Community-Based Monitoring in a Changing Northern Ontario

WCS CANADA

Summary of Thunder Bay Workshop
April 24 and 25, 2018

About Wildlife Conservation Society Canada

WCS Canada (www.wcscanada.org) was established as a Canadian conservation organization in July 2004. Our mission is to conserve wildlife and wild places by improving our understanding of and seeking solutions to critical problems that threaten key species and large wild ecosystems throughout Canada. We implement and support comprehensive field studies that gather information on wildlife needs and then seek to resolve key conservation problems by working with a broad array of stakeholders. We also provide technical assistance and biological expertise to local groups and agencies that lack the resources to tackle conservation concerns. WCS Canada is independently registered and managed, while retaining a strong collaborative working relationship with sister Wildlife Conservation Society (WCS) programs in more than 60 countries.

Executive Summary

Northern Ontario is undergoing rapid ecological and social change. Over the past decade, there has been mounting evidence of environment impacts caused by climate change. These changes create challenges for the First Nations living in northern Ontario as well as the fish, land, waters, and animals they depend on in the region.

At the same time, industrial development, including all-weather roads, mines, and hydroelectric facilities, proposed for the region could increase impacts on the terrestrial, freshwater, and marine ecosystems and lead to new patterns of land, freshwater, and marine use that can also affect First Nations.

There is a growing need for long-term monitoring and observations to better understand the impacts of interrelated sources of change on interdependent ecological and social systems in northern Ontario. Too often, government-led monitoring programs are not integrated with one another and may vary in the space and time of data collection because of the costs of monitoring, particularly in the Far North, and results are not publicly available or may take a long time to emerge. Finally, these programs rarely consider the values and participation of affected First Nations communities.

Susan Morse

Of course, monitoring in northern Ontario did not begin with the introduction of formal scientific monitoring programs. For generations, Indigenous communities, including First Nations in northern Ontario, have been monitoring what takes place on their traditional territories. When does freeze-up begin? Are there fewer animals today than a few years ago? Are there more fires in the forest? Out of this experience of observations and caring for the land, community-based monitoring (CBM) has emerged as an important response to assessing and addressing change and its impacts on communities, drawing on the best available knowledge, including traditional knowledge held by Indigenous Peoples.

This summary describes the outcomes of a CBM workshop for northern Ontario in Thunder Bay on the traditional territory of the Fort William First Nation, signatory to the Robinson Superior Treaty. The workshop was hosted by WCS Canada as part of the Up North ON

Climate Change Conference. The goal of the workshop was to create the basis for a CBM project in northern Ontario by:

- Providing a space to discuss the fundamentals of CBM monitoring (why, what, how) with interested First Nations.

- Hear about and learn from First Nation CBM practitioners and their partners engaged in programs across Canada and identify "best practices" from these programs.

- Consider how a pilot CBM project may emerge in northern Ontario drawing on the expertise and knowledge of current initiatives and First Nation interests.

During April 24 and 25, 2018, 40 First Nations citizens from 18 communities within Treaties No. 9, 3, and Robinson Superior met. Three First Nations experts (Billy Isaac, Jennifer Simard, Shaunna Morgan Siegers) offered their guidance and knowledge and provided examples, context, and feedback to support the discussion with participants. The overall approach to the workshop was to consider the main questions associated with the development of a CBM project (Figure 1).

