

Land use and freshwater resource management on small islands: A social ecological metabolism method

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Abstract

Islands such as Prince Edward Island (PEI), Canada's smallest province and its only island with provincial jurisdiction, have traditionally focused on primary sector industries such as agriculture, fishing, and increasingly aquaculture. Farmers and aquaculturists depend on stable freshwater supplies, and they are increasingly turning to pumping groundwater from traditional and in some cases high-capacity wells. Like many islands, population, tourism, and coastal developments are rapidly growing in PEI. This contributes to concerns about groundwater supplies and the risks associated with climate change, it helps to drive policy interventions, and in some cases it pressures primary sector stakeholders to consider mitigation strategies and even substantial changes in land use and other practices.

This paper reports on two recently funded freshwater projects, and it introduces methods and feedback gained from participatory research with primary sector stakeholders. The "Sustainable Agriculture and Water Use for Prince Edward Island" NSERC Alliance project aims to quantify and optimize sustainability trade-offs associated with both agriculture and water use to improve environmental, economic, and social outcomes. The authors have developed a social ecological metabolism profile method that presents stakeholders with information about long-run changes in both land use and freshwater resource management practices in order to gauge their willingness to consider sustainability tradeoffs. By creating metabolic profiles at the watershed scale, this approach offers social science research instruments that are innovative in both scale and scope. This is the main focus of the paper. However, stakeholder engagement is also underway for a second project, the Ocean Frontiers Institute-funded "SOURCE: Offshore Groundwater resources in the Continental Shelf surrounding PEI" project. Preliminary results will be shared from research on the willingness of primary sector stakeholders to engage in non-traditional freshwater sources, including freshwater aquifers located beneath island coastal waters.

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