Application of Sentinel-1 SAR imagery for near real-time flood mapping

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Flood monitoring plays a crucial role in hazard management and loss reduction. During the last decade, remotely sensed data have been used widely for flood monitoring as well as flood mapping. We utilized Sentinel-1 synthetic Aperture Radar (SAR) imagery to identify flooded/inundated areas along the Kashkan river in the Zagros Mountain range, Iran. The average annual discharge of the Kashkan river is measured at 33.2 cubic meters at the Kashkan bridge station. The length of the Kashkan river in the study area is about 100 km. In March and April 2019, three flooding events occurred in the study area. To extract flooded/inundated extend from SAR imagery, we used the OTSU threshold segmentation method. OTSU thresholding is an algorithm to determine the threshold of binary classification. For pre-processing and processing steps, we used SNAP and MATLAB software. Flood map of the March 25th showed that with a daily average precipitation of 47.46 mm, 6.51 percent of the study area was flooded/inundated. on March 31st the daily average precipitation was 31.64 mm. flood maps showed that 3.96 percent of the study area was flooded on March 31st. Results also showed that meanders are the most flood-prone sections of the study area. Results revealed that Sentinel-1 SAR imagery are useful tools for near real time flood mapping.