Figure 1. Simple schematic to support the development of a CBM process during the workshop.
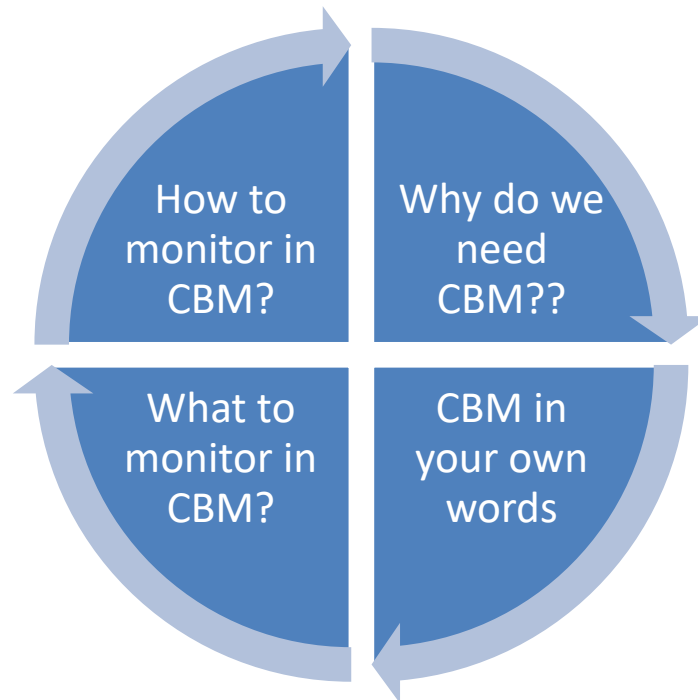
During each session, we considered the following questions:

- Why do we want community-based monitoring?

- What is monitoring in your own words and from your own perspectives?

- What do we monitor in community-based monitoring?

- How do we monitor in community-based monitoring?

A general introduction to each question was provided based on published papers and reports about community-based monitoring followed by time for each expert to introduce their experience and responses to the question. After questions and discussion with the panelists, smaller breakout groups considered each question and their responses were then shared with the larger group to stimulate further discussion about issues, interests, and areas of concern.

The rest of this report focuses on the discussion during each session.

Allan Lissner

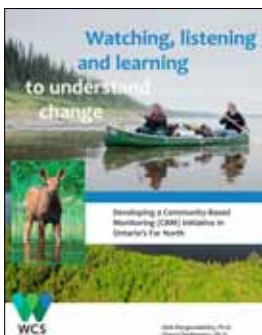*Lawrence Sakanee from Neskantaga First Nation*

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Introduction

Northern Ontario is undergoing rapid ecological and social change. There is increasing evidence of impacts to the environment due to climate change, which is affecting the animals and plants living in the region. These changes to fish, wildlife, plants, and the land and water have implications for First Nations living in northern Ontario and their important cultural relationships with these species, a relationship that is part of their constitutionally protected Aboriginal and Treaty rights. Climate change creates additional challenges for remote First Nations. For example, few communities in the Far North have all-season road connections and remote communities rely on the 3,100 km network of winter roads, usable only during deep-freeze conditions, for vehicle travel. Climate change is reducing the viability and safety of winter roads. Additional impacts of climate change include flooding events[1] and extreme wildfire events[2] resulting in evacuations.

At the same time, industrial development, including all-weather roads, mines, and hydroelectric facilities, can increase human impacts on terrestrial, freshwater, and marine ecosystems and lead to new patterns of land, freshwater, and marine use. Some northern First Nations communities may be engaged in planning to address these impacts, in part, through community-based land use planning under Ontario's *Far North Act, 2010* and environmental impact assessment under Ontario's *Environmental Assessment Act* as well as the federal impact assessment legislation. These planning processes are driven by Government, but have impacts on First Nations communities, their values, roles and responsibilities, as well as rights.

There is a growing need for long-term monitoring and observations to better understand the impacts of climate change and development on ecological and social systems in northern Ontario. The Government of Ontario has developed and leads a number of scientific monitoring programs including the Far North Biodiversity Program, the Broadscale Inland Lakes Monitoring Program, and wildlife monitoring. It is also responsible for air and water quality monitoring and tracking contaminants, such as mercury, in freshwater fishes. Government typically also monitors the effects of its management planning by tracking indicators for forest management and biodiversity. Project proponents may also conduct monitoring as part of the requirements for project approval under impact assessment processes.
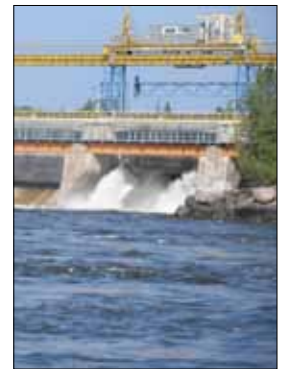
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Industrial development can affect many traditional values, including food sources such as fish

