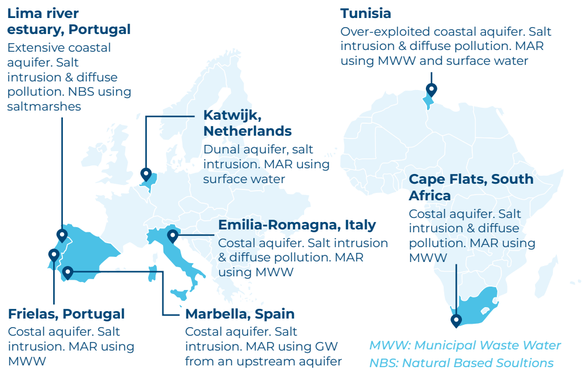
MAR2PROTECT at a glance

Seven demo sites (5 across the EU, 2 at international level in Tunisia & South Africa) were selected to be representative of a **wide panorama** in terms of climatic conditions, type of groundwater (GW) pollution, water source used for Managed Aquifer Recharge (MAR) and political /societal context, and to maximize the potential replication of the MAR2PROTECT holistic approach and impact.

All demo sites include a **coastal aquifer affected by salinity intrusion**. Demo sites were also carefully chosen by their degree of maturity from previous successful projects developed by the partners.



MWW: Municipal Waste Water
NBS: Natural Based Soultions

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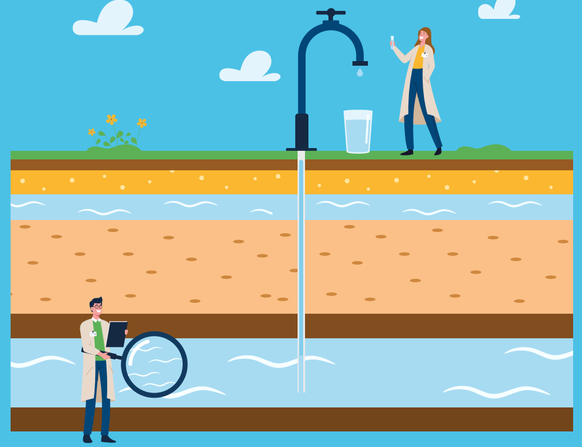


MAR2PROTECT

Preventing groundwater contamination related to global and climate change through a holistic approach based on managed aquifer recharge

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No GA 101082048

Funded by the European Union

The project

MAR2PROTECT will provide a holistic approach to prevent **groundwater** contamination from climate change impacts, through different innovative technologies.

The main idea consists in a tool supported by **Artificial Intelligence** that will receive real-time information from sensors placed in risk locations where the technologies will be implemented, among other vitally important information (innovative technologies, preferences of social agents, risk assessment...).

The tool is based on a new generation of **Managed Aquifer Recharge** approach to improve groundwater quality and quantity. The core of the innovative Managed Aquifer Recharge is the **M-AI-R Decision Support System** which will incorporate technological and societal engagement information using an Artificial Intelligence-based evaluation to improve groundwater quality.

Partners

The consortium is balanced with **11 partners**; 9 from 6 different european-countries (including Switzerland) and 2 international partners (Tunisia, South Africa).

The consortium covers Europe from South to North, including an Eastern partner (Lithuania) with complementary skills in water research. **2 international partners**, located in South and North of Africa, (Republic of South Africa and Tunisia) will provide 2 demosites, with different characteristics and will ensure a strong international collaboration within the project.

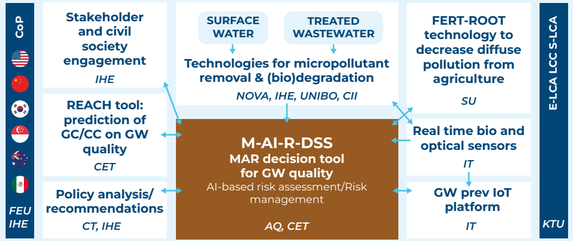
Objectives

In order to prevent groundwater pollution, the European MAR2PROTECT project will focus on the following **9 specific objectives**:

- To prevent MAR-related groundwater contamination through the development of **9 cost-efficient technologies** for the removal and (bio)degradation of salinity and emerging pollutants.
- To **prevent** groundwater diffuse **pollution from agriculture**.
- To develop innovative real-time integrated sensing systems and analytical methods inter-connected through an **IoT platform** for the monitoring of pollutants.
- To **predict the impacts** of global and climate change on groundwater quality.
- To develop groundwater management strategies through the development of a decision support system based on **AI techniques**.
- To increase the active role of **societal actors** in the prevention of water contamination and groundwater management.
- To integrate and validate the MAR2PROTECT technologies and societal engagement actions in **5 demo sites**.
- To **facilitate the use** of the MAR2PROTECT results in the prevention of water contamination and groundwater management.
- To promote the **market uptake** of the technologies and societal engagement actions.

Methodology

The MAR2PROTECT consortium will work according to the following methodology.



Partners: FCT NOVA (NOVA); UNIBO; FEUGA (FEU); CIIMAR (CII); CETAQUA (CET); AQUATEC (AQ); IHE DELFT (IHE); IT; ISSBAT (ISS); KTU; SUWI (SU).
Associated partners: AdTA; FHNW, DUNEA (DU); City of Cape Town (CT).
Abbreviation/acronym: Global change (GC); Climate change (CC); Internet of Things (IoT); Environmental Life Cycle Assessment (E-LCA); Life Cycle Cost (LCC); Social Life Cycle Assessment (S-LCA); Community of Practice (CoP).

Demosites

To ensure a high replication potential, M-AI-R Decision Support System will collect information from 7 demo sites in 4 European countries and 2 in non-European countries.

1. Katwijk, Netherlands

2. Tunisia

3. Frielas, Portugal

4. Emilia-Romagna, Italy

5. Cape Flats, South Africa

6. Marbella, Spain

7. Lima river estuary, Portugal

MAR2PROTECT

MAR2PROTECT will provide a holistic approach to prevent groundwater contamination from the impacts of global change and climate change based on a **new-generation Managed Aquifer Recharge**. The core of this innovative Managed Aquifer Recharge is **M-AI-R Decision Support System** that will incorporate technological and societal engagement information using an Artificial Intelligence-based approach to improve groundwater quality and quantity.