URBAN SQUARE

UrbanSquare: DestinE Empowering Urban Resilience Against Climate Challenges

Destination Earth User eXchange #3

15-16 October 2024

esa imperative space SISTEMA ENVIRONMENTAL INFORMATION MINING MOZAIKA MURMURATION

Agenda

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- Introduction
- The Team
- The Challenge
- Focus on Flood
- Next steps
- Audience Q&As

Introduction

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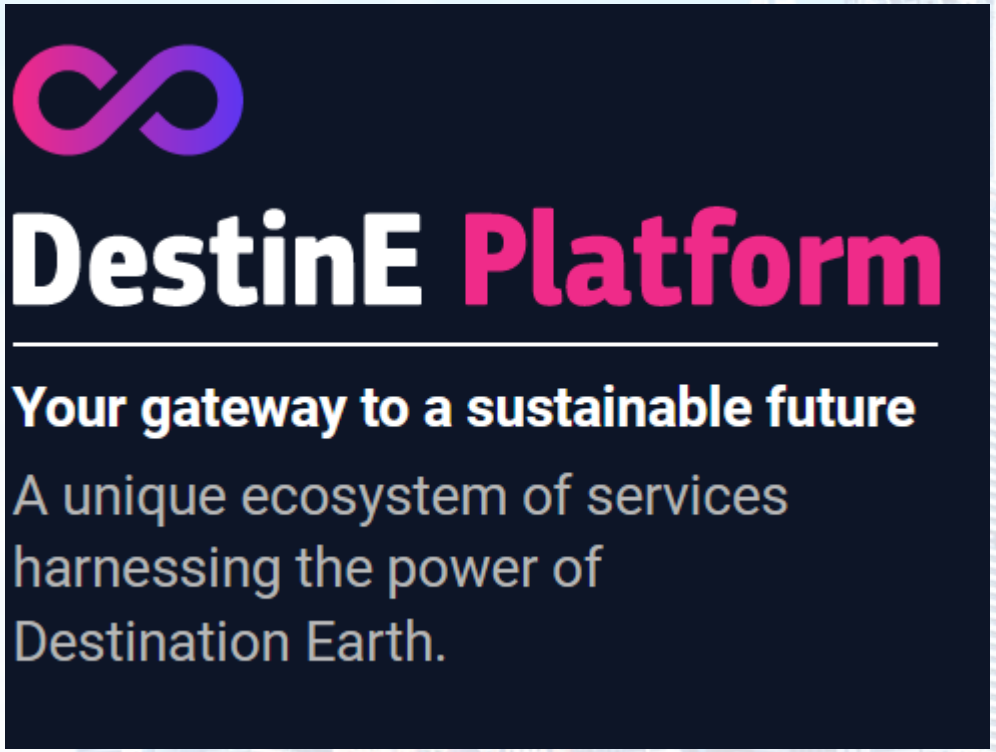

5 DestinE use-cases:

- GFTS
- DESIDE
- CityNexus
- DRE
- **UrbanSquare**

The Team

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The Challenge

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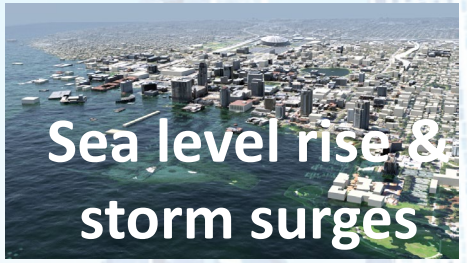
Understanding and mitigating the impacts of heat waves, storms, air pollution, flooding, and infrastructure disruptions



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Flood

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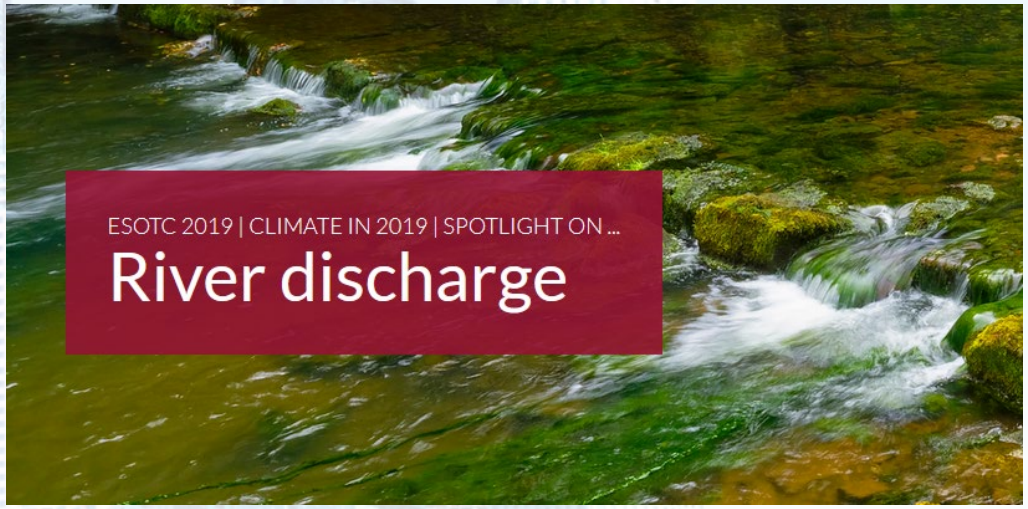
Focus: what is the challenge that municipalities are facing regarding flooding ?

Climate change: recent years river discharge across Europe

- Lower than average 2/3 of the year
- November and December 158 flood notifications

This has important impact on the climate conditions in the entire continent.

https://climate.copernicus.eu/ESOTC/2019/river-discharge



Flood

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Municipalities

- Engaged in emergency response situations
- Comply with national level emergency response regulations
- Implement centralized flood risk reduction measures
- Face damage control needs
- Responsible for the population
- Identify and plan the recovery of urban infrastructure
- Relate and cater to inundated agricultural fields
- etc.

Need

- Get warning about an upcoming flood way in advance
- Get indication about the flood span and the size of the damages
- Plan in compliance with the emergency response regulations
- Get information about what resources will be needed for recovery
- Be able to plan based on what-if scenarios