[1] https://www.ctvnews.ca/canada/kashechewan-residents-evacuated-over-flood-fears-1.1818986

[2] https://globalnews.ca/news/3670737/ontario-forest-fire-evacuation/

Often these types of monitoring programs may not be integrated with one another and may vary in the space and time of data collection. Too often, the results are not publicly available or take a long time to emerge. These kinds of monitoring programs rarely consider the values, or include the participation of, affected First Nations communities. In addition, monitoring programs are generally insufficient for addressing the cumulative impacts of past, present, and future projects when combined with climate change.

Indigenous communities, including First Nations in northern Ontario, have been monitoring what takes place on their traditional territories for millennia. When does freeze-up begin? Are there fewer animals today than a few years ago? Are there more fires in the forest? Based on these observations, they would change their activities on the land – move their camp to a new place or respond to daily movements in the animals they are hunting, fishing, or trapping in a given area. At the same time, their observations of subtle environmental indicators and their familiarity with animal behaviour and population dynamics have facilitated a better understanding of the impacts of climate change, particularly in the Arctic. Being on the land also enables First Nations to make regular and routine observations of fisheries, mining, forestry, and other industrial developments occurring in their territories. As such, monitoring is a process that First Nations engage in for their own purposes and on their own terms.

Community-based monitoring (CBM) has only recently emerged as an important response to assessing and addressing change and its impacts on communities, with communities themselves taking on an increasing role in research, policy, and assessing best practices.

More recently, CBM has been considered a good vehicle for bringing science and traditional knowledge together. Traditional Knowledge (TK) is defined as the cumulative living body of knowledge, practices, and beliefs about the relationships between people, other living beings, and their environment, handed down through generations, primarily through oral and hands-on transmission. Traditional knowledge held by Indigenous Peoples is inextricably integrated with the Earth and Indigenous languages, cultures, spirituality and Natural Law. This knowledge system includes an understanding of environmental

dynamics over time, and can lead to new knowledge that can be used to assess and address change (i.e., mitigation, adaptation). As such, TK can identify gaps in scientific knowledge, offer alternate interpretations of observations, and provide a more holistic and long-term understanding of the environment. Overall, this can encourage the development of appropriate community responses that help maintain the integrity and resilience of the environment and the relationships between communities and the land over time.

As an approach to monitoring, CBM offers a range of benefits to communities, researchers, government agencies, non-governmental organizations, and other interested parties. For example, CBM can increase the capacity of communities to document and respond to change, and of scientific researchers and management agencies to collect year-round data. CBM can support development of new networks and relationships, and can lead to the co-creation of data that decision makers can use across the range of scales needed to make informed decisions about the stewardship of the environment in the context of changing climate and land use.

Designing and implementing a CBM project also creates a number of challenges including:

- Finding funding and individuals to do the work.

- Data management within different knowledge systems, which requires planning, capacity and attention to detail and some consistency given traditional and/or Indigenous knowledge.

- Developing a shared or co-created approach that respects and recognizes rights holders (i.e., First Nations) and their knowledge.

In order to consider the role and value of CBM in northern Ontario, we asked the following questions of experienced CBM practitioners:

- Why do we want community-based monitoring?

- What is monitoring in your own words and from your own perspectives?

- What do we monitor?

- How do we monitor in community-based monitoring?

Why Do We Monitor?

It is important to find out if people in the community understand what community-based monitoring (CBM) is, and if they think it is important and why. In our session, we invited experts and participants to explore why CBM is important and identify the key challenges for their communities. These issues can help determine what First Nations might want to monitor and inform the goals and design of a CBM project.

Shaunna Morgan Siegers with the Indigenous Leadership Initiative, describes why CBM is important for Indigenous Peoples today.

Shaunna Morgan Siegers with the Cree Nation of Waskaganish and representing the Indigenous Leadership Initiative[3a] on the panel started by quoting an Elder:

"If you push a man and he's standing in a field, that is one thing. But if you push a man and he's standing at the edge of a cliff, that's a completely different thing."

