

Presentation Type:

Platform Preferred

Track:

Aquatic Toxicology and Ecology

Session:

Creating and Using Exposure-Response Relationships from Field Data

Abstract Title:

Combination of a Stressor-Response Model with a Conditional Probability Analysis Approach to Develop Candidate Criteria from Empirical Data

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Abstract:

We show that a conditional probability analysis that utilizes a stressor-response model based on a logistic regression provides a useful approach for developing candidate water quality criteria from empirical data. The critical step in this approach is transforming the response data into a binary variable using a threshold that is a desirable management goal for the intended water bodies. A logistic regression analysis on the stressor and binary response data is conducted and the result is interpreted as the probability of missing the management goal. This approach can be viewed as transferring uncertainty in empirical data to an estimate of the probability of missing the management goal. Several examples will be presented to demonstrate the robustness of this approach. The examples involve lakes in the northeast U.S., wadable streams on the mid-Atlantic U.S., and estuaries in Florida. This approach is also able to incorporate multiple stressors into the analysis. This capability allows one to look at the interaction among stressors that can be observed from the data. The issue of nutrient co-limitation in estuaries will be used to demonstrate this capability.