Panel: From innovation to market: Integrating public and private initiatives into action

Moderator: Maria Martin de Almagro, DG ECHO.B3

16:00 – 17:30

- *DG GROW.H2 - Machinery, Equipment & AI*, Cesare Dunker, Policy Officer
- *UN Global Initiative on Resilience to Natural Hazards through AI Solutions*, Elena Xoplaki, Vice Chair
- *TEMA (Horizon Europe project)*, Alessandro Paciaroni, Public sector innovation expert
- *ICEYE*, Jussi Sainio, Senior Product Manager, Natural Catastrophe Solutions
- *OroraTech*, Julia Gottfriedsen, Head of Data Science & AI

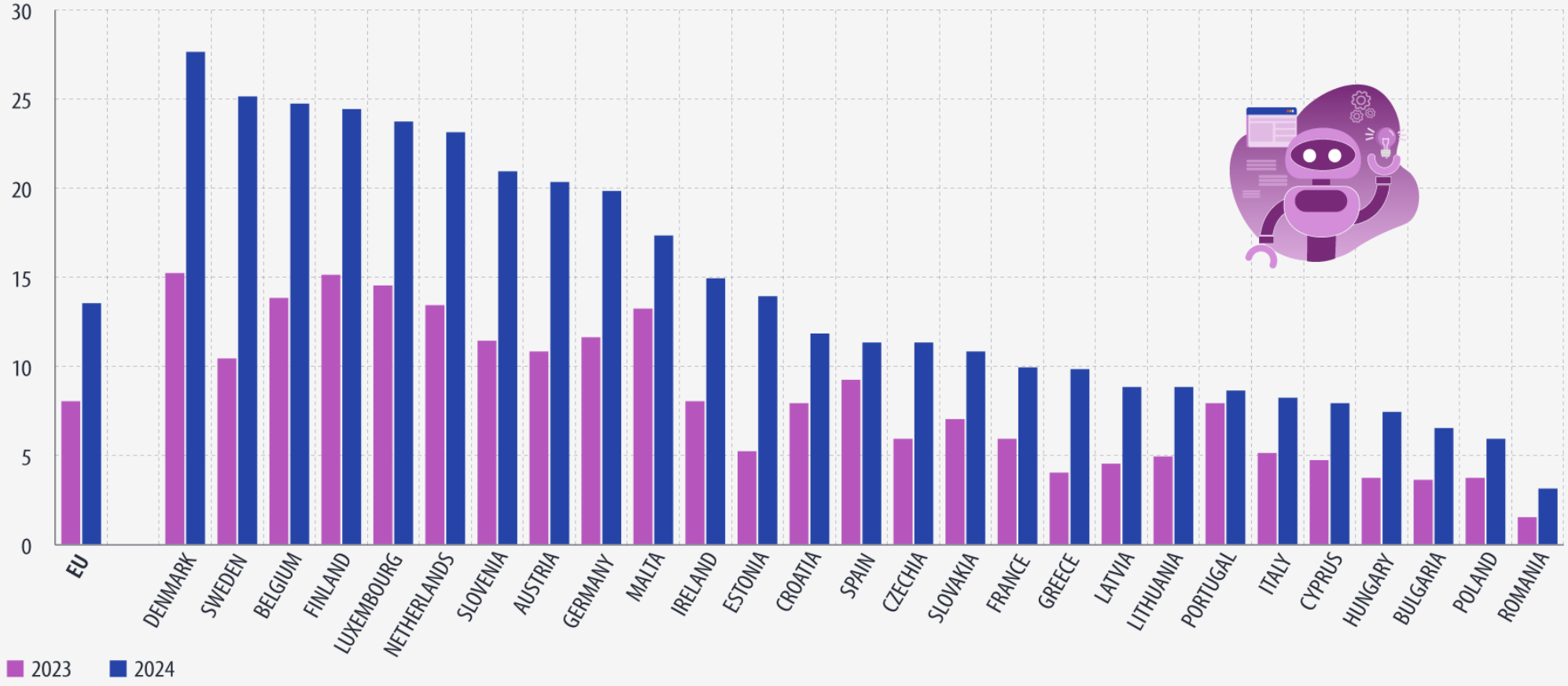
Industrial AI:
Enabling a competitive EU

Cesare Dunker, Policy Officer
Machinery, Equipment & AI – DG GROW

EU firms are increasingly utilising industrial AI solutions

Enterprises using AI technologies, EU, 2023 and 2024

(% of enterprises)



France and Sweden: break in time series in 2023.

Industrial AI is expected to unlock economic value in the EU and globally

AI is expected to contribute 2 trillion, or 7%, to EU GDP over a ten-year period, through capital and labour productivity (ECFIN 2024). The EU, US and China are the world's main advanced manufacturing hubs (GROW, JRC 2024).

- In the EU, 14% of firms are using AI solutions, with notable use cases in manufacturing-oriented ecosystems such as energy, construction, mobility, aerospace, agrifood and health.

- In China, 83% of respondents to an industry survey used AI in their operations (Reuters 2024). China has launched the AI Plus initiative to scale industrial AI.

- In the US, 93% of manufacturing firms have started new AI projects in 2024.

Sources: Artificial Intelligence: Economic Impact (ECFIN 2024), EU Advanced Manufacturing Industry (GROW, JRC 2024),

Industrial AI applications have significant EU competitiveness potential

Industrial AI is currently being deployed in key sectors.

Manufacturing

- Predictive maintenance
- Process optimisation

3D Printing/Additive Manufacturing

- Design optimisation
- Real-time defect detection in 3D printed output

Industrial Robotics

- Adaptive industrial robotics with GenAI
- AI-powered human-machine collaboration

Barriers for industrial AI uptake in the EU

What is holding the EU back in terms of deploying AI solutions in business models?

Industrial Data

- Low data generation
- Interoperability issues
- SME digital lag

AI Skills

- Skills gap
- AI deployment remains technical

Access to AI Infra

- Limited compute access
- High upfront costs
- Uncertain ROI

Thank You

International standards for responsible AI in disaster management

Elena Xoplaki

elena.xoplaki@geogr.uni-giessen.de, elena.xoplaki@cmcc.it

18 June 2025

Extreme events in a changing climate – How can we enhance resilience?

Floods and landslides
2021, 2024, 2025

Preparedness!

Rhine River (Bonn), August 2022
Copyright: Andreas Rentz (Getty Images)

CC0 1.0 Universal: rawpixel.com / U.S. Department of Agriculture (Source)

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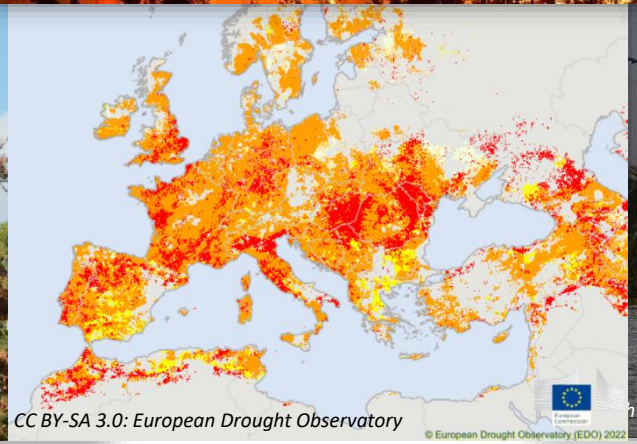
CC BY-SA 3.0: European Drought Observatory

Copyright: Christopher Pike / Bloomberg via Getty Images

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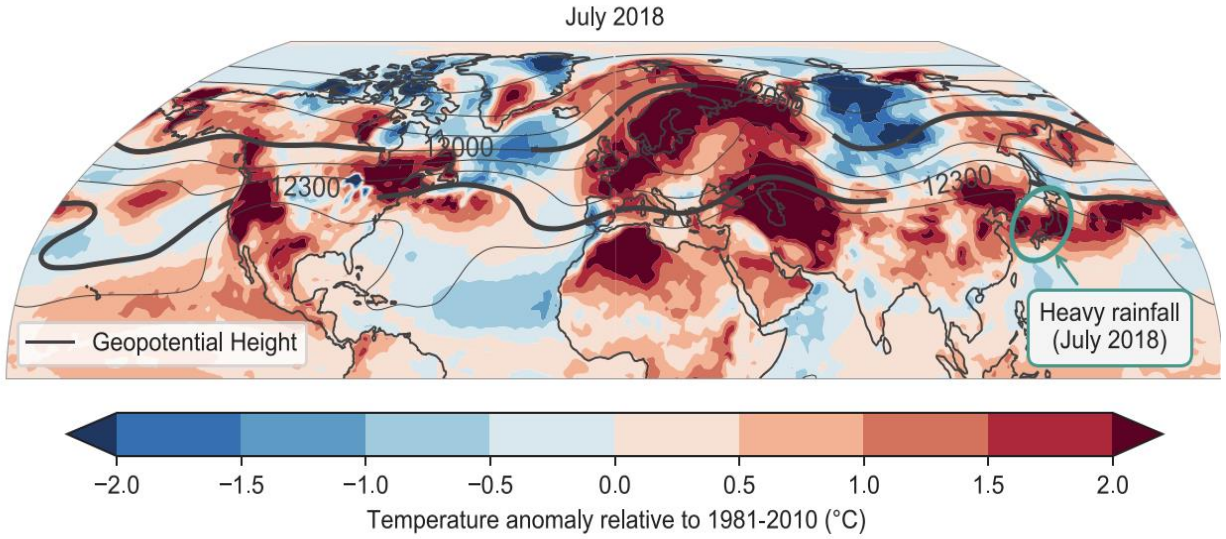
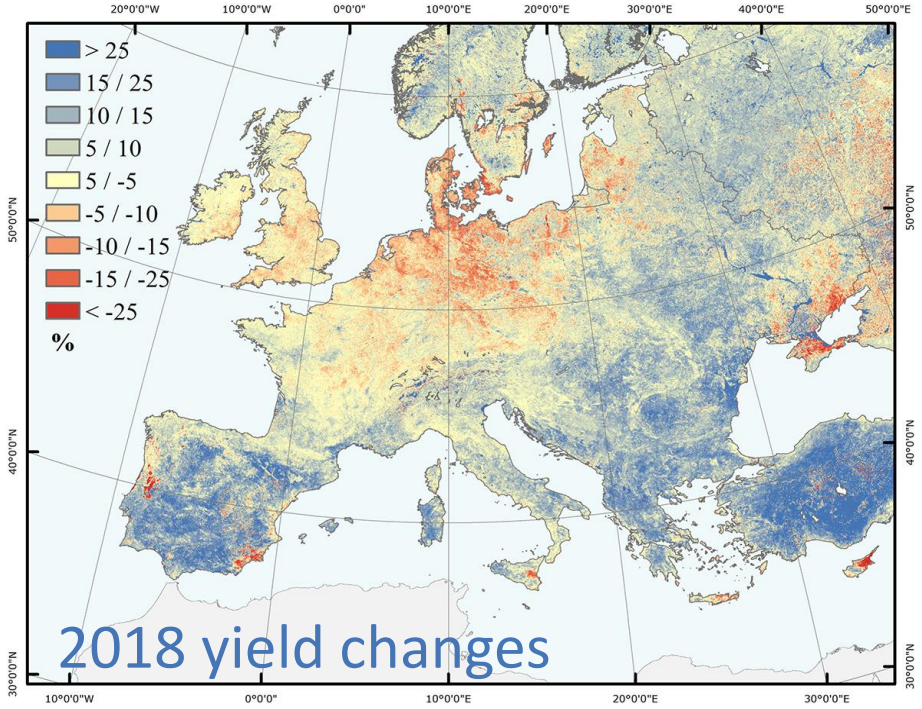
Detection of extremes

Compound events, Concurrent extremes
The exceptional year 2018

Combination of multiple drivers and/or hazards that contribute to **societal / environmental risk**

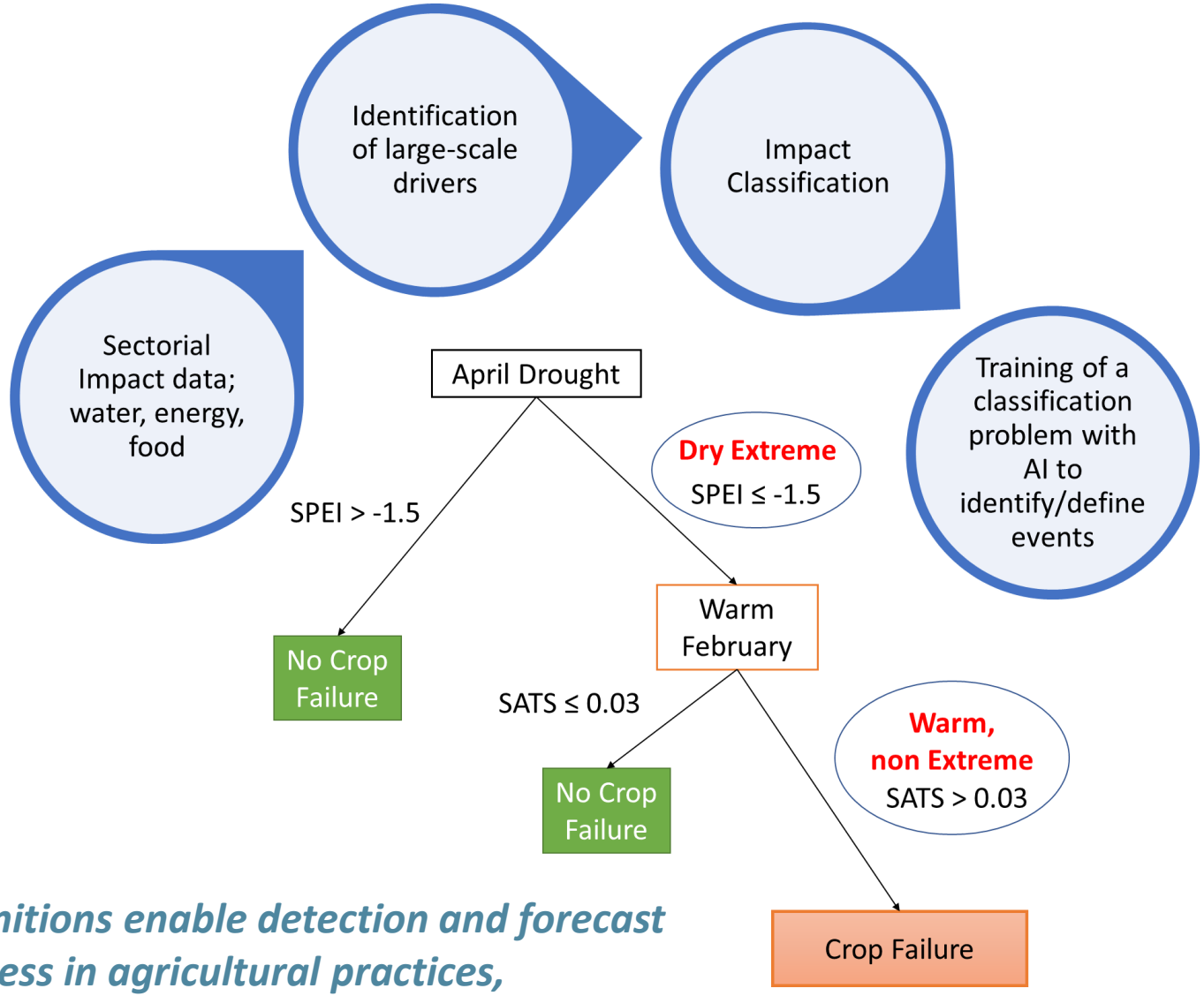


IPCC 2021



Toreti et al. 2019

Compound events and impacts – the not extreme events



Updated threshold definitions enable detection and forecast AI-enhanced preparedness in agricultural practices, competition between sectors, multi-sectoral impacts

MedEWSa

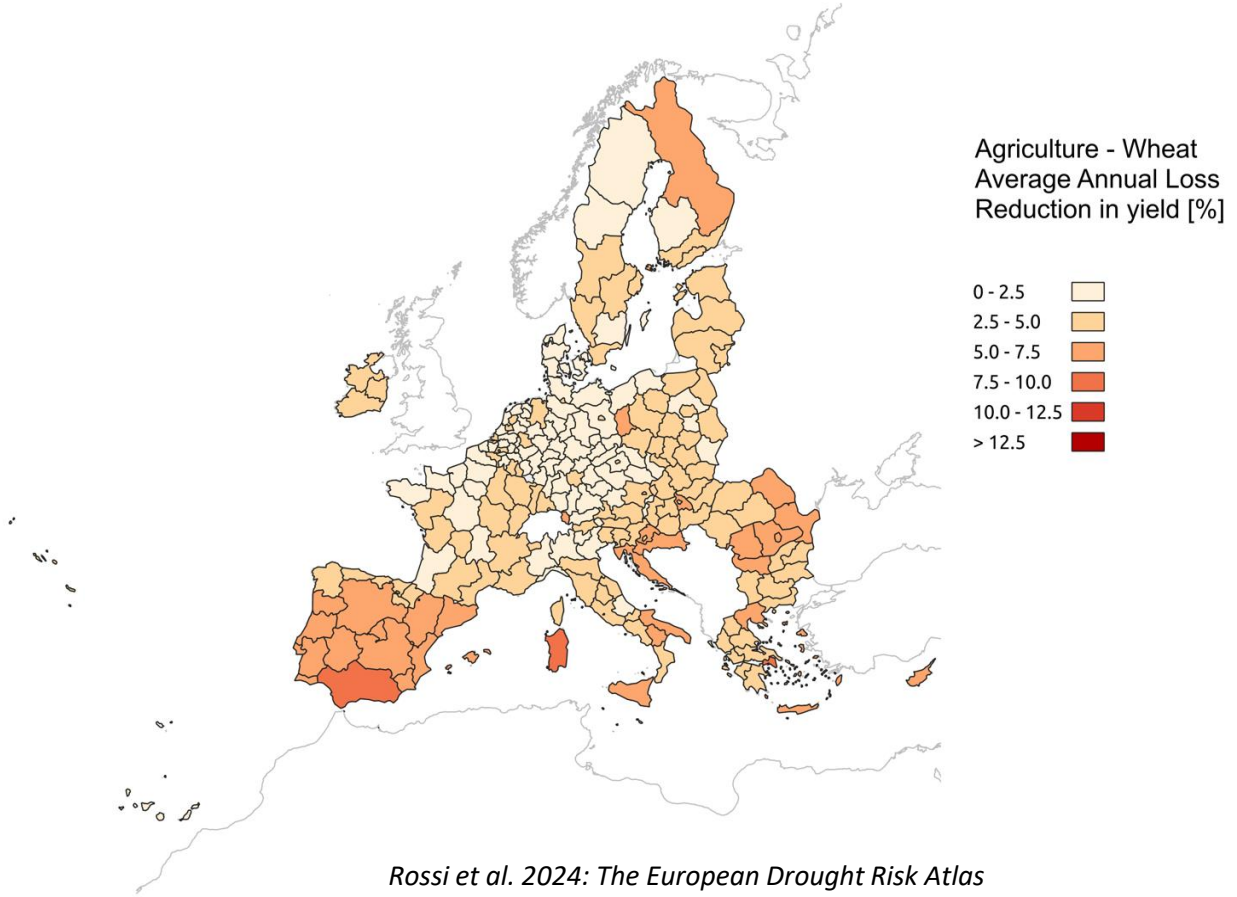
Luther et al. in prep.

CLINT CLIMATE INTELLIGENCE

From hazard to impact-based forecasting

- Impact-based forecasting integrates hazard, exposure, and vulnerability data.
- Machine learning enhances spatial and temporal impact prediction.
- Operational systems require systematic sectoral data integration and thus systematic data collection

Average annual production loss [%] due to drought



Rossi et al. 2024: The European Drought Risk Atlas

Digital technologies for drought management

- AI enhances multi-source data integration and pattern detection
- Digital Twins simulate drought scenarios for proactive decision support
- UAVs enable high-resolution, real-time drought impact assessments
- Integration with operational systems is critical for effective risk management

M. Menon 2024

nature

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COMMENT | 01 October 2024

AI to the rescue: how to enhance disaster early warnings with tech tools

Artificial intelligence can help to reduce the impacts of natural hazards, but robust international standards are needed to ensure best practice.

