GEO VIRTUAL SYMPOSIUM 2021

Parallel Session F: EuroGEO contributions to disaster resilience

EuroGEO Disaster Resilience Action Group: The operational FloodHub system for flood early warning and monitoring

Thursday

24/06/2021

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CHALLENGE: Flood was the most frequent type of disaster and the only one increasingly deadly in 2020

Figure 2

Occurrence by disaster type: 2020 compared to 2000-2019 annual average

368 2000 to 2019 < 389 in 2020

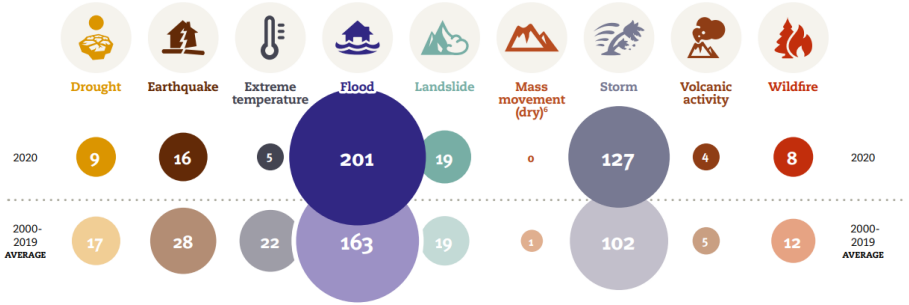
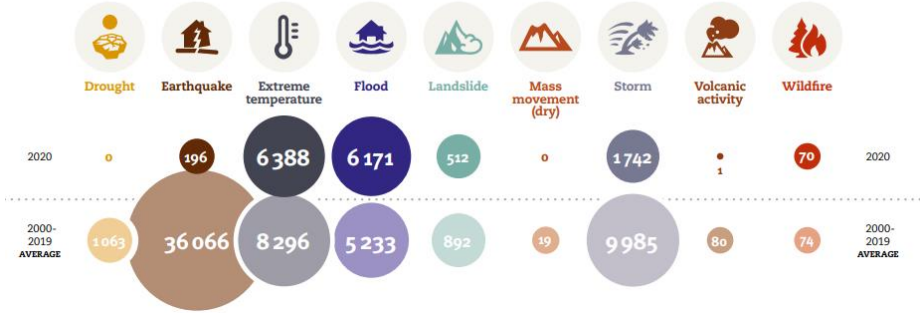


Figure 4

Number of deaths by disaster type: 2020 compared to 2000-2019 annual average

61,709 2000 to 2019 > 15,080 in 2020



Flood in Mandra, Greece, 2017:

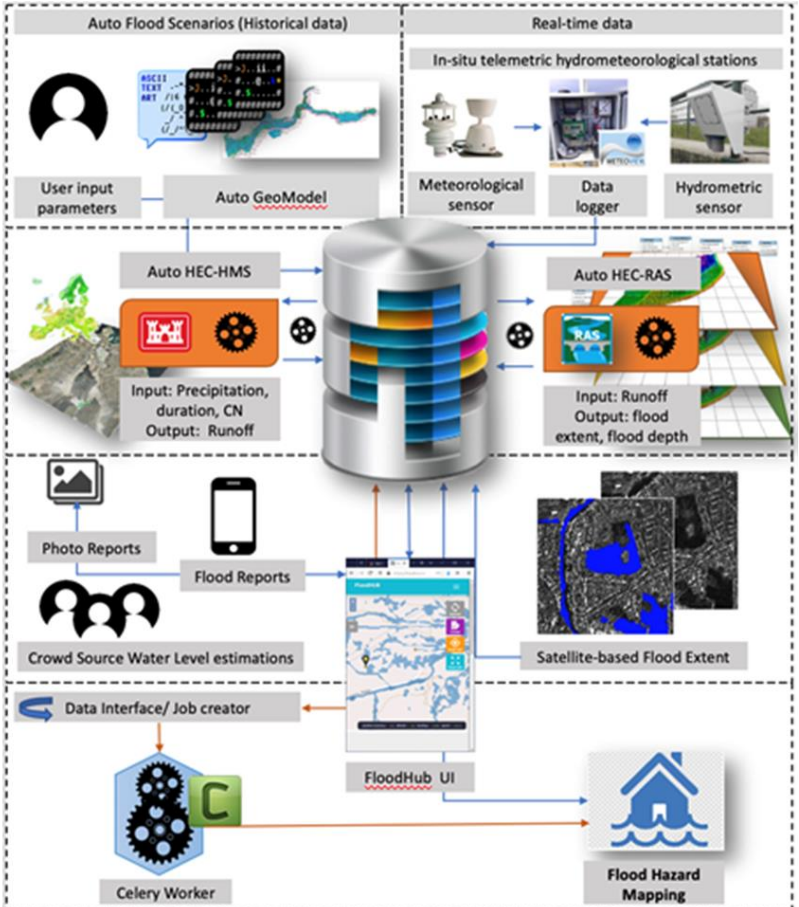
This extreme flash flood event affected the urban and suburban area of Mandra with landslides, extensive million-euro damages to property and infrastructure and 24 recorded fatalities rendering it the deadliest flood in Greece in the last 40 years.

