Canadian Ocean Literacy Coalition

La coalition canadienne de la connaissance de l'océan

UNDERSTANDING OCEAN LITERACY IN CANADA

'INLAND CANADA' REGIONAL REPORT

JUNE 2020

Canadian Ocean Literacy Coalition

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TABLE OF CONTENTS

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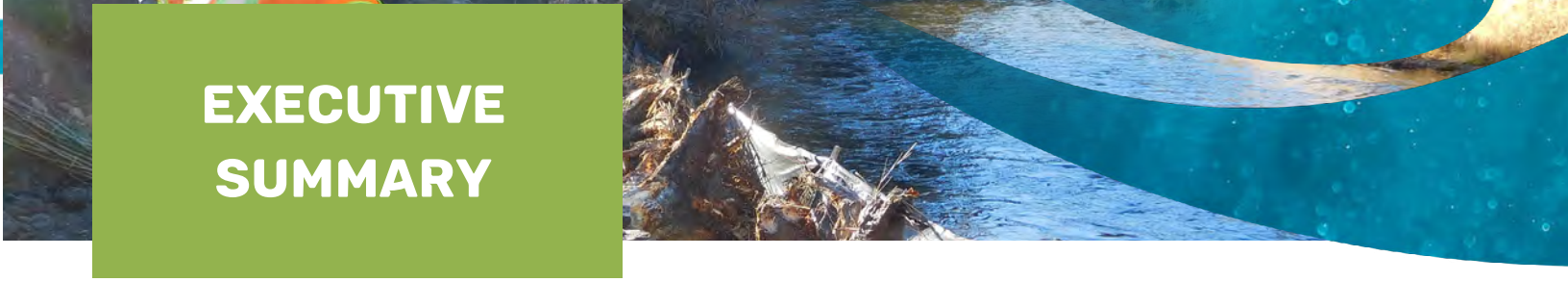

EXECUTIVE SUMMARY

This report is one of five regional reports that support a Canada-wide study conducted by the Canadian Ocean Literacy Coalition (COLC) to establish a baseline seascape of ocean literacy (OL) in Canada. The study's results will be used to develop an evidence-based national OL strategy and implementation plan.

This report shares the findings from the Inland Canada Region, which for the purposes of this study consists of four provinces (this study consists of four provinces Alberta (A.B), Saskatchewan (S.K.), Manitoba (M.B.), and Ontario (O.N.), as well as one territory, the Yukon (Y.K.).) as well as one territory (Yukon). The regional study draws on interviews with representatives from 24 organizations and a document scan (22 documents). It considers the practice of OL within nine sectors to (1) explore current understandings of OL, (2) identify strengths, gaps, and barriers to OL, and (3) propose recommendations for advancing OL regionally and nationally.

The key strengths of OL identified in the region are: (1) established community water monitoring and information sharing; (2) place-based experiential education; and (3) "water is life": building land-water stewardship action.

The key barriers to OL identified include: (1) a lack of funding and restrictive guidelines; (2) limited access and capacity sharing; and (3) a lack of frameworks and policies for ocean and water literacy initiatives.

Three preliminary recommendations emerged from the research: (R1) Increase support and capacity in community-based water initiatives; (R2) provide space for open dialogue and collaboration between ocean and water literacy experts and practitioners; and (R3) develop regionally-specific resources that tie into an overarching national water/ocean narrative.

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** The above partners directly contributed to supporting this region's research. See Appendix E for complete list of all funding partners.*

INTRODUCTION:
FRAMING OUR CANADA-WIDE STUDY

Canada has the longest coastline in the world and jurisdiction over an area of ocean equivalent to about 55% of the country's landmass.[1] For the 6.5 million Canadians living in a coastal zone[2] the ocean is deeply embedded in the fabric of community livelihoods, food security, and well-being. Across Canada, the ocean is a major economic driver, the backbone of weather and climate systems, and a recreational playground for millions of Canadians and global visitors. Ocean conservation is increasingly highlighted as a priority, as signalled by Canada's pledge to establish marine protected areas covering 25% of our ocean waters by 2025 and 30% by 2030.[3]

The ocean space is not just about species and industries; it is also about people, livelihoods, relationships, and identity. A knowledgeable and engaged citizenry is required to support and ensure ocean and community health, sustainable ocean economies, and social equity.

The Canadian Ocean Literacy Coalition (COLC) is an alliance of organizations, networks, institutions, and communities working together to better understand and advance ocean literacy (OL) in Canada. Widely accepted internationally, OL is defined as "**understanding our impact on the ocean and the ocean's impact on us**."[4] COLC's primary project since its inception in 2018 has been to lead a Canada-wide research initiative to better understand Canadians' varying relationships with the ocean and to examine how OL is understood and practiced across different regions and sectors. The aim of this work is to establish a baseline *seascape* of OL in Canada, and in so doing, to co-develop an evidence-based national OL strategy and implementation plan.

This report presents the results for the Inland Canada Region. It is one of a set of five regional reports and one national report that are available at www.colcoalition.ca.

Photo: Lee-Anne Walker

OUR APPROACH AND METHODS

Through a collaborative research approach, and drawing on qualitative and quantitative methods, the study focuses on five Canadian regions (Pacific, Inuit Nunangat, Atlantic, St. Lawrence, and Inland Canada), as well as a national overview. The study moves beyond an examination of OL in the context of formal education and youth to consider the practice of OL within nine sectors: Government, NGO and Advocacy, Academia and Research, Industry, Education, Community, Media, Cultural Heritage, and Health.

Data was primarily collected from participants who are directly engaged in OL, or in other ocean-related work that: (1) advances **ocean knowledge** systems (e.g., scientific, Indigenous, expert, local, etc.); (2) strengthens **ocean values** (e.g., life-sustaining, economic, personal, communal, etc.); and/or (3) implements **ocean actions** (i.e., individual behavioural change, social justice actions, policy changes, etc.).

THE STUDY WAS GUIDED BY THREE CENTRAL RESEARCH QUESTIONS.

1. What is the current understanding and state of OL in Canada?
2. What are the current strengths and barriers of OL in Canada?
3. What are the key recommendations to advance OL in Canada?

5 REGIONS

9 SECTORS

3 DIMENSIONS OF OL

Figure 1: The conceptual framework used for the study, integrating the five regions, nine sectors, and three dimensions of OL – ocean knowledge, values, and actions.

Eight different methods were used in the study. Table 1 provides the sample total for each method, nationally and for the Inland Canada Region. See Appendix C for further details on research methodology, ethics, and links to research tools.

TABLE 1: COLC RESEARCH BY THE NUMBERS

Data Method	Description	National (total data)	Inland Canada
Canadian Ocean Literacy Survey (COLSurvey)	National online survey with COLC members' networks & interested Canadians (For Findings Report PDF)	1,359 respondents	519* Respondents
Nanos Research Poll	National poll conducted with random sample (For Findings Report PDF)	1,010 respondents	506 (ON=309; AB/MB/SK=197)
Focused Document Scan	Documents and reports reviewed for context	332	24 documents (see references)
Interviews	Semi-structured, 45 minutes (see Appendix B)	188	24 participants (see Appendix A)
Ocean Literacy Mapping Survey (OLMSurvey)	Organizational-level online survey for OL providers	136 total respondents	N/A**
Youth Workshops	Researcher facilitated, semi-structured focus groups (For Youth Report PDF)	3 workshops – 210 youth total	*National scale only*
Arts-based Engagement	Public interactions with artwork and research question (For Inland Art PDF)	5 interactive art works - 250 responses	1 artwork 117 responses
Media & Social Media Scan	Course-scale analysis of topics discussed in Canadian media & twitter (For Media Report PDF)	1,253 articles; 88 influential accounts (800+ followers)	*National scale only*

*The majority of respondents were from Ontario (n=415), followed by Alberta (n=38), Manitoba (n=33), Saskatchewan (n=23), and Yukon (n=10).

** Whereas data for the four other regional reports were collected through both interviews and the OLMSurvey, the Inland Canada Report is based on interview findings only. Funding was not secured to hire a dedicated regional coordinator for 'Inland Canada,' as was the case in the other four regions. Moreover, with the practices in the region being generally tailored towards water literacy rather than OL, it was slower to generate engagement overall. Two research assistants were hired for short-term contracts to conduct the Inland interviews, analyze the data, and co-draft the regional report that was shared for review with all regional participants.

