

LANDSCAPE SOURCES, ECOLOGICAL EFFECTS, AND MANAGEMENT OF NUTRIENTS IN LAKES OF NORTHEASTERN USA

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Lakes face escalating pressures associated with land cover change and growing human populations. Ecological responses provide context for identifying stressor severity, land use impacts, and management effectiveness. We used EPA National Lakes Assessment data and GIS to develop indicators and models relating diatom communities from tops of sediment cores to various extents of land use, nutrient concentrations, and natural factors. We found that diatom communities and metrics were strongly correlated with physico-chemical gradients and percent agriculture and urban development in basins. Major changes in community structure and metrics, some as threshold responses, occurred between 10-25 $\mu\text{g TP / l}$, at which sensitive and low nutrient taxa decreased in presence and relative abundance. Examining diatom community responses with boosted regression trees showed shallower lakes were more sensitive to losses of natural vegetation in basins than larger lakes. These results and approaches, along with ongoing work quantifying the effects of land cover at various spatial extents, can be used to inform nutrient criteria and land use management strategies that protect and restore lake ecosystems.