Flood

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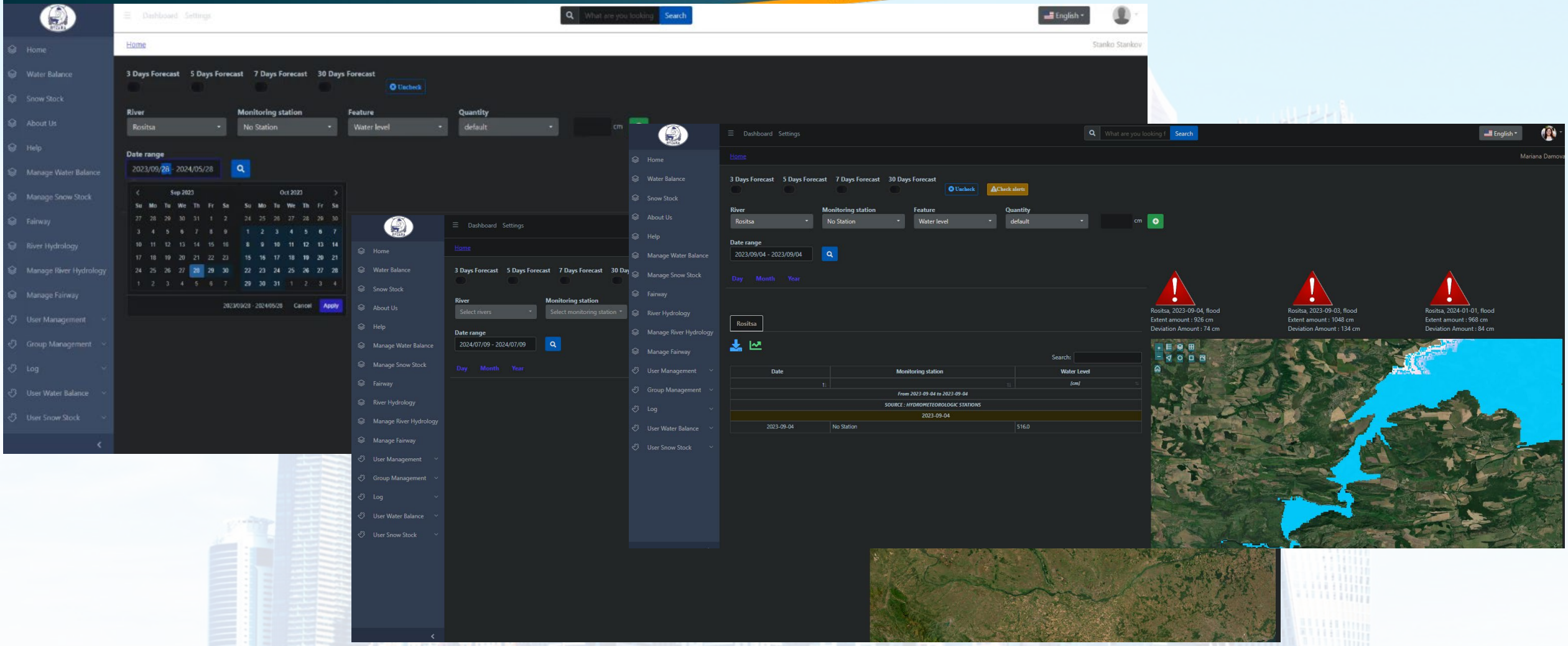

Flood span and damages evaluation

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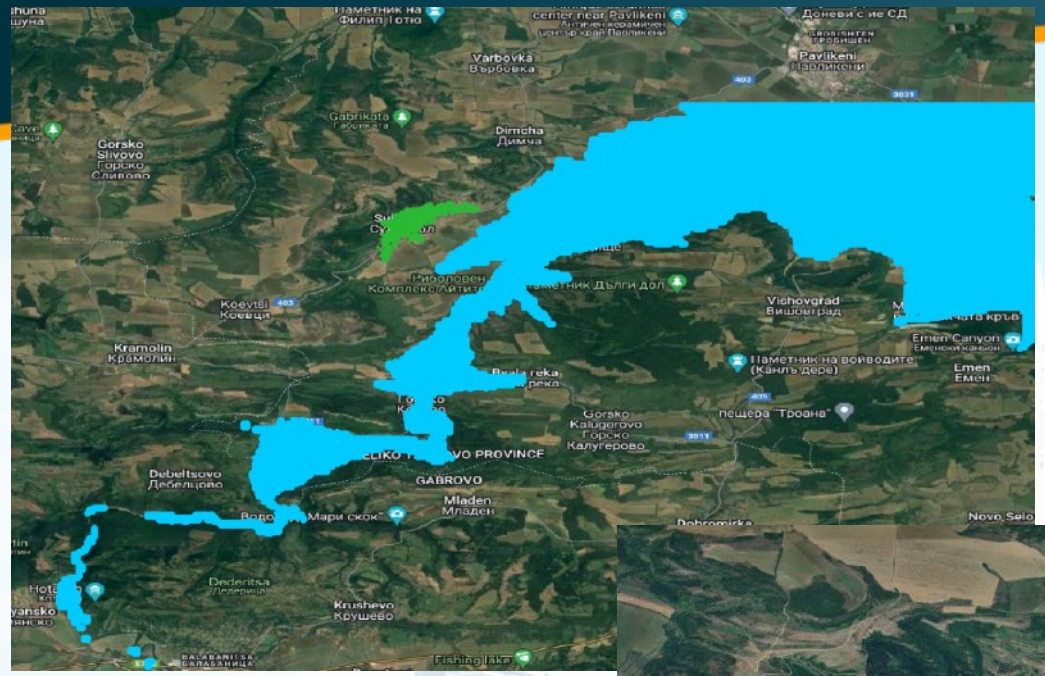

