



Monitoring of Anthropogenic Groundwater by Using GRACE Satellite Gravimetry Data

Shahab Asaadi (1) and Gholamreza Joodaki (2)

(1) Zanzan university, Geodesy, Tehran, Iran, Islamic Republic Of (shahabasaadi71@znu.ac.ir), (2) Graduated from Ph.D. from NTNU University, Trondheim, Norway (Gh_reza@znu.ac.ir)

In this research, GRACE satellite data have been used in order to investigate possibility of estimating the amount of groundwater used in agriculture. The level-2 data of the GRACE satellites have been used to estimate the monthly groundwater level changes in Iran during the period of 2002 to 2017. The results indicate a sharp decline in groundwater levels in all 6 Iran's main catchment areas. One-degree grid is used along with corrections of soil moisture, canopy, rainfall and snowfall from GRACE satellite data with the GLDAS hydrology model. The results revealed the amount of current groundwater in Iran and agricultural usage from groundwater have been determined (the largest consumer of groundwaters).

verification of the results has been done by comparing the GRACE satellite data and piezometric wells data. Furthermore, ArcMap software were used for data analysis.

The verification results show that these two series of data are in good consistency. The following conclusion can be gained that, by using the GRACE satellite data, not only the amount of groundwater resources could be estimated but also, the contribution of agriculture in these water resources could be achieved with good accuracy.