INLAND CANADA:
BACKGROUND

"What do ranchers, heavy-duty mechanics, teachers, and secretaries from this part of Canada say to the ocean? How do we see Canada's extensive coastal waters in relation to our wheat fields and coalmines?" These questions from Alberta-based artist Karen Tamminga-Paton are at the heart of looking at ocean literacy (OL) through an 'Inland' lens. And yet, identifying what precisely characterizes 'Inland Canada' is not altogether clear – is it a specific distance from the ocean? Is it in the geo-political borders that frame a province, territory, or municipality as being coastal, and another not? Is it through stronger connections to local watersheds than to the ocean?

Canada has the largest proportion of freshwater lakes of any country in the world.[5] There are over two million lakes and more than 8,500 rivers,[6] creating a diverse landscape of interconnected water systems that can be considered the pulse of Canadian ecosystems.[7] In classrooms and communities across Canada, we are commonly taught that Canada has about 20% of the planet's freshwater resources.[8] Less conveyed is an understanding that more than half of this water drains northward into the Arctic Ocean and Hudson Bay – the opposite direction from which 85% of Canadians live.[9] Also, fewer than half of these freshwater resources are renewable, with the bulk of water being found in lakes, underground aquifers, and glaciers.[10]

All of Canada's 8500+ rivers (see Figure 2) and massive inland systems like Lake Winnipeg and the Mackenzie River Basin,[11] drain into one of the five ocean watersheds in Canada– the Atlantic (which includes the Great Lakes and St. Lawrence River), the Arctic, Hudson Bay, the Pacific, and, bordering the United States, the Gulf of Mexico (see Figure 3).[12] Collectively, the complex landscape of watersheds and inland waterways consists of diverse climates that drive terrestrial and hydrologic environments.[13] Such regions include Canada's boreal zone, which is situated below the tundra and above the temperate forest, and extends from Yukon to Newfoundland and Labrador. Water defines this region through the presence of thousands of rivers and lakes that support 307 million hectares of forest and culturally significant species like the woodland caribou.[14]

Figure 2: Throughout Canada, there is estimated to be more than 8500 named rivers in the country. Check out Canadian Geographic's "Visualizing Canada's fresh water." Map credit: Chris Brackley/Canadian Geographic

Figure 3: There are five ocean watersheds within and connected to Canada, including the: Atlantic Ocean, Arctic Ocean, Hudson Bay, Pacific Ocean, and Gulf of Mexico. Check out Canadian Geographic's "Protect Your Watershed" resource. Map credit: Steven Fick/ Canadian Geographic

Heading Photo: Sharissa Johnson/Unsplash

Although some of the Inland regions included in this report have coastal boundaries (e.g., Yukon to the Arctic Ocean; Manitoba and Ontario to Hudson Bay), the majority of the populations of Inland Canadians have limited access to coastal regions. According to Statistics Canada, as of 2020, the entire Inland region contains approximately 21.7 million people, making up about 57% of the Canadian population.[15]

There are several hundred First Nations with traditional territories across this region.[16] The Métis homeland encompasses much of Manitoba, Saskatchewan, and Alberta, as well as parts of British Columbia, and Ontario. And there are numerous Inuit communities (e.g., Qamani'tuaq or Baker Lake).[17] It is also important to acknowledge urban Indigenous communities within the Inland Region.

Exploring OL in Inland Canada as situated above required a broadening of the term and conceptual understanding to include water literacy. In so doing, the voices that come through in this report are those of the dozens of established experts and leading water literacy-related organizations across Canada. Many of the conversations with these experts highlighted stewardship and community building through local watershed initiatives, all while connecting to broader, human-imposed challenges that surround water, such as contamination from high population densities and industries like mining, oil drilling, hydropower, and agriculture.

This report serves to provide a baseline understanding of some of the important water literacy work currently being done in Inland Canada and how the people leading this work see the links to OL efforts (or not). The aim of this report is to identify preliminary recommendations as to how to better bridge long-running and recently-established initiatives on (fresh)water connectedness, stewardship, and literacy with emerging OL efforts. Together, how can these collective efforts inspire Inland Canadians to form a better understanding of connections between backyard creeks, streams, rivers, and lakes to the ocean? What are effective points of intersection in the water and OL spaces, to broaden the engagement of Canadians in ensuring a healthy ocean and healthy freshwater for all?

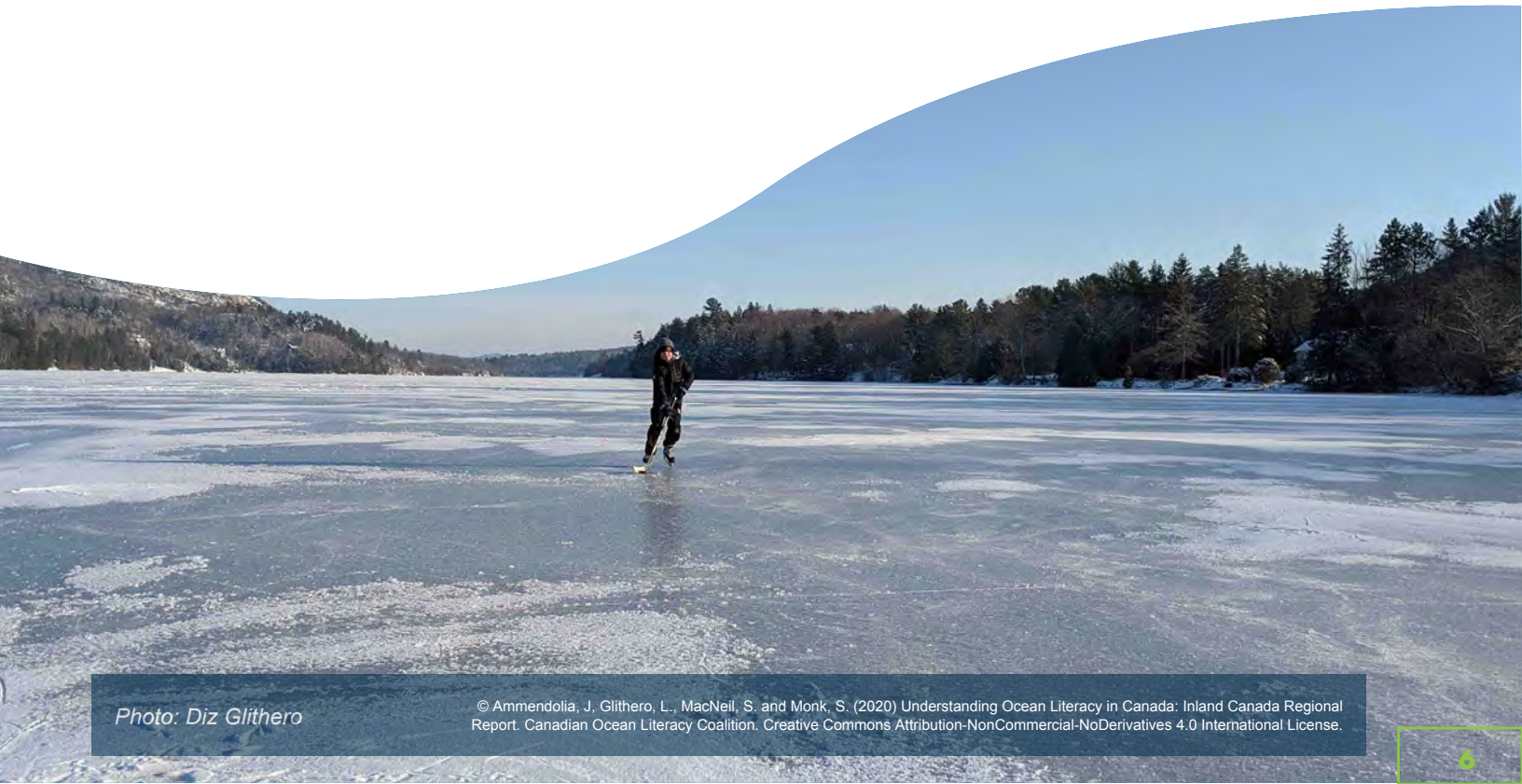


Photo: Diz Glithero

EXPLORING TERMS

The majority of the interviewed participants did not actively use the term 'ocean literacy.' Instead, their activities and work focus on promoting the quality and health of freshwater ecosystems (e.g., lakes and rivers). The terms 'freshwater literacy' and 'water literacy' were familiar for some participants but similarly to OL, they were not widely used terms.

