

Sharing
our
Stories
to
Co-create
a
National
Ocean Literacy
Strategy

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Figure 1: There were six *Paddle to the Sea* canoes carved for the shooting of the film in 1966. One of those carvings was temporarily loaned to join the Canada C3 Expedition in 2017, a 150-day expedition around the coast of Canada from Toronto, Ontario, to Victoria, British Columbia, via the Northwest Passage. Thousands of Canadians held *Paddle to the Sea* during that voyage – dozens were moved to tears upon holding it.

“The truth about stories is that that’s all we are.” So wrote acclaimed writer Thomas King in his book *The Truth About Stories: A Native Narrative* (2003). Stories, both lived and told, influence our ways of knowing. Stories can connect and inspire us. Stories can make truths more personal, facts more relational.

In 1966, legendary canoeist Bill Mason taught a generation of Canadians what a watershed was through his iconic film adaptation of *Paddle to the Sea* based on Holling C. Holling’s 1941 book of the same name. Viewers follow the tale of a young boy’s hand-carved canoe as it journeys from the spring melt waters in the Lake Superior region to the Gulf of St. Lawrence. This story, brought to life by Mason, made thousands of Canadians, young and old, recognize that we are each connected to a watershed that leads to an ocean basin, no matter where in this country we call home (Figure 1).

At the time of Mason’s film release, Canada’s population was just over 20 million people. Today, the population sits at 37.6 million,

with only an approximate 6.5 million Canadians living near our marine coasts (according to Natural Resources Canada 2016 report on Canada’s *Marine Coasts in a Changing Climate*). All provinces and territories (with the exception of Alberta and Saskatchewan) touch on the approximate 243,042 km of our coastline – the longest of any country. Roughly nine in ten Canadians today live within 200 km of the United States border, with nearly half of those congregated along the Great Lakes and St. Lawrence waterways. As articulated in *Canada’s Oceans Strategy*, we are an “ocean nation” – but to what extent do we all recognize the ocean in our national identity? To what extent do we acknowledge the critical importance of the ocean, particularly a healthy one, to our own physical, economic, and socio-cultural well-being? Do today’s generations of Canadians know their local watershed, let alone its broader connection to one of Canada’s five ocean watersheds – the Atlantic (which includes Great Lakes and St. Lawrence River), the Arctic, Hudson Bay, the Pacific, and the Gulf of Mexico? Is there a need for

a new *Paddle to the Sea* story to inform and inspire new generations of the connection between backyard creeks, streams, rivers, and lakes to the ocean?

Water Connectedness

In classrooms and communities across Canada, we are commonly taught that Canada has about 20% of the planet's freshwater resources. Less conveyed is an understanding that more than half of this water drains northward into the Arctic Ocean and Hudson Bay – the opposite direction of where 90% of Canadians live. Furthermore, less than half of these freshwater resources are renewable, with the bulk being considered “fossil water,” found in lakes, underground aquifers, and glaciers.

Nonetheless, with Canada's population representing only 0.5% of the world's total population, we are indeed blessed with abundance and, in turn, shouldered with a civic responsibility to protect its water resources. Thankfully, there is incredible and extensive work being done by local, regional, and national non-governmental organizations (NGOs) to connect Canadians to their local water sources and waterways, often in partnership with varying levels of government and supported by industry and philanthropy leaders. As examples, Swim Drink Fish, based in Toronto, spearheads citizen science monitoring that directly informs water quality decision making, and has developed a Swim Guide app for public use. The Unama'ki Institute of Natural Resources, which represents the five Mi'kmaw communities of Unama'ki (Cape Breton, Nova Scotia), regularly monitors community drinking water as part of its Aquatic Research and Stewardship program. On a national and highly collaborative scale, the Gordon Foundation, Living Lakes Canada, and WWF-Canada convened a national roundtable in 2018 focused on community-based water monitoring, leading to a national report and recommendations for the federal government to act upon. In the Kootenay region of British Columbia, Wildsight works with industry,

scientists, governments, and communities to guide practice and steward change through its “know your watershed” program. Waterlution, an organization initiated and led by youth, equips young leaders to tackle water challenges through its intensive training-based Water Innovation Labs. With dozens more examples upon which to draw, there is no shortage of programs and pathways for Canadians to actively engage in water stewardship and water governance processes. The challenge, however, lies in cultivating a citizenry that values water health as essential to all life, and that is willing to change behaviours and act, both personally and collectively, to ensure water quality, supply, and access for current and future generations. Although *Paddle to the Sea* so beautifully linked freshwater to the ocean, more often than not, work on water connectedness is siloed from efforts to better understand, value, and care for the ocean.

