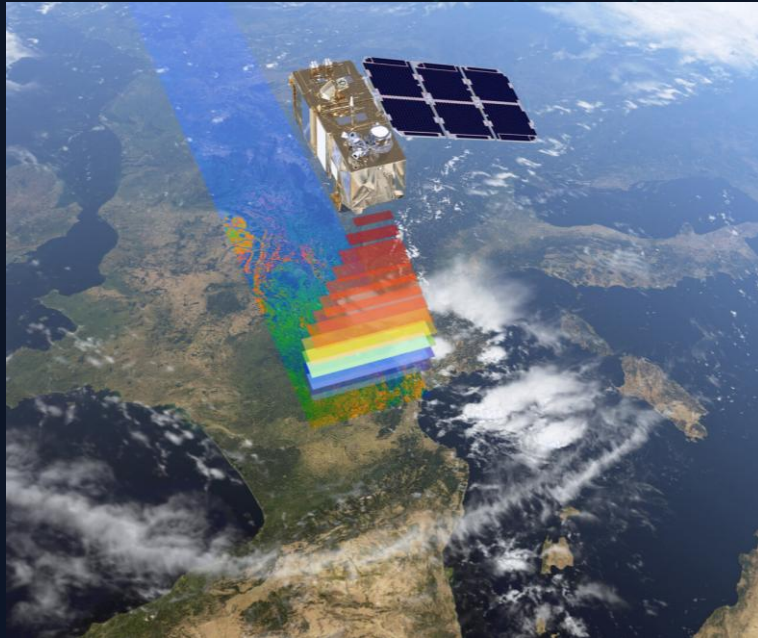


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La géo-intelligence au service de la résilience
Geo-intelligentie voor een veerkrachtige toekomst



From Satellites to Decisions: Belgium's Role



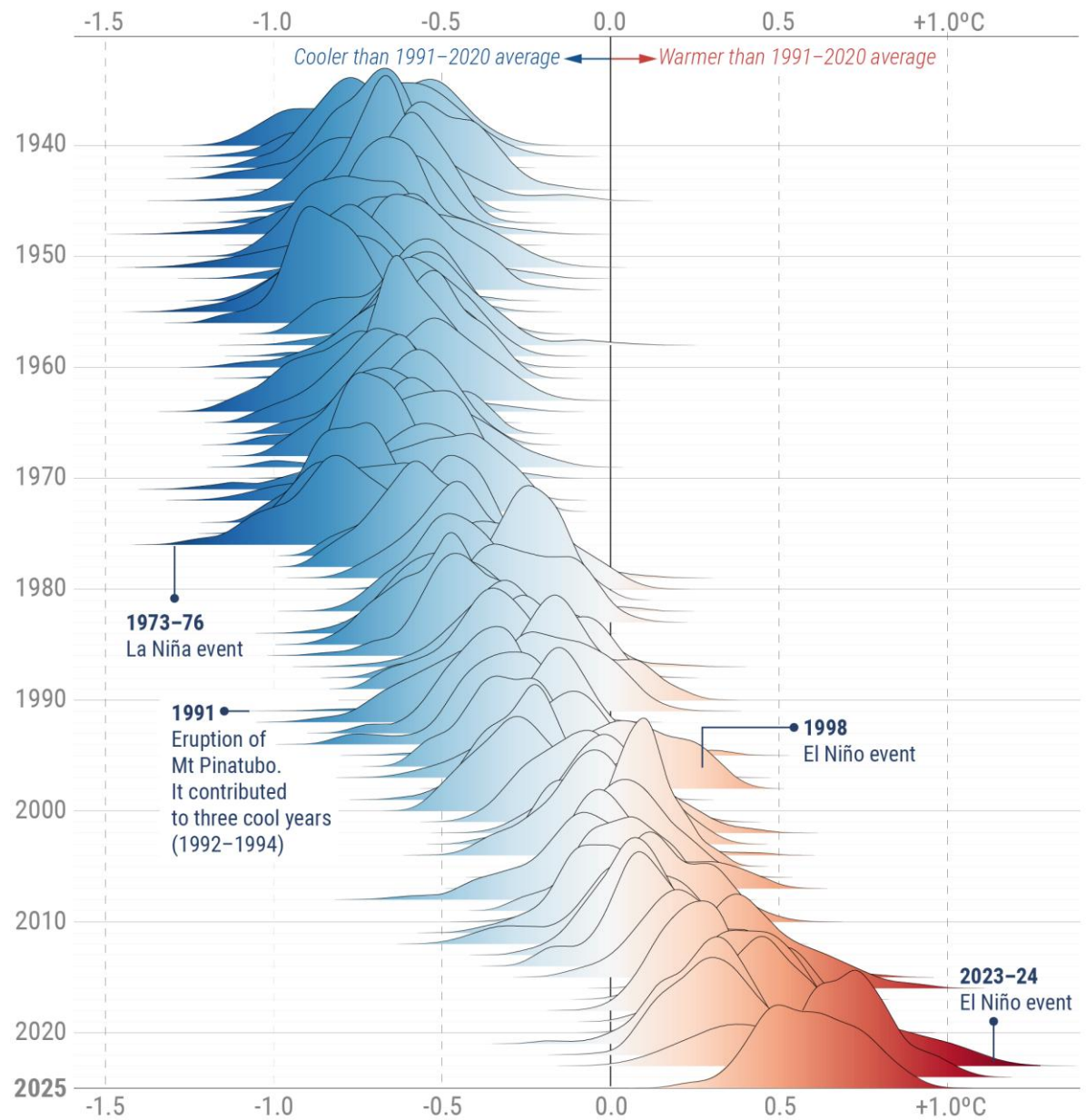
Jan Verbesselt
Belgian Delegate
at European Space Agency and
EU Copernicus Earth Observation program



