

ORAL PRESENTATION

DIATOMS AS AN EARLY WARNING SYSTEM FOR IMPACTS FROM EUTROPHICATION, INVASIVE SPECIES AND CLIMATE CHANGE

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Multiple stressors require management options in the Laurentian Great Lakes and diatom-based paleolimnology provides tools to track changing conditions and predict future impairments. We can provide early data reflecting aquatic impacts before they are realized in higher trophic levels, thereby predicting future conditions. Here are two examples of how paleolimnology is being used to inform management decisions for the Great Lakes. (1) The RAP for the St. Louis River requires removal of beneficial use impairments associated with nutrients. Sediment cores were analyzed for physical, chemical and biological remains and long-term changes in diatoms provided evidence that some areas have improved since nutrient abatement. However, nearshore areas show increasing nutrients and algal abundance, likely due to stressors that are not fully understood (climate change, sediment nutrients). Recommendations for delisting and future studies are forthcoming. (2) A diatom-based paleolimnological study has revealed the first biological effects of climate change on the base of the food webs in all five Great Lakes: an increasing relative abundance of *Cyclotella sensu lato*. Atmospheric warming is the strongest correlate with these changes, and recommendations are made regarding the eventual impacts on food webs throughout the Great Lakes system.