Ocean Connectedness

For the 6.5 million Canadians living within a coastal zone, the ocean is deeply embedded in the fabric of community livelihoods, food security, and socio-cultural well-being. Across Canada, the ocean is a major driver of our economy, the backbone of our weather and climate systems, and a recreational playground for millions of Canadians and global visitors. Growing investments in ocean infrastructure (e.g., Churchill Marine Observatory, Ocean Networks Canada) and science-industry initiatives (e.g., Canada's Ocean Supercluster, Northern Marine Transportation Corridors Initiative) underscore the strong economic opportunity presented by the ocean. Ocean conservation is increasingly highlighted as a priority, as signalled by Canada's push to establish 25% marine protected areas by 2025 and 30% by 2030. For the 30+ million Canadians who live nowhere near the ocean, however, are linkages to ocean health, protection, and management being cultivated in ways that personally resonate? Are the impacts and opportunities of a growing “blue economy”

being effectively communicated? How do we mobilize a largely inland constituency to value the opportunities and responsibilities that come with being an “ocean nation”?

Anne Stewart, founder of the Canadian Network for Ocean Education (CaNOE), addresses some of these questions in her foundational essay *Ocean Literacy Matters in Canada* (submitted in a previous JOT issue; see Vol. 14, No. 2, 2019) by defining and situating ocean literacy within a Canadian context. The term “ocean literacy” itself was coined in 2002 in the United States as part of a growing effort to improve scientific understanding of the ocean. The landmark *Ocean Literacy Essential Principles of Ocean Sciences* guide was first published in 2005 by the U.S. National Oceanic and Atmospheric Administration in collaboration with the National Science Foundation, the Centers for Ocean Sciences Education Excellence, the College of Exploration, the National Marine Educators Association, and the National Geographic Society. In this early work, ocean literacy was initially defined as “an understanding of the ocean’s influence on you and your influence on the ocean.” Following the first ever United Nations Ocean Conference in 2017, held in New York, the Intergovernmental Oceanographic Commission (IOC) of UNESCO recognized the value of engaging citizens towards the development of a “civic relationship with the ocean.” This understanding of ocean literacy was outlined in IOC-UNESCO’s subsequent publication in 2017, *Ocean Literacy for All: A Toolkit*.

Specific to government and policy, interest in ocean literacy is growing quickly. Recent reports, such as the United Nations Intergovernmental Panel on Climate Change’s Special Report on *The Ocean and Cryosphere in a Changing Climate*, for example, serve as a wake-up call for all – industry leaders, policy makers, and citizens alike – as to the need for greater ocean understanding, knowledge sharing, and collaboration. Ocean literacy’s rise has been more formally signalled by

its inclusion in several recent international agreements, including the *Galway Statement on Atlantic Ocean Cooperation* in 2013 and the *Belém Statement on Atlantic Research and Innovation Cooperation* in 2017. Ocean literacy has also been identified in the strategic objectives for the upcoming United Nations Decade of Ocean Science for Sustainable Development (2021-2030).