The term "literacy" itself did not resonate with many interviewees, as it was perceived as being limiting in describing one's relationship with water, and having negative associations with notions of "deficit," "lacking," or "illiteracy." It is a term, as seen by some, that risks creating barriers between individuals and as seen by others, that may create positive connections of understanding and engagement with water and freshwater systems. Instead of 'literacy,' many participants shared that they more commonly used terms such as "awareness," "outreach," and "community engagement."

Below is a brief sample of interview participants' responses that reflect varying perceptions of the term "ocean literacy" and/or "water literacy."

> *I think it doesn't capture enough. People think it's just about children [and schooling]... it's just not holistic enough of a word.*
> ***Carolyn DuBois, Director of the Water Program, Gordon Foundation***

> *[OL means] awareness into action – becoming aware of how important water is. The ocean is on the planet for all of us, and all of life, and inspiring people to act.*
> ***Remy Rodden, Manager of Environmental Education and Youth Programs, Environmental Education & Youth, Yukon Government***

> *People need to be reminded of their impact on the ocean and waters, and the impact of the ocean and waters on their lives. Water is a metaphor for everything essential that we care for, to preserve ourselves and the planet.*
> ***Simon Jackson, Founder, Nature Labs***

> *I would define the term as a hands-on experience that engages and connects people both locally and beyond to other regions with opportunities to deepen their learning.*
> ***Katrina Froese, Fort Whyte Alive, Outdoor Education Park***

> *Water is the essential connection between life and the giver of life, the natural world. It nourishes our bodies and minds and supports us in a variety of ways. Also metaphorically and spiritually, it connects us to everything else. It helps us reflect on the reawakening of gender roles and the importance of respecting women as the water carriers. We talk more about building relationships with the people of the land. We're exploring the idea of the canoe as a vessel of reconciliation, as a vessel of understanding, as a vessel of connection. We need a term for our connection to the water. We build this knowledge through the heart.*
> ***James Raffan, Author, Director External Relations, Canadian Canoe Museum***

> *I use the concept of system literacy – water as part of a bigger system of connectivity that is not just about water, but the connection to all living things.*
> ***Dr. Shoshanah Jacobs, Associate Professor, Ideas Congress, University of Guelph***

> *Water literacy is thinking, planning, and acting with water in mind. Being water literate means having an understanding of the significance of water and life; having an understanding of where water comes from and how to use it sustainably. It focuses on everything from wetlands to lakes to groundwater to transboundary water issues.*
> ***Janine Higgins, Strategy Division, Environment and Parks, Government of Alberta***

HOW DO 'INLAND CANADA' RESIDENTS LEARN ABOUT THE OCEAN?

- **82%** MEDIA (75% in the rest of Canada)
- **68%** SCHOOL/FORMAL EDUCATION (69% in the rest of Canada)
- **67%** VISITING THE OCEAN (80% in the rest of Canada)
- **60%** VISITING MUSEUMS/AQUARIUMS (69% in the rest of Canada)
- **47%** FAMILY, FRIENDS AND/OR COMMUNITY MEMBERS (53% in the rest of Canada)
- **41%** RECREATIONAL ACTIVITIES (63% in the rest of Canada)
- **35%** ARTS & CULTURE (36% in the rest of Canada)
- **28%** LIVELIHOOD/EMPLOYMENT (52% in the rest of Canada)
- **15%** FOOD GATHERING ACTIVITIES (30% in the rest of Canada)

Findings from 519 respondents from Ontario (n=415), Alberta (n=38), Manitoba (n=33), Saskatchewan (n=23), and Yukon (n=10) to the Canadian Ocean Literacy Survey

The map below is a sample of the emerging interactive digital OL database that will be part of the National OL Strategy. See Appendix D for a full list of the 24 organizations that were identified through the interview process to be included on the Inland Canada OL Asset Map. More will be added over the coming months.

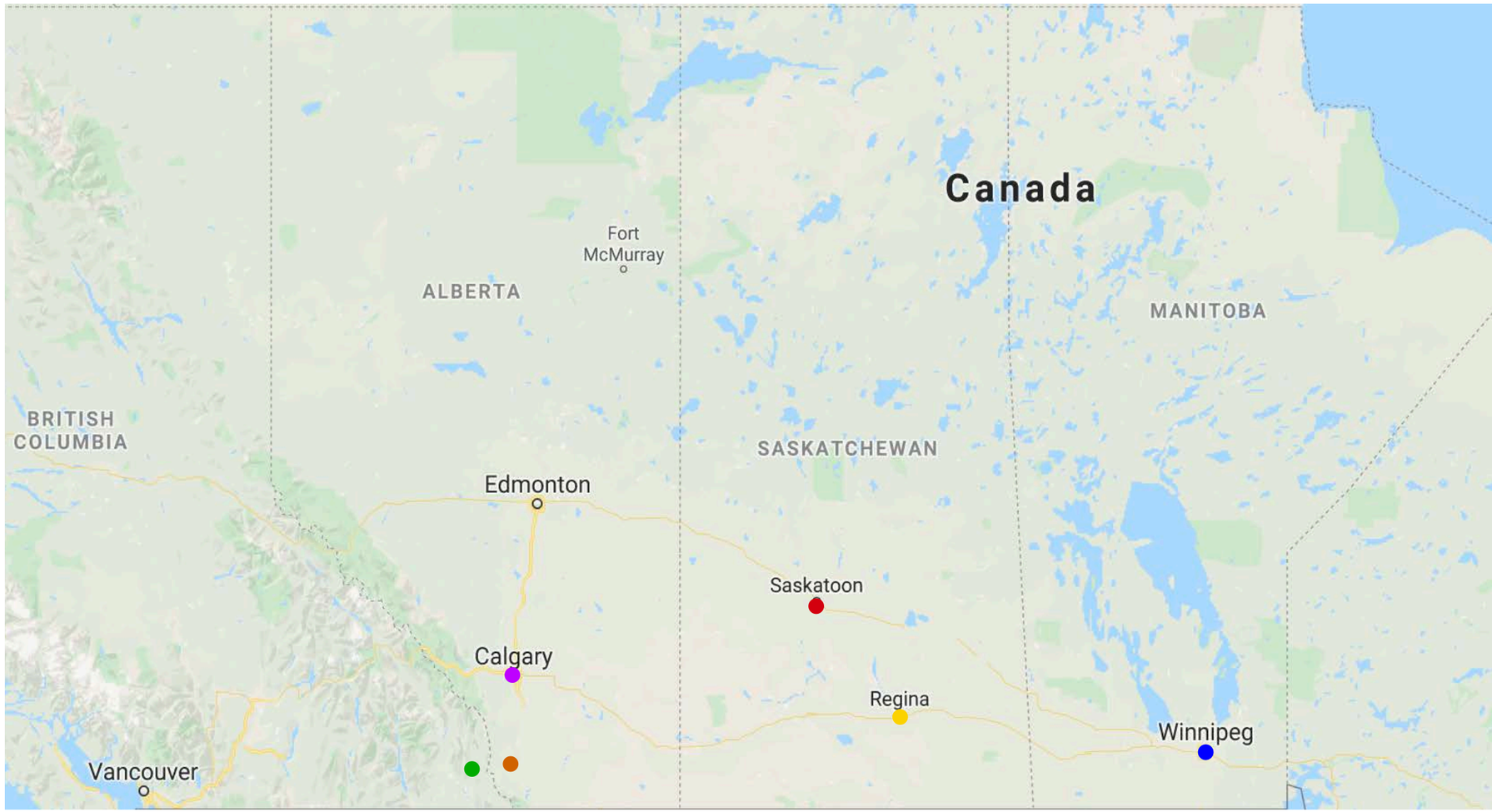


Figure 2: Inland Ocean Literacy Map

KEY FINDINGS:
REGIONAL STRENGTHS OF WATER/OCEAN LITERACY

Heading Photo: The Humber River, Toronto, O.N., Photo Credit Justine Ammendolia, COLC

Interviews were conducted with over twenty individuals and organization representatives across sectors who are leading water literacy-related work in the region. Broad themes emerged through participants' insights into effective approaches to deepen water understanding, connections, and engagement at the individual and community level. Three key strengths were identified: (1) Established community water monitoring programs and information sharing; (2) Place-based and experiential education; and (3) "Water is life": Building land-water stewardship connections.

