Flood inundation modelling in the Kuantan River Basin using 1D-2D Flood Modeller coupled with ASTER-GDEM

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ABSTRACT

Topography dataset is an important input in performing flood inundation modelling. However, it is always difficult to obtain high resolution topography that provide accurate elevation information. Fortunately, there are some open source topography datasets available with reasonable resolution such as SRTM and ASTER-GDEM. In Malaysia particularly in Kuantan, the modelling research on the floodplain area is still lacking. This research aims to: a) to investigate the suitability of ASTER-GDEM to be applied in the 1D-2D flood inundation modelling for the Kuantan River Basin; b) to generate flood inundation map for Kuantan river basin. The topography dataset used in this study is ASTER-GDEM to generate physical characteristics of watershed in the basin. It is used to perform rainfall runoff modelling for hydrological studies and to delineate flood inundation area in the Flood Modeller. The results obtained have shown that a 30m resolution ASTER-GDEM is applicable as an input for the 1D-2D flood modelling. The simulated water level in 2013 has NSE of 0.644 and RSME of 1.259. As a conclusion, ASTER-GDEM can be used as one alternative topography datasets for flood inundation modelling. However, the flood level obtained from the hydraulic modelling shows low accuracy at flat urban areas.

KEYWORDS:

Flood control; Rivers; Topography; Water levels; Watersheds