

## **EFFECTS OF PHOSPHORUS ON BENTHIC DIATOM ASSEMBLAGE NETWORK STRUCTURE**

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Ecological network analysis helps identify how relationships among species differ over time and across sets of species. Microbial assemblages are ideal for evaluating changes in species interactions due to environmental changes because they are speciose and respond at multiple scales. To determine how phosphorus limitation influences diatom network structure, I analyzed relationships among 257 species of diatoms from benthic microbial (periphyton) mats from 10 years of annual samples collected from 136 sites. Expected evidence of changes in network structure in response to periphyton TP were not found, likely due to species replacement with increased TP. Analysis of species connection distributions and the effects of species removal on connections found frequency changes increases along a mean TP gradient for 51 species with significant roles in network structure. Trends in species frequency were variable, with 23 species increasing in frequency along the TP gradient, 13 species decreasing, and 15 species displaying a variable pattern along the TP gradient. This study brings a new methodology of study to the field of ecosystem restoration studies.