1. ESTABLISHED COMMUNITY WATER MONITORING AND INFORMATION SHARING

Within this region there is a strong emphasis on community-based water monitoring (CBWM) and knowledge mobilization that lead to collaboration and collective action. Through long-running monitoring efforts and the development of big datasets, communities have demonstrated their ability to monitor and understand changes in their local watersheds, as well as developing stewardship practices and strong connections to their local systems. Below is a sample of four organizations leading CBWM efforts in Inland Canada.

Swim Drink Fish

Swim Drink Fish, an NGO based in Toronto, connects people across the country with water. Projects are geographically diverse and include initiatives like: the Lake Ontario Waterkeeper, the North Saskatchewan Riverkeeper and the Fraser Riverkeeper. Meanwhile, other initiatives are done through partnerships with the Fundy Baykeeper, the Happy Valley Goose Baykeeper and the Ottawa Riverkeeper. Each initiative has its own goal, such as restoration, re-naturalizing shorelines and community-scale monitoring. All initiatives, however, are linked by an overarching aim to inform and motivate an action-based Canadian citizenry to ensure that the country's waters are "swimmable, drinkable, and fishable" now and for generations to come. Their citizen science tool and mobile app, Swim Guide, provides water quality information and interactive maps informing users about local beaches and how safe they are for swimming. Through interactive applications, users can add knowledge and real-time updates regarding the water quality of their community beaches. Swim Drink Fish President and Lake Ontario Waterkeeper, Mark Mattson, describes Swim Guide as the "best engagement, best advocacy tool, and best movement builder" because of its ability to foster the growth of community hubs where individuals learn about the fundamental roles of water in their day-to-day lives.

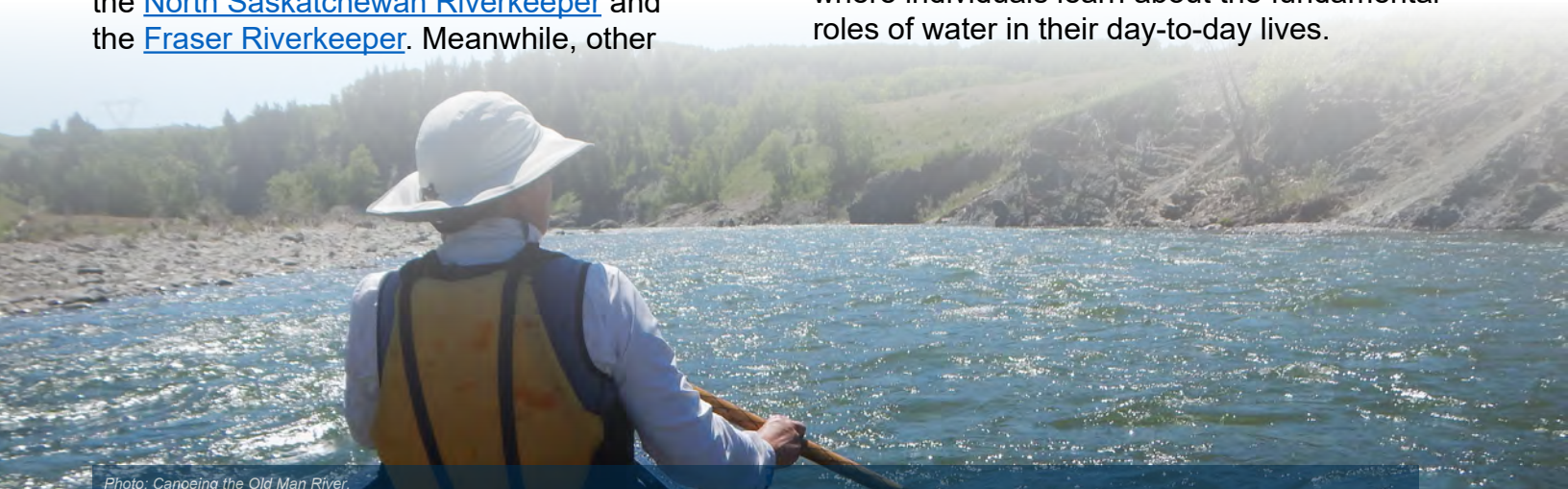


Photo: Canoeing the Old Man River, Front Ranges, Alberta. Photo credit: Gary Walker.

The Gordon Foundation

The Gordon Foundation is an NGO with a long history of working to protect Canada's waters and foster stewardship in partnership with Indigenous communities. Current programming focuses on improving access to water data across the country with an emphasis on supporting community-based water monitoring initiatives. To do this, The Gordon Foundation built DataStream, an online open access platform for sharing water data. DataStream is free to use and is designed to promote open sharing, collaboration across sectors and jurisdictions and widespread access to critical information about freshwater health. The site contains data collected by over 80 organizations including community-driven science efforts as well as initiatives from different sectors (e.g., government and academic research) to create a holistic picture of water monitoring throughout various watersheds in Canada.

The Gordon Foundation leads DataStream at a national level and carries it out in close collaboration with three regional partners: the Government of the Northwest Territories (Mackenzie DataStream's founding partner) the Atlantic Water Network and the Lake Winnipeg Foundation. Each of these organizations has played a leadership role in advancing community-based water monitoring for many years. For example, the Lake Winnipeg Foundation coordinates a highly successful program that engages citizens in monitoring phosphorus levels that cause harmful algae blooms in Lake Winnipeg. Communities participating in these grassroots monitoring programs experience firsthand the impacts of changes to water quality, and use the tools The Gordon Foundation provides to help increase the impact of critical frontline community observation and action.

When asked how CBWM advances water literacy and about bridging water and ocean literacy work, Carolyn DuBois, Director of the Water Program with The Gordon Foundation, shared: "communities actively monitoring is a really good channel towards working directly with communities on something very practical. They are the water experts in their communities. If we were to look to work together with groups who are already doing monitoring work in coastal estuaries, like the Fraser River for example, it might be a good starting point to **bridging these two worlds that shouldn't be separate**."

The Yukon Conservation Society

The Yukon Conservation Society shares water-related information with communities. According to Davon Callander, Executive Director, "generally people are interested in the outdoors and connected to wilderness," and part of the organization's work is to inform people about interacting with the water as part of the outdoors, furthering their connection with water. Focusing on the significance of river stewardship is one means the organization uses to mobilize knowledge and contribute to bridging the freshwater-ocean connection. This knowledge sharing occurs across a broad range of topics, for instance through highlighting examples of marine-freshwater species like salmon who rely on both ecosystems, as well as through activities such as energy, mining, and land-use and their potential impact on water systems in the territory.

Photo: Training Streamkeepers of all ages, At the Continental Divide, B.C.. Photo credit: Elk River Alliance.

Water First

Water First, based in Ontario, provides a platform for fostering leadership and water stewardship in partnership with First Nations communities. Through community consultations and meetings with the organization's First Nations Advisory Council, two leading initiatives are undertaken by communities to address water issues: (1) rehabilitation projects that restore waterways, and (2) water quality training programs targeted to teach youth to become water treatment operators in their communities. Through the water quality training programs, youth become leaders in their communities by being able to monitor water, which becomes drinking water and is used in homes, as well as being important habitats where country foods are harvested. This stewardship also extends to creating meaningful intergenerational ties, as youth are encouraged to go out onto the land with Elders.

2. PLACE-BASED EXPERIENTIAL EDUCATION

The majority of organizations interviewed conduct event-driven outreach (e.g., workshops and one-day events) and/or have an educational component for youth that often complements provincial/territorial science curriculums. Through examples shared by interview participants, experiential learning was identified as a means to create opportunities for students to connect with water in a more meaningful and personal way.

Commonly identified enablers of successful place-based experiential education include making learning experiences accessible and affordable for students and school districts, and making hands-on programming locally relevant. As an example, the programs at the Outdoor Education Park in Fort Whyte, Manitoba, provide opportunities for students to learn firsthand about the impact humans have on the environment, as the property itself is located on what used to be a clay pit mine. The grade eight Blue Planet program features hands-on activities that teach about clean drinking water while high school programs cover the connections between smaller systems (e.g., streams and creeks) and larger watersheds (e.g., rivers and lakes), wherein students learn about interactive scientific sampling. Canadian-wide NGO Riparia uses an experiential learning model to "connect young women and science on the water" by offering free multi-day trips on Canadian rivers and lakes, building personal connections to water and promoting freshwater conservation among Indigenous and non-Indigenous youth. From the vantage of canoes, participants learn about water through science, experience, and storytelling, with the aim of "getting [participants] equipped and comfortable to spend time outdoors on the water and to grow a connection, care, and fascination for water" (Andrea Reid of the Nisga'a Nation and Riparia Co-founder).

