



Groundwater Modelling in Agricultural Basins with FREEWAT Modelling Environment: Palas Basin Case Study

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Abstract

Palas Basin (Kayseri, Turkey) is an agricultural basin, where both surface water and groundwater are used for irrigation. In recent years, groundwater levels went down and groundwater quality deteriorated due to intensification of agriculture. Palas Basin also hosts an ecologically-important wetland ecosystem, called Tuzla Lake. Tuzla Lake is fed by surface and groundwater flows, therefore has been affected negatively by the changes in the basin. In this study, a groundwater model was developed for Palas Basin using the FREEWAT platform. FREEWAT (FREE and open source software tools for WATER resource management) is a modeling platform developed under a HORIZON 2020 project that aims at promoting water resources management by means of innovative GIS integrated open source and public domain ICT simulation tools. The FREEWAT platform is based on the groundwater models (i.e., MODFLOW) and has been integrated as plugin into the open-source QGIS program. In this study, we simulated the groundwater component of the hydrologic system in the Palas Basin. The linkage between surface water and groundwater was examined and the effects of agricultural practices were discussed.

Keywords: Irrigation water quality, Agricultural production

Keywords: FREEWAT, groundwater modeling, participatory approach, Palas Basin.

Acknowledgment: 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.