vrú nws

2025 continues the shift towards higher global temperatures

Distribution of daily global surface air temperature anomalies (°C) from 1940 to 2025



*The height of each curve is proportional to the number of days experiencing a given temperature anomaly
Data: ERA5 • Reference period: 1991-2020 • Credit: C3S/ECMWF



PROGRAMME OF
THE EUROPEAN UNION



The Copernicus Climate Change Service (C3S) implemented by the **European Centre for Medium-Range Weather Forecasts (ECMWF)**

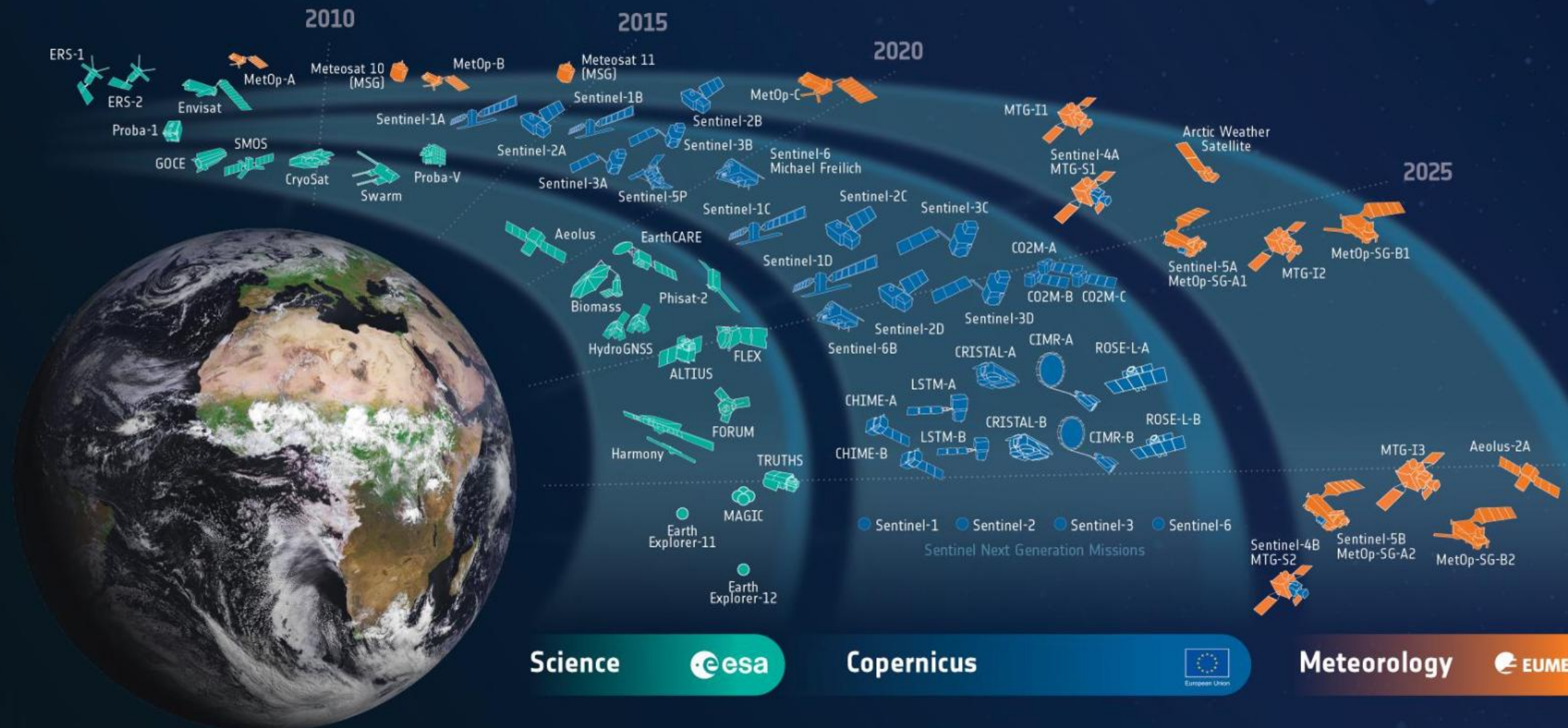




- Europe's Earth observation program
- Sentinel Satellites
- Free and open data

Copernicus

- ESA: European Space Agency
- EUMETSAT: EU organisation Exploitation of Meteorological Satellites