In southeastern British Columbia, the Elk River Alliance, based in Fernie, conducts educational programing and outreach that engage and challenge residents to know their watershed. Through their outdoor programming, designed for a range of ages, participants learn about where their water comes from and its many uses, and build a sense of connection and stewardship. According to Lee-Ann Walker, Founder and Senior Advisor, interacting with local watersheds and building lasting relationships with water in general is essential in order to value it.

> *"People need to see it, feel it, float in it, touch it – make a primal connection to it, to experience it through all of their senses and cultivate a sense of awe and reverence."*

Photo: Canadian Waters Kelp Forest, Ripleys Aquarium of Canada (based in Toronto)

In Inland Canada, only a few hands-on learning programs made direct connections to the ocean. At Ripley's Aquarium of Canada, provides experiences on local levels (freshwater tanks), national levels (saltwater tanks), and engages guests with global issues (e.g., climate change, plastic pollution), all the while promoting that ocean protection and awareness begin with local watershed conservation. Katie McMahon, Manager of Education and Conservation, shared that their facilities "give people experiences that build personal connections and allow for conscious messaging."

3. "WATER IS LIFE": BUILDING LAND-WATER STEWARDSHIP ACTION

Honouring water and recognizing that water, in its many forms, sustains all life is central to many Indigenous relationships with land and water. Georgina Riel, member of the Ojibwe Nation, Anishinaabe Traditional Knowledge Keeper and Consultant, recognizes the interconnections between land and water: "I'd like to see places where I am surrounded by a large body of water where people hold themselves accountable not just to the land but also to the water. It's only looked upon as extraction, as a natural resource to extract, to utilize and to service people. Water needs a voice. We need to listen to what is being said." Similarly, the Assembly of First Nations honours water since, "as Indigenous peoples, First Nations recognize the sacredness of our water, the interconnectedness of all life and the importance of protecting our water from pollution, drought and waste. Water is the giver of all life and without clean water all life will perish."[18] In recognition of Indigenous rights to clean water, Indigenous governance bodies have Lands and Waters departments working to ensure Indigenous communities work with various levels of government to protect water and land.[19] Indigenous water warriors and water protectors, such as Autumn Pelletier from Wiikwemkoong Unceded First Nation, have succeeded in garnering international support for Indigenous rights to water and water protection. The connection between water and life acknowledges the importance of Indigenous water governance. For instance, in the Mackenzie River Basin, N.W.T., the Keepers of the Water's (KOW's) mandate is to "elevate decolonized traditional Indigenous water governance. This is done by emphasizing Indigenous land-based knowledge, language and culture. KOW challenges the colonial narrative through a critical analysis of past and present practices in education, research and policy development."[20]

Several participants pointed to Indigenous-led land stewardship and guardian programs as models of success in fostering and strengthening communities' relationships with the land – which inherently includes water – and their desire to protect it. Valerie Courtois of Innu Nation and Director of the Indigenous

Leadership Initiative, commented, "in our recent [February 2020] 'Land Needs Guardians' Campaign gathering in Ottawa, many attendees shared that 'we're really happy to do the [guardian] work on land. But you know, we're salmon people or we're trout people, or we're people of the lake and we really want to talk about the lake and how it relates to the land.' Water and lands are so interconnected but funding and management doesn't always consider this. From an Indigenous perspective, all is important and working to enable Indigenous-led management and stewardship of waters and its species is essential to building the model of Guardians."

An example of strong Indigenous leadership and stewardship can be seen in the relationship the Anishinaabeg maintain with their ancestral lands and water. The UNESCO World Heritage site Pimachiowin Aki, for instance, is maintained by the communities of Bloodvein River, Little Grand Rapids, Pauingassi and Popular River in an area of the boreal shield in Manitoba and Ontario. Key to this long-standing stewardship is the tradition of *Ji-ganawendamang Gidakiiminaan* ("Keeping the Land") through respecting and honouring both the environment and people. As a direct result of this practice, the land continues to support community traditions, activities, and livelihoods, and is an active site for fishing, hunting, trapping, travelling routes (via water), and access to sacred sites. Pimachiowin Aki was designated as the first ever "mixed-site" by UNESCO in 2018, as a significant site that represents an inherent interconnection of culture and nature. As a result of this first designation of its kind, advisory bodies have begun to collaborate with UNESCO in evaluating and selecting other mixed sites.

CASE STUDIES

There are myriad strong examples of water-related initiatives in Inland Canada, ranging from policies to citizen-led science to research institutions and foundations. For the purposes of this study, the focus remains on the guiding question of this report: how do we connect

OL with what is already effectively known and practiced as water literacy?

Below are three case studies that showcase waterways to bring OL and water literacy together. They are the source for the preliminary recommendations to begin to take us *down that stream.*

CASE STUDY #1: Government of Alberta's Water Literacy Strategy

The 2019-2024 Water Literacy Strategy (WLS) was developed by Alberta Environment and Parks with the goal of bringing the population to "think, plan, and act with water in mind."[21] As the first and only provincial water literacy strategy in Canada, the WLS targets a wide range of audiences and water users, including domestic, recreational, commercial/industrial, agricultural, and governmental. With an accompanying five-year implementation plan (2019-2024), the aim of the WLS is to motivate Albertans to value and support efforts to protect the province's water resources for future generations.[21, 22] Throughout the programs and projects that will emerge over the course of implementing the WLS, the central goal remains to increase water literacy across the province, with water literacy defined by the WLS as "having an understanding of the significance of water in life and understanding where water comes from and how to use it sustainably."

Key themes highlighted by the WLS are:

1. Water and watersheds (e.g., watersheds, wetlands, lakes, ground water, rivers, drinking water and wastewater).
2. (Water management systems (e.g., water legislation and management, water policy and planning).
3. Extreme water events (e.g., flood and drought).

CASE STUDY # 2: The Alberta Narratives Project

The Alberta Narratives Project (ANP) is a community-driven initiative organized by the Alberta Ecotrust Foundation and Pembina Institute, with the objective to establish a constructive narrative arou nd climate change and energy in Alberta. The ANP is a regional offshoot of the Global Climate Narratives Project, which works with regional and national partners to develop audience-specific messaging around polarizing issues.

Narrative workshops organized by ANP and held throughout Alberta brought together diverse groups of people – farmers, oil sands workers, energy leaders, business leaders, Indigenous leaders, youth, environmentalists, and New Canadians, amongst others – to engage in discussions weaving in participants' backgrounds and values. Results from the workshops outline effective language that bridges the gaps in participants' worldviews. These narratives were synthesized in a report that acts as a guide for "*Climate and Energy Communicators*" to establish effective communication among diverse audiences and find common ground.

The ANP project consists of two reports: *Communicating Climate Change and Energy in Alberta*[23] and *Communicating Climate Change and Energy with Different Audiences in Alberta*.[24]

The results of the ANP process outline what language is most and least effective in controversial dialogues regarding energy and climate change in Alberta. The methodology used by ANP is publicly available and can be replicated in working towards successful communications and establishing narratives with diverse audiences.

CASE STUDY # 3: Elevating Community-Based Water Monitoring in Canada

In response to the growing momentum of community-based water monitoring (CBWM) and related initiatives across Canada, there emerged a need to support the movement with "strategic investment, collaboration, and leadership across sectors, watersheds, and jurisdictional boundaries [as well as] active integration of CBWM data into policy and decision-making."[25] As a result, The Gordon Foundation, Living Lakes Canada, and WWF-Canada came together to lead a process in identifying actionable steps for the federal government to take in order to show leadership and support in advancing CBWM in Canada.

In November 2018, following on the heels of a national CBWM survey, over 50 leading Indigenous and non-Indigenous CBWM practitioners, water scientists, and policy and data experts came together to participate in a collaborative dialogue. The roundtable served as a means for participants to highlight strong freshwater ecosystem monitoring initiatives already established across the country, as well as identifying common challenges and opportunities they faced.

