عنوان مقاله:

Flood Detection and Susceptibility Assessment using Deep Learning Methods: A Case Study of Al-Kut, Wasit Governorate, Iraq

محل انتشار:

سومین کنفرانس بین المللی و ششمین کنفرانس ملی صیانت از منابع طبیعی و محیط زیست (سال: 1401)

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خلاصه مقاله:

Flooding is a natural hazard that affects the environment, agricultural services, and human settlements. In Iraq, floods are becoming more intense as a result of uncontrolled urban expansion and negative human activities. This research developed deep learning methods for flood detection based on Sentinel-۲ satellite imagery for a flood event that happened on November ۲۶, ۲۰۱۸ in Al-Kut city, Wasit province, Iraq. A dataset was prepared based on a flood reference map given by SERTIT for the research area and a total of ۱۴۴ samples, both negative and positive. Flooding extends in the study area were detected using Normalized Difference Water Index (NDWI) and Convolutional Neural Network (CNN). The results were compared with Support Vector Machine (SVM) and Random Forest (RF). Finally, the overall accuracy (OA), intersection over union (IoU), and F۱-score of flood detection models were evaluated. The results showed that NDWI performed poorly, with OA, IoU, and F۱-scores of ۰.۵۲, ۰.۴۸, and ۰.۵۱, respectively. CNN outperformed the SVM and RF models. According to OA (۰.۹۸۹), IoU (۰.۹۷۹), and F۱-score (۰.۹۸۹), the map was the most accurate.

کلمات کلیدی:

Flood detection, Deep learning, Sentinel, Wasit province