Apoqnmatulti'k: Turning the Tide for Collaborative Research

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ABSTRACT

A collaborative and holistic approach is essential to achieving a healthy and resilient aquatic ecosystem. Apoqnmatulti'k (Mi'kmaw for "we help each other") is a partnership that involves the Unama'ki Institute of Natural Resources, the Confederacy of Mainland Mi'kmaq, commercial fisher Darren Porter, the Ocean Tracking Network, Acadia University, Dalhousie University, and Fisheries and Oceans Canada-Science. Apoqnmatulti'k is founded on the shared participation of Mi'kmaw, local, and Western scientific knowledge holders, aiming to better understand valued aquatic species in Pitu'pa'q (Bras d'Or Lake) and Pekwitapa'qek (Minas Basin). Guided by the principle of Etuaptmumk (Two-Eyed Seeing), Apoqnmatulti'k serves as a model for how the incorporation of diverse perspectives can enhance knowledge, ensure transparency and accessibility of information, and transform fisheries management and conservation. This paper focuses on the challenges, lessons learned, and achievements derived from collaboration and the development of a strong partnership.

KEYWORDS: Two-eyed seeing; aquatic telemetry; integrated science; fisheries management; fish ecology; marine biology; animal tracking

POSITIONALITY

We are a collaborative group of Indigenous and non-Indigenous individuals who collectively hold a complement of Mi'kmaw, local, and western knowledge. Our backgrounds span the natural, social, and integrative sciences, as well as technical and traditional techniques and approaches. While we come from different places, we work together in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. In Mi'kma'ki, the treaties were established not to determine ownership of land but to ensure peace and friendship among all who live in the region. This is the spirit in which this project was born and is central to how we work together. Our project was named Apoqnmatulti'k ("we help each other") by Mi'kmaw Elder Dr. Albert Marshall. Apoqnmatulti'k signifies our commitment to learning from one another through shared decision making, dialogue, and mutual benefit. This paper is a collective reflection on the lessons we have learned over the course of our partnership and is inspired by what we shared at the Muiwatmnej Etuaptmumk Conference in Membertou, Unama'ki, in November 2023. While we continue to explore what reconciliation can look like in the sciences, we hope that Apoqnmatulti'k can serve as a model for others working collaboratively across knowledge systems and worldviews.

INTRODUCTION

Around the world, many aquatic species are in decline from anthropogenic impacts including overfishing, habitat destruction, pollution, and climate change (Costello & Ovando, 2019; Reid et al., 2019). Fisheries management is complex, evolving, and—in many jurisdictions—overly reliant on a western science-driven approach to guide its policies (Holling, 2001). In Canada, academic, government and, industry researchers feed data into regulatory bodies to support decision making (Hamelin et al., 2023), but some argue that these decisions are overly politicized and made by managers thousands of miles away from where the impacts are felt (von der Porten et al., 2019).

In contrast, Indigenous and coastal communities have had a rich relationship with the coast and its inhabitants for millennia: however, bridging or integrating their perspectives and knowledge into regulatory decisions and management frameworks remains challenging (Alexander et al., 2021). Fisheries management in Canada continues to be structured around the coloniality of positivism, imperialism, and capitalism (Cadman et al., 2024a). As a result, Indigenous perspectives and wisdom about fisheries and oceans have been lost over time, with key pieces of historical and lived knowledge missing from management and regulation frameworks. If management decisions are to be truly effective, holistic, and inclusive, they must include the perspectives of those with Indigenous and local knowledge—the people who live, work, and play in coastal communities.

Apoqnmatulti'k is a collaborative initiative that brings together three knowledge systems (Indigenous, local, and western scientific) to generate and mobilize information on culturally, ecologically, and commercially valued aquatic species in Mi'kma'ki (Atlantic Canada). Founded in 2018 with funding from the Natural Sciences and Engineering Research Council of Canada, Apoqnmatulti'k is a partnership among the Unama'ki Institute of Natural Resources (UINR), Confederacy of Mainland Mi'kmaq (CMM), commercial fisher Darren Porter, Ocean Tracking Network (OTN), Acadia University, Dalhousie University, and Fisheries and Oceans Canada- Science (DFO-Science).

