

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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National Observatory of Athens

EuroGEO



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 < 389
2000 to 2019 in 2020

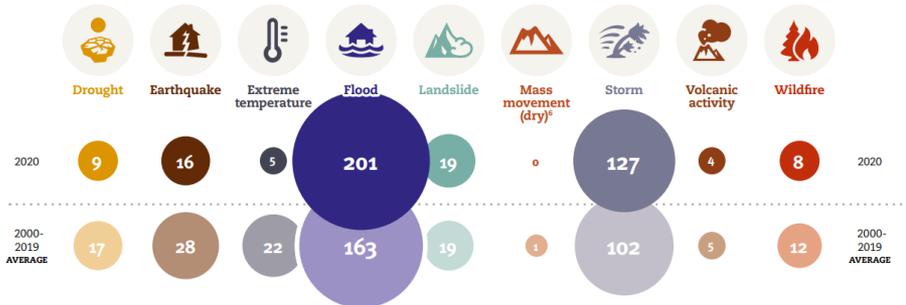
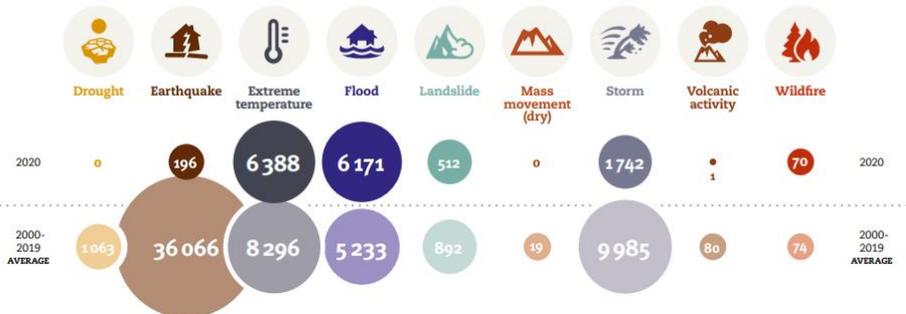


Figure 4

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

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



Flood in Mandra, Greece, 2017:

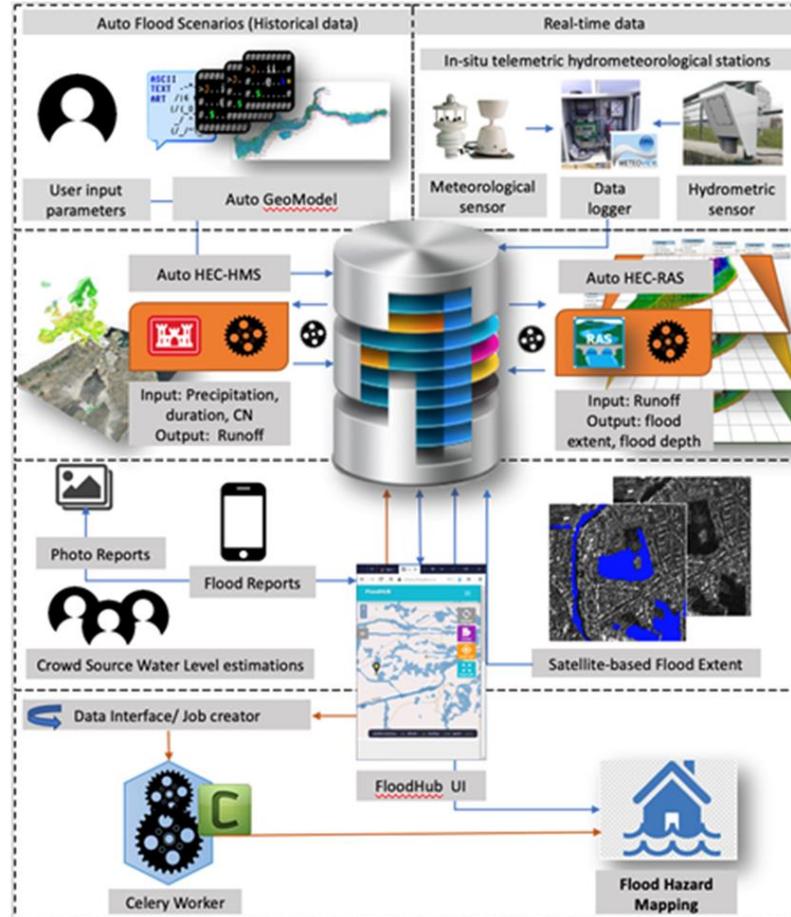
This extreme flash flood event affected the urban and suburban area of Mandra with landslides, extensive million-euro damages to property and infrastructure and 24 recorded fatalities rendering it the deadliest flood in Greece in the last 40 years.



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

Αγγλικά (αρχικά)

Σήμερα είναι: 11/03/20, 11:48

Αναζήτηση...

ΜΕΝΟΥ

- Αρχική
- Δεδομένα
- Εξοπλισμός
- Αρχείο
- Χρήστες
- Ρυθμίσεις

Έξοδος, αι.: 5/7/00

Χάρτης

Μάνηρα Κόμβος

Πλάγας Οθόνη

ΜΕΤΡΑ

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HELLENIC PETROLEUM

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FloodHub: Web platform of the 3 telemetric hydrometeorological stations

Today is: 11/05/20, 16:22

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METRICA
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Ν Πέτρου

Άγιος Αθανάσιος

Μάνδρα-Εκτροπή

Μάνδρα-Κόμβος

ΆΓΙΟΣ ΑΘΑΝΑΣΙΟΣ

Perfecture: ΑΤΤΙΚΗΣ
City: Μάνδρα
Territory: Μάνδρα
Installation Time: 07/24/20

[Live Photos](#)

SELECTION FILTERS FOR DATA VIEW

Date Interval: Choose Interval Date From* Time from 00:00 Date To* Time to 23:59

Sensors*

average surface velocity	Water level	Discharge	Barometric Pressure
Air temp	Relative humidity	Ηλιακή ακτινοβολία	Wind direction
Wind speed	Rainfall	Battery supply	

Single Y Axis

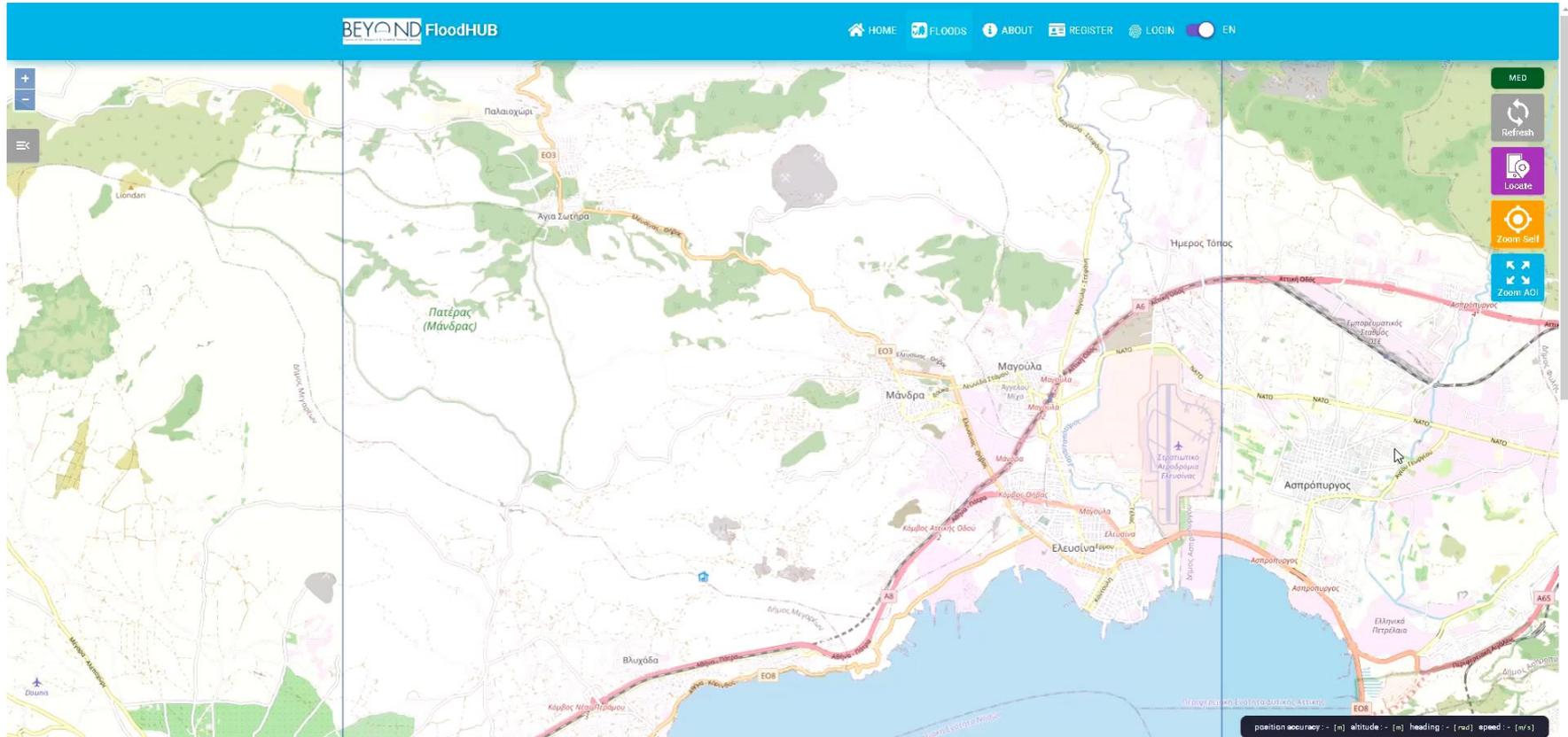
Compare to sensors of other stations:

