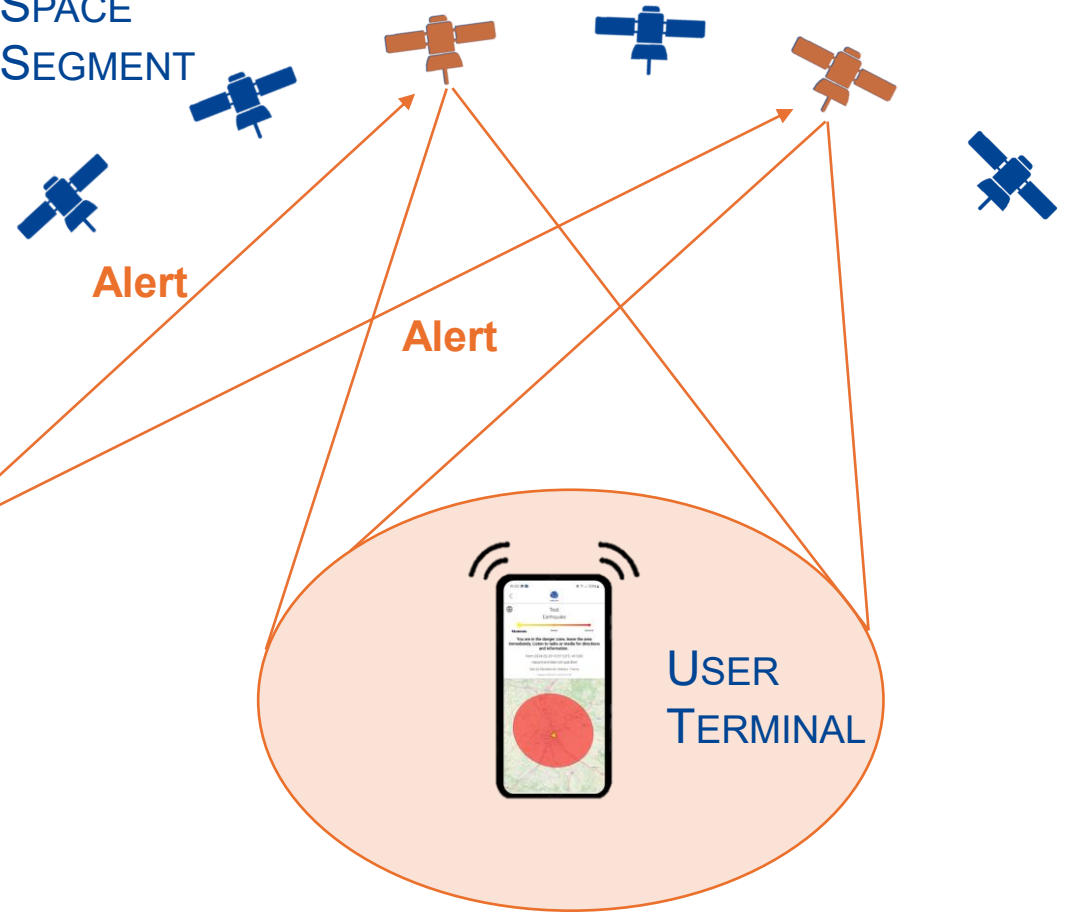
GALILEO GROUND SEGMENT

Alert

3 **Alert is processed by Galileo ground segment and relayed to satellites**

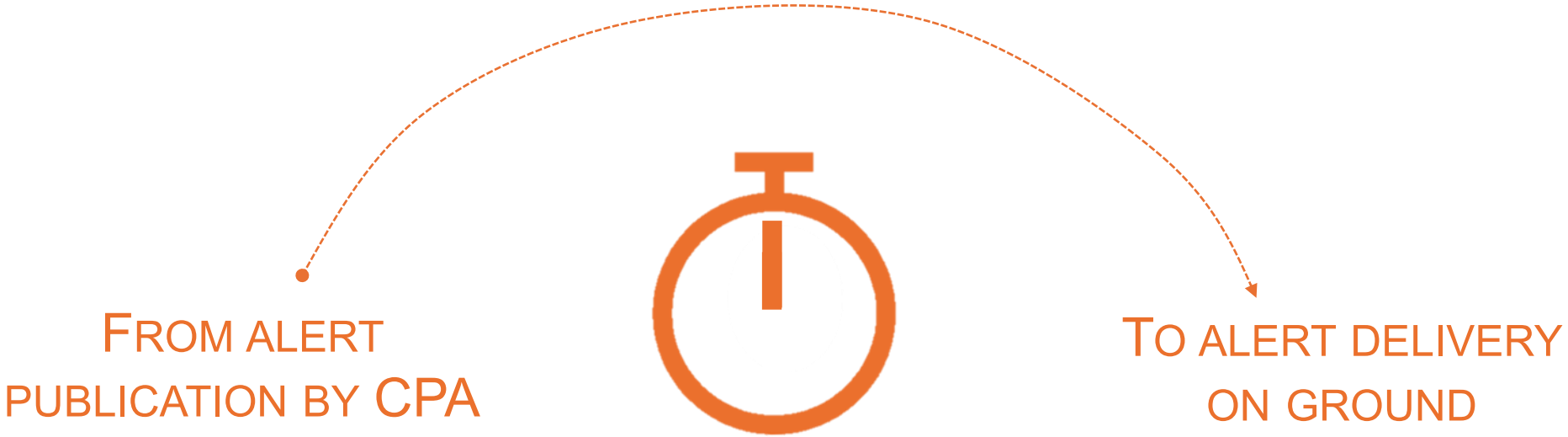
4 **Alert is broadcasted by satellite repeatedly**

GALILEO SPACE SEGMENT



5 **Alert is notified by the terminal**

Time to alert delivery



- For **high priority** alert - within **1 min.**
- For **nominal priority** alert - within **10 min.**

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Agenda

- General presentation of Galileo EWSS
- How does Galileo EWSS work?
- **Application to fire use case**
- Galileo: a robust link to warn citizens

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Application to fire use case

Wildfires in Portugal - September 2024

- At least seven fatalities and over 160 injuries.
- At least 54 people displaced (23 September, DG ECHO Daily Map).
- At least 130,000 hectares of land burned, including the loss of approximately 300 hectares of forest and agricultural land, and destruction of a dozen houses.

