



THE HEART OF
OUR BIOSPHERE:
EXPLORING OUR
CIVIC RELATIONSHIP
WITH THE OCEAN
IN CANADA

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© Glithero, L., Simon, M., Waterfall, P., and Watson-Wright, W. (January 2020). "The Heart of Our Biosphere: Exploring Our Civic Relationship with the Ocean in Canada." Ottawa, ON: Canadian Commission for UNESCO's IdeaLab.

“WE EXIST IN RELATIONSHIP
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IT IS OUR JOB TO FIND WAYS TO BELONG TO THE WHOLE
WHILE UPHOLDING THE SPECIFICITY OF PEOPLE AND PLACE.”

Zita Cobb, CM
Founder and CEO, Shorefast
Innkeeper, Fogo Island Inn



Take a moment. Take two breaths. As you inhale, thank the trees. As you exhale, thank the ocean.

Through our lived and shared experiences, the ocean can come to mean something different to us all. For some, the ocean is directly linked to livelihoods, food security, and socio-cultural well-being. For others, the ocean is an escape, a place to recalibrate, recreate, and explore. For others still, whether by lack of accessibility or by choice, the ocean is a distant unknown.

We depend on the ocean for all manner of needs. Scientists inform us that the ocean absorbs 30% of all anthropogenic carbon emissions and 80% of the heat added to the global system, contributing to the regulation of regional and global climate.¹ Government and industry report that the ocean and its resources provide over \$20 billion in annual economic activity in Canada, including food, medicines, and mineral and energy resources, as well as billions more in ocean trade passing through our waters.² Coastal Indigenous peoples and local experts teach us (best) about ocean relationship(s) and resiliency: ways of knowing grounded in place, in which health, culture, equity, and livelihoods continuously intersect.

From the Pacific Coast to Inuit Nunangat to the Atlantic, to the Great Lakes and St. Lawrence region – arguably Canada’s fourth coastline – and to all the waterways that exist in(land) between, Canada is as

diverse as it is big. We are taught, as Canadians, that we have the longest coastline of any country in the world. We hear our federal government reference Canada as an “ocean nation.” For Inuit and coastal First Nations, a more apt reference might be Canada as a “nation of ocean nations.” Subsequently, for the 27 million+ Canadians living inland, far from any coastline, how does the concept of an “ocean nation” resonate (or not)?

Amidst the facts, diverse perspectives, and expertise, some key questions remain: to what extent do we, as Canadians, recognize the ocean as the determining life system of the planet? If our life on land depends on the ocean, and particularly on a healthy one, to what extent do we need to be engaging in a civic relationship with the ocean, and what responsibilities might that entail? Is a personal connection (be that physical, geographical, socio-cultural, emotional, or spiritual) to the ocean needed for us to act, individually and collectively, with ocean health in mind?

Enter ocean literacy.

A BRIEF HISTORY OF A MODERN TERM

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, outlined in IOC-UNESCO’s subsequent publication in 2017, *Ocean Literacy for All: A toolkit*,³ was developed on the shoulders of pioneering work done in the United States in the early 2000s. The landmark “Ocean Literacy Essential Principles of Ocean Sciences” guide⁴ 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 (COSEE), the College of Exploration, the National Marine Educators Association, and the National Geographic Society.⁵ 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.”⁶ In 2010, the National Marine Educators Association and COSEE further expanded this work in an effort to embed more ocean science education into the U.S. national elementary and secondary science education curricula.⁷

The ocean literacy fundamental concepts and corresponding principles were quickly adapted for use in the European Union. Some countries, such as Portugal, expanded the principles to include geography, social studies, culture, art, and music in their efforts to link ocean knowledge to curricula. Other countries, such as France, were not involved in the ocean literacy movement, but instead took the “education for sustainability” route to arrive at a similar place.

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In 2013, one of Canada’s ocean literacy pioneers, Anne Stewart, and others, founded the Canadian Network of Ocean Educators (CaNOE), a volunteer-based, non-profit organization, to engage formal and non-formal marine educators in similar discussions in classrooms and communities across Canada.

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*,⁸ 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 signaled by its inclusion in several recent international agreements, including the Galway Statement on Atlantic Ocean Cooperation⁹ in 2013 and the Belém Statement on Atlantic Research and Innovation Cooperation¹⁰ in 2017. Ocean literacy has also been identified in the strategic objectives for the upcoming United Nations Decade of Ocean Science for Sustainable Development¹¹ (2021-2030). Canada’s federal government has a legal commitment and responsibility to advance ocean literacy in Canada. How to do so, however, presents some critical and epistemological challenges upon which this reflection paper will focus.