The credibility of non-scientific knowledge is often questioned or not recognized (Latulippe, 2015). While this perception is starting to shift, it is rare that all three knowledge systems are brought together through a united collaborative effort. Apoqnmatulti'k emerged out of a shared desire to demonstrate the power in bringing all perspectives to the table from the beginning. Built on joint participation from Mi'kmaw, local, and western scientific knowledge holders, Apoqnmatulti'k has two core goals: (a) gather and apply knowledge about valued aquatic species to help inform stewardship initiatives for current and future generations, and (b) advance a collaborative and holistic research model that ensures transparency and accessibility.

The project's approach is relatively novel, but it should not be. Collaborative partnerships are one avenue for continuing the process of reconciliation with Indigenous peoples and ensuring that treaties are honoured and upheld. In Mi'kma'ki, these treaties were established to ensure peace and friendship among all who live in the region. As aquatic species and ecosystems face growing threats, building trust and relationships

with communities that depend on these resources deepens our collective understanding and stewardship of the natural world.

Seeing with Two Eyes

Apoqnmatulti'k is guided by the principle of Etuaptmumk (Two-Eyed Seeing). Conceptualized by Mi'kmaw Elder Albert Marshall and the late Murdena Marshall, it refers to learning to see from one eye with the strength of Indigenous knowledge and ways of knowing and from the other eye with the strength of western knowledge and ways of knowing (Bartlett et al., 2012). As a result, Two-Eyed Seeing requires space for co-learning and co-development through respectful dialogue. In keeping with this principle, all aspects of Apoqnmatulti'k have been co-developed, such as project governance, communication outputs, knowledge co-production, and capacity building. Even so, the group has continually reckoned with positionality and power in project relationships and functioning. Just as fisheries management derives power from its coloniality, so do universities and their partnerships. Partnerships formed with the best of intentions can still falter when university systems control their work (Cadman et al., 2024b). To that end, sustained conversation and reflection on who project members are and what expertise they bring are essential, and team members have worked hard on listening with open hearts to find shared space for learning.

Drawing on the strengths of Mi'kmaw, local, and western scientific knowledge systems—and learning to see with both eyes—enables partners to gather new information about study species and has the potential to transform decision making and fisheries management. Dr. Shelley Denny, senior advisor at the Unama'ki Institute of Natural Resources, explains that true collaboration requires relinquishing comfort and familiarity and embracing new-to-you perspectives:

Two-Eyed Seeing expects you to leave your comfort zone and explore another way of interpreting the world around you. When we do this, our knowledge systems will collide. While this may be a potential barrier to collaborating, it is also the opportunity for Two-Eyed Seeing. This is where values and beliefs, and underlying tensions, surface. Instead of walking away from those collisions, Apoqnmatulti'k uses them to guide our work.

FIGURE 1
At the Muiwatmnej Etuaptmumk Conference

Note. Pictured are project partners Dr. Shelley Denny (UINR), Meghan Borland (OTN), Evelien VanderKloet (OTN), Skyler Jeddore (UINR), and Alanna Syliboy (CMM) at the Muiwatmnej Etuaptmumk Conference, hosted in Membertou, Unama'ki, in November 2023.

Bridging Apoqnmatulti'k and Communities

As part of putting Etuaptumumk into practice and facilitating knowledge transfer, paid community liaisons have been appointed to the Pitu'pa'q (Bras d'Or Lake) and the Pekwitapa'qek (Bay of Fundy), two study sites in Nova Scotia. While not typically built into a natural science project, community liaisons play a critical role in connecting communities to the project and ensuring community considerations and values are front and centre in project activities.

