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Indigenous and Other Ways of Knowing

Government Science and Innovation in the New Normal
Discussion Paper

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ABOUT GSINN – CANADA NEEDS A NEW RELATIONSHIP WITH SCIENCE AND INNOVATION THAT REFLECTS OUR TIME

In December 2020, the Institute on Governance launched *Government Science and Innovation in the New Normal (GSINN)*, a multi-year, collaborative research initiative designed to explore the impact of the pandemic on federally-performed science and innovation, to support medium-term planning for federal science and innovation departments and agencies, and to provide insights to help rebuild the relationship between science and society.

Throughout the pandemic, anti-vaxxers – joined by anti-maskers – have challenged scientific evidence and public health officials with a mandate to keep us safe and stop the spread of the disease. This is just one example that demonstrates society’s relationship with science is under strain.

But society’s relationship with science and innovation did not decline overnight. The governance model that underpins Canada’s relationship with science is based on a report called *Science: The Endless Frontier*. (Bush, 1945) This report outlined a basic compact in which society supports science with public funds and assures the scientific community a great deal of autonomy in exchange for the considerable but unpredictable benefits that can flow from the scientific enterprise.

Today, many of the underlying social, economic, and political assumptions in the postwar compact are outdated. This project examines the relationship between science and society and begins to imagine a new relationship, through nine specific themes:

- Equity, Diversity, and Inclusion;
- Global Research Collaboration and Infrastructure;
- Inclusive Innovation;
- Interdisciplinary Collaboration;
- Indigenous and Other Ways of Knowing;
- Mission-Driven Research and Innovation;
- Science Communications, Outreach, and Public Engagement;
- Skills and Knowledge; and,
- Trust, Integrity, and Science Ethics.



Taken together, these themes suggest elements of a new governance framework for science and innovation in Canada that embraces our current social, cultural and political realities, that recognizes the opportunities and limits of science. Perhaps most importantly, the project reinforces the role of science as part of society, and a tool ready to serve the needs of society.

Findings of the GSINN initiative were developed as a result of extensive research and engagement that included: a hindsight exercise, multiple foresight workshops, eight multisectoral roundtable discussions, and expert consultations that fed into this collection of 10 papers (one for each of the themes above and one capstone paper). Each discussion paper has been peer reviewed and explores a facet of how the relationship between government science, innovation, and society needs to be repaired in order to ensure science remains relevant in the new reality.

IOG extends its heartiest thanks to the eight federal departments and agencies that supported this work: Agriculture and Agri-Food Canada, Health Canada, Innovation, Science and Economic Development Canada, National Research Council, Natural Resources Canada, Public Health Agency of Canada, Public Services and Procurement Canada, and Transport Canada. We also wish to thank all of the individuals who participated in the workshops and roundtables whose input helped clarify and develop the project themes and findings. Finally, we want to acknowledge the following reviewers whose thoughtful feedback improved this paper: Steven Alexander, Matteo Bernabo, Amanda Hunter, Chantel Lariviere, and Trevor Stocki.



INTRODUCTION

During the last century, Western science—as a type of evidence and a knowledge system—has held a privileged place in Canada, as demonstrated by the role it plays in primary, secondary and tertiary education systems, in academic research, and how it informs the systems that govern the country at the national, regional, and municipal levels. Yet, a Western, discipline-based approach to science is but one interpretation of a knowledge system.

Canada is living through a process of telling the truth about the history of, and working towards reconciliation with Métis, First Nations, and Inuit communities¹. Each of the Métis, First Nations, and Inuit communities themselves encapsulate a wide range of communities, cultures, and knowledges, many with a unique knowledge system.

On 1 June 2008, the Government of Canada launched the Truth and Reconciliation Commission. The Commission was active from 2008 until 2015; during this time the Commission was responsible for documenting the history and impact of the Canadian Indian Residential school system on the students and their families. The work of the Commission provided survivors of residential schools an outlet to share their experiences. By way of concluding their work, the Commission released a series of reports that told the truth about cultural genocide committed towards Indigenous Peoples in Canada and presented 94 Calls to Action to guide Reconciliation between Indigenous Peoples, the Crown, and colonial settlers. In summary, these Calls to Action identify specific ways to address the legacy and ongoing damages of the residential school system on First Nations, Inuit and Métis communities. (Government of Canada, 2021e)

What could the Canadian education and research landscape look like if it was redesigned, giving equal privilege to Western knowledge and Indigenous Knowledge systems and other ways of knowing?

This paper examines the ways in which the drawing of disciplines in a Western, Canadian context has privileged one knowledge system above others and how this continues to impose limitations on the use and validation of other knowledge systems. The paper is divided into six sections. The first section of this paper explores the concept of knowledge systems in a Western context and

¹ While the Government of Canada employs the term “Indigenous Peoples” to represent the Métis, First Nations and Inuit communities, globally, there is no accepted definition of the term “Indigenous Peoples”. It is often used to refer to the original inhabitants of a land and their descendants, and there is consensus that the term is assimilatory and fails to recognize the large number of culturally and linguistically unique groups that it attempts to represent (Vowel, 2016). The term also attempts to collectivize these distinct populations who have all had, and continue to have, different experiences under colonialism. It is considered best practice to refer to the names that communities have chosen for themselves (Vowel, 2016).



introduces both Indigenous and other ways of knowing. The second section presents a brief historical overview of Indigenous Peoples and their experiences with Canada's governance system. The third and fourth sections explore work that has been completed or is underway that aims to interweave Indigenous and other ways of knowing into governance systems and or research in Canada and the challenges that remain. The fifth section gives an overview of the IOG roundtable discussion, while the sixth presents series of questions for discussion.

KNOWLEDGE SYSTEMS

According to Miller and Munoz-Erickson (2018) knowledge systems are the organizational practices and routines that make, validate, communicate, and apply knowledge. Building on that definition, Mthembu (2020) explains a knowledge system comprises many aspects within a sphere of influence, including social and cultural norms, ethical values, beliefs, and even technology. This implies that societies have differing and various ways of knowing.

INDIGENOUS KNOWLEDGES

Indigenous Knowledge(s) is often used as an umbrella term that attempts to encapsulate the knowledge systems held by Indigenous Peoples. This paper uses the term Indigenous Knowledges to refer to the vastly differing and dynamic ways of knowing held by individual Métis, First Nations, and Inuit communities.

As noted above, knowledge systems involve the social and cultural norms, ethical values, beliefs, and technologies of any given society. (Mthembu, 2020) It is thus important to acknowledge that an individuals' knowledge is developed through their social, cultural and physical surroundings. Leanne Betasamosake-Simpson (2017) conveys this in her book *As We Have Always Done: Indigenous Freedom Through Radical Resistance*, when she speaks to her own struggles to connect to her community after being displaced as a child. Betasamosake-Simpson (2017) explains that Nishnaabeg intelligence is specific to the Nishnaabeg people and can only be developed through the Nishnaabeg experience. Indigenous Knowledges are therefore not solely a knowledge one possesses, but also something that is lived and learned, and which has geographic, cultural, and spiritual context. As such, working with Indigenous Knowledges requires close collaboration with the community in which it was generated.

Indigenous Knowledges are often misunderstood, and framed as supplementing Western knowledges and Western sciences, rather than as a science itself. Knowledges generated by First Nations, Inuit, and Métis communities may also be scientific; these two ways of knowing are not antonyms. For example, recent studies in the North using Inuit traditional knowledge reinforce that traditional knowledge is scientific knowledge, as it "(...) requires understanding of complex physical,



biological, cultural, and economic processes in Inuit Nunangat”. (Pfeifer, 2018) Hunters have played an integral role in their community, and are Arctic scientists and professors, who have used their research and experiences in wildlife, ice, water, and environmental knowledge to benefit their communities. (Pfeifer, 2018)

“OTHER” WAYS OF KNOWING

Crucial to working with “other” ways of knowing is to consider one’s position within the broader landscape of knowledge acquisition and production, and what constitutes “other”. In *Orientalism*, Edward Said (2003) emphasizes the ways that cultural and political environments in which people exist influence how they come to know and their perceptions towards new knowledges and cultures. A country’s education system, media, literature, and other mediums play significant roles in how the views of citizens are shaped and how they come to interpret new knowledge.

Occidental countries, such as Canada, have created a system that privileges a single knowledge system (Western science) by default. The cultural norms and principles of this disciplinary interpretation of science have resulted in a hierarchy within science, assigning greater authority to those disciplines associated with the natural and physical sciences, technology, engineering, mathematics and economics. According to Said (2003), this has resulted in an “othering” of all other knowledge systems. And, often, knowledges produced in systems foreign to the default are viewed as inferior or lacking in legitimacy. In the Canadian context, settlers have primarily adopted ways of knowing deeply informed by Western epistemologies. As a result, Indigenous and other ways of knowing have been silenced and discredited as Western ways of knowing became the dominant, normative knowledge system within Canada.

RECONCILIATION WITH INDIGENOUS PEOPLES

In 1876, parliament passed the first Indian Act. This wide-ranging piece of legislation was designed to control the lives of Indigenous People. Under the Act, children were forcibly removed from their homes and forced to attend Indian Residential Schools. Indian Residential Schools operated in every province except Prince Edward Island and New Brunswick, from the 1880s until 1996. The schools were designed to be far away from communities to prevent their parents from visiting. The purpose of the Indian Residential Schools was to eradicate the culture and languages of the country’s Indigenous populations. An estimated 150,000 children attended these schools. Many were physically and sexually abused and an untold number died from disease, neglect, and suicide. (Voce et al, 2021; Union of Ontario Indians, 2013)



A great deal of this harm was perpetuated by the Government of Canada in the name of research. Articles such as “Administering Colonial Science” (Mosby, 2013) speak to the harms perpetuated through residential schools, and by researchers, doctors and other medical professionals in communities and in collaboration with the Government of Canada. Mosby (2013) found documentation of research experiments between 1942 and 1952 on Manitoba reserves and six residential schools across Canada for which consent was never provided. Malnourished children were given vitamins and minerals instead of food and drink to observe the effects. Dental care was intentionally withheld in order to experiment with different substances. When communities – such as Cross Lake First Nation – asked Ottawa for help, they became the intentional targets for more experiments. (Mosby, 2013)

The harms perpetuated in Indian Residential Schools are now a documented source of trauma and intergenerational trauma for many First Nations, Inuit, and Metis People. While the full impact of intergenerational trauma is still being investigated, there is evidence that it can increase the risk of psychological distress for children and grandchildren of those who were abused. This means they are “more prone to symptoms of anxiety, depression, substance [abuse], and thoughts of suicide and suicide attempts”. (Limmena, 2021) Children experiencing intergenerational trauma are also more likely to experience adversities that will have a significant impact on their physical and mental health, including abuse, poverty, and separation from their parents. This kind of trauma early in life can “put residential school survivors at higher risk for health problems (heart disease, diabetes) and social conditions (homelessness, substance abuse)” as well as impact their ability to care for children they may bear, thus perpetuating the cycle of trauma. (Limmena, 2021)

Following the Indian Residential Schools Settlement (Truth and Reconciliation Commission of Canada, 2006), the Government of Canada announced the implementation of The Truth and Reconciliation Commission of Canada (TRC) in 2007 (Government of Canada, 2021e), and launched the Truth and Reconciliation Commission in 2008.

The mandate of the TRC was two-fold: a) to tell the truth about Canada’s Indian Residential Schools and, b) to advance reconciliation with First Nations, Inuit, and Metis People in Canada. The Commission operated according to a series of principles that promoted harm reduction, transparency and prioritized health and safety (Truth and Reconciliation Commission of Canada, 2002). The TRC acknowledges the harm that has been perpetuated by science (in a Canadian context) and research and refers to it as “(...) a racism that chose to cloak itself in the language of science”. (TRC, 2015)



In 2015, the Commission published 94 Calls to Action to “redress the legacy of residential schools and advance the process of Canadian reconciliation”. (TRC, 2015)

While the following principles and Calls to Action by the Truth and Reconciliation Commission (2015) are identified in the context of education, they are equally applicable to the conduct of science as it remains a source of knowledge that informs education systems at the primary, secondary, and tertiary levels. These principles highlight many of the barriers that Métis, First Nations, and Inuit Peoples face in the pursuit of education (and scientific study) in Canada:

- Providing sufficient funding to close identified educational achievement gaps within one generation.
- Improving education attainment levels and success rates.
- Developing culturally appropriate curricula.
- Protecting the right to [Indigenous] languages, including the teaching of [Indigenous] languages as credit courses.
- Enabling parental and community responsibility, control, and accountability, similar to what parents enjoy in public school systems.
- Respecting and honouring Treaty relationships.
- We call upon the federal government to provide adequate funding to end the backlog of First Nations students seeking a post-secondary education.
- We call upon the federal, provincial, territorial, and [Indigenous] governments to develop culturally appropriate early childhood education programs for [Indigenous] families. (TRC, 2015)

Lack of funding and culturally inappropriate curricula have long contributed to educational achievement gaps between Métis, First Nations and Inuit students and non-Indigenous students. (TRC, 2015) While the provision of education is the mandate of the provincial governments in Canada, these governments are relevant to this discussion as they relate to how science is taught in a Canadian context.

The TRC process has created “an awakening of conscience that rocked our...country”. (Whetung, 2021) This awakening has inspired action across the country, and among all sectors of the economy. There is an appetite for hard conversations, and for demonstrations of accountability towards Indigenous Peoples that has contributed to the adoption of the United Nations Declaration on the Rights of Indigenous Peoples, Duty to Consult, and created demand for meaningful consultation with Indigenous Peoples on issues affecting their communities and their way of life.



UNITED NATIONS DECLARATION ON THE RIGHTS OF INDIGENOUS PEOPLES

The Declaration on the Rights of Indigenous Peoples (UNDRIP) was published in 2007 and addresses many of the ongoing issues related to research with Indigenous communities. In 2016, Canada officially announced the adoption of the UNDRIP, promising its implementation into Canadian laws and commitments to the rights of Indigenous Peoples. In 2020, the *United Nations Declaration on the Rights of Indigenous Peoples Act* was introduced in parliament and articulates the need for an Action Plan in which the following UNDRIP principles are included (Government of Canada, 2021):

- To address injustices, combat prejudice and eliminate all forms of violence, racism, and discrimination against Indigenous Peoples, including elders, youth, children, persons with disabilities, women, men, and gender-diverse and two-spirit persons.
- To promote mutual respect and understanding, as well as good relations, including through human rights education.
- Related to the monitoring, oversight, follow-up, recourse or remedy or other accountability with respect to the implementation of the Declaration.

While the TRC's Calls to Action do not explicitly reference science, the UNDRIP affirms the role of science in reconciliation. Governments and researchers around the world have benefited from Indigenous Knowledge and other ways of knowing. (Sidik, 2022; ITK 2018) The United Nations has acknowledged and attempted to redress the legacy of knowledge appropriation and extractive research through the implementation of an international standard on Indigenous rights.

Several of the TRC articles discuss the role of science in reconciliation. This paper focuses on Article 31, (United Nations, 2007) which is the most direct in its wording. Article 31 states:

1. Indigenous Peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge, and traditional cultural expressions, as well as the manifestations of their sciences, technologies, and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports, and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions.
2. In conjunction with Indigenous Peoples, States shall take effective measures to recognize and protect the exercise of these rights.



THE DUTY TO CONSULT

UNDRIP and the TRC's Calls to Action both call for increased consultations with Indigenous communities in matters that concern them. The Government of Canada has worked towards improving consultation practices following a series of court decisions in 2004 and 2005. A series of rulings by the Supreme Court of Canada affirmed the Government's duty to consult with First Nations communities on matters which could impact their rights or treaty rights. (Government of Canada, 2021e)

In these cases, the Supreme Court turned to Article 35 of the 1982 Constitution Act which "(...) recognizes and affirms the existing [Indigenous] and treaty rights of Indigenous Peoples". (Brideau, 2019) Article 35 has been interpreted by courts of law as a constitutional requirement and is a foundational piece of the [Indigenous] Consultation and Accommodation Guidelines for Federal Officials to Fulfill the Duty to Consult released in March of 2011. The guidelines were released as part of the Federal Action Plan on [Indigenous] Consultation and Accommodation which was published in 2007 and led by [Indigenous] Affairs and Northern Development Canada as well as Justice Canada.

IMPACT ASSESSMENT

Included within the Duty to Consult (Government of Canada, 2021) is the acknowledgement that consultation practices must vary according to scope and acknowledge the diversity of First Nations, Inuit and Métis Peoples in Canada. The Act states:

"The development of a federal approach to consultation and accommodation is not intended to be a one-size-fits-all approach. Differences in history, geography, demographics, governance, relationships, and other circumstances of [Indigenous] communities and organizations in Canada are relevant when considering how to address any consultation obligations that may arise".

As such, federal departments and agencies have developed unique consultation guidelines for working with Métis, First Nation and Inuit communities. These guidelines articulate the need for:

- Early and regular engagement and participation
- Collaboration and cooperation
- Respect for Indigenous rights and jurisdiction
- Mandatory consideration of Indigenous Knowledge
- Building Crown-Indigenous relations and capacity
- Forms of accommodation may include changing a development project's scope, location, or timing. It may also involve changes to Crown policy proposals. In that regard, finding interim



solutions within the consultation process may prevent irreparable harm or minimize the effect of infringement.

- Co-development of research
- Co-leadership
- Consensus based decision making

The actions discussed above have contributed to a move within the federal public service that encourages and supports engagement, even when legal duty to consult is not triggered. For example, the Fisheries Act (Government of Canada, 2022b) includes the following:

Rights of Indigenous Peoples of Canada: This Act is to be construed as upholding the rights of Indigenous Peoples recognized and affirmed by section 35 of the Constitution Act, 1982, and not as abrogating or derogating from them.

Duty of Minister: When making a decision under this Act, the Minister shall consider any adverse effects that the decision may have on the rights of the Indigenous Peoples of Canada recognized and affirmed by section 35 of the Constitution Act, 1982.

DEMANDING RESPECT FOR INDIGENOUS KNOWLEDGES AND ENFORCING BOUNDARIES

For too long, extractive research practices and performative consultation practices (or no consultation at all) have harmed Indigenous communities around the world. Researchers, have entered Indigenous communities, collected personal biological and anatomical data, artefacts and other cultural items, and divorced them from the communities which they belong, or misused Indigenous Knowledges. These improper research practices have resulted in much harm to the communities of origin. (Sidik, 2022; ITK, 2018; Tuhiwai Smith, 2021) In other cases, data have not been shared with communities, or used in ways for which the communities had not consented, or used to uphold deficit representations and stereotypes of Indigenous Peoples. In other cases, researchers collected or produced data that was not useful for the community because their research needs and priorities were not included in the design of the research process. Canada is no exception to this practice; Inuit Tapiriit Kanatami (ITK) documents Canadian researchers entering Inuit communities, conducting research, and then ignoring the communities they worked with when creating the outcomes of their work. (ITK, 2018)



When collaboration through research does not follow respectful and culturally appropriate practices, Indigenous Peoples, their communities, and their knowledges suffer. Indigenous knowledges should not be “incorporated” into existing methods, but “(...) an ethic of knowledge coexistence and complementarity in knowledge generation” should be accorded to Indigenous Knowledges, alongside other ways of knowing. (Reid, 2021) For example, improper research and misuse of knowledge has perpetuated a lack of clean drinking water in many First Nations communities and reserves across Canada. While the federal government continues to make financial contributions to “fix the problem”, Castleden et al. (2017) argue that the issues persist partially due to the assumption that current methods of addressing these challenges are universally applicable. Following a review of water research intending to integrate Indigenous knowledge systems into current practices, Castleden et al. (2017) concluded that existing biases of the researchers prevented a truly integrative practice and opportunities to integrate First Nations knowledges into this problem have been long overlooked.

ITK, an Inuit-led organization that represents more than 65,000 Inuit across Canada, released their (2018). This strategy confronts the damage that improper research practices and the misuse of knowledges have had within Canada:

“For far too long, researchers have enjoyed great privilege as they have passed through our communities and homeland, using public or academic funding to answer their own questions about our environment, wildlife, and people. Many of these same researchers then ignore Inuit in creating the outcomes of their work for the advancement of their careers, their research institutions, or their governments. This type of exploitative relationship must end”. (ITK, 2018, 3)

ENFORCING BOUNDARIES

As a result of harmful research practices, many First Nations, Inuit and Metis communities and organizations have developed guidelines, consultation practices, policies, and protocols that are specific to their communities and identify proper methods for collaboration with the communities and for sharing knowledges. The purpose of these policies is to eliminate the harms perpetrated by researchers and to protect their knowledges. For example, a) the Mississauga of the New Credit First Nation published a signed protocol for consultation practices alongside the Government of Canada (Government of Canada, 2021d), b) the *New Brunswick Mi'gmaq Indigenous Knowledge Study (NBMIKS) Process Guide* (Mi'gmaq Sagamaq Mawiomi, 2016) gives researchers a detailed guide on the communities' consultation practices and what the community anticipates from researchers. Here are a few more examples of documents that promote the ethical conduct of research between Indigenous and settler communities:



- First Nations Ethics Guide on Research and Aboriginal [sic] Traditional Knowledge. (Assembly of First Nations, n.d.)
- National Inuit Strategy on Research (Inuit Tapiriit Kanatami, 2018)
- The First Nations Principles of OCAP (First Nations Information Governance Centre, n.d.)
- Tri-Council Policy Statement (2) Chapter 9, Research Involving the First Nations, Inuit and Métis Peoples of Canada. (Government of Canada, 2018)
- CARE Principles of Indigenous Data Governance. (Global Indigenous Data Alliance. 2019)
- Principles of Ethical Métis Research (NAHO Metis Centre, 2018)

Operating across multiple knowledge systems is not a new concept. Mi'gmaq Elder Albert Marshall refers to the practice of operating in two knowledge systems as “two-eyed seeing”. Two-eyed seeing illustrates the ways in which a person must negotiate between knowledge systems and their respective cultures. (Reid et al., 2021) Elder Albert Marshall speaks from the perspective of a member of the Eskasoni First Nation and demonstrates the ways in which First Nation Peoples must often switch between “two eyes”; using the strength of Indigenous knowledges and ways of knowing from one eye, and the strengths of Western knowledge from the other. In *What Are Indigenous and Western Ways of Knowing* (2018b), the Canadian Research Institute for the Advancement of Women, in consultation with Indigenous partners, reviewed 19 frameworks that attempt to combine Western scientific and Indigenous ways of knowing. While these frameworks are not easily transferable or universally applicable, they offer evidence—a starting point for researchers—that it is possible to braid together two knowledge systems.



OVERCOMING OUR BIASES, WORKING TOGETHER

Tuhiwai Smith (2021) and Pfeifer (2018) speak to how academic disciplines derive their knowledge from Western ways of knowing and often lack methodologies for working with other knowledge systems.

Research institutions also contribute to this system in which only Western Knowledge is valued, an example being the move towards “evidence-based decision making”. As research assumptions of what counts as scientific evidence are rooted in Western knowledge, other knowledges, such as Inuit traditional ecological knowledge (TEK) or Inuit traditional knowledge, are often refused funding eligibility. (Pfeifer, 2018) Additionally, other forms of knowledge are solely considered as being legitimate if they are engaged or associated with Western education or research institution. (Pfeifer, 2018)

It is important to consider how our disciplinary training and personal experiences may influence how we view other ways of knowing. A person who was trained within Canadian academies/the Canadian context must consider the effects of their own training, knowledge, views, ways of thinking and how these may influence their biases. (Mthembu, 2020) According to Blue et al. (2013) those situated within Western epistemologies “(...) may not be able to understand [I]ndigenous perspectives (past or present) simply by translating [I]ndigenous ways of knowing” .(p. 4) This poses difficulties when working with Indigenous Knowledge(s). Subject matter experts who supported IOG to outline this paper (IOG, 2020) explain such a lack of understanding often results in a discrediting of or an unwillingness to work with other ways of knowing. Roundtable participants (IOG 2021, IOG 2022) concur that traditional structures in academia and adjacent research institutions place Indigenous and other ways of knowing in opposition to Western ways of knowing. To achieve Reconciliation, there is work to be done to promote respect for these other knowledge systems, their rigour and validity. Knowledge systems should be braided together, rather than in competition with one and other.

Scientists trained in Canadian academies are not taught to ask questions regarding research that Edward Said (2003) identifies as crucial to working with an “Other”. For example, “Who writes the research? For whom is the writing being done? In what circumstances?” Have community members influenced the research design or methodology to address their interests, or is this solely in the domain of the scientist? Often, research questions, accessibility and the processes facilitating research are not designed in consideration of Indigenous research practices or knowledge(s). Examples of this may include:

- Lack of time and funding for relationship development prior to project development.



- Lack of mechanisms to support the continuation of the relationship after a project ends.
- Processes which prevent researchers from accessing honoraria and gifting, when both are needed for engagement.
- Funding structures in science branches which do not allow for money to be given directly to a community for research²
- Indigenous knowledge holders not being listed as project partners on applications, and having to be listed as “other”.

WORKING TOGETHER TO SAFEGUARD INDIGENOUS KNOWLEDGES

While this paper speaks to the pursuit of knowledge in a Canadian context, the purpose is not to imply that mutually beneficial collaboration and research practices do not exist between First Nations, Métis, and Inuit knowledges and Western practices. Indeed, Indigenous knowledges have globally advanced the understanding of Western scientists in ecology and many other disciplines, and members of the scientific community in Canada are increasingly looking to First Nations, Métis, and Inuit communities for guidance. (Blue et al., 2013)

While the Government of Canada has made notable improvements to incorporate other ways of knowing, there is not yet a federal framework to safeguard First Nations, Métis, and Inuit knowledges. However, there is evidence of progress in this direction, for which UNDRIP (2007) provides a framework by emphasizing “(...) Indigenous rights to self-governance and authority to control their Indigenous cultural heritage embedded in their languages, knowledge, practices, technologies, natural resources, and territories”. UNDRIP also informs practices for safeguarding Indigenous data and research findings, which researchers have historically failed to share with Indigenous communities. (Global Indigenous Data Alliance, 2019)

Here are just a few examples of mutually beneficial, culturally appropriate collaborations between First Nations and Inuit communities and the federal science community.

- *The Land is Our Teacher*, a series of Indigenous Knowledge-based projects that describes how Parks Canada has worked with Indigenous Knowledge holders to meet its mandate. The series recognizes, “(...) that [Indigenous] peoples’ understanding of the environment, years of practical experience living in local places and observing natural processes and generations of collective wisdom can greatly enhance the Agency’s understanding of heritage places” (Brascoupe, 2015).

² Vote 10 (Grants and Contributions) is not always available in science branches.



- A study by Lee et al. (2019) conducted on the abalone species integrated First Nations traditional knowledge systems that led to the identification of an annual population decline 9.5 times higher than when researchers solely relied on Western methodologies.
- “That’s How We Know They’re Healthy”, (Osterag et al, 2018), the ISR’s Fish and Marine Mammal Community Monitoring Program collaborated with community members from Inuvik, Paulatuk and Tuktoyaktuk who had experience in harvesting beluga in order to study beluga health in the Eastern Beaufort Sea.
- In 2019, the Oceans and Fisheries Act (Government of Canada, 2022b) was amended to include the following provisions:

Before Bill C-68	New Fisheries Act
No explicit reference to consideration of the rights of Indigenous Peoples and their unique knowledge to inform decision-making.	<p>Provided Indigenous traditional knowledge must inform habitat decisions</p> <p>Requirement to consider adverse effects of decisions on the rights of Indigenous Peoples</p> <p>Protection for Indigenous Knowledge when provided in confidence to the Minister</p>
Ability to enter into certain agreements restricted to provinces and territories only	Added ability to enter into agreements with Indigenous governing bodies and anybody established under a land claims agreement, as well as provinces and territories.

- Staff at Agriculture and Agri-Food Canada are working to support amendments to legislation which would consider Indigenous knowledge exempt by default from Access to Information requests (ATIPs). (IOG, 2021)
- Staff at the Office of the Chief Science Advisor are working with the First Nations Information Governance Centre to develop a training module on the First Nations principles of ownership, control, access and possession of data (OCAP) for all staff who handle data in the science-related departments. (IOG, 2021)
- The Health Canada Northern Contaminants Program (NCP) was established in 1991, in response to “concerns about human exposure to elevated levels of contaminants in wildlife species that are important to the traditional diets of northern Indigenous Peoples”. (Government of Canada, 2022c) More than 30 years later, the program has become a mutually beneficial collaboration which requires engagement with impacted northern communities before a research project may receive funding. The Northern Contaminants Program also has a well-established process for communication throughout the lifetime of the project. (Government of Canada, 2022c)



- To promote greater collaboration between scientists and Indigenous Knowledge holders as one means of reconciliation, Wong et al. (2020) released 10 calls to action for natural scientists. The following three are also supported by the University of Waterloo's Indigenous Initiatives Office (University of Waterloo, 2021):

Call 2: We call on natural scientists to recognize that generating knowledge about the land is a goal shared with Indigenous Peoples and to seek meaningful relationships and possible collaboration for better outcomes for all involved.

Call 3: We call on natural scientists to enable knowledge sharing and knowledge co-production.

Call 5: We call upon natural scientists to provide meaningful opportunities for Indigenous community members, particularly youth, to experience and participate in science.

FINDINGS FROM THE IOG ROUNDTABLE DISCUSSIONS

In April 2021, the Institute on Governance hosted a half-day workshop on Interdisciplinary, Indigenous and Other Ways of Knowing (though this paper focuses exclusively on Indigenous and Other Ways of Knowing). Subject matter experts from eight federal departments—Agriculture and Agri-Food, Health, Innovation, Science and Economic Development, National Research Council, Natural Resources, Public Health Agency, Public Services and Procurement, and Transport—participated in the discussion. The workshop employed the seven-question foresight methodology to explore the topic of Indigenous and Other Ways of Knowing. In March 2022, the IOG hosted a multisectoral roundtable with partners of the above listed departments to discuss this topic in the context of relationships with federal departments; meetings with subject matter experts occurred between these two roundtables, both formally at a meeting in December 2021 and informally via phone and email.

The topics raised by workshop and roundtable participants during the discussion demonstrate close alignment with academic literature on the subject. Any repetition of ideas in previous sections of this paper serves to illustrate this alignment.



- **Superficial Integration:** Indigenous knowledges removed from Indigenous Peoples has resulted in harm to the communities from which the knowledges have come. Participants in the workshop articulated that the federal public service lacks Indigenous representation. A report published by the Government of Canada in collaboration with the Knowledge Circle for Indigenous Inclusion (Government of Canada, 2021c) confirms this and in 2019, across 44 federal departments, there lacked representation of Indigenous employees within the cluster of ‘science’ departments as identified by the Office of the Chief Human Resources Officer’s annual ADM Talent Management cycle. As a result, there are not enough Indigenous scientists or knowledge holders within the federal public service to meaningfully integrate Indigenous Knowledges. The report also notes a disproportionate number of Indigenous Peoples being hired for contract, casual or terms of less than 6 months. Subsequently, there are not enough Indigenous People being hired in long-term or executive positions to promote the necessary culture change to recognize Indigenous knowledges as legitimate ways of knowing and to avoid potentially reproducing the misuse of these knowledges.
- Beyond a superficial integration, there is fear surrounding **co-opting Indigenous Knowledges** to disguise colonial practices. Scopers gave examples of “green washing” or “green colonialism”, which refer to current practices being recycled with a mildly different and seemingly more “benign” approach. Scopers additionally spoke to the need for government to not only fund conversations surrounding reconciliation, but to invest in traditional knowledge to be reclaimed again. A renewed relationship with Indigenous knowledges must include conversations and supports surrounding sovereignty and autonomy, not simply equity, diversity and inclusion. (IOG, 2021)

Participants identified the current culture as a barrier to integrate other ways of knowing into science-based departments and agencies. Roundtable participants shared examples of disagreements between social scientists and natural scientists to illustrate the cultural differences between scientific disciplines, and pockets of intolerance towards interdisciplinary or transdisciplinary work, let alone bridging multiple ways of knowing. The process to shift to a culture where multiple ways of knowing is valuable is a large task that will require time, training, and leadership. Additionally, processes which currently exist to promote this way of thinking tend to exist towards the end of a project lifecycle, which does not promote broad cultural change.



LOOKING FORWARD: QUESTIONS FOR DISCUSSION

Our collective ability to create spaces where knowledge is created and validated across multiple knowledge systems is an activity in enlightened self-interest. Through identifying and mapping multiple ways of knowing that excel where others are limited – and bridge those systems in meaningful, relevant and respectful ways – we may create new, more rigorous and robust ways of producing knowledge that advances our understanding of our natural world and our place in it.

Building understanding across multiple ways of knowing is fundamentally an act to support good governance and to advance evidence-based decision-making.

The following questions are intended to provoke discussion on how government science can further engage with Indigenous and other ways of knowing.

- In what ways could scientists and researchers in the public service be taught to work with Indigenous and other ways of knowing?
- How can we support researchers in uncovering and countering their own biases?
- In what ways are we able to move beyond treating Indigenous Knowledge/ Methodologies as “in addition” to current practices and ensure they are included meaningfully and equally?
- Does sufficient oversight exist to prevent further instances of extractive research and performative consultations with Indigenous Peoples?
- How can federal departments and agencies work together to advance the interweaving of science and Indigenous ways of knowing?



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APPENDIX 1: LIST OF TERMS

Canada and the “West”: At times this paper discusses the Canadian context, and in other places it refers to the “West” or Western knowledge. This term refers to countries or regions where the administrative powers are operated by “settler governments” (Blue et al, 2013), established primarily by Anglophone settler colonial societies which attempted to gain control over Indigenous lands. These countries – such as Australia, Canada, New Zealand and the United States – share “common histories and [...] contemporary issues among Indigenous populations and settler colonialists” (Paul, 2014), that continue to inform much of the operations of the above listed countries to date. These countries are linked by philosophies, epistemologies, capital, migration, governmental alliances, and accommodation by Indigenous People(s) (Blue et al., 2013). Their people, economies, and historical processes are intertwined. It is through this lens that we define science (as a practice and a way of knowing), and the Canadian context which refers to the definitions, methodologies, and constructions of science as established by the settler-colonial society of Canada.

Co-developed research: First phase of a research process, in which researchers and non-academic partners jointly develop a research project and define research questions that meet their collective interests and needs. (OECD, 2020)

Co-production/Co-creation of knowledge: A collaborative model that includes stakeholders in the knowledge production phase of the research process, e.g., engagement of patients in health research. (OECD, 2020)

Discipline: Branch of knowledge or learning. Practitioners of a given discipline generally share characteristic background knowledge, objects of analysis, terminology, analytic methodologies, and mechanisms for training, collaboration, and knowledge exchange. (OECD, 2020)

Extractive or directive research models: The “directive” model is business-as-usual, in which “best practices” emerge from university research with the expectation that communities should change their priorities and practices accordingly. Researchers who recognize the limitations of that approach may prioritize “engagement” but can sometimes practise an “extractive” approach, which centres questions that the researcher and their colleagues are interested in, unfolds according to academic timelines, and seldom results in research findings or products that meet the needs of communities. When conducted in the name of equity and with or “on” historically marginalized and under-resourced communities, this approach is especially problematic, as it creates additional burdens on these communities while burnishing the “expert” credentials for researchers with unclear impacts on equity outcomes. (Derrickson, 2019)



Interdisciplinary: Research that involves two or more academic disciplines in a way that forces them to cross subject boundaries to create new knowledge and theory in achieving a common goal. Integration of knowledge from the natural science disciplines with the social sciences and humanities (SSH) is particularly relevant to addressing complex societal challenges, including those related to human—environmental systems (HES), but poses substantial challenges. (OECD, 2020)

Indigenous Knowledge systems: Although Indigenous Knowledge is not a monolith, several characteristics are considered common across many Indigenous Peoples, cultures, histories, and contexts. Together, these emphasize an approach to knowledge that is place-based, holistic, oral/symbolic, relational, and intergenerational. Indigenous ways of knowing rely heavily on many forms of intelligence, including interpersonal, kinesthetic [physical], and spiritual intelligence. Within Indigenous Knowledge systems, land is often regarded as Mother Earth, who provides teachings that determine traditional values or ways of knowing. An important question in Indigenous Knowledge is, “how am I fulfilling my role in this relationship?” (Canadian Research Institute for the Advancement of Women, 2018).

Multidisciplinary: Research that involves contributions from two or more academic disciplines working in parallel on a common problem, but following their individual disciplinary precepts and ways of working. Participants exchange knowledge, but do not aim to cross subject boundaries to create new, integrated knowledge and theory. This lack of integration may make it difficult to satisfactorily resolve complex societal problems. (OECD, 2020)

Science: Systematized knowledge derived from observation, analysis, and experimentation carried on to determine the nature or principles of what is being studied; a branch of knowledge or study, especially one concerned with establishing and systematizing facts, principles, and methods, as by experiments and hypotheses. Sometimes “Science” is used to denote natural sciences, to the exclusion of the social sciences and humanities (SSH); however, in its broadest interpretation it encompasses all disciplines of academic knowledge and both quantitative and qualitative methods. (OECD, 2020)

Scientific knowledge systems: Scientific knowledge is organized into disciplines often with an emphasis on logic, rationality, objectivity, and the quantitative measurement of observable phenomenon. The philosophical tradition of positivism, which rejects the metaphysical or spiritual realm as a source of knowledge, has had a significant impact on Western scientific knowledge systems. This is especially true in the natural science disciplines but it is also common in the social sciences. (Canadian Research Institute for the Advancement of Women, 2018)



Transdisciplinary research: integrates both academic researchers from multiple disciplines and non-academic participants to achieve a common goal involving the creation of new knowledge. Transdisciplinary research is necessarily interdisciplinary. In drawing on non-scientific knowledge domains such as local and traditional knowledge, and cultural norms and values, it aims to supplement and transform scientific insights for the good of society. (OECD, 2020)