THE PROBLEMS AND POTENTIAL OF OCEAN LITERACY

Although the concept of ocean literacy has rightfully evolved from a singular focus on ocean science knowledge mobilization to a broader understanding of one’s “civic relationship with the ocean,”¹² it is a conversation that is largely being taken up within academic, government, and policy spaces, and, to a lesser extent (in Canada, at least), formal education. As a result, the understanding of what ocean literacy is and what its role or relevance is in society can often appear high-level, narrow, and arguably elitist.

A further point of consideration is that this understanding does not really have a place within Indigenous cultures, even less so under the wrappings of the term “ocean literacy.” In Canada, for instance, Inuit and coastal First Nations have understood the inextricable link between themselves and the ocean (and land) for thousands of years. Their relationship with the ocean has always been, and continues to be, directly linked to their livelihoods, food security, and socio-cultural well-being. Such a modern intervention as “ocean literacy” is nebulous and perplexing, as ocean connectedness has been understood and practiced for generations in much deeper ontological and relational ways. Furthermore, the word “literacy” itself is problematic. It has social and historical contexts rooted in a colonial mindset. Although literacy has arguably evolved to be

understood in the context of multiple literacies and one's ability to "participate fully in society,"¹³ it remains a challenging and deficit-based term (i.e. to address a gap in society). Literacy in all its forms, ocean and otherwise (e.g. ecological literacy, physical literacy, digital literacy, STEM literacy, etc.) has always risked leaving out the local, place-based, and Indigenous knowledge base – an essential knowledge, particularly when it comes to ocean-, nature-, or ecological-based literacy – that we all need to navigate the historic times in which we live.

Mindful and respectful of the problematic roots of "literacy," the potential of ocean literacy rests in a rapid awakening that we are witnessing across society, Canadian and global. That is, the awakening to the gap that exists when it comes to our shared understanding of just how important a healthy ocean is to human and planetary well-being, and how our actions – individual and societal – are impacting the ocean. With climate change, biodiversity collapse, mass migration, food and water shortages, resource extraction, consumption patterns, and plastic pollution, to name only a few, the cumulative impact of human activities on marine (and all) ecosystems has become acute.

In this context, and as Canada looks to follow through on its binding agreements to advance ocean literacy and map out our country's

role and contributions to the upcoming UN Decade, how might we, together, leverage the international momentum and commitments around ocean literacy as an opportunity to better understand the many different relationships with the ocean that exist in and across Canada? Can the concept of ocean literacy be reimaged here in Canada in such a way that it holds meaning and relevance for all? How can we together seize the opportunity that a UN Decade presents?

These 10 years represent an opportunity to foster a Canadian and global citizenry that better understands, values, and cares for the ocean in terms of recognizing it as the determining life system of the planet. What roles do governments and policy-makers, industry leaders, philanthropists, academics and knowledge keepers, non-governmental organizations, media, educators and communicators, and citizens need to play to ensure that this 48th UN Decade (since the first in 1960)¹⁴ does not come and go without measureable changes and action?

To explore the above questions, we now turn to three women, giants in Canadian society in different ways, to offer diverse perspectives on their respective, and our collective, relationship(s) with the ocean. We begin in the Pacific region and hear from Hilistis Pauline Waterfall, esteemed Heiltsuk (Hailhzaqv) knowledge keeper and

educator. We then move to Inuit Nunangat and hear from Mary Simon, internationally renowned advocate of Inuit rights and former diplomat. Finally, in the Atlantic region, we hear from Wendy Watson-Wright, Chief Executive Officer of the Ocean Frontier Institute.

A PACIFIC PERSPECTIVE

In Heiltsuk language, *D'mxsaxv* refers to the salt quality of the ocean and *Gla'soulk* refers to the ocean in general. Heiltsuk nu'ym (story) places us here at the beginning of time. Archeological evidence confirms continuous occupancy in our homelands for at least 14,000 years – or 700 generations. With this antiquity, the Hailhzaqv, as with all coastal peoples, evolved and sustained a longstanding interrelationship with their natural world and its life.

In 1910, American anthropologist Livingston Farrand recorded the Heiltsuk nu'ym of the origin of the killer whale clan at the ancient Heiltsuk village of Nulu. This story describes how there was nothing but ice, water, and a narrow strip of shoreline to begin with. Heiltsuk cultural leader, William Housty, describes this as the place where our ancestors moved for survival during the ice age. Hakai Institute research validates that this area remained unglaciated during the ice age and provided refuge for animals and plants. Furthermore, the subsequent flooding from glacial melting is corroborated by the



Heiltsuk flood story of this area. Heiltsuk pedagogy continues to be endorsed by Western Science as traditional knowledge that paves a new way forward.