By Monique M. Kuglitsch, Jon Cox, Jürg Luterbacher, Bilel Jamoussi, Elena Xoplaki, Muralee Thummarukudy, Golestan Sally Radwan, Soichiro Yasukawa, Shanna N. McClain, Rustem Arif Albayrak, David Oehmen & Thomas Ward

nature COMMUNICATIONS

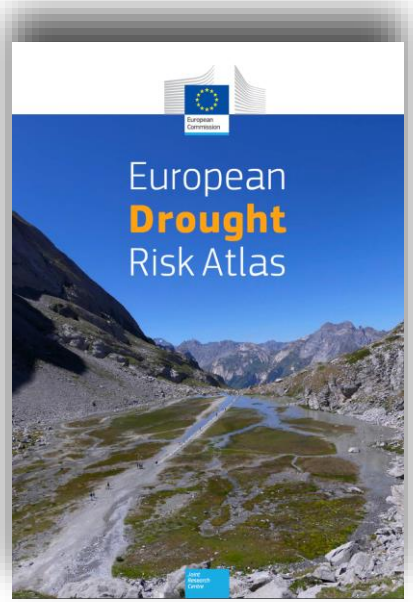
COMMENT

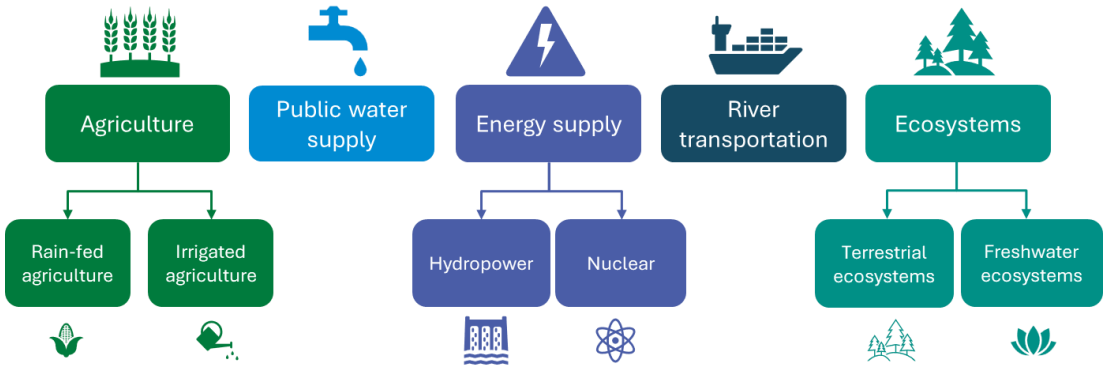
https://doi.org/10.1038/s41467-022-29285-6 OPEN

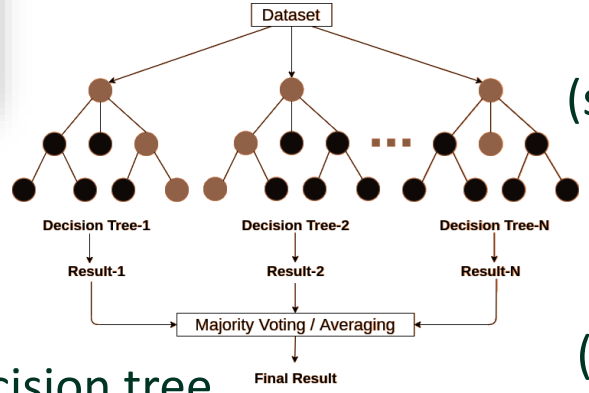
Facilitating adoption of AI in natural disaster management through collaboration

Monique M. Kuglitsch[1✉], Ivanka Pelivan[1], Serena Ceola[2], Mythili Menon[3] & Elena Xoplaki[4]

Pan-European, Mediterranean, North Africa







Hazard
(standardised indices)

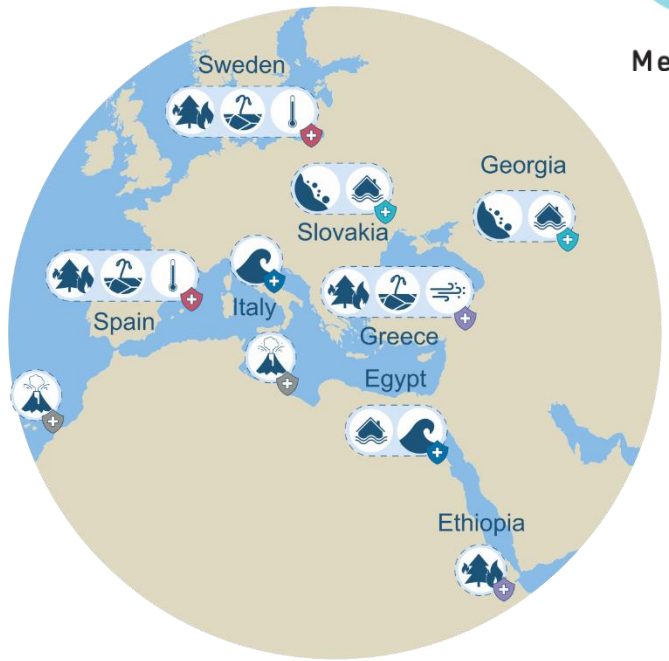
Impacts
(e.g. production loss,
mainly from Eurostat)

- Fast and frugal decision tree
- Non-compensatory, nonlinear
- “Predicting” multiple binary impact classes

Rossi et al. 2024: The European Drought Risk Atlas

The MedEWSa project

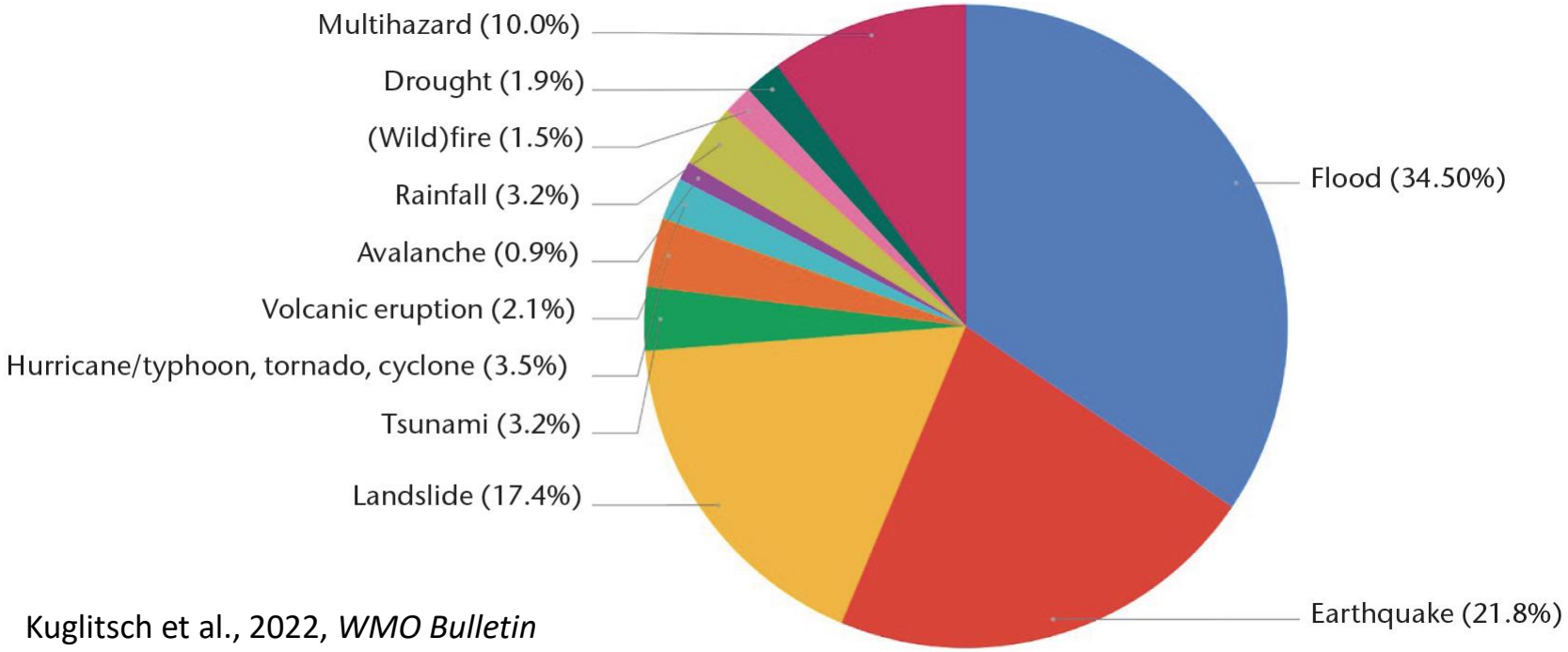
MedEWSa



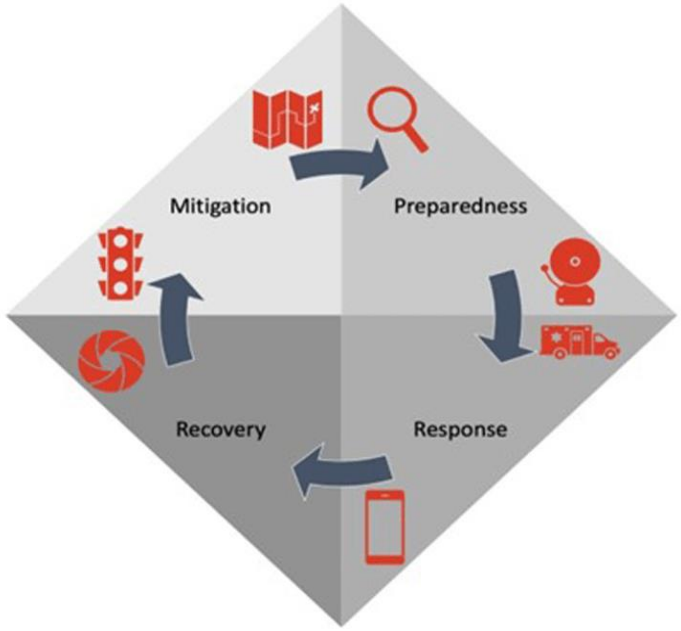
https://www.medewsa.eu/

AI to support natural hazards management

AI for Natural Disaster Management
ITU Focus Group



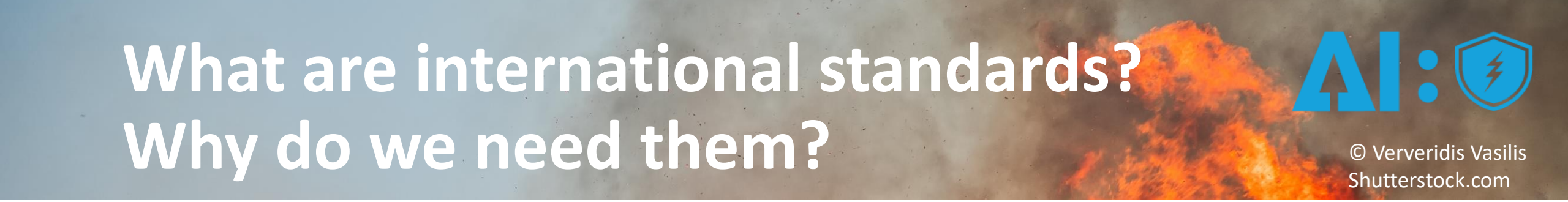
Kuglitsch et al., 2022, *WMO Bulletin*



Kuglitsch et al., 2024, *Eos*

"AI can contribute at each phase of disaster management, from mitigation (e.g., optimizing the location of traffic sensors and providing susceptibility maps), to preparedness (e.g., forecasting or monitoring conditions and triggering alerts), to response (e.g., providing situational awareness and decision support), and into recovery (e.g., damage assessment)."

What are international standards? Why do we need them?



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Guidelines & best practices on how to use **technology**.

Produced by an **international SDO**.

Mandatory by **adoption** into national laws.

nature

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COMMENT | 01 October 2024

AI to the rescue: how to enhance disaster early warnings with tech tools

Artificial intelligence can help to reduce the impacts of natural hazards, but robust international standards are needed to ensure best practice.

"AI tools created in the absence of international standards could have a variety of problems, including (…) not being compatible or interoperable with each other. Because disasters can move across borders, this is a lost opportunity for continuous early-warning coverage."

(Kuglitsch et al., 2024, *Nature*)

Where are international standards? Where are the gaps?

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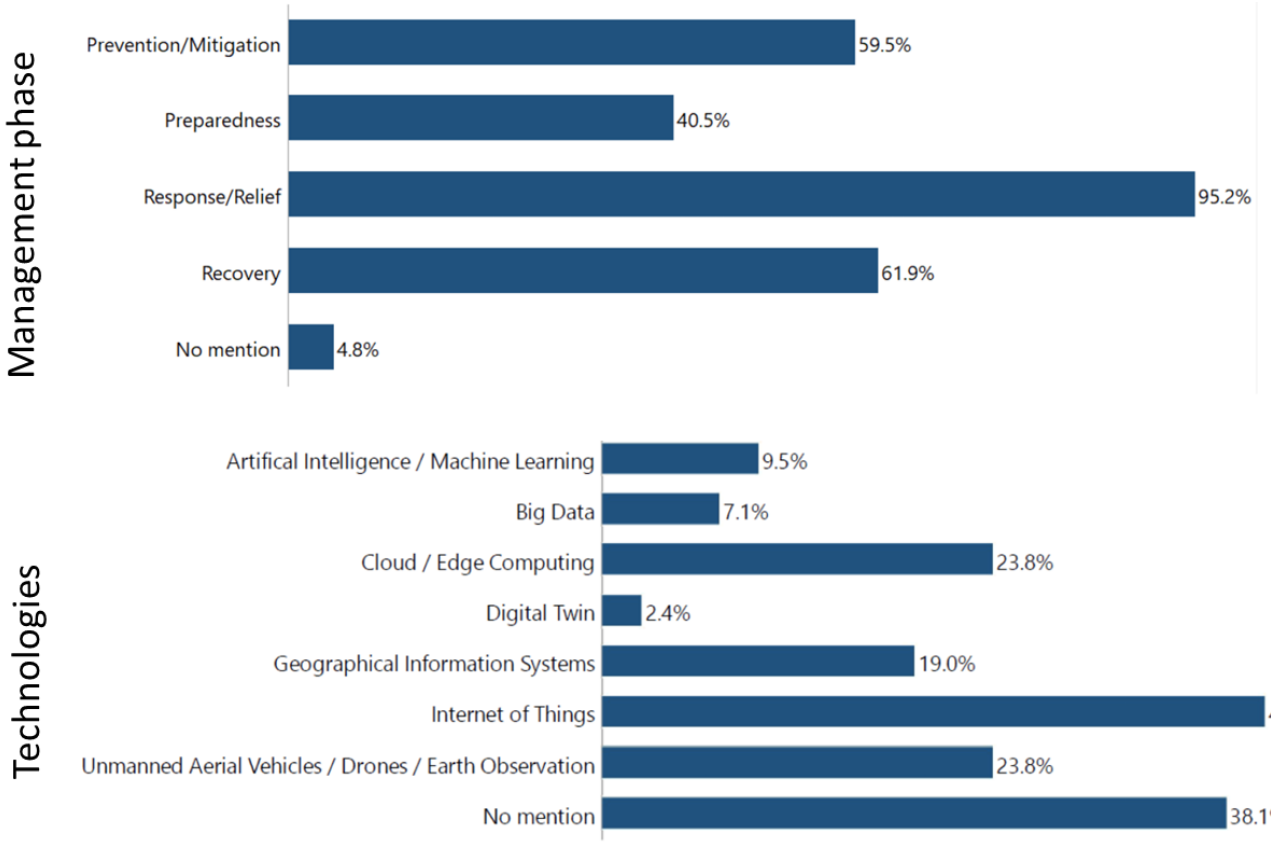
- Persistent data governance, accessibility, and privacy issues.
- Ethical concerns regarding AI transparency, accountability, and bias.
- Lack of interoperability limits multi-sectoral integration.
- Digital divides restrict access to early warning technologies.
- Absence of global technical standards hinders scalability and reliability.

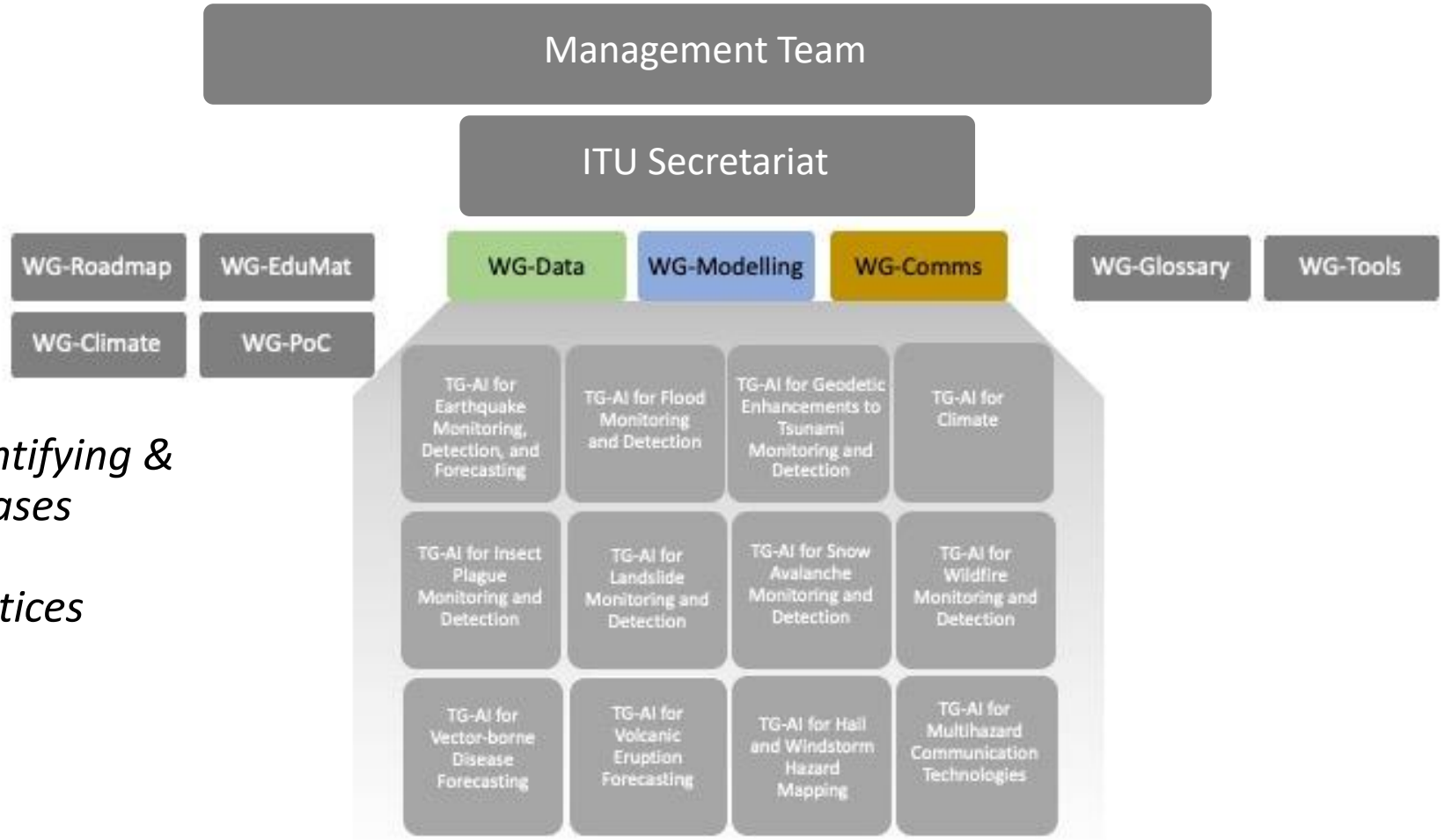
Gaps in Standardization – Disaster Management Focus Group AI for Natural Disaster Management



Filling the gaps

1. Systematically identifying & deconstructing use cases

2. Distilling best practices



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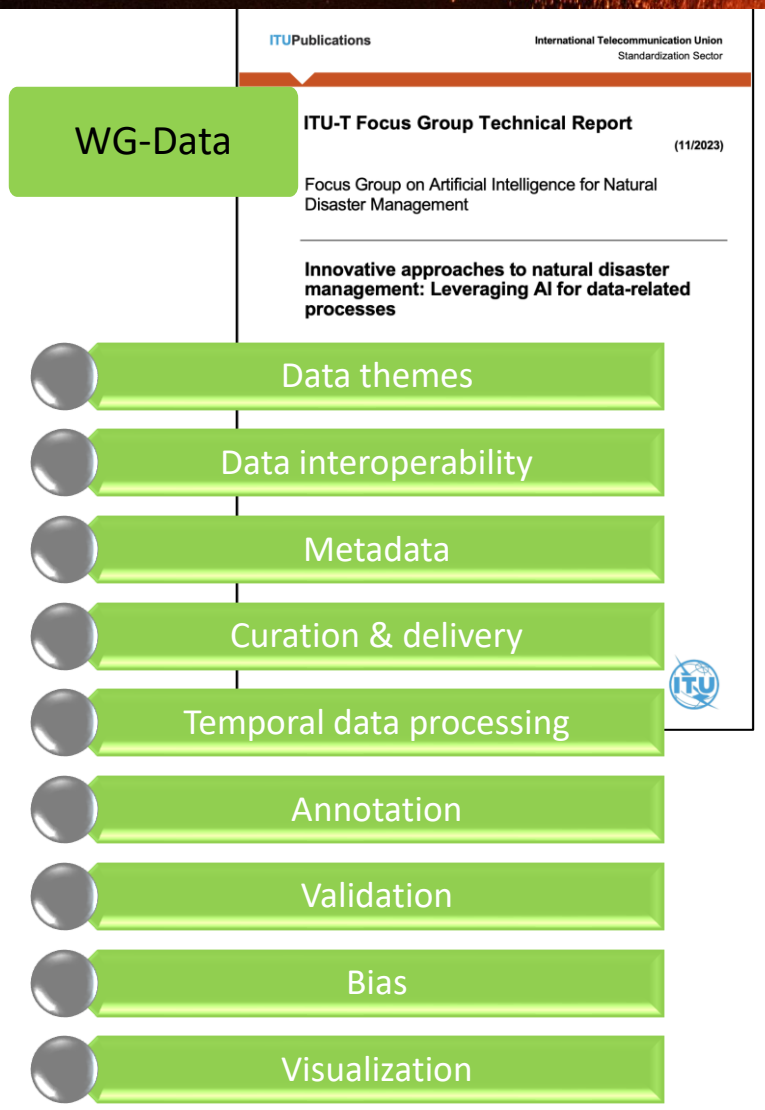
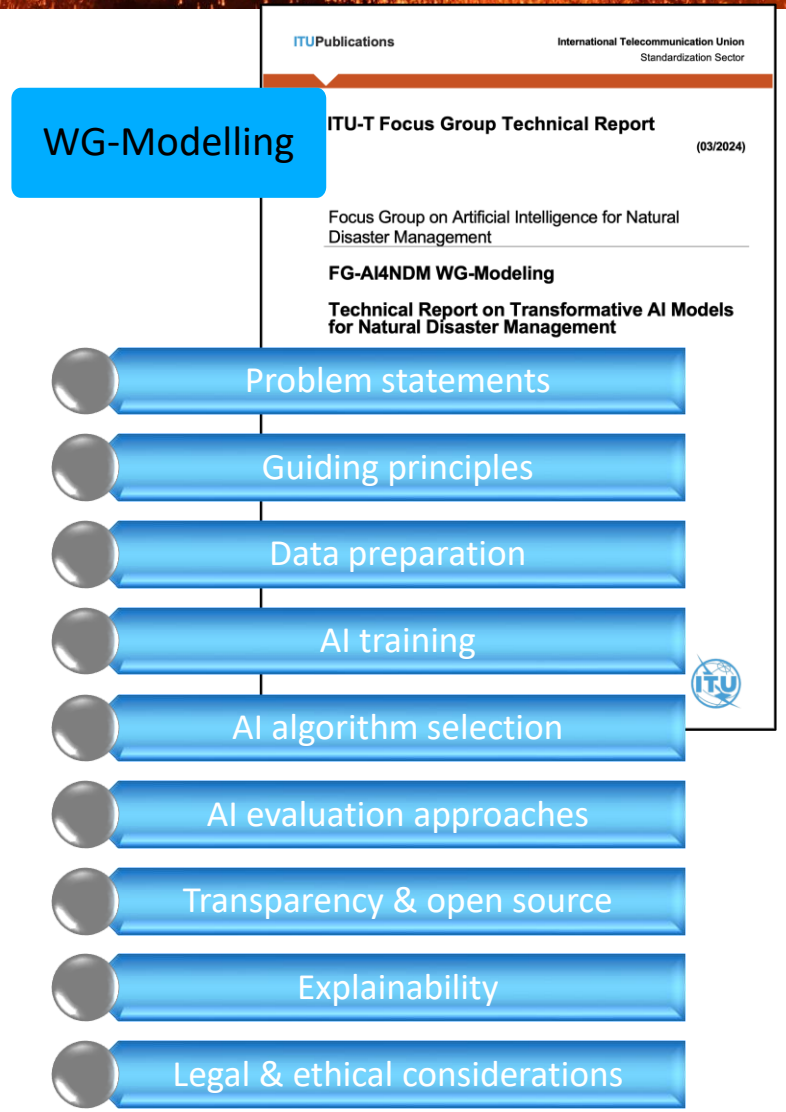
Outcomes



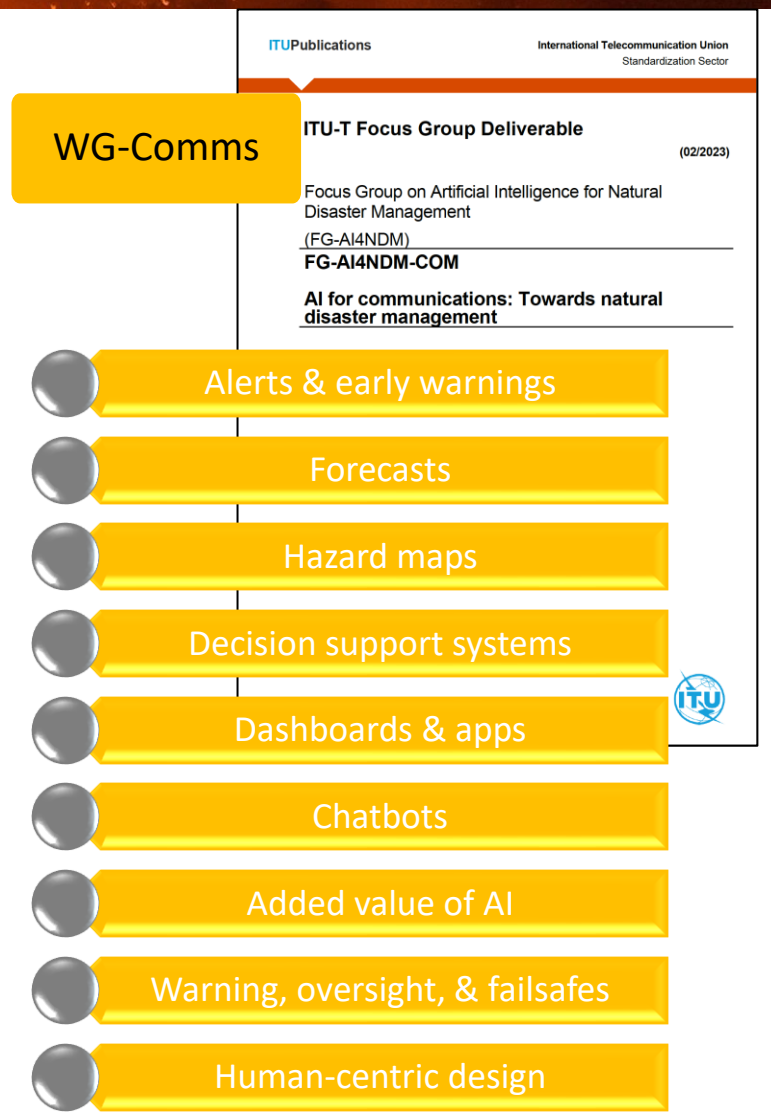
WG-Data

- Data themes
- Data interoperability
- Metadata
- Curation & delivery
- Temporal data processing
- Annotation
- Validation
- Bias
- Visualization



WG-Modelling

- Problem statements
- Guiding principles
- Data preparation
- AI training
- AI algorithm selection
- AI evaluation approaches
- Transparency & open source
- Explainability
- Legal & ethical considerations



WG-Comms

- Alerts & early warnings
- Forecasts
- Hazard maps
- Decision support systems
- Dashboards & apps
- Chatbots
- Added value of AI
- Warning, oversight, & failsafes
- Human-centric design

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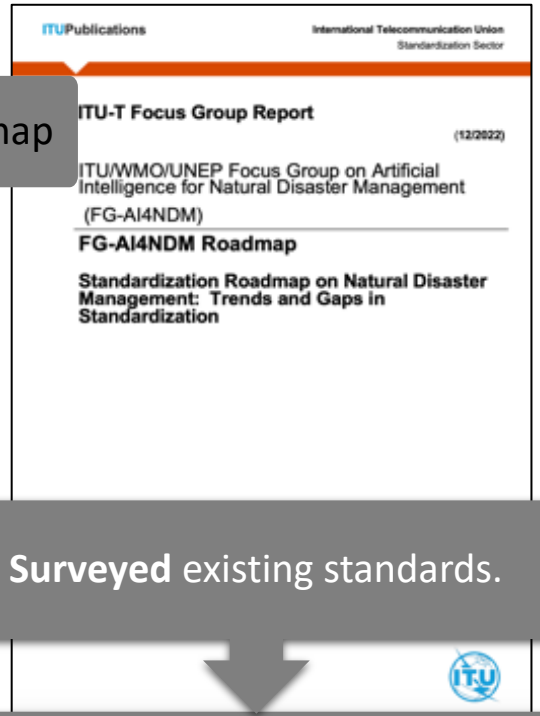
Outcomes

WG-Roadmap


ITUPublications
International Telecommunication Union
Standardization Sector

ITU-T Focus Group Report
(12/2022)

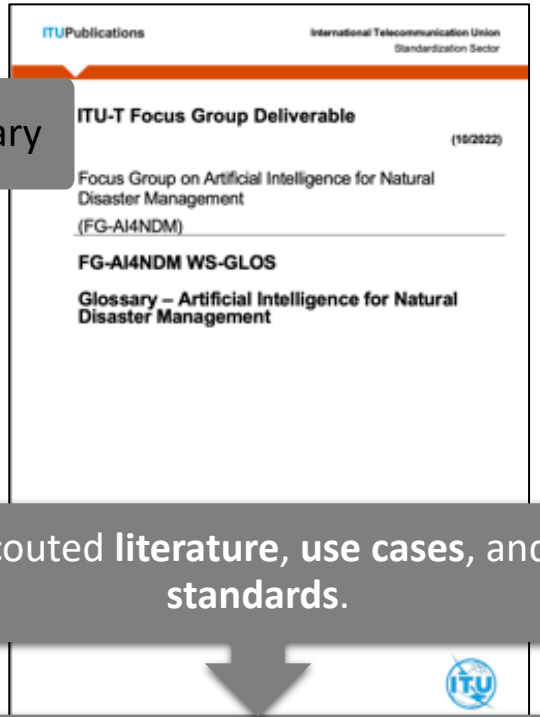
ITU/WMO/UNEP Focus Group on Artificial Intelligence for Natural Disaster Management
(FG-AI4NDM)

FG-AI4NDM Roadmap

Standardization Roadmap on Natural Disaster Management: Trends and Gaps in Standardization

- **Surveyed** existing standards.
- **Liaised** with SDOs.
- Made **gap analysis**.

WG-Glossary


ITUPublications
International Telecommunication Union
Standardization Sector

ITU-T Focus Group Deliverable
(10/2022)

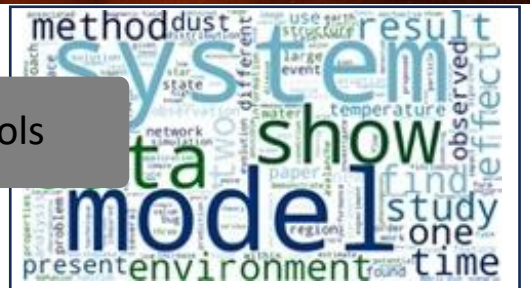
Focus Group on Artificial Intelligence for Natural Disaster Management
(FG-AI4NDM)

FG-AI4NDM WS-GLOS

Glossary – Artificial Intelligence for Natural Disaster Management

- Scouted **literature**, **use cases**, and **standards**.
- Identified **524 terms of relevance**.
- Compiled **definitions** for different users.

WG-Tools



- Trained **LLM** on 2.3 M ArXiv papers.
- Applied to understand **AI trends** in geosciences.

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Outcomes

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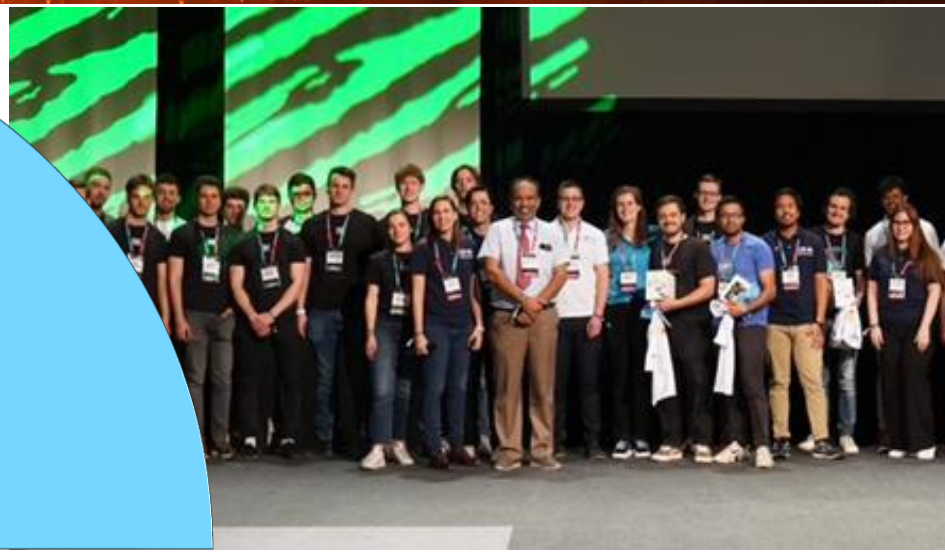
WG-EduMat

- *WMO Bulletin*
- *Nature Communications*
- *Environmental Research Letters*
- *Nature Scientific Reports*
- *Eos*
- *Nature*

publications

hacks & challenges

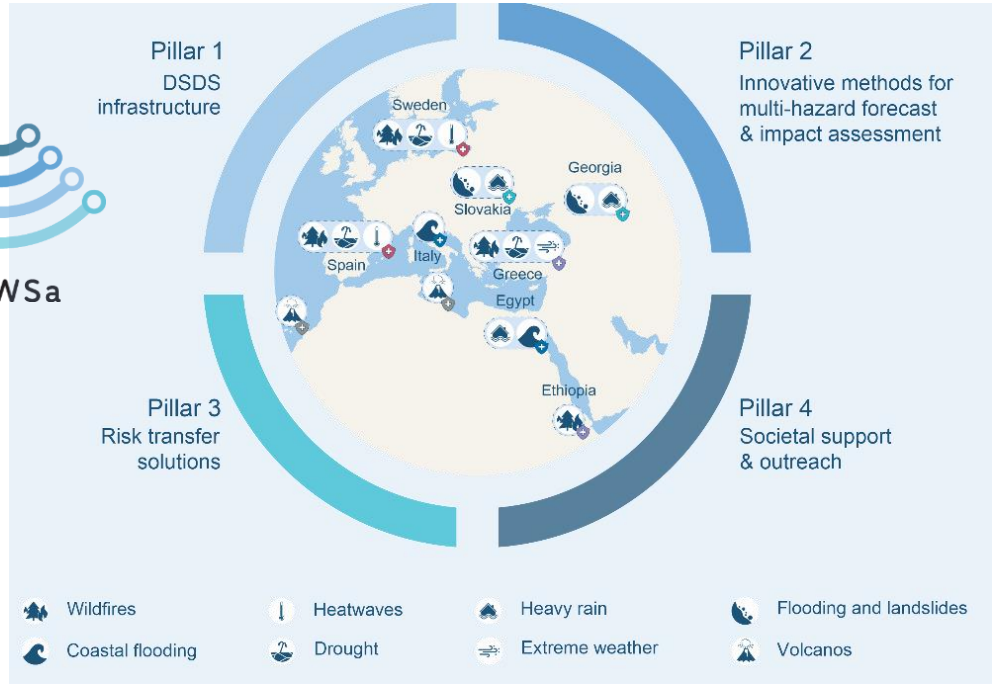


workshops & webinars

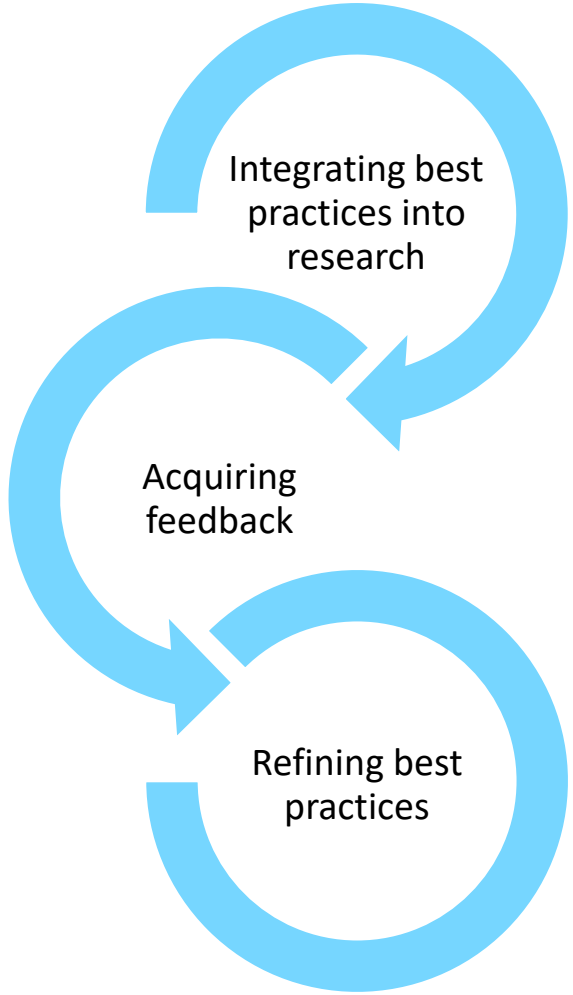
hands-on training sessions

Proof of concepts

WG-PoC

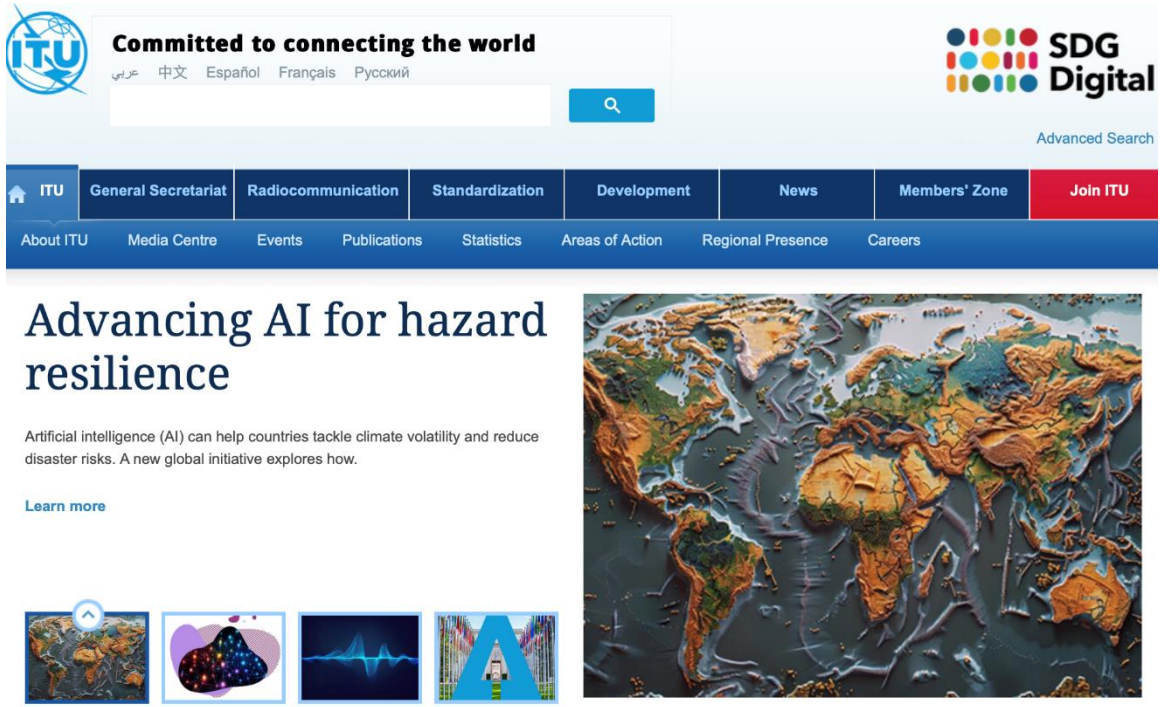


- MedEWSa (coordinated by JLU)
- Retriever (coordinated by Meta & Qualcomm)
- AINPP (coordinated by CMA)
- ChatClimate (coordinated by WMO)
- Fusing Lidar and AI (coordinated by USGS)



Focus Group -> Global Initiative

*Transition of Focus Group into a Global Initiative announced by the ITU Secretary General during the **AI for Good Global Summit**, June 2024.*



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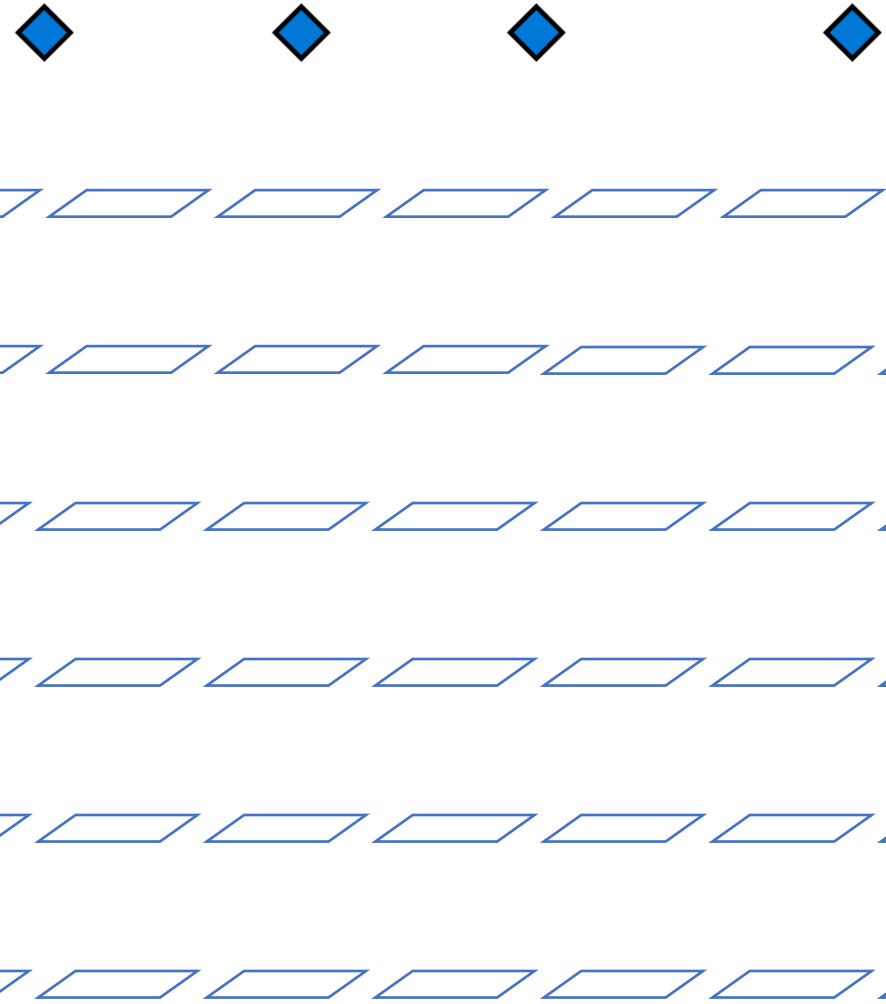
rtemis



TEMA

TRUSTED
EXTREMELY PRECISE
MAPPING AND PREDICTION
FOR EMERGENCY
MANAGEMENT

The Project at a Glance

PROJECT NAME:

TEMA
Trusted Extremely Precise Mapping and Prediction for Emergency Management

CALL:

HORIZON-CL4-2022-DATA-01-01
Methods for exploiting data and knowledge for extremely precise outcomes (analysis, prediction, decision support), reducing complexity and presenting insights in understandable way (RIA)

Project Consortium:

19 partners
from 8 European countries,
key players in the fields of data analysis, AI, modelling, drone technologies, simulation and visualization, analytics and cloud computing, as well as policy counselling
and emergency response authorities/public bodies.

Project Duration:

48 months.
Starting date: 1 December 2022

Budget:

€ 11.340.223,50

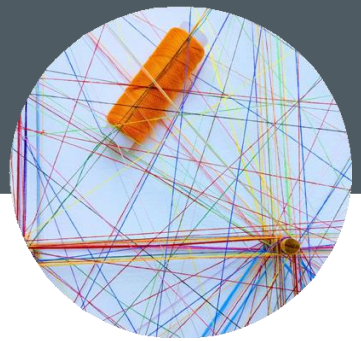
Needs / What brought us here

1 Trustworthy information:

access to heterogeneous, accurate, and reliable data is crucial to providing useful information to first responders and public protection and disaster relief

2 Transferability:

a solution provided with cloud and edge computing infrastructure can offer scalability, performance, storage, ubiquitous access and security enabling global transferability of services and products to other geographic regions and disaster types



3 Scenario prevision:

the use of cutting-edge technologies and data analysis can increase the quality, precision, and completeness of the situational picture, particularly in sub-urban and more densely populated areas, and elaborate response strategies

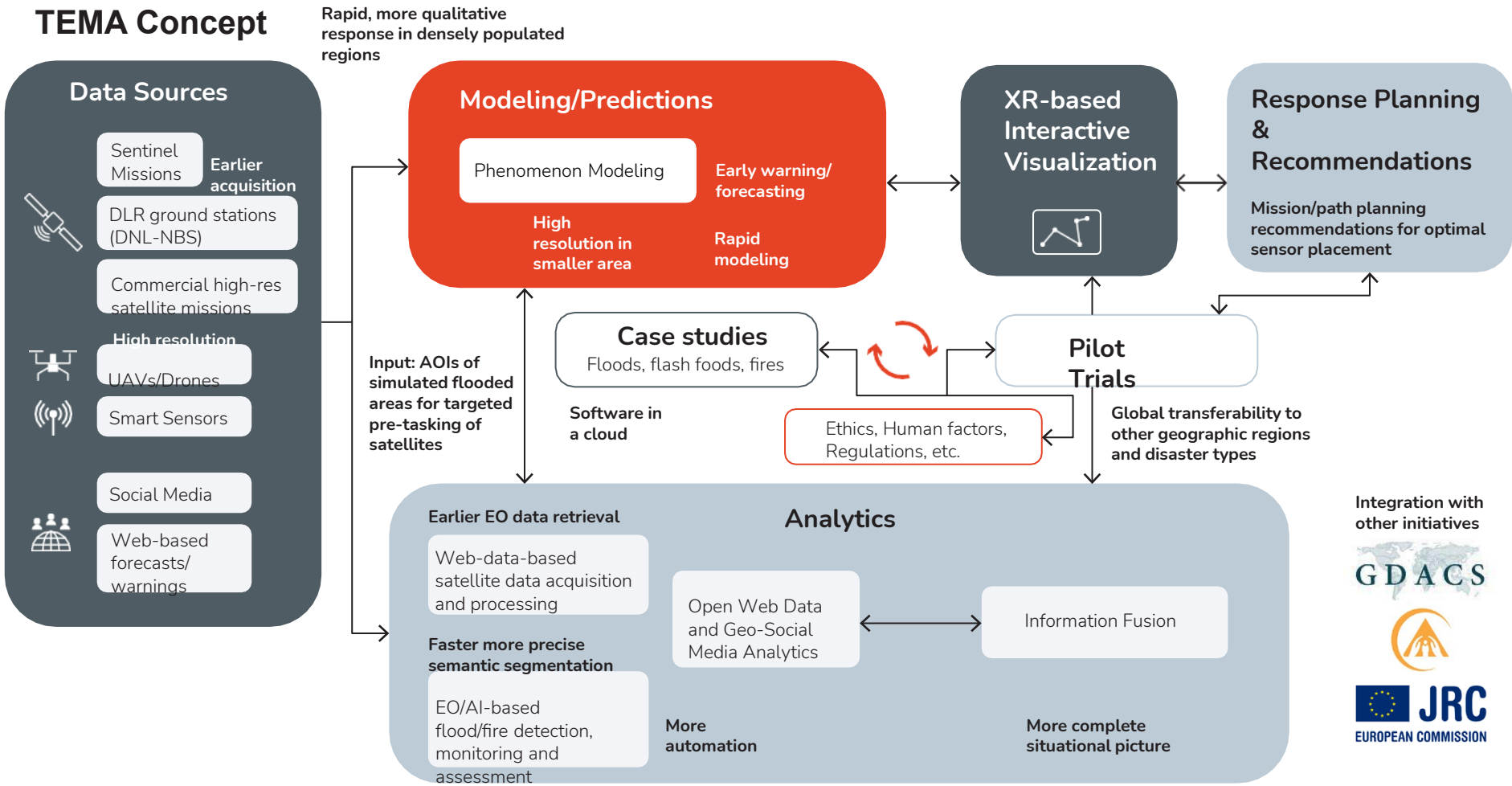
The Vision

TEMA aims to develop beyond-state-of-the-art technologies for facilitating **Natural Disaster Management**, by dynamically exploiting data sources and Artificial Intelligence technologies in order to provide an accurate assessment of an evolving crisis situation.

The **goal** is to deliver a technical solution that is supportive in disaster response and management by bringing situational data to relevant end-users, enabling transferability to tackle different disaster types in various geographic regions, thus providing the relevant information that can help make the best possible operative decisions.

TEMA

Concept



TEMA

Three Guiding Questions

1. What are the affordances of artificial intelligence in disaster management?

2. What capacity and capabilities are needed in the public sector to adopt and deploy AI?

3. What are the critical strategy and policy points for public-sector AI uptake?

Three Affordances

- Situational awareness
- Interoperability and security
- Sustainable computing

Capacities and Capabilites

Pillar	OECD strategic-procurement	AI Continent Action Plan	UK AI Playbook & AI-Native	Gap for DRM
Data governance	Solution co-design; open & reuse clauses	Data Union Strategy; sectoral datasets	Impact-assessment & monitoring	Trusted, real-time hazard data registries
People & skills	Innovation-procurement competence centres	AI Skills Academy (fellowships)	AI-native agencies with embedded talent	Internal talent pipeline & retention
Processes / procurement	Needs, inclusion, friction, alignment	AI Factories templates; pre-commercial routes	Ethical contracting; open-source options	Outcome-based tenders; vendor lock-in guards
Compute & infrastructure	–	Gigafactories; shared HPC	–	Access & budgeting for burst compute

Four Critical Strategy And Policy Points

Shared, trusted **compute** – Regional pools with public-private extensions.

Data and interoperability – Standing data-trusts and open adapters for hazard, mobility, energy data.

Agile **procurement** and open-model partnerships – Innovation-partnership route + AI Commons clauses.

Talent and community – AI Fellows, govtech labs, private secondments

Local governments prepare for adoption and can deploy AI within weeks without vendor lock-in nor overburden

How To Use AI in Emergency Management

The Consortium

ARISTOTLE UNIVERSITY OF THESSALONIKI

Atos

Bayerisches Rotes Kreuz

DLR Deutsches Zentrum für Luft- und Raumfahrt
German Aerospace Center

ENGINEERING
THE DIGITAL TRANSFORMATION COMPANY

Fraunhofer HHI

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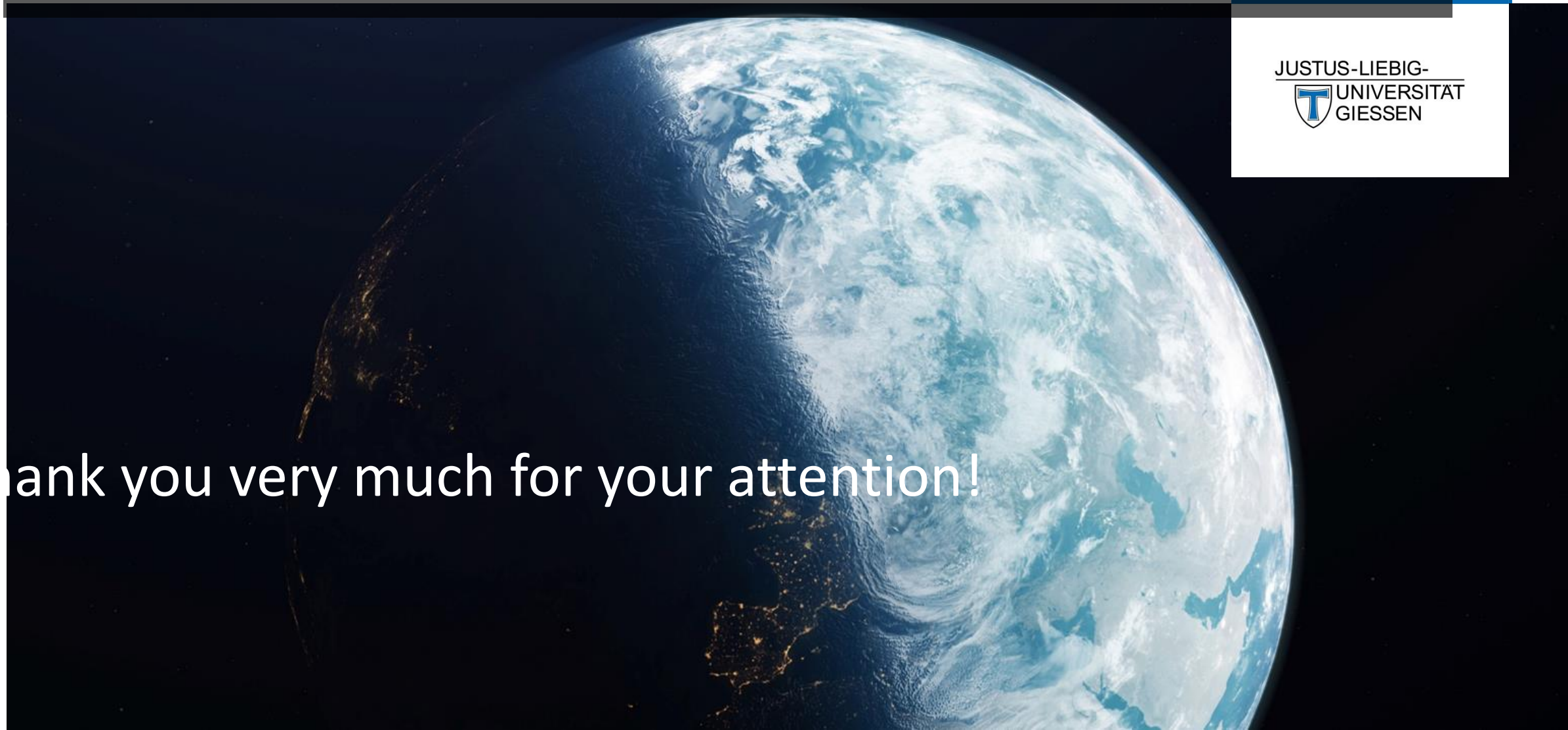


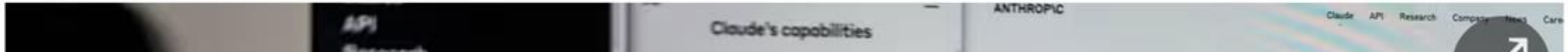
hank you very much for your attention!

theguardian.com/technology/2025/jun/09/apple-artificial-intellige...

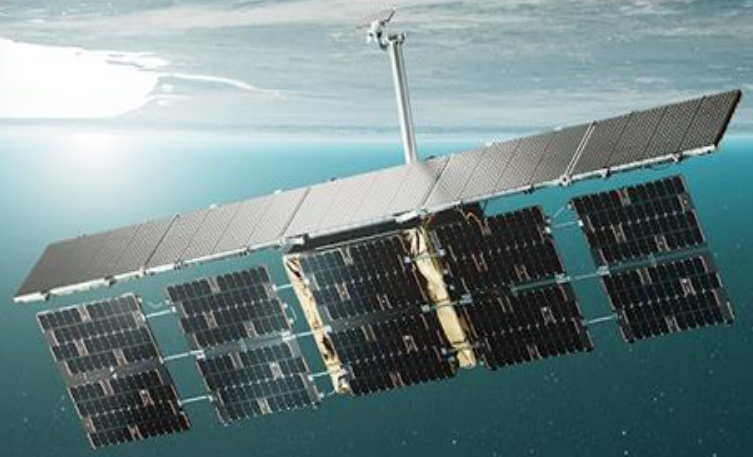
Artificial intelligence (AI)

Advanced AI suffers 'complete accuracy collapse' in face of complex problems, study finds

'Pretty devastating' Apple paper raises doubts about race to reach stage of AI at which it matches human intelligence



ICEYE



You need a reliable, rapid, and comprehensive source of truth

Jussi Sainio
Senior Product Manager
ICEYE Natural Catastrophe Solutions

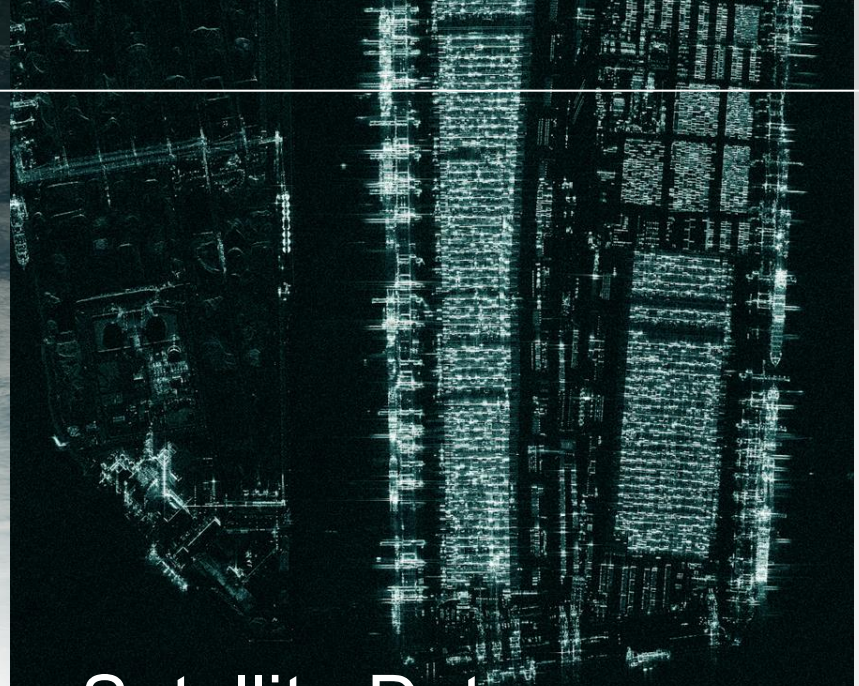
16 June 2025

Satellite Missions

We build synthetic aperture radar (SAR) satellite capacity

48 satellites launched as of March 2025

HQ in Finland, Offices in Poland, US, UK, Japan



Satellite Data

High-resolution SAR images of any location on Earth — day or night, regardless of weather conditions

Imaging capacity millions of square kilometers per day globally, with revisit

NatCat Solutions

Consistent, high-resolution datasets for near real-time information to make critical decisions for natural disasters.

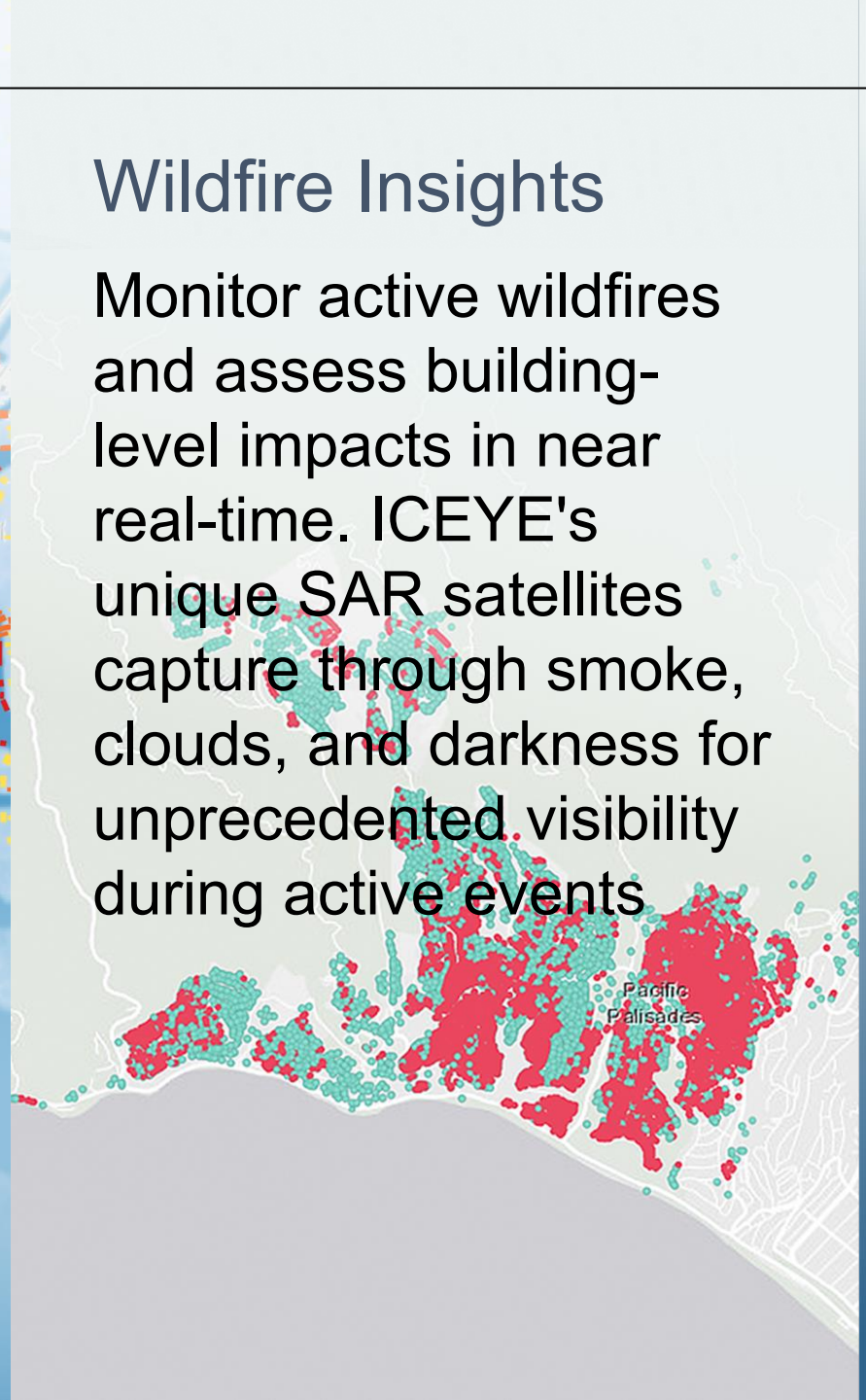
Automated solutions provide comprehensive insights several times a day per event within

Flood Solutions

Flood impacts with near real-time extent and depth data inside your GIS. ICEYE's flood intelligence is powered by the world's largest constellation of SAR microsatellites

Wildfire Insights

Monitor active wildfires and assess building-level impacts in near real-time. ICEYE's unique SAR satellites capture through smoke, clouds, and darkness for unprecedented visibility during active events



Hurricane & Cyclone

An innovative way to detect large changes to building structures after landfall of major hurricanes in the US and cyclones in Australia

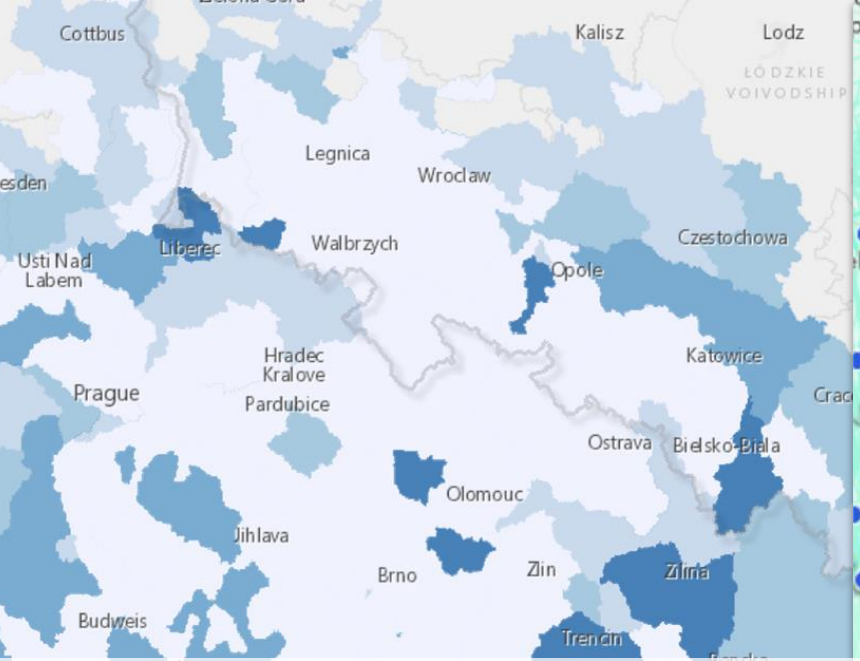
Civil Security Hub — Case Study Overview:

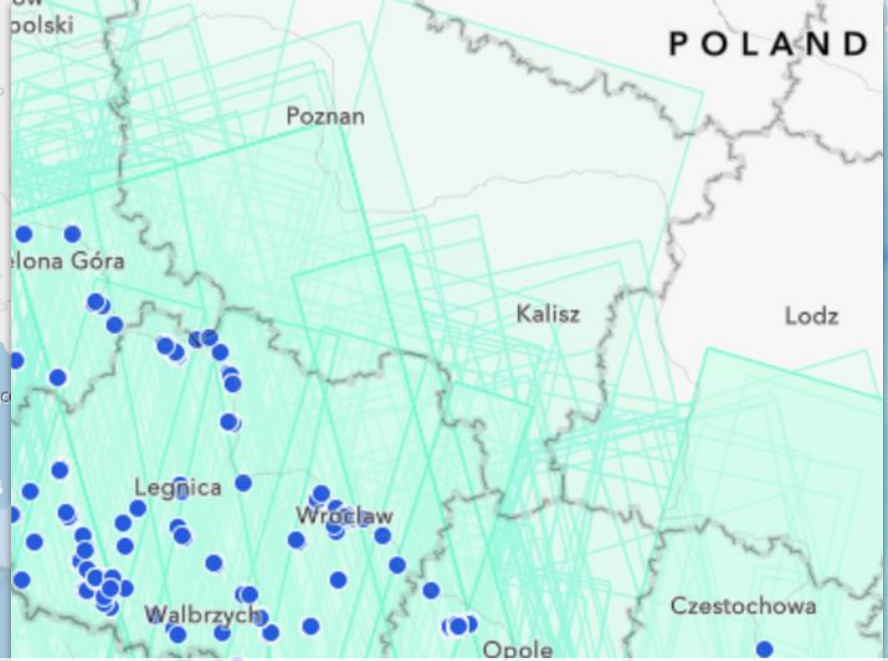
Storm Boris Flood in Poland September–October 2024

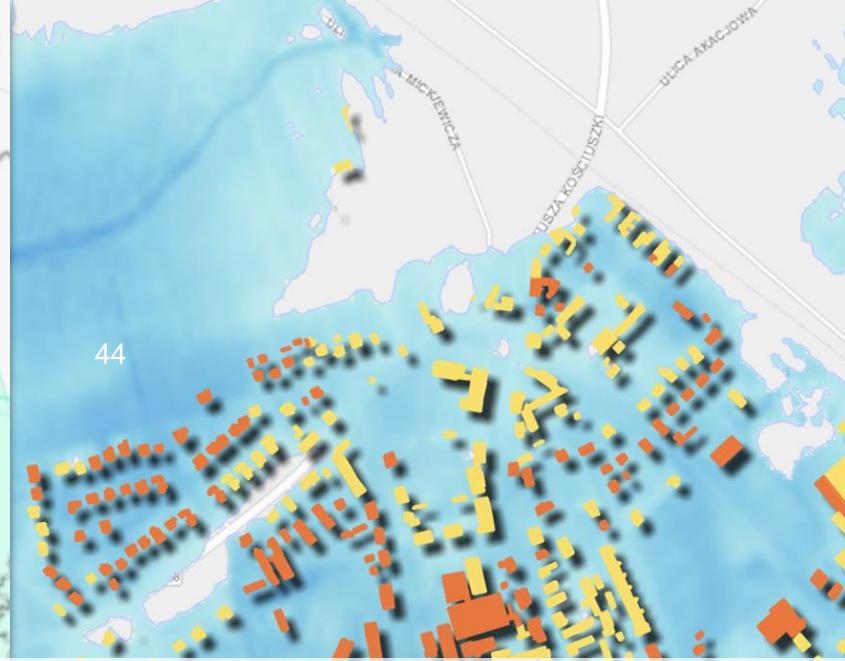
ICEYE

esa

Work supported by ESA's
Civil Security from Space (CSS) program







Before the storm

ICEYE's Meteorology team followed ICEYE's Flood Early Warning model and other forecast sources, and pinpointed high-risk areas, allowing for **early response preparation and a timely**

Real-time actions

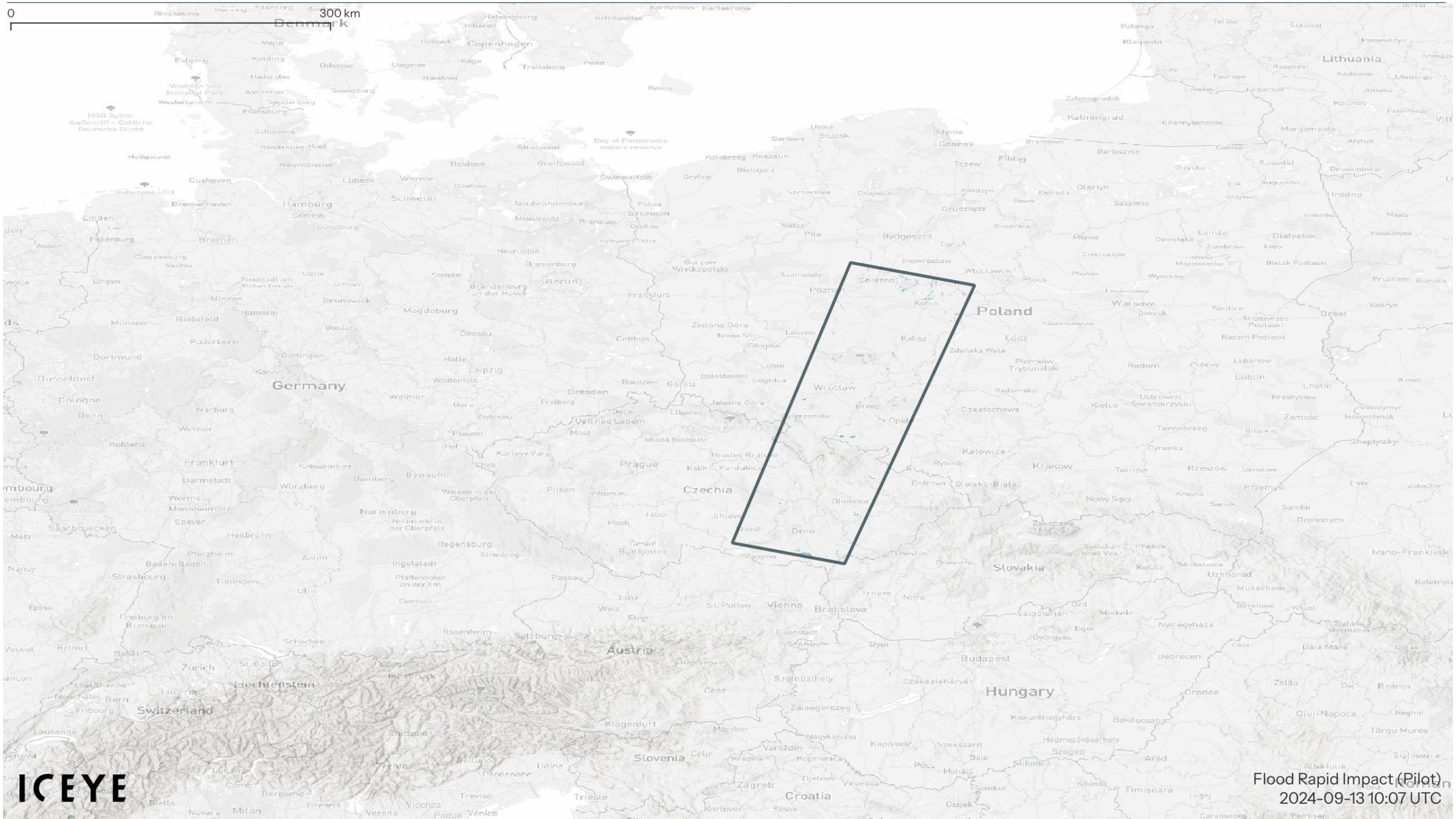
Throughout the storm, ICEYE collaborated with the Polish Crisis Information Center (CIK).

ICEYE provided Flood Rapid Impact (FRI) extent data every six hours —

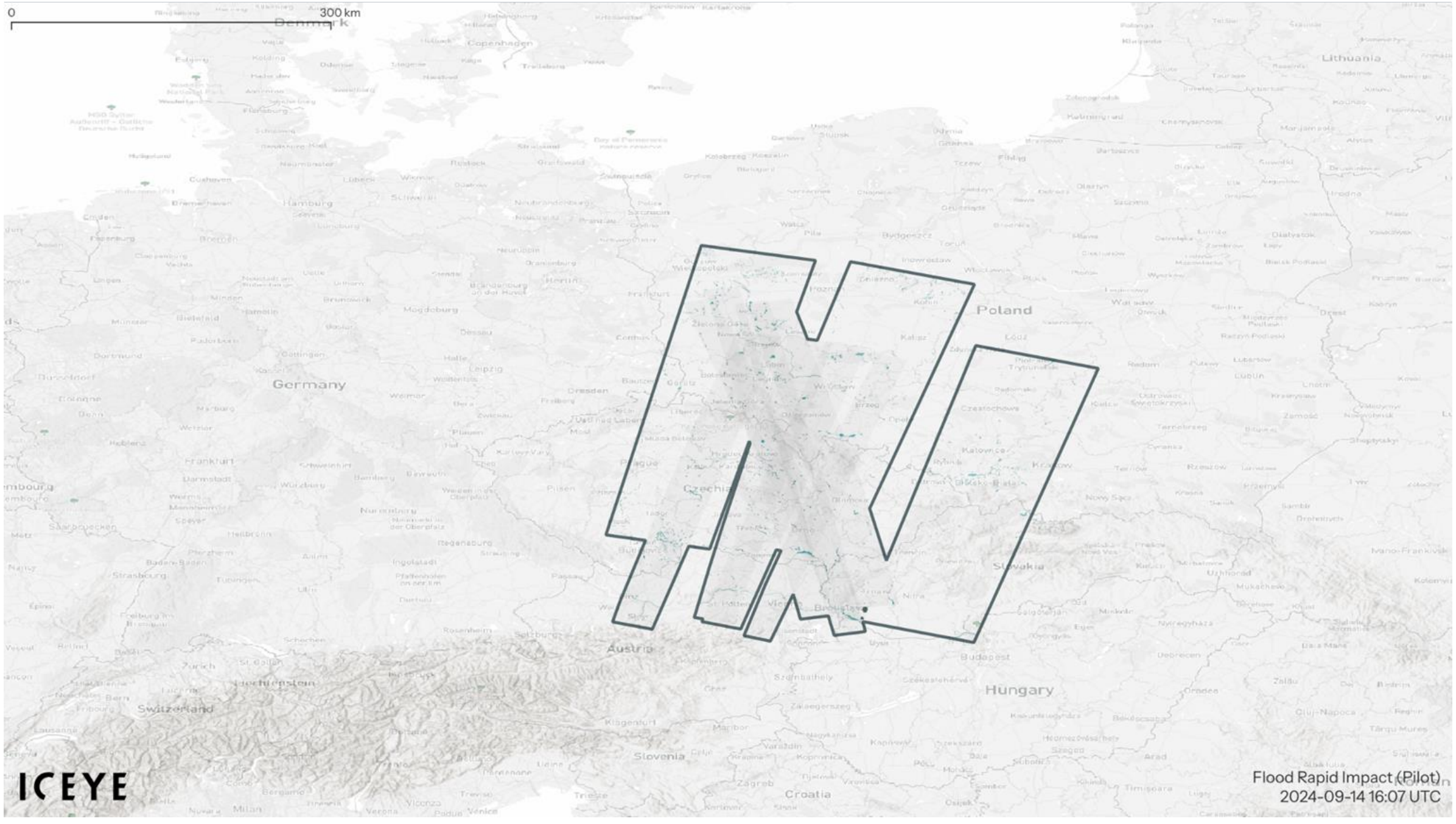
After the storm

After ICEYE delivered Storm Boris flood extent and depth data, CIK provided impactful feedback: "As of 8 October 2024, we have delivered nine flood analysis reports for

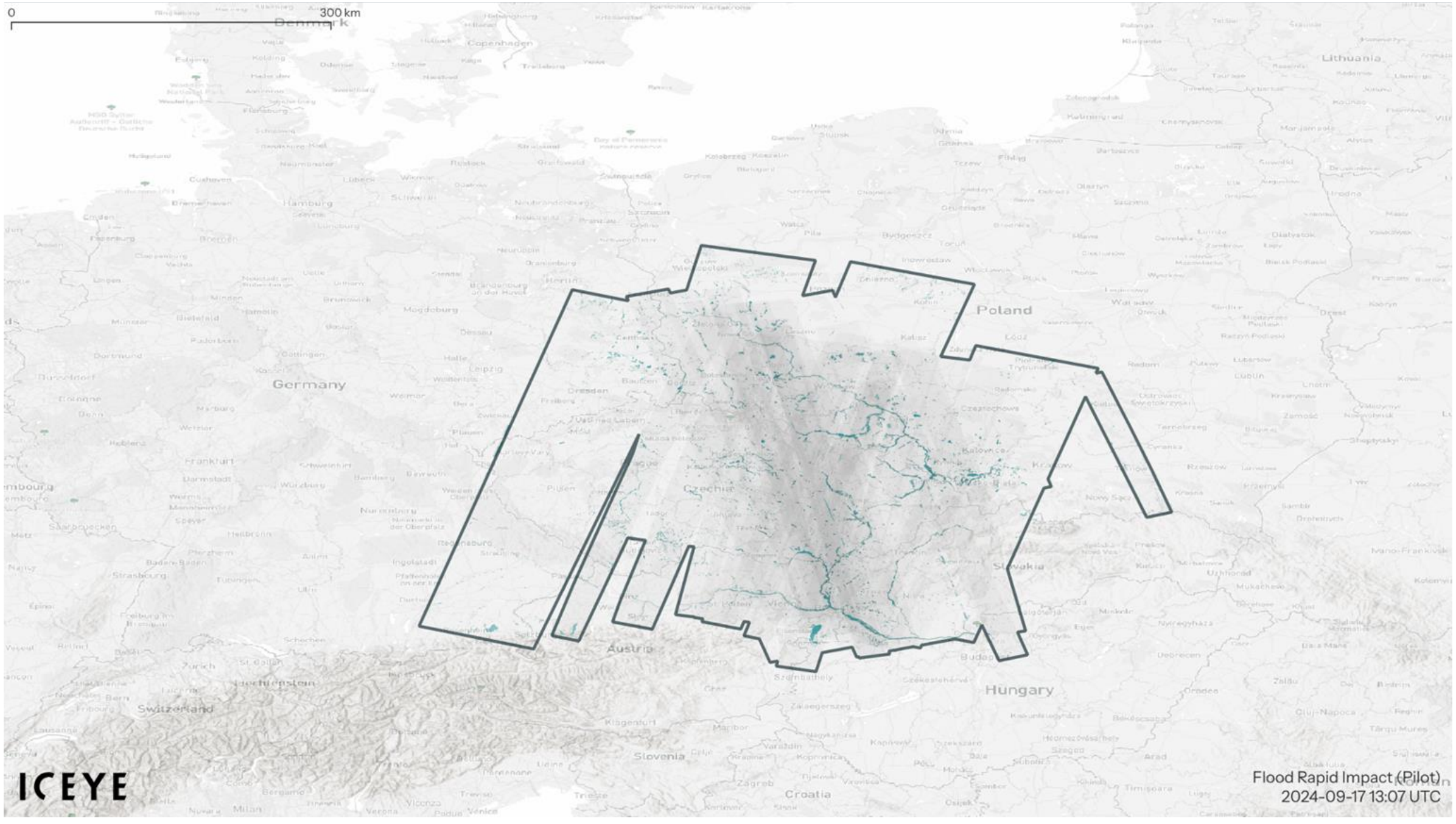
Flood Rapid Impact coverage in FSD-2212 Storm Boris, Poland



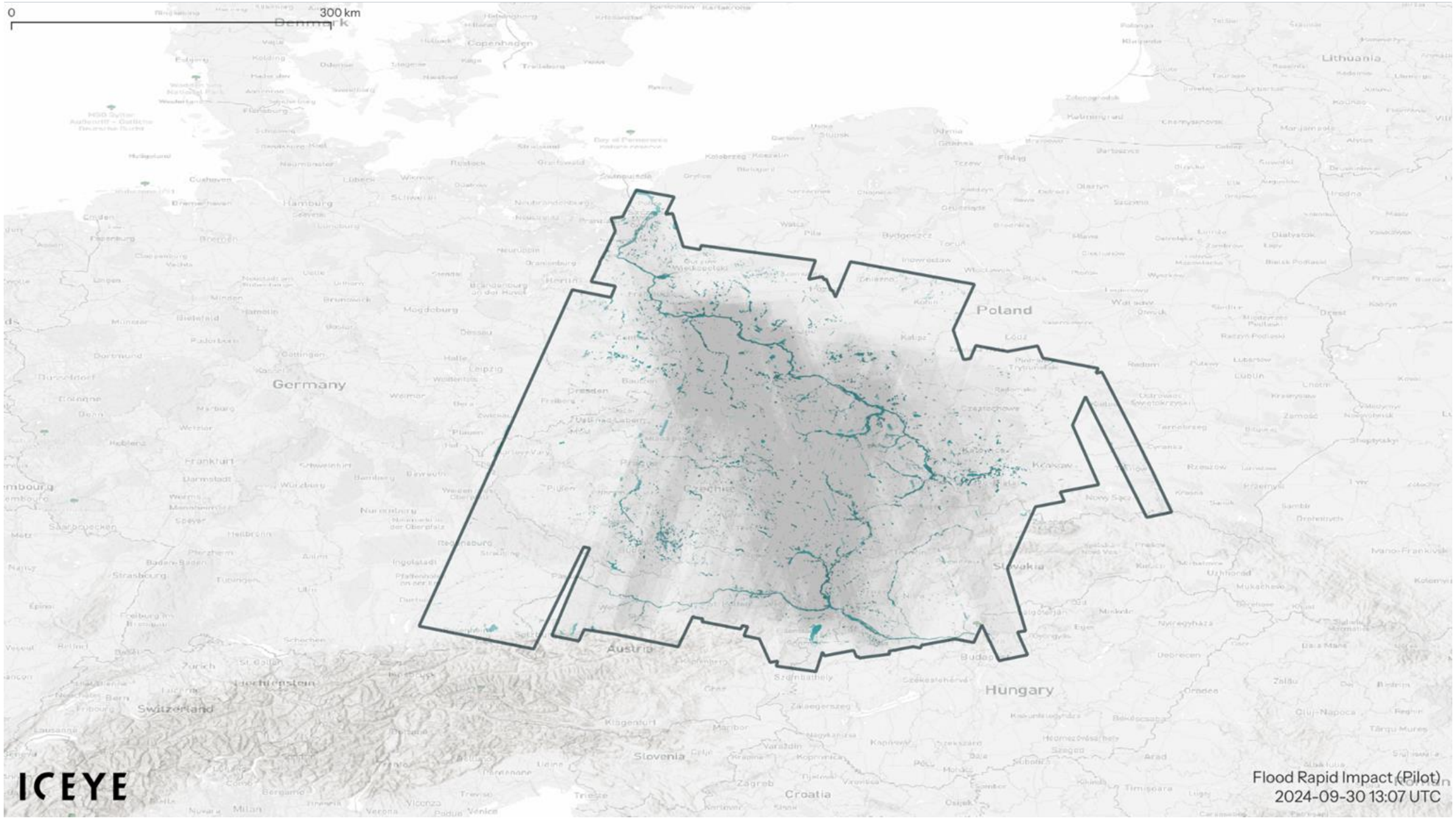
Flood Rapid Impact coverage in FSD-2212 Storm Boris, Poland



Flood Rapid Impact coverage in FSD-2212 Storm Boris, Poland

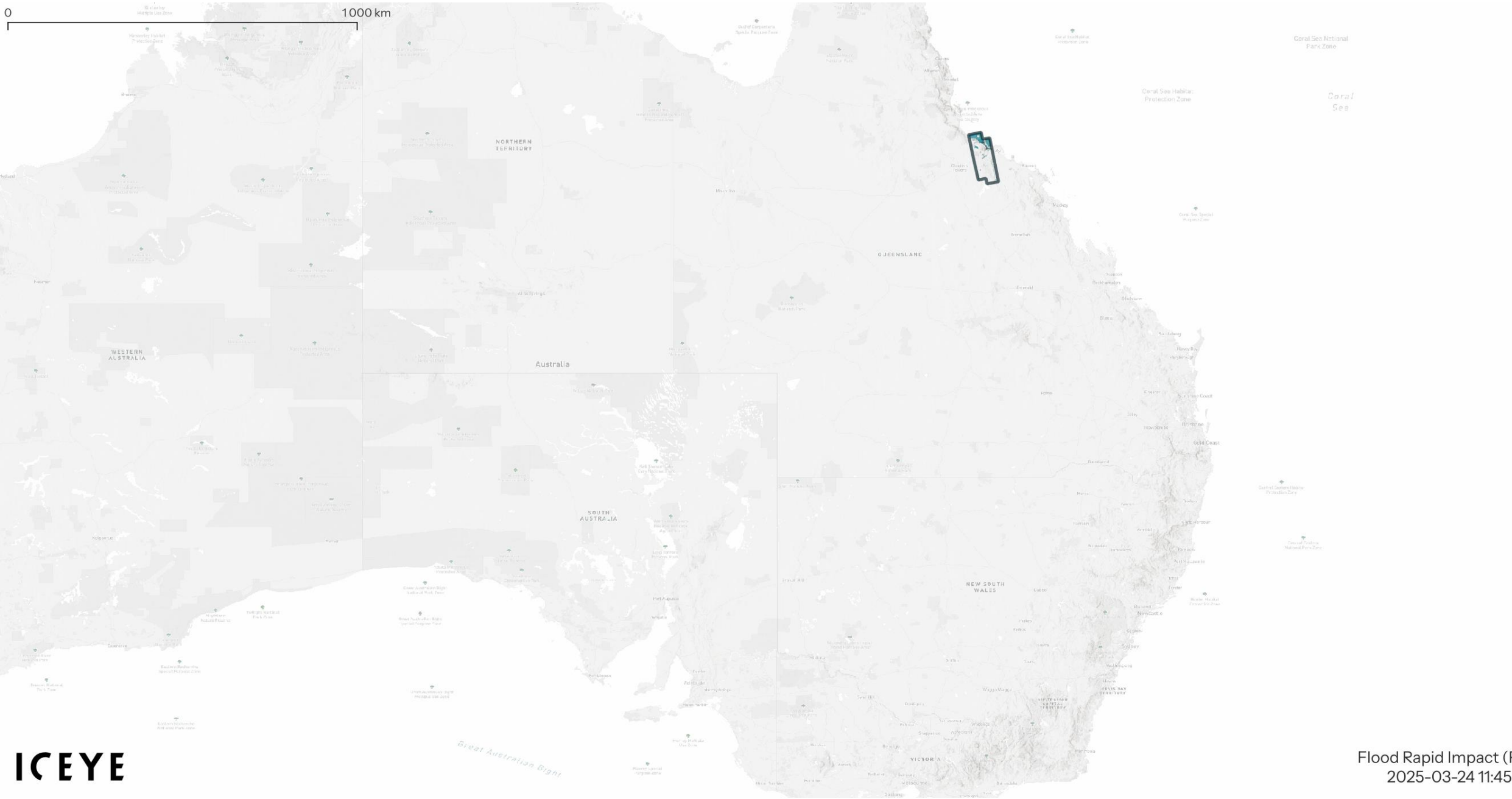


Flood Rapid Impact coverage in FSD-2212 Storm Boris, Poland



Work supported by ESA's
Civil Security from Space (CSS) program

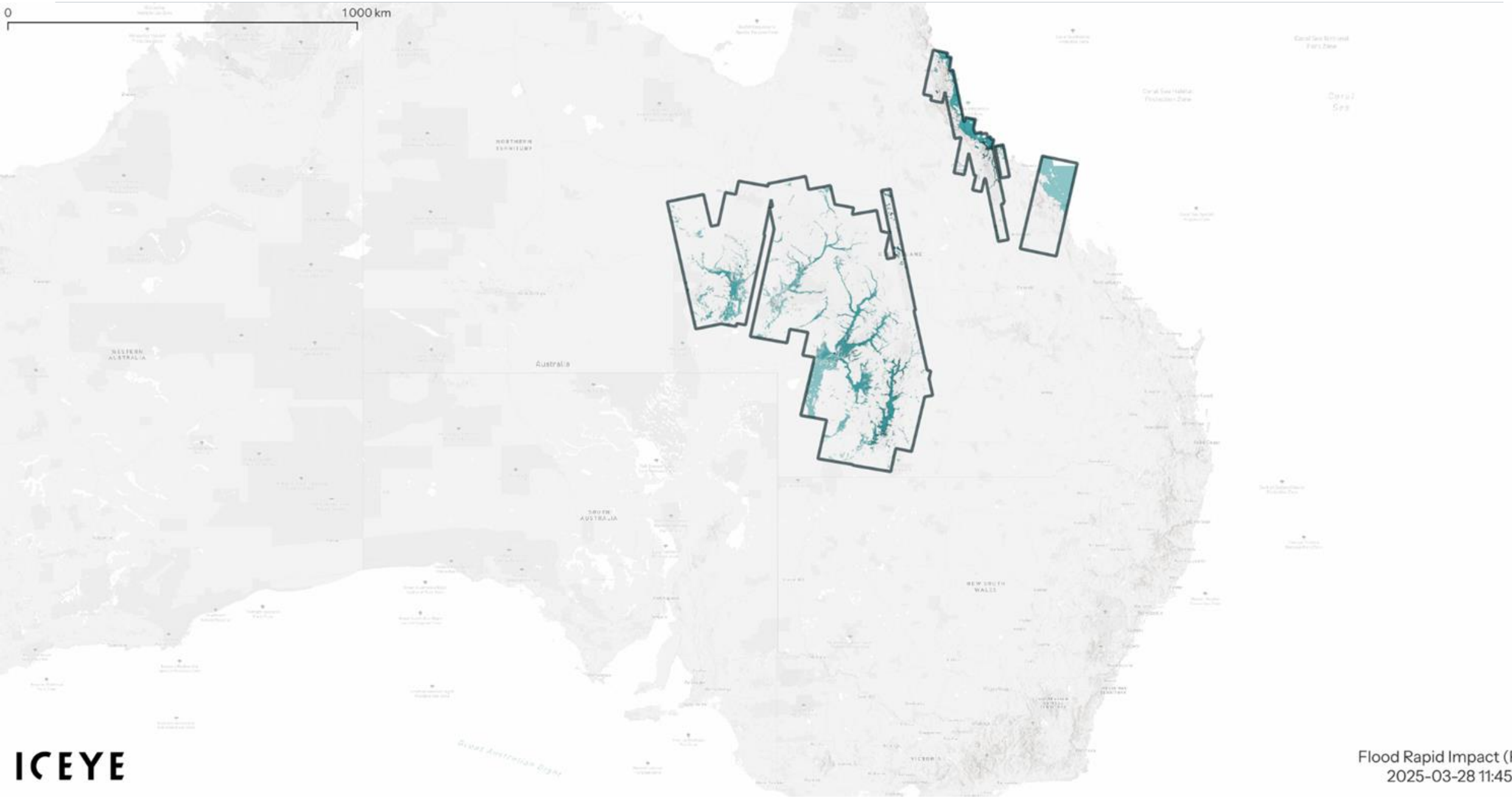
Flood Rapid Impact coverage in Australia FSD-2442 NSW, FSD-2438 QLD, FSD-2456 SA



ICEYE

Flood Rapid Impact (Pilot)
2025-03-24 11:45 UTC

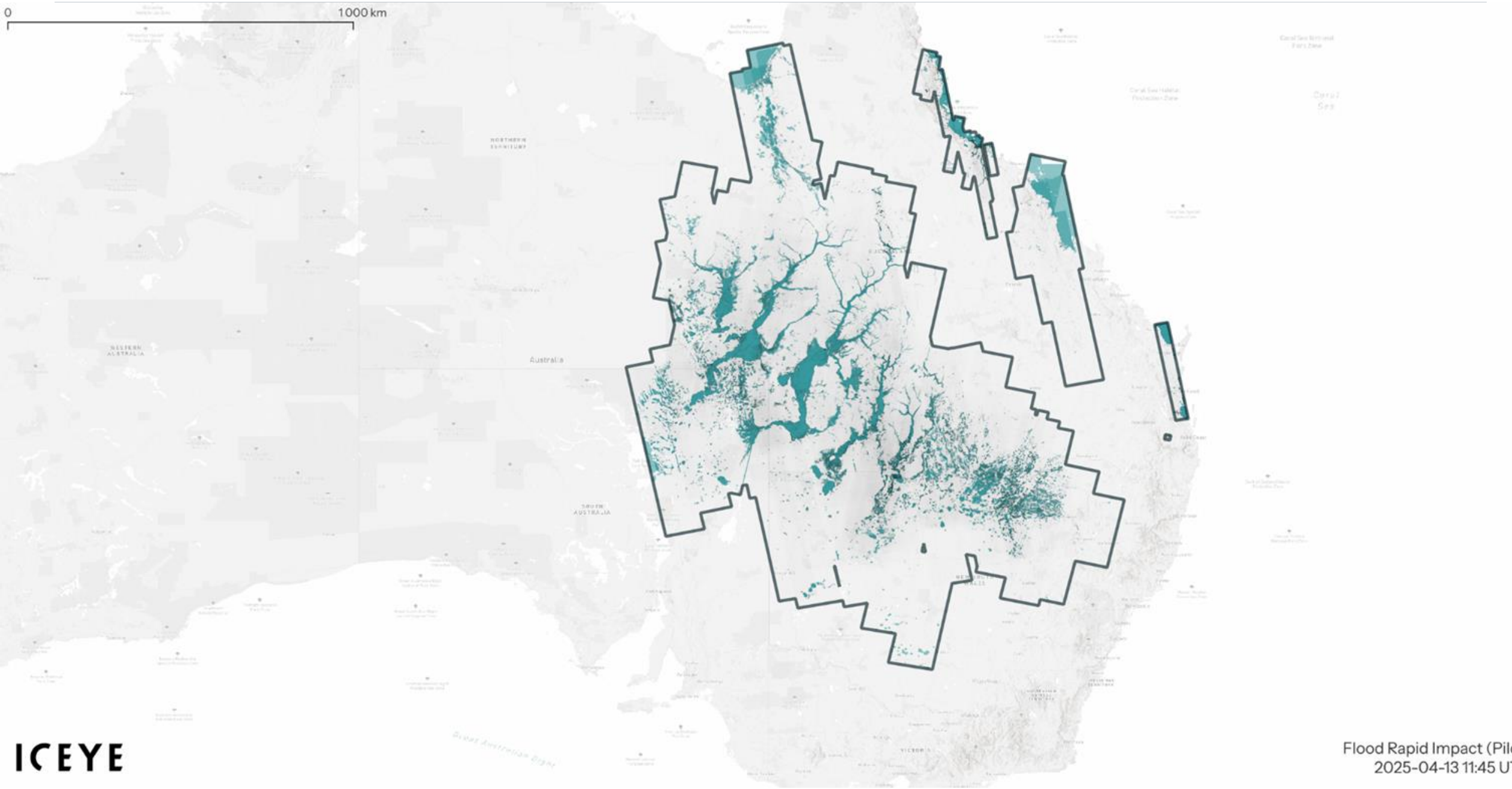
Flood Rapid Impact coverage in Australia FSD-2442 NSW, FSD-2438 QLD, FSD-2456 SA



ICEYE

Flood Rapid Impact (Pilot)
2025-03-28 11:45 UTC

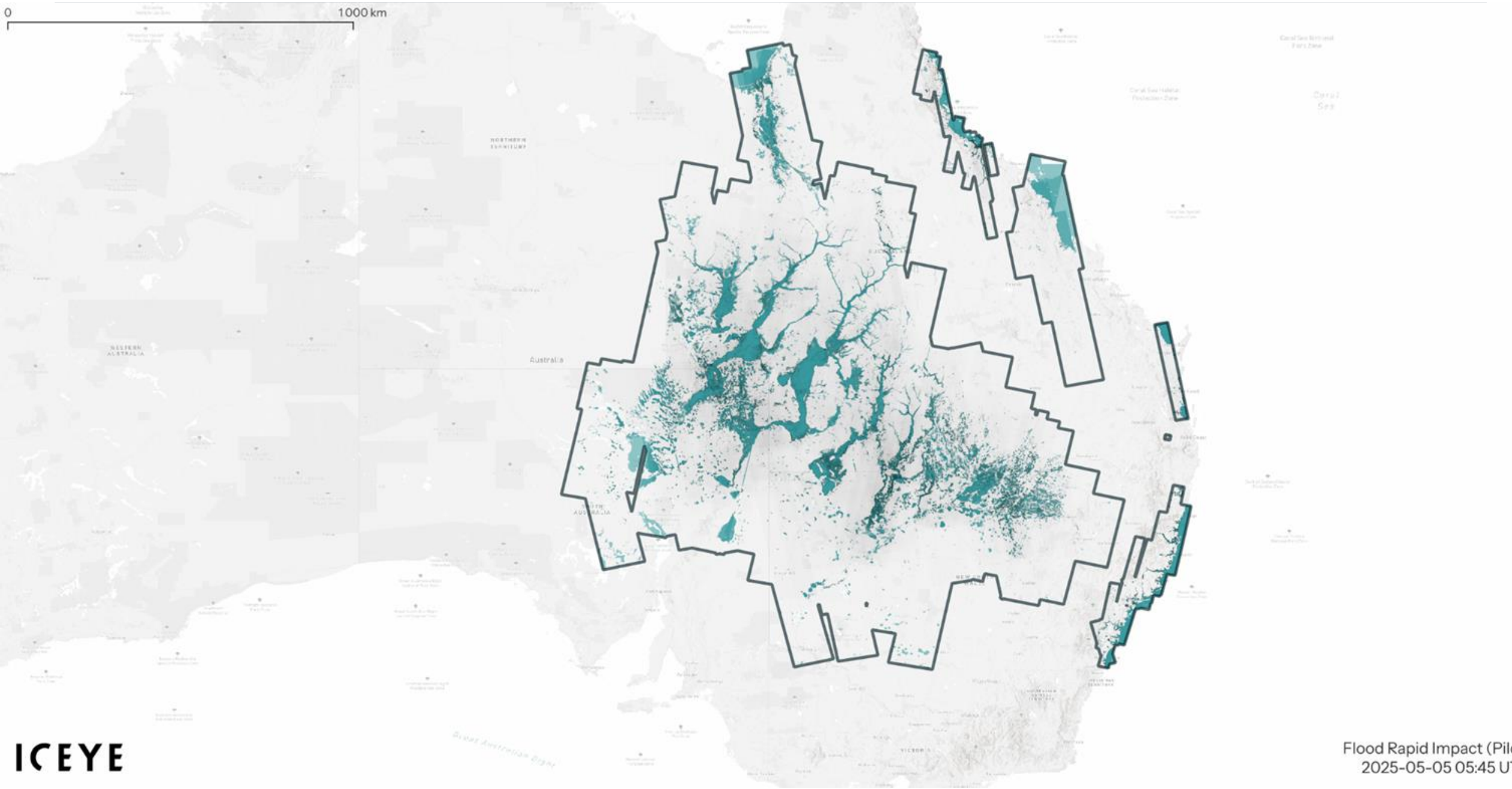
Flood Rapid Impact coverage in Australia FSD-2442 NSW, FSD-2438 QLD, FSD-2456 SA



ICEYE

Flood Rapid Impact (Pilot)
2025-04-13 11:45 UTC

Flood Rapid Impact coverage in Australia FSD-2442 NSW, FSD-2438 QLD, FSD-2456 SA



ICEYE

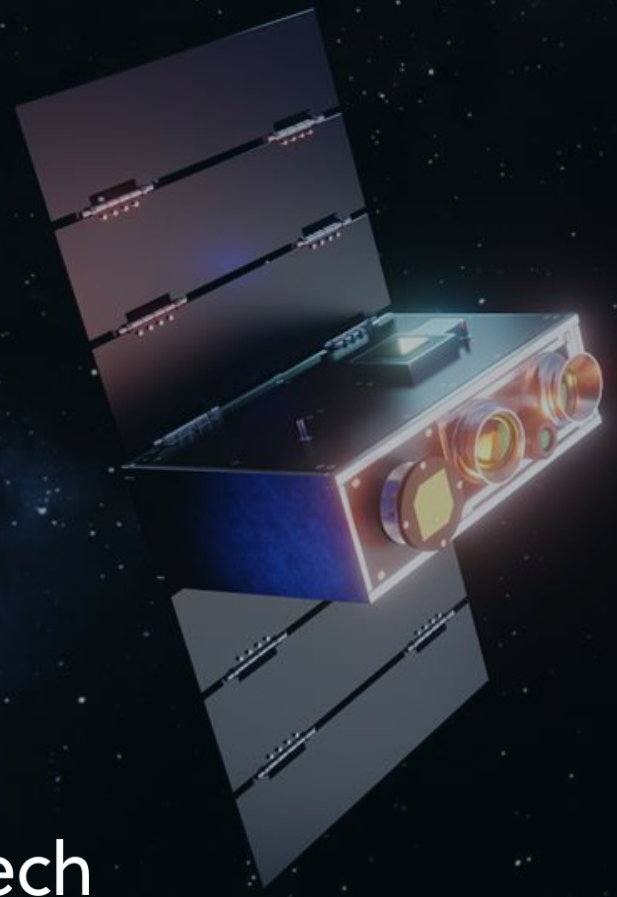
Flood Rapid Impact (Pilot)
2025-05-05 05:45 UTC

Summary in three points

- AI and automation needs to be used with good judgement — to carry out well-tested, specific tasks in transparent and predictable manner
- A reliable, rapid and comprehensive source of truth is key for assessing the impact of natural disasters and managing the risks — industry can provide tremendous capabilities that complement the public ones
- The Civil Security Hub/Portal model seems to provide a good basis for bringing industry and governmental agencies together and boost national capabilities in disaster risk management

ICEYE

AI for Preparedness



OroraTech

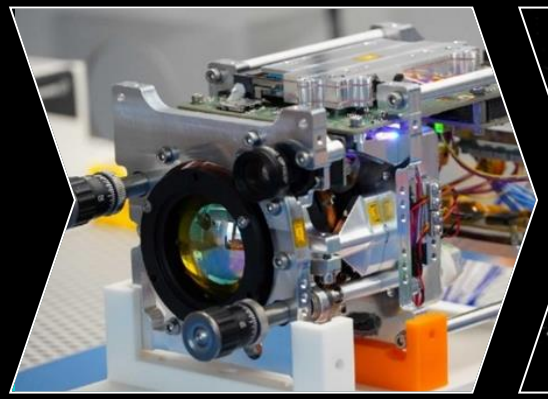
Hi, we are OroraTech

2018
Founded
in Munich

~140
Employees on
4
continents

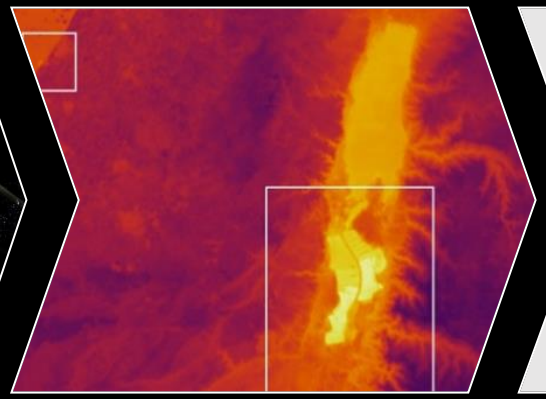
300
Users in
20
countries

27
Satellite sources
10
Own satellites
in orbit
NEW

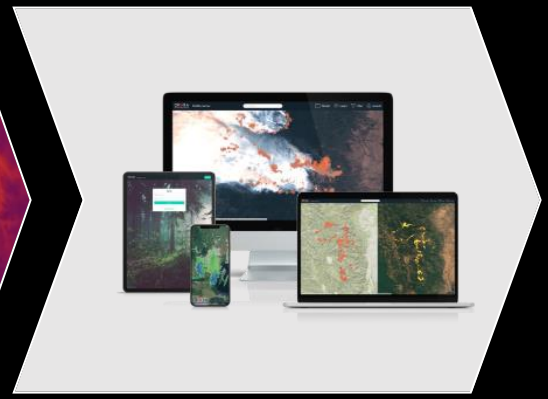


Patented thermal camera

Unique constellation for real-time data



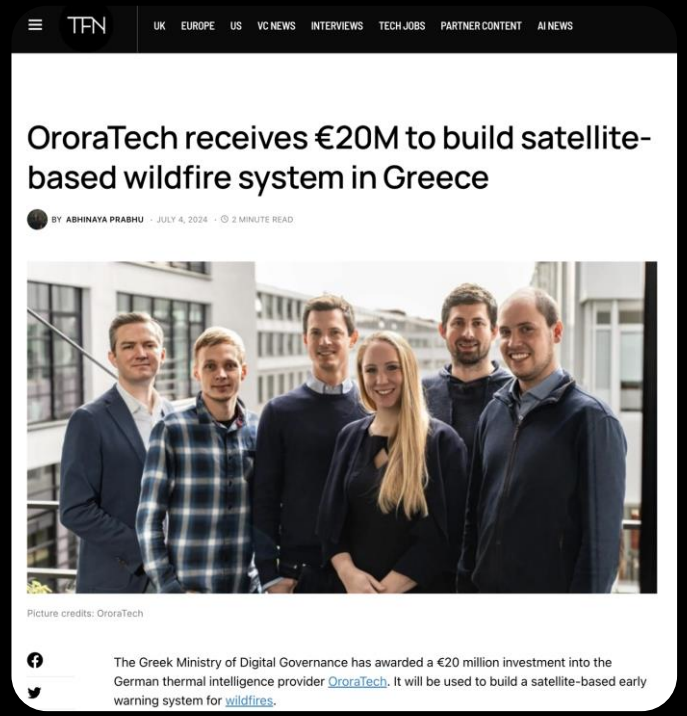
On-Board Fire Detection



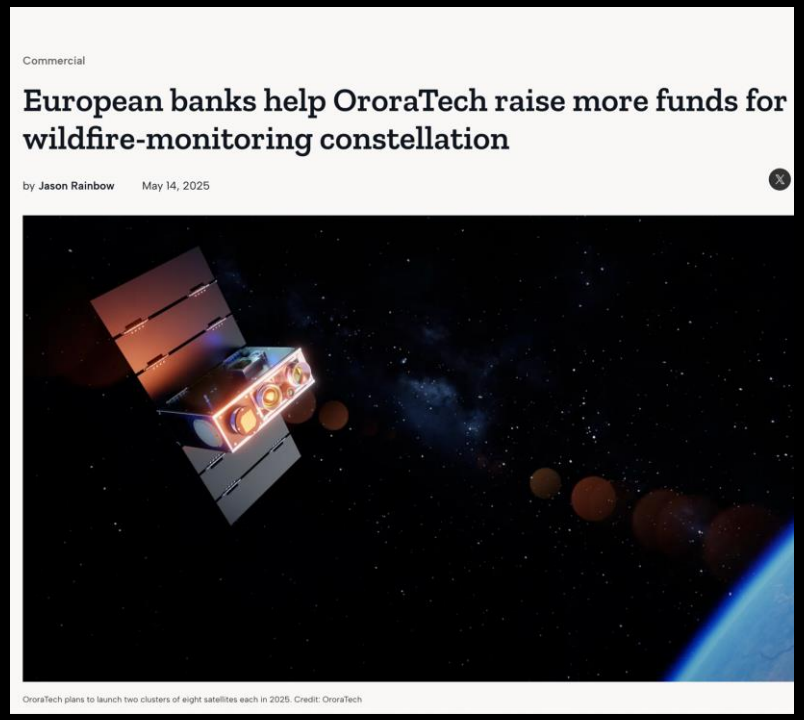
Visualization, API

Recent News

20M Greece



37M Series B closed



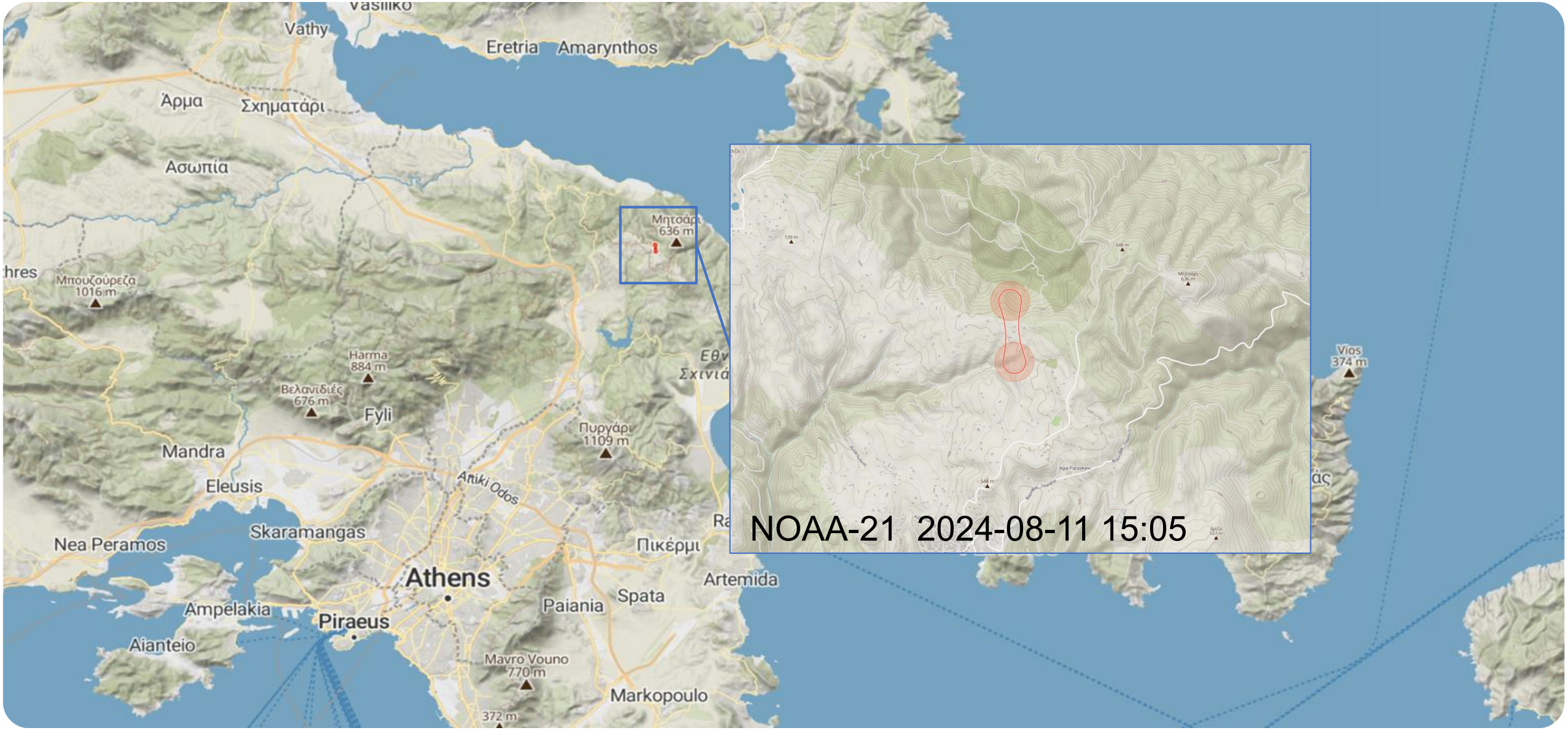
72M CAN with Spire

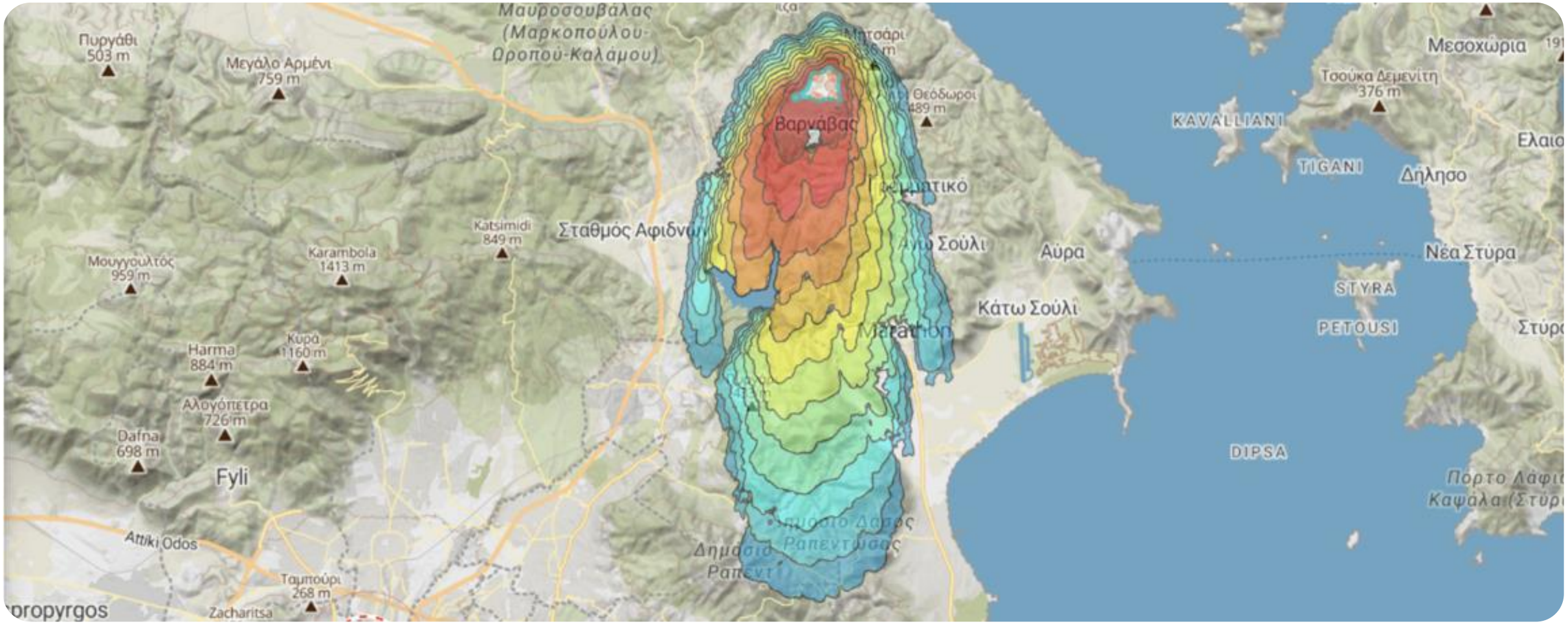
2024 Attica wildfires

CNN World Africa Americas Asia Australia China Europe India Middle East More

World / Europe

Evacuations ordered near Athens as Greek authorities try to contain wildfires


Vathy
Eretria
Amarynthos
Άρμα
Σχηματάρι
Ασωπία
Μητσάρι
636 m
Μπουζούρεζα
1016 m
Harma
884 m
Βελανιδιές
676 m
Fyli
Mandra
Eleusis
Πυργάρι
1109 m
Antiki Odos
Skaramangas
Nea Peramos
Athens
Πικέρμι
Artemida
Spata
Paiania
Ampelakia
Piraeus
Aianteio
Mavro Vouno
770 m
Markopoulo
372 m
Vios
374 m
NOAA-21 2024-08-11 15:05



Fire Spread Simulation

Real Time calibrated based on Satellite Data

Situational Awareness During Suppression Efforts

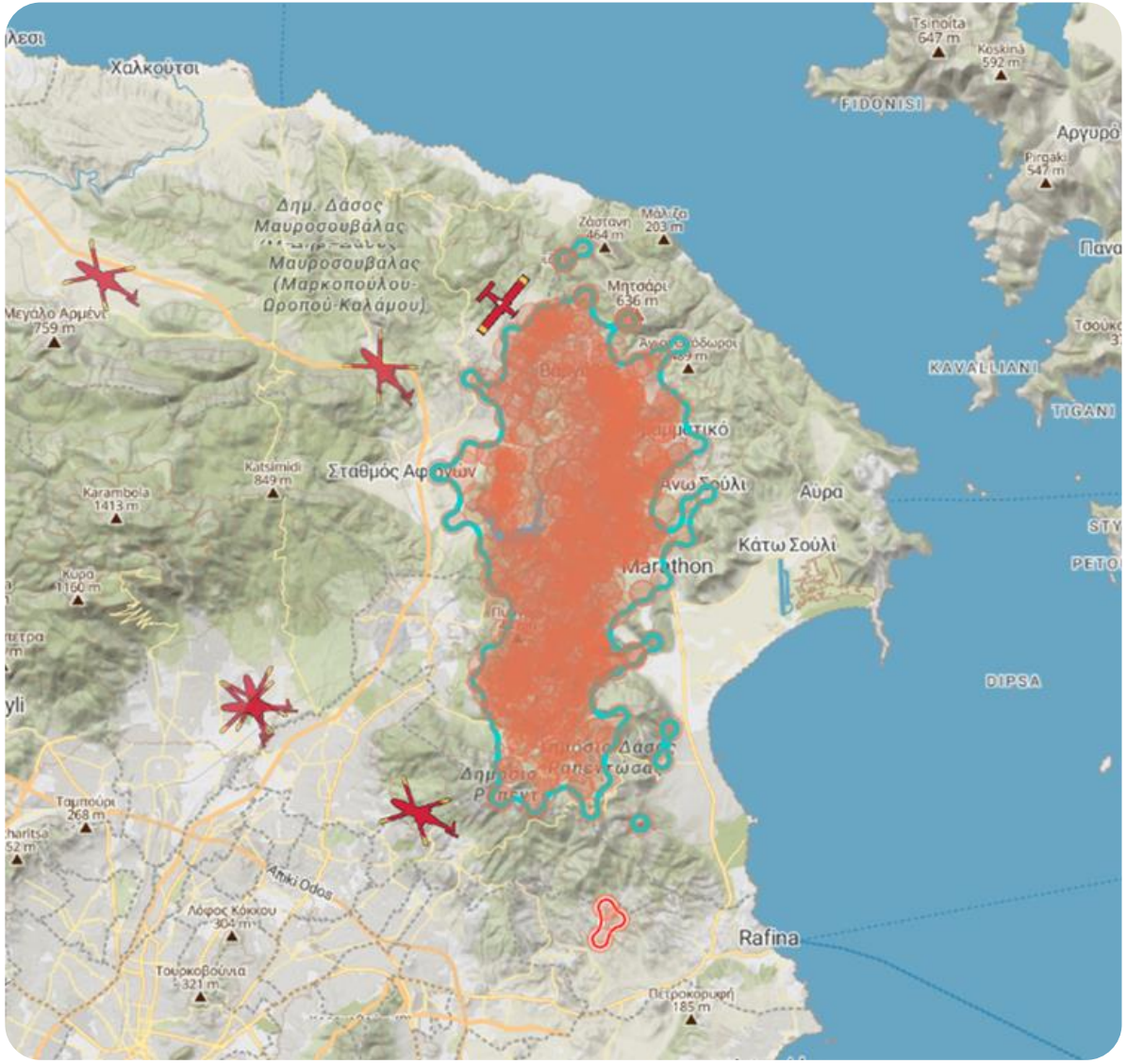
702 Firefighters

199 Vehicles

27 Forest Commando Groups

17 Aircraft

8 Helicopters

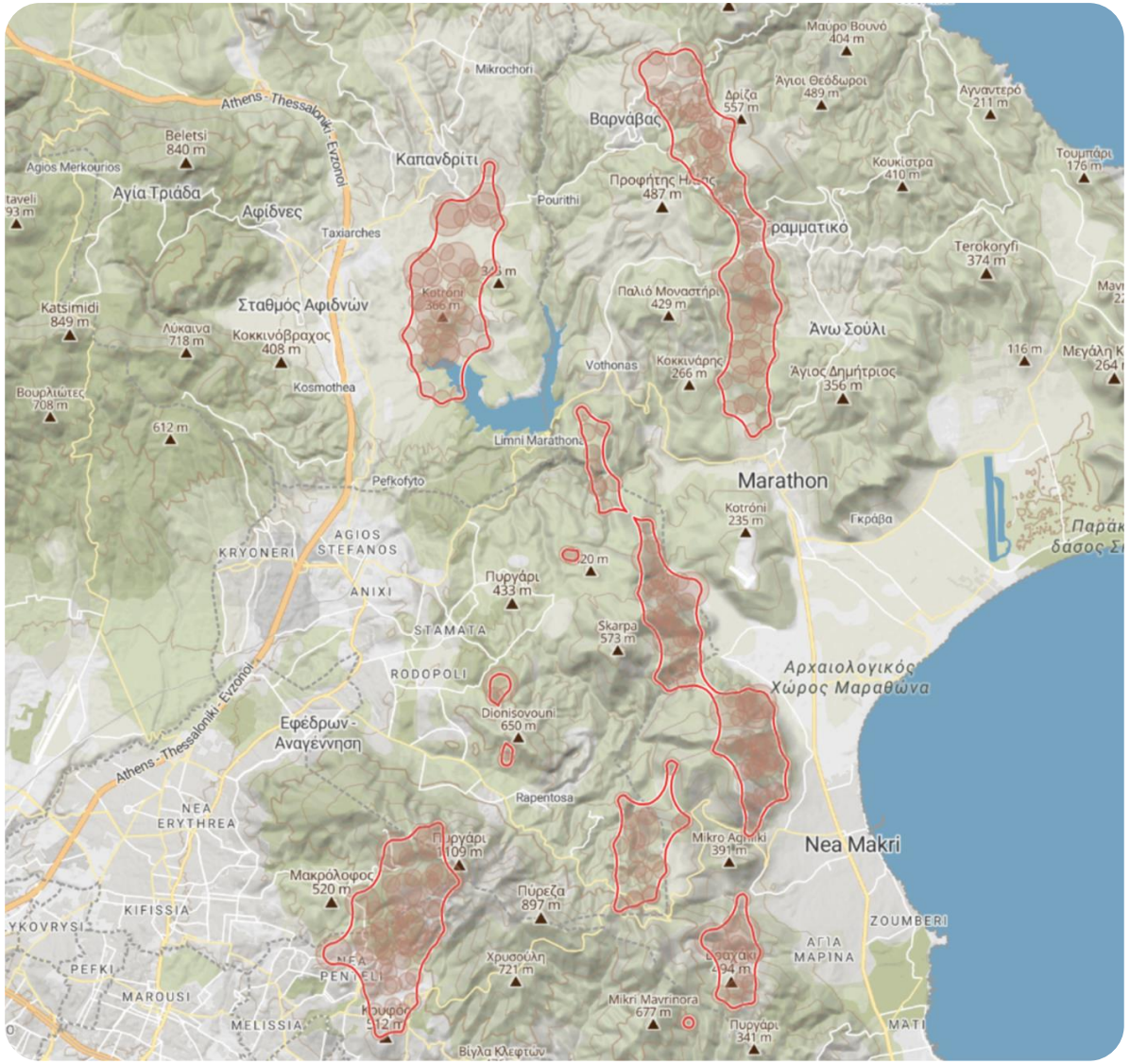


Monitoring Distributed Fire Hotspots

Customer Feedback

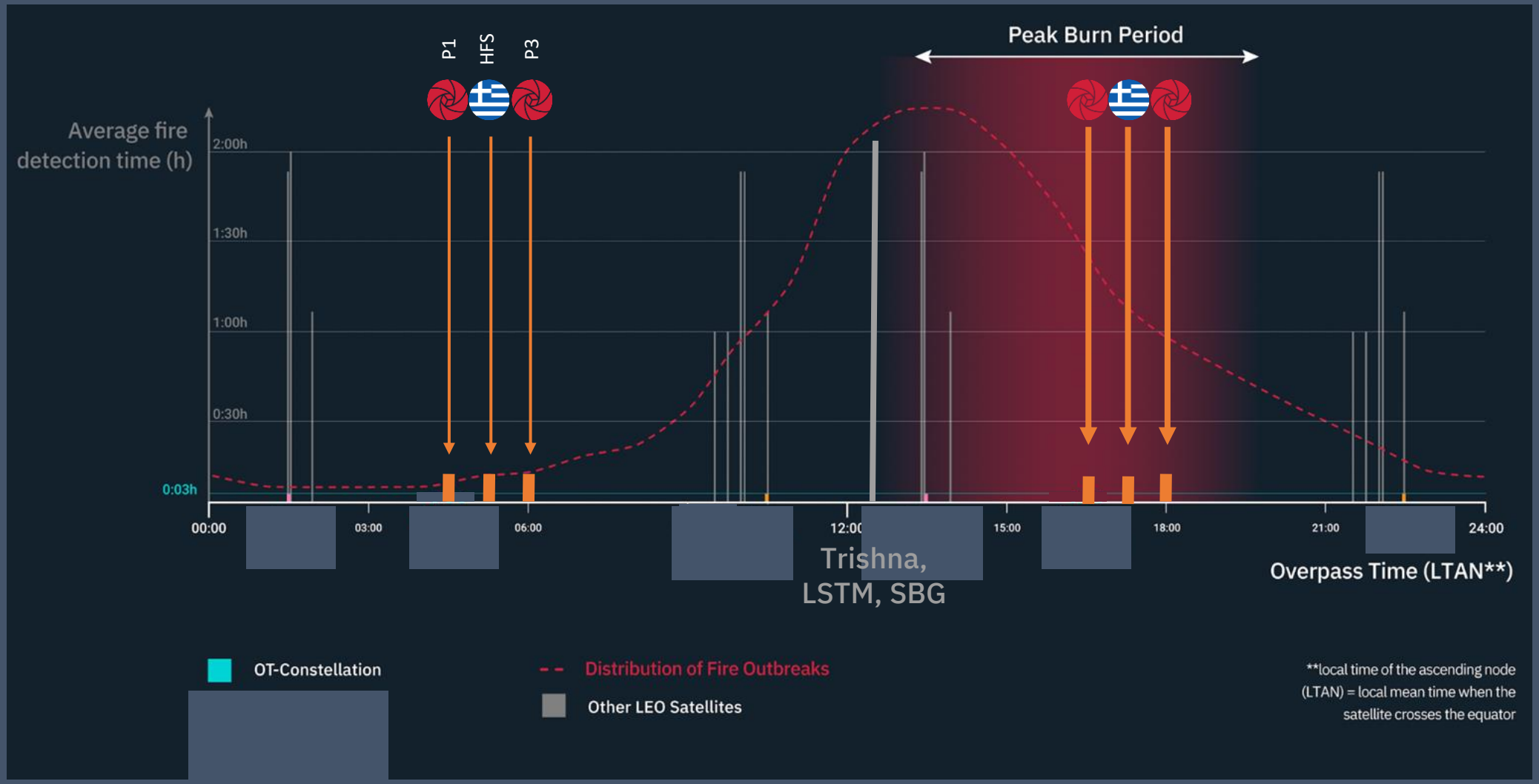
“Satellite intel became the basic information for observing the daily progression of fires and producing progression forecasts.

This was very useful in defining our priorities and putting energy and resources in the right places.”



Only one problem:

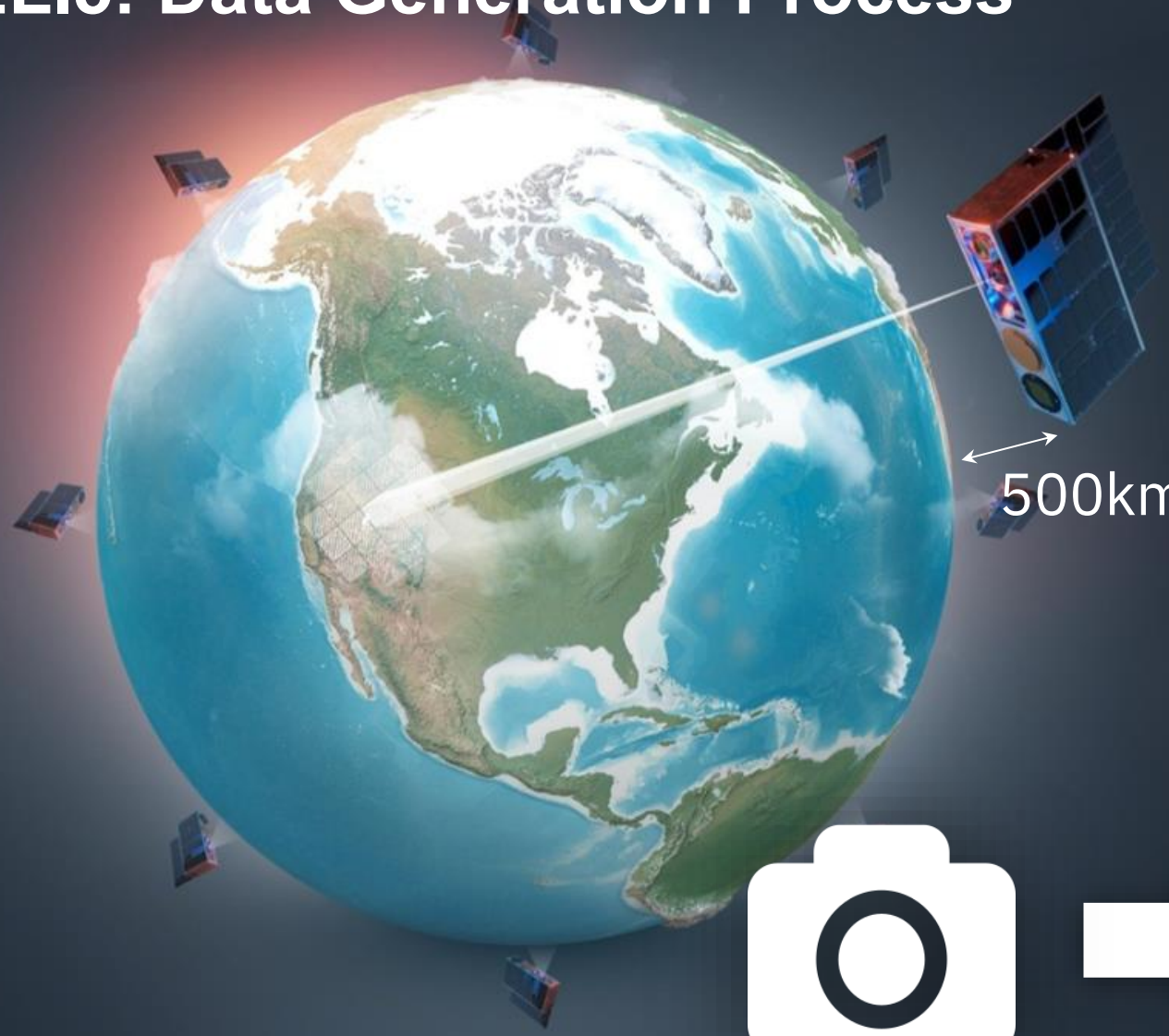
The data gap in the afternoon…

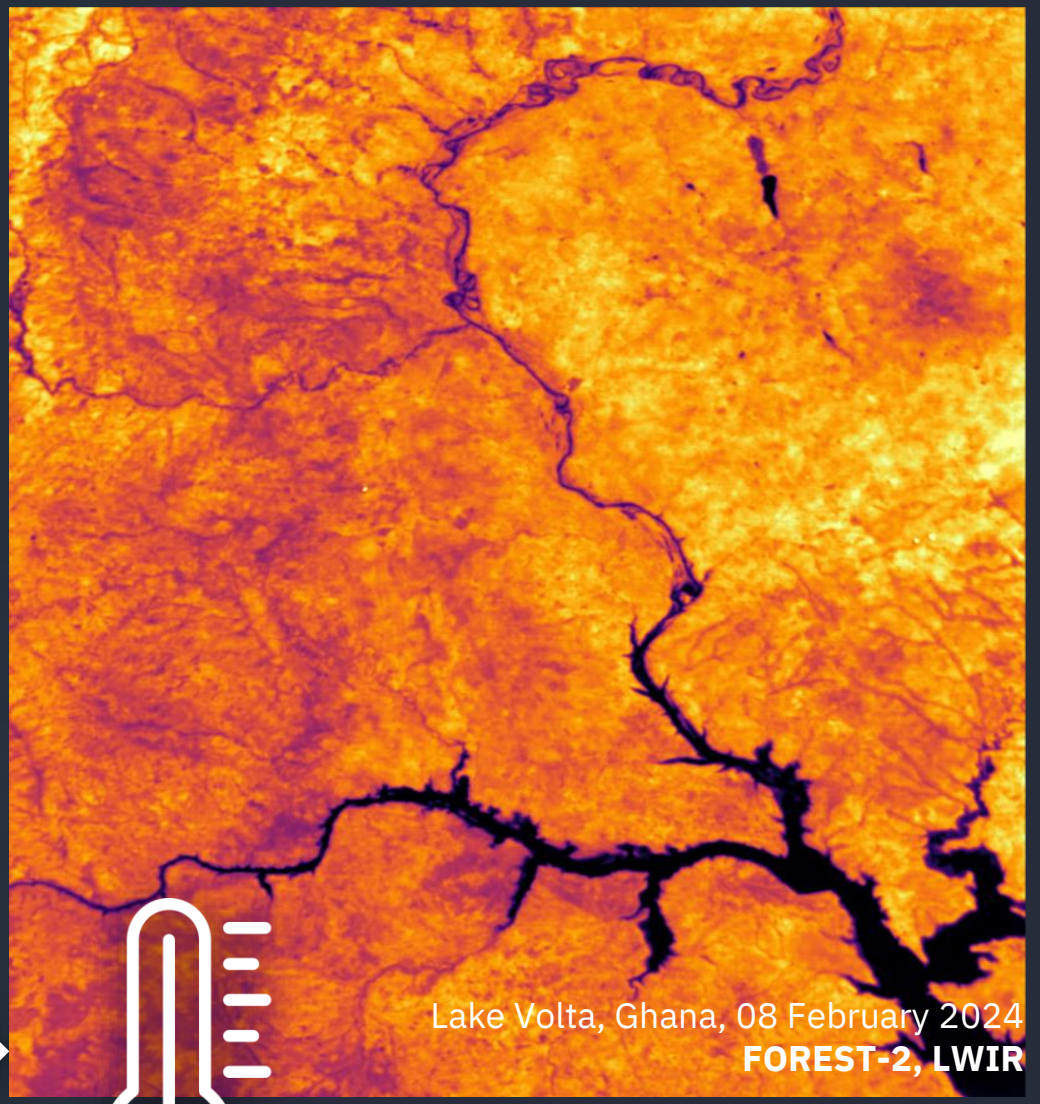


News: OroraTech Plane 1 launch successful

Dedicat

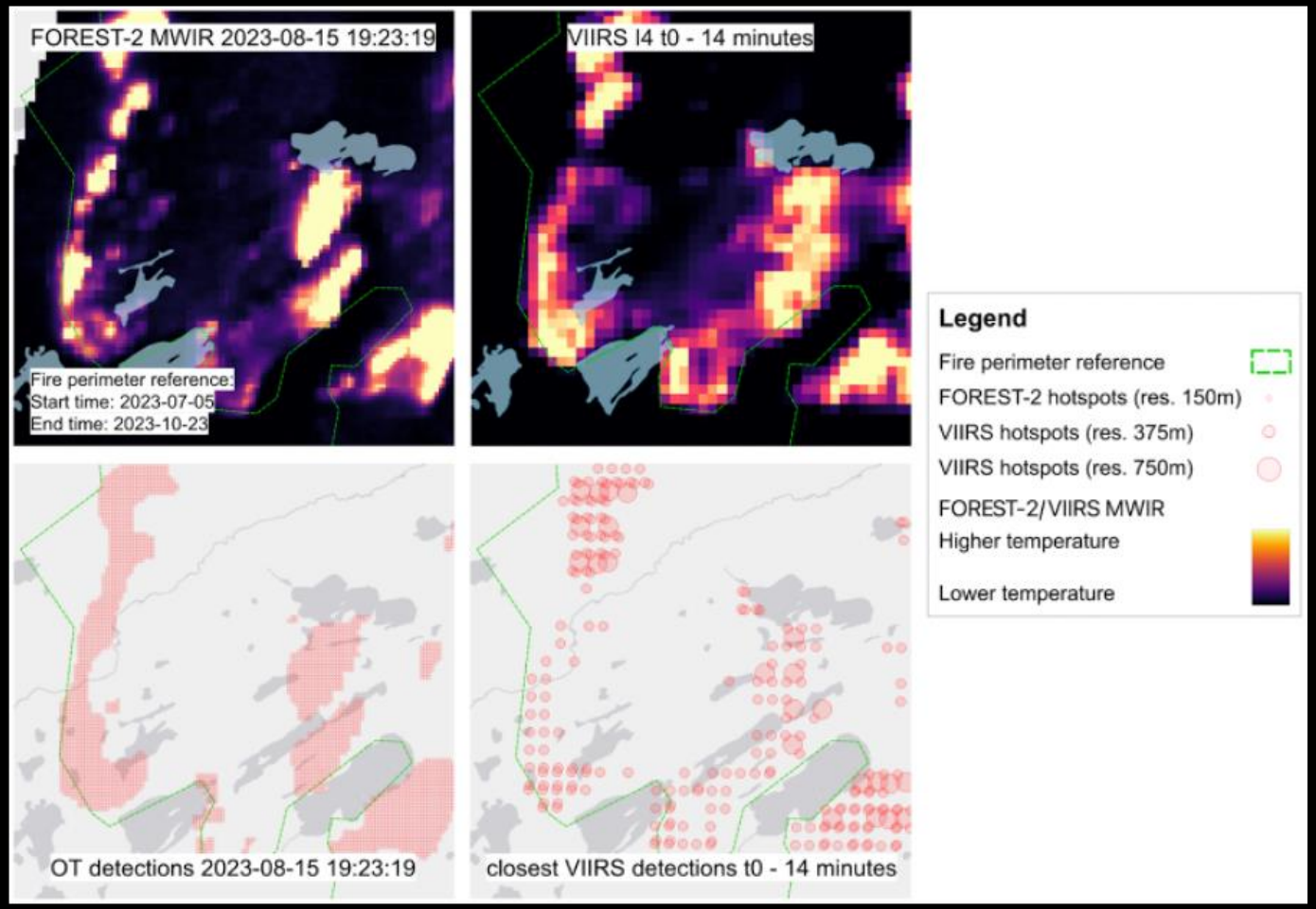
ELI5: Data Generation Process





OroraTech

Miniaturized technology, on-board fire detection

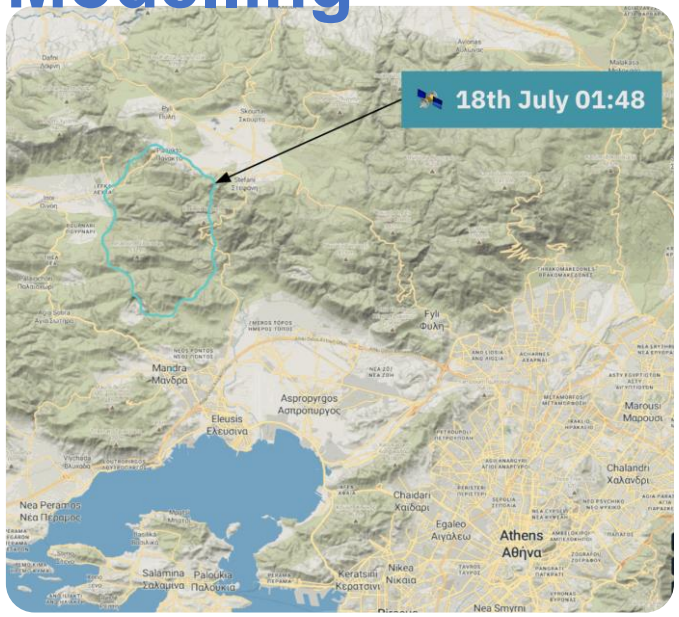


OroraTech

AI based Predictive Analytics

Hourly

Fire Spread Modelling



Daily

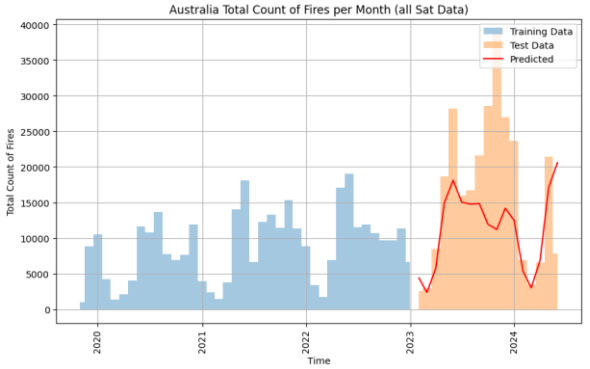
Short-term fire hazard

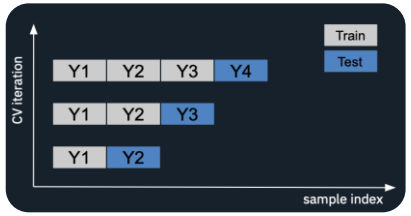
Ground Truth
Baseline

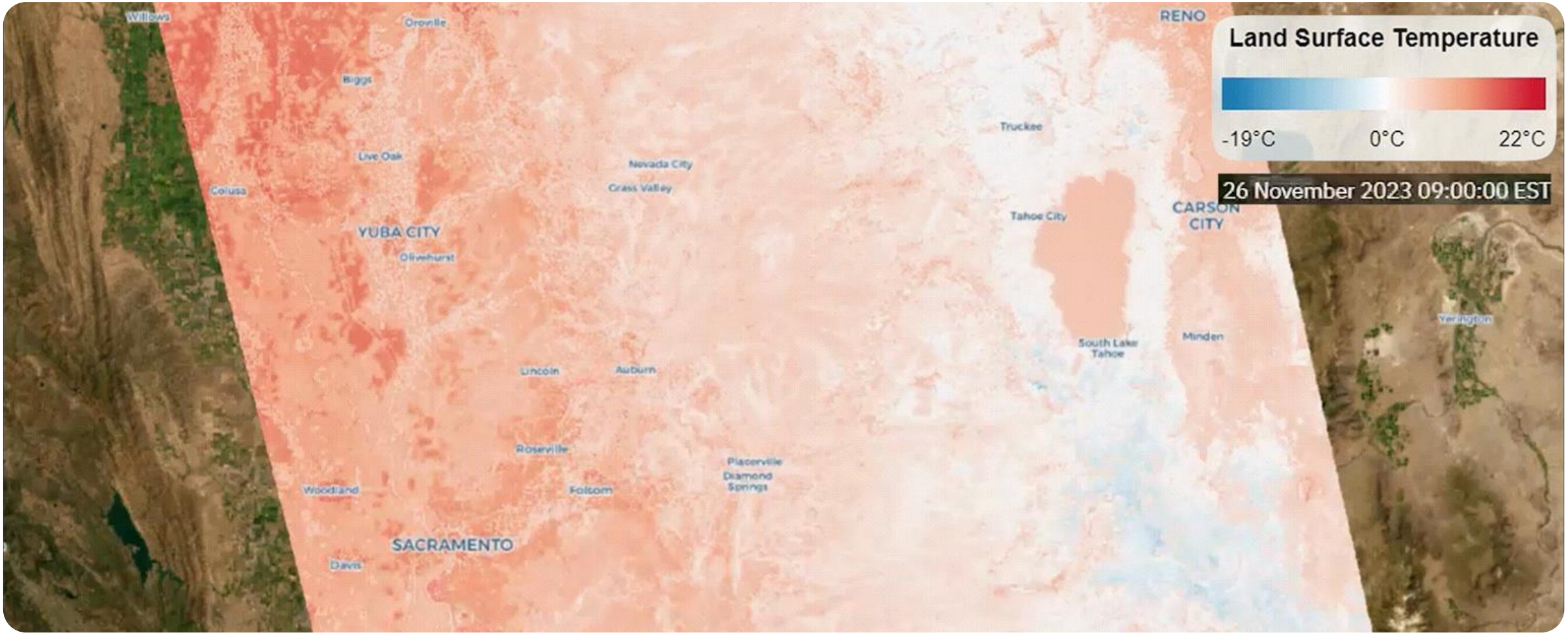
Our Prediction

Seasonal

Long-term fire hazard







Vision: Thermal Digital Twin of our planet.

Thank you!

Questions?

Julia Gottfriedsen

Head of Data Science & AI

julia.gottfriedsen@ororatech.com

We're hiring!
https://ororatech.com/careers/

OroraTech