Reducing our agricultural footprint to preserve, protect, and restore the ecological health of the Great Lakes

By 2050, humanity will need to produce 10 times more food each year than all the food ever produced throughout the history of humankind. However, current "best-practices" are wholly unsustainable. Agricultural run-off is leading to toxic algal blooms in our Great Lakes, and the prophylactic application of pesticides on agricultural landscapes has been linked with biodiversity loss, including declines in birds and pollinators. Around the world, arable land is being gobbled up by development, while new, pristine land and forests are converted to monoculture cultivation. Small-scale farmers experience difficulty entering the market and are often forced to consolidate with large-scale operations just to break even. The pandemic has exposed the fragility of global food economies that were designed for maximizing profits and feeding the masses but at a high environmental cost. We need a vision to reimagine sustainable food production because continuing with business as usual is no longer an option.

Our paper argues the 2020s can be a transformative decade for human interaction with the environment. We present an agrosystem approach that is inspired by the United Nations' 17 Sustainable Development Goals. The agrosystem model we propose is defined to promote regenerative agriculture, an integrative approach that provides greater resilience to a changing climate, reverses biodiversity loss, and improves soil health; honors Indigenous ways of knowing and a holistic approach to living off and learning from the land; and supports the establishment of emerging circular economies and community well-being.

To truly develop a regenerative and nourishing food system in the Great Lakes that will feed humanity by 2050, we need to go beyond individualistic approaches and adopt community-centric approaches that create a sustainable path for the future. Creating unity of vision requires unity in action.

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Adopting an agrosystem approach inspired by the United Nations' Sustainable Development Goals can result in a regenerative and nourishing food system in the Great Lakes that is community-centric and sustainable. Photo courtesy of the Ontario Agricultural College, University of Guelph.

Exploring pluralism in ecosystem governance

While pluralism is not a new idea in environmental governance, recent calls for broadening participation in ecological and sustainability solution-building—such as for climate change-related extreme weather events and the COVID-19 pandemic—have prompted renewed urgency in understanding how diverse institutions and people can effectively govern ecosystems to promote ecological sustainability and human well-being. By pluralism, we refer to the diversity of aspects of human culture and/or the natural environment.

The field known as translational ecology (TE) emphasizes linking ecological science to evidence-based decision making, taking its verbiage from translational medicine. TE uses cross-disciplinary research, together with broader participation, to address the social, ecological, and political contexts of environmental problems, with an aim to improve decision making for environmental management and conservation. This approach, along with other, similar approaches, requires deliberate engagement with a range of actors, as well as an understanding of the social and cultural contexts in which research is conducted. One challenge of this approach lies in integrating different types of knowledge, like scientific evidence, practical know-how, and Indigenous and traditional knowledge. TE and other fields of participatory environmental research also recognize that much of what we know does not get "used" because of implementation challenges.

Related to our work on the scientific project ResNet, which promotes sustainable and resilient ecosystems in Canada, our upcoming special issue of the *Advances in Ecological Research* book series titled "Pluralism in Ecosystem Governance" aims to deepen understanding of pluralism in a translational ecology context. This issue will present a diverse selection of in-depth synthesis articles that explore a range of ideas, from human-animal relations to conservation conflicts. These studies represent a range of disciplines, geographies, methods and case studies.



Academic collaborators and students get the lay of the land at Windsor causeway foreshore salt marsh, Bay of Fundy NS, August 2018. Photo by Kate Sherren.

By Jen Holzer, Environmental Sustainability Research Centre, Brock University.