“Haikilaxsi čisłá wáwáxtusa gáyáqla qñts dñxsaǵv: to respect and take care of our ocean relatives.” This is the name and title of the Heiltsuk Ocean Act¹⁵ currently being finalized as an integral part of our Gvi'l'las (traditional laws) and our Heiltsuk Constitution. The Ocean Act encompasses the principles of respecting and taking care of our living ocean and our marine waa-waaxtoos (family). It embodies the teaching that all life is deemed to be of equal value existing in synchronous harmony to maintain a seamless interconnection and balance. The Ocean Act complements the Heiltsuk Marine Use Plan ratified in 2018 where socio-economic and cultural needs are congruent with the healthy maintenance of the ocean upon which our symbiotic relationship continues to exist. Further, the Ocean Act reflects the vision of the Heiltsuk Integrated Resource Management System to combine traditional and scientific knowledge to both protect and shape conservation-based economies. This commitment was demonstrated in the 2015 local lockdown of the Department of Fisheries office by Heiltsuk leaders and membership to protest against proposed commercial sac-roe herring fishery. Through local knowledge and experience, Heiltsuk

marine experts and fishers knew that the tenuous herring stocks would be depleted with the planned fishery. The scientific research to justify a commercial fishery was based on an aggregate of the biomass count of the whole of the central coast, rather than on the specific fishing area under question. In the end, local knowledge was proven to be true. This resulted in a herring co-management agreement that continues to inform seasonal fishery decisions that take into account Heiltsuk knowledge.

Another stance to protect our ocean and waa-waaxtoos (marine family) happened in March 2012 with the local public hearing of the Enbridge Northern Gateway Pipeline Project Joint Review Panel. A cultural welcome ceremony was perceived by panelists to be a threat resulting in the cancellation of the hearing. With the negotiated intervention of Heiltsuk leaders, it was reinstated so that Heiltsuk experts could give presentations, which were previously submitted, scrutinized, and vetted as being acceptable by the panel process. An outstanding example of Heiltsuk expertise was the presentation of Chief Peter Mason who, at 73, was a retired as a commercial fisher after 51 years of work at sea. He was born in a village located on Moore Island near the planned shipping route for the pipeline project. Based on his lived experience, he described in precise detail the dangerous marine conditions that included prevailing

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winds and resulting swells that build up along the banks, making it impossible to travel and navigate the waters that are worsened during winter seasons with endless storms. His testimony included knowledge about extreme tidal actions due to outflow from nine inlets along the proposed navigation route that result in perilous marine conditions with ocean swells building up to 30 feet in height. The tankers would go by ocean peaks and pinnacles on either side of a narrow channel with absolutely no room for navigational errors. Despite expert Heiltsuk knowledge and advice shared, in 2014, the Federal Government approved the pipeline project, subject to 209 conditions. In 2016, a legal challenge by Coastal First Nations and the Gitga'at Nation resulted in a ruling that the province of British Columbia failed to consult with the First Nations regarding the Northern Gateway Project. A long, protracted, and expensive but dedicated stance finally succeeded in protecting our *Gla'soulk* and its threatened balance of life.

To add insult to injury, in October 2016, an American-owned tugboat and articulated barge ran aground at nearby Gale Pass, close to an old Heiltsuk Village site. The spill contaminated the rich marine ecosystem from which traditional foods are regularly harvested. The Heiltsuk launched an investigation and published a report that documented their findings within the first 48 hours of the spill.

A scientific and traditional testing process was launched and continues to be undertaken to monitor the health of food sources. A Heiltsuk adjudication process took place to determine if the Heiltsuk *Gvi'l'las* was breached as a result of this disaster. The adjudication committee identified where breaches took place and published a report of its findings, together with recommendations to mitigate and amend the fallout from this accident. A notice of civil claim was filed in 2018.




Clearly, this demonstrates the continued Heiltsuk commitment to protect, preserve, and maintain the environmental integrity and health of the natural world and all life therein.

Looking to our history reinforces our teachings to be responsible stewards of our homelands and waters. For example, a ceremonial ritual was performed with the first salmon catch each year. As a young child, my father witnessed how his grandfather spoke gently to the first salmon caught as he cleaned and prepared it. He placed sacred eagle down on the fish as a sign of deep respect and appreciation. He promised its spirit that only what was needed for sustenance would be taken and thanked the salmon for sacrificing its life to provide food for him and his family. Carefully, he put it back into the ocean and asked it to give his message to the salmon family with gratitude and reverence for their gifts of life. Another act of respect is to remain quiet and observant while herring lay their eggs on submerged kelp and hemlock branches. Loud noise frightens herring fish and the cycle of reproduction is interrupted or stopped.

Ancient cultural practices give insight into our close relationship with the ocean. A Heiltsuk salmon dance is performed by twin children at potlatches. The first twin represents the salmon's head and the second its tail. Our ancestors believed that twins were a special

mark of favor from Miasila, the Salmon Chief. The twins' affinity to salmon was believed to ensure plentiful runs of salmon. If twins were born into a Heiltsuk Chief's family, the chief was required to refrain from salmon fishing for the season – fishing for salmon would be a breach of our Gvi'l'las and was perceived as an act of greed. The chief and his wife were already bestowed the gift of abundance with the blessing of their twin children. There is also a Kingdom of the Sea dance series that tells the story of our inseparable relationship with the ocean and coexistence with its living creatures as being essential to our respective survival and health.

