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## Practical use of SRTM digital elevation dataset in the urban-watershed modeling

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### Abstract

The advent of satellite-based elevation dataset acquired by Shuttle Radar Topography Mission (SRTM) made new and novel techniques possible to model hydrological process in midsize to large scale watersheds. This application is important in regions with poor photogrammetric coverage and land use in appropriate scale. Watersheds are natural integrators of hydrological processes and as such require an integrated approach in data analysis and modeling. The first task is to delineate watershed boundaries accurately using terrain dataset. This research assessed the effectiveness of satellite base Digital Elevation Model (DEM) with photogrammetric base DEM in the Upper Klang watershed which is a complex urban area located on peninsular Malaysia. Watershed parameters include slope, area, perimeters and mean elevation are derived from two sources of elevation data. The first set of parameters is derived from a 30 m grid DEM generated by the digital topo sheets at the scales of 1:25,000 and 1:10,000. The same parameters are derived from SRTM-DEM. Arcview extension HEC-GeoHMS V1.1 is used as GIS tool for watershed boundary delineation and parameterization. An inter comparison of four geometrical parameters are investigated using Nash-Sutcliff Efficiency (NSE). It was found the general agreement of about 88% between the two derivations. The largest discrepancy occurred in delineation of the sub-watersheds in the flat urbanized areas. It is that SRTM-DEM can be used for extracting watershed parameters with a reasonable degree of confidence especially in high relief non-urbanized regions.

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### Keywords

SRTM-DEM; Watershed modeling; Hydrological model; HEC-GeoHMS

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