Flood Detection in Malawi Before and After Cyclone Idai by Multi-temporal Sentinel-1 SAR Imagery

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Abstract

Tropical cyclone (TC) Idai landing twice in March 2019 had made great losses to Malawi and surrounding countries. Before the TC Idai landed, Malawi had already experienced heavy rainfall since January. In order to observe this disaster situation, 17 images of Sentinel-1 Synthetic Aperture Radar (SAR) from 13 January 2019 to 19 April 2019 are used here to estimate the flooding extent based on change detection. Results show that the flooding area varied from 315 to 622 km2, arable land suffered most, and for the percentage of flooding area the urban area suffered most. This demonstrates obviously that the TC Idai may cause great agricultural losses and make many people homeless. For flood detection, SAR has shown much more powerful that optical sensors for its ability of all-weather and all-day.

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Average precipitation amount