Later that month, the *Context for a National Discussion: Elevating Community-Based Water Monitoring in Canada* was published, outlining draft recommendations to emerge from roundtable discussions. The final recommendations, published in April 2019, were developed collaboratively with insights from roundtable participants and diverse experts and individuals with practical CBWM experience.

The five thematic areas for the recommendations to elevate CBWM in Canada are:

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

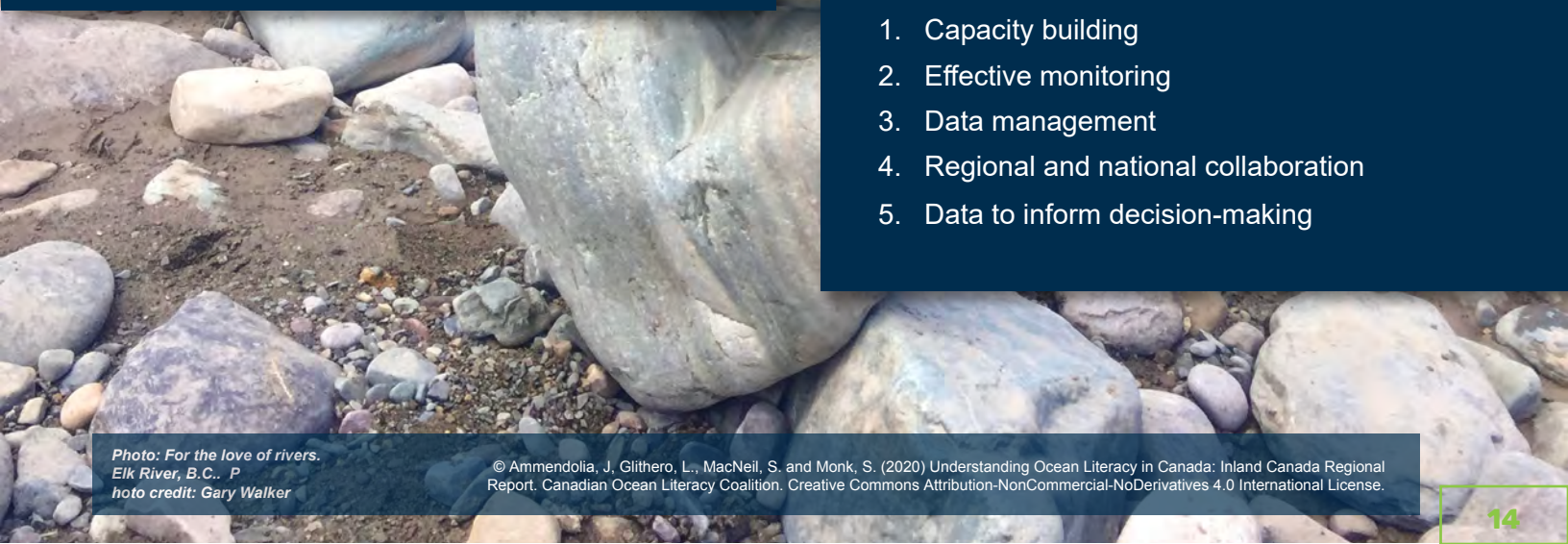
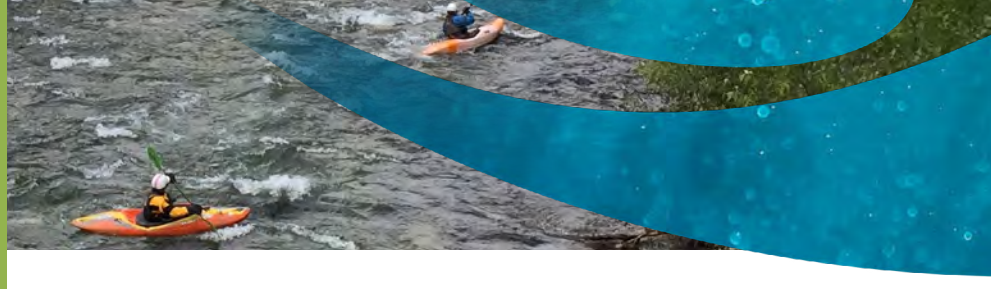


Photo: For the love of rivers. Elk River, B.C.. P hoto credit: Gary Walker

KEY FINDINGS:

BARRIERS TO WATER/OCEAN LITERACY



Inland Canada interview participants identified several obstacles to their work, with three main barriers emerging: funding was cited by most interviewees as a limitation to water stewardship work and efforts; limited access and connection to water, which result in a lack of understanding of the true value of water; and a lack of guiding frameworks and policies as related to ocean and water literacy.

1. FUNDING AND RESTRICTIVE GUIDELINES

The underfunding of government grants as relates to water and water literacy was often cited as a barrier, particularly among community organizations and NGOs who face exhaustion in trying to sustain community water projects on too few resources. Unsustainable funding models are compounded by a granting system that favours short-term projects (e.g., single events and short-term campaigns) over longer-term ones (e.g., monitoring programs and youth science camps). Consequently, organizations deploy much of their resources and capacity towards securing more funding. As stated by Andrea Reid of the Nisga'a Nation and Riperia Co-founder, small organizations are "in a constant state of seeking out grants, applying for grants and turning those over." It was further noted across interviews that this "eternal chase" for funds through the charity and advocacy system stifles creativity and innovation.

Funding is further limited in the OL and freshwater space by the guidelines and timeframes imposed by funding bodies. For instance, funding may be limited when it comes to taking the time and effort of building trusting relationships with communities. Andrew Spring, a postdoctoral fellow at Wilfred University, highlighted that spending time in the community and listening is important

> *"because if you want your answer, you've got to spend several years having tea."*

2. LIMITED ACCESS TO WATER AND CAPACITY SHARING

Interview participants from across Inland Canada were united in voicing that most Canadians have limited relationships with water. Specific to Inland Canadians, most interviewed participants reported limited activities and opportunities for connection to ocean issues within their organizations. For instance, Sean Brandt, outdoor educator with Saskatchewan Outdoors, commented that "our biggest issue with students in Saskatchewan is that three-quarters of the students have never seen the ocean – it's an abstract concept and it makes it tough for them to actually care about the ocean." Without having hands-on, experiential learning and personal experiences with the ocean it is difficult to inspire care and stewardship especially with youth within Inland provinces.

Photo: Kayakers ready to run the rapids.
Photo credit: Lee-Anne Walker

The tenuous connection between Inland Canadians and the ocean also extends to local watersheds. As stated by Lee-Anne Walker, Elk River Alliance: "Canadians are complacent about the fact that we have so much water… We're not as water wealthy as we think we are."

This "out of sight, out of mind" mentality points to a fundamental gap in knowledge with respect to where drinking water comes from, and how much fresh water Canada actually has. Although many of the NGOs interviewed reported an abundance of literacy activities specific to local watersheds, these programs often do not make the broader connections to bigger watershed systems like Canada's ocean. A lack of opportunities to form networks and unite efforts across multiple provinces and territories was cited as a reason for this gap, as well as an overarching lack of space for OL organizations to "come together and share that knowledge and help each other out" (Andrea Reid of the Nisga'a Nation and Riperia Co-founder).

3. LACK OF FRAMEWORKS AND POLICIES FOR OCEAN AND WATER LITERACY INITIATIVES

Interviewees identified the lack of regional and national frameworks for OL and freshwater initiatives as a challenge in advancing OL and water literacy. An additional challenge is the need for goals and objectives established in government water literacy strategies to be flexible "and responsive to shifting priorities that reflect the will of the people through their elected representatives" (Janine Higgins, Government of Alberta). As a result, the inconsistent support for water-related goals over time does not allow water to be on the forefront of Inland Canadians' minds. Similarly, participants shared that within their own provincial and territorial governments, OL and water literacy were simply not priorities. According to Mavis McRae Founder of the Prairie Ocean Coalition Coalition (Inland Ocean Coalition), "Canadians take a different, less vocal approach to advocacy and politics," which might have a role in establishing the status of water as a non-pressing issue and/or priority for both provincial and territorial levels.