Smoke from the fires in Portugal
Copernicus (2024)

House destroyed by the fire
The Guardian (2024)

Wildfires near Sever do Vouga
Euronews (2024)

1 September the 14th 2024, several wildfires are detected by local authorities in Averia region, Portugal

2 Civil Protection Authority receive information about the hazard in the form of a CAP file (extract)

```
<sender>ANEPC</sender>
<msgType>Alert</msgType>
<source>Portuguese Civil Protection</source>
  <info>
    <category>Fire</category>
    <event>Forest fire</event>
    <severity>Severe</severity>
     <senderName>ANEPC</senderName>
     <headline>Wildfire Alert in Northern Portugal</headline>
     <description>A wildfire has been detected in the region. Residents in the affected area are advised to follow civil protection instructions and prepare for possible evacuation.</description>
     <instruction>Forest fire danger. Under these conditions fires may develop and spread rapidly resulting in damage to property and possible loss of human and/or animal life. Do not throw away any burning cigarettes or matches to the environment. […] </instruction>
     <area>
       <areaDesc>Wildfire in Northern Portugal between Aveiro and Porto</areaDesc>
       <polygon>40.9,-8.6 40.9,-8.3 40.7,-8.2 40.5,-8.2 40.5,-8.7 40.7,-8.6 40.9,-8.6</polygon>
     </area>
    </info>
 </alert>
```


Source: Paulo Novais/EPA, via Shutterstock, The New York Times

Inspired by Wildfires in Portugal 2024

3 **CAP file is injected into Galileo EWSS plaform**

4 **Civil Protection Authority publish the alert to warn the citizens about the fire and ask for vigilance**

Type

! Alert

Severity

severe

Alert name

ANEPC-Portugal-Wildfire-Alert

Event category and hazard type

Fire | Forest Fire

Guidance to react

Forest fire danger. Under these conditions fires may develop and spread rapidly resulting in damage to property and possible loss of human and/or animal life. Do not throw away any burning cigarettes or matches to the environment. Do not make a fire outdoors. Do not light any fireworks. Do not barbeque in open places. Vegetation is easily ignited and large areas may be affected. Follow the instructions from the local authorities.

Event start (local time)

14 September 2024 at 15:44

Duration of the event

not specified

Specific option

Improved Resolution of Main Ellipse

Source: https://www.thetimes.com/travel/advice/where-are-the-portugal-wildfires-is-it-safe-to-travel-ttflwnmnr

Inspired by Wildfires in Portugal 2024

5 During the next hours, the wildfires expand significantly

6 Civil Protection Authority decide to send updated alert to the citizens to ask for evacuation. An update of the Initial alert is sent to citizens, with increased severity, instruction to evacuate and expanded alert area.

Type

Update

Severity

Extreme

Event category and hazard type

Fire | Forest Fire

Guidance to react

You are in the danger zone, leave the area immediately and reach the evacuation point indicated by the area plotted in yellow. Listen to radio or media for directions and information.

Event start (local time)

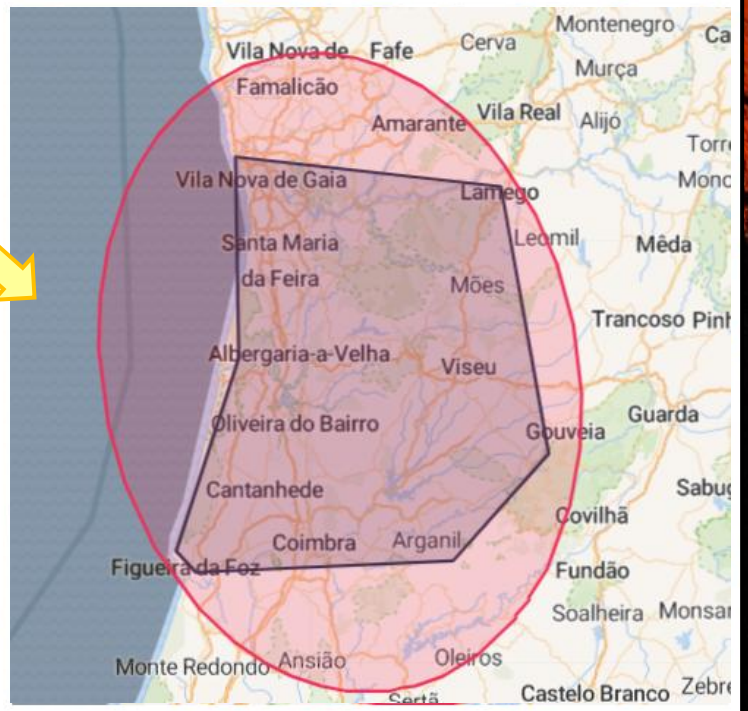
14 September 2024 at 15:44

Duration of the event

not specified

Specific option

Improved Resolution of Main Ellipse



Source: https://www.thetimes.com/travel/advice/where-are-the-portugal-wildfires-is-it-safe-to-travel-ttflwnmnr

Inspired by Wildfires in Portugal 2024

7 After a few days, fires are under control by the firebrigades.

8 Civil Protection Authority decide to send an All Clear message to the citizens, informing them that the situation is back to normal.

Type

All clear

Severity

Extreme

Event category and hazard type

Fire | Forest Fire

Guidance to react

Conditions have improved and are no longer expected to meet alert criteria.

Event start (local time)

14 September 2024 at 15:44

Duration of the event

not specified

Specific option

Improved Resolution of Main Ellipse

Source: https://www.thetimes.com/travel/advice/where-are-the-portugal-wildfires-is-it-safe-to-travel-ttflwnmnr

Inspired by Wildfires in Portugal 2024

Agenda

- General presentation of Galileo EWSS
- How does Galileo EWSS work?
- Application to fire use case
- **Galileo: a robust link to warn citizens**

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A complementary channel

Galileo EWSS **complements existing National Public Warning Systems** (Radio, Cell-broadcast, Location based SMS, mobile applications…)

Authorities will decide to use Galileo on top of or instead of other alerting channels according to the situation.

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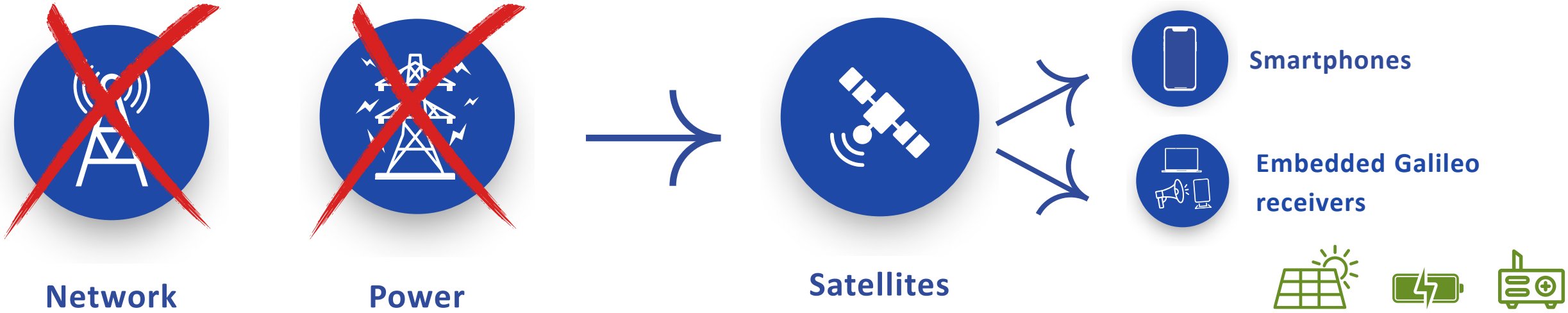
Robust to ground network disruption