View per: [Total](#) [Minutes](#) [Hour](#) [Day](#) [Week](#) [Month](#) [Year](#) [Chart](#)

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

BEYOND FloodHUB

DASHBOARD HOME FLOODS ABOUT SETTINGS LOGOUT LOCK EN

Send Report

GPS Monitor Edit Delete Cancel Submit

PERIOD: [dropdown]
COVERED: [dropdown]
TIME: [dropdown]

Select Scenario

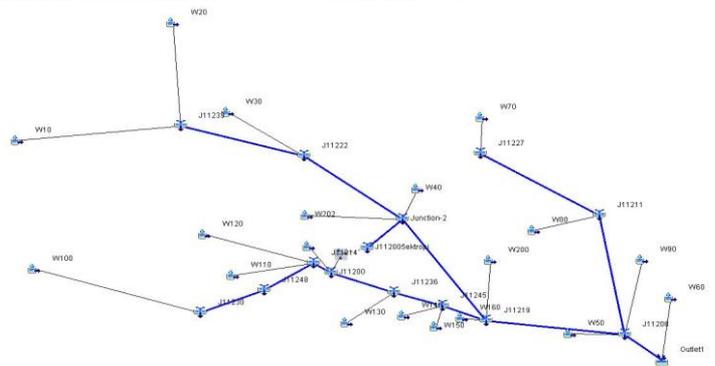
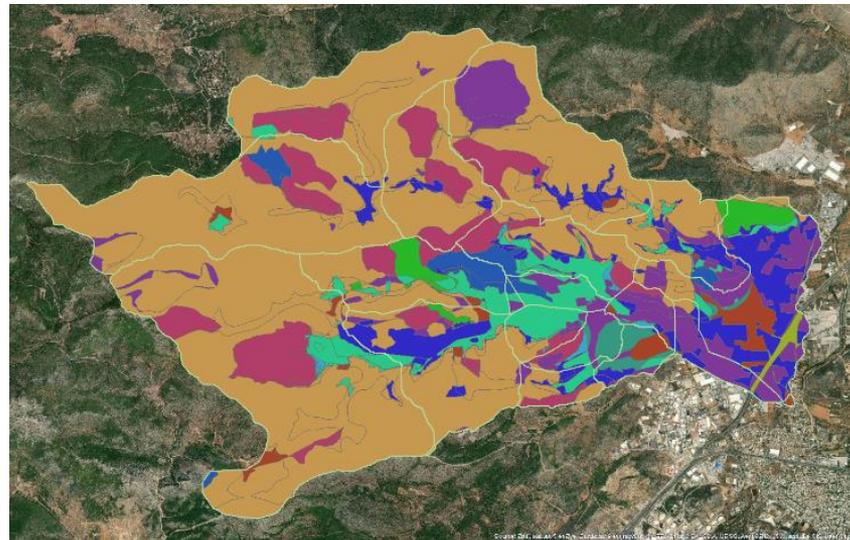
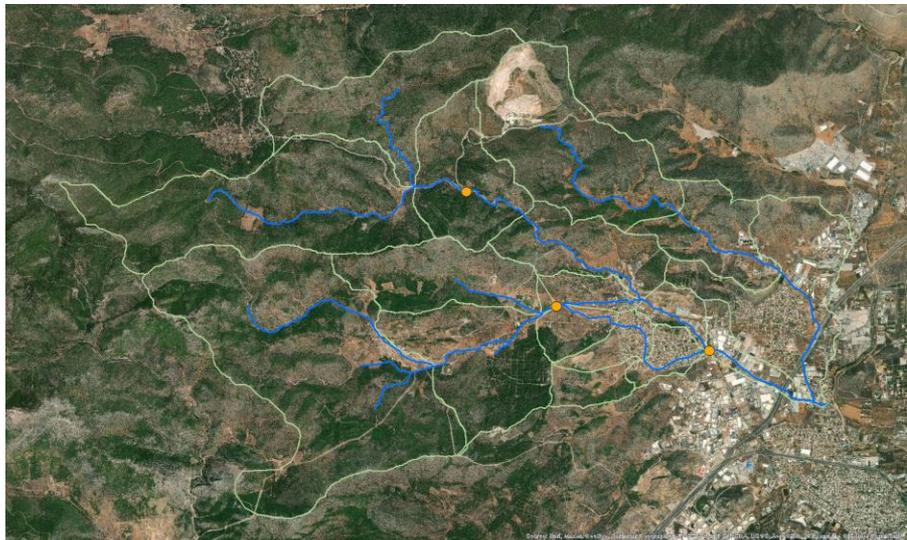
Print error, latitude=[0/0], [0/0] | IT = 1 | CN = 2

