

Outline

1. What is a Digital Twin?

2. SCORE DT-EWS System Architecture

SCORE Digital Twin Structure

The User Scenario Evaluation (USE) module

Ecosystem-Based Adaptation (EBA) solutions

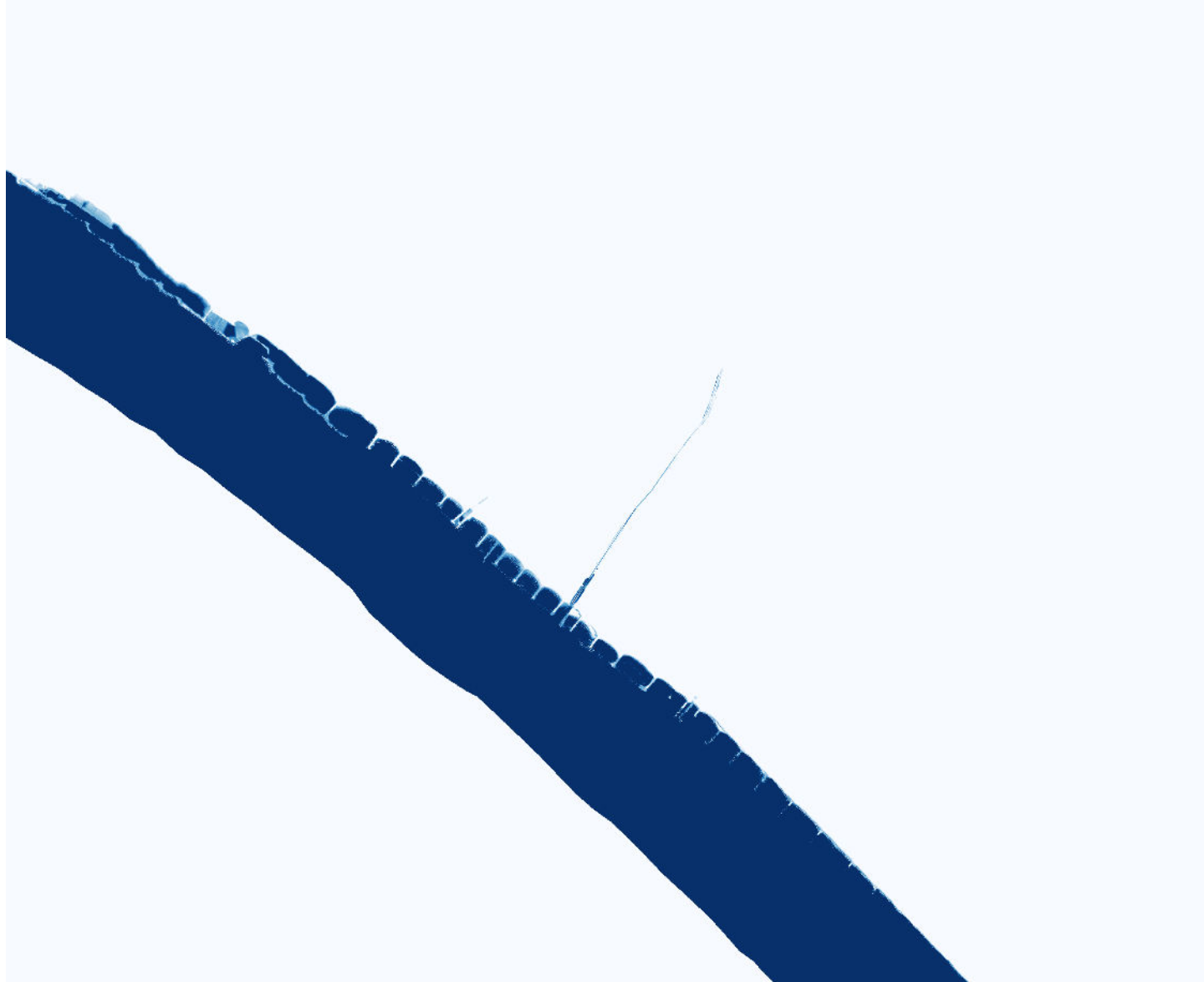
The Early-Warning Support (EWS) module

3. System usage

The Graphical User Interface (GUI)

Some examples of simulations outputs

Examples of simulation outputs – Intense rain event in the area of Massa (Italy)



