



ICOCEE – CAPPADOCIA 2017
Nevsehir, TURKEY, May 8 - 10, 2017

Participatory Approach to Groundwater Modeling with FREEWAT at the Palas Basin in Turkey

F. Dadaser-Celik^{*1}, M. Celik² and S. T. Azgin³

^{1,3} Environmental Engineering Department, Erciyes University, TURKEY.
(E-mail: fdadaser@erciyes.edu.tr, stazgin@erciyes.edu.tr)

² Computer Engineering Department, Erciyes University, TURKEY.
(E-mail: mcelik@erciyes.edu.tr)

ABSTRACT

This study aims to develop a groundwater flow model for Palas Basin in Kayseri 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. This study presents a case study developed at the Palas Basin with the FREEWAT platform. Palas Basin is a semi-arid closed basin in the Central Anatolia region of Turkey. The climate in the Palas Basin is characterized by hot and dry summers and wet and cold winters. Tuzla (Palas) Lake, which is the second largest salt lake in Turkey, is part of the Palas Basin. Tuzla Lake is fed by surface and groundwater flows generated in the Palas Basin and therefore is very susceptible to the changes in water use practices. In this study, we aim to estimate groundwater flow to the Tuzla Lake by developing a model for the basin and evaluate the effects of groundwater pumping on these flows. A participatory framework is followed in the modeling process. All stakeholders are included from the beginning to ensure that interests of all groups are represented in the model. Our study focuses on the central alluvial plain to the east of the Tuzla Lake, where groundwater use is dominant. A model grid with 250 m x 250 m was created. Two hydrostratigraphic units were identified. Groundwater pumping, rainfall recharge and evapotranspiration were represented in the model. The model was successful in simulating groundwater flows in the Palas Basin.

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.