To arrive at a Canadian context for ocean literacy, early conceptualization evolved through the work of pioneering practitioners associated with the Vancouver Aquarium (1956), Marine Institute of Memorial University (1964), Huntsman Marine Laboratory (1969), Western Canadian Universities Marine Sciences Society (1970), Bamfield Marine Sciences Centre (1972), International Ocean Institute, Canada (1972), International Centre for Ocean Development (as an NGO in 1985, coming into existence between 1986-1992 as a federal Crown Corporation of Canada), the Great Canadian Shoreline Clean-Up (1993), the *Gwaii Haanas Agreement* (1993), *Canada’s Oceans Act* (1996), and the growth of collaborative international activities around ocean sustainability. One such example is World Oceans Day, the first edition of which was declared on June 8, 1992, and was in fact inspired by an event organized by the Oceans Institute of Canada, and supported by the Government of Canada, during the Global Forum held at the UN Conference on Environment and Development in Rio de Janeiro.

Returning to Stewart’s essay, she eloquently positions ocean literacy as being about more than conservation, science knowledge mobilization, and economics. Rather ocean literacy is more a social science that is focused on behaviour change and, according to Stewart, the “complex relationships that involve sustainability, global climate change, communication, culture, values, and social justice.” Stewart further highlights CaNOE’s critical engagement of formal and non-formal educators and community practitioners, as well as identifying other leading – big and small,



Figure 2: Founding members launch COLC at the Inspiration Expo in Halifax as part of the G7 Ministerial Meetings in September 2018.

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established and emerging – ocean literacy programs, initiatives, and approaches across Canada, including the recent establishment of the Canadian Ocean Literacy Coalition (COLC). Despite all the good work being done in spaces and places from coast to coast to better connect Canadians to the ocean, this work has been identified as being fragmented, not widely known between and beyond those involved, and lacking in collective impact coordination. There are also mixed ideas as to how to effectively bridge (fresh)water and ocean literacy-related work across Canada. Out of a keen, collaborative interest to better understand and align these various efforts, COLC was born.

Working Together, Co-creating Momentum

COLC officially launched in September 2018 at the Inspiration Expo as part of the G7 Ministerial Meetings in Halifax (Figure 2). The Coalition was the outcome of a small informal consultation process (February-March 2018) and development plan report that was presented and discussed at a national workshop in Ottawa (April 2018). This work was supported by

a funding contribution from Fisheries and Oceans Canada and guided by a multi-partner committee including Ocean School/Ocean Frontier Institute, Ingenium, Canadian Museum of Nature, CaNOE, Ocean Networks Canada, Ocean Wise, Students on Ice, NIVA, Clean Foundation, Canadian Wildlife Federation, Oceans Learning Partnership, and Canadian Geographic Education. These efforts also included a literature review conducted by Dr. Sherry Scully that examined peer-reviewed journals, industry reports, NGO web sites, conference proceedings, and unpublished research to establish a baseline of what we know, what has been tried, what has worked well, and where gaps remain. The findings of the literature review were able to better inform an evidence-based approach to developing a national ocean literacy strategy in Canada. Literature was examined in areas relating to public and key stakeholder engagement, communities of practice, Indigenous rights holders’ perspectives, formal and informal approaches to ocean education, and methodologies for assessing impact. Among the key findings from the literature review were:

- Trans-situational conditions (i.e., being connected to the issue, seeing the impact of the issue on them and their families/communities) were the most significant factor in influencing the shift to knowledge mobilization and motivation to act;
- Social network sites and other digital channels can be effective tools for ocean researchers to reach the public and share recent findings, but not all sites are effective at building interaction, dialogue, and participation from and between users;
- Citizen science was often recognized as a paradigm for a collaborative approach to tackling broad and complex issues that fall into the socio-scientific categories;
- Media tended to over-utilize conflict frames, focusing their reporting on polarized stakeholder views, and were not effective at conveying the key issues that were most germane to the public. Although the public tended to trust information from the media, the level of reporting left the public poorly informed about the most relevant issues and the science in which those issues were grounded;
- Youth did have an impact and did develop agency through their community and citizen science (CCS) experiences when certain conditions were in place, including having long-term CCS experiences and having repeated experiences to build connections to a place or issue, and having a chance to explicitly contribute to authentic research; and
- Indigenous scholars outlined the necessary components of Indigenous pedagogy for successful programs promoting Indigenous knowledge, and necessary components for integrating Western science into Indigenous programs. This work emphasised grounding programs in Indigenous ways of teaching and learning, which reinforces the concept that Indigenous Knowledge is not only content but also process, as well as the inextricable connection with land, ocean, resources, and culture.

