

House of Commons
Standing Committee on Environment and Sustainable Development

Study on Freshwater in Canada

Brief submitted by Living Lakes Canada

February 22, 2024



Living Lakes Canada acknowledges that our water stewardship work originated in the unceded traditional territories of the Ktunaxa, Lheidli T'enneh, Secwépemc, Sinixt and Syilx Nations who have stewarded these lands for generations.

Introduction

[Living Lakes Canada](#) is pleased to provide our recommendations to the Standing Committee on Environment and Sustainable Development in support of the study on freshwater. These recommendations are shaped by more than 20 years of experience working with Indigenous and non-Indigenous communities to protect freshwater across Canada.

Living Lakes Canada has collaborated with federal government departments and agencies on freshwater issues in the past, including:

- A [national roundtable](#) co-convened in 2018 by Living Lakes Canada, WWF-Canada and The Gordon Foundation aimed at identifying actionable steps the federal government can take to advance community-based monitoring of freshwater ecosystems in Canada, which was financially supported by **Environment and Climate Change Canada** and **Crown-Indigenous Relations and Northern Affairs Canada**.
- The four-year [STREAM](#) (Sequencing The Rivers for Environmental Assessment and Monitoring) pilot project co-delivered by Living Lakes Canada, WWF-Canada, the University of Guelph and **Environment and Climate Change Canada** from 2019-2022 to explore aquatic ecosystem health assessments using DNA metabarcoding of benthic macroinvertebrate samples collected from 15 nationally distributed watersheds based on data deficiencies and local capacity.
- A four-year contribution agreement with **Fisheries and Oceans Canada** from 2019-2022 to update the federally-developed [Foreshore Inventory Management Planning](#) protocol and apply it to priority lakes in the Canadian Columbia Basin to improve the quality and quantity of information about lake foreshore habitat integrity and species at risk.
- Attending the historic UN 2023 Water Conference in New York as an organization granted special accreditation by the General Assembly, and participating in the **Canadian Reception at the Permanent Mission of Canada to the United Nations** with Head of the Canadian Delegation Parliamentary Secretary Terry Duguid.

Living Lakes Canada is a charitable water stewardship NGO that partners with hundreds of other organizations including all levels of government, water stewardship groups, academia, consultants and other sectors, to facilitate collaboration in monitoring, restoration and policy development initiatives for the long-term protection of lakes, rivers, wetlands, aquifers and watersheds in Canada. Our science-based programs are aligned with Provincial and Federal monitoring protocols and include groundwater, lake, stream and wetland monitoring, foreshore health assessments, biomonitoring for aquatic assessment and restoration, and water database development and management. We build capacity through community-based water monitoring training courses to support local climate adaptation strategies, and deliver educational programs

targeting both youth and adults to promote water literacy and to encourage a water conservation ethic. Our work has been recognized with multiple [awards](#).

Recommendations

The effects of climate change are escalating throughout Canada, affecting freshwater sources and jeopardizing the essential water supply that supports communities, ecosystems, industries, and agriculture. Data deficiency remains a major challenge in understanding the health of Canada's watersheds. Numerous reports have documented the deficiency of data required for informed decision making around sustainable watershed management.

In a national assessment on the health of and threats to freshwater in Canada, the [2020 WWF-Canada Watershed Reports](#) were unable to assign scores to 60 percent of Canada's sub-watersheds due to data deficiencies. In the Canadian Columbia Basin located in southeastern British Columbia — considered one of North America's most important water towers — a series of reports dating back to 2006 have highlighted the issue of inadequate data for managing and protecting the region's water sources in response to climate change.

Increasing monitoring and research to more appropriately understand climate impacts, while developing a collective, large-scale and coordinated effort to prepare communities and industry for change, must become a priority of the federal government.

For implementing this effort, our recommendations are as follows:

Recommendation #1: That the Federal Government recognize the Canadian Columbia River Basin as one of the priority watersheds named in the Freshwater Action Plan with designated funding to bolster current monitoring and research efforts in the region to help protect freshwater in this critically important transboundary watershed.

Recommendation #2: That the expansion of water and climate monitoring urgently needed across Canada is built upon existing successful regional community-based water monitoring efforts, replicating best practices and tested methodologies region to region to achieve the fastest, most cost-effective approach.

Recommendation #3: That the advancement of Indigenous Knowledge and data sovereignty be a pillar of this new approach, to provide the opportunity for applied Reconciliation through water stewardship. It's through the decolonization of water governance and water data that our relationship to water can shift from the current compartmentalized and siloed system into a new and adaptive paradigm. A coordinated collaborative approach to protect water for many generations to come will position Canada as a progressive global water leader.

