RESCUE
Resources in coastal groundwater under hydroclimatic extremes

Water4All
Water security for the planet

Abstract

Freshwater resources in coastal regions are under enormous stress due to population growth, pollution and climate change. The last years of extended drought have suddenly left several European coastal regions with protracted water shortages.

The RESCUE project aims to use research and innovation to improve water security in these regions, by applying novel physical and numerical workflows to identify freshwater resources in previously unexplored coastal deep and offshore aquifers. These aquifers could provide a crucial strategic resource for freshwater at times of increased need.

Our rationale is rooted in recent scientific research undertaken by the project partners, which have highlighted that deep (>400m to few km) onshore aquifers, and their offshore extensions, can potentially provide additional water for human consumption, farming and industrial uses, as well as representing a significant cost-saving input to desalination. The overarching strategic aim of RESCUE is to build knowledge of deep, onshore and offshore low salinity aquifers in European coastal areas, in order to evaluate novel water resources and help secure a steady supply of water to both population and industry in times of hydroclimatic extremes.

We will achieve our objectives by combining academic expertise in offshore groundwater, hydrogeology, geophysics, resources, big data science, outreach and public engagement, with applied industry know-how in deep freshwater resources exploitation and its socio-economical aspects.

RESCUE will work on existing geological, hydrogeological and geophysical databases, with the innovative contribution of Oil & Gas data and new geodata acquisition, to build new large-scale models for deep and offshore water resources in the target European Mediterranean coastal regions. Further data will arise from engagement with stakeholders and citizens. Supercomputing capabilities allow integration of physical data analysis with digital solutions, testing the limits of large-scale modelling on UK databases. Finally, we will perform cost-benefit and sustainability analysis of extracting these resources, while our outreach team will engage stakeholders and analyse public perception of potential follow-up exploitation projects. This project will benefit from complementary activities and synergies with the EU COST Actions (OFF-SOURCE), UK EPSRC IAA and GCRF grants, EU JPI Oceans and grant CASE NO. 19/3720 (Norwegian Ministry of Foreign Affairs) in which the RESCUE partners are currently involved.

The RESCUE project is relevant to:

- Topic 1-Resilience, adaptation and mitigation to hydroclimatic extreme events, subtopic 1.2-Developing and demonstrating innovative (or improved) societally acceptable adaptation and mitigation strategies to cope with hydro-climatic extreme events and their increase in length and duration; and

- Topic 2-Tools for water management - in the context of hydroclimatic extreme events, subtopic 2.2-Generating new methodologies, tools and models for water resources assessment/modelling. The project addresses the Theme III field of interest within the SRIA of Water4All: Water for the future: Sustainable water management; and the cross-cutting issue 6: International cooperation.

Success in addressing these themes will be facilitated through the following enablers: The digital revolution (big data, remote Earth observation); Existing/future research infrastructures; Technologies enabling more efficient water management; Changes in people's awareness and vision towards natural resources.

Our results and globally applicable workflows will ultimately support policy makers to develop novel strategies to counteract the effects of increasingly frequent climatic extremes, such as prolonged dry spells, which are expected to intensify in upcoming decades. Our universal approach will have applicability both in developed and developing nations, thus also supporting the implementation of the UN SDG 6: Clean water and sanitation.

Sample
find a relevant picture for the project
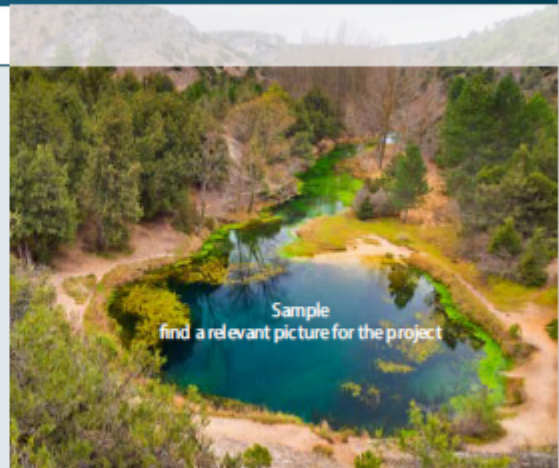
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- L-UNIVERSITA' TA' MALTA - MALTA
- RUDEN AS - NORWAY
- UNIVERSITY OF DERBY - GREAT BRITAIN

▶ **Funding organisations**

MUR (ITALY) / MEEE (MALTA) / RCN (NORWAY) / EPSRC UKRI (GREAT BRITAIN)

▶ **Duration**
3 years

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MAP TO BE ADDED

Water resources,
Hydrology (Water science),
Natural resources exploration and exploitation,
Environment, resources and sustainability

KEYWORDS