

Anett Trebitz\*, John Brazner, Danny Tanner, and Roger Meyer  
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Mid-Continent Ecology Division, U.S. Environmental Protection Agency  
6201 Congdon Boulevard, Duluth MN 55804 U.S.A.

Lake Superior coastal wetlands fish assemblages and habitat conditions in relation to watershed connectivity and landcover.

\*Corresponding/presenting author

The role of the coastal margin and the watershed context in defining the ecology of even very large lakes is increasingly being recognized and examined. Coastal wetlands are both important contributors to the biodiversity and productivity of large lakes and important mediators of the lake-basin connection. We explored wetland-watershed connections and their relationship to wetland function and condition using data collected from 37 Lake Superior wetlands spanning a substantial geographic and geomorphic gradient. While none of these wetlands are particularly disturbed, there were nevertheless clear relationships between watershed landuse and wetland habitat and biota, and these varied consistently across wetland type categories that reflected the strength of connection to the watershed. For example, water clarity and vegetation structure complexity declined with decreasing percent natural land cover, and these effects were strongest in riverine wetlands (having generally large watersheds and tributary-dominated hydrology) and weakest in lagoon wetlands (having generally small watersheds and lake-dominate hydrology). Fish abundance and species richness both increased with decreasing percent natural land cover while species diversity decreased, and again the effect was strongest in riverine wetlands. Lagoonal wetlands, which lack any substantial tributary, consistently harbored the fewest species of fish and a composition different from the more watershed-linked dendritic and riverine wetlands. The most strongly watershed-linked wetlands were the most diverse in habitat and fish composition but also those whose conditions were most readily impacted by landuse changes.