

The Use of Shuttle Radar Topographic Mission (SRTM) for Extracting Hydrology Characteristics of Vu Gia – Thu Bon River Basin, Vietnam

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Abstract: Vu Gia – Thu Bon is the biggest river basin in Central Region of Vietnam. Studying about hydrology features of this river basin plays an important role in watershed management as well as many applications on natural resources monitoring. This research aims to characterize the stream network, basin boundary and other hydrology patterns of Vu Gia – Thu Bon river basin using the Digital Elevation Model (DEM) derived from NASA's Shuttle Radar Topographic Mission (SRTM). SRTM DEM is one of the global free DEM that are current used widely and effectively in various kinds of study. This study used the SRTM version 4 released by the Consortium for Spatial Information (CGIAR_CSI SRTM 90m) that has more advantages than previous SRTM version such as: void filling, shoreline masking. Firstly, the image pre-processing was carried out to fill missing values in SRTM. This process used 3DEM open source software with Terrain Patching Procedure. Subsequently, another open source software named GRASS GIS 6.4.3 was use to extract the flow direction, flow accumulation, stream network, channel network, watershed boundary and sub-watershed boundary with various parameters in experiment. The best parameters were chosen by comparing the river network extracted from SRTM and the actual river network in Landsat 8 satellite imagery. As the result, it can be concluded that the river network as well as the areas of the delineated watersheds that were derived from SRTM are almost accord with the actual river network and watersheds boundary from Landsat satellite image. The hydrology features from this result can be very useful for many applications, especially the disaster management such as flood, soil erosion while Vu Gia – Thu Bon river basin is one of the vulnerable areas of natural disaster.

Keywords: SRTM, Hydrology Analysis, Vu Gia – Thu Bon Basin, Watershed Management.