



## **Water resource monitoring in Iran using satellite altimetry and satellite gravimetry (GRACE)**

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Human civilization has always been in evolution by having direct access to water resources throughout history. Water, with its qualitative and quantitative effects, plays an important role in economic and social developments. Iran with an arid and semi-arid geographic specification is located in Southwest Asia. Water crisis has appeared in Iran as a serious problem. In this study we're going to use various data sources including satellite radar altimetry and satellite gravimetry to monitor and investigate water resources in Iran. Radar altimeters are an invaluable tool to retrieve from space vital hydrological information such as water level, volume and discharge, in particular from regions where the in situ data collection is difficult. Besides, Gravity Recovery and Climate Experiment (GRACE) provide global high resolution observations of the time variable gravity field of the Earth. This information is used to derive spatio-temporal changes of the terrestrial water storage body. This study isolates the anthropogenic perturbations to available water supplies in order to quantify human water use as compared to available resources. Long-term monitor of water resources in Iran is contain of observing freshwaters, lakes and rivers as well as exploring ground water bodies. For these purposes, several algorithms are developed to quantitatively monitor the water resources in Iran. The algorithms contain preprocessing on datasets, eliminating biases and atmospheric corrections, establishing water level time series and estimating terrestrial water storage considering impacts of biases and leakage on GRACE data. Our primary goal in this effort is to use the combination of satellite radar altimetry and GRACE data to study on water resources as well as methods to dealing with error sources include cross over errors and atmospheric impacts.