Ocean literacy, as a modern term, is not familiar to or used by Heiltsuk. The ocean is an extension of our home. It provides food, employment, and transportation systems that have supported our way of life for eons. We don't own the ocean – we belong to it and, as such, are responsible for its well-being which, in turn, defines and reinforces our well-being. If we interpret "literacy," however, in its broadest sense to include knowledge of a subject, or ability to read, then our people are, and have always been, ocean literate by existing in such a longstanding, interdependent, and intimate relationship with the ocean. Our fishers were able to "read" the conditions and factors that they learned over at least 700 generations to become successful mariners and fishers.



This teaching was demonstrated in the use of rock fish traps constructed near salmon producing rivers. In her youth, my 92-year-old mother harvested salmon in these rock traps together with her grandmother. She was taught to take only the smaller ones so that the bigger, more robust ones can spawn, ensuring healthy future salmon stocks. At the end of the season, the rock trap walls were opened to release remaining salmon and support the continuation of life cycles.

Seasonal predictable cycles of nature have changed exponentially with the forces of change imposed upon our world and our ways of life. However, there are some strategies for consideration including educating ourselves about climate change and its impacts. For example, the sockeye salmon stocks in our local waters collapsed this past season. What caused this and how can it be mitigated? How can we secure our traditional marine food stocks? One way is to revitalize our ways of using rock fish traps. How can we renew the clam stocks that were contaminated by the fuel spill? One solution is to repair and revitalize clam gardens so that we can continue to maintain and manage this important food source.

Gitksan grandmother, Na'ah Bertha Starr, lived to be a century old, and prior to her death, she shared a prophecy with my aunt. Na'ah lived through the Great Depression but didn't suffer the resulting hunger and poverty because her people were sustained by the natural wealth of her homelands and abundance of traditional food sources. She lived a long, productive life that she attributed to consuming traditional foods and to living an active life. She predicted that there would be another depression with global economies collapsing and its impacts would be more severe than the first one, affecting the world at large. Humanity's greed and drive to exploit natural resources would create imbalances resulting in climate changes and disruption of the natural order of existence. Hunger and poverty would ensue. Floods and fires would become norm. The first sign of the coming changes would be animals found in places where they haven't been found previously because their habitations would be disrupted. Today, we see evidence of her prophecy with the epic floods in Venice, the uncontrolled forest fires in southern California and Australia, the closure of resource-dependent industries resulting in mass employee layoffs, and so on.

What can we learn from this prophecy? How can we strengthen our capacity to protect natural habitats and resources? One way is to form tribal alliances, as the Heiltsuk and Haida Nations have

done through their Peace Treaty. Through this, strategies can be developed for environmental protection and legal challenges as needed. Another way is to teach our young people about respectful and meaningful relationships with our natural world and its life. We need to be educated about climate change and decarbonization. Partnering with organizations, such as Coastal First Nations, is a step towards reducing fossil fuel consumption and implementing renewable energy sources. The SEAS (Supporting Emerging Aboriginal Stewards) program¹⁶ offered in our local school is a key to connecting our youth to the environment and promotes awareness of and involvement with its sustainability and health. Lobbying governments to partner with Indigenous Nations to preserve the integrity and biodiversity of our environment is important. The recent endorsement of the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) by the province of British Columbia is a major step towards reconciliation that acknowledges and affirms our inherent rights and principles.

Reflecting on our contemporary and traditional values and truths is another key to reinforcing and strengthening our relationship with the ocean and our natural world. In 2009, three First Nations traditional knowledge keepers collaborated to share stories and truths that have sustained their connection to the land and sea over


millennia. Their teachings are documented in “Staying the Course, Staying Alive,” which is available through open source access. This metaphor continues to be relevant as we move forward into a future that is increasingly uncertain in this age of climate change and its impacts upon our world.

Affirming human rights of equality and self-determination are keys to survival as we work together to build a secure future for generations to come. In turn, this would benefit all Canadians as we draw upon our respective knowledge bases and experiences to ensure a healthy ocean and better future for all.

AN INUIT NUNANGAT PERSPECTIVE

Inuit Qaujimagatuqangit (IQ) is the term used to describe Inuit epistemology or the Indigenous knowledge of Inuit. The term translates directly as “that which Inuit have always known to be true.”

When considering the relationship of Inuit, throughout Inuit Nunangat to the ocean, this relationship can be conveyed through the concept of Inuit Qaujimagatuqangit. Over millennia, there has been little need for any formal discussion of “ocean literacy” as Inuit lived, breathed, and ate near or from the ocean and lived in relative harmony with animals and seasons. Inuit language interweaves values and



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Mary Simon, OC

numerous words for elements of the ocean that are based on thousands of years of experience, knowledge, and observations.