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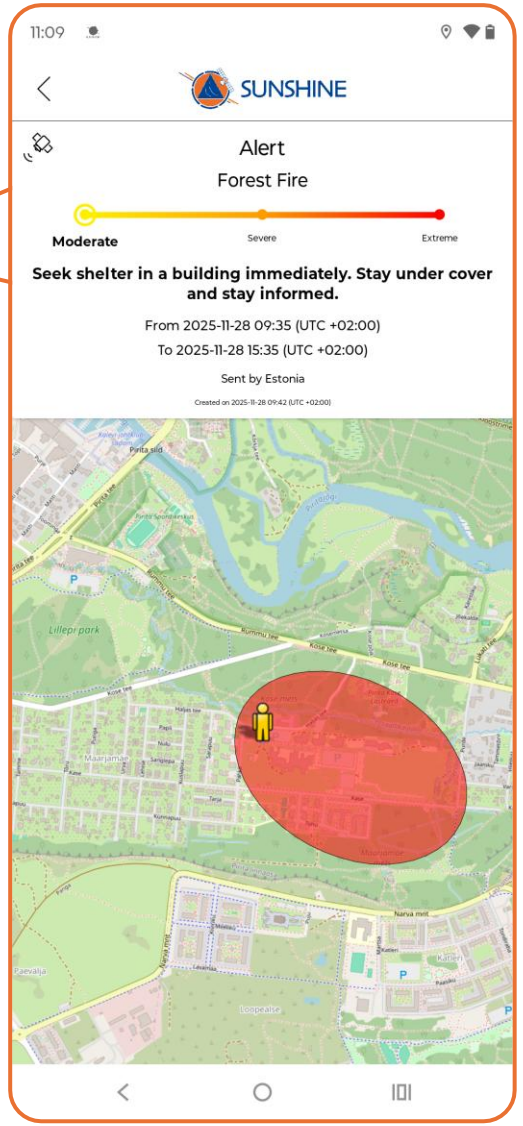
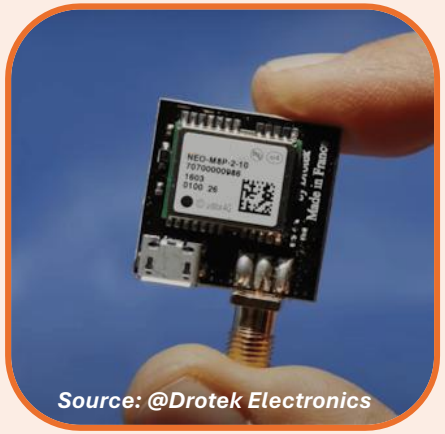
Targets mass market devices



But all devices embedding a Galileo chipset are potential EWSS compatible terminals



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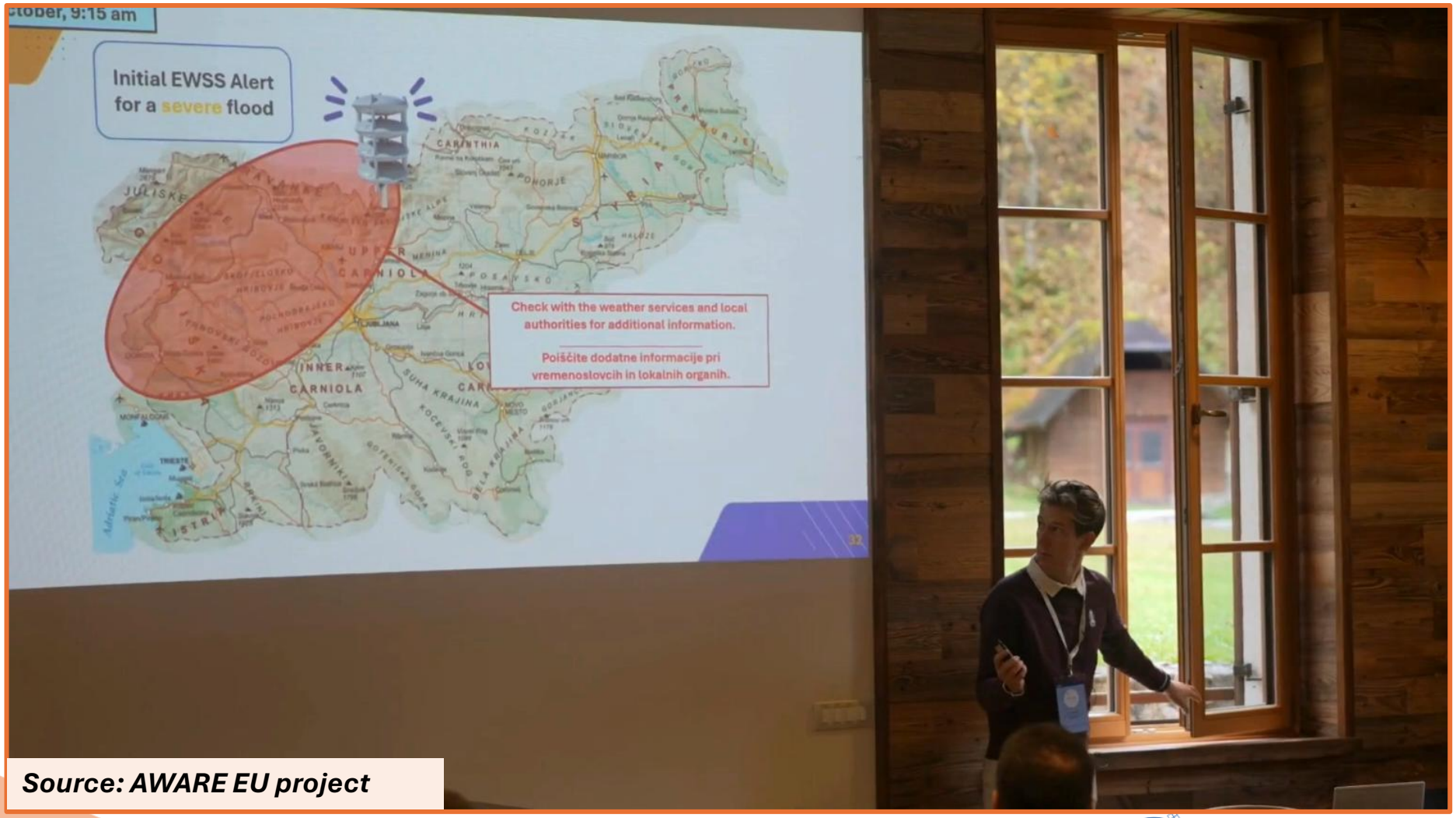
EWSS compatible speakers



Source: AWARE EU project

Funded by the European Union

EUSPA European Union Agency for the Space Programme

AWARE REVOLUTIONISING PUBLIC WARNING

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EWSS compatible digital panels

Source: AWARE EU project

Funded by the European Union

EUSPA European Union Agency for the Space Programme

AWARE REVOLUTIONISING PUBLIC WARNING

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Want to learn more about EWSS?

Join one of the **SUNSHINE Seminars** and:

- Discover EWSS alerts detailed creation process
- Concepts of notifications
- Possible synergies with Copernicus EMS

… and much more !

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Credit: www.euspa.europa.eu

Galileo for accuracy

Ensuring accuracy of Galileo PVT

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What is accuracy ?

