



In preparation for the House of Commons Standing Committee on Environment and Sustainable Development's study on fresh water:

The response from IISD Experimental Lakes Area

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Who We Are

IISD Experimental Lakes Area (IISD-ELA) is the world's freshwater laboratory.

A series of 58 lakes and their watersheds in northwestern Ontario, Canada, IISD-ELA is the only place in the world where scientists can research on and manipulate real lakes to build a more accurate and complete picture of what human activity is doing to freshwater lakes. The findings from over 50 years of ground-breaking research have rewritten environmental policy around the world—from mitigating algal blooms to reducing how much mercury gets into our waterways, water quality to fish health—and aim to keep fresh water clean around the world for generations to come.

We also focus on water monitoring, data collection, management, and analyses, including the use of innovative technologies such as artificial intelligence. Furthermore, we have long promoted the use of natural infrastructure such as floating treatment wetlands for water-related services such as wastewater and stormwater management.

What makes us unique is that we then take those scientific findings to inform policy recommendations so that governments and other decision makers can make informed and effective decisions—taking social, economic, and ecological factors into account.

How We Work and Collaborate with Federal Departments and Agencies

Our work involves **research and funding agreements with various Government of Canada departments**, as well as playing a variety of roles on expert committees and boards.

These include, for instance, working with **Environment and Climate Change Canada** on freshwater management, watershed management, ecosystem health, long-term environmental monitoring, and climate change impacts on water; with **Fisheries and Oceans Canada** on fish habitat, fisheries management, ecosystem health, contaminants, and remediation; and **Agriculture and Agri-Food Canada** on nutrient management, agricultural water management, natural infrastructure solutions, and watershed modelling. Other departments we've worked with include **Indigenous and Northern Affairs Canada**, **Natural Resources Canada** and **Infrastructure Canada**.

These **relationships have proven to be highly successful and influential**. Our research over the last 50 years—on issues ranging from acid rain to mercury—has informed global policy and discussions on issues ranging from eutrophication to microplastics management, to the remediation of oil spills.

We have also worked with the Government of Canada to make the case for long-term monitoring of freshwater lakes, leveraging large datasets to understand the long-term trends in our freshwater systems, as well as to provide critical scientific evidence and practical



guidance on the use of remediation systems and natural solutions, particularly on chronic and emerging water quality issues such as eutrophication and oil spills.

When it comes to the nascent **Canada Water Agency**, we have provided inputs on its role based on our research, our data collected over fifty years, and targeted policy analyses on our areas of work. You can find more detailed recommendations for the Canada Water Agency in the section below.

Developing Federal Water Legislation, Policies and Regulations

As a policy-oriented research organization, IISD provides **targeted policy analysis** such as cost-benefit analysis and impact analysis of management options related to policies, legislation, or funding programs.

Research at IISD-ELA has included “mock” impact studies that have provided insights into how impacts can be mitigated and in what timelines, and how unmitigated impacts might be offset. Whole ecosystem research has included measuring the impact of microplastics on fresh water¹, provides guidance on the use of non-lethal sampling of fish² relevant for industrial and public sector fish monitoring, or the impacts of oil spills on freshwater systems and the effectiveness of various remediation solutions³

In addition, IISD-ELA staff provide regular inputs into government consultations, such as the recent consultations on the Canada Water Agency and inputs on ongoing changes to the Fisheries Act. IISD-ELA experts participate on various federal, regional and local freshwater management related committees and boards providing insights based on IISD-ELA’s experiences.

Some recommendations, initially provided in the context of the Canada Water Agency, include:

- Establishing a **regular and comprehensive national water assessment** to identify, assess and highlight issues of highest urgency and magnitude, and to direct research, monitoring and investment to those of highest priority for Canadians.
- **Developing a mechanism to enable collaboration between government departments** at all levels, and the many stakeholders in the water sector (e.g., academic, non-profit, community-based monitoring, industry, agriculture, etc.) to undertake activities required for managing the complex network of Canadian water systems.
- **Conducting a review of the 1987 Federal Water Policy** and the interdepartmental committee that oversaw its implementation, focussing on improvements in water management.

¹ See <https://www.iisd.org/ela/research/current-research/measuring-impact-microplastics-fresh-water/>

² See <https://www.iisd.org/ela/research/current-research/measuring-impacts-fish-without-impact/>

³ See <https://www.iisd.org/ela/research/current-research/discovering-oil-spills-fresh-water/>



- **Playing a greater role in highlighting water data needs**, standard protocols and supporting existing initiatives on long-term data collection, management and clarifying meta-data needs.
- **Establishing a freshwater science advisory committee** to identify research priorities for freshwater science, linking to existing mechanisms such as federal CRCC and the CSO.
- **Creating a Canadian emerging freshwater contaminants watchlist** (similar to one that already exists in the European Union) to communicate key threats, their magnitude and urgency.

Collecting Information and Data

There is **currently insufficient data and information** for informed, evidence-based decisions-making on Canada freshwater systems. According to recent WWF watershed report cards, 60% of Canada's sub-watersheds are data deficient⁴. This means that in large swathes of the country, it is hard to determine the key challenges and how we might address them successfully.

This represents a critical area for improvement in Canada. But there are key innovations that can be supported and scaled up. DataStream⁵, an open access platform for sharing water quality data, is making much of this data accessible. With regional hubs across Canada, DataStream provides a digital backbone allowing users to access, visualize and download water quality data sets from disparate sources.

Public registries associated with the Canadian Environmental Assessments Act and under the Fisheries Act should be **presented in a meaningful way to enable ease of access and accountability**. This will contribute to improving the overall knowledge and capacity for managing, mitigating and offsetting the impacts of developments across Canada.

Furthermore, **metadata and report generation should be standardized** so users can transform data based on jurisdiction, watershed, watercourse, etc. Many of these systems, like the National Pollutant Release Inventory (NPRI)⁶, are outdated. GeoData should be easy to use (standardized and documented) for intercomparison to other spatial datasets, like the WWF Watershed reports, NPRI (above), climatic datasets, and provincial planning/land-use data.

Many of the freshwater issues on which we work, including non-point contamination of Canadian freshwater lakes, are **limited by a lack of standardized data and information**. We have long advocated for targeting policies and programs to geographic regions and sectors

⁴ See <https://wwf.ca/wp-content/uploads/2020/10/WWF-Watershed-Report-2020-FINAL-WEB.pdf>

⁵ See <https://gordonfoundation.ca/initiatives/datastream/>

⁶ See <https://pollution-waste.canada.ca/national-release-inventory/archives/index.cfm?lang=En>



where they might provide the most return on investment. This is challenging in the current context of data scarcity.

In our research to address non-point sources nutrient loading into Lake Winnipeg or determining return on investment for management solutions, or environmental outcomes from program interventions, we have often encountered challenges related to data scarcity.

IISD also has a comprehensive plan to contribute to better information and data collection on freshwater in Canada by growing the research, training, and public engagement conducted at the ELA. IISD is seeking Federal contributions of \$37.5 million over six years to help execute that plan. That funding would support the development of Canadian solutions for freshwater protection, sustainability, and climate change.

From Canada to the Rest of the World

Canada can establish itself as a leader in freshwater science, management, and collaboration by enabling partnerships in key areas with similar issues such as the African Great Lakes.

In fact, we are already working on making this happen.

IISD-ACARE⁷ brings together IISD's research and science capacity from IISD Experimental Lakes Area with networks of scientists and practitioners under the African Center for Aquatic Research and Education (ACARE), focused on the health of the African Great Lakes that underpin the welfare and livelihoods of 50 million people across ten countries.

This partnership demonstrates the value of pairing large-scale efforts on freshwater management between Canadian and international agencies, building in peer-to-peer learning, sharing best practices, scientific evidence, and research protocols. As well, IISD-ACARE's African Women in Science provides training and mentorship to emerging female scientists working in the context of the African Great Lakes and demonstrates a practical application of Canada's feminist International Development Policy.

About IISD-ELA: Founded in 1988 with the support of the Federal government, the International Institute for Sustainable Development is an award-winning independent think tank working to accelerate solutions for a stable climate, sustainable resources, and fair economies. IISD Experimental Lakes Area (IISD-ELA) is an exceptional natural laboratory comprised of 58 small lakes and their watersheds set aside for scientific research. IISD assumed operations of ELA in 2014.

⁷ See <https://www.iisd.org/articles/scientists-two-continents-work-together-improve-health-african-great-lakes>