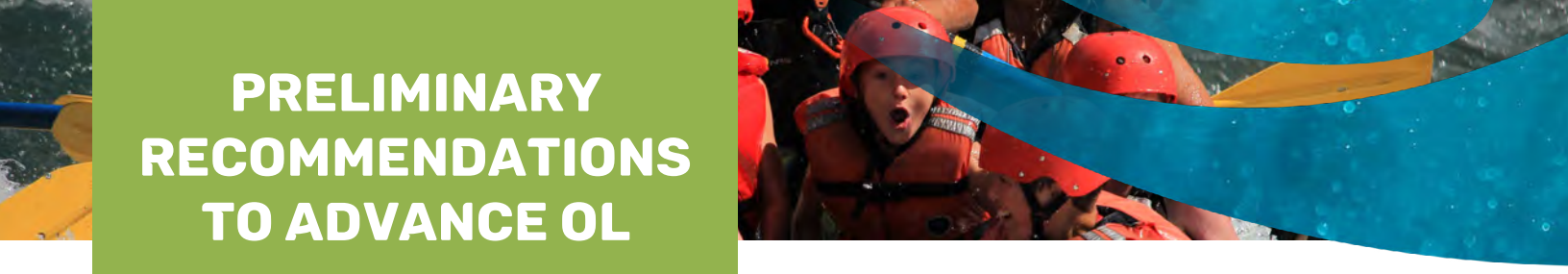
Photo: Bank stabilization while enhancing fish habitat, Alexander Creek, Continental Divide, B.C.. Photo credit: Elk River Alliance

Also identified as a challenge is a deficit in school curricula: there is an absence in provincial and territorial curricula of content to target youth engagement with water. As Lee-Anne Walker, Elk River Alliance, stated:

> *"If we are truly a nation of three oceans, it needs to be embedded in our curriculum and learning, because what could be more important than water? Without water there is no life."*

Finally, the lack of representation of Indigenous communities in water-related policies and the public consciousness were also identified as barriers: In Canada, the "prevailing approaches to water governance often exclude meaningful participation of Indigenous peoples, and systemic inequities constrain Indigenous peoples' access to water and ability to get access to water and ability to exercise inherent water rights and associated responsibilities."[21]

PRELIMINARY RECOMMENDATIONS TO ADVANCE OL



The preliminary recommendations to advance OL and water literacy in the context of this report are based on interview and survey participant input, and have also been built upon the foundational work already done by three initiatives: the Alberta government's *2019-2024 Water Literacy Strategy*, which provides a comprehensive and tangible model of provincial policy addressing water literacy; the recommendations outlined in the report *Elevating Community-Based Water Monitoring in Canada,* which stem from a bottom-up approach and outline support and leadership needed on a national scale for freshwater ecosystem monitoring; and the principles for shaping inclusive narratives that emerged from the Alberta Narratives Project, which serve as applicable guidelines to approaching contentious issues using a community-minded empathetic approach (see summaries below).

What emerges from these models, and was echoed in the interviews from the Inland region, is the need to increase support and capacity in community-based water initiatives, provide space for open dialogue and collaboration between ocean and water literacy experts and practitioners, and develop regionally-specific resources that tie into an overarching national water/ocean narrative.

R1. INCREASE SUPPORT FOR AND CAPACITY IN COMMUNITY-BASED WATER INITIATIVES

- Support long-term initiatives and increase funding for infrastructure related to operations (e.g., funding salaries and building maintenance).
- Invest in training and skill-building, particularly for youth, women, and Indigenous people, in leading community-run projects and initiatives.
- Increase engagement in citizen-led science and community-based monitoring programs.
- Promote opportunities for Canadians of all ages to get connected with their watersheds through hands-on experiences.
- Recognize Indigenous rights to clean water, Indigenous governance, and Indigenous knowledge systems that centre water in all its forms as sustaining all life.

R2. PROVIDE SPACE FOR OPEN DIALOGUE AND COLLABORATION BETWEEN OCEAN AND WATER LITERACY EXPERTS AND PRACTITIONERS

- Provide funding for targeted programs combining ocean and water literacy.
- Prioritize time and funding for relationship-building.
- Create advisory roles on freshwater councils, working groups, caucuses, etc. for OL experts and vice-versa (e.g., create freshwater counsellor roles for OL groups).
- Create resources highlighting connections between local watersheds and broader ocean systems.
- Collaborate on provincial and territorial curricula that teach about regional and national water systems for both coastal and Inland systems.
- Include Indigenous knowledge systems and water governance as part of curricula and pedagogical approaches.

Photo: Families floating together.
Photo credit: Gary Walker

R3. DEVELOP REGIONALLY-SPECIFIC RESOURCES THAT TIE INTO AN OVERARCHING NATIONAL WATER/ OCEAN NARRATIVE

- Increase knowledge of water management systems regionally and nationally, including important policies, regulations, Indigenous governance and infrastructures, as well as supporting access these resources.
- Equip policy and decision-makers at all levels with tools and resources to make informed decisions with water and the ocean in mind.
- Foster national stewardship and Indigenous guardian programs that encourage regional action.
- Encourage Canadians to form emotional and personal relationships with water through experience, storytelling and culture.
- Increase awareness on the interconnectedness of community and environmental health and well-being with healthy water systems.

REPORT SUMMARIES

Recommendations on how the federal government can strategically engage with and support CBWM efforts across Canada.
From *Final Recommendations: Elevating Community-Based Water Monitoring in Canada.*

1. Support CBWM capacity building – by increasing funding to programs like Indigenous Guardians and making investments in skills and training;
2. Ensure effective monitoring practices are in place and easy to share – by determining the gaps and needs and providing leadership on best standards and practices;
3. Facilitate regional and national collaboration – by creating formal, integrated liaison positions within existing federal monitoring programs and following best practices for program governance and engagement with communities (e.g., Northern Contaminants Program);
4. Strengthen CBWM data management – by providing support to scale up existing data management efforts to build capacity and championing well-established data standards; and
5. Use CBWM data in decision-making – by developing a cross-departmental strategy to leverage CBWM data in science, policy, and regulatory decision-making, and, tracking and

10 Principles for Applying Sub-Narratives
From *Communicating Climate Change and Energy with Different Audiences in Alberta: Alberta Narratives Project, Report II*

1. Respect
2. Validate their contribution
3. Build messaging from their values and keywords
4. Use their narratives and language
5. Draw support from trusted sources
6. Take people as far as they are willing to go
7. Enable an open discussion between peers
8. Identify actions aligned with the audience's strengths
9. Present positive outcomes
10. Test it. Above all, it is essential to test communications

Gaps identified in WLS Needs Assessment
From *2019-2024 Alberta Water Literacy Strategy*

1. Better understanding where and how to access water-related information.
2. Increased knowledge of Alberta's water management system, including the Water Act and regulations, water management infrastructure.
3. Better understanding of the importance of healthy watersheds for water quality and quantity, and how climate change may impact this.
4. Adopting key behavioral attributes, such as being curious, responsible, thoughtful, committed, deliberate and helpful, that lead to water-related stewardship and sustainability.
5. Better understanding of the GOA, municipalities and their roles during extreme weather events such as flood and drought.
6. Increased engagement in citizen science and community-based monitoring programs.
7 Additional resources required on topic gaps identified in AWC Report; Drinking water and wastewater, healthy aquatic ecosystems, water allocation and hydraulic fracturing.

