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Project team

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Abstract

Aquatic ecosystem integrity is essential for fisheries, recreation, flood control, and biodiversity. While ecosystem integrity can be affected by both natural dynamics and human pressures, increased infrastructure development and land-use changes further exacerbate these adverse effects on aquatic ecosystems globally. Yet aquatic ecosystems are also complex due to highly dynamic variations both spatially and temporally. Furthermore, species community responses to aquatic ecosystem changes vary according to spatio-temporal scales. Species in certain functional groups within aquatic ecosystems are more sensitive to anthropogenic development upstream and pollution within a watershed, which are cumulative downstream. Pulse disturbances from landscape pressures on species communities first require identifying key spatio-temporal scales to improve predictions of the aquatic ecological response to stressors. Press disturbances, such as obstacles and culverts in stream networks, negatively reduce connectivity for diadromous fish species that must migrate through both marine and freshwater habitats to complete their lifecycle. My research therefore aims to quantify species community responses within key spatio-temporal scales of analysis of the press and pulse disturbances at the watershed level. This research will be critical to maintain healthy ecosystem integrity by determining areas vulnerable to anthropogenic impact and potentially to Canadian health.

Keywords: connectivity, estuaries, fish community, functional group, indicator species, migratory fish, watersheds

Geographic Location: Ontario watersheds, Ontario, Canada, Miramichi River, New Brunswick, Canada, Northumberland Strait watersheds, New Brunswick, Canada

How does your project link to Canadian aquatic ecosystem services?

Policy targets based on these improved predictions of species community responses will aid in the conservation of aquatic ecosystems services and human health in Canada.