Recommendation #1

- *That the Federal Government recognize the Canadian Columbia River Basin as one of the priority watersheds named in the Freshwater Action Plan with designated funding to bolster current monitoring and research efforts in the region to help protect freshwater in this critically important transboundary watershed.*

The transboundary Canadian Columbia River in southeastern British Columbia has been overlooked as a [waterbody of national importance](#) since the Freshwater Action Plan was first announced in Budget 2017, yet:

- It is considered one of the world's most important water towers, and is one of the five most critical towers in North America¹. The term “water tower” is used to describe the water storage and supply that mountain ranges provide to sustain environmental and human water demands downstream. The Columbia River serves 9 million people in Canada (Alberta and British Columbia) and the United States (Washington, Idaho, Montana, California, Oregon, and Wyoming).²
- It is considered a priority watershed by Fisheries and Oceans Canada. Combined, the Canadian portion of the Fraser River basin and the Columbia Basin host 70% of the Pacific Region's freshwater aquatic species at risk, including White Sturgeon, Chinook Salmon and Westslope Cutthroat Trout. Species at risk in the Columbia watershed face a large number of threats caused by human activities, resulting in the loss of habitat quality and quantity, decreased water quality and quantity, barriers to migration and the introduction of invasive species.³
- It is the foundation of the Columbia River Treaty, the decades-long internationally respected water management agreement between Canada and the United States centered on flood control management and power generation on Columbia Basin river systems. In the face of escalating drought conditions, renegotiations have been taking place to modernize the Treaty involving First Nations revenue-sharing and the inclusion of ecosystem services.

The critical issues of water management amid climate change impacts in this region have been identified in a series of reports dating as far back as 2006⁴. More recently, the University of British Columbia published a 30-year study⁵ suggesting the glacier-melt contributions to runoff

¹ Immerzeel, W.W., Lutz, A.F., Andrade, M. et al. Importance and vulnerability of the world's water towers. *Nature* 577, 364–369 (2020). <https://doi.org/10.1038/s41586-019-1822-y>

² National Geographic (2019), [The world's supply of fresh water is in trouble as mountain ice vanishes](#).

³ Fisheries & Oceans Canada, [Columbia Watershed Priority Area](#).

⁴ Living Lakes Canada (2022), [Columbia Basin Water Monitoring Framework Pilot Implementation Report 2022: Planning for Watershed Security](#).

⁵ Moore RD, Pelto B, Menounos B and Hutchinson D (2020) [Detecting the Effects of Sustained Glacier Wastage on Streamflow in Variably Glacierized Catchments](#). *Front. Earth Sci.* 8:136. doi: 10.3389/feart.2020.00136

have already passed peak water for summer stream flows in the Canadian Columbia Basin. This has alarming implications for community water supply and adaptation options, and for fish spawning streams during times of drought, currently the case throughout British Columbia.

Early, rapid snowmelt combined with a hot, dry spring and summer set the stage in 2023 for the worst wildfire year on record in B.C. and an extended provincial State of Emergency due to the out-of-control wildfires and severe drought conditions. With record-low snowpacks recorded across the province so far this winter, concerns are mounting that B.C. will experience a potentially worse year of drought in 2024 than in 2023. Evidence of drought in the Canadian Columbia Basin is visible in:

- Aggressive wildfires resulting in back-to-back evacuation alerts and orders across many Indigenous and non-Indigenous communities
- Loss of homes due to wildfire in Indigenous community
- Damage to municipal water supply structure due to wildfires
- Air quality warnings and related very high health risks
- Increased water restrictions
- Low flows in rivers and streams (the natural inflow into Kootenay Lake, the fifth largest lake in B.C., from its tributaries hit a near historic low leading into July 2023)
- Low lake levels and lakes drying out; drops in aquifer (groundwater) levels
- Negative impacts on agriculture, fish, ecosystems, tourism and local economies
- Water quality impacts from drought, fires and flooding

In this context, Living Lakes Canada has begun building a [network of water and climate monitoring stations](#) across this vast region to fill documented data gaps to help track climate impacts on water supply. This Columbia Basin Water Monitoring Framework is uniquely designed to include local Indigenous and non-Indigenous water concerns and priorities in combination with scientific parameters — including the results of a data gap analysis — when determining monitoring site selection. We are currently operating:

- 34 groundwater monitoring wells
- 55 hydrometric monitoring stations
- 7 lake and wetland level stations
- 19 biomonitoring sites
- 8 high elevation lake ecosystem study areas
- 7 climate stations

This is a significant addition to the government-run monitoring network in the region, equivalent to a 105% increase in hydrometric monitoring and a 425% increase in groundwater monitoring.

