

A research vessel is seen on the dark blue waters of the Adriatic Sea. In the background, a range of mountains stretches across the horizon under a clear, light blue sky. The overall scene is serene and professional, suitable for a scientific project poster.

**Project**

# **ECOSS**

**ECOLOGICAL Observing System in the Adriatic Sea:  
oceanographic observations for biodiversity**

# Adriatic Sea

The Adriatic Sea is the northernmost basin of the Mediterranean Sea, stretching around 800 km from the Gulf of Venice in the north to the Strait of Otranto in the south, and never exceeding 200 km across. Despite its relatively small size of 138 600 km<sup>2</sup>, it has an important role in the wider Mediterranean region due to its rich biodiversity, diverse geology and complex circulation patterns. For example, almost a third of all freshwater flow into Mediterranean comes through the Adriatic Sea, which exchanges its entire volume within three to four years – a strikingly short period.

The western Adriatic coast is predominantly alluvial and terraced, whereas the eastern coast is mostly made of limestone. Here, the chemical and mechanical erosion of limestone resulted a highly diverse coastline with over 1000 islands and numerous sinkholes, towers and caves.

This geological complexity supports rich biodiversity and high degree of specialization in some of the species. So far, more than 7000 species have been recorded in the Adriatic Sea, many of them rare, endemic or endangered. Of commercially important species, two thirds are today considered over-fished.



# Challenges

Although a relatively small sea, the Adriatic hosts diverse habitats and species which make it a recognized **biodiversity** hotspot. The **ecosystem services** of the Adriatic Sea are, directly or indirectly, at the core of many local economies. Yet, the Adriatic Sea is exposed to numerous threats: global warming, pollution from land and sea sources, overfishing, intense maritime traffic, damage to the sea floor by oil platforms and uncontrolled coastal development and tourism. These threats can have a significant negative impact upon habitats and biodiversity, thus affecting millions of inhabitants and tourists visiting this attractive region.

Scientifically obtained inter-disciplinary knowledge is a pillar of any conservation initiative. Although the research and monitoring on various components of the Adriatic Sea started over a century ago, these programs were either limited on spatial scale or focusing on single topic, preventing from obtaining the big picture. Thus, preservation of ecosystems and biodiversity of the Adriatic Sea requires not only cross-border cooperation, but also integration of **ecological** and **oceanographic research** with conservation programs, such as **Natura 2000**. The integrative approach should encompass various disciplines and a wide range of temporal and spatial scales to include both coastal and off-shore areas. It further requires active involvement of all stakeholder groups, from scientists and conservation professionals, over businesses and decision-makers to local communities.

## Glossary

### Biodiversity

Biodiversity is the variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.

### Natura 2000

A European Union wide network of nature protection areas designated as either Special Areas of Conservation or Special Protection Areas. Natura 2000 is based on Habitats Directive and Birds Directive. Today it includes over 27000 sites on land and at sea, with marine sites covering more than 360 000 km<sup>2</sup>.

Project “**ECOLOGICAL Observing System in the Adriatic Sea: oceanographic observations for biodiversity**”, in short **ECOSS**, is a collaboration between 10 organizations from Italy and Croatia, co-funded by Interreg Italy-Croatia CBC Programme. Project ECOSS aims to provide an essential contribution for improving the conservation status of the habitat types and species of the marine Natura 2000 sites in the Adriatic Sea. To achieve this, ECOSS is:

## Integrating knowledge

Through a series of case studies ECOSS will assess the current state of knowledge, merge the existing data infrastructures and create a basis for integrated future ecological and oceanographic monitoring in the Adriatic.

## Engaging stakeholders

Successful marine conservation relies on much more than just ecology and oceanography. Therefore, ECOSS will involve stakeholders from scientific community, governance, local economies and general public.

## Investing in our future

Current marine conservation initiatives are meaningful only in the long run. This is why ECOSS will produce educational materials to engage future generations of marine scientists and conservationists.

## Improved management of Natura 2000 sites

ECOSS will use ecological connectivity approach to link key management questions of Natura 2000 sites in the Adriatic with results from oceanographic and ecological monitoring to support decision making in a wider context.

## Ecosystem indicators

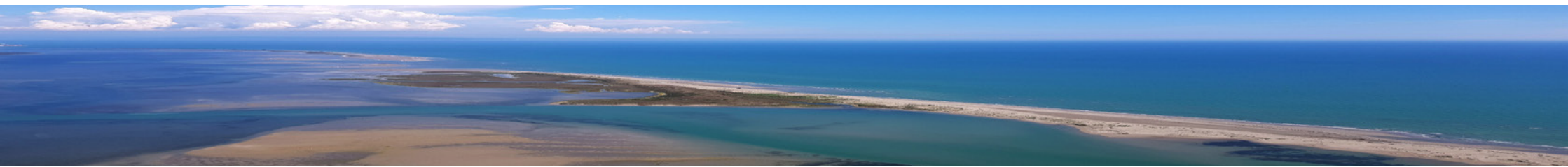
A comprehensive and coherent ecosystem based set of indicators for threatened Natura 2000 habitats and species in the Adriatic Sea will ensure alignment of the conservation measures with the requirements of EU directives.

## Data management system

A robust data management infrastructure will be based on open science principles to provide support to Natura 2000 sites managers and scientific community and to enable long-term viability and transferability of project results.

## Stakeholders involvement

Extended network of marine conservation professionals, researchers, decision-makers, representatives of tourism and local businesses, and public involvement will ensure that marine conservation measures in the Adriatic respond to needs of the society.



### Oceanographic research

Oceanographic research concerns with all aspects of the world's oceans and seas, including their physical and chemical properties, their origin and geologic framework, and the life forms that inhabit the marine environment.

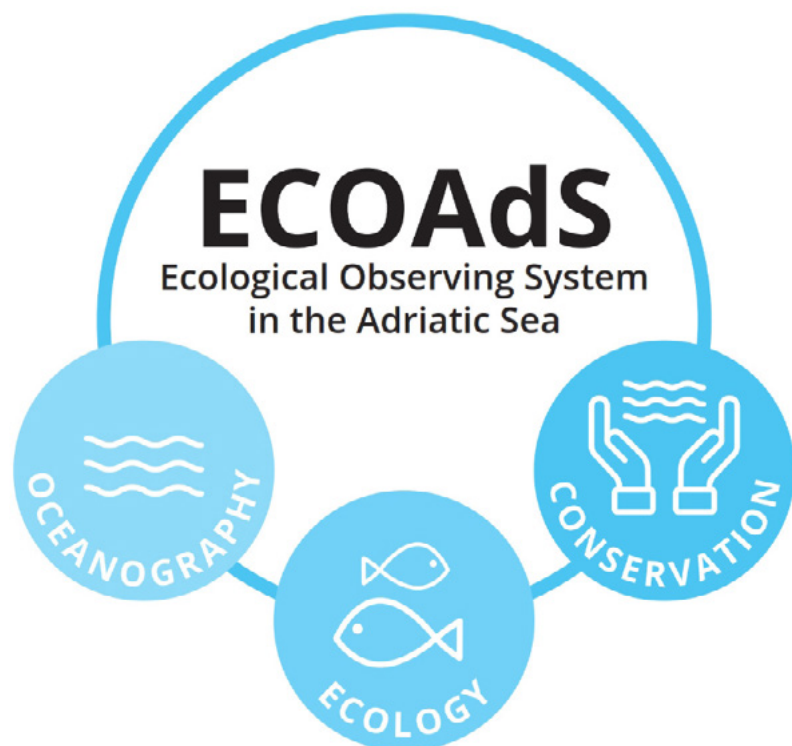
### Ecological research

Studies focusing on interactions between organisms and their environment. Ecologists investigate processes between and within species, such as cooperation or competition, but also how biotic and abiotic components of environment affect biodiversity, distribution of organisms and biomass. Marine ecology is therefore linking marine biology and oceanography.



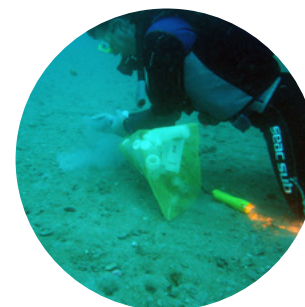
# What is ECOAdS?

**ECOLOGICAL observing system in the Adriatic Sea**, in short **ECOAdS**, is the main outcome of the ECOSS project. It will integrate ecological and oceanographic research and monitoring with Natura 2000 conservation strategies and in this way it will directly respond to requirements set out in Marine Strategy Framework Directive, Habitats and Birds Directive and EUSAIR Action Plan. Shared between Italy and Croatia, ECOAdS will enhance the marine observational capacities for improving the conservation status and the expansion of the marine component of Natura 2000 network in the Adriatic Sea.



To achieve its goals, ECOAdS will be built around four main components:

- 1 Existing facilities, infrastructures and data resources**  
In compliance with the strategy and the objective to enhance cooperation and overcome fragmentation in the Programme area, ECOAdS will be primarily built on the facilities, infrastructures and long-term ecological data already existing in Italy and Croatia.
- 2 Management questions, ecological variables and oceanographic processes**  
Basing on the connectivity among habitats and species in coastal and offshore waters, ECOAdS will integrate the main Natura 2000 conservation management questions, key ecological variables and oceanographic processes.
- 3 Web portal, tools and services**  
Building on the open science principles, ECOAdS will integrate different datasets into a new data infrastructure, providing also a set of tools and services to allow selection, analysis, visualization and reuse of integrated biological, ecological and oceanographic data.
- 4 Stakeholder engagement**  
ECOAdS will address all the societal actors in order to better align the project activities and outcomes with the values and needs of the society.