Operational services



CLIMATE CHANGE



MARINE MONITORING



ATMOSPHERE MONITORING



LAND MONITORING

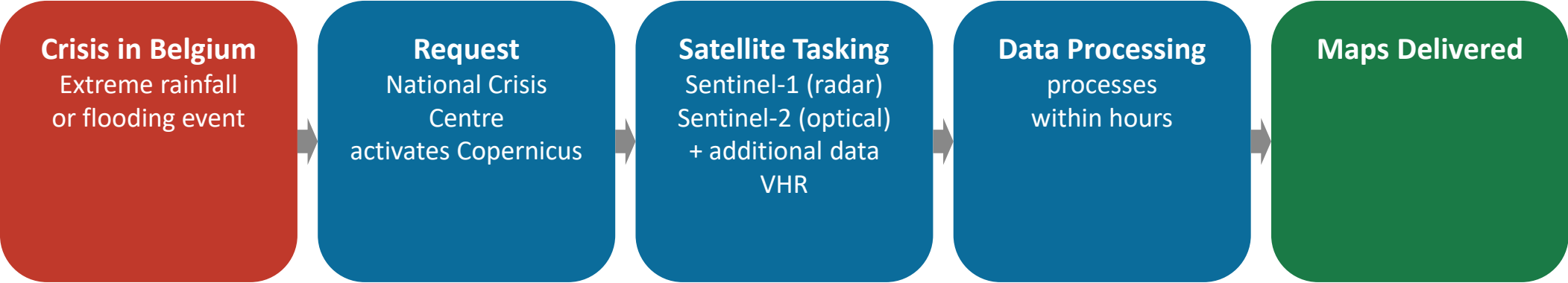


SECURITY



EMERGENCY MANAGEMENT

How Copernicus Emergency Mapping Works



First crisis map delivered in <24 hours



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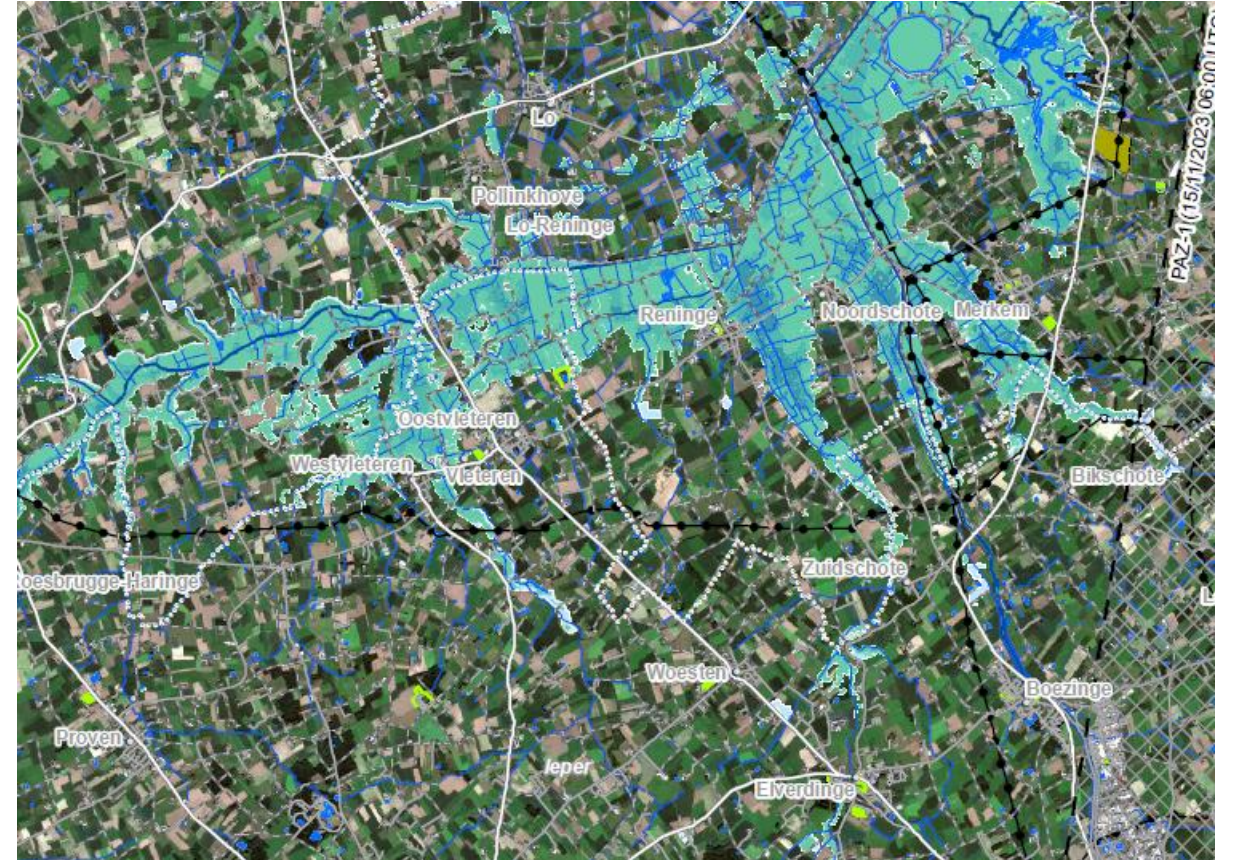
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Belgian Case Study: West Flanders Floods (EMSR708)

