



Representing a Large Region with Few Sites: A New Approach for Studies on Small Streams

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Many environmental studies attempt to characterize a large geographical region but financial and logistical constraints limit the number of field sites used. A systematic approach to site selection can ensure that an adequate range in the variables of interest is captured. We present a novel method to select small watersheds for a study examining relationships between agricultural land use, landscape characteristics and stream phosphorus export. This method reduces subjectivity and uses commonly-available geospatial datasets while considering practical constraints on site selections. We selected several variables representing agricultural P inputs or intensity and landscape susceptibility to P loss. We ordinated regional-scale data on cross plots and then superimposed potential field sites, picking those that covered the range shown, and over-representing areas with high P inputs losses. We represent an 110,000 km² geographic area with 10 sites, with good coverage of four variables, using six sites from a previous study and four new sites. The site selection method can easily be adapted to studies with a variety of goals and settings. Additionally, ordinating watersheds or regions along axes (here, “agricultural” and “landscape”) can provide insight into relationships among variables and help identify areas of particular concern, thus guiding stewardship and management programs. The largest challenge is resolution: small study watersheds (20 – 70 km²) may not be well represented by spatially and temporally coarse data.