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خلاصه مقاله:

This study characterizes land subsidence in Feyzabad plain, central Iran, using Sentinel-1A SAR data. These techniques are based on the analysis of pairs of synthetic aperture radar (SAR) images that are able to identify sub-centimeter changes in the line of sight (LOS) position of targets. Excessive groundwater withdrawal has caused several land subsidence in the studied area in the past few years. Using remote sensing techniques and SAR data, we analyzed the rate of land subsidence and its associated landforms in the area in a short time span. Feyzabad plain is located in an arid region with 154 mm annual precipitation. The most famous fault in the region is the Darouneh left-lateral fault with an east-west trend. To investigate land subsidence and the related effects, we first monitored ground motions between 2017 and 2018 in a 45-day period (for each pair of images) using SAR data and SNAP software. Then, we extracted linear landforms for each year to analyze subsidence in more details. We also mapped NDVI for both years so that we could compare the displacement and the vegetation cover in the studied area. Results showed that the maximum rate of subsidence was 3.9 cm in 2017 while the maximum rate in 2018 was 1.3 cm. NDVI maps revealed that decreasing pistachio cultivation has direct effects on the rate and magnitude of land subsidence. Results also showed that intensive subsides were centered in 2018 while in 2017, subsidence was scattered across the region.

کلمات کلیدی:

land subsidence, Sentinel-1A, Interferometry, Feyzabad plain (Iran), NDVI

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