Building from the development plan and literature review findings, the overarching objective of COLC is to establish a strategic path forward to advance ocean literacy in Canada, and to enable strong collective impact through joint activities that catalyze broad public engagement across the country. The primary project since inception has been to lead a national research initiative, taking the pulse of ocean literacy in Canada, and in so doing, to co-develop an evidence-based national ocean literacy strategy and implementation/action plan. The aim of the study is threefold: 1) better understand Canadians' diverse relationship(s) with the ocean; 2) examine how ocean literacy is understood (or not) and practiced across different regions and sectors; and 3) investigate effective ways to communicate the importance and value of the ocean to community, regional, and national well-being. The research is guided by three questions: What is the current state of ocean literacy in Canada? What are the current gaps, barriers, and enablers to Canadian ocean literacy, both by region and sector? What are the key recommendations to advance a national strategy for ocean literacy?

In the context of this study, ocean literacy is being examined through three central dimensions: ocean knowledge(s), ocean values, and ocean actions. These dimensions were recently explored in a co-authored Canadian Commission for UNESCO publication entitled *The Heart of our Biosphere: Exploring our Civic Relationship with the Ocean in Canada*. Through perspectives presented by four authors, all women, one from each of Canada's coasts (considering Great Lakes/St. Lawrence as Canada's fourth coastline) and two Indigenous, two settler-Canadian, it was concluded that "we may not be calling it the same thing or fostering ocean understanding, values, and actions in the same way, but there is an increasing awareness and will to ensure a healthier, more sustainable and just future for all our children, grandchildren, and future generations." This is central to COLC's



Figure 3: Conceptualizing ocean literacy in Canada.

regional engagement across five regions – Atlantic, Inuit Nunangat, Pacific, Great Lakes/St. Lawrence, and inland Canada – and within nine pre-identified sectors: NGO and advocacy, government, industry, academia and research, education, cultural heritage, community, health, and media.

Through a better understanding of how ocean literacy is perceived and practiced across these diverse regions and sectors (see inner rings of Figure 3), as well as its role in relation to several relevant national and international initiatives/frameworks (see outer rings of Figure 3), we aim to collectively advance ocean literacy in Canada, in its broadest, most holistic understanding. In so doing, we hope to better position Canada as an active contributor and collaborator to ocean literacy research and practice internationally. By reimagining ocean literacy to recognize the differing knowledge systems and ocean relationships across Canada, we can help shift perceptions of the term “literacy” to go beyond a deficit model of knowledge, one that often implies a linearity to knowledge transfer. This can in turn create space for a much broader perception of knowledge production and exchange, and what it means to become a fully informed

and engaged citizenry whose behaviours, decisions, and actions directly impact ocean (water) and societal health and well-being.

Regional Engagement, National Conversation

Since its launch in fall 2018, there has been rapid momentum to COLC’s work, largely due to the fact that this work is not being led by any one organization or sector. Rather, the establishment of COLC allowed for a neutral and trusted space in which to lead a national conversation on what ocean literacy means and what its usefulness is (or is not) to Canadians across diverse regions. This neutrality has been COLC’s greatest strength, along with an approach that is rooted in relationships.

COLC’s team, comprised of a national coordinator, national advisory council, five regional coordinators, two research assistants, and an extensive network of organizational partners, has targeted regional and sectoral engagement using a mixed-methods approach. Surveys, a national poll, interviews, a media analysis, document scans, youth workshops, and arts-based research (Figure 4) were included in the approach. Some early key findings from the national poll conducted by Nanos Research with a random sampling of 1,010 Canadians include:



Figure 4:
Alberta-based artist,
Karen Tamminga-Paton, is one
of five artists across Canada using
large interactive artworks to explore with
Canadians the question, “If the ocean and humans
spoke the same language, what would they say to one
another,” as part of COLC’s research initiative.