The data collected is made publicly accessible on the open source [Columbia Basin Water Hub](#) database (also developed by Living Lakes Canada) to inform community resilience and climate

adaptation planning, ecosystem sustainability and restoration efforts, and support wildfire suppression. Documented uses of this data by the provincial government to date include:

- Flow data to assess wildfire impacts to water quality;
- Groundwater data to better understand groundwater connectivity with surface water and inform the province's drought response;
- Water quantity data to make allocation decisions on water license applications by the water authorizations branch.

The scale is considerable, requiring the participation and expertise of a wide range of environmental professionals, hydrologists, GIS analysts, field technicians, data analyzers and monitoring equipment. The work ranges from applying advanced technology to on-the-ground restoration; the development of water resource management; and watershed and climate adaptation planning. This project also provides training, internship and meaningful career opportunities for youth entering the watershed sector.

The Columbia Basin Water Monitoring Framework received B.C. government funding in 2021 and 2022, which guaranteed operations through to the end of 2024. By supporting the continued monitoring and research made possible by this network and the hundreds of established partnerships involved, Canada would be proactively addressing transboundary freshwater challenges and opportunities, in line with the Canada Water Agency mandate.

Notably, the Columbia Basin Water Monitoring Framework will be featured in a special issue of ***Water International*** published by the International Water Resources Association which will be released during the World Water Forum in Bali in May 2024.

Recommendation #2

- *That the expansion of water and climate monitoring urgently needed across Canada is built upon existing successful regional community-based water monitoring efforts, replicating best practices and tested methodologies region to region to achieve the fastest, most cost-effective approach.*

Hundreds of community-based water monitoring (CBWM) groups across Canada are helping communities become aware of the challenges their local water bodies face. These monitoring networks are excellent examples of the on-the-ground collaborations already in place to monitor and protect waterways across the country.

It is our recommendation that any coordinated water and climate monitoring networks or databases being implemented by the federal government to address water data gaps are built upon existing successful regional efforts, such as the Columbia Basin Water Monitoring Framework and the Columbia Basin Water Hub developed by Living Lakes Canada, or other

templates. It is quicker and more cost-effective to replicate best practices of successful and tested methodologies from one region to another. It is vital that we maximize the utility of limited resources available to support water monitoring and stewardship for the benefit of enhanced community adaptation options.

In the case of the Columbia Basin Water Monitoring Framework and the Columbia Basin Water Hub, both initiatives were developed as templates to be expanded to other regions.

CASE STUDY: COLUMBIA BASIN WATER HUB — A REGIONAL DATAHUB

After recognizing the critical importance of water data and the need to make it transparent and easily accessible, Living Lakes Canada convened a conference attended by 120 water and data experts from across Canada and the northwest United States to envision what a central water data repository would look like for the Columbia Basin region.

The Columbia Basin Water Hub officially launched in March 2021. Today, more than 50 contributors across multiple sectors provide their datasets to this publicly accessible platform. The Water Hub was designed to support data governance, and allows groups to maintain a level of control over how their data is shared, accessed and used. This allows it to align with the First Nations principles of OCAP® (ownership, control, access, and possession) when working with First Nations data, and to support the unique needs and preferences of a wide range of contributors. Living Lakes Canada has worked directly with each group on data management, data upload and data sharing. This has created strong relationships with the groups conducting water monitoring projects in the Columbia Basin, and has informed data needs in the region.

Based on the success of the Columbia Basin Water Hub, Living Lakes Canada was selected by the Nicola Watershed Governance Partnership, a collaboration between the Province of British Columbia and the five Nicola First Nations governments, to assist them in the development of their own water data portal, set to be launched in 2024.

The Canadian Open Data Society recognized the Columbia Basin Water Hub with an “Open Data Quality Award” in 2023.

As a “best practices” template, Columbia Basin Water Hub highlights the importance of regional databases in freshwater management in Canada.

- In contrast to national or provincial-scale databases, regional databases offer a more specialized approach to water data, enabling a deeper level of detail that corresponds to local priorities and specific challenges.
- Regional databases often serve as platforms for collaboration among diverse partners, including government agencies, academia, NGOs, and local communities. This

collaborative approach fosters a more holistic and inclusive approach to water management.

- Regional freshwater databases can provide decision makers with the data necessary to develop evidence-based policies and strategies to make informed choices that benefit both the local environment and communities.

Data integration and interoperability remains a top priority, achieved by connecting these regional scale databases across provinces to avoid decentralization and the risk of data loss.

Living Lakes Canada has presented to the Canada Water Agency data team to share our experience and best practices about the role of regional data hubs in the national data strategy.

Organizations in other river basins across Canada have expressed an interest in implementing similar coordinated water monitoring and data sharing initiatives based on our work in the Columbia Basin. This includes our innovative [Groundwater Monitoring Program](#), which operates under the umbrella of the Columbia Basin Water Monitoring Framework. A cost-effective approach to groundwater monitoring, this program partners with well owners who volunteer their wells for monitoring. Partners include municipalities, First Nations, and private landowners. The program complements the BC Provincial Groundwater Observation Well Network, which has only a limited number of observation wells in the Columbia Basin region.

Taking a strategic and collaborative approach to water monitoring, data sharing, and subsequent adaptive watershed management is critical in this era of unprecedented climate disruption.

Recommendation #3

- *That the advancement of Indigenous Knowledge and data sovereignty be a pillar of this new approach, to provide the opportunity for applied Reconciliation through water stewardship. It's through the decolonization of water governance and water data that our relationship to water can shift from the current compartmentalized and siloed system into a new and adaptive paradigm. A coordinated collaborative approach to protect water for many generations to come will position Canada as a progressive global water leader.*

The environmental stewardship sector is predominantly driven by Western science for the collection and analysis of data. Indigenous worldviews are diverse across nations and cultures. They're interconnected with the *timx^w* (people, animals, plants, air and water in the *nsyilxcən* language). In addressing climate change, water security and biodiversity, both worldviews must be present, heard and understood in policy and decision making.

It's with this perspective that the Nicola Watershed Governance Partnership (NWGP) identified the need for a water data hub to house watershed information and selected Living Lakes

Canada to build a portal that supports NWGP information governance. Both the NWGP water data hub and the Columbia Basin Water Hub are aligned with OCAP® to support First Nations data sovereignty. Standing for ownership, control, access and possession, it asserts that First Nations have control over data collection processes in their communities, and that they own and control how this information can be used. This is significant in the advancement of Reconciliation.

Peripheral to the NWGP portal development, Living Lakes Canada is partnered with a B.C. First Nations on a [pilot project](#) dedicated to aligning Indigenous Knowledge with Western science using the DFO federally-developed Foreshore Integrated Management Planning protocol which surveys shorelines to protect critical habitats and guide lake management. The precedent-setting methodology developed for this project allows for inclusive and respectful collaboration between Indigenous and Western science partners. From the project's development through to the application, intentional and consistent relationship building over time has been pivotal in building trust between partners. This project aims to provide a framework to decolonize shoreline decision making to promote more inclusive and sustainable practices.

Living Lakes Canada is carrying out these comprehensive watershed projects in tandem with the [Yukon Lakes Monitoring Initiative](#), our collaboration with the Yukon Government and multiple Indigenous communities to implement a coordinated territory-wide lake monitoring network where Indigenous perspectives and Western science are interwoven.

Each Indigenous community has its own cultural protocols, but the process of developing place-based Frameworks for interweaving Indigenous worldviews with Western protocols is what can act as a model for other communities.

Conclusion

In addition to the three recommendations outlined in our written submission, as a Steering Committee Member of the [Canadian Coalition of Healthy Waters](#) (CCHW) and a Member of the [BC Watershed Security Coalition](#), Living Lakes Canada also supports the recommendations put forward by these Coalitions in their respective Freshwater Study briefs.

We also endorse the recommendations put forward by the [POLIS Water Sustainability Project](#), which include,

For the Canada Water Agency:

- The Canada Water Agency should act as both a coordinating body within the federal government and a mechanism for intergovernmental collaboration on water across the country.

- Its governance mechanism should allow for efficiency, leadership and cooperation across Canada, with a mandate to initiate immediate solutions and provide the necessary information and knowledge as the climate continues to change.
- It must ensure water investment is done pragmatically, efficiently, and urgently with maximum local impact.
- Investments should be prioritized through a risk-based analysis using science and research and in collaboration with Indigenous peoples and stakeholders for targeted actions that are most likely to improve the state of the aquatic environment.

For a modernized Canada Water Act:

- Advance Reconciliation with Indigenous peoples consistent with the Truth and Reconciliation Commission and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).
- Integrate river basin planning and management to protect, restore, and maintain the ecological integrity of the nation's waters. This should include the power to proactively enforce basin level water quality and quantity standards and thresholds.
- Create decision-making tables where representatives have the authority to participate fully and make decisions at the table.
- Generate measurable improvements to environmental, social, and economic realities in Canada's watersheds.

In closing, we strongly encourage the federal government to support community-based water monitoring and stewardship, since it is at the local level in Indigenous and non-Indigenous communities, rural regions, and agricultural areas where the impacts of climate change are most acutely experienced, through floods, droughts and forest fires.

The Canadian Climate Institute issued a [report](#) in 2022 stating that by 2025, climate impacts will slow down Canada's economic growth by \$25 billion dollars annually. A modernized approach to water stewardship in Canada will not only guide us into a sustainable future and instill pride in our country's water legacy, it will allow us to showcase progressive stewardship efforts and elevate our international leadership role on the global stage.

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