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MoST

Monitoring Sea-water intrusion
 in coastal aquifers and
 Testing pilot projects
 for its mitigation



REGIONE DEL VENETO

MITIGATION STRATEGIES TO REDUCE SALTWATER INTRUSION



COMBATING THE SALINIZATION OF THE COASTAL AQUIFERS: THE MoST PROJECT



Saltwater intrusion in coastal aquifers is a worldwide problem caused, among other factors, by the aquifer over-exploitation related to human activities- such as water supply for human consumption and irrigation, land reclamation of low-lying farmlands- to the rise of the saltwater wedge in the rivers or to climate changes, which contribute to the reduction of the groundwater natural recharge.

This topic has been gaining continuously more importance and therefore efforts are being intensified to acquire a better understanding of the physical processes that drive the continental-marine water exchanges, in order to define suitable countermeasures. In this regard, geophysical surveys and monitoring sites, as well as laboratory and numerical experiments and effective freshwater management plans are fundamental.

Both Italy and Croatia are significantly affected by saltwater intrusion in their coastal regions with serious consequences on agricultural activities and tourism that may become dramatic in a relatively short time due to climate change effects.

In this framework, the main objective of the **Interreg Italy-Croatia MoST (Monitoring Sea-water intrusion in coastal aquifers and Testing pilot projects for its mitigation)** project is the monitoring of the seawater intrusion in specific regions of the northern Adriatic coasts of Italy and Croatia to assess its relevance, and suggest and test appropriate countermeasures, in a transnational level.

The project is developed in two main phases: firstly, a detailed data collection and geophysical survey will be carried out. This step includes the capitalization of previous experiences regarding the saltwater intrusion monitoring, mitigation plans and implemented countermeasures. The analysis of the collected data will help understanding the process and its evolution.

In the second phase, pilot sites will be established to verify the efficiency of possible countermeasures, e.g. underground barriers, recharge wells, recharge drains established along elevated high-permeability paleo-channels (ancient stretches of watercourses by now buried underground), in order to mitigate the seawater intrusion and contamination. Moreover, laboratory physical models will be developed to serve as benchmarks for the numerical models adopted to simulate and analyze the field results.

The project will be developed with the collaboration and the involvement of local populations and authorities, who will be the main stakeholders of the project actions, due to the expected benefits in agriculture and touristic activities.

Partners:

- LP: University of Padova – Department ICEA
- PP1: CNR
- PP2: Consorzio di Bonifica Adige-Euganeo
- PP3: Regione Veneto – Direzione Difesa del Suolo
- PP4: University of Split – Faculty of Civil Engineering Architecture and Geodesy
- PP5: Croatian Waters
- PP6: Regional Development Agency Dubrovnik – Neretva County (DUNEA)



- PROJECT DURATION**
01/01/2019 - 30/06/2022
- ERDF**
2.208.817,31
- TOTAL BUDGET**
2.598.608,61 €



APPLICATION:

THE COMBAT AGAINST THE SALTWATER WEDGE IN THE AQUIFER UNDER THE COASTAL TERRITORY OF CAVARZERE AND CHIOGGIA.

The practical implementation of the project is the monitoring and mitigation of the progressive salinization of the area below sea level between the Veneto municipalities of Cavarzere-Chioggia, in the southern part of the province of Venice, characterized by a strong agricultural tradition.

The parties involved are:

Università di Padova – Dipartimento di Ingegneria Civile Edile e Ambientale, CNR, Consorzio di Bonifica Adige-Euganeo, Regione Veneto – Direzione Difesa del Suolo, University of Split – Faculty of Civil Engineering Architecture and Geodesy, Croatian Waters, Regional Development Agency Dubrovnik – Neretva County (DUNEA).

The intervention involves the construction from scratch of an irrigation derivation through a steel pipe with a diameter of 25 cm placed at the right bank of the Canal Morto in the Municipality of Chioggia.

The crossing of the provincial road n.7 at the 16 + 700 km is carried out using the guided drilling technique, at a laying depth of 1 m with respect to the road surface. This intervention aims at replenishing the surface water table contaminated by the salt water that comes from the river Bacchiglione and the Venice lagoon and seeps into the agricultural lands of the hinterland. The infiltration of fresh water from the Canal Morto into the water table would take place by exploiting, without energy consumption, the permeable layers of the paleo-river beds of the ancient watercourses tracing back to the Adige and Po rivers 2000 years ago.

