

Challenges to the Lake

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During the past decade we have extensively studied coastal ecosystems in the Great Lakes. Some research efforts have linked coastal receiving systems to conditions in their contributing watersheds; others have focused on developing invasive species detection and monitoring strategies in at-risk coastal habitats. In additional studies, specifically in Lake Superior, we have incorporated sampling of the shallow nearshore zone into a more comprehensive lakewide assessment, as part of binational monitoring efforts (2005-2006). Using depth-based stratification and a spatially-balanced probability survey design, we sampled food web components throughout the lake, and made additional physical-chemical measurements throughout the water column in all depth zones. Through comparisons of our data to the only previous spatially-comprehensive sampling of the Lake — over 3 decades ago (1973) — we provide select examples of the magnitude and nature of some physical (T), chemical (N, C, cations), and biological (plankton, benthos) differences and trends. The observations help define potential challenges to the lake, but further challenge us to develop integrated monitoring and research to understand and forecast ecological consequences of environmental changes.