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SWAMrisk

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Subsurface WAter monitoring and Management to prevent drought risk in coastal systems

D.3.7.4. Scientific papers

Draft, September 2024

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Project Acronym	SWAMrisk
Project ID Number	ITHR0200479
Project Title:	Subsurface WAter monitoring and Management to prevent drought risk in coastal systems
Priority Axis:	2 - Green and resilient shared environment
Specific objective:	SO 2.1 - Climate change adaptation
Work package	WP3 Modeling, forecasting and assesment
Activity	A.3.7. Communication and target group informing
Deliverable	D.3.7.4. Scientific papers
Partners in charge	LP - FGAG, PP3 - M3E, PP6-AQUEUM, PP8-CNR-IGG
Status	Draft
Distribution	Internal

Contents

1. Introduction

This document presents the SWAMrisk project Deliverable D.3.7.4, which includes a scientific paper and provides an overview of the scientific study conducted by CNR, titled "Disentangling hydrodynamic drivers of the Southern Venice (Italy) coastal aquifer via frequency decomposition analysis: Insights, challenges, and limitations."

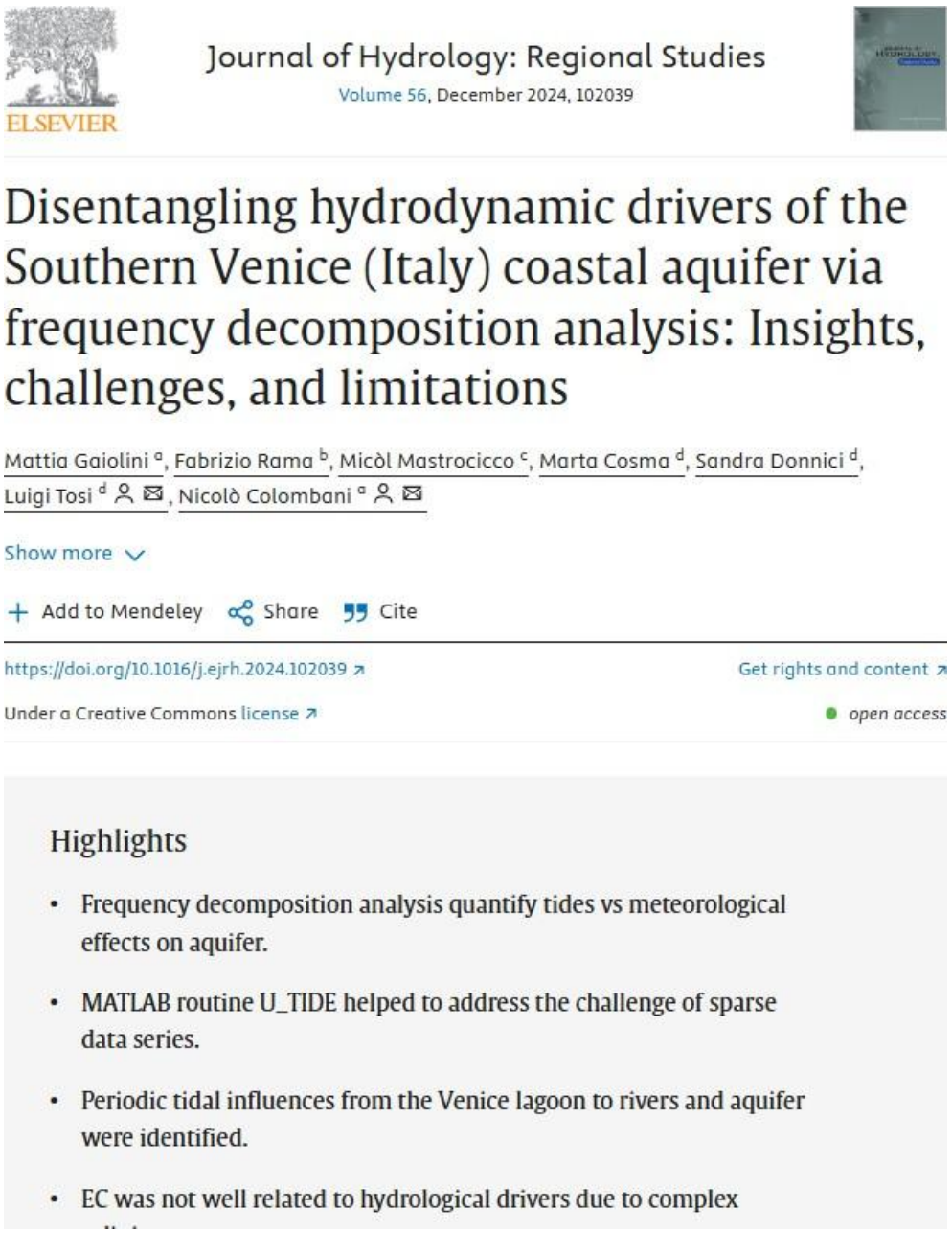
The scientific study conducted by CNR utilizes frequency decomposition analysis to disentangle the various drivers influencing the hydrodynamic behavior of the Southern Venice coastal aquifer. This advanced methodological approach provides valuable insights into the aquifer's response to environmental and anthropogenic pressures, highlighting both the potential and the limitations of current analytical frameworks.

The findings of this study align closely with the SWAMrisk project's objectives, contributing to a deeper understanding of hydrodynamic processes and informing strategies for mitigating risks associated with coastal aquifers. This deliverable consolidates the research findings and explores their implications for broader project goals and policy recommendations.

2. Scientific paper

The scientific study conducted by CNR, titled Disentangling hydrodynamic drivers of the Southern Venice (Italy) coastal aquifer via frequency decomposition analysis: Insights, challenges, and limitations, is published and accessible at this link.

Picture 1. Scientific paper screenshot



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Disentangling hydrodynamic drivers of the Southern Venice (Italy) coastal aquifer via frequency decomposition analysis: Insights, challenges, and limitations

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Highlights

- Frequency decomposition analysis quantify tides vs meteorological effects on aquifer.
- MATLAB routine U_TIDE helped to address the challenge of sparse data series.
- Periodic tidal influences from the Venice lagoon to rivers and aquifer were identified.
- EC was not well related to hydrological drivers due to complex

Picture 2. Scientific article screenshot

CRediT authorship contribution statement

Marta Cosma: Writing – review & editing, Visualization. **Micòl Mastrocicco:** Writing – review & editing, Validation. **Luigi Tosi:** Writing – review & editing, Validation, Data curation, Conceptualization. **Sandra Donnici:** Writing – review & editing, Validation. **Fabrizio Rama:** Writing – review & editing, Supervision, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Mattia Gaiolini:** Writing – original draft, Visualization, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Nicolò Colombani:** Writing – review & editing, Validation, Supervision, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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