

POSTER ABSTRACT

Data-driven analysis and regional modelling for the assessment of Transboundary Aquifers in the Mediterranean region

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¹Department of Aquatic Ecosystem Analysis and Management, Helmholtz Centre for Environmental Research-UFZ, Magdeburg, Germany (nahed.ben-salem@ufz.de, rafael.chavez@ufz.de) ²Potsdam University, Potsdam, Germany (robert.reinecke@uni-potsdam.de) The Mediterranean region is recognized as a climate change and anthropogenic pressure hotspot. Today, increasing water demands and high variability in precipitation are already challenging the region's water future. Groundwater is considered as a strategic freshwater reserve and plays a vital role in supply for basic human needs and economic development. Transboundary aquifers (TBA) are important freshwater sources, particularly in arid and semi-arid regions, like the South Mediterranean. However, groundwater status in the South Mediterranean region remains poorly characterized, and its total water budget is uncertain. Lack of multistate systematic monitoring and data sharing are limiting the TBA assessment, delaying sustainable management. In recent years, groundwater modelling at a regional/global scale has offered further insights into groundwater status, especially in data-scarce regions. Even though it remains unclear to what extent those models can support management decisions, they will open new horizons on TBA assessment in limited-data conditions, such as the South Mediterranean region. A combination of regional-scale groundwater modelling and data-driven analysis has shown great potential for improving our physical understanding of groundwater systems functioning. This will guide for implementing science-based adaptation and sustainable management in the Mediterranean. In this study, we aim to first use available long-term groundwater level monitoring data, along with a review of regional assessments to identify and evaluate trends in groundwater storage where observations sites are available and identify their controlling factors. Then, we present a groundwater level regional model under steady-state and transient regimes in the Mediterranean region, calibrated with the collected data. These outcomes are expected to give insights in groundwater depletion at a regional scale, especially useful for the areas with low data availability and highly defragmented management strategies, like the Nubian Sandstone Aquifer System (NSAS) and the North-Western Sahara Aquifer System (NWSAS). This study provides a new step towards a better assessment of TBA. It contributes to enhancing the role of combining available observation data and regional-scale modelling, as an efficient tool in assessing and then predicting changes in groundwater resources availability under socio-economic and environmental management capacities within the sharing countries. This work was supported by Sustain-CAOST and InTheMED projects. Sustain-CAOST was funded by the German Federal Ministry of Education and Research (BMBF, Germany, Grant 01DH19015) under the EU PRIMA 2018 programme. InTheMED is part of the PRIMA programme supported by the European Union's Horizon 2020 research and innovation programme under grant agreement No 1923.

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