Source: Centre for Research on the Epidemiology of Disasters & UN Office for Disaster Risk Reduction, 2021

SOLUTION: Floods Monitoring & Early Warning Architecture of the FloodHUB system

An integrated near-real-time flood monitoring system:

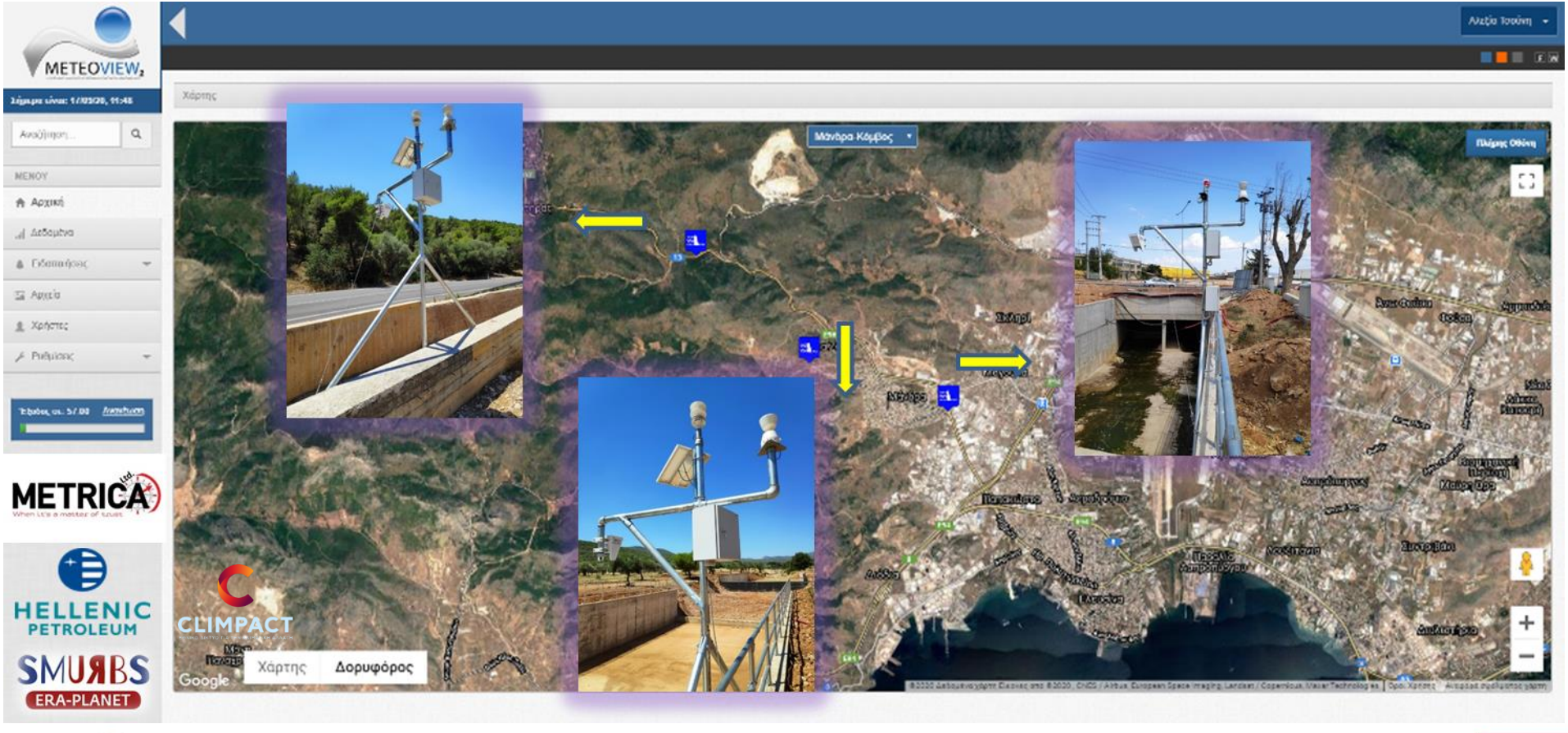
- based on modeling, multi-source EO and crowdsourced data
- with a fully scalable and transferable modular architecture
- delivering a reliable operational awareness picture of the crisis every 5-15 minutes to all the relevant authorities



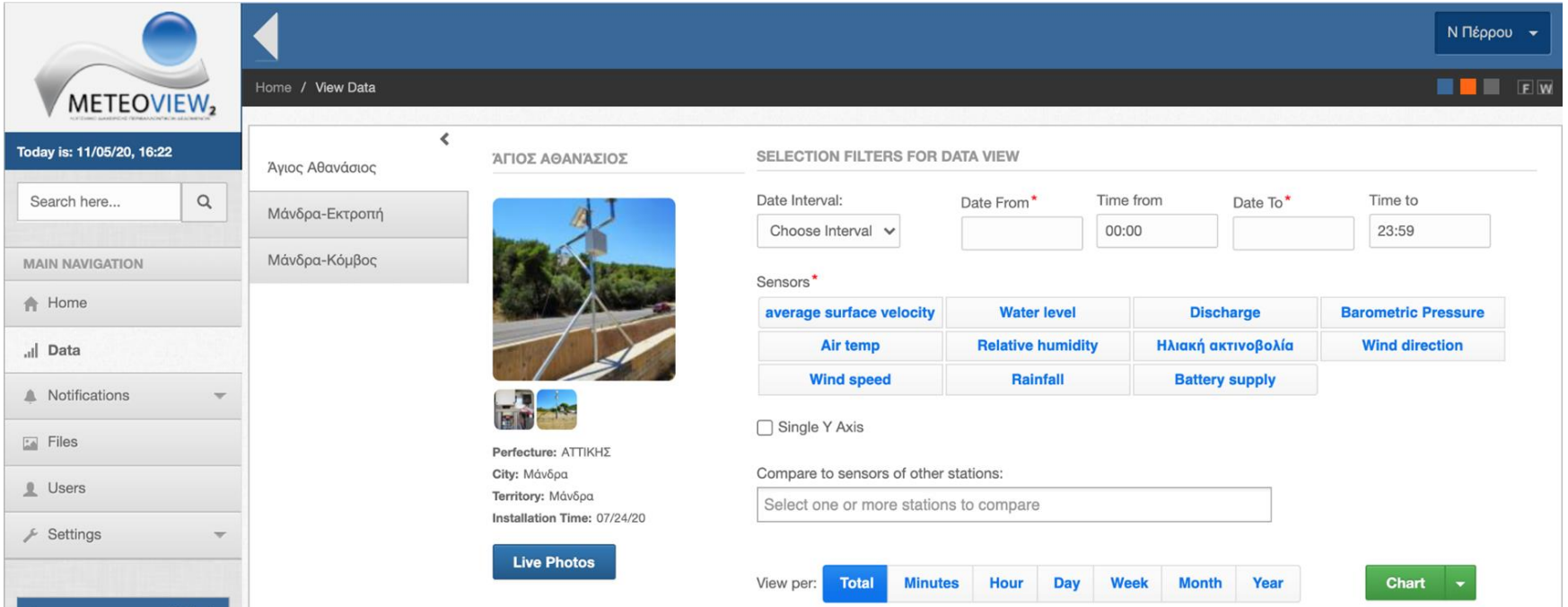
Near-real-time ingestion and assimilation of:

- hydrometeorological parameters measured at 3 in-situ telemetric stations (installed at 3 critical locations)
- satellite data (e.g. from high resolution Sentinels collected from the Hellenic Mirror Site)
- crowdsourced data (collected via the dedicated crowdsourcing platform).

FloodHub: Web platform of the 3 telemetric hydrometeorological stations

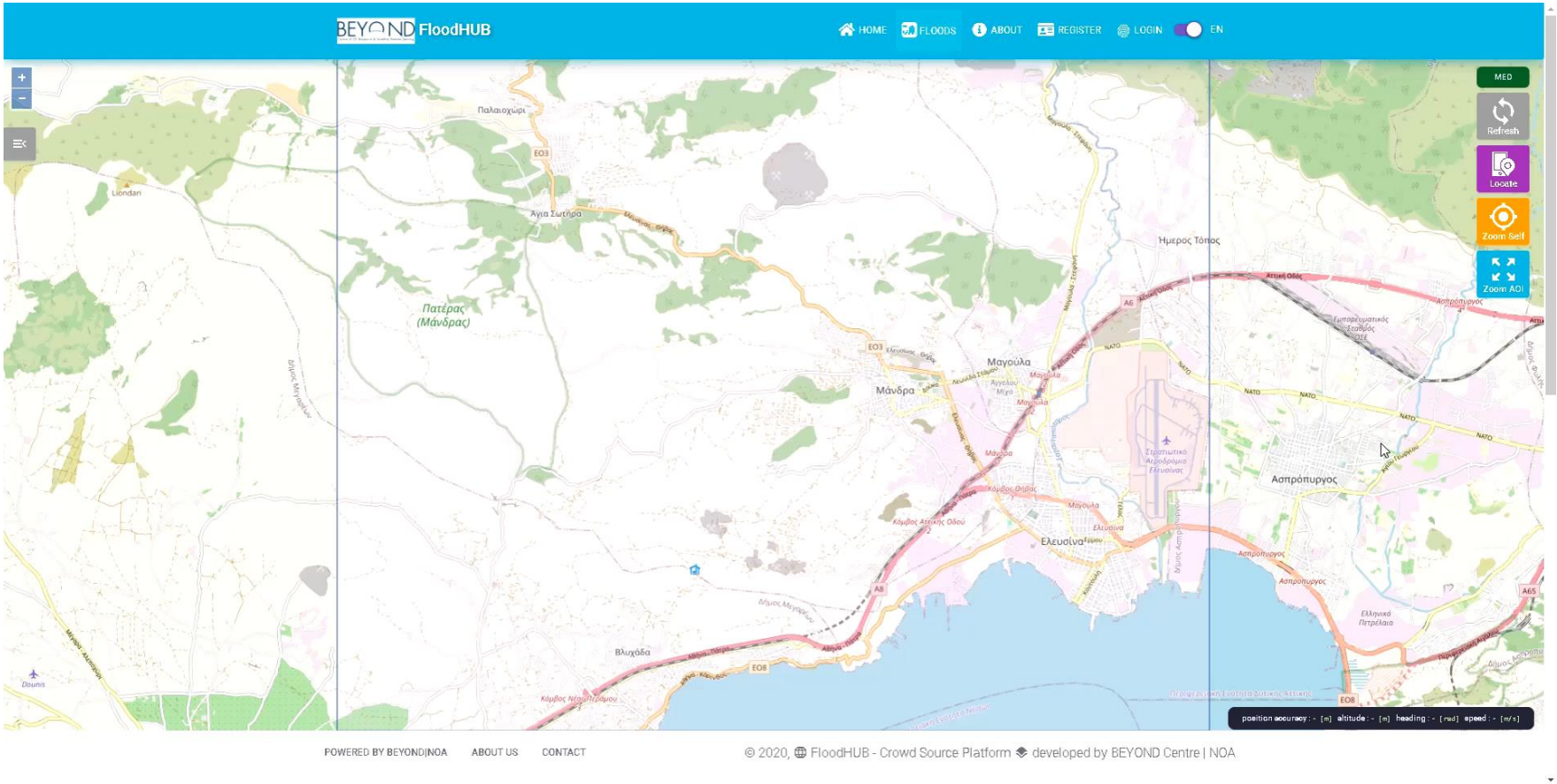


FloodHub: Web platform of the 3 telemetric hydrometeorological stations

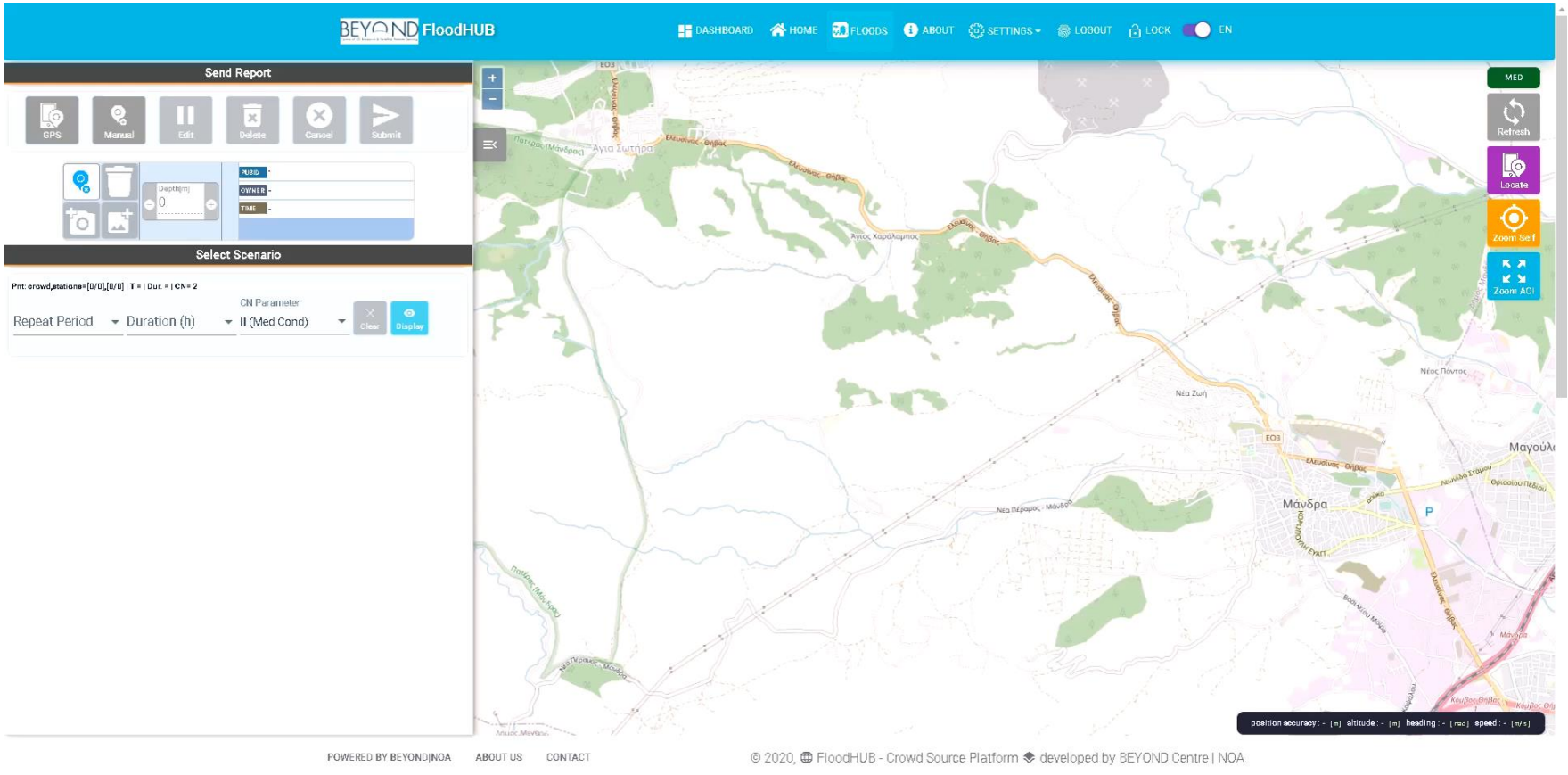


The BEYOND Center of Excellence can now provide **to the relevant operational bodies (e.g. civil protection and local authorities)** every **5-15 minutes** measurements for **10 parameters:** rainfall, water level, discharge, average surface water velocity, wind direction, wind speed, air temperature, barometric pressure, relative humidity and solar radiation.

