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# “Using Earth Observation data, drones and augmented reality for disaster management in Portugal“

Vanina Fissore (Head of Unit - R&D at Ithaca S.r.l.), OVERWATCH project



## Project overview



Start: November 2022  
End: April 2026  
Duration: 42M  
Currently at M37

<https://overwatchproject.eu/en/>



Project funded from the Horizon Europe call "HORIZON-EUSPA-2021",  
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# Technologies and aims

The OVERWATCH project seeks to develop an **integrated crisis management system** to enhance communication, information gathering and coordination among disaster response teams in case of **wildfire and flood events**.



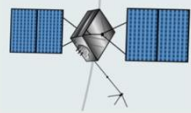
Earth Observation



Drones



Artificial Intelligence



GNSS – Galileo HAS

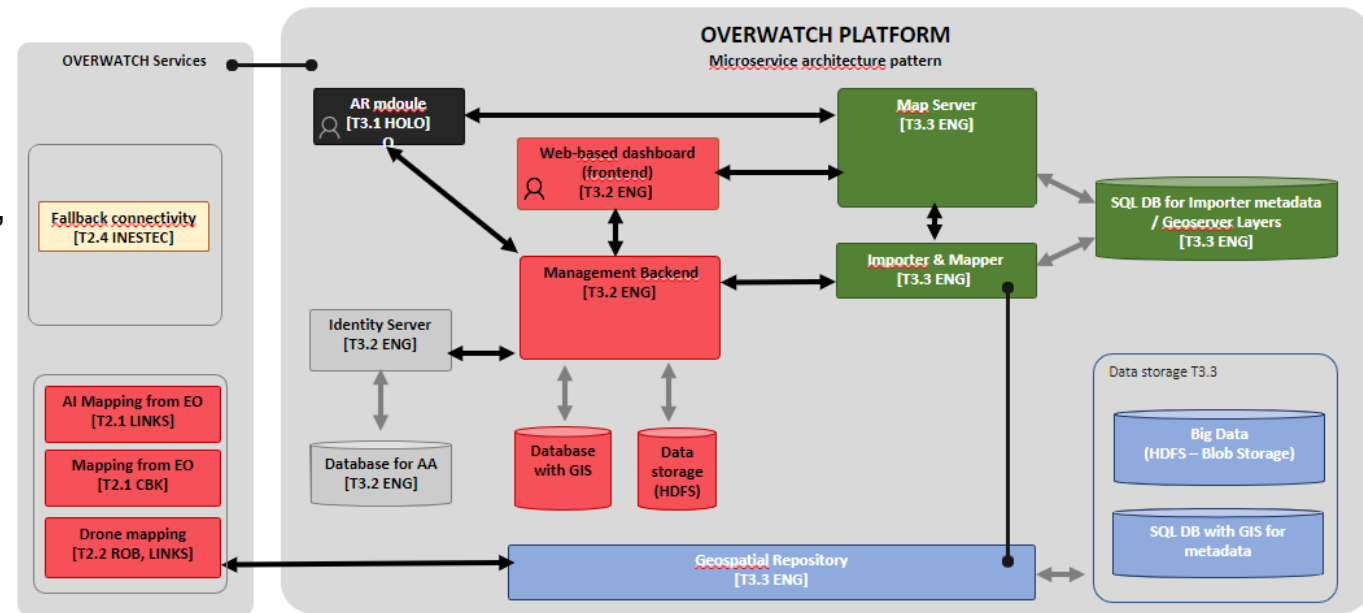


Augmented Reality



# System concept

- OVERWATCH Platform
  - Management Backend, Map Server, Importer & Mapper, DBs, Data Storage, Geospatial Repository, Identity Server, Web Dashboard
  - AR
- OVERWATCH Services and Hardware
  - Fallback Connectivity
  - AI Mapping from EO
  - Drone Mapping



# Challenges

Wildfire pilot demonstration in Portugal,  
27-31 October 2025, Santa Margarida  
Military Camp.

- Ensure communications
- Support decision-making
- Acquire (and make available) reliable and accurate geospatial information of the ongoing disaster event





## Wildfire pilot demonstration



# Challenges vs. solutions

## Ensure communications – Deploy a Resilient Emergency Communication Network

The **Fallback Connectivity (FC) module**, ensures robust emergency communications when terrestrial networks fail. By deploying a **tethered drone equipped with a satellite backhaul**, the FC module provides an aerial hotspot offering Wi-Fi coverage to field teams and ground stations to exchange voice, images and metadata. It establishes a reliable link between the Emergency Communication System and the AI-based Incident Management System (AIMS), maintaining the communication flow among emergency responders.

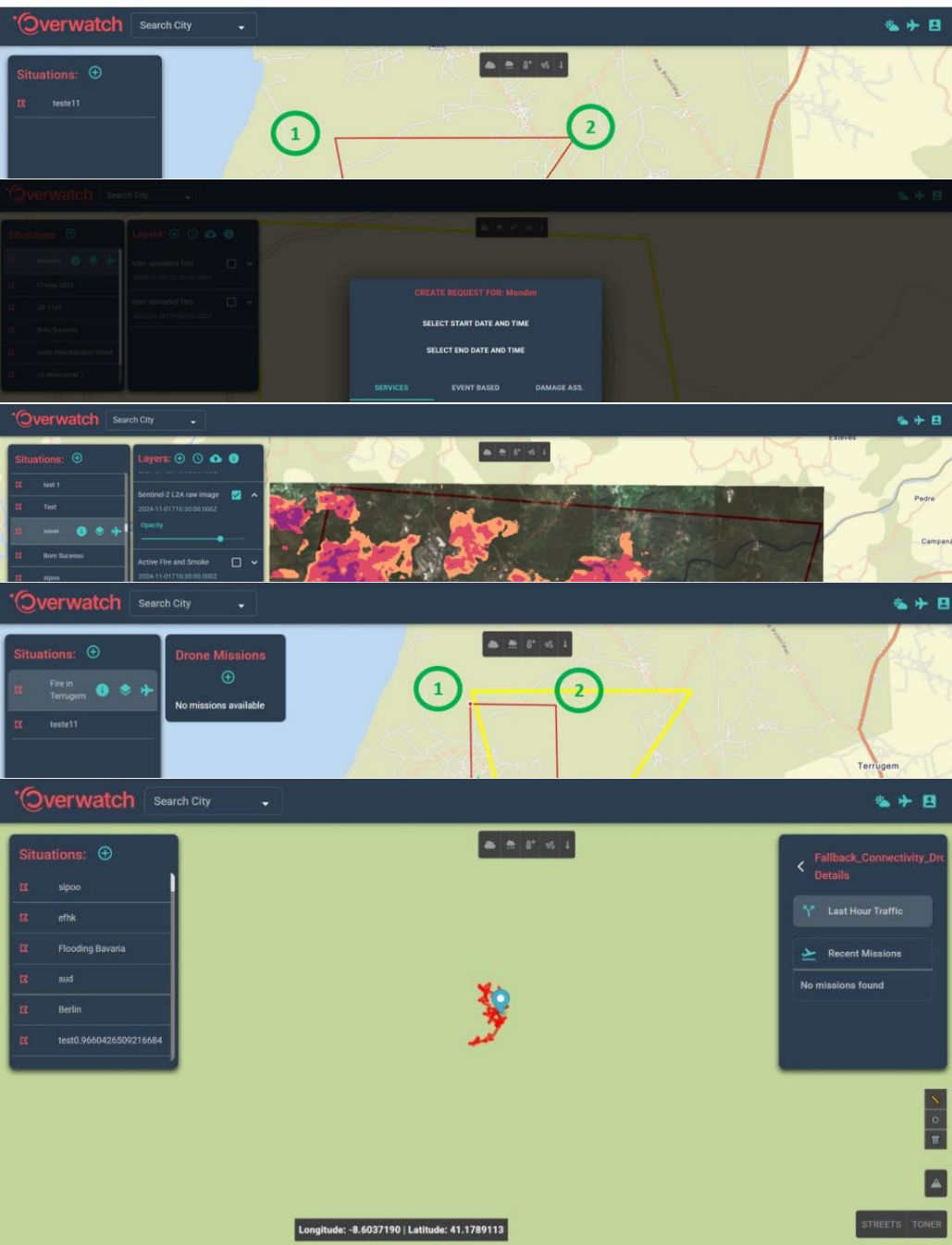


# Support decision-making - Manage the Response to a Forest Fire.

Enabling the management of the overall response to a forest fire, via OVERWATCH platform through the command interface, continuously updating the AIMS with data from drones and EO sources.

Walkthrough steps:

1. Creation of a Situation Awareness
2. Request Mapping Services
3. Ingestion of the EO Service outcome
4. Visualization of the WMS layers
5. Drone Deployment
6. In-field communication with the drone may be carried out through the Fallback Connectivity module
7. Visualization of the WMS layers of Drone flight result





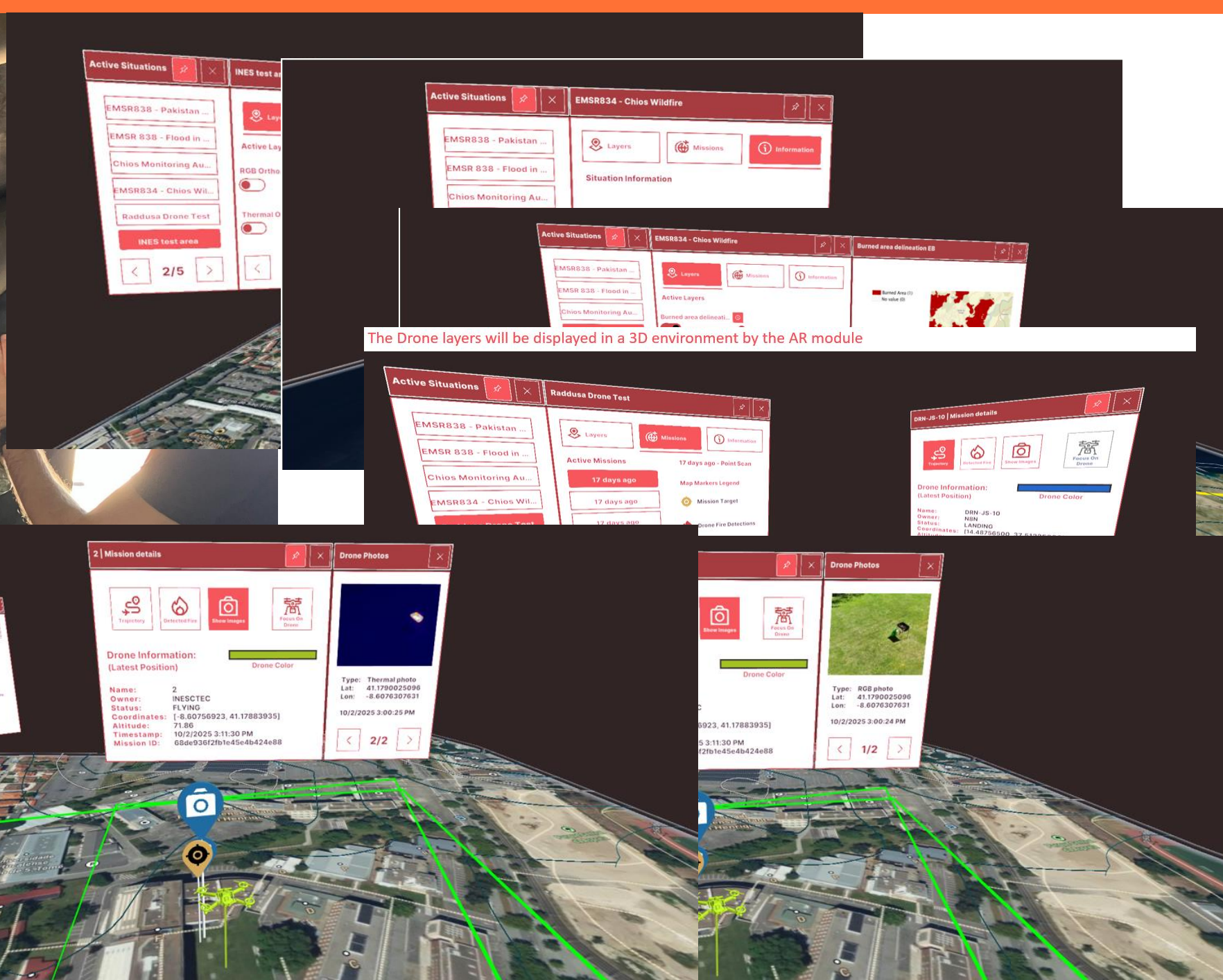
## Acquire reliable and accurate geospatial information of the ongoing disaster event - **Support Situation Assessment and Reconnaissance Teams**

**Drone deployment** to collect RGB and thermal imagery. Acquired data are processed by the **AI-based Mapping from EO Service** to get thematic geospatial layers, such as burned area delineation, fire severity estimation, and vegetation/fuel analysis. These outputs are integrated into the **OVERWATCH Geospatial Repository and Map Server** via the **Importer & Mapper**, creating actionable visual data for Situation Assessment and Command and Control (C2).

# Augmented Reality (AR) Module.

The platform functionalities can be visualized and navigated in the AR devise.

The AR Module enhances situational awareness by projecting real-time geospatial data in a 3D environment, supporting decision-making and resource allocation by the Incident Commander.



# Conclusion

Every single component of the system (Dashboard, data ingestion, communication among components, AR, drone...), was successfully tested as stand-alone units, confirming the robustness of the stand-alone functionalities.

**End-users** were engaged and showed strong interest in the tools and demonstrations. They had the occasion to try it and we could collect their feedback through questionnaires.

## Next steps

**A further technical day** to test the communication between the acquiring drone and the OW platform, i.e. integration.



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