While traditional foods continue to provide a vital part of culture, nourishment, and survival, changes in sea ice, an essential transportation infrastructure, and in the timing of when, what, and how many animals appear in accessible waters, are changing the relationship of Inuit to the ocean. These changes in species distribution and accessibility to communities are on top of the long-term accumulation of pollutants in the Arctic foodweb,¹⁷ which have already impacted Inuit health.

With successive generations now farther from living on the land and from the water and no longer migrating based on weather and food availability, there have been changes in what Inuit know to be true, and this is being exacerbated and vastly accelerated by climate change impacts in Inuit Nunangat. Climate change is interrupting millennia of accumulated knowledge and culture; patterns and experiences that have been passed down through generations are no longer valid.

Much of the global focus on climate impacts is on small island developing states that must relocate as communities are inundated

by rising seas. The melting of permafrost and rising seas are having a similar, yet more rapid, impact on many Inuit communities. Despite the severity of the impacts, there is a lack of similar focus on aid and relocation that is seen in the south. There are close similarities to previously imposed changes, including the removal of children from families and the relocation of families from the land to permanent communities, neither of which were under the control of Inuit communities.

As Inuit attempt to adjust to modern conservation concepts, there is a need to adjust those concepts to include Inuit governance. In some cases, this occurs from the bottom up as exemplified by the Pikialasorsuaq Commission,¹⁸ which sought to create a process and outcome for protection of the Pikialasorsuaq upwelling area between Nunavut and Greenland. This polynya (a stretch of open water surrounded by ice) provides critical habitat for species upon which the surrounding communities depend and guiding conservation principles are based on Inuit values and knowledge.

Canada has explored the concept of Indigenous Protected Areas, largely through the appointment of expert panels, and in two cases in Inuit Nunangat has co-designated protected areas with Inuit governments and communities. Established in 2016, Anguniaqvia

niqiqyuam, near Paulatuk in the Northwest Territories, was the first protected area with specific objectives based on Inuit knowledge. Parks Canada, together with the government of Nunavut, established Tallurutiup Imanga in October 2019, following the conclusion of discussions on an Inuit Impact Benefit Agreement. While these two areas mark progress, much needs to be done to create the pathway for Inuit governance and guardianship for additional Indigenous Protected Areas. Several recommendations were included in the Indigenous Circle of Experts Report¹⁹ and in the final report of the National Panel on Marine Protected Area Standards,²⁰ but these recommendations have yet to receive a full response from the Government of Canada.

With international efforts to recognize the rights and knowledge of Indigenous Peoples, and the signing of UNDRIP in 2016,²¹ Canada has a responsibility to ensure that this declaration is upheld in its relationships with Inuit and that this relationship is carried over to international agreements. This may require revisiting existing agreements to which Canada is a signatory to ensure that Inuit Qaujimagatuqangit is part of knowledge sharing. Currently, the Galway Statement,²² signed in 2013, and which details a research partnership between Canada, the European Union, and the United States, makes no mention of Inuit or Indigenous knowledge despite

a partial focus on Arctic Ocean observation. The information gathered via this agreement contributed to the 2016 World Ocean Assessment,²³ which, in part, has integrated traditional knowledge, though not explicitly. Commitments to protect biodiversity made under the Convention on Biological Diversity have been a focus of Canada's government over the past 4 years, with the majority of action taken on Aichi Target 11 – and the goal to protect 10% of marine and coastal environments by 2020. Yet, in Aichi Targets 14²⁴ and 18,²⁵ which commit government to maintaining and restoring ecosystem services relating to the health and well-being of Indigenous and local communities, among others, “traditional knowledge” is fully integrated into the implementation of the convention. The recently-signed Central Arctic Ocean Agreement²⁶ fully embeds Inuit knowledge within treaty language.

Knowing that the ocean has been integral to Inuit culture, language, and practices since the beginning, there is slow progress in integrating this knowledge into global governance practices and Canadian efforts, although there are commitments to do so. With rapid changes coming to the Arctic via climate change, and knowledge being lost with the death of elders who were among the last generation to live on the land, there is a sense of urgency around maintaining what was and catching up to what is and what will be.

AN ATLANTIC PERSPECTIVE

In September 2015, Canada, along with all other United Nations Member States, adopted the 2030 Agenda for Sustainable Development.²⁷ This is a shared blueprint for partnership, peace, and prosperity for all people and the planet, now and into the future, with a focus on the commitment to leave no one behind. At the heart of this agenda lies the 17 Sustainable Development Goals (SDGs) that aim to address today's social, economic, and environmental challenges. The SDGs call for action by all countries in all stages of development to promote prosperity while protecting the planet. They recognize that ending poverty requires strategies that build economic growth and address a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection.²⁸ Central to the 2030 Agenda and the present document is SDG 14, Life Below Water, which deals specifically with ocean issues.

