

Arctic Freshwater Biodiversity Monitoring Plan Canada, 2013 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 2014

- 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

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 the environment and progress towards sustainability, and evaluate 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 2013 Achievements

The Canadian Freshwater Expert Network (FEN), created in Autumn 2013, reports to the Freshwater Steering Group. They amalgamate national monitoring data and analyze spatial and temporal trends for assessments of the state of Canadian Arctic freshwaters. The Canadian FEN members, their affiliation and expertise are listed below:

Joseph Culp is a 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 is a 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.

Krista Chin is an Environmental Management Scientist with the Government of the Northwest Territories. She is experienced in benthic community monitoring in northern freshwater ecosystems.

Michael Power is a 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 is an Assistant Professor at the University of Waterloo. She is specialized in fish ecology, stable isotope analysis, and mercury bioaccumulation in Arctic lakes.

Fred Wrona is Senior Science Adviser with Environment Canada, Professor at the University of Victoria and Canadian Head for AMAP. He investigates climate change/variability effects on hydro-ecology and food web dynamics of Arctic freshwaters.

Donald McLennan is 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 is 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 is a 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.

Funding

Environment Canada supports the Canadian FEN by funding travel costs and secretariat support. For 2014, the Canadian FEN will be seeking an additional US\$50K to subsidize acquisition of data, analysis and travel associated with FEN meetings.

Communication

Communications in 2013 included within-FEN communications regarding the establishment of the network. The first in-person FEN meeting occurred in February 2014.

Data

The Canadian FEN is collecting metadata that summarize the freshwater monitoring activities within the Canadian Arctic for contemporary and historical periods. Canadian data originate from various federal, territorial, provincial and industry monitoring programs, as well as university and government-based research programs. FEN members began collection of metadata in autumn 2013, and will finalize metadata summaries in 2014.

For more information

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