

## SEARCH TERM: Economic (and synonyms) – 7 Projects

### Agriculture Water Futures

- Integration of water quality components into hydro-economic models
- Accounted for economic impacts of climate change in the agricultural sector in the Great Lakes Region
- Coupled spatial environmental-economic optimization model for BMP selection
- Continued examination of producer behaviours and incorporation of economic choices and producer behaviours into decision-making
- Improved understanding of farmer behaviours and economic choices in the adoption of management practices and the inclusion of coupled human-natural systems (CHANS) into hydrological models

### Linking Water Governance in Canada

Project: Linking Water Governance in Canada to Global Economic, Social and Political Drivers

### Integrated Modeling Program for Canada

- **Integrated Water Management modelling** (Drs. Razavi & Brouwers' teams): Model integration efforts successfully completed so far combine the MODSIM Water Resource Management framework with the Inter-Regional Supply-side Input-Output (ISIO) economic model to evaluate relative economic impacts in the SRB under changing climate conditions, socioeconomic development, and policy interventions, to identify opportunities for building resilience into the SRB water system. Several python scripts have been developed to link ecological metrics to the modelling framework as described below.

### Lake Futures

- Developed a new hydro-economic model for the GLB which analyzes the direct and indirect impacts of possible future water use restrictions due to climate change on economic activities
- Completing an economic analysis, including conducting cost-benefit analysis of the implementation of policy measures in the Great Lakes to improve water quality
- Policy brief summarizing the economic analysis

### Managing Urban Eutrophication Risk

- Collect and archive data on historical (i) chlorophyll (*chl-a*) concentrations from publicly available Moderate Resolution Imaging Spectroradiometer (MODIS) daily data (and other

remote sensing sources), and (ii) additional open access water quality (P concentrations, temperature, meteorological data) and demographic plus socio-**economic** (census) data.

### **Paradigm Shift in Downscaling Climate Model Projections**

- Projected changes in average, maximum and minimum temperature over Canada and for different climate regions in Canada are evaluated. Both Spatial and temporal changes (till 2100) for different Shared Socio-**economic** Pathways (SSPs) are calculated.
- Obtaining projected changes in precipitation over Canada and for different climate regions in Canada is under process. Both Spatial and temporal changes (till 2100) for different Shared Socio-**economic** Pathways (SSPs) will be evaluated.

### **What is Water Worth?**

- Designed and administered a survey instrument to estimate the **economic** value of restoring the Saskatchewan River Delta
- Completed and published (in Canadian Water Resources Journal) a review of existing **economic** valuation literature related to water quality improvements in Canada
- Synthesize the existing **economic** valuation literature related to water quality improvements in Canada (published recently in 2021 here: <https://doi.org/10.1080/07011784.2021.1973568>)
- Draft state-of-the-art non-market valuation guidelines for water practitioners to better inform policy and decision-making related to sustainable water use and management.
- Connect the **economic** valuation of aquatic ecosystem services to available water quality monitoring data and policy-relevant biophysical indicators for the water quality challenge in question. Where possible, use will be made of available environmental models to assess changes in baseline water quality conditions due to water quality policy intervention scenarios. In particular, we aim to employ and update the current prototype of the Water Quality Valuation Model developed by ECCC as an integrated environmental-**economic** water quality modeling framework.
- Set up a geo-referenced national data and information system for the **economic** values of relevant aquatic ecosystem services across Canada, and
- Derive and test a generic Canadian water quality valuation function for aquatic ecosystem services that can be used by policy-makers to assess the benefits of improving water resources. We will explore potential collaboration with the Environmental Valuation Reference Inventory (EVRI), initiated in the 1990's by ECCC.