Simulation duration: 1h

N. of frames: 20

Event settings: 15' no rain
30' @ 200 mm/h
15' no rain

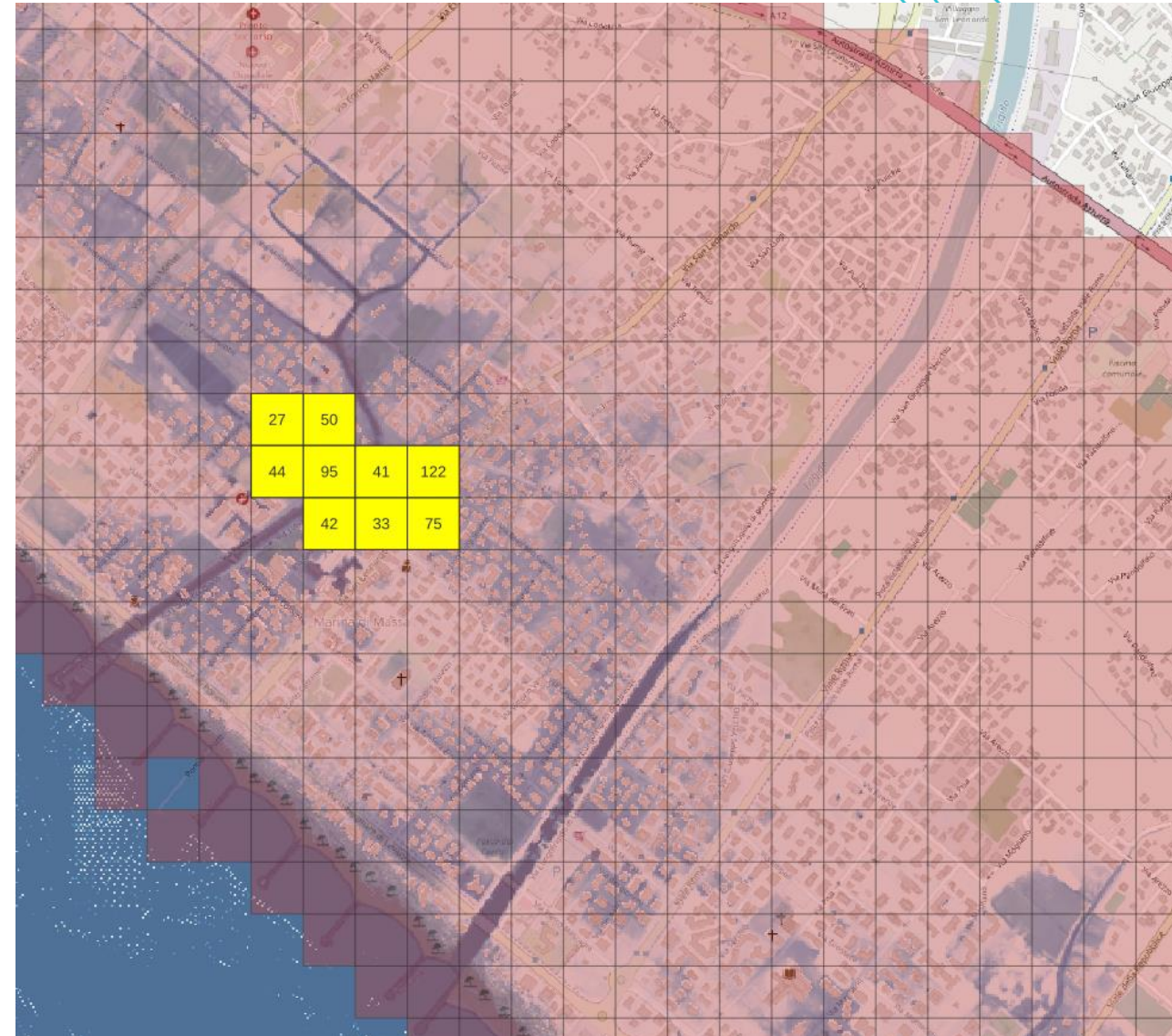
Examples of simulation outputs – Flooding maps

- Both EWS and USE, at the end of simulations, produce as output a flooding map of the study area



