

# Arctic Freshwater Biodiversity Monitoring Plan Sweden, 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

About 20% of Sweden's almost 100,000 lakes larger than one hectare are situated in the Arctic/Alpine region of the Scandinavian Peninsula. Monitoring of lakes and streams/rivers in Sweden consists of national and regional efforts coordinated by the [Swedish Agency for Marine and Water Management \(SWaM\)](#) and regional county boards, respectively. Monitoring is directed towards the requirements that are set by the [European Water Framework Directive](#) and national Environmental Objectives. The [Swedish Environmental Protection Agency \(EPA\)](#) is responsible for the coordination of contaminant monitoring in freshwater biota. Monitoring includes both water chemistry and a suite of focal ecosystem components, i.e. phytoplankton, zooplankton, benthic invertebrates and diatoms, and fish. Some of the lakes/streams have been monitored for over 25 years and the time series illustrate the decadal changes in water chemistry and biodiversity. The Department of Aquatic Sciences and Assessment at the [Swedish University of Agricultural Sciences \(SLU\)](#) is the national data host for freshwater monitoring data for lakes and streams/rivers.

Priorities for the Swedish Freshwater Expert Network during 2014 include the listing of ecological and paleolimnological studies on Swedish freshwaters, the identification of important research data sets (including the 'grey literature'), as well as of long-term data sets on ice-out, glacial retreats, permafrost dynamics, and/or other proxies for ongoing change in Northern Scandinavia.

# Freshwater Expert Network Summary of 2013 Achievements

The Swedish Freshwater Expert Network (FEN) was assembled in late 2013 and consists of experts in various fields of aquatic science:

## **Tobias Vrede**

Associate professor at the Department of Aquatic Sciences and Assessment, Swedish University of Agricultural Sciences (SLU). Expertise in zooplankton ecology and lake food web dynamics.

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## **Johan Östergren**

Research Associate at the Department of Aquatic Resources, SLU and an expert in fish ecology, in particular diadromous salmonids.

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## **Jan Karlsson**

Professor at Umeå University with specific expertise in in-lake processes and nutrient and carbon cycling in arctic/alpine lakes.

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## **Maria Kahlert**

Associate professor at the Department of Aquatic Sciences and Assessment (SLU) and an expert in benthic diatom ecology, in particular their use as indicators of ecological quality.

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## **Willem Goedkoop**

Professor at the Department of Aquatic Sciences and Assessment, SLU, who has expertise in benthic ecology, food web dynamics, and ecotoxicology. He is the Swedish representative to the CBMP's Freshwater Steering Group.

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## **Funding**

Annual funding for the Swedish FEN work is expected to come from SWaM, the Swedish EPA and by the so called 'authority support' that the Department of Aquatic Sciences and Assessment supplies to the above authorities. A FEN-kick-off meeting will be arranged during 2014. Links will be established to Norwegian and Finnish FENs to make joint analyses for the Scandinavian peninsula.

## **Data**

Data for national and regional monitoring programs are available from the national data host at the Department of Aquatic Sciences and Assessment at SLU. Metadata for Swedish lakes and rivers/streams will be reported to CBMP in 2014.

## **Communication**

2013 was a starting year for the implementation of the [Arctic Freshwater Biodiversity Monitoring Plan](#) and the activities have focused on the establishment of the national network and the compilation of metadata. Annual progress reports and country one-page updates will be provided to national authorities and the Swedish CAFF-representative.

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## **For more information**

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