This SDG was the primary focus of the 2017 UN Ocean Conference, which concluded with a 14-point "Call for Action." Among the items listed, #13 calls for "all stakeholders to conserve and sustainably use the oceans, seas, and marine resources for sustainable development." Notably, subitem (e) calls for all to "Support plans to foster ocean-related education, for example as part of education curricula, to promote ocean literacy and a culture of conservation,



restoration, and sustainable use of our ocean.”²⁹ The inclusion of this subitem within the call for action was seen as a victory for those involved in ocean education and ocean literacy. It was introduced by Canada’s Ocean Frontier Institute and its Ocean School.

Another major achievement of the conference was the more than 1,328 voluntary commitments made toward ocean conservation.³⁰

The commitments covered a wide range of topics by governments and other stakeholders, and raised awareness at the highest political level about the importance of the ocean to human survival. Most relevant for this audience is perhaps the commitment toward “Ocean Literacy for All, A Global Strategy to Raise the Awareness for the Conservation, Restoration, and Sustainable Use of Our Ocean,”³¹ which was submitted by the IOC-UNESCO and its partners, of which the OFI is one.

I was the former Assistant Deputy Minister of Science in the federal Department of Fisheries and Oceans Canada, where our earlier work focused on marine conservation through a scientific and policy lens. Although this remains an important aspect of my current role as CEO of the Ocean Frontier Institute (OFI),³² knowledge mobilization across boundaries of academia, government, industry, education, and the general population is a primary focus.

At its heart, OFI models transnational, transdisciplinary, and cross-sectoral collaborations and partnerships. Representing a historic partnership of three academic institutions across the Atlantic Canadian provinces³³, along with eight international organizations,³⁴ OFI brings together oceanographers, marine biologists, lawyers, social scientists, management specialists, computer scientists, and engineers to focus on ocean changes, ocean solutions, and safe



and sustainable ocean development. Engaged throughout this work are academics, federal government scientists, managers, regulators and policy-makers, provincial governments, and more than twenty private sector companies, along with the Centre for Ocean Ventures and Entrepreneurship (COVE) and Canada's Ocean Supercluster.

For OFI, knowledge mobilization is multidimensional. It involves working with the private sector on commercialization of research, as well as with government partners to ensure the research influences public policy. Findings from the science also need to be communicated with the general public to ensure knowledge generated by research directly contributes to better societal understanding and meaningful application. This can include promoting and investing in educational (formal and informal) outreach and experiences to generate broader understanding and engagement around ocean issues, innovations, and behaviour change. Across all these dimensions, ocean literacy is an important cross-cutting theme.

Beyond knowledge *mobilization*, there is a need for knowledge *exchange* to support the commercialization of research as a means to strengthen existing or to support new sustainable ocean industries and blue tech enterprises. This will not only heighten the visibility of ocean career opportunities to Canadians, but will also enable the

development of new training and skills certification programs, as well as the building of a more diverse and inclusive workforce.

Specific to ocean education, another key piece of OFI's mandate is the integration of more ocean knowledge into provincial and territorial school curricula, which has culminated in a unique partnership known as Ocean School.³⁵ Ocean School is a free online educational experience, showcasing a combination of interactive audio-visual media, innovative educational technologies, evocative storytelling, and an inquiry-based learning approach. The purpose of the platform is to engage learners in ocean science, enterprise, and culture to foster generations of engaged, ocean-literate citizens.

Ocean literacy plays a critically important role in ensuring policy makers and citizens alike understand the ocean as one large interconnected system, and the need to balance ocean health with ocean development and social equity. The ocean space is not just about species and industries; it is also about people, livelihoods, and relationships. Collaboration across boundaries of understanding is essential; in turn, more work in academic, government, and industry spaces in particular is needed to ensure Indigenous knowledge is better recognized and validated as we work together to ensure ocean health and human prosperity.

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Canada is trying to change the narrative³⁶ on the ocean and to create stories that engage, inspire, and innovate, to support the UN call for action.³⁷ Better understanding of the ocean by all Canadians is at the centre of future human – and planetary – well-being.

CONCLUSION

Each perspective in this paper stems from the author's particular background and story. We've heard from a Heiltsuk elder, steadfastly working to educate the next generation of teachers and Heiltsuk stewards. We've heard from an Inuit leader, who authored a vision for the Arctic and champions Inuit-led conservation. We've heard from a science-policy practitioner, working to better understand the nexus of academia, government, and industry. As a great granddaughter of a shipbuilder in Govan (now part of Glasgow), Scotland, my own perspective is that of an educator, social science researcher, and coordinator of a national conversation to explore our civic relationship(s) with the ocean as Canadians. Through these four perspectives, though, we should begin to see a fifth emerge: your own.

There is much more alignment than difference. 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. Regardless of place, culture, or profession, the heart of the biosphere of which we are all part is the ocean.

Walas gayasixa Pauline. Nakurmiik Mary. Thank you Wendy. Thank you, reader.

The Canadian Ocean Literacy Coalition would like to thank the Canadian Commission for UNESCO for the invitation to write a reflection paper on ocean literacy as part of the Commission's IdeaLab 2020 series. We are grateful for this opportunity. To learn more about CCUNESCO's IdeaLab, visit: <https://en.ccunesco.ca/idealab>

The Canadian Ocean Literacy Coalition (COLC), an alliance of existing and diverse organizations, institutions, networks, and communities, established in September 2018, has initiated a Canada-wide research initiative to take the pulse of ocean literacy in Canada. This national conversation is not being led by any one organization or sector. The outcome of this research is the co-development of a national ocean literacy strategy, an implementation/action plan, and an ocean literacy communications plan for Canada for the upcoming UN Decade of Ocean Science for Sustainable Development. To learn more, visit www.colcoalition.ca.

ABOUT THE AUTHORS

Lisa (Diz) Glithero, PhD

Diz specializes in the intersection of education, environmental stewardship, and civic engagement. Through 20 years of experience as an educator, researcher, adjunct professor (University of Ottawa), and consultant, Diz has led a number of community, regional, and national projects focused on pedagogy, policy, and socio-ecological change. In 2017, Diz served as the Education Lead for Canada C3, a Canada 150 Signature Initiative that involved a 150-day journey by ship from Toronto to Victoria via the Northwest Passage. Most recently, Diz serves as the national coordinator of the Canadian Ocean Literacy Coalition, leading a multi-year, collaborative research initiative to develop a national ocean literacy strategy.

Mary Simon, OC, QC

Mary comes from Kuujjuaq, Nunavik, and was born in Kangiqsualujjuaq, Nunavik (Arctic Quebec). She led Canada's negotiations during the creation of the eight-nation Arctic Council in the mid 1990s. The Arctic Council includes the Indigenous Peoples of the Circumpolar Region as permanent participants. Mary is the past president (2006-2012) of the Inuit Tapiriit Kanatami, the National Inuit Organization, and completed her term as Chairperson of the National Committee on Inuit Education with a mandate to implement a comprehensive national strategy. She has advanced critical social, economic, and human rights issues for Canadian Inuit regionally, nationally, and internationally. Over four decades, she has held senior leadership positions including President of Makivik Corporation (the Land Claims Organization for Inuit of Nunavik), President of the Inuit Circumpolar Council, and Canadian Ambassador for Circumpolar Affairs as well as to the Kingdom of Denmark. She is the founder of the Arctic Children and Youth Foundation. Mary has received many national and international distinctions. Her most recent appointments include serving as Chair of the Oceans North Board, Chief Negotiator for the Nunavik Inuit government, and board member of the Vanier Institute.

Hilistis Pauline Waterfall

Pauline is a Hailhzaqv knowledge keeper who was born in Bella Bella. She is a 75 year old educator who is the founder of Heiltsuk College and is an adjunct professor at Vancouver Island University. She is a recipient of the Order of British Columbia and former elected Heiltsuk Tribal Councilor. She gives First Nations Culture & History orientation workshops to local and provincial organizations and presented to Northern Gateway Enbridge hearings. She was a member of the Daduqwala Adjudication Committee with regards to the Nathan E. Stewart fuel spill to determine if Heiltsuk Gvi'l'as (laws) were breached with this incident. She is presently engaged in finalizing the Hailhzaqv Constitution on behalf of Heiltsuk Nation.

Wendy Watson-Wright, PhD

Dr. Wendy Watson-Wright is the Chief Executive Officer of the Ocean Frontier Institute (OFI), the Canadian-led interdisciplinary transnational research institute, whose aim is the safe and sustainable development of the ocean frontier. From 2010–2015, Dr. Watson-Wright was the Executive Secretary and Assistant Director General of UNESCO's Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) in Paris. For most of her career, she held various senior positions within Fisheries and Oceans Canada, including 8 years as Assistant Deputy Minister of Science. Dr. Watson-Wright has been on several boards and panels including the Strategic Advisory Board for the European Union's Joint Programming Initiative on Oceans (JPI Oceans), the Council of Canadian Academies' Expert Panel on Ocean Science, and the Scientific Advisory Board of the Wendy Schmidt Ocean Health X-Prize.

