

Across Hydrological Interfaces from Coastal Watersheds to the Open Lake: Finding Landscape Signals in the Great Lakes Coastal Zone

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Over the past decade, our group has been working to bring coastal ecosystems into integrated basin-lakewide monitoring and assessment strategies for the Great Lakes. We have conducted a wide range of research on coastal tributaries, coastal wetlands, semi-enclosed embayments and harbors, and fully-open nearshore waters along exposed coastlines; these coastal “systems,” although tough to classify unambiguously, represent a series of semi-distinct hydrological situations and ecological interfaces which modify signals of stressors delivered from watersheds out to the lake. A principal study goal has been to efficiently characterize conditions across the diverse, dynamic, and heterogeneous array of coastal habitats distributed over the vast shoreline; this is to enable a comprehensive but consistent approach to Great Lakes coastal assessments. A second goal has been to evaluate how coastal ecosystems, as interfaces, link with and respond to landscape drivers on the upstream side, but also to identify the degree they are influenced by interactions coming from the lakeward edge, on the downstream side. Thirdly, for the lakeward edge of the coastal zone (i.e., the “open” nearshore) we have developed an overall approach to identify landscape-derived signals such that the nearshore can serve as sentinel for potential longer-term, lakewide change. This talk will highlight several research findings that have helped define the general relationship between coastal watersheds and the mosaic of aquatic ecosystems that collectively form the coastal zone.