

Final Recommendations

Elevating Community-Based Water Monitoring
in Canada

APRIL 2019



About This Document

These recommendations are the outcome of a national roundtable discussion aimed at identifying actionable steps the federal government can take to show leadership and support in advancing community-based monitoring of freshwater ecosystems in Canada. The roundtable was convened in November, 2018 by Living Lakes Canada, WWF-Canada and The Gordon Foundation. All three organizations engage with CBWM in different ways and are committed to advancing collaborative and evidence-based water stewardship across Canada.

The convening team thanks the roundtable participants for their willingness to share their work, knowledge and expertise with the Government of Canada. We would also like to thank Environment and Climate Change Canada (ECCC) and Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) for providing financial and in-kind support for this initiative and most importantly for their openness and willingness to work collaboratively towards achieving shared water stewardship objectives.

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Overview

In November of 2018, The Gordon Foundation, Living Lakes Canada and WWF-Canada convened a collaborative dialogue around federal government engagement and support for community-based water monitoring (CBWM) in Canada. The key objective was to identify actionable steps the federal government can take to show leadership and support in advancing community-based monitoring of freshwater ecosystems in Canada.

More than 50 leading Indigenous and non-Indigenous CBWM practitioners, water scientists, policy and data experts took part in panels and workshops designed to illuminate the breadth and diversity of initiatives across the country, along with common challenges and opportunities.

Through focused discussions, participants developed tangible recommendations on how the federal government can strategically engage with and support CBWM efforts across Canada. Recommendations are divided into the following key thematic areas of focus:

1. Capacity building
2. Effective monitoring
3. Data management
4. Regional and national collaboration
5. Data to inform decision-making

Water governance in Canada is complex and cross-jurisdictional. While this fragmented landscape poses challenges, community groups offer an untapped capacity. The federal government can overcome fragmentation by working alongside CBWM initiatives to ensure communities and governments have the data necessary to manage and maintain healthy freshwater resources¹.

To support reconciliation with Indigenous peoples, any implementation of the recommendations outlined below must uphold the standards of UNDRIP and the federal government's Principles Respecting the Government of Canada's Relationship with Indigenous People².

The following recommendations for the Government of Canada were developed collaboratively with diverse experts, including individuals with practical experience carrying out both Indigenous and non-Indigenous CBWM programs, combined with insights drawn from roundtable participants.

¹ While federal supports for CBWM are the focus of these recommendations, many Indigenous Nations, municipalities, provinces and territories provide significant supports for CBWM through leadership, collaboration, and resourcing.

² These principles mark a move to align federal policy with the provisions of UNDRIP, such as affirming self-determination and free, informed and prior consent. The Declaration can be read on the U.N. website, accessible at www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html. The federal government's principles can be found on the Department of Justice Canada's website, accessible at www.justice.gc.ca/eng/csj-sjc/principles-principes.html.



Capacity Building

The following actions can be taken by the federal government to build capacity for CBWM.

1.1 Invest in cross-sectoral partnership development.

- Take stock of the nature and effectiveness of engagements in CBWM by federal departments and agencies, including levels of engagement, scope of financial and human resource investments, and objectives of the programs. Determine levels of investment of human and financial resources, identify common goals and objectives across programs, and assess key strengths and weaknesses in engagements.
- Develop partnerships with CBWM organizations and other sectors to conduct monitoring.
- Partner with Indigenous “bridging organizations” to leverage existing capacities. Bridging organizations refer to groups and organizations that create connections across sectors and at different levels of governance to build trust, share resources and knowledge, and facilitate co-ordinated action towards achieving common goals and mandates.
- Increase the level and duration of funding for Indigenous-led CBWM programs such as Indigenous Guardians.

1.2 In Indigenous monitoring contexts, give highest priority to Indigenous protocols and policies in establishing CBWM programs and undertaking collaborative data collection.

- Ensure that investment begins with acknowledging Indigenous self-determination and accounts for the broader political, economic, and jurisdictional challenges and inequities resulting from ongoing legacies of colonialism.
- Encourage non-Indigenous partners within federal departments to build their capacity to work with Indigenous peoples by improving individual and organizational understanding of Indigenous systems of knowledge, law, and governance, for example, through training.

- Focus capacity-building efforts on investments that are directed by community needs and ensure that these are honoured in knowledge-sharing and program governance agreements.