ENDNOTES

- 1 <https://www.ipcc.ch/sr15/chapter/chapter-3/>
- 2 <https://www.dfo-mpo.gc.ca/oceans/publications/cos-soc/index-eng.html>
- 3 <https://unesdoc.unesco.org/ark:/48223/pf0000260721>; the toolkit was expanded to become part of an Ocean Literacy Portal in 2019 - <https://oceanliteracy.unesco.org/>
- 4 Version 2 of the guide was published in March 2013 and was retitled “Ocean Literacy: The Essential Principles and Fundamental Concepts of Ocean Sciences for Learners of All Ages.” See: <http://www.coexploration.org/oceanliteracy/documents/OceanLitChart.pdf>
- 5 An article titled, “Science Content and Standards for Ocean Literacy: A Report on Ocean Literacy,” was published in November 2005 (see reference below) that detailed the collaborative and open process to create the landmark “Ocean Literacy Essential Principles of Ocean Sciences” guide. Cava, Francesca, S. Schoedinger, C. Strang, and P. Tuddenham. (2005). *Science Content and Standards for Ocean Literacy: A Report on Ocean Literacy*
- 6 <http://oceanliteracy.wp2.coexploration.org/ocean-literacy-framework/>
- 7 http://oceanliteracy.wp2.coexploration.org/ocean-literacy-framework/?page_id=1073
- 8 <https://www.ipcc.ch/srocc/home/>
- 9 https://ec.europa.eu/research/iscp/pdf/galway_statement_atlantic_ocean_cooperation.pdf
- 10 https://ec.europa.eu/research/iscp/pdf/belem_statement_2017_en.pdf
- 11 <https://en.unesco.org/ocean-decade>
- 12 Santoro, F. et al., 2017, p. 61 – <https://unesdoc.unesco.org/ark:/48223/pf0000260721>
- 13 Draper, R. (Ed.), 2015, (Re)Imagining Content-Area Literacy Instruction. New York, Teachers Press College
- 14 <https://www.un.org/en/sections/observances/international-decades/>
- 15 <https://www.wcel.org/publication/revitalizing-hailzaqv-law-land-air-and-water-telling-relaw-story>
- 16 <http://www.emergingstewards.org/>
- 17 Kirby, R. 2008. Persistent Organic Pollutant Accumulation in the Arctic. Sustainable Development Law and Policy. Vol 8, Issue 3. Environmental Change in Polar Regions. <http://digitalcommons.wcl.american.edu/cgi/viewcontent.cgi?article=1065&context=sdlp>
- 18 <http://pikialasorsuaq.org/en/Resources/Reports>
- 19 <https://www.conservation2020canada.ca/ice>
- 20 <https://www.dfo-mpo.gc.ca/oceans/publications/advisorypanel-comiteconseil/2018/finalreport-rapportfinal/page01-eng.html>
- 21 <https://www.cbc.ca/news/indigenous/canada-adopting-implementing-un-rights-declaration-1.3575272>; important to note, that Bill C-262 has yet to be passed by the Canadian Senate - <https://openparliament.ca/bills/42-1/C-262/?tab=mentions>
- 22 See endnote 7 above

- 23 <https://www.un.org/regularprocess/sites/www.un.org.regularprocess/files/woacompilation.pdf>
- 24 Aichi Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.
- 25 Aichi Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.
- 26 <https://www.mofa.go.jp/mofaj/files/000449233.pdf>
- 27 https://www.international.gc.ca/world-monde/issues_developpement-enjeux_developpement/priorities-priorites/agenda-programme.aspx?lang=eng
- 28 <https://www.un.org/sustainabledevelopment/development-agenda/>
- 29 <https://oceanconference.un.org/callforaction>
- 30 <https://sdg.iisd.org/news/un-ocean-conference-concludes-with-call-for-action-and-1300-commitments/>
- 31 <https://oceanconference.un.org/commitments/?id=15187>
- 32 OFI is headquartered at Dalhousie University in Halifax, Nova Scotia, and co-led with Memorial University of Newfoundland and the University of Prince Edward Island. It is a relatively new international hub for ocean research funded largely by the Canada First Research Excellence Fund.
- 33 See above endnote
- 34 The eight partnering organizations include: from France (LabexMER, now ISBlue), Germany (GEOMAR , Alfred Wegener Institute, CAU -Kiel), Ireland (Marine Institute), Norway (Institute of Marine Research), and the United States (Woods Hole Oceanographic Institution, LamontDoherty Earth Observatory of Columbia University)
- 35 <https://oceanschool.nfb.ca> Ocean School is the result of novel partnerships with Dalhousie University and the National Film Board of Canada under the auspices of the Ocean Frontier Institute. Ingenium, Fisheries and Oceans Canada and more recently, the Prince Albert II of Monaco Foundation are key supporters.
- 36 Canada was accused of suffering from “sea blindness” as recently as 2010 in an editorial in the *Canadian Naval Review*.
- 37 See endnote 26 above



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Ocean
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La coalition
canadienne de
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de l'océan