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GIS-BASED MAPPING AND MORPHOMETRIC ANALYSIS OF FLOOD PRONE SITES IN THE THREE WATERSHEDS OF BUKIDNON

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ABSTRACT

This study applied the combined technologies of geographic information system (GIS) and global positioning system (GPS) with digital elevation model (DEM) in mapping flooded sites and the morphometric attributes in the Manupali, Taganibong and Maramag watersheds of Bukidnon. The geospatial analysis focused on morphometric characteristics of the watershed as the influencing parameters of flooding which was done mainly within GIS environment using DEM, GPS and survey data on flood extent and depth. DEM database was generated from the topographic map of NAMRIA with 1:50,000 scale and 20-m contour interval. DEM obtained from PhilGIS was also used in the study. Boundary and stream network of the three watersheds were also delineated using MapWindow Open Source GIS. Morphometric parameters of the watershed such as basin shape, area, elongation ratio, circularity ratio, form factor value, relief ratio, elevation, slope, stream order, stream frequency, stream density, among others were also determined. Geospatial analysis of these parameters was made in relation to flooding within the three watersheds. Results showed that flood coverage can be delineated based on the topographic attributes of the watersheds and survey data on flood depth within specific locations. Highly flooded areas are concentrated in the low lying portions of the watersheds. The likelihood of wider flood coverage was directly affected by the size of