Many Indigenous Peoples are experiencing the cumulative impacts of development and climate change in their communities and on their territories. In many places, there are impacts on people's health and this has caused death and illnesses. Shaunna felt that CBM was important because it allowed her community to keep track of what is happening on the land, share that information with each other, and use this information to help do things differently. She also emphasized that Indigenous Peoples have relationships with the plants, the waters, and the animals and lean on these relationships, including asking for guidance on how to do things in a good way. Shaunna also noted that there have been socio-economic studies in Canada[3] and Australia[4], where Guardian or similar programs have been developed, that show there are many positive benefits to maintaining the connection of Indigenous Peoples to the land. For example, social benefits include reductions in suicide and incarceration rates and violence against women. CBM programs can help people feel like they have a purpose in taking care of the land.

[3a] https://www.ilination-hood.ca/

[3] https://www.ilination-hood.ca/our-work/guardians/

[4] https://www.environment.gov.au/indigenous/workingoncountry/publications/pubs/fs-woc.pdf

Jennifer Simard with Moose Cree First Nation and a member of the panel began by describing her personal experience with monitoring. She felt she was born where she was for a reason and that her whole life has been preparation for this role starting with time spent on the land in her childhood and youth with her family. She felt many people in communities feel the same responsibility to look after the land – their home – as she does. While Indigenous Peoples have been looking after the land for many years, they have been marginalized in decision making for too long. As a result, in many places, the situation for First Nations and the environment is bad and many mistakes have been made. Jennifer described, for example, how when they began their process of monitoring, they had a ceremony to ask the Creator for forgiveness for the damage that had already been done to the land, water, and community. She emphasized that it is time to step up and bring these lessons to neighbours and partners in a good way so that the information and process will be respected and used. She emphasized that Indigenous Peoples still want to share this information, which is a good thing, but that the current approach in policy, management, etc. needs to give space to and protect these efforts. CBM can be one way to do this.

Jennifer Simard, Moose Cree First Nation, describes how she has been preparing for her role in monitoring all her life.

Billy Isaac with Moose Cree First Nation and a member of the panel described how he enjoys being out on the land, conducting fieldwork, monitoring the rivers and the land, and animals, and birds. He said we all share the land and need to work together. He enjoys talking to people about what they are doing (e.g., setting nets, hunting, fishing), learning, and what is changing over time. Billy also recognized the importance of taking the family out on the land and teaching young people about the importance of taking care of the land. Finally, Billy has noticed many changes in the weather over the years, making it difficult to travel. He felt his community had to learn how to adapt to these changes.

Billy Isaac, Moose Cree First Nation, talks about why he enjoys being on the land and monitoring change.

Sam Hunter, Weenusk First Nation, describes some of the adaptations in the animals around Peawanuck.

Sam Hunter, an Environmental Steward with Weenusk First Nation and a participant in the CBM workshop, described his role and the importance of CBM in Peawanuck. He described sharing knowledge from western science with the community and working with the Elders to consider the changes they were seeing now. He described changes they are seeing in the animals around them, including snow geese, as well as adaptations by polar bears, which are eating new foods such as birds and black bears. Some of the adaptations that his community are making include plans to grow their own food and raise their own animals to help offset the high cost of food at the Northern Store. He also predicted that more people would be moving into the north as climate change starts to open the region.

Xavier Sugatch, Eabametoong First Nation, describes how he has spent years on the land, watching and learning about the changes he sees.

Xavier Sugatch, the community-based land-use planning coordinator with Eabametoong First Nation, described how, even though he doesn't have a formal monitoring role, he has spent many years on the land, watching and learning about the changes he sees. He has also documented these changes over time using photography. He described the changes he has observed in the distribution, numbers and behaviour of animals, waters, and land, including species declines, such as for leopard frogs, and new species coming in, such as pelicans. He has also observed and documented the impacts of mining and exploration companies. His main concern is that all this Traditional Knowledge is in his head, and when he goes, he'll take that knowledge with him.

