

## **QUANTITATIVE SAMPLING OF BENTHIC MACROINVERTEBRATE COMMUNITIES AND RESPONSE TO ELEVATED SALINITY IN CENTRAL APPALACHIAN COALFIELD STREAMS**

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Anthropogenic salinization of freshwater is a global concern. In freshwater environments, elevated levels of total dissolved solids (TDS) and specific conductance (SC) can cause adverse effects on aquatic biodiversity and ecosystem structure. In central Appalachia, eastern USA, studies have largely relied on Rapid Bioassessment Protocols based on semi-quantitative sampling to characterize benthic macroinvertebrate community response to increased salinity caused by surface coal mining. These protocols require subsampling procedures and identification of a fixed number of individuals regardless of sample density, limiting measures of community structure including taxon richness, diversity, dominance, and detection of rare taxa. Quantitative sampling involves enumeration of all individuals collected within a defined area, allowing expanded characterization of the benthic community. Working in headwater streams of central Appalachia, we compared semi-quantitative and quantitative sampling methods to characterize benthic macroinvertebrate community response to elevated salinity. Additional analyses including identification of taxon-specific extirpation thresholds and critical SC values, estimates of population size, and effect of population density will be presented. Results of this research will improve ability to assess biotic condition in streams subjected to salt pollution and provide guidance for water resource management in Appalachia and beyond.