عنوان مقاله:

Flood hazard mapping in an urban area using combined hydrologic-hydraulic models and geospatial technologies

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خلاصه مقاله:

Flooding is one of the most occurring natural hazards every year risking the lives and properties of the affected communities, especially in Philippine context. To visualize the extent and mitigate the impacts of flood hazard in Malingon River in Valencia City, Bukidnon, this paper presents the combination of Geographic Information System, high-resolution Digital Elevation Model, land cover, soil, observed hydro-meteorological data; and the combined Hydrologic Engineering Center-Hydrologic Modeling System and River Analysis System models. The hydrologic model determines the precipitation-runoff relationships of the watershed and the hydraulic model calculates the flood depth and flow pattern in the floodplain area. The overall performance of hydrologic model during calibration was very good fit based on the criterion of Nash-Sutcliffe Coefficient of Model Efficiency, Percentage Bias and Root Mean Square Error – Observations Standard Deviation Ratio with the values of 0.87, -8.62 and 0.46, respectively. On the other hand, the performance of hydraulic model during error computation was intermediate fit using F measure analysis with a value of 0.56, using confusion matrix with 80.5% accuracy and the Root Mean Square Error of 0.47 meters. Flood hazard maps in 2, 5, 10, 25, 50 and 100-year return periods were generated as well as the number of flooded buildings in each flood hazard level and in different return periods were determined. The output of the study served as an important basis for a more informed decision and science-based recommendations in formulating local .and regional policies for more effective and cost-efficient strategies relative to flood hazards

کلمات کلیدی:

geographic information system (GIS),Inundation,Light detection and ranging,Model calibration