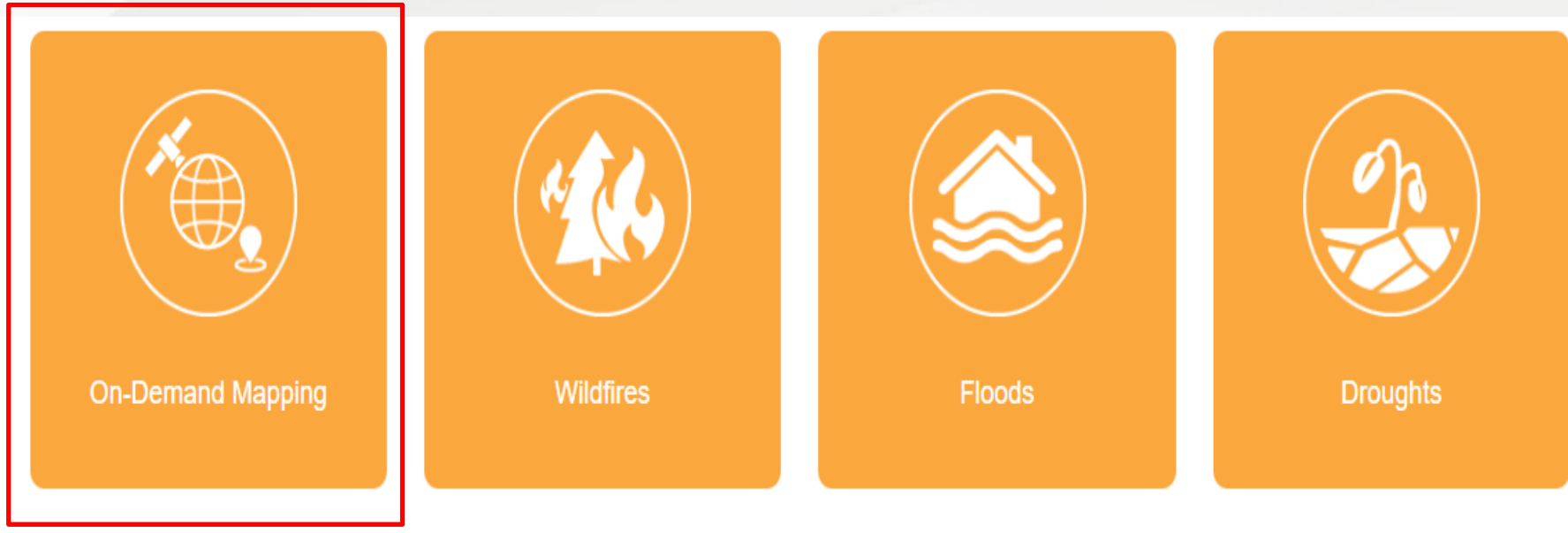
Activation EMSR708 — November 2023

- Activation date: 10 November 2023
- Authorized user: Crisis Centre Belgium (NCCN)
- Use: delineation and monitoring of flood extent for emergency response
- Area flooded: ~4,332 hectares
- Potentially affected population ~2000

Real. Not hypothetical. NCCN used these maps.



Copernicus Emergency Management Services:



- **On-Demand Mapping**
 - Provides satellite-based maps within hours after a disaster

Copernicus Emergency Management Service



On-Demand Mapping



Wildfires



Floods



Droughts

- **On-Demand Mapping**
 - Provides satellite-based maps within hours after a disaster
- **Early Warning & Monitoring Systems**

Belgium: A Key Player in the European Space Ecosystem

European EO ecosystem

- **Copernicus:** Belgium delegates shape EU EO policy and service development
- **ESA:** BELSPO represents Belgium; E.g. Belgian companies in Sentinel build chain
- **EUMETSAT, ECMWF:** consistent Belgian participation across all EU space agencies

National EO ecosystem

- **STEREO:** national EO research programme building world-class expertise
- **Terrascope:** national open EO data platform, free access to Copernicus data + AI tools

The Invisible Foundation: Accurate Positioning



DISCOVER GENESIS

MEASURING EARTH DOWN TO THE MILLIMETRE

GENESIS will contribute to enhancing the accuracy of the International Terrestrial Reference Frame (ITRF), establishing a coordinate system for mapping Earth with an accuracy of 1 mm and a long-term stability of 0.1 mm/year. Beyond navigation, countless fields will benefit from a more accurate ITRF.



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What's Next: Digital Twins & AI