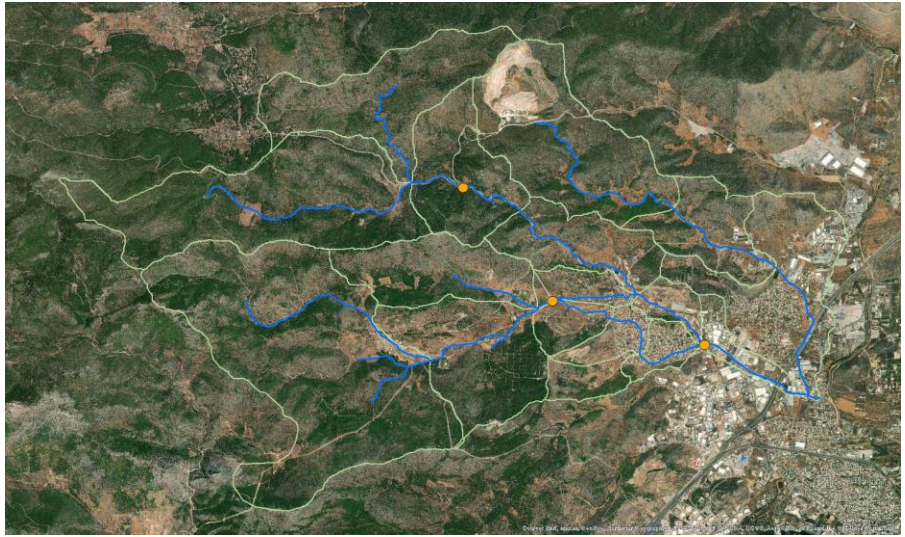
FloodHub: Integrated near-real-time flood monitoring and early warning system

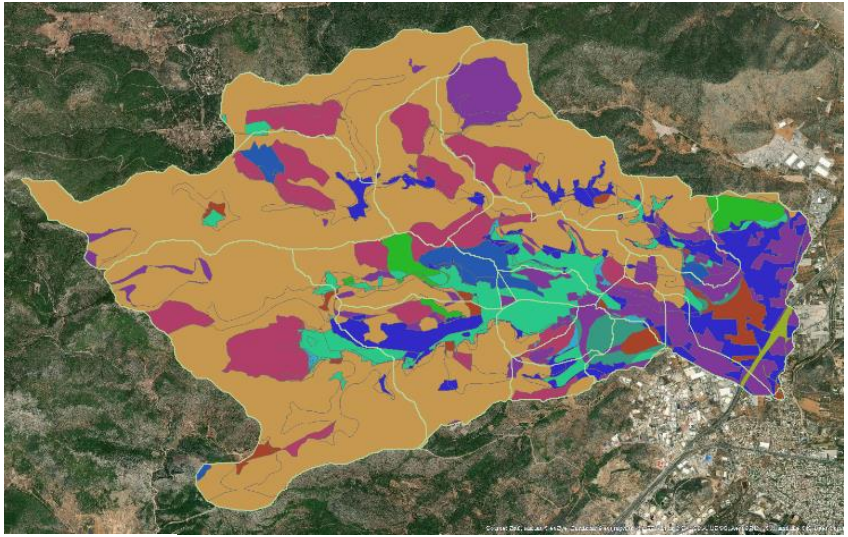


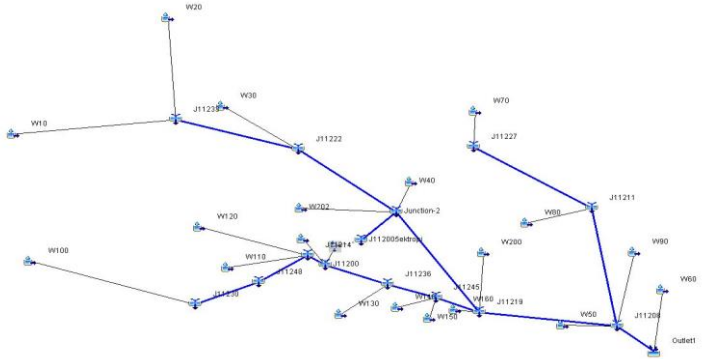
FloodHub: Integrated near-real-time flood monitoring and early warning system