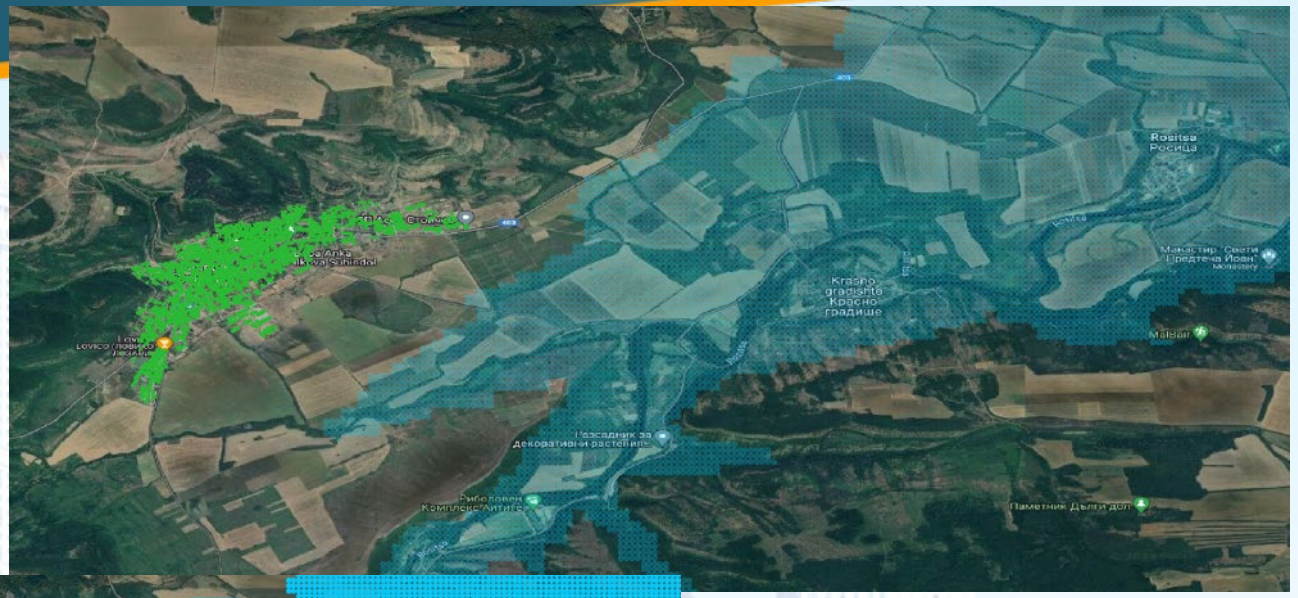

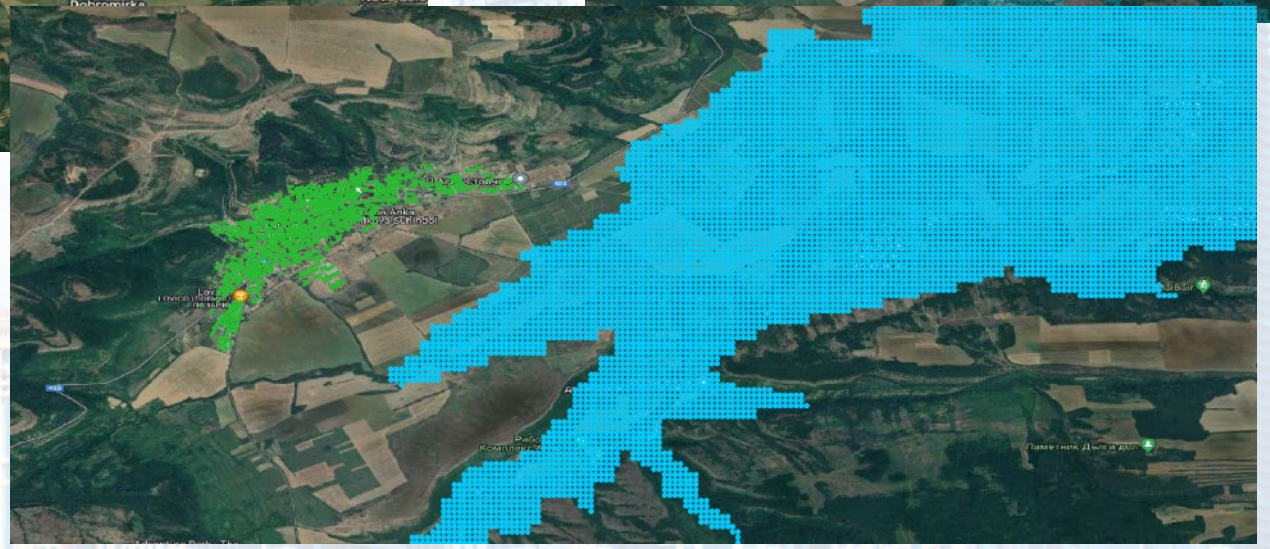

Flood forecasting and simulation

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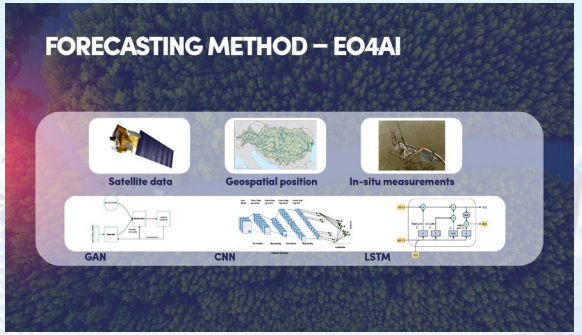
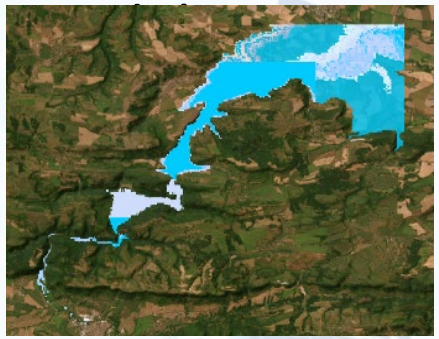
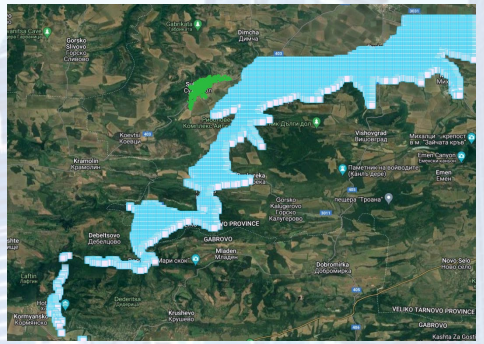
EO4AI to forecast water levels and river discharge for 30 days ahead and more



Simulation with increased of discharge and precipitation levels and elevation



Design and experiment with What-if scenarios via administrative GUI



DestinE integration → **Go global**

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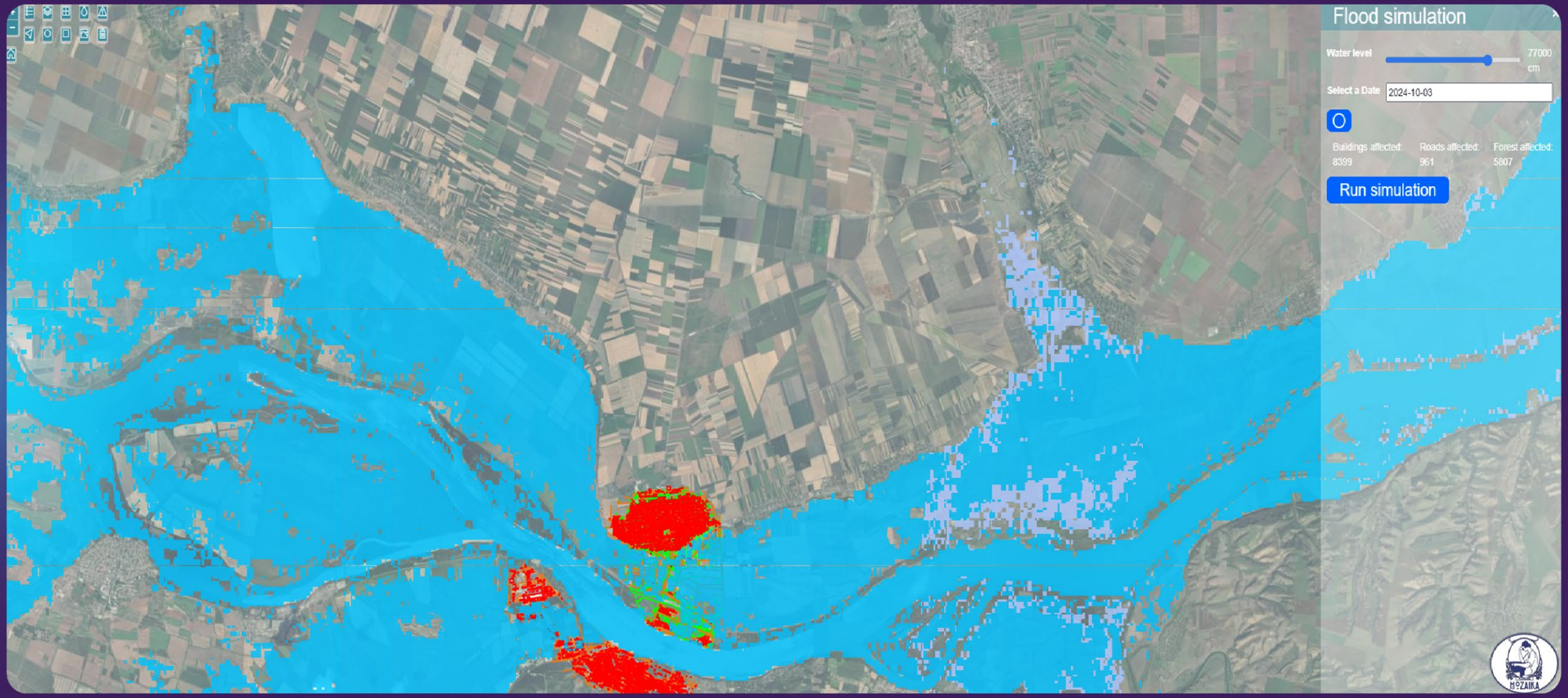
FLOOD SIMULATION AND FORECASTING



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Next steps

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The tools to scale-up

- Generalise the approach to a global scale service
- Adapt to a growing number of instantiations across the globe
- Building on DestinE as an operational platform : scalability & efficient data access

One place to access a wide range of data

Dataset	Component
CAMS air quality forecast	Air
ERA-5 meteorological condition	Air
Landsat 8/9 thermal imagery	Heat
Sentinel-2 optical imagery	Heat, Infrastructures
Water quantity indicators	Flood
CAMS solar radiation	Flood
CLMS vegetation indices	Flood
CEMS River discharge	Flood
Copernicus Elevation Model	Sea level rise, Air
Climate Digital Twin	Air, Heat, Sea level rise, Flood, Resources
Eurostat Population distribution	Resources

