

Analysis of Resolution and Resampling on GIS Data Values

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Elevation, soils, and land cover data are often used as base datasets for generating parameters for watershed and water quality models. These data layers, often in raster format, can be generated at various resolutions and resampled to different pixel sizes to support models at particular scales. We have developed datasets within geographic information systems (GIS) for four watersheds at a variety of resolutions and analyzed the effects of resolution and resampling on both the original GIS datasets of elevation and land cover and the parameters generated from these data for use in the Agricultural Non-Point Source (AGNPS) pollution model. Our results indicate that elevation from independent collections at 3 m and 30 m post spacing correlate at an R^2 value of 0.80 over a random sampling of 500 points in the watersheds. Land cover classes for the same 500 point positions vary significantly and are not significantly correlated based on categorical data analysis. Analysis of data resampled from 30 m to 60, 120, 210, 240, 480, 960, and 1920 m pixels indicate a general degradation of both elevation and land cover correlations as resolution decreases. Parameters generated for AGNPS follow the same trends as the original elevation and land cover data with decreasing correlation to original data as cell sizes increase.