

## ORAL PRESENTATION

### DIATOM INDICATOR MAGIC: THE LAW OF LARGE NUMBERS PROVIDES GOOD METRIC PERFORMANCE DESPITE CURRENT LEVELS OF TAXONOMIC INCONSISTENCY

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Consistent identification of diatoms among taxonomists is certainly a source of error in ecological assessments, but the magnitude of that error is not well understood. Diatom metric performance in US national assessments has been high when compared to other organism groups. But concerns remain about taxonomic uncertainty. The likely explanation for good metric distinction between high and low quality sites is the law of large numbers, which holds frequencies of events with the same likelihood of occurrence even out, given enough trials or instances. For example, the more times you flip a coin, the closer you get to 50% heads and 50% tails. Therefore, if we assume misidentifications of species cause random, unbiased error in metrics and we have enough observations of different species in samples, a few accurate identifications with corresponding ecological indicator values provides the true value for metrics. I used duplicate counts of the same samples (used for quality control (QC)) from the 2008-2009 USEPA's National Rivers and Streams Assessment (NRSA) to evaluate this hypothesis. I found differences in metric values between QC counts decrease with increasing numbers of species observed in a samples. Differences in metric values between QC counts decrease with increasing similarity between QC samples. Results from these analyses are consistent with predictions of the law of large numbers. Additional analyses showed metric deviance responded relatively little to QC changes compared to other factors.