Skyler Jeddore, the community liaison and field technician for the Pitu'pa'q, demonstrates how Etuaptumumk can be practiced. Growing up in Eskasoni and based at UINR, Jeddore has spent his entire life on the Bras d'Or. His strong ties to the community and good-natured personality make him a natural at bridging the gap between project activities and community interests. An avid recreational fisher, Jeddore works closely with Mi'kmaw harvesters to gather samples. As Jeddore explains,

> Mi'kmaw fishers know not to fish lobster during certain times in the summer out of respect that lobsters are molting. By working with Mi'kmaw harvesters, we ensure we're tagging at the right time of year. When we set out to collect samples in the fall, we check for shell thickness and wait for these cues to start tagging. Together, we have the shared goal of waiting to start tagging once the lobsters finish molting that season.

This is one of many examples of how Jeddore's knowledge about important ecological cues helps inform research plans.

FIGURE 2
Deploying Acoustic Receivers into the Pitu'pa'q (Bras d'Or Lake)

Note. Pictured are Skyler Jeddore (UINR) and Nathan Glenn (OTN) in the field. Photo credit: Nicolas Winkler Photography.

Alanna Syliboy is another key member: she is the Culture, Education, and Engagement Manager at CMM and the Apoqnmatulti'k community liaison in the Pekwitapa'qek. Her deeply rooted connection to her culture and community help guide and shape project activities, including communications outputs and outreach events. Through her passion for sharing knowledge, Syliboy is continually finding ways to bring Mi'kmaw practices and teachings into the project, whether through building traditional eel pots or beginning meetings with an invitation to reflect on how partners are—or can—put reconciliation into action.

Project members like Jeddore and Syliboy are key to redirecting the project if it becomes too narrowly focused on western science. They also reinforce the importance of taking time to build relationships, thinking holistically, and listening to learn instead of listening to respond. As Syliboy notes,

> Apoqnmatulti'k is about sharing, growing, and learning for the future of our environment and all that is needed to sustain life for the next seven generations. By learning from one another, we are able to strengthen our collective knowledge and understanding of the natural world.

Co-Learning in Practice

Within a collaborative project, each team member and their associated organization brings unique core values and desired outputs to the table. Since Apoqnmatulti'k's inception, partners have worked together to understand these core values and to adapt project processes and activities to better reflect individual and organizational priorities. For Syliboy and Jeddore, Apoqnmatulti'k offers an avenue to restore and rebuild knowledge that has been lost through generations of oppression and the legacy of residential schools. But developing relationships with community members and sharing knowledge takes time and flexibility: it does not happen in a boardroom or during a standard work week. It requires conversations in communities, for partners to be present and take the time to connect with elders, youth, and harvesters, who are all integral to informing research activities.

To do this work properly and meaningfully, academic partners must let go of control and traditional academic timelines. As Evelien VanderKloet, senior operations manager at OTN,[1] explains,

> There are timeline pressures that fall onto western science that do not align and often actively contradict the amount of time it takes to build relationships, seek input from communities, and incorporate Indigenous values and perspectives into the research study. Collaborative projects like Apoqnmatulti'k require academic partners to let go of control over the timing of research activities, the timing of meetings–including how long meetings might take–and what's important to be discussed. They have to not only commit to taking this time, but they also need to value the time it takes to do this work meaningfully.

Through Apoqnmatulti'k, project partners have learned the importance of sharing information beyond the traditional academic sphere in order to reach a broader audience. Examples include social media posts in plain language and the translation of materials, infographics, and videos into Mi'kmaw. Within Apoqnmatulti'k, there is a communications subcommittee, with representation from each knowledge system, that works together to co-develop content and communications outputs.

However, while sharing information is important, it is essential that First Nations' data sovereignty is recognized and respected. To support this, the project has a commitment to abide by the First Nations Principles of Ownership, Control, Access, and Possession (OCAP), and all partners receive training through the First Nations' Information Governance Centre. These principles help determine not only how information is shared, but also collected, used, and stored. Per Syliboy,

> It is important to make sure we are respectful. When we gather knowledge, we need to have permission and consent because it is not our information. We must let the individual pave the way to how it will be shared and what that will look like and that may not match a typical academic timeline.

FIGURE 3
Fishing for Punamu

Note. Alanna Syliboy (CMM) tosses a net into the Shubenacadie River to catch punamu (Atlantic tomcod).

Conflict as a Catalyst

While co-learning and co-development are key to building a holistic and inclusive research paradigm, it comes with challenges. Darren Porter, a local commercial fisherman and project partner, describes his onerous journey in developing a relationship with academia and the people working within it:

> It started in conflict—I disagreed with the papers I was reading. The reality was different compared to what academics were publishing, and it took a long time to build relationships with them. My relationship with Mi'kmaw communities started in friendship—I had some friends with like-minded ideals, which led to networking. I'm very honoured to now be at the table, and to help dismantle the idea that one system of knowledge is the only one.

What started as a collision of two worlds burgeoned into a transformative approach that brought scientists and fishermen together to find more comprehensive answers to their mutual questions. Dr. Michael Stokesbury, professor of biology at Acadia University, recognizes the power and necessity of this approach:

> Both local and Indigenous knowledge holders are closely tied to the natural process of the ecosystem. By pairing these knowledges with western scientific methods, we not only extend the time scale of observation from tens to hundreds to thousands of years, but we also learn new ways to observe and understand the natural world that science alone cannot achieve. This is critical for determining long term temporal trends in biological and physical variables, and, therefore, for gaining a comprehensive understanding of the natural history of organisms and the functioning of healthy ecosystems.

Denny echoes the importance of bringing all perspectives to the table. She emphasizes the necessity of not only expecting conflict along the way, but of learning how to properly navigate it for the benefit of relationships and the project as a whole:

> Expect those bumps, I think those happen in relationships, and knowing how to navigate those bumps is very handy. Even if you don't know, it's just as important to have that courage and honesty to come forward and be truthful to your partners.

Turning the Tide

Apoqnmatulti'k has built a successful, holistic partnership, one that takes time to establish and requires listening, learning, and finding resolutions along the way. The project is shaped by research that is guided by, and responds to, community knowledge and priorities. Its co-developed approach to understanding the aquatic environment enhances the quality and richness of the information collected and ensures transparency and accessibility to communities that rely on healthy coastal ecosystems. VanderKloet stresses that while the project's approach is relatively novel, it can be tailored to any research project:

> While this project is place-based, the approach can be adapted and applied anywhere. It starts with the premise that we all hold knowledge, and an exchange of what we do know, what we do not know, what we want to know. All of that is based on the understanding that in order to truly do collaborative science, all partners need to be at the table from the beginning.

Apoqnmatulti'k is generating new, valuable information on commercially and culturally important species in Nova Scotia and is facilitating co-learning and the transfer of knowledge across cultures and sectors, slowly and steadily helping turn the mainstream paradigm of research and management on its head. At its core, this is what Two-Eyed Seeing is all about: generating transformative knowledge with the purpose of bringing about transformative change and action. With each new hurdle and accomplishment, Apoqnmatulti'k is demonstrating possibilities for turning the tide for a more inclusive and just future. As Denny notes,

> When we talk about Two-Eyed Seeing we talk about transformative knowledge but what about transformative change and the action that Elder Albert Marshall is always talking about? That's what we want. We want action. Through this project we have demonstrated a lot of change and a lot of action.

Apoqnmatulti'k's purpose extends well beyond aquatic animal tracking and the collection of scientific data—it provides a scaffold for co-learning, equal participation, and building relationships and trust that reflect the treaties encircling us all.

FIGURE 4
Apoqnmatulti'k Steering Committee Members

Note. Apoqnmatulti'k is a collaborative partnership comprised of the UINR, CMM, commercial fisher Darren Porter, OTN, Acadia University, Dalhousie University and DFO-Science.

END NOTES

[1] OTN brings tracking equipment and expertise to the project in addition to providing project management and communications support.

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