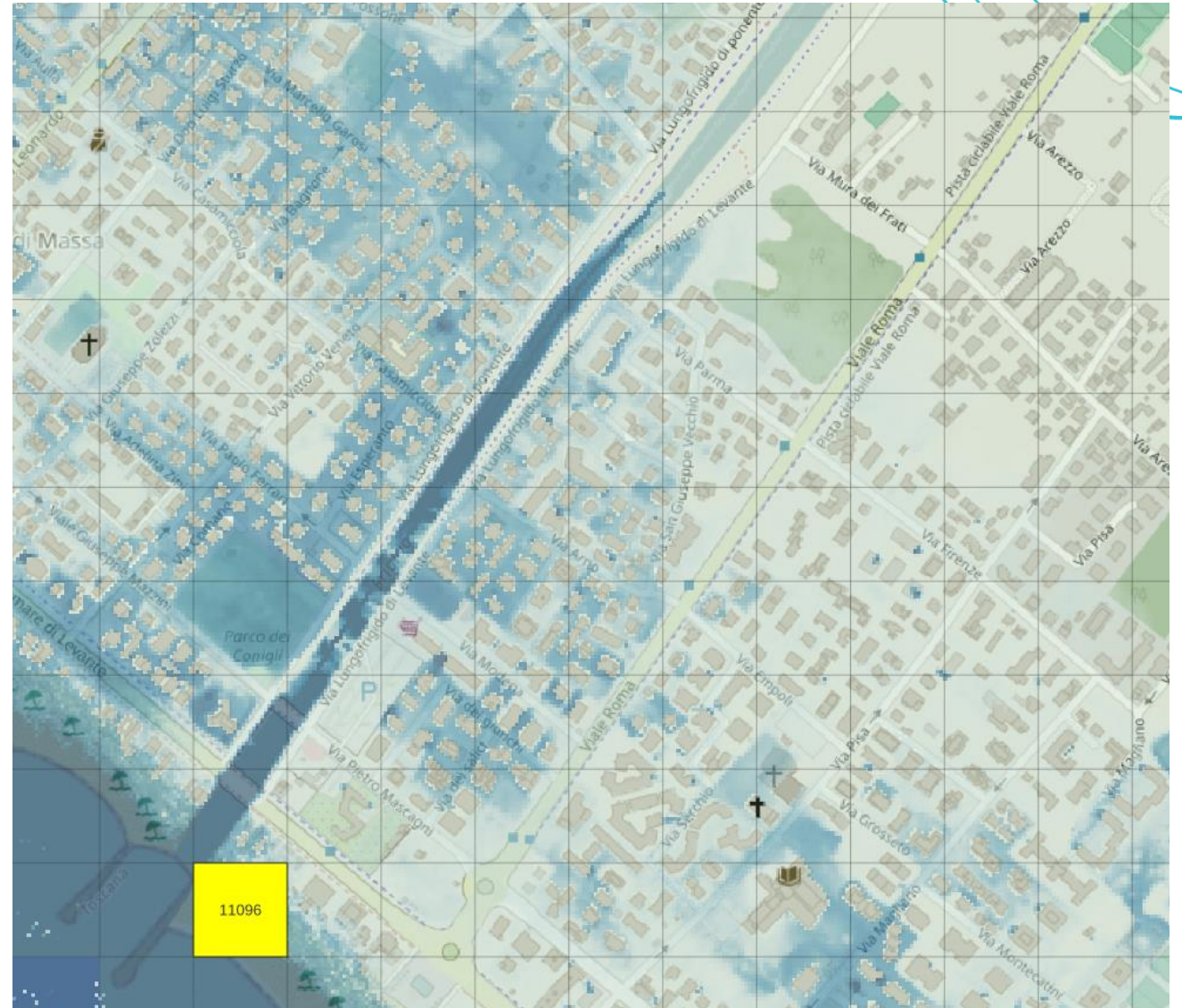
Examples of simulation outputs – Affected population

- The obtained flooding map is overlaid on the population vulnerability and exposures maps, i.e., the presence of people in different areas of the city
- An evaluation of the **population affected by flooding** is performed



