Article

Presentation of DeMa (Decision Support Software and Database for Wellfield Management) and Its Application for the Wadi Al Arab Wellfield

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Abstract: This article aims to present the structure and the workflow of a new software DeMa (Decision Support Software and Database for Wellfield Management), to support wellfield managers in their decision-making processes. There is a recognized need to improve the management of groundwater resources, especially with the increased demand for fresh water in arid and semi-arid regions. DeMa differentiates from other available software, by combining data collected for the well's maintenance, operation, design, installations, and cost data with the collected hydrological field measurements. Additionally, DeMa links the different information and provides an effective graphical representation of the data. We applied the software to the Wadi Al Arab wellfield case study to support wellfield managers in the decision-making process of three typical problems: identification of missing data and information concerning the wells, identification of maintenance needs for a well, and identification of a suitable location for a new well. In the application to the Wadi Al Arab wellfield (Jordan), we collected data and documents from the Yarmouk Water Company (YWC), the Jordan Ministry of Water and Irrigation (MWI), and private drilling companies. The software application highlights the beneficial effects of the digitalization of water resources management by improving data availability and management and achieving data and research-based decisions on the wellfield.

Keywords: wellfield management; water management; digitalization; software; database management