

# LITERATURE-BASED SYNTHESIS OF NUTRIENT STRESSOR-RESPONSE RELATIONSHIPS TO INFORM ASSESSMENT, MONITORING, AND CRITERIA DEVELOPMENT IN RIVERS AND STREAMS

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Eutrophication from nitrogen and phosphorus pollution is a major stressor of freshwater ecosystems globally. Despite recognition of this problem by scientists and stakeholders, synthesis of scientific evidence is still needed to inform nutrient-related management decisions and policies, especially for streams and rivers. A rigorous assessment of what is known about nutrient-stressor response relationships and modifying factors is a critical first step for identifying, managing, and restoring aquatic resources impaired by eutrophication. We conducted systematic reviews of the literature that asked: “What are the responses of chlorophyll-a, diatoms, and macroinvertebrates to TN and TP concentrations in lotic ecosystems,” and “how are these relationships affected by other factors?” We describe the reviews and discuss preliminary results based on the ~300 publications documenting cause-effect relationships between relevant nutrients and endpoints that were obtained after screening >22,000 publications from academic databases, and >4000 from other sources, for relevance, duplication, and quantitative effect sizes. These reviews provide a state-of-the-science body of evidence for assessing nutrient impacts to the most widely-used indicators of biological responses to nutrients. Synthesis of the data extracted from papers on diatom responses to nutrients is a challenging step because of high variability in the types of response measures reported in the literature. We seek feedback from the diatom research community about the most effective ways to synthesize effect sizes and other measures of diatom responses to nutrients.