

**PARTNERS**  
16 from Italy  
and Croatia



**DURATION**  
33 months  
Start date: 01/04/2020  
End date: 31/12/2022



## STREAM

### STRATEGIC DEVELOPMENT OF FLOOD MANAGEMENT

A transnational cooperation project that seeks to improve the flood risks management capacity of local authorities and emergency services in the Adriatic coastal regions. To do so the project will develop tools and plans for risk monitoring and early warning.

### FACTS & FIGURES

Financing Programme: Interreg Italy - Croatia

**BUDGET**  
**9.411.657,83 €**  
total budget  
for infrastructures  
507.530 €



**ACTIONS**  
9 pilot actions



## DISCOVER MORE ABOUT STREAM

Stream is funded by the ITALY CROATIA CROSS-BORDER COOPERATION PROGRAMME

- [www.italy-croatia.eu/](http://www.italy-croatia.eu/)
- [www.italy-croatia.eu/web/stream](http://www.italy-croatia.eu/web/stream)
- [www.facebook.com/InterregStreamproject](https://www.facebook.com/InterregStreamproject)
- [www.twitter.com/STREAMproject1](https://www.twitter.com/STREAMproject1)
- [www.linkedin.com/in/streaminterreg](https://www.linkedin.com/in/streaminterreg)



## STREAM STRATEGIC DEVELOPMENT OF FLOOD MANAGEMENT

A STREAM OF SOLUTIONS TO COPE WITH FLOODING RISKS

## WHO WE ARE

STREAM partnership is made of regional agencies, local authorities and universities from Croatian and Italian regions working together to bring about a shared and enhanced knowledge on the management of coastal and urban flooding on both sides of the Adriatic Sea with a combined bottom-up and top-down approach.

- Zadar County Development Agency Zadra Nova (Lead partner)
- Dubrovnik Neretva County
- Public institution RERA S.D. for coordination and development of Split Dalmatia county
- University of Zadar
- Regional Agency for Prevention, Environment and Energy in Emilia-Romagna
- Regional Strategic Agency for the Eco-Sustainable Development of the Territory – Apulia Region

- CNR-ISMAR Institute of Marine Science
- Euro-Mediterranean Centre on Climate Change – CMCC
- Polytechnic University of Marche
- Marche Region
- Public Body for the Right to Study – Teramo
- Public Institution Development Agency of Lika-Senj County – LIRA
- Karlovac County
- Town of Poreč-Parenzo
- City of Venice
- IUAV – University of Venice



## WHY STREAM?

In the last decades, flooding events have increased along the Adriatic coasts and are expected to further do so in the next 50 to 100 years. This is a tangible effect of climate change that local communities experience. Fluvial floods, pluvial flooding in urban areas, coastal floods caused by extreme weather have caused damages to the population, the environment and infrastructure in the project area. STREAM thus aims to reduce human and socio-economic losses in case of flood hazards, by improving flood risk management of local authorities and

emergency services with a cross-border approach.

To do so STREAM will:

- Build shared knowledge related to floods
- develop flood risk monitoring tools and innovative early warning systems
- enhance the intervention capacity of the emergency services
- raise awareness of citizens on the proper behaviour in case of floods.

Main outputs of the project will be tools, plans, training schemes:

## TOOLS

- **I-FLOOD:** an online international platform to collect and share data on floods in the Adriatic in open source mode.
- **A Flood forecasting system** for the entire Adriatic Ionian area.
- **EWS:** a system for early warning to support rescue management in case of flood.

## PLANS & TRAINING

- **2 Flood Cadastre in Italy and Croatia**  
Development of a coastal flood register in Croatia and updating of the flood cadastre in Italy as a shared basis of information.
- **3 Flood Risk Management Plans**  
Drafting of flood management risk plans covering all aspects of flood risk management plans.
- **Training schemes** for the Civil Protection volunteers and coastguard operators and purchase of new equipment.
- **Awareness raising and information activities** addressed to citizens on flood alert systems and behaviour procedures.

## PILOT ACTIONS

### MARCHE REGION

The Marche Region will improve the regional early-warning and monitoring systems by implementing new precipitation radar products and installing soil moisture sensors and webcams. The Region will upgrade the Flood forecast operational chains, including the dams water regulation and hydraulic scenario on the Chienti and Foglia watersheds and investigating the sea river interaction on the case studies.

### EMILIA-ROMAGNA COAST

ARPAE will develop a probabilistic early-warning system based on the morphological numerical model XBeach to locally address coastal risk in Emilia-Romagna. The installation of a tide gauge and a webcam network along the littoral intend to enhance regional coastal flood knowledge.

### PO DELTA

ARPAE, CNR\_ISMAR and CMCC will cooperate to develop a forecasting system for simulating hydrodynamic conditions and flooding in the whole Po Delta region including all the river branches and lagoons particularly hit by the coastal flooding phenomenon.

### VENEZIA

The City of Venice will reinforce its sea-condition forecast system and use it to set out dynamic maps of flooding of the urban surface and build operating forecast flooding scenarios based on the simulation of past flooding events. To define specific thresholds for coastal impacts, the City of Venice will add a network of small buoys off the Venetian coast to the sensors already operating in the area.

### PUGLIA

The pilot activities will consist of upgrading the existing monitoring observing systems in the Peschici and Manfredonia/Siponto area, the Inland watershed of Ofanto river and the related low coastal area, in Lecce and Torchiarolo areas with wave-buoys, hydrometer and a low-cost sea level station. A dedicated hydro-meteo-ocean modelling system will be developed for inland and coastal area at each pilot and used in real-time for an EWS.

### ADSU PILOT

ADSU identified a wastewater treatment plant in the Province of Teramo to test its pilot action. The action will develop in 3 steps:

- Increasing the knowledge concerning the hydraulic and environmental criticalities in the inland and coastal areas of the Teramo Province.
- Optimization of network management in the area
- Reduction of the hydraulic and polluting load related to the net in case of a meteoric event.

### EMERGENCY SERVICES' PILOT

The emergency services in Zadar, Dubrovnik, Gospic, Porec and Split, especially Rescue centers and Fire departments, will be supplied with new equipment to respond urgently to all sudden flood-related crises. The purchased equipment includes vehicles, water pumps, boats, electricity generators. A Flood monitoring and Risk prevention Centre will be set out in Opuzen contributing to the safety of the area.

### SMART URBAN DRAINAGE SYSTEM

Nature-based green infrastructure solutions such as rain gardens in Zadar and drainage wells in Biograd na Moru are the core of the smart urban drainage system which will be built on the site. The purpose of this system is to find sustainable and natural solutions for the run-off water which is a huge threat for Zadar County. The technical documentation of the smart urban drainage system will be developed also for one selected pilot area in the Town of Poreč - Parenzo.

### KARLOVAC

In Karlovac County, existing space will be newly equipped and turned into an intervention command post where an Integrated Flood Management System (IFMS) will be installed. The IFMS integrates GIS and telemetry systems, video surveillance and alarm systems. It will contribute to coordinate the interventions more efficiently in case of floods hazards.



## EXPECTED RESULTS



A more effective and timely management by local authorities of floods on the Adriatic coast



An increased level of information on potential risks



Effective early warning and monitoring systems



New strategies to build a flood resilience



Better collaboration between Italian and Croatian regions for sharing information and data across cross-border areas