

# Decision Support System (DSS) to manage the Zeuss Koutine Groundwater (Tunisia) using the WEAP-MODFLOW framework

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**Introduction:** “Zeuss Koutine” aquifer is located in Easter South of Tunisia. It belongs to the coastal plain of the Jeffara. (Fig. 1). The area of the aquifer is estimated to 1305 Km<sup>2</sup>, shared by four main river basins: “Oued Zigzaou”, “Oued Zeuss”, “Oued Oum Zessar”, and “Oued Sidi Makhlouf”. The collaboration between INAT, the Federal Institute for Geosciences and Natural Resources (BGR), the Arab Centre for the Study of Arid Zones and Dry Lands (ACSAD) and the German technical cooperation (GIZ), permitted the development of a monthly management model (1982 – 2030) for the Zeuss Koutine aquifer, using the WEAP software. The WEAP schematic used to model the real hydraulic system is shown in fig. 2.

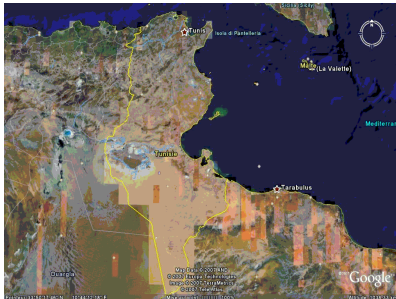


Fig. 1. Location of the study area.

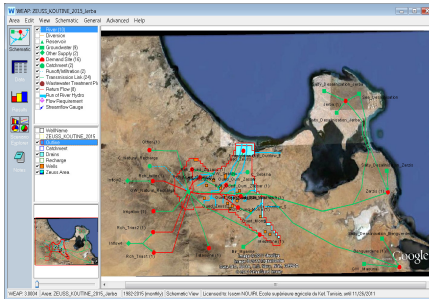


Fig. 2. WEAP schematic of the study area.

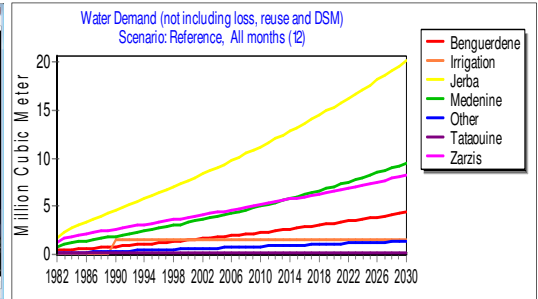
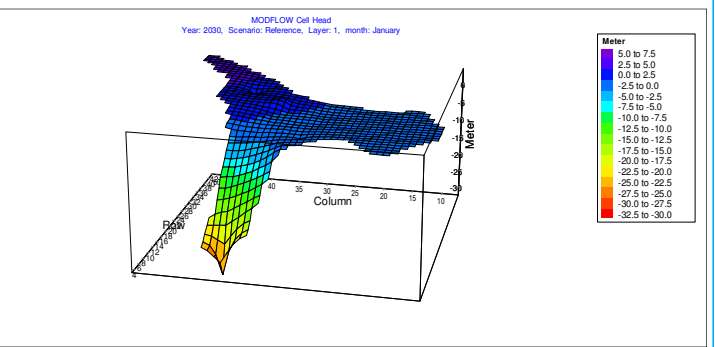
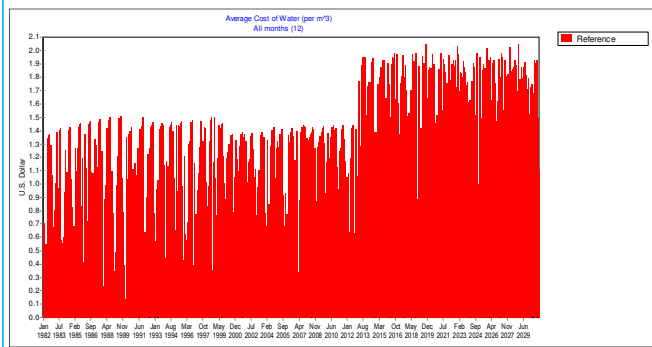
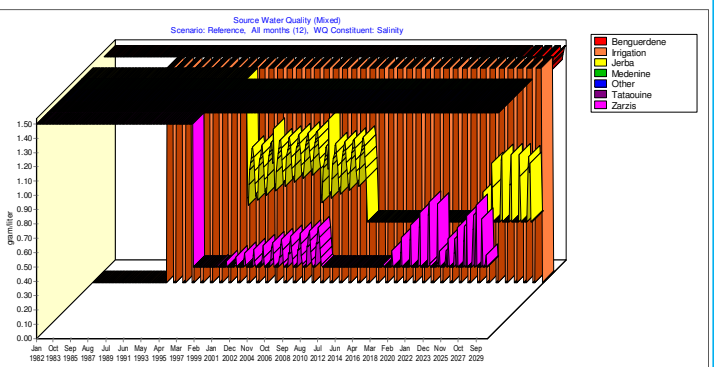
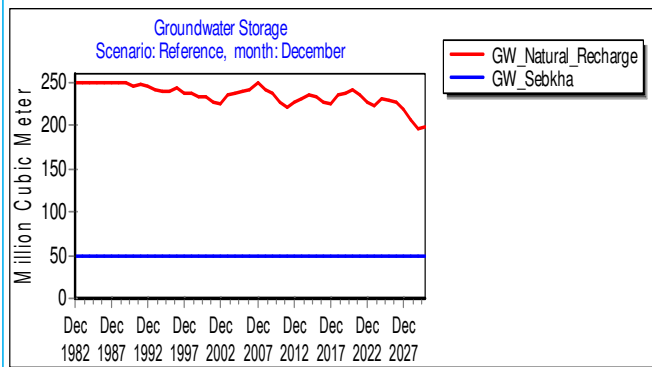


Fig. 3. Monthly water demand of the study area.

**Results:** Results demonstrate that the desalination plants already build in Jerba and Zarzis cities have contributed to the decrease of the continue drawdown observed before 1999. The use of sea water desalination plant, to supply Jerba and Zarzis cities in the future, is a solution to stop the Zeuss Koutine aquifer drawdown up to 2030. The definition of its optimal capacity and its starting year constitute the main research questions proposed by decision makers.



**Conclusions :** The WEAP-MODFLOW DSS for Zeuss Koutine aquifer constitutes an rich database of the physical and hydraulic system of the Eastern South of Tunisia. It was able to simulate and compare different management scenarios such as climate change and use of sea water desalination plants to face the increase of the water demand.