 KAREN TAMMINGA-PATON

- Just over nine in ten Canadians agree that the ocean plays an important role in Canada's economy, while over four in five agree they would like Canada to be an international leader in ocean protection. Three in four Canadians at least agree they are willing to make lifestyle changes to support ocean health with just over half agreeing that their day-to-day actions impact the ocean;
- A large majority (78%) of Canadians agree or strongly agree that Canada is an ocean nation, while there exist mixed perceptions as to what Canadians value, if anything, about the ocean(s) on Canada's coasts – 18% frequently mentioned biodiversity/aquatic life, followed by aesthetics/scenery/beauty (16%), economic and livelihood – fisheries (14%), and cleanliness (11%); and
- Specific to ocean knowledge, Canadians most frequently mention they have learned about the ocean through the media (e.g., news, social media, movies, podcasts) (77%), followed by visiting the ocean (66%), and thirdly, school/formal education (53%).

COLC's national and regional coordinators will be analyzing, synthesizing, and validating the data gathered through the regional engagement process into peer reviewed reports that highlight the emergent regional findings and recommendations. These reports will be presented at a national roundtable in late May 2020 and their findings will contribute to the co-drafting of the national strategy and implementation/action plan.

Activating our Stories

What can this Canada-wide collaborative research initiative offer to us as Canadians? Immediate outcomes will be in establishing a baseline of Canadians' current perceptions, attitudes, and values in relation to the ocean, showcasing a landscape analysis of the current state of ocean literacy in Canada, and providing recommendations to advance ocean (and water) understanding, connectedness,

and actions. This can, among other things, serve as a benchmark from which to measure changes over the upcoming UN Decade of Ocean Science for Sustainable Development (2021-2030). The strategy will be designed with the COLC's broad support base in mind, as a resource for policy and decision makers, (social) scientists and communicators, industry leaders and educators, NGOs and community groups, and others interested in our current and changing relationship(s) with the ocean. Future outcomes of the strategy could enable the creation of new partnerships, collaborations, and joint initiatives, and changes to existing programs and funding priorities to ensure efficacy and impact.

Since its inception, the work of COLC has largely been about the listening to and gathering of stories. These stories have been rooted in place, culture, and profession, linking our past, current, and changing relationships with the ocean, and more broadly, water. What stories are lived and told, by who and how, is important to consider. The stories we have heard through this research, of passion, concern, urgency, solutions, and hope, are all needed, and are all crucial in shaping this national strategy. So what is your story? And how can all of our stories, as varying and defining as they are, intersect at a space where the universal need for a healthy ocean and water in general is valued and acted upon by all? ~



Canadian Ocean Literacy Coalition

<https://colcoalition.ca>

<https://colcoalition.ca/about/our-funding>

Canada's ocean strategy

www.dfo-mpo.gc.ca/oceans/publications/cos-soc/index-eng.html

Ocean Literacy For All: a Toolkit

<https://unesdoc.unesco.org/ark:/48223/pf0000260721>



As an educator, researcher, and consultant, Dr. Diz Glithero has led community and national projects focused on the intersection of education, environmental

stewardship, and civic engagement. In 2017, she served as the Education Lead for the Canada C3 Expedition. Currently, she serves as the National Coordinator of the Canadian Ocean Literacy Coalition.



Over the past 15 years, Janet Stalker has guided the development of environmental education programs and strategic science communication initiatives to advance ocean literacy in Canada and the United States,

predominantly in the NGO and academic sectors. She is currently serving as the Program Director of Ocean School at Dalhousie University.



Sarah MacNeil has both a BA and an MA in translation (specializing in literary translation), and has channelled her passion for communication into projects that emphasize outreach and

engagement. Her work has spanned both private and public sectors, most recently through Stratos Inc., a sustainability and management consultancy firm, and many seasons with Parks Canada. She currently works as a regional coordinator with the Canadian Ocean Literacy Coalition.



Dr. Sherry Scully holds an interdisciplinary PhD in social psychology and management from Dalhousie University, as well as an MBA with a concentration in change strategy, and two degrees in

education. She is the Executive Director of COVE Workforce Initiative, where she leads a research project relating to workforce development across the national marine and ocean industries.

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