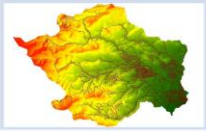
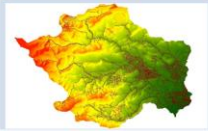
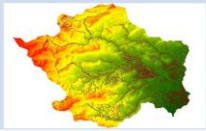
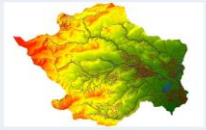
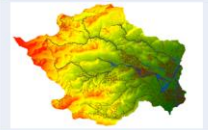
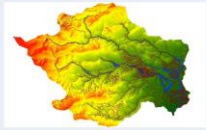
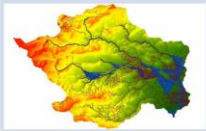
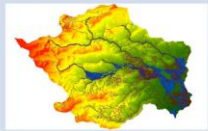
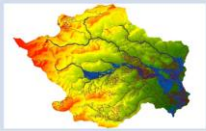
FloodHub: Hydrologic & hydraulic modelling







FloodHub: Flood mapping results

T = 50 years	d = 3 hours	d = 6 hours	d = 9 hours
CN I Dry conditions			
CN II Average conditions			
CN III Wet conditions			

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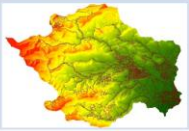
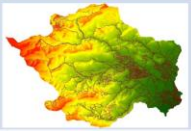
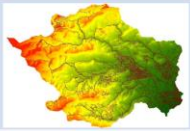
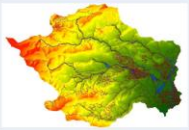
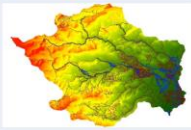
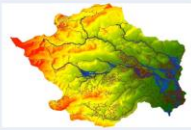
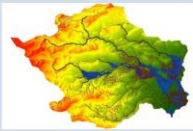
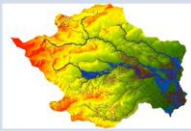
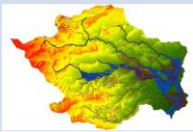
CN I Dry conditions			
CN II Average conditions			
CN III Wet conditions			

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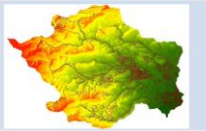
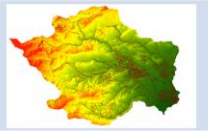
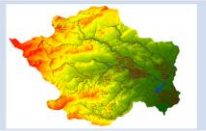
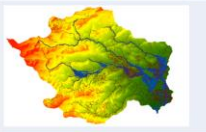
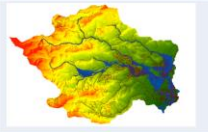
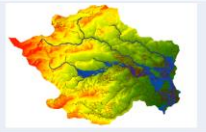
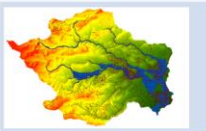
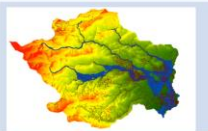
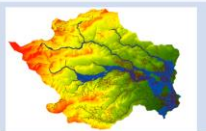
CN I Dry conditions			
CN II Average conditions			
CN III Wet conditions			

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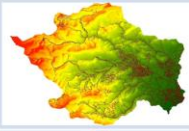
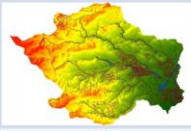
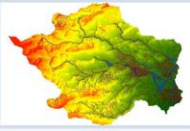
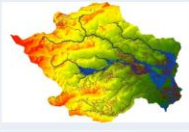
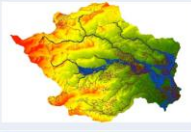
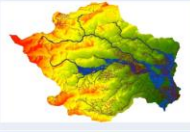
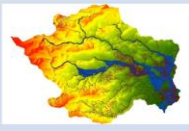
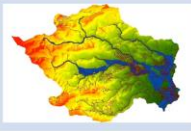
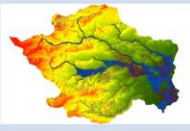
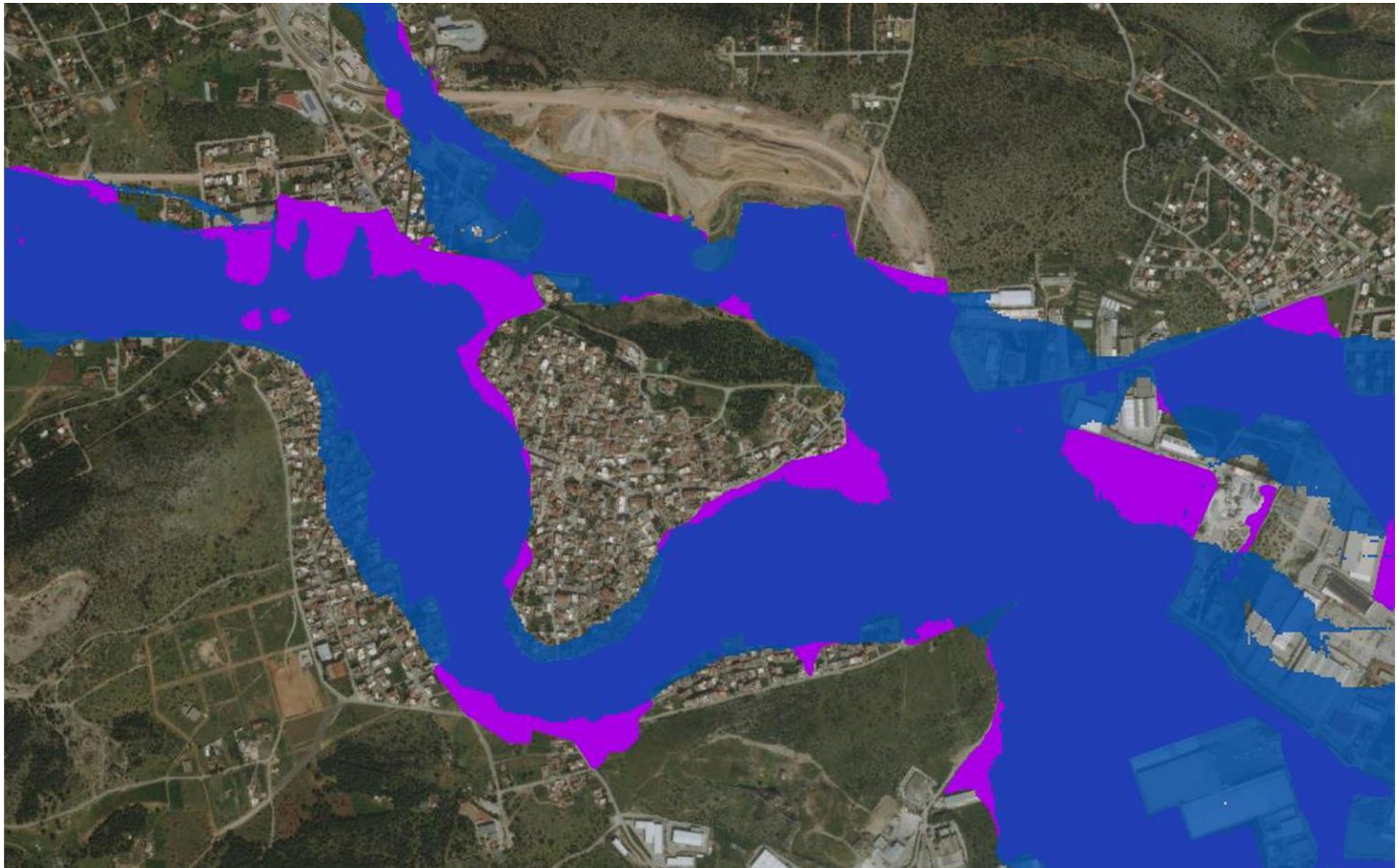
CN I Dry conditions			
CN II Average conditions			
CN III Wet conditions			

FloodHub: Validation

Blue: Simulation of flood scenario T1000 CNIII d6



Pink: VHR satellite-based mapping (Meteoview)

FloodHub: Co-design & capacity building

FloodHub: Supporting decision makers

In line with the requirements for the implementation of the:

- ✓ **EU Floods Directive 2007/60/EC "on the assessment and management of flood risks"**
- ✓ **Sendai Framework for Disaster Risk Reduction**
- ✓ **UN SDGs:**

- ✓ **GEO's Societal Benefit Areas:**
  - Disaster Resilience
  - Sustainable Urban Development
  - Water Resources Management
  - Public Health Surveillance
  - Food Security and Sustainable Agriculture
  - Infrastructure and Transportation Management

EuroGEO

Disaster Resilience Action Group

BEYOND

Centre of EO Research & Satellite Remote Sensing

http://beyond-eocenter.eu

FloodHUB

SMURBS

ERA-PLANET

EXCELSIOR

CLIMPACT

Thank You!

Alexia Tsouni, National Observatory of Athens, 24/06/2021

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Collaborate and communicate with GEO: