Newsletter

No. 2

Interreg ADRION ADRIATIC-IONIAN

European Regional Development Fund - Instrument for Pre-Accession II Fund

The first output of the project SEAVIEWS refers to the development of a transnational repository network that will receive, store and analyse data about the sea water quality from a network of smart sensors allocated in critical points.

The operation of the transnational repository network prerequisites the installation of smart sensors in static and dynamic positions in various sea and coastal areas of the Adriatic Ionian Sea region as well as the use of the developed mobile application by the broader community (e.g. tourists, local residents, etc.).

The kind of data that will be gathered and analysed from the smart sensor network are related to the water quality, e.g. salinity, pH, etc. whereas the data from the mobile application will locate marine pollution. Hence there will be a continuous monitoring of the water quality and this process aiming to promote the protection of the environment.

Installation of smart sensors for monitoring

SEAVIEWS

The SEAVIEWS project is dedicated to the prevention of the diffusion of marine pollution of the Adriatic-Ionian Sea, implementing the installation of multiparametric probes. The probes will be able to record 9 different parameters and help develop a transnational repository network that will receive, store and analyse data about the sea water quality. The probes will be installed in critical stationary and moving points across ADRION region. The aim is to create an innovative virtual early warning system for preventing and managing the marine pollution from various sources.

The probe is equipped with 9 ports (depending on the model), with which it is possible to directly or indirectly obtain all required parameters.

To evaluate the properties of seawater there are three types of water quality parameters: physical (e.g. temperature, turbidity), chemical (e.g. oxygen, salinity, pH), and biological (e.g. bacteria, algae, organic matter). Among these parameters there are some that respond quickly to pollution events (e.g. fluctuation of salinity from effluent pollution by an industry) and can be used to monitor and act rapidly against them. This is the main aim of the SEAVIEWS project that has selected a range of 9 (or 10 for one specific probe) parameters to its scope. The selected parameters are temperature, salinity, pH, conductivity, dissolved oxygen, turbidity, Oxydation/Reduction Potential, Total Dissolved Solids and depth. One of the 18 sensors to be installed monitors also Chlorofyll a. These are the basic ones that can describe the water masses.

Sensor installation in Croatia

SEAVIEWS project partner **University of Zagreb (Faculty of Mechanical Engineering and Naval Architecture)** installed a sensor in the ***Krka River estuary***, located near Šibenik.

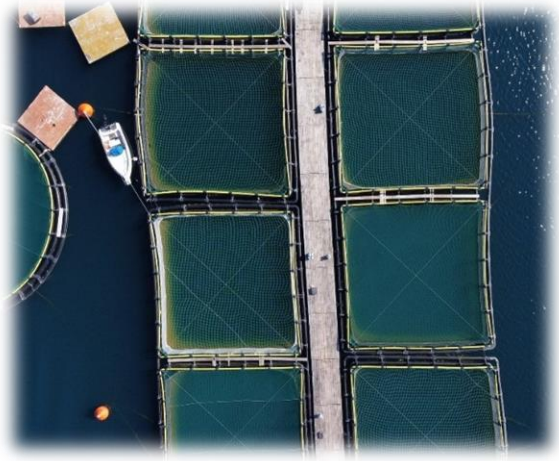
The Krka River estuary is a Natura 2000 site under the name "Krka Mouth" and it is also Marine Protected Area (MPA). The area is well also known as mussel farming area. Numerous aquaculture plants (~20) for mussels farming as well as a fish farming are mainly located in the lower part of the estuary. For the SEAVIEWS project, a location at the aquaculture (mussels and fish farms) field is suggested due to the following main reasons:

(1) the low salinity is not tolerable for the mussels and fish and mortality can occur. This is probable scenario in case of the high inflow of the Krka River, characteristic for the rainy period (mostly in winter).

(2) the increased copper concentration can be harmful for the mussel embryos as well as for the fish and the monitoring of Cu concentration in the estuary is of great value in estimating its real threat.

(3) the monitoring of water quality is essential for the growth and the reproduction of species.

The installation of the sensor was performed with the help of the associated partner, the Ruđer Bošković Institute in Zagreb. The installation process of the selected EXO2 multiparameter probe took place on 28th July 2021. You are invited to visit the web-site with an on-site camera view: https://sites.google.com/view/seaviews/home



The Croatian part of the Adriatic sea states as a clean and well-preserved sea, attracting tourists to its shores, which makes it an important part of the Croatian economy. Traces of oil spilled from ships can appear on the Adriatic, but they are not characteristic of the Croatian coast. Major environmental problems cause:

- *The concentration of copper. Parts of a ship that are immersed in the sea are coated with anti-fouling coatings to protect it from algae and other organisms. The coatings melt in water and emit heavy metals such as copper. Higher concentrations of heavy metals accumulate in the marine environment, affecting the health and development of fish, shellfish and other organisms.*
- *Nutrients and sediments load. The environment is affected by the emission of substances from aquaculture farm, which occurs as a by-product of feeding and the dissolution of substances in seawater.*
- *Chemical anomalies. Different sediments and greater inflow of freshwater can cause changes in oxygen concentration, salinity level and pH values. This problem is crucial in shellfish farming.*

Sensor installation in Italy

The Italian partner **CoNISMa** has completed the installation of the first stationary sensor of the SEAVIEWS Project in the **Marine Protected Area in Porto Cesareo,** Italy in March.

The Marine Protected Area (MPA) of Porto Cesareo in the south of Italy is characterised by a wide heterogeneity of environmental habitats on the coast as in the sea. The sea turtle *Caretta caretta* annually nests on the MPA beaches and recently the Mediterranean monk seal (*Monachus monachus*, Hermann 1779), the only living representative of the genus *Monachus* and one of the most endangered mammals in the world, was spotted in the MPA (data from January 2021), highlighting the importance of the protection of this natural site along the Ionian coast.

The Porto Cesareo MPA is located in a territorial context economically based on small professional fishing, sport and tourism, generating socio-economic needs often in conflict with each other and in contrast with the priority purpose of the establishment of the Area: i.e., environmental protection.

A flux of plastic of about 0.8 kg (km day)$^{-1}$ is reported as plastic pollution in the Specially Protected Area of Porto Cesareo and the shipping was identified as the main contributor (77%) followed by the city of Gallipoli (6%), the River of Crati (3%), and the city of Taranto (2%). Additionally, in the Gulf of Taranto is located the port of Taranto with 18 million tons of cargo capacity/year

On 4th of March 2021 the multisensors probe has been installed on the buoy delimiting the north point of the Zone A in front of La Strea peninsula at the exit of the lagoon of Porto Cesareo.

Also a mobile multisensor probe will be used in dynamic positions on the research vessel "Pelagia" belonging to the University of Salento (operative unit of CoNISMa) for acquisition of data all around the Salento peninsula.

Sensor installation in Slovenia

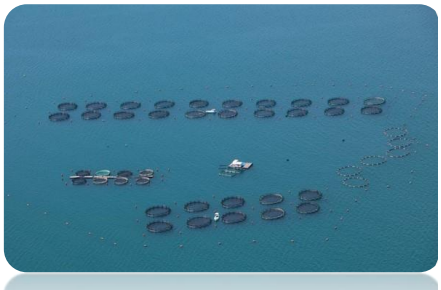
Slovenian waters and the 46 kilometres of the Slovenian coast are situated within and along the Gulf of Trieste at the northernmost part of the Adriatic Sea.
Surrounded by ancient salt fields of the **Sečovlje Salina Nature Park** in the Piran Bay, at the southernmost part of the Slovenian sea, the only active Slovenian sea fish farm is located. In the frame of the SEAVIEWS project the location for the installation of sensors on the entrance to the Fonda fish farm was selected due to local monitoring of water quality which is esential for sustainable and quality growth and reproduction of fish and shellfish, completely in sync with nature, without any unnecessary chemical products applied for anti-fouling practices.

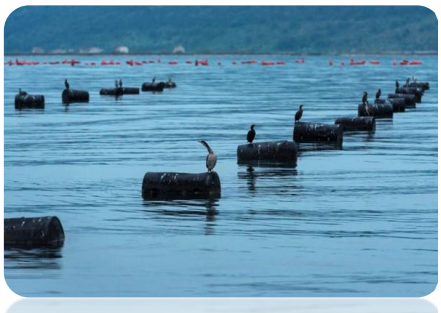
Shallowness, small water volume and weak currents in the Slovenian part of the Gulf of Trieste are manifested in environmental sensitivity. Major environmental problems in Slovenian sea are:

- *Plastic waste and microplastics*
- *Decrease of biodiversity*
- *Pollution due to intentional or unintentional discharges*
- *Underwater noise*
- *Introduction of nonindigenous species*
- *Overfishing*
- *Increased probability of occurrence of floods*

The installation of Hydrolab sensor took place on 21st of May 2021 and was proceeded by Slovenian partner **E-Institute** and the provider of the sensor CGS labs d.o.o.

Sensors have been installed in the floating pier where a small wooden house is situated. On the roof of the house solar cells has been instaled, while hardware is in the house itself and sensors are situated in the sea approximately 2 meters deep.





Follow us on our website and social media profiles:
https://seaviews.adrioninterreg.eu/