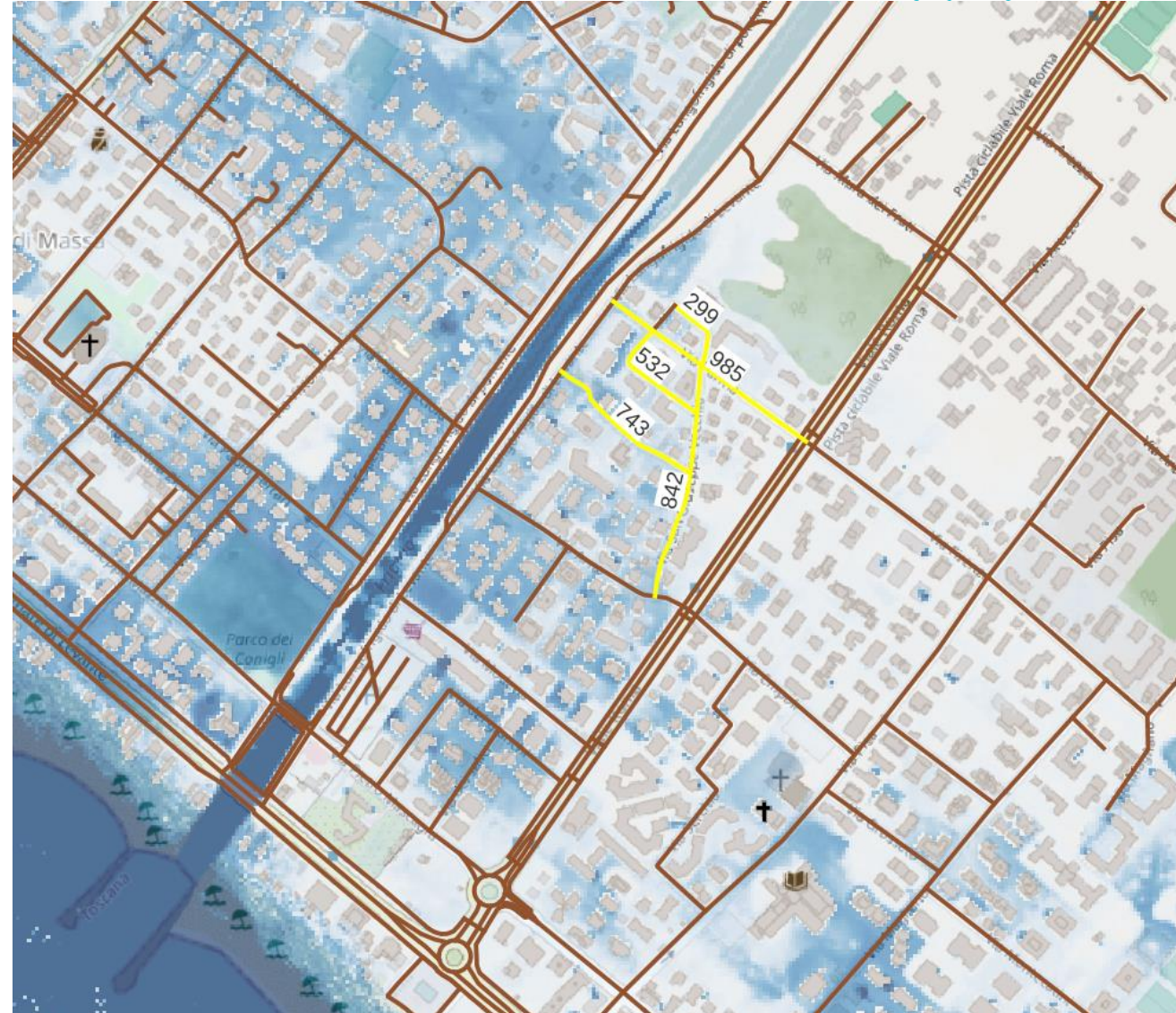
Examples of simulation outputs – Economic damages to buildings

- The obtained flooding map is overlaid on the economic vulnerability and exposures maps, i.e., the kind of buildings in the study area and their economic value
- An evaluation of the economic damages to the structures is performed and expressed in €



Examples of simulation outputs – Economic damages to infrastructures

- The obtained flooding map is **overlaid on the economic vulnerability and exposures maps**, i.e., **the infrastructures** in the study area and their **economic value**
- An **evaluation of the economic damages** to roads, railways, etc., is performed and **expressed in €**



Conclusions

- **Digital Twins** are a powerful tool to **safely analyse** real-world systems and processes
- In the SCORE project, the developed DT-EWS system is intended to **support coastal cities** in **enhancing their resilience** against **climate change**
- The SCORE DT-EWS is composed by the **USE module**, for **simulations**, and by the **EWS module**, that launch **alerts** in case of imminent flooding
- The system is **equipped with a GUI** that helps users in **intuitively operate** with it
- Users can predict the **impact of EBA solutions** on improving the **resilience** of their cities **against climate change**
- The SCORE DT-EWS **outputs maps** containing **flooding levels and damages** to people, buildings, infrastructures, helping in long- and short-term **disaster prevention**
- The presented system is **flexible and can be adapted** to other use cases other than coastal cities

Any question?



Thanks for your attention!

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