

Prasit Maksin 2011: Effect of DEM Resolution and Sources on the Computation of Hydrological Parameters. Master of Science (Forest Engineering), Major Field: Forest Engineering, Department of Forest Engineering. Thesis Advisor: Assistant Professor Payattipol Narangajavana, D.Agr.Sc. 115 pages.

Digital Elevation Model (DEM) is an importance basic information to derive the topographic attributes which are useful for surface analysis and hydrological works. The effect of DEM resolution and sources on the computation of five topographic attributes (Elevation, Slope, Overall Curvature, Plan Curvature and Profile Curvature) and five hydrological parameters (Watershed Area, Watershed Morphology, LS Factor, Specific Catchment Area; SCA and Topographic Wetness Index; TWI) were investigated in this study. Three sources of DEM data were 1) RTSD data from topographic map 1:50,000-scale 2) Wang Nam Khiao sub-district data from topographic map 1:10,000-scale 3) Land Development Department (LDD) data from Digital DEM data at 1:4,000- scale, and using ArcGIS software to resample at 8 resolutions (5, 10, 20, 30, 40, 60, 80 and 100 m.). The study area was Lam Sema and Khlong E-Tao sub-watersheds located in the upper Lam Phra Phloeng watershed, Wang Nam Khiao district, Nakhon Ratchasima province.

The results revealed that all of topographic attributes and hydrological parameters have effected and significantly difference with DEM resolution at 99 % confident level, especially in the range of 5-30 m DEM resolution, except elevation and watershed area. When grid cell size increased, the average slope, the maximum-minimum of curvature, watershed morphology and LS factor decreased, in contrast to the SCA and TWI increased. For DEM sources, LDD data provided more details than other sources on the slope, LS factor, SCA and TWI. RTSD data also provided more details on the curvature. The estimated soil loss decreased significantly with the increasing DEM grid size greater than 10 m. The runoff estimation calculated from SCS-CN method found that DEM resolution and sources had no significantly difference but have related with watershed area.

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