Repeat Period [dropdown] Duration (h) [dropdown] II (Med Cond) [dropdown] Clear Display

position accuracy: [m] altitude: [m] heading: [rad] speed: [m/s]

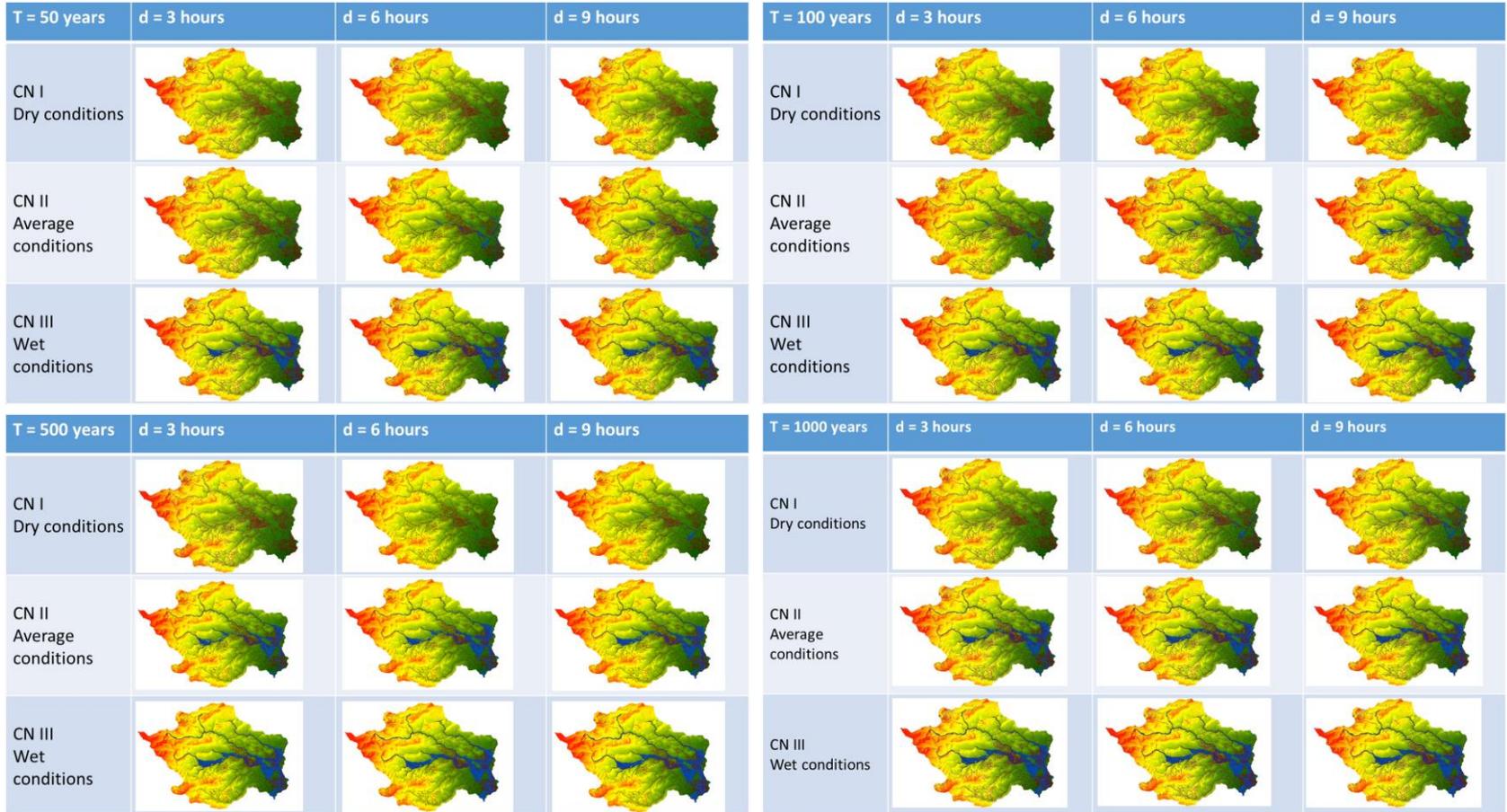


FloodHub: Hydrologic & hydraulic modelling



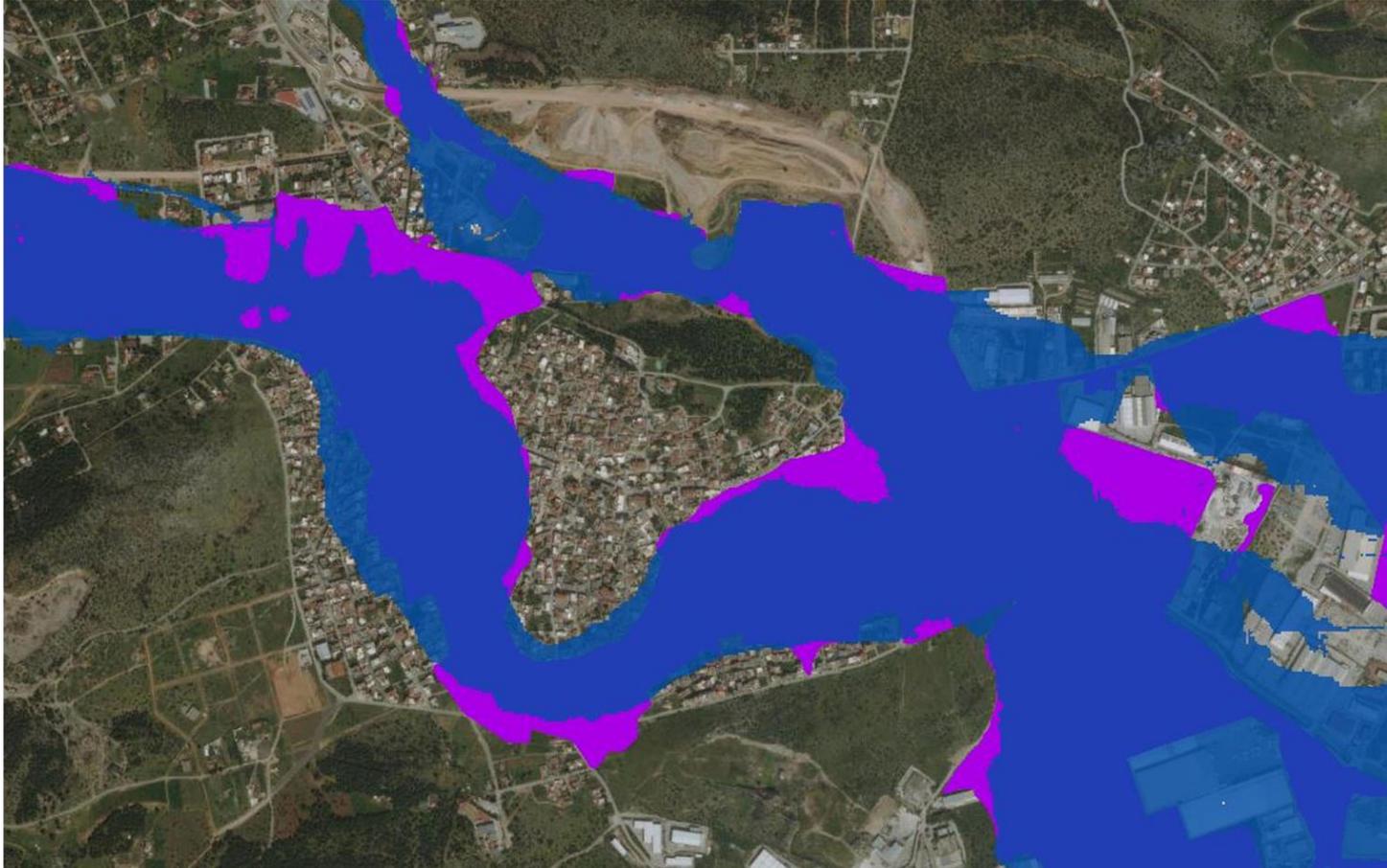


FloodHub: Flood mapping results





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



Disaster Resilience
Action Group



<http://beyond-eocenter.eu>



Thank You!

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

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Collaborate and communicate with GEO:

