

Arctic Freshwater Biodiversity Monitoring Plan Canada 2014 Implementation



The [Arctic Freshwater Biodiversity Monitoring Plan](#) outlines the framework for improving circumpolar monitoring efforts in Arctic freshwaters, including ponds, lakes, rivers, and their associated tributaries and wetlands. The Freshwater Plan provides Arctic countries, monitoring professionals and volunteers with a set of guidelines for common approaches and indicators in future monitoring activities, and for collecting existing data. The Freshwater Plan will facilitate information collection and analysis, identify and fill knowledge gaps, and provide better information for use in policy and decision-making.

The Freshwater Plan is the second of four long-term, integrated biodiversity monitoring plans produced by the [Circumpolar Biodiversity Monitoring Program \(CBMP\)](#) of the [Conservation of Arctic Flora and Fauna \(CAFF\)](#), the biodiversity working group of the Arctic Council, and was approved in 2013.

Canada and Sweden co-led the Freshwater Plan's development, which involved the work of experts from Arctic nations, Permanent Participants and other Arctic Council working groups. These experts identified focal ecosystem components, key drivers and indicators, and designed optimal sampling schemes, common parameters and standardized monitoring protocols for application across circumpolar Arctic freshwaters.



Top CBMP Freshwater Priorities in 2015

- Finalize the collection of national metadata summarizing existing paleo, historical and contemporary monitoring data (Project 1)
- Create summary maps for focal ecosystem components (Project 2)
- Produce summary reports describing existing data (Project 2)
- Aggregate existing data, national and regional dataset compilations, QA/QC, data agreements, and formatting (Project 3)
- Secure funding to support the activities of national Freshwater Expert Networks
- Promote and share the work of the CBMP Freshwater group at key international meetings and conferences, increasing partnerships and collaboration with Arctic colleagues

Links with National Priorities

Freshwater biodiversity priorities in the Canadian Arctic relate to conducting research and monitoring of water quality, quantity, and ecosystem health. The protection of these freshwater resources is overseen by the federal government, provinces, and territories. The Arctic Freshwater Monitoring Plan and work of the Canadian Freshwater Expert Network aims to contribute to these priorities by linking to the following primary issue areas:

- **Climate Change Adaptation:** Identify the impacts of climate change and variability on Arctic lakes and river ecosystems to inform adaptation planning and mitigation actions, including responsible resource development, and supporting the development of domestic and international water policy decisions;
- **Freshwater Quality Monitoring:** Through collaborative monitoring of the physical, chemical and biological characteristics of northern Canadian freshwaters, assess the status and trends of freshwater quality and aquatic ecosystem health at provincial/territorial and international boundaries, within federal lands, and nationally significant bodies of water;
- **Environmental Indicators:** Develop indicators that can be used to measure the status and trends of environment state, progress towards sustainability, and evaluation of these indicators against national guidelines for the protection of aquatic life; and
- **Contaminants in the Arctic:** Relate contaminant levels and trends in the Arctic environment to ecosystem health to support domestic and international chemical management initiatives and provide the information that assists decision making by individuals and communities in their food use.

Freshwater Expert Network Summary of 2014 Achievements

Joseph Culp: Senior Scientist with Environment Canada, Professor at the University of New Brunswick, and the lead of the Canadian FEN. He studies multiple stressor impacts on aquatic ecosystems, particularly riverine food webs of Arctic and northern temperate aquatic ecosystems.

Jennifer Lento: Research Scientist at the Canadian Rivers Institute in the Department of Biology, University of New Brunswick. She has expertise in benthic ecology, particularly the quantitative assessment of benthic assemblages.

Michael Power: Professor at the University of Waterloo. His research centres on freshwater fisheries ecology/management, and the use of stable isotope analysis in fish communities of Arctic ecosystems.

Heidi Swanson: Assistant Professor at the University of Waterloo. She is specialized in fish ecology, stable isotope analysis, and mercury bioaccumulation in Arctic lakes.

Fred Wrona: Vice President of the Alberta Environmental Monitoring, Evaluation and Reporting Agency (AEMERA), and Professor at the University of Victoria. He investigates climate change-variability effects on hydro-ecology and food web dynamics of Arctic freshwaters

Donald McLennan: Head of Monitoring Science at the Canadian High Arctic Research Station. He investigates the development of ecosystem inventories and satellite-based monitoring methods for assessing ecological change in tundra ecosystems.

Jennie Knopp: Program Coordinator for the Inuvialuit Settlement Region–Community-Based Monitoring Program. She has expertise in fish ecology, community-based monitoring, and combining Traditional Knowledge with contemporary scientific knowledge.

Milla Rautio: Professor at the Université du Québec à Chicoutimi. She studies boreal and high-latitude freshwater ecology, especially the role of carbon from terrestrial systems in lake food webs and organism responses to ultraviolet radiation.

Jim Reist: Senior Scientist at Fisheries and Oceans Canada. He has been active in many Arctic Council initiatives including acting as a member of the Arctic Climate Impact Assessment steering group and as a lead author for the Fishes chapter of the Arctic Biodiversity Assessment.

Funding

Environment Canada supported the Canadian FEN in 2014-2015 by funding travel costs and a secretariat that supports the CBMP Freshwater. This funding ends in March 2016, therefore the Canadian FEN will be seeking renewed funding for Fiscal Year 2016-17. Acquisition of future funding is critical for completion of the State of Freshwater Arctic Biodiversity Report (SAFBR) as this additional support (approximately US\$40K required) will subsidize data analysis, synthesis of national reports and science writing for the SAFBR to be produced by CBMP Freshwater.

Communication

The first in-person FEN meeting was held in February 2014, with a follow-up meeting in December 2014. In-person meetings, emails, and teleconferences were used to finalize the metadata

collection and summary report. Canadian FEN members will take part in the CBMP Freshwater's Inter-FEN workshop in Copenhagen in October 2015, where members of all national FENs will collaborate to finalize the outline and approach for the State of Arctic Freshwater Biodiversity Report.

Data

The Canadian FEN finalized metadata collection and drafted a report to summarize the freshwater monitoring activities within the Canadian Arctic. Canadian data originated from various federal, territorial, provincial and industry monitoring programs, as well as university and government-based research programs. FEN members began collection of high-quality data identified in the metadata summary reports in autumn 2014, and will finalize data collection in 2015.

For more information

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