ORAL PRESENTATION

DEVELOPING ALTERNATIVE DIATOM ENUMERATION METHODS TO BUILD BETTER PREDICTIVE BIOASSESSMENT MODELS

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Diatoms are routinely sampled in biological assessments of water quality, but the method traditionally used to characterize diatom communities does not adequately capture species richness for use in most assessment applications. The traditional enumeration method of 300-600 cell fixed counts was designed to characterize the relative abundance only of dominant taxa, making it inappropriate for common bioassessment applications such as observed/expected (O/E) models, which rely on species richness. We analyzed the nature of diatom communities in reference sites of varying diversity using a measure of counting efficiency, which revealed 600-cell fixed counts did not consistently characterize high diversity sites compared to low diversity sites. To address this problem, we compared the fixed count method to a stratified method, which captures both abundance and richness, and a timed presence method, which captures richness for O/E models. The stratified and timed presence methods captured greater species richness compared to fixed counts. We then built O/E models using genus and species-level data for data collected with both the fixed and timed presence methods. The timed presence method produced more sensitive and precise models than the fixed method at both the genus- and species-level. A timed presence method could thus improve measurements of stream health while expediting analyses and saving money.