



Evaluation of Groundwater Storage changes at Konya Closed Basin, Turkey using GRACE-based and in-situ measurements

Koray Kamil Yilmaz (1), Mohamed Saber (1,2), and Mustafa Tugrul Yilmaz (3)

(1) Middle East Technical University, Department of Geological Engineering, Ankara, Turkey (yilmazk@metu.edu.tr), (2) Geology Department, Faculty of Science, Assiut University, Egypt, (3) Department of Civil Engineering, Middle East Technical University, Ankara, Turkey

The Konya Closed Basin (KCB) located in Central Anatolia, Turkey, is the primary grain producer in Turkey. The lack of sufficient surface water resources and recently changing crop patterns have led to over-exploitation of groundwater resources and resulted in significant drop in groundwater levels. For this reason monitoring of the groundwater storage change in this region is critical to understand the potential of the current water resources and to devise effective water management strategies to avoid further depletion of the groundwater resources. Therefore, the main objective of this study is to examine and assess the utility of the Gravity Recovery and Climate Experiment (GRACE) and the Global Land Data Assimilation System (GLDAS) to monitor and investigate the groundwater storage changes in the Konya Closed Basin. Groundwater storage changes are derived using GRACE and GLDAS data and then are compared with the groundwater changes derived from the observed groundwater levels. The initial results of the comparison indicate an acceptable agreement between declining trends in GRACE-based and observed groundwater storage change during the study time period (2002 to 2015). Additionally, the results indicated that the study region exhibited remarkable drought conditions during 2007-2008 period. This study shows that the GRACE/GLDAS datasets can be used to monitor the equivalent groundwater storage changes which is crucial for long-term effective water management strategies.