## Glossary

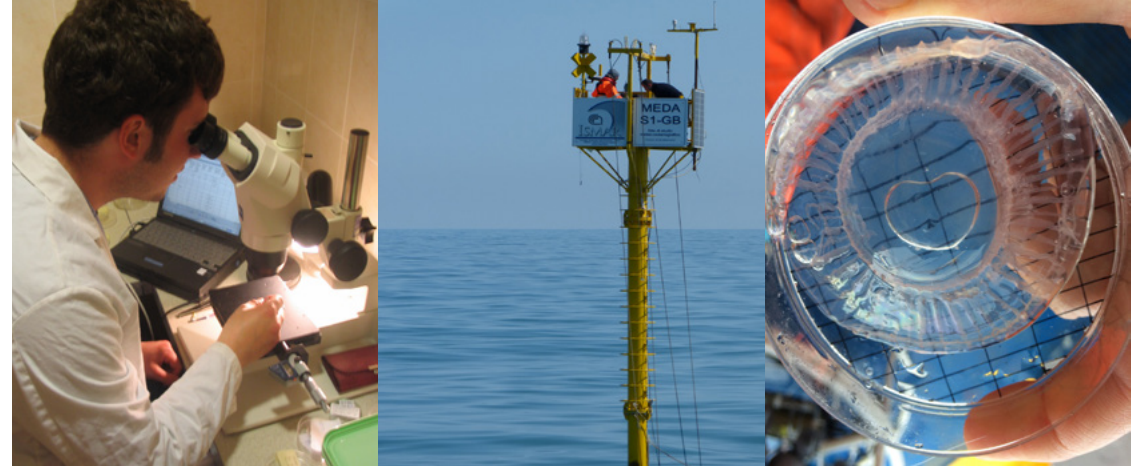
### Ecosystem Services

These are various material and non-material benefits provided to people by healthy ecosystems. The ecosystem services provide goods like food and water, regulate our environment by influencing climate, support life by providing nutrients, and provide cultural and economic values such as recreation and tourism.

# Case studies

Six marine and coastal protected areas included in the Natura 2000 network are used as case studies in the ECOSS project. Diverse oceanographic, ecological and anthropogenic features of these sites will be used to investigate their conservation requirements and extrapolate the lessons learned to other Natura 2000 sites in the Adriatic.

- 1 Po river delta (IT3270017 and IT3270023)**  
With Po being the most significant river flowing into the Adriatic Sea, this river delta is an excellent case to study the links between the land and the sea.
- 2 Tegnùe di Chioggia (IT3250047)**  
The isolated rocky substrates in predominantly muddy surroundings provide a natural support for sessile benthic organisms, making this site a real micro-hotspot for biodiversity.
- 3 Trezze San Pietro e Bardelli (IT3330009)**  
This unique site features coralligenous algae that provide a suitable habitat for numerous demersal and benthic fish species in otherwise monotonous environment.
- 4 Cres-Lošinj (HR3000161)**  
This area is home to a resident sub-population of bottlenose dolphins, counting approximately 200 individuals. Studied since 1987, this sub-population is among the best-known ones in the Mediterranean.
- 5 Vis (HR3000469)**  
Waters around the island of Vis are among the most pristine habitats of bottlenose dolphins in the Adriatic and a biodiversity hotspot.
- 6 Mali Ston (HR4000015)**  
This area is under significant influence of river Neretva and the specific environment conditions result in very rich biodiversity.





# ECOSS Partners



National Research  
Council of Italy

National Research Council  
Rome, Italy



National Institute of Oceanography and Applied Geophysics  
Trieste, Italy



Regional Agency for Prevention, Environment and Energy in Emilia Romagna  
Bologna, Italy



INSTITUT ZA OCEANOLOGIJU I RIBARSTVO SPLIT

Institute of Oceanography and Fisheries  
Split, Croatia



Po Delta Veneto Regional Park  
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BLUE WORLD INSTITUTE

Blue World Institute of Marine Research and Conservation  
Veli Lošinj, Croatia



Ustanova javne službe za upravljanje zaštićenim prirodnim područjima Dubrovnik-neretva

Public Institution for the Management of Protected Natural Areas of  
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Split, Croatia



Shoreline

Shoreline  
Trieste, Italy



Ca' Foscari  
University  
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Ca Foscari University of Venice  
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**GOVERNMENT OF THE REPUBLIC OF CROATIA**  
Office for Cooperation with NGOs

Project is co-financed by the Government Office for Cooperation with NGOs.

**More details on:**



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