

# Case Study: Pagasitikos Gulf

*Assessing impacts and  
recovery from natural  
disasters through a One  
Health lens*





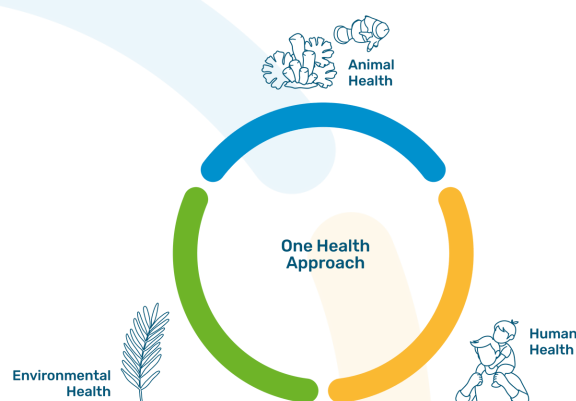


## What's at Stake: One Health Approach applied to the Pagasitikos Gulf

One Health is a **holistic framework** that recognises the deep interconnections between human health, animal health, environmental quality, and biodiversity. As shown in our first case study on [Barcelona Urban Beaches and Ebro Delta](#), this approach is indispensable for tackling the multiple challenges faced by **coastal areas** such as the **Pagasitikos Gulf**, which is under significant **climate change pressures**.

Beyond climate pressures, the Gulf is under constant stress from agriculture, **livestock farming**, urban development, and tourism, all of which affect water quality and biodiversity.

At the same time, the Gulf sustains local fisheries, supports coastal communities, and provides key economic and recreational value. Its combination of ecological importance and **climate risks** makes it a strategic site for ENHANCE to test and validate new solutions for resilient coastal management.



### How do natural disasters disrupt ecosystems like the Pagasitikos Gulf?

In recent years, extreme events—most notably **storms Daniel and Elias** in 2023—have accelerated **ecosystem destabilisation** in the Pagasitikos Gulf. These disasters triggered **severe flooding**, heavy sediment loading, and widespread marine degradation, turning the Gulf into a **living case study of resilience** and recovery. Beyond the tragic loss of life, the floods caused lasting environmental damage: floodwaters carried dead livestock, disrupted wastewater systems, and flushed fertilisers, agrochemicals, debris, and garbage directly into the Gulf.

In a **semi-enclosed gulf** such as Pagasitikos, limited water exchange, combined with inputs from the Thessaly plain, mariculture, and urban discharges around Volos, can further tip the system toward **algal blooms**, hypoxia, and ecosystem disruption.



## The Region, Its Communities and Economy

### PAGASITIKOS GULF

#### *Agricultural Pressures & Human Life*

- The **Pagositikos Gulf** is home to **Volos**, the regional capital with around 140,000 residents. This **coastal city**, together with surrounding villages, relies on the Gulf as a vital support for both urban life and local communities.
- The Gulf is a **vital space** for recreation, mental and physical health, with swimming, fishing, and sailing deeply tied to local culture and everyday life.
- Its economy relies heavily on a **clean, resilient marine environment**: aquaculture farms, fisheries, beach cafés, and marine ecotourism (e.g., snorkeling and boat tours) all depend on healthy waters and thriving coastal ecosystems.
- The **Thessaly plain**, surrounding the Pagositikos Gulf, is one of Greece's **largest agricultural regions**, providing a significant share of the country's crop and **livestock production**. This makes agriculture both a key economic driver and a major source of pressure on the Gulf's ecosystems



## The Goals



### People

Protect the health and wellbeing of local communities by monitoring water quality and assessing pollution risks from floods, agriculture, and urban discharges



### Nature

Mitigate pressures from nutrient inflows, algal blooms, and hypoxia. Develop strategies to address extreme events such as storms, which pose serious threats to the ecosystem.



### Economy

Support the diverse economic activities of the region by providing AI-enabled monitoring and decision-support tools for sustainable growth.



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## The Challenge

In the Pagasitikos Gulf, the challenge lies in confronting the combined effects of **climate extremes** and **human activity** in a fragile, semi-enclosed marine system. This case study addresses multiple pressures—from agriculture, mariculture, and urban discharges to **climate-related events** such as storms, floods, and droughts—that are increasingly shaping the region's future.



## ENHANCE Tools & Innovations

### SCIENTIFIC & ADVANCED MONITORING

- **Monthly sampling** will track water quality — including clarity, oxygen, and acidity — and check fish health for pathogens and resistance to antibiotics.
- **Remote sensing & Earth Observation datasets** (Copernicus Sentinel-2 satellite images and Copernicus Mediterranean Bio-Geo-Chemical layers) to track eutrophication and ecosystem pressures.

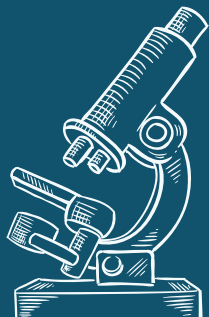
### PARTICIPATORY SCIENCE

- **Living Labs** will foster a knowledge-sharing network among farmers, local fisheries, coastal businesses and sea-excursion operators.
- **Co-creation** with local authorities to design tailored monitoring and response tools.



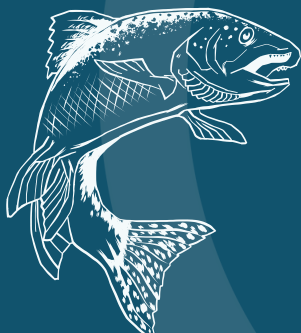
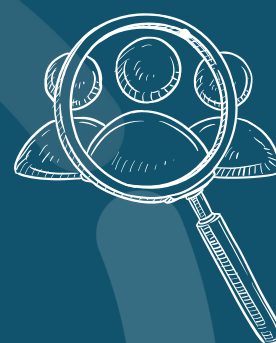


## Who's involved: the One Health Community for the Pagasitikos Gulf



**Leading community (Academia):** The **University of Thessaly** leads the case study demonstration and evaluation in the Pagasitikos Gulf, carrying out scientific monitoring and regular sampling of water quality and marine life.

**Participatory community (Civil Society):** **AMARANTHUS** drives the local actors mapping, citizen engagement, and the establishment of Living Labs. They anchor the local knowledge and participatory dimension of ENHANCE.



**Mobilising community (Blue economy Actors):** Local fisheries and fishers, along with scuba diving and **sea-excursion operators**, contribute their knowledge and practices to strengthen sustainable use of the Gulf.

**Facilitating community (Public Authorities):** **Greek Civil Protection** ensures preparedness and response to extreme events, **Public Health services** monitor risks linked to water quality, and **Agricultural authorities** work to balance farming practices with coastal protection.



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# Lead Partners in Pagasitikos Gulf Case Study



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CITIZENS . SCIENCE . SUSTAINABILITY . WELLBEING

## How to get involved ?

Explore ENHANCE project and follow  
our progress and milestones!



Join our community!  
[enhance-onehealth.eu](https://enhance-onehealth.eu)



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**MINKA**

A project coordinated by

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"This project has received funding from the European Union's Horizon Europe under grant agreement No 101180146 –ENHANCE. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the granting authority. Neither the European Union nor the granting authority can be held responsible for them."

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