Geophysical Research Abstracts
Vol. 20, EGU2018-3641, 2018
EGU General Assembly 2018

Evaluating the Mosul Dam's Instability after Resumption of Maintenance

Yasir Al-Husseinawi, Zhenhong Li, Peter Clarke, and Stuart Edwards
Newcastle, School of Engineering, Geomatics, United Kingdom (bd_ysr@yahoo.com)

There is serious concern about the safety of Mosul dam in the north of Iraq. Millions of people in the downstream area are exposed to risk of catastrophic collapse of this dam due to its soluble foundation. Recent study (Milillo et al., 2016, Scientific Report/10.1038/srep37408) reported that the dam deformation has accelerated since August 2014, when grouting operations were interrupted due to the conflict in the region. In this study, we investigate the health of Mosul dam since Jun 2016 using three independent datasets: Sentinel-1A/B SAR images, levelling, and GPS measurement. The latter are based on three epochs of terrestrial observation for levelling and GPS data: March 2016, December 2016 and July 2017. During this period, maintenance operations are being recovered to keep the dam stable. The monitoring network, on which the levelling and GPS observations are based, consists of eighty-seven pillars distributed on the dam surface. The results from InSAR and leveling data show that the dam crest is settling by 9 mm/yr. In contrast to previous studies, our results show a deceleration in the settlement. This may be due to the maintenance operations performed in the last few months. InSAR time series analysis was performed using the in-house tool TM-SBAS. When using the small baseline Sentinel-1 constellation, all possibilities of image choice are taken into consideration and the SRTM DEM accuracy is sufficient to generate the differential interferograms. Data from both Sentinel-1A and -1B images are used, and these results can be compared with multi-platform (Envisat, Sentinel-1, Cosmo-SkyMed, and TerraSar-X) data collected during the period between March 2003 and September 2016.