Submission

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Submission ID: 815

Title: Identification of areas affected by flooding, through image processing and statistical simulation, at Municipal head of Bocas de Satinga, in the interval 2017 – 2020

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Topic(s):
- Software and Systems Modeling
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- Information Technologies in Education
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Abstract: The purpose of this research is the identification and delimitation of areas susceptible and affected by the floods that occurred in the Bocas de Satinga municipal seat in the time interval 2017 - 2020. For this, four (4) satellite images were obtained with spatial resolution of three (3) meters, correctly corrected, and with cloud cover less than ten percent (10%), subsequently, an application of the indicators was carried out: Normalized Differential Water Index (NDWI), Normalized Differential Vegetation Index (NDVI) and extraction of moisture through the tasseled cap transform, followed by the application of high- and low-pass filters, the use of map algebra to reduce errors, and reclassification to highlight susceptible and flooded areas. As the number of samples is small, the use of statistical simulation was proposed, therefore, the Bootstrap method was implemented for the generation of 6250000 samples, thus obtaining the average of the affected territory in the time interval set with errors close to the pixel area. It is observed that the combination of fluvial and pluvial floods represents the highest percentage of affectation, with approximately 25.02%, followed by pluvial flooding with 23.29%, and continues with the area susceptible to fluvial flooding, due to failure, erosion, or rainfall and by erosion or failure. The images used to allow the implementation of products with an efficient scale and considerably improve the use of these technologies for risk management, in turn, the statistical simulation method proposes an effective approach to reality, since, when dealing with images coming from a passive sensor, the possibilities of finding optimal images to carry out this process are reduced, and reflecting potentially affected areas contributes considerably to the foundations for control and monitoring plans.

Comments: