

# Arctic Freshwater Biodiversity Monitoring Plan Canada 2016 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.



Photo: George Burba

## Top CBMP Freshwater Priorities in 2017

- Finalize the strategy to manage differences in sampling and processing methodologies among data sources, to facilitate circumpolar comparisons of data (Project 4)
- Assess regional and circumpolar spatial and temporal trends in Arctic freshwaters using aggregated circumpolar dataset (Projects 5 and 6)
- Develop first draft of State of Arctic Freshwater Biodiversity Report and first drafts of papers for an accompanying special issue of a scientific journal (Projects 5 and 6)
- Secure funding for Freshwater Expert Network activities (data assessment and report writing)
- Secure funding for Freshwater Steering Group Science Coordinator (to facilitate writing and completion of State of Arctic Freshwater Biodiversity Report)

## 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 2015-16 Achievements

## Funding

Environment and Climate Change Canada supported the Canadian FEN in 2015-2016 by funding travel costs and a secretariat with the Canadian Rivers Institute that supports the CBMP Freshwater. This funding ends in March 2017, therefore the Canadian FEN will seek renewed funding for Fiscal Year 2017-18. 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

In-person meetings, emails, and teleconferences were used to finalize the data collection and sampling approach information. Canadian FEN members participated in the CBMP Freshwater's Inter-FEN workshop held in October 2015 near Copenhagen, where members of all national FENs met to finalize the outline and approach for the State of Arctic Freshwater Biodiversity Report and a scientific journal special issue.

## Data

The Canadian FEN finalized the collection of high-quality data from the Canadian Arctic for contemporary and historical periods. Canadian data originated from various federal, territorial, provincial and industry monitoring programs, as well as university and government-based research programs. FEN members participated in the assessment of regional and circumpolar spatial and temporal trends in Arctic freshwaters. In addition, information on sampling methods and approaches were summarized for use in a circumpolar assessment of sampling approaches for the various Focal Ecosystem Components that will be completed in 2017.

## Canadian Expert Network Membership

**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.

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

**Jennie Knopp:** Community Science Advisor for Oceans North Canada. She has expertise in anadromous fish ecology, community-based monitoring, and combining Traditional Knowledge with contemporary scientific knowledge.

**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.

**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.

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

## For more information

### Joseph Culp

Environment and Climate Change Canada  
Canadian Rivers Institute  
Department of Biology, University of New Brunswick  
10 Bailey Drive, PO Box 4400  
Fredericton, NB, Canada E3B 5A3  
Telephone: +1 (506) 457-1837  
Fax: +1 (506) 458-7597  
Email: [joseph.culp@ec.gc.ca](mailto:joseph.culp@ec.gc.ca)  
Website: [www.ec.gc.ca](http://www.ec.gc.ca)

### Joseph Culp and Willem Goedkoop

CBMP Freshwater Steering Group Co-Chairs  
[joseph.culp@ec.gc.ca](mailto:joseph.culp@ec.gc.ca); [willem.goedkoop@slu.se](mailto:willem.goedkoop@slu.se)

### Conservation of Arctic Flora and Fauna (CAFF)

Borgir, Nordurlod  
600 Akureyri, Iceland  
[www.caff.is/freshwater](http://www.caff.is/freshwater)  
[www.cbmp.is](http://www.cbmp.is)  
[caff@caff.is](mailto:caff@caff.is)

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