1.3 Invest in youth programming to strengthen and grow CBWM by improving access to required tools and training.

- Work with Indigenous and non-Indigenous CBWM practitioners to implement training in field practices and specific protocols. Examples of such approaches include:
 - Canadian Aquatic Biomonitoring Network (CABIN)
 - Environment Technology programs
 - Academic accreditations for work done in the field, specifically for Indigenous Guardians
 - Train the trainer programs
 - Safety training (First Aid, CPR, swift water rescue, etc.), especially for those working in remote locations
 - Indigenous Guardians programs and internships
 - Provide more opportunities for Indigenous and non-Indigenous CBWM practitioners to obtain training in data management, analysis and interpretation.

1.4 Support expenses of monitoring by providing access to lab space, in-kind support, or both, for lab analyses, as use of commercial labs can be cost-prohibitive.



Effective Monitoring

The federal government can take the following actions to encourage effective monitoring:

2.1 Participate in the co-design of water monitoring plans.

- Honour the importance of Indigenous knowledge and local perspectives in the creation of water monitoring plans that are driven by community questions and needs.
- In co-designing, identify through existing provincial and federal monitoring agreements and CBWM programing opportunities where existing research infrastructure (e.g., HYDAT stations network) or long-term datasets can be leveraged to determine data monitoring gaps and needs.
- Support development of a CBWM program design toolkit and checklist in collaboration with experienced CBWM practitioners, both Indigenous and non-Indigenous.
- Provide leadership on best practices and standards for monitoring protocols, to ensure spatial, temporal, and methodological consistency and comparability amongst communities of practice, where desired and appropriate.
- Provide support for and participate in sampling and lab comparison studies to evaluate data comparability.
- Follow principles of Open Government, ensuring protocols are openly shared and accessible.





Regional and National Collaboration

The federal government can take the following actions to promote regional and national collaboration:

3.1 Facilitate coordination and collaboration among a growing range of actors.

- Support non-governmental organizations, platforms, and networks that are well-positioned to facilitate regional collaboration (e.g., Indigenous Leadership Initiative / Indigenous Guardians, Swim Drink Fish, Our Living Waters).
- Seek opportunities to co-design and manage water monitoring through mechanisms that promote cross-sectoral collaboration (e.g., watershed- and basin-based entities such as non-governmental organizations, water boards and councils).
- Follow best practices for program governance and community engagement when working within networks and with partnerships (e.g., Northern Contaminants Program).
 - Clearly articulate best practices in publicly accessible forums such as government websites.
 - Strengthen efforts to increase the role of Indigenous monitoring networks in federal water monitoring programming, as outlined in federal mandates.

3.2 Create formal, integrated regional liaison positions within existing entities or offices of federal departments and entities.

Regional liaison positions could accomplish the following goals:

- Create and maintain relationships both across federal departments and with external CBWM organizations, including provincial, territorial and Indigenous governments, NGOs, and academia
- Share knowledge on protocols, funding and training opportunities to maximize the impact of CBWM organizations in the areas where they work.
- Help CBWM groups make their data and information relevant to policy by ensuring it is available during policy and decision-making discussions.
- Act as a hub or institutional knowledge-keeper within federal government as part of a broader nation-wide CBWM network.
- Host a biennial gathering of CBWM organizations, where the focus would be on collaboration, idea exchanges and future planning, and where youth would be involved in all discussions. For example, the United States Environmental Protection Agency and other federal agencies sponsor gatherings for the North American National Water Quality Monitoring Council and Volunteer Monitoring Network.
- Promote CBWM across federal departments, for example, by integrating CBWM into individual departmental mandates, priorities and programs. Such positions could also examine funding sources from relevant departments to see how they can be adjusted to support CBWM.
- Broadly, actively and consistently engage in CBWM through the following activities:
 - Attending local and regional non-governmental CBWM gatherings and water management meetings to enhance federal awareness of the scope of CBWM work across watersheds and to stay abreast of opportunities to collaborate;
 - Investing staff time and resources (capacity, financial support, other infrastructure) in projects that are designed to bring local actors together to address practical issues of common concern.



Data Management

The federal government can help improve CBWM data management by taking the following actions:

4.1 Provide support to scale up existing data management efforts both within and outside government to leverage capacities and avoid duplicating efforts.

