

Flood Monitoring in the Vietnamese Mekong Delta Using Sentinel-1 SAR with Global Flood Mapper

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Abstract : Satellite monitoring is an essential tool to study, understand, and map large-scale environmental changes that affect humans, climate, and biodiversity. The Sentinel-1 Synthetic Aperture Radar (SAR) instrument provides a high collection of data in all-weather, short revisit time, and high spatial resolution that can be used effectively in flood management. Floods occur when an overflow of water submerges dry land that requires to be distinguished from flooded areas. In this study, we use global flood mapper (GFM), a new google earth engine application that allows users to quickly map floods using Sentinel-1 SAR. The GFM enables the users to adjust manually the flood map parameters, e.g., the threshold for Z-value for VV and VH bands and the elevation and slope mask threshold. The composite R:G:B image results by coupling the bands of Sentinel-1 (VH:VV:VH) reduces false classification to a large extent compared to using one separate band (e.g., VH polarization band). The flood mapping algorithm in the GFM and the Otsu thresholding are compared with Sentinel-2 optical data. And the results show that the GFM algorithm can overcome the misclassification of a flooded area in An Giang, Vietnam.

Keywords : SAR backscattering, Sentinel-1, flood mapping, disaster

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