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APPENDIX A: INTERVIEW PARTICIPANTS

Organization	Participant
Anishnaabe Traditional Knowledge Keeper; Riel Consulting	Georgina Riel
Artist and Educator	Karen Tamminga-Patron
Assiniboine Zoo	Stephen Peterson
Canadian Canoe Museum	James Raffan
Prairie Ocean Coalition (Inland Ocean Coalition)	Mavis McRae
Centre for Indigenous Environmental Resources	Sjoerd van der Wielen
Elk River Alliance	Lee-Anne Walker
Environmental Education and Youth, Yukon Government	Remy Rodden
Environment and Parks, Government of Alberta	Janine Higgins
Fort Whyte Outdoor Education Park	Katrina Froese
Geoscience, Osum Oil Sands	Jen Russel-Houston
Gordon Foundation	Carolyn DuBois
International Institute for Sustainable Developments- Experimental Lakes Area	Pauline Gerrard
Ministry of Parks, Culture and Sport, Government of Saskatchewan	Leah Luciuk
Nature Labs	Simon Jackson
Riparia; Member of the Nisga'a Nation	Andrea Reid
Ripley's Aquarium of Canada	Katie McMahon
Saskatchewan Outdoors	Sean Brandt
Swim Drink Fish; Lake Ontario Waterkeeper	Mark Mattson
University of Guelph	Shoshanah Jacobs
Water First	Cody Avery
Waterlution	Karen Kun
Wilfred Laurier University	Andrew Spring
Yukon Conservation Society	Davon Callandar

APPENDIX B: INTERVIEW QUESTIONS

1. From your perspective, how does your organization (or community) foster a relationship with the ocean?
2. Is ocean literacy a useful or familiar term for you(r) organization? If so, how do you define it? If not, why?
3. What factors contribute to the success of your (organization's) work on ocean literacy? (can include ocean knowledge(s), ocean values, ocean action(s))
4. Can you provide some specific examples of positive impacts from your (organization's) work (specific to OL)?
5. What are the key challenges and barriers to your (organization's) work on ocean literacy?
6. What would you like OL to look like in Canada by 2030? How do you think we can get there?
7. Do you have any long-term goals for your organization goals for OL in Canada? If so, what are they? If not, why not?
8. How would you like to see ocean literacy defined in Canada?
9. Who would you identify as a leader in OL in Canada? Why?
10. What are your (organization's) most important partnerships, networks, collaborations, for ocean literacy work?
11. Are there any organizations (or communities/ groups) you would like to work with in the future (on OL)?
12. Are there any people within this region/sector that you think I should interview?

APPENDIX C: RESEARCH ETHICS AND METHODS SUMMARY

Drawing on qualitative and quantitative methods through a collaborative research approach, the study focused on five Canadian regions (Pacific, Inuit Nunangat, Atlantic, St. Lawrence, and inland Canada), as well as nationally. As a Mitacs-funded and Canadian Ocean Literacy Coalition (COLC)-led project, the research team included postdoctoral fellows, graduate students, supervising professors at partner universities (Dalhousie University, University of Ottawa, Simon Fraser University, and Trent University), and an extensive network of industry/organizational partners located across Canada.

In order to co-develop a national OL strategy based on regional findings and recommendations, the team engaged in three central lines of inquiry:

1. reviewed regional ocean-related studies, reports, policies, media, and other publicly available documents for linkages to OL through a focused document scan. This process also contributed to OL mapping.
2. conducted semi-structured interviews and a comprehensive asset mapping methodology to understand the ways in which OL is being interpreted and implemented regionally across nine pre-identified sectors; and
3. conducted a national online ecosystem survey (COLS - Canadian Ocean Literacy Survey), as well as a National Poll, conducted by Nanos Research, for the general Canadian public.

In addition to the above lines of inquiry, an arts-based methodology was used led by a team of artists (one per region), 3 youth workshops (e.g., focus group approach), and a Canadian media content analysis and social media scan.

Interview data was organized by key questions (see Appendix B) and then coded and categorized into key themes. The findings from the interviews were then examined with the findings from the OLM (regional/organizational) Survey and the COL (national) Survey. A convenience sample of self-identified participants within the COLC network was used along with a snowballing technique to further expand the initial sample (i.e., participants suggested others to interview and participate in the OLMSurvey). This report primarily focuses on data collected from participants who are directly engaged in OL or in other ocean-related work. Data collected from a random sampling of the Canadian public took place via the national poll conducted by Nanos Research and the arts-based research data.

To view all research tools and related reports, please visit: https://colcoalition.ca/research-tools/ and https://colcoalition.ca/our-projects/regional-reports

All research tools and protocols were approved by Dalhousie Research Ethics, REB# 2019-4891 as the lead (national) research institution, as well as by regional partners universities' ethics.

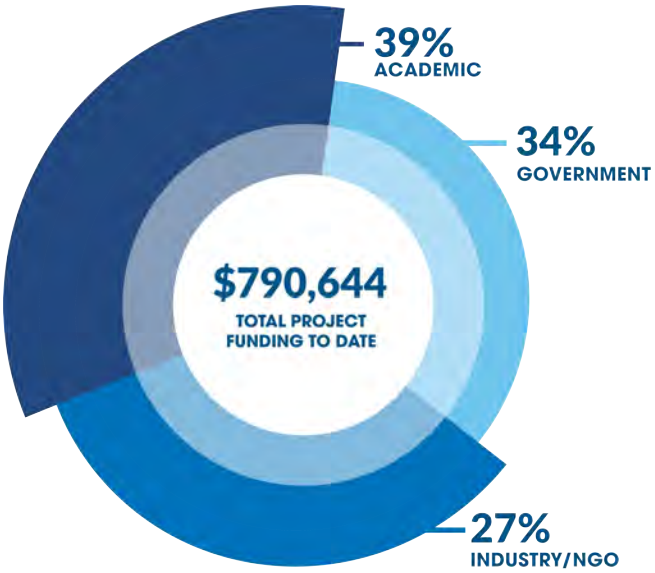
Validation: The draft Inland Regional report and case studies were sent for review to the participating organizations and individuals. This final report reflects this review process.

APPENDIX D: INLAND CANADA OL ASSET MAP – LIST OF ORGANIZATIONS

Organization	Sector(s)	Location
Anishnaabe Traditional Knowledge Keeper; Riel Consulting	Cultural Heritage Community Education	Kitchener, ON
Artist and Educator	Cultural Heritage	Crowsnest Pass, AB
Assiniboine Zoo	NGO & Advocacy Community	Winnipeg, MB
Canadian Canoe Museum	Cultural Heritage Education	Peterborough, ON
Prairie Ocean Coalition (Inland Ocean Coalition)	NGO & Advocacy Education	Winnipeg, MB
Centre for Indigenous Environmental Resources	NGO & Advocacy Education	Winnipeg, MB
Elk River Alliance	NGO & Advocacy	Fernie, BC*
Environmental Education and Youth, Yukon Government	Government Education	Whitehorse, YK
Environment and Parks, Government of Alberta	Government	Edmonton, AB
Fort Whyte Outdoor Education Park	Education	Winnipeg, MB
Geoscience, Osum Oil Sands	Industry	Calgary, AB
Gordon Foundation	NGO & Advocacy	Toronto, ON
International Institute for Sustainable Developments- Experimental Lakes Area	NGO & Advocacy Academia & Research Education	Winnipeg, MB
Ministry of Parks, Culture and Sport, Government of Saskatchewan	Government	Saskatoon, SK
Nature Labs	Education	Calgary, AB
Riparia; Member of the Nisga'a Nation	NGO & Advocacy Education	Montreal, QC
Ripley's Aquarium of Canada	Industry Education	Toronto, ON
Saskatchewan Outdoors	Education	Lumsden, SK
Swim Drink Fish; Lake Ontario Waterkeeper	NGO & Advocacy	Toronto, ON
University of Guelph	Academia	Guelph, ON
Water First	NGO & Advocacy	Creemore, ON
Waterlution	NGO & Advocacy	Oakville, ON
Wilfred Laurier University	Academia	Waterloo, ON
Yukon Conservation Society	NGO & Advocacy	Whitehorse, YK

* Although this organization is based in British Columbia it was considered for the Inland Report due to its proximity to the Alberta border and project work focused on local watersheds.

APPENDIX E: STUDY FUNDING



The COLC is comprised of NGO, government, academic, industry, and philanthropic organizations. Our funding reflects this collaboration.

Total Project Budget to date: **$790,644**

Federal Government — $266,630

Fisheries and Oceans Canada	$200,000
Environment and Climate Change Canada	$20,000
Polar Knowledge Canada	$25,000
Science Horizons Internship Program	$13,750
Ingenium (Canadian Museum of Science and Technology)	$5,000
Natural Sciences and Engineering Research Council of Canada	$2,880

Industry/NGO/Philanthropic — $220,750

Students on Ice	$63,750
Ocean Wise	$50,000
NIVA Inc.	$25,000
Clean Foundation*	$25,000
Canadian Commission for UNESCO	$18,000
Stratos Inc	$15,000
McConnell Foundation	$10,000
Ocean Networks Canada	$9,000
Baffinland	$5,000

** with support from Environment and Climate Change Canada*

Academic — $303,264

Mitacs	$169,664
Ocean Frontier Institute	$80,000
Marine Environmental Observation, Prediction and Response Network	$23,600
Ocean Frontier Institute Seed Fund	$20,000
Marine Institute	$10,000