

Code of abstract: T6.1.2
Type of presentation: Oral presentation
Topic: T6. Coastal and Island Hydrogeology
Session: T6.1. Modelling of coastal and island aquifers

Optimising the management of the Gozo Mean Sea Level Aquifer (Malta)

Sapiano Manuel¹, Schembri Michael¹, Debattista Henry¹, De Filippis Giovanna², Rossetto Rudy²

¹Energy and Water Agency, Valletta, Malta

² Scuola Superiore Sant'Anna, Pisa, Italy

KEY WORDS Groundwater, Island, Quantitative Status, Model

ABSTRACT

The island of Gozo with a land-area of 68.67 square kilometers is the second largest island in the Maltese archipelago. The water demand generated by the population, their economic activities and the needs of the water dependent environment is estimated to exceed the available natural freshwater resource-base. In as much the island is directly linked to a sea-water desalination plant in the island of Malta to supplement potable water needs. The agricultural sector on the island is totally dependent on groundwater and harvested rainwater, although the commissioning of a treated wastewater polishing plant later in 2017 will introduce an alternative water resource, reducing the impact on groundwater.

Malta's 2nd River Basin Management Plan (RBMP) estimates that the mean sea level aquifer in Gozo still suffers from overexploitation, and hence is classified as being in poor quantitative status. The aquifer system is utilized for the abstraction of water intended for human consumption and the agricultural and commercial sectors. The strategic importance of groundwater for the islands therefore calls for the development of tools for its protection, in order to protect it from over-abstraction and related risks of sea-water intrusion.

This issue was addressed under the FREEWAT project (Rossetto et al., 2015) through the development of a management tool (numerical model) of the Gozo mean sea-level aquifer which permits the evaluation of the quantitative status of the water body. The model permits the assessment of the impact of measures programmed under Malta's 2nd RBMP and their capacity to achieve good quantitative status. Furthermore, the model introduces a spatial dimension in the water balance assessment by taking due consideration of the spatial variation of groundwater abstraction, and therefore helps the identification of regional water management issues. The model thus supports the optimized management of this aquifer system through increasing the reliability of quantitative status assessments.

The model also permits the assessment of future groundwater management scenarios, including the effects on quantitative status arising from climate change impacts, such as reduced precipitation and increased abstraction, and therefore is also an effective tool to support water managers in the identification of the necessary adaptation measures.

Acknowledgements

This paper is presented within the framework of the project FREEWAT, which has received funding from the European Union's HORIZON 2020 research and innovation programme under Grant Agreement n. 642224.

References

Rossetto, R., Borsi, I. & Foglia, L. FREEWAT: FREE and open source software tools for WATER resource management, Rendiconti Online Società Geologica Italiana, 2015, 35, 252-255.