Air quality dashboard

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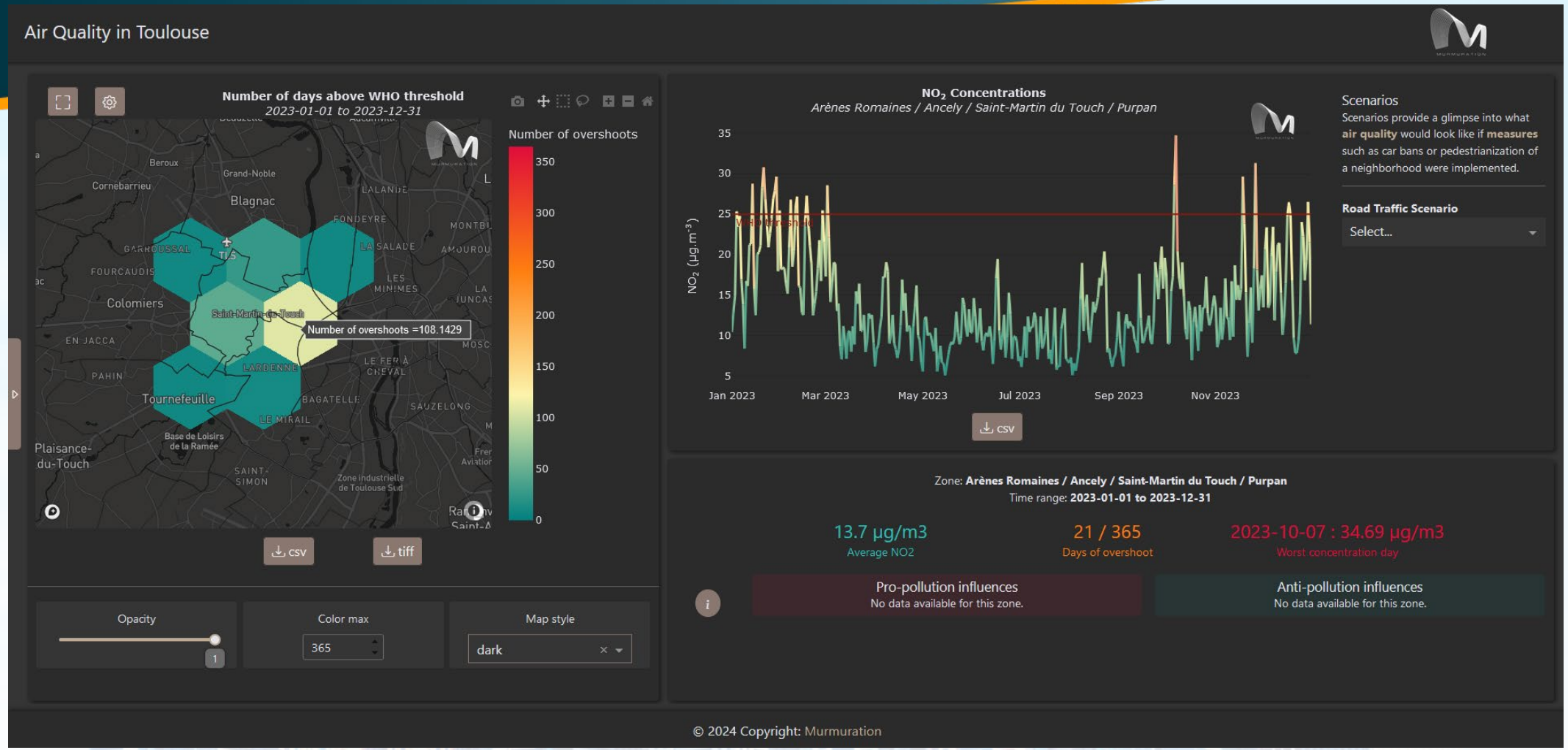

Audience Q&As

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Any questions?