- **Destination Earth (DestinE) — EU Digital Twin of the Earth**
- Extreme Weather Digital Twin: real-time simulation of climate extremes
- Coupling Copernicus observations with DestinE predictions for earlier warnings

- **Copernicus 3.0 — The AI Revolution**
- Agentic AI
- Belgian platforms (Terrascope) and companies building next-gen services

A graphic titled 'DESTINATION EARTH' featuring a glowing blue digital globe with a network of lines and nodes. Below the globe is a circular interface with five segments labeled 'MONITOR', 'UNDERSTAND', 'SIMULATE', and 'ANTICIPATE'. The ESA logo is in the top right corner. The text describes the goal of creating a digital replica of Earth to monitor and anticipate climate-related challenges.

DESTINATION EARTH

A DIGITAL REPLICA OF OUR PLANET

Destination Earth (DestinE) aims to develop a highly accurate digital model of Earth to monitor the effects of natural and human activity on our planet, anticipate extreme events and adapt policies to climate-related challenges.

MONITOR UNDERSTAND SIMULATE ANTICIPATE

Logos: European Union, ECMWF, ESA, EUMETSAT



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Thank You

- Extreme weather is intensifying — faster, better information is critical
- Copernicus turns satellite data into operational crisis maps — free and open
- Belgium plays a key role: from building satellites to operating data platforms
- Investments in space science secures Belgium's seat at the table
- AI + DestinE: towards predictive crisis management

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- **Useful resources**

- <https://terrascope.be/en> — Belgian open EO platform
- <https://destination-earth.eu/event/5th-destine-user-exchange/>