- Take stock of where and how CBWM data is currently housed and shared and make this information publicly available in a clearing house or catalogue.
- Where appropriate, leverage existing technology and support independent data sharing platforms³ so that they can serve the needs of CBWM groups over the long term.
- Provide incentives for CBWM groups funded through federal programs to use existing platforms where possible rather than building new systems from scratch, and facilitate knowledge and resource sharing to this end.

4.2 Build CBWM data management capacity.

- Tie CBWM funding to data management-related activities; that is, require that fundees provide a data management plan and evidence of how and where data is being managed and shared
- When reviewing existing or proposed data management plans, ensure that there is adequate support and access to locally-relevant tools and training for managing data effectively.
- Encourage the use of existing data management best practices wherever practical and appropriate. Work with communities to ensure a good match between the practices put in place and the objectives of the monitoring program.
- Design data systems to reflect social and organizational components such as policy, data access models, legal and ethical dimensions and other facets related to the human context.

³ For example, DataStream, the Canadian Watershed Information Network (CanWIN) and Swim Guide.

- Invest in “data rescue” by supporting initiatives to digitize and manage historical CBWM data.

4.3 Respect and implement principles of data sovereignty within Indigenous water monitoring contexts.

- In conducting research with First Nations, adhere to OCAP® principles (Ownership, Control, Access and Possession), which provide useful standards, including how to approach data management⁴.
- In conducting research with Inuit, uphold their specific principles and guidelines for access, ownership and control over water data and information.

4.4 Provide leadership on best practices and standards for managing data to promote interoperability.

- Lead by example and promote use of FAIR data principles in design of data management systems (data is Findable, Accessible, Interoperable and Reusable).
- Champion and communicate existing and well-established data standards and help establish them where needed⁵.
- Ensure that these resources are publicly available in plain language; for example, develop an online catalogue for data management standards, templates, and use case examples for data management methodologies that have worked well. Similar existing resources like the Portage Network hosted by the Canadian Association of Research Libraries could guide this process.
- Encourage and participate in adoption of a standard metadata schema, through a process of engagement with data providers and data users, to agree on common standards for data sharing.

⁴ OCAP® is a registered trademark of the First Nations Information Governance Centre (FNIGC).

⁵ Including the US EPA WQX standard for water quality, the Swim Drink Fish Open Standard for Recreational Water, or the Open Geospatial Consortium Standards (i.e. Sensor Observation Service and WaterML).



Data to Inform Decision-Making

The federal government can help use data to inform decision-making with the following actions:

5.1 Co-ordinate federal support for CBWM across departments.

- Champion CBWM at the Canadian Council of Ministers of the Environment (CCME) by providing standards and other resources for CBWM groups and organizations.
- Develop a cross-departmental strategy to leverage CBWM in Canada. Ensure that this becomes part of the work plan for the federal liaison position recommended in Section 3.

5.2 Establish processes for integrating CBWM data into federal databases and decision-making at various levels (policy, planning and management).

- Include provisions for use of CBWM data in existing regulatory, legislative and policy processes with an impact on water, for example, under the Fisheries Act, proposed Impact Assessment Act, and Canadian Navigable Waters Act.
- Ensure CBWM data used in regulatory, legislative and policy processes not only includes empirical data, but can also include traditional and Indigenous knowledge and testimony.
- Work with communities and monitoring groups to develop tools and approaches that help provide context for raw CBWM data.
- Ensure CBWM groups understand when, where and how their data can be used in a policy context.
- Ensure governance systems include CBWM groups in decision-making processes.
- Track and report the ways in which government departments use CBWM data in decision-making to normalize the practice.

5.3 Promote knowledge-sharing best practices in government-funded research and science.

- Enable Tri-Agency partnerships⁶ with CBWM initiatives, and provide incentives for the use of CBWM data in water research through grant applications.
- Work with the Tri-Agency administration to reduce “embargo periods” of data in federally-funded research involving CBWM partnerships or data.

5.4 Provide case studies of data analyses and interpretations to demonstrate how successful CBWM programs can inform decision-making.

- Recognize the value of non-traditional outputs beyond peer-reviewed publications among federal scientists and academic institutions working with communities. Examples range from non-academic reports to websites and other creative media.
- Before public dissemination, ensure that information and knowledge products derived from CBWM data are provided to the community that collected the data, and in a timely fashion.

⁶The Tri-Agency Financial Administration includes the Natural Sciences and Engineering Research Council of Canada (NSERC), Canadian Institutes of Health Research (CIHR) and Social Sciences and Humanities Research Council of Canada (SSHRC)

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