The Sustainability of Saudi Arabia's Water Resources from the Past Decade: A Remote Sensing Approach

Arya Pradipta[1], M Makkawi[1], Hatim Sharif[2], Abdalla Elamin[1], and Ismail Kaka[1]

[1]Geoscience, KFUPM, Dhahran, Saudi Arabia.
[2]UTSA, San Antonio, TX, United States.

ABSTRACT

Saudi Arabia is classified as country with poor of water resources. Growth of economy and population, ineffective of irrigation and climate change definitely put strain on water availability. Utilization of Gravity Recovery and Climate Experiment (GRACE) in this region would be helpful to observe the sustainability of water resources since hydrologic data are often unmonitored. This study estimated the sustainability of Saudi's water resources by computing GRACE observation model over 10 years, from July 2006 to July 2016. The result of this study shows that the Kingdom has been experiencing depletion in total water storage of approximately 7.764 ± 0.233 mm/year, equal to 16.692 km3 of water loss volume. Jouf, Hail, Qassim, Northern Borders and northern part of Riyadh and Eastern Province are regions that have high contribution of Saudi's water deficits due to extensive irrigated agriculture and low annual precipitation. However, since Saudi water demand relies on groundwater, further research is required to observe it by integrating with another NASA satellite and local well observation.