Resolution or Analysis Scale: What Matters Most?

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Identifying the scale at which different covariates best explain the variation of soil properties reflects the geographic strategy of using map generalization (relative size of map delineations) to identify the scale at which phenomena occur. The size of map delineations corresponds to resolution in raster data models. Although not always considered in digital soil mapping studies, resolution is widely recognized as an important factor in identifying covariates in digital spatial analysis. However, many variables that are useful as predictors in digital soil mapping are dependent upon spatial context. For example, the slope gradient at a specific location can only be calculated by considering the surrounding area. In these cases, an analysis neighborhood is used when calculating such variables using a raster data model. The context or area considered is then dependent upon both the resolution and the number of cells (window size) used to define the neighborhood. This presentation explores the difference between resolution and analysis scale, then tests which concept is most important for identifying optimal scales of correlation for digital soil informatics.