Simple definition: *How close the computed position is to the true position*

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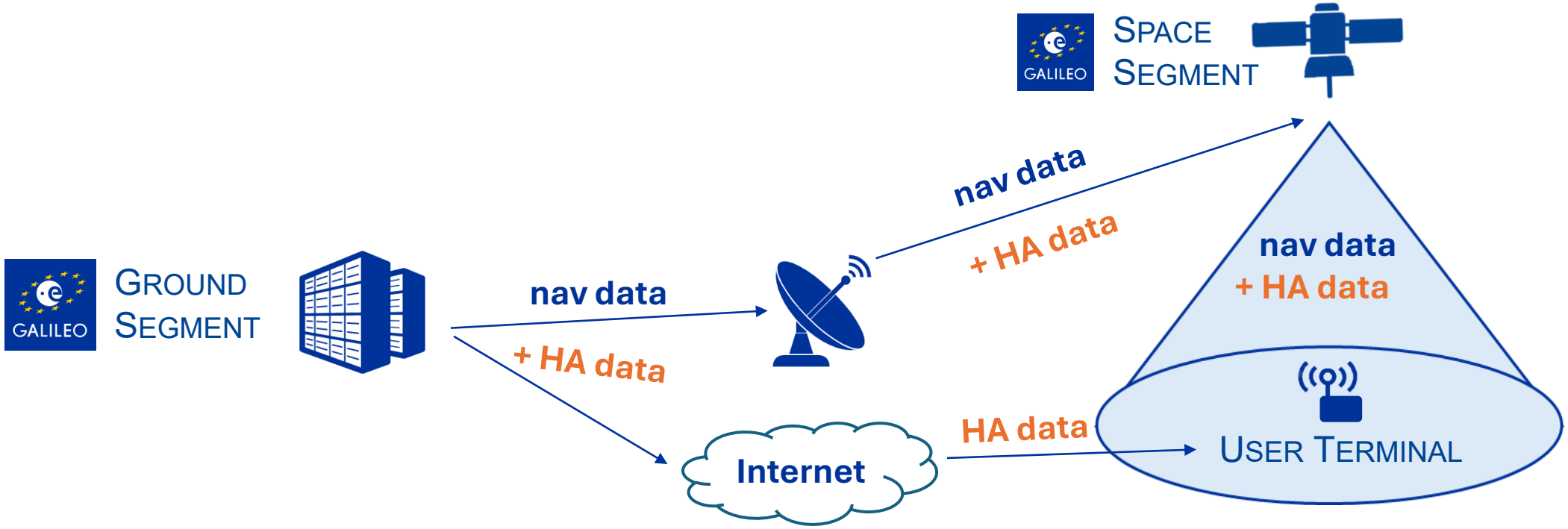
High Accuracy Service



- **High Accuracy Service (HAS)** provides **corrections** required to estimate an accurate positioning solution in real-time:
  - Through the Galileo signal
  - Through the Internet

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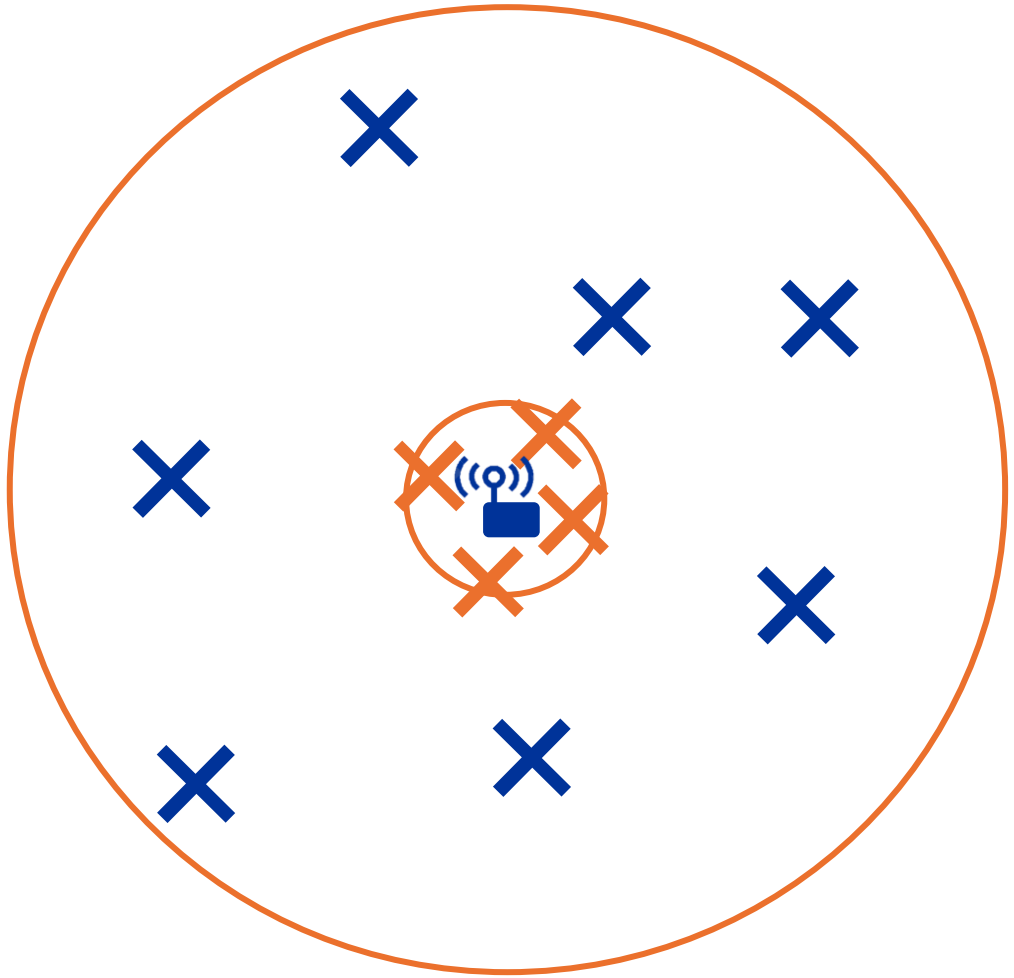
Improved accuracy

With HAS
20 cm



Without HAS
5 m

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Need for specific receivers

- HAS corrections are provided free of charge
- Requires procurement of HAS capable receivers

Link to List* of HAS capable receivers

€ HAS capable receivers cost thousands of euros

*Non exhaustive list, maintained by EUSPA

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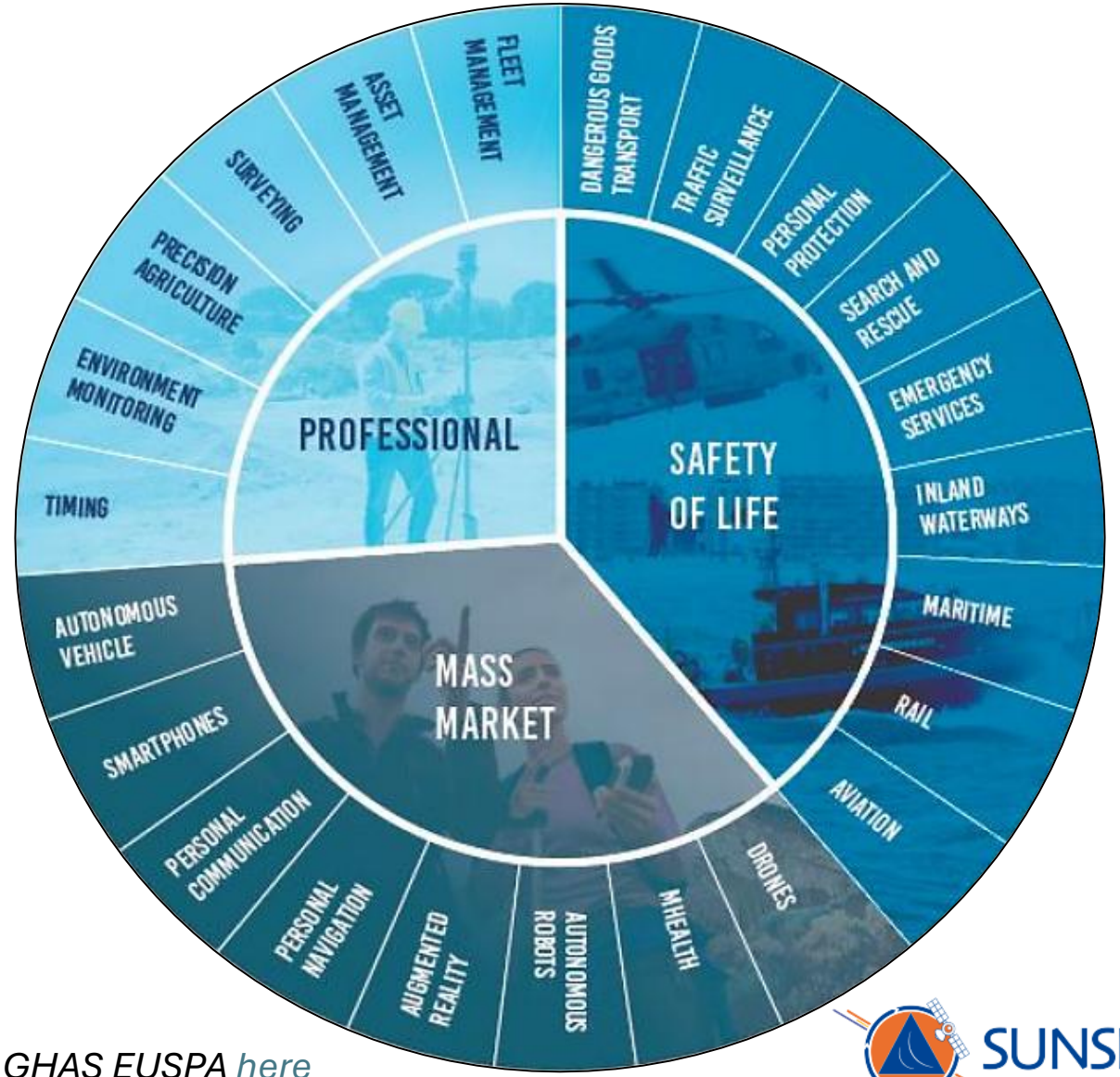
HAS applications



Source: GHAS EUSPA here

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Applications to fire use case

Team	Mission
Fire-fighter brigade	On-site team conducting the interventions
Aircraft	Monitor and assess fires
Drones	Cartography of the fire
Commandment centre	Coordination of the units on site
Post event recovery	Assessment of damages

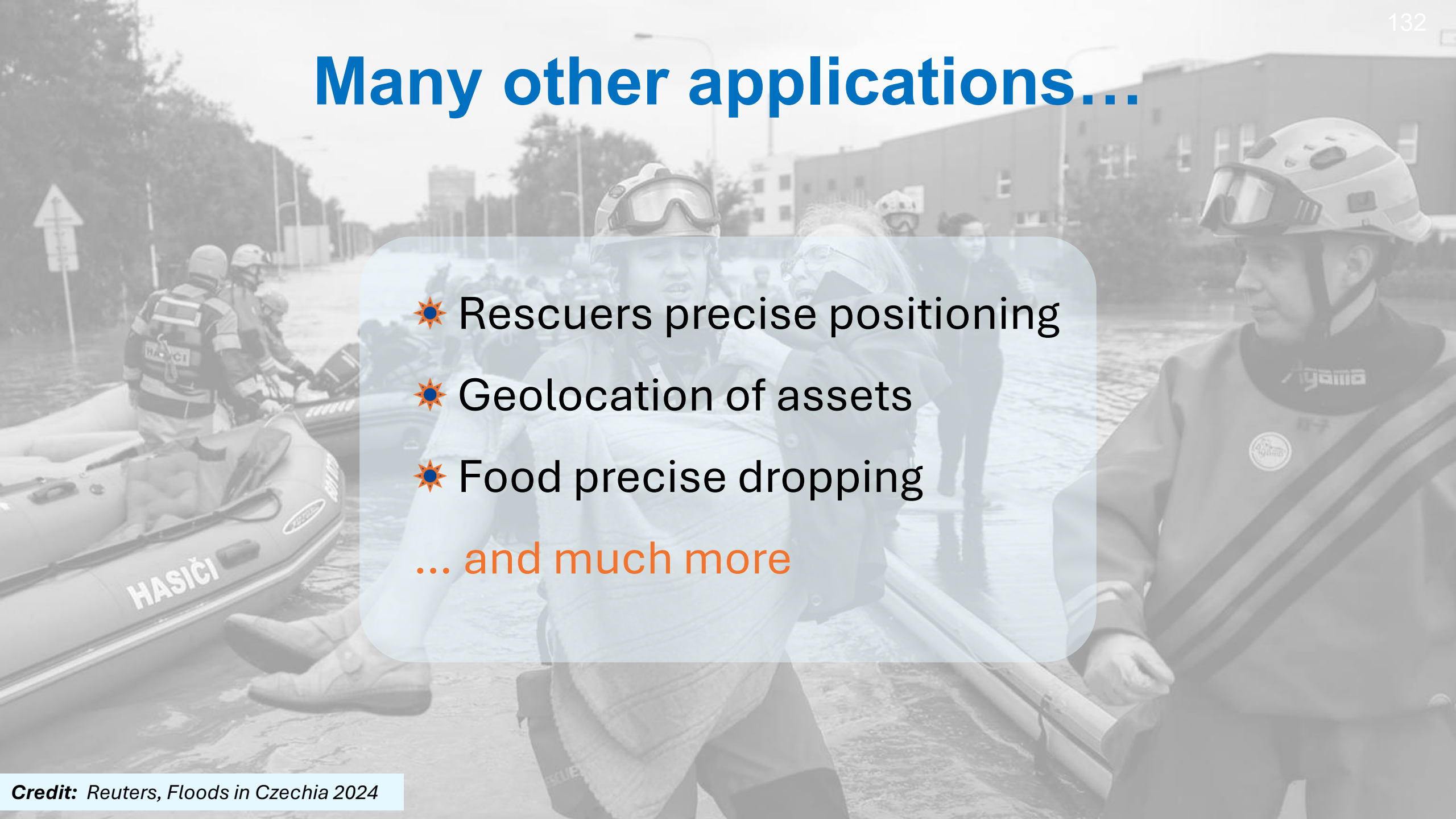
Source: Report on Emergency Management and Humanitarian Aid User Needs and Requirements - EUSPA

Credit: The times, Portugal 2024

Many other applications…

- Rescuers precise positioning
- Geolocation of assets
- Food precise dropping

… and much more



Credit: *Reuters, Floods in Czechia 2024*

Galileo against cyber attacks

Ensuring trustworthiness in Galileo information

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Credits: EU Agency for the Space Programme (EUSPA), 2022

Security threat on GNSS

- GNSS receivers are **vulnerable** to counterfeit signals
  - Fake signals can mislead receivers about their position and time
  - These signals can even contain fake Emergency Warning Messages

- Emission of fake GNSS signals is called a **spoofing attack**

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Security threat on GNSS

- **Growing threat** of GNSS spoofing attacks
  - Cost of a spoofing attack is decreasing
  - GNSS counterfeit signals are already observed

- **Protection** against spoofing attacks is mandatory for civil protection applications (EWSS, rescue operations…)

Device to perform spoofing

Mapping of events

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What is Galileo OSNMA

- **OSNMA** means **O**pen **S**ervice **N**avigation **M**essage **A**uthentication
  - **OS** is the free of charge, worldwide positioning and timing service of Galileo
  - **NMA** is a cryptographic mechanism protecting the information emitted by the Galileo satellites

- OSNMA allows a GNSS receiver to **authenticate Galileo information**
  - Ensuring the data comes from genuine Galileo satellites
  - Ensuring the data has not been altered

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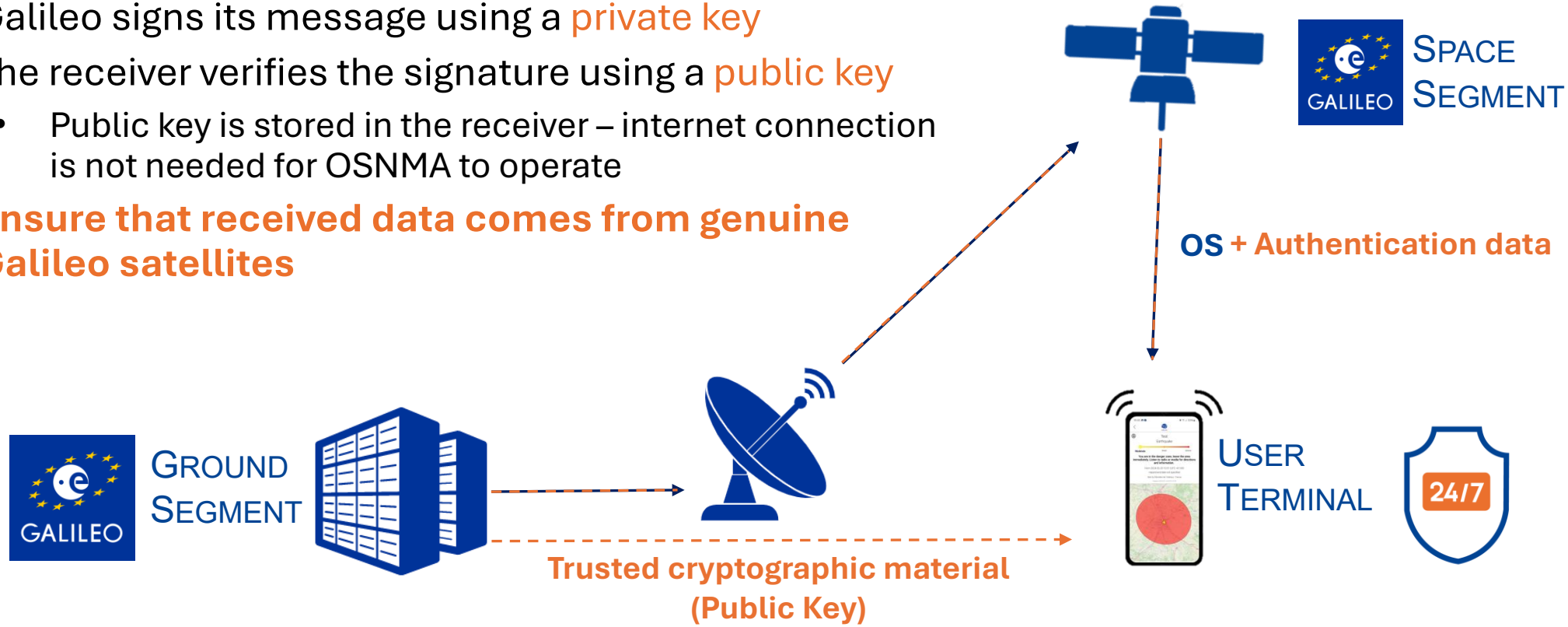
How OSNMA works

- OSNMA incorporates specific data in the **navigation message** that cannot be predicted or forged by an attacker
- **Digital signature**
  - Galileo signs its message using a private key
  - The receiver verifies the signature using a public key
    - Public key is stored in the receiver – internet connection is not needed for OSNMA to operate
  - **Ensure that received data comes from genuine Galileo satellites**



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How to use OSNMA

- OSNMA processing is **internal to the GNSS receiver**
  - No specific user action is needed
  - No specific interface is needed
  - Free of charge
- **Secure OSNMA enabled receivers are already on the market**

List of OSNMA compatible receivers

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OSNMA usage for positioning and timing

- **Example use cases:**
  - Deployed rescue team relying on GNSS for navigation
  - UAVs for search and rescue or essential aid delivery
  - Communication stations relying on precise GNSS timing
  - …

Fairfax County Urban Search & Rescue Team, OpenStreetMap


(C) 2026 Escadrone


satcom.actia.com/solutions/terminaux-satcom/

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OSNMA usage for positioning and timing

- An OSNMA enabled receiver provides **trusted positioning and timing** in crisis situations

Fairfax County Urban Search & Rescue Team, OpenStreetMap


(C) 2026 Escadrone


satcom.actia.com/solutions/terminaux-satcom/

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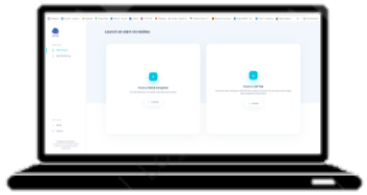
OSNMA usage for public warning

1 **CPA creates the Alert**

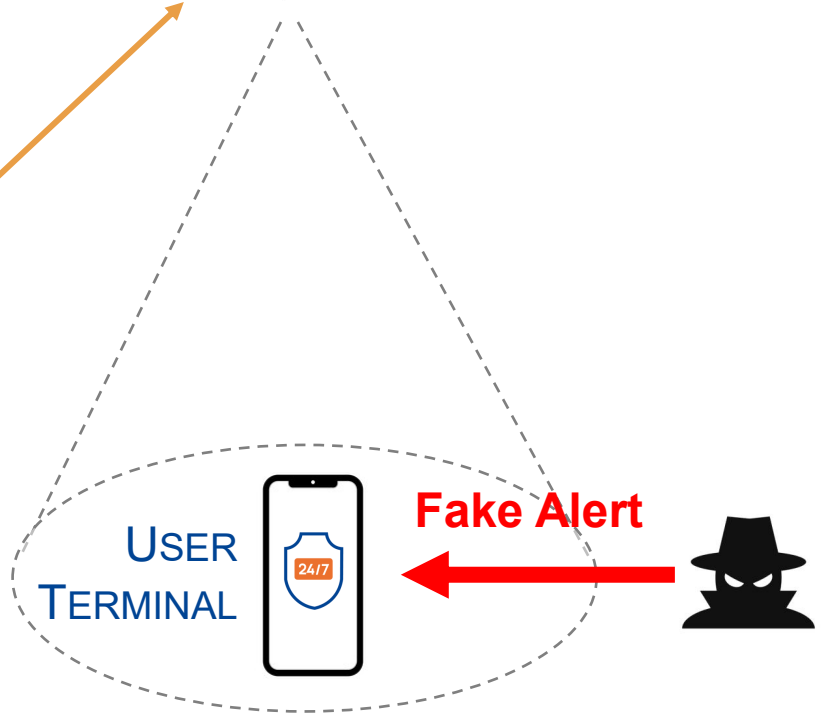


ALERT PLATFORM

GALILEO GROUND SEGMENT

2 **Alert is processed by Galileo ground segment and relayed to satellites**

3 **Alert is broadcast by satellites**



4 Fake alert is **detected** by OSNMA function
User is **not notified** with a fake alert

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Galileo OSNMA demonstration

Application to disaster response operations

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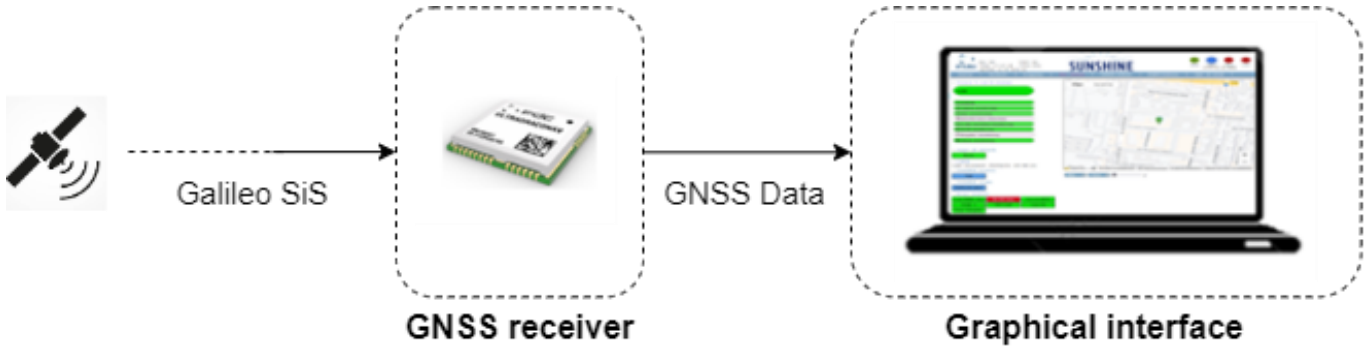
The demonstrator

1 Genuine Galileo signals



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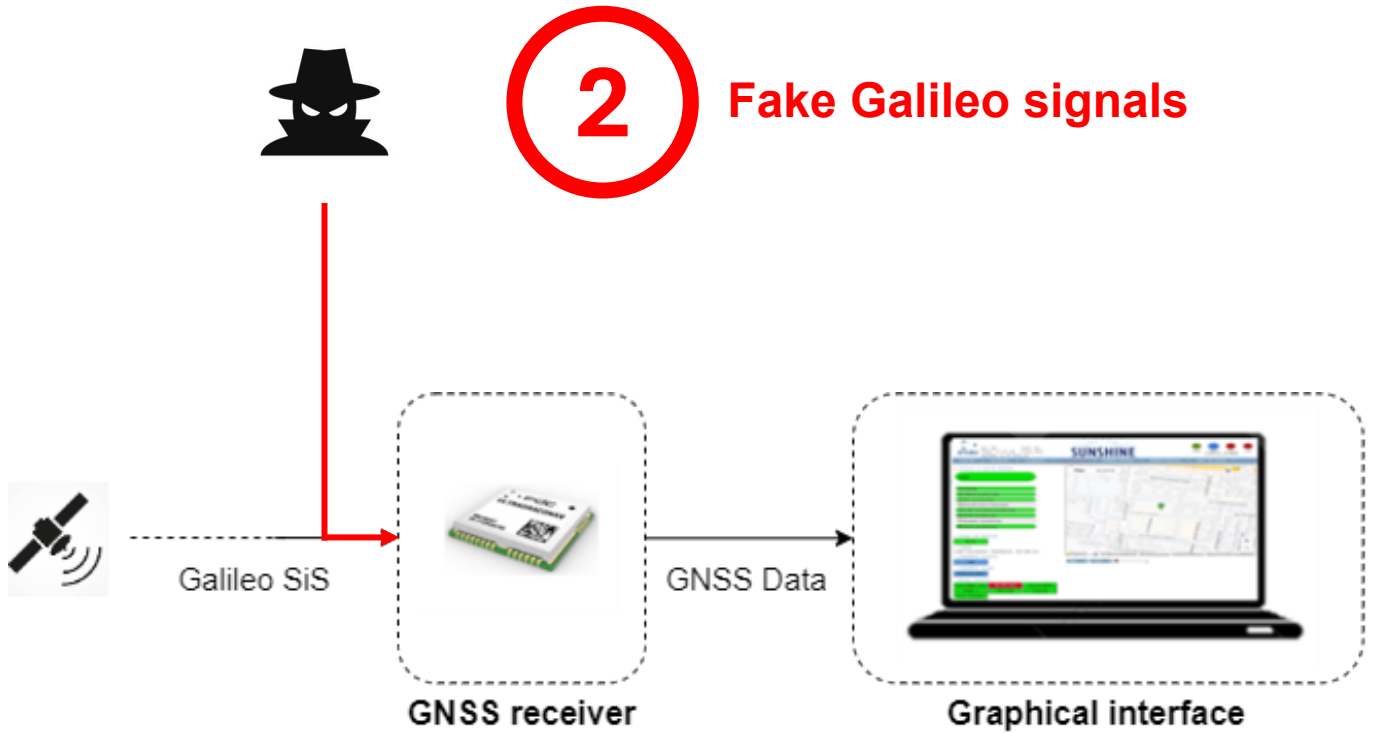
The demonstrator



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Want to learn more about OSNMA?

Join one of the **SUNSHINE Seminars** and an in depth OSNMA demonstration including:

- Live Galileo signals processing
- On the field navigation use case
- Galileo alert protection use case

… and much more !

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Source: Search and Rescue Galileo Service Definition Document, © European Union, 2024

Galileo to save lives

Last resort link with rescuers

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What is Cospas Sarsat?

"Search And Rescue satellites listen worldwide for distress calls*"

- **Born in 1979** from a joint effort of Canada, France, the United States, and the former Soviet Union
- **45 countries and organisations** participating in the operation and management of the system today

*https://www.cospas-sarsat.int

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How does it work?

Source: Search and Rescue Galileo Service Definition Document, © European Union, 2024

Cospas Sarsat distress beacons are **specific terminals**, designed to be resilient to very harsh environment.

Allows a user **to issue a distress when other communication means are unavailable**.

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Distress beacons for civil protection

Distress beacons allow to send distress in harsh environment when other communication means are unavailable.

Areas in which Civil Protection is deployed are by definition:

- Dangerous areas
- Areas in which ground network may be down

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Galileo: a contributor to Cospas Sarsat

GEOSAR
8 Satellites
36 000 km

MEOSAR

Glonass
24 Satellites
19 000 km

GPS
24 Satellites
20 000 km

Galileo
29* Satellites
23 000 km

LEOSAR
5 Satellites
850 km

Galileo Search And Rescue (SAR)

** Value in November 2025*

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Return Link: a unique Galileo feature

Source: Search and Rescue Galileo Service Definition Document, © European Union, 2024

Galileo satellites

Ack.

Galileo Return Link Service is operational since 2018

Cospas Sarsat Ground Segment

Rescue Coordination Centre

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Two Way Communication Return Link Service

+ Answers

Question

Galileo satellites

+ Answers

Question

Galileo Ground Segment

Cospas Sarsat Ground Segment

+ Answers

Question

Rescue Coordination Centre

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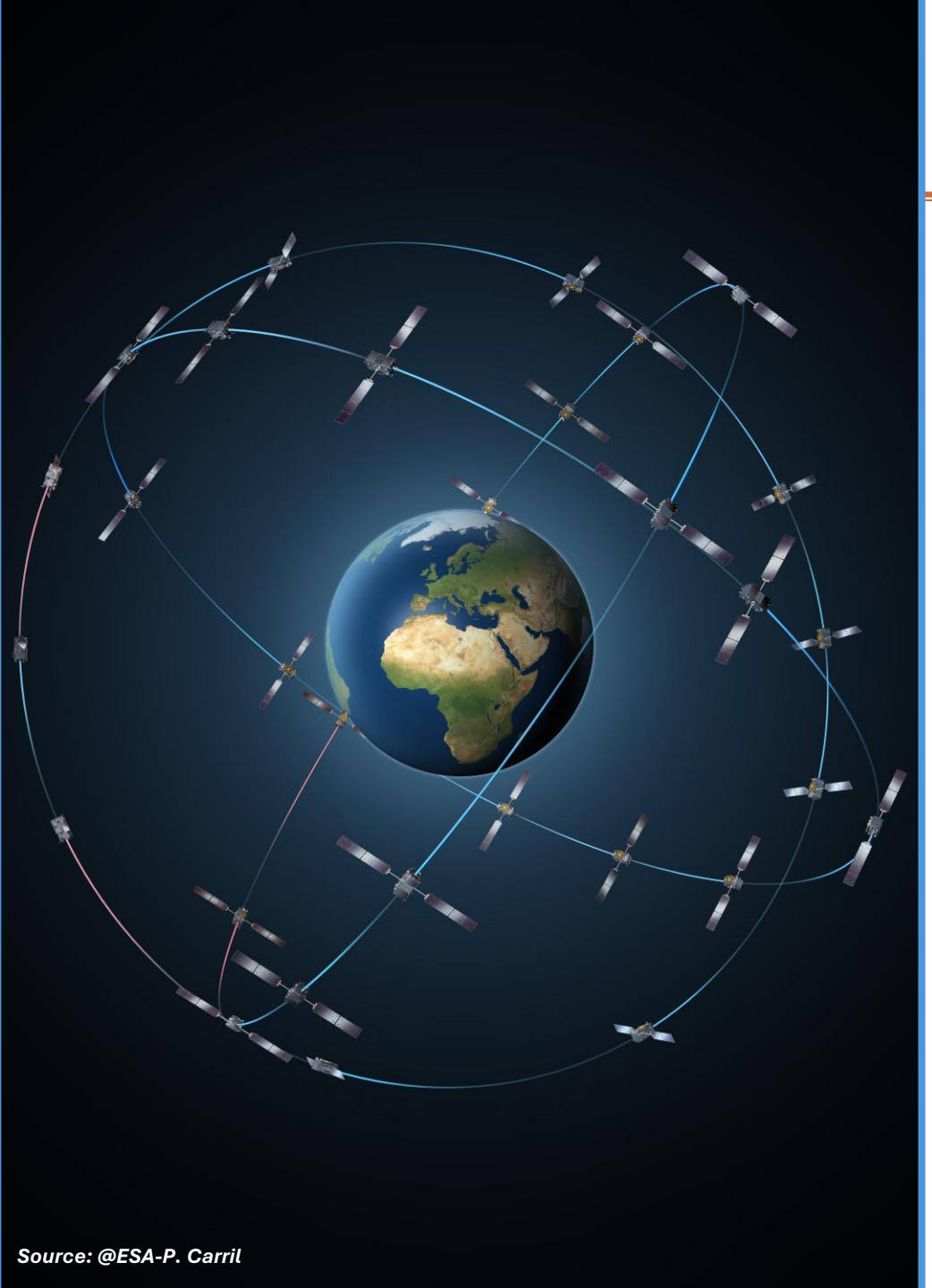
Now you know



Source: @ESA-P. Carril

- **Galileo EWSS** is a robust channel to alert populations
- Galileo offers services to support **higher accuracy** and **resilience against cyber attacks**
- These services are **free of charge** and available to civil protections authorities through **specific equipment** and/or **procedures**
- Galileo **Search And Rescue** is saving lives

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Useful resources

- FAQ | European GNSS Service Centre (GSC)
- Services | European GNSS Service Centre (GSC)
- Galileo Search And Rescue Service Definition Document : here
- Return Link Service architecture (EUSPA) : here
- Cospas Sarsat Official Website: here
- Cospas Sarsat training platform : here
- ESA news on SAR Galileo: ESA - Galileo infographic: 'Saving lives from space'
- Receivers implementing Galileo OSNMA | European GNSS Service Centre (GSC)
- Access to PRS info: Galileo — access to the public regulated service | EUR-Lex
- Report on Emergency Management and Humanitarian Aid User Needs and Requirements
- HAS: Status of Galileo Services, Galileo_Seach_and_Rescue-Return_Link_Service.pdf

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What comes next?

Upcoming Training Opportunities

Seminars

- 3rd to 6th of March 2026 in Strasbourg, France
- 5th to 8th of May 2026 in Timișoara, Romania
- 23rd to 26th of June 2026 in Zagreb, Croatia

REGISTER HERE

Simulation Exercises

- 24th to 25th of March 2026 in Brussels, DG DEFIS
- 6th to 7th of October 2026 in Brussels, DG DEFIS

Interested to participate? **Scan the QR code** to fill in the Expression of Interest form!

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Want to watch the webinar again?

The **recording** of the webinar and **slides** presented will be available on the SUNSHINE page of the Union Civil Protection Knowledge Network platform.

Follow this page *for more updates and news from the SUNSHINE project!*

SCAN ME

SUNSHINE page on UCPKN platform

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Webinar Evaluation

SCAN HERE

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Contacts

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sunshine@telespazio.com

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