Feedbacks and Dynamics of Aquatic Ecosystem Services in a Multi-use Watershed

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Abstract
Truly understanding and managing aquatic ecosystem services (AES) requires understanding their interactions, feedbacks, and dynamics. Yet, most research into ecosystem services takes a static, one-time approach to measurement that is poorly suited to understanding these interactions. To better understand AES dynamics, we synthesize a suite of approaches, asking three main questions: (1) How dynamic and interrelated are AES along river-floodplain gradients? We integrate GIS and aerial photography to capture relationships among floodplain connectivity (e.g., lateral, longitudinal) and AES. Long-term spatial dynamics will be addressed using historical imagery. (2) How do AES capacity and demand differ in river-floodplain systems? Using participatory approaches, we engage with communities to map both the benefits provided by and demand for AES. We integrate this information to understand the community's priorities and behaviors with respect to management of AES and the benefits they confer. (3) How might future management influence AES interactions and dynamics? We work with local communities to develop future scenarios, to assess the potential changes in AES that would come with these futures, and to understand how communities might best respond. Pairing spatially-explicit approaches with scenarios and long-term datasets provides a unique opportunity to explore interactions and trade-offs among AES across river-floodplain gradients.

Keywords: Landscape position, ecosystem service interactions, landscape history, participatory mapping, floodplain, rivers, aerial photography, connectivity

Geographic Location: Batchawana watershed, Northern Ontario, Ontario, Canada

How does your project link to Canadian aquatic ecosystem services?
Our project maps Drawing on datasets often available across Canada (aerial photograph, remote sensing, and local knowledge), our work represents a case study approach to understanding interactions among AES important in a local and Canada-wide context.