Other workshop participants offered their perspectives on why monitoring was important to them. The main themes drawn from conversations during the session and round-table discussions, include:

- It is important to reconnect Elders and youth and support teachings about roles and responsibilities in taking care of the land and to support youth in stepping into their roles of protecting the land. Youth are not engaged, but Elders are willing to help. CBM can be a way to help re-engage youth through cultural awareness and language teachings. Elders can

provide these connections and support these relationships and teachings.

- CBM can benefit the community as a way of restoring skills and sharing knowledge and values. This sharing can be between Elders, "baby elders", and youth as well as among adults who often don't have much time to go on the land because they are working. Communities may need to create a space to support this sharing process and dialogue. Through this sharing process, the community could become more accountable and responsible for taking care of the land.

Elder Joel Bighead and Bellamie Bighead from Wunnumin Lake First Nation share their insights on how to take care of the land.

- Developing a CBM program as a way of "stepping up" and taking a lead at the community level to take care of the land. This would also shift the "pendulum" towards knowledge systems based on Indigenous knowledge and processes that draw on their stories of origin and relationships with the land and Creator. This approach recognizes that First Nations have been the eyes and ears on the land for many years. Ultimately, CBM can be a way to create change in how we relate to the land, water, and animals and this will benefit all of us, including the settlers and colonizers.

- CBM can be a way for Indigenous Peoples to have a greater role in decision making affecting their traditional territories.

- CBM could be a way to protect, maintain, and monitor cultural and sacred sites that are important to Indigenous Peoples. For example, maintaining fishing camps and cabins also enables people to maintain a presence on the land. In addition to environmental monitoring, CBM could be a way to support Indigenous communities to continue with social and cultural activities and protecting sacred sites.

Wayne Neegan, Constance Lake First Nation, suggests CBM could be a good way to promote sharing within the community.

- CBM could be a way to include and draw on the power of ceremony and individual and community values in taking care of the land by asking the land for guidance on how to proceed and what is needed.

- CBM can be a way for youth to experience other forms of employment and training opportunities, for example, as Guardians or Environmental Stewards. This is important, because few remote communities have access to good science education and few opportunities for employment that are focused on taking care of the land.

- Workshop participants highlighted a number of issues as important for their communities that should be part of a CBM program or project including:

  o Using multiple knowledge systems to understand the impacts of glyphosate-based herbicides, deforestation, and erosion. CBM could be a way to document concerns about these impacts and share the information within and across communities and with partners, as well as a way to demand changes in policy and practice.

  o Applying this knowledge in a good way to create policy and processes for the land and water that respect the values and information gained through CBM.

  o Using multiple knowledge systems, track contaminants, particularly mercury, in water and fish and consider the impacts on human health.

  o Track new species of animals (e.g., pelicans, turkey vultures, pigeons, snow geese) and plants, some of which the communities have no names for or stories about.

  o Tracking changes in the number and distribution of animals and plants that are important to the community for food, medicines, and other values. This has implications for food security and First Nations well-being.

- Being aware of who else is out on the land, letting those people know whose territory they are on, and also monitoring what they are doing. CBM could be a way to help document and monitor outsiders activities and impacts.

Isabell Souliere, Missanabie Cree First Nation/Mushkegowuk Council, describes why cultural sites need to be a part of a CBM program.

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- All participants expressed concerns about funding and having support to do this work. Often funding is piecemeal. Many First Nation communities have applied for funding through existing sources. A number of participants expressed support for increasing the funding for the Guardian Program. Some participants mentioned approaching industries to help support the monitoring interests in their community.

Overall, there is a huge interest by First Nation participants in developing and implementing a CBM initiative and they felt it would be very useful to their communities.

What Is Working Well in CBM?

Jennifer Simard with Moose Cree First Nation described that the monitoring program with Moose Cree First Nation grew out of a negotiation with Ontario Power Generation (OPG) based on a past grievance about a project that created over 50 years of damage on their river (e.g., impacts to fish, flow, water quality). The grievance gave them some leverage when OPG wanted to redevelop the Lower Mattagami. However, the community didn't just want a cash settlement. They wanted to be part of determining what would be done in the new project and how it would go forward in the future. Jennifer's community negotiated for nearly 20 years to establish this partnership based on their terms. This work had to be done up front and while there was funding and resources available as a result, this situation may not be the same for other communities.

While a partnership still requires working together, Jennifer described the main successes as having up-front funding for the projects they wanted to do, being able to set the terms and create the framework that included Moose Cree needs, interests, and values, and that the project brought the community together to share and talk about what they

wanted. People said they wanted to have a healthy river and know that their great-great-children will be able to come to the river and know that they will still be able to use that water. Jennifer emphasized that Elders are an important part of the process and they are recognized and compensated for their time and expertise.

Shaunna Morgan Siegers with the Indigenous Leadership Initiative described some successes of the Guardians Program. First, she talked about funding. The recent announcement of funding support of the Guardians Program is a good start, but this was much less than requested and will need to be divided between the three groups of Indigenous Peoples in Canada. Despite the outcomes of the Haida Gwaii Program[5], which has been in existence for over 40 years, and the Innu Nation program, which has been in place for over 30 years, the Government of Canada needed more proof that empowering Indigenous Peoples to be the caretakers of the land and maintaining their relationships with the land, works. Consequently, the Indigenous Leadership Initiative sees this recent funding from the government as a "pilot". While Guardians need to be able to control the money, determine what the terms are and how the money will be applied, Shaunna indicated that some funds will go to established programs while it is still to be determined how the remaining funds will be used to support programs that haven't been established yet.

Second, Shaunna noted that the funding is considered to be core funding and can be applied to support the communities own program and vision and hopefully employ 1-2 people to go out and do this kind of work.

Third, Shaunna talked about the Innu Nation Guardian Program[6] as an example of one Guardian Program to highlight how they got the project started and what worked well. Similar to Moose Cree First Nation, the Innu Nation in Newfoundland were dealing with many issues on their land, including low-level flying aircraft that affected caribou behaviour and health. There was also mining, forestry, and hydroelectric development. After protests and engagement with the Premier, the Innu were able to negotiate that if forestry companies wanted to work in the forest, they had to let the Guardians monitor the outcomes. This included a role for Guardians in developing the forest management plan in which the Guardians were paid by the company, but worked for the Innu Nation. Over time, it became clear that the Guardians were doing a better job of managing the forest. Similarly, with mining, the Guardians detected a leak in the tailings pond that prevented a lot of damage to water and resulted in a lower fine for the company. Finally, because the Guardians Program was successful, other development projects were also allowed to go forward using this model.

5 https://www.pc.gc.ca/en/culture/autochtones-indigenous/gardiens-guardians

6 Guardian programs focus on environmental training for Indigenous Peoples. They increase environmental management capacity while supporting traditional knowledge and cultural values. See more information about the Innu Guardian Program at St. Mary's University online at http://www.smu.ca/research/innu-guardian-program.html

How Is CBM Considering Climate Change?

Jennifer mentioned the Elders always talk about water levels and climate change as being related. Within the current monitoring plan, however, this aspect needs to be included more directly. She noted that the recent Ontario government's emphasis on climate change has resulted in changes in the way infrastructure, such as dams, are assessed. For example, to address the impact of extreme weather events predicted with a changing climate, the response has been to build bigger/higher dams. She also described how infrastructure is considered an asset and companies are investing significant money into "protecting" their assets from climate change. But, there is no equal consideration or funding allocated to the social and cultural values that are affected by climate change. In many cases, the mitigation strategies themselves (e.g., carbon markets, offsets) also impact the community and their social and cultural values. She knows Elders have different insights and teachings about climate change and what should be done and these actions should be brought into the conversation. She mentioned that it is challenging to describe ideas like offsets for pollution and carbon trading when the Cree language has no word for carbon, for example. At this stage, her community is fighting for the opportunity to have the conversation about climate change – why it is happening and what can be done about it.

Shaunna mentioned that climate change will have impacts on the forest through extreme weather leading to more fire as well as more pests that can affect the trees. This could lead to more devastating wildfires similar to what happened in northern Alberta. Monitoring for moisture and forest pests (e.g., mountain pine beetle, emerald ash borer) will be important components of a CBM program.

What Is Monitoring?

Once the community has decided monitoring is important to them and they want to consider a CBM approach, a next step can include finding ways to describe what "monitoring" means to the community. For example, the Łutsël K'é Dene First Nation considered the "monitoring" in the Chipewyan language and came up with the following:

Net'î horédhâ honeltÿn benerédí dhi bek'orejâ t'así Æedø núdhier jâ ʔîåá háyorñla náts'edé sí

which means, "*watching, listening, learning and understanding about changes in the community*" (Parlee 1998).

First Nations participants in this session did not have any other words for monitoring from their perspective or language and all were comfortable and seemed familiar with the use of the term community-based monitoring or CBM.

Within the community, some other ways for collecting this information could include a community meeting to get some ideas about monitoring and working with Elders and local literacy experts to identify words in the local language and consider how monitoring ideas and concepts can be translated from western and/or scientific perspectives that are predominantly in English. Since Elders are the experts in the local language, their role in the accurate recording and translation of their words is very important.

Figure 2. Summary of Day 1 of the CBM workshop.

How Do We Monitor?

The goal of this session was to begin to consider the value and role of indicators based on the best available information (e.g., science, traditional knowledge). Indicators are signs or symbols of change. Indicators can help show how the health of the community and environment is changing over time. Some indicators can also show the changes or the effects of industrial development projects on the community such as employment, language retention, and time on the land vs. employment. If these indicators are also included in relevant planning and management processes with the community, then monitoring can be an effective tool for understanding and addressing these effects.

Beedahbin Desmoulin, Four Rivers Environmental Services Group, suggested CBM is a way to document the damage being done to Mother Earth.

Participants highlighted a number of social and ecological issues and concerns that were affecting individual and community health and well-being, including:

- impacts on land, water, fish, wildlife and human health due to forestry activities, mining and hydroelectric impacts,

- contaminants, especially in country foods,

- impacts of development and climate change on cultural sites,

- presence of new species of animals and plants for which there were no names or stories,

- health and availability of species that First Nations harvest and that have important cultural and ecological functions,

- loss of language, which has direct consequences for maintaining relationships with the land, water, fish, and animals,

- loss of connection between youth, Elders and community and their relationships with each other and responsibilities in taking care of the land.

To help consider these issues, a CBM project or program would involve the community identifying what kinds of indicators would be useful to begin measuring as a way to document and understand what was happening in terms of health and well-being. Monitoring generally

involves three tasks: data gathering or information collection, summarizing and evaluation, interpretation and reporting.

To begin this session, we invited Jennifer, Shaunna and Billy to talk about their experience with how they developed monitoring programs

Jennifer described that, as a first step, MCFN considered all the information that was available for the river based on western science. There were many studies that had been done, but MCFN didn't have the information that had been collected. Consultants provided a summary and a gap analysis and noted about 50 areas where information was either not available or missing, which could be the basis for a monitoring program.

This report was shared with the community and the Elder advisory group who identified and highlighted areas of high traditional use and other important information about the river. The community also wanted to identify reference rivers where there is lots of community use and likely traditional knowledge and compare this with information on the Lower Mattagami, which is more impacted.

Elders started generating indicators as they talked about their knowledge of the creeks and rivers and shared stories about their traditional use. For example, they would set up fishing camps in areas where certain minnows were found since the minnows meant the water in the creeks was good to drink. This is an excellent example of developing indicators based on local and traditional knowledge – indicators that were already being measured by people out on the land. **Traditional Knowledge Indicators** reflect the knowledge and experiences of Elders and previous generations of Moose Cree First Nations.

Orion McKay, from Kitchenumaykoosib Inninuwug, fishing on the Fawn River

Jennifer also identified indicators based on what was already being done based on standard western scientific monitoring programs focused on water quality and other aspects of aquatic health based on

western science Indicators. These indicators reflect knowledge gained through non-MCFN institutions.

These two kinds of information were used to create relevant social and ecological indicators that then form the basis of their monitoring program. The two sets of indicators may be interrelated or not, but both can contribute to a better understanding about what is happening. Together, these indicators can help fill in the gaps in information and provide important feedback to the community about the impacts of a project. Finally, Jennifer noted that you may not know all the things you need to monitor until you are out on the land and see what is happening.

Kelvin Moonias, centre, and Neskantaga community drummers

Shaunna described some of the big-picture components that are relevant to CBM. One of the first things that Elders talk about is the need for and importance of ceremony. By preparing the heart and head, you are able to receive guidance from the spirit and ancestors or to pray in a way that prepares you, with humility, to ask what the land, animals, and water need. In turn, this allows participants to receive the knowledge and use it in a good way. Including and relying on the Elders is fundamental to understanding how things are changing, what things were like, and what indicators are important and useful.

Another factor Shaunna emphasized was governance. What are the laws and policies that the community has put in place (e.g., hunting laws)? These laws help identify what you need to watch for and monitor for.

Finally, Shaunna described different tools such as I-Tracker software that can support data management and help you collect and organize the information. However, you may need to work with people with experience in data management and analyses to support reporting, including maps. Maps can be really useful tools at various stages of the process, particularly if they include Indigenous place names. Shaunna emphasized that many Indigenous place names have information about the land and the relationships to that place embedded in the language, making Indigenous place names a powerful tool in CBM.

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Developing Indicators

The published literature on CBM practice suggests that some of the questions to ask when considering what indicators are useful to the community include:

- Is it relevant to your community?

- Where does the indicator come from?

    o Traditional knowledge indicators

    o Science indicators

- How easy is it to gather information on this indicator?

- How much does it cost to collect information on this indicator?

- What does the community think is most appropriate for measuring change and why?

Collecting Data and Information on the Indicators

Some of the issues to consider when collecting the information include:

- Rules and protocols for collecting the information (both social and ecological).

- Confidentiality.

- Timing for the collection of data. Are these seasonal indicators (e.g., fish migration, wildlife movements, ice dynamics, water flow)?

- How do you include the community in collecting the information?

- How do you include different perspectives due to age and gender?

- How do you store and access the information to protect confidentiality and address ownership and security?

There are many tools to help with the collection of information including:

- Paper and pen.

- Recorders (video, audio).

- Computers and hand-held devices such as tablets and iPads as well as storage devices.

- Software and apps designed specifically for data collection (e.g., I-Tracker Land Patrol Application[7]).

Some of these tools may require specialized training, but a general rule of thumb is to keep it simple.

Approaches to Collecting the Information

Approaches to collecting the information will depend on the indicator. **Social indicators** will rely on social methods such as interviews, focus groups, or other ways of hearing from individuals and groups in the community. Observations can be recorded using different approaches (e.g., journal, mapping). These records can be systematic and organized or freestyle, unstructured records collected on a regular basis. They could include meetings that are organized by theme and scheduled regularly and reported on. They may include a survey of the whole community. **Ecological indicators** will determine the methods used, including remote sensing, sampling, and modeling. These approaches vary depending on whether you are considering aquatic or terrestrial indicators.

Other examples include:

- **Patrol** – local people record their observations of specific environmental conditions important to the community.

- **Human Sensor** – interviews during one-on-one, group or community meetings.

- **Journal** – keeping a journal, to regularly record personal observations of environmental conditions.

[7] http://www.nailsma.org.au/i-tracker/i-tracker-land-patrol-application

- **Community maps** – collecting and sharing traditional knowledge-based spatial information about past and current land use.

- **Seasonal calendars** – documenting changes in fish and wildlife, and other important sources of local subsistence.

- **Participatory media** – community radio and/or video to document and share information about environmental changes.

Evaluating the Information and Knowledge Co-Creation

As data and information are collected, it is important to evaluate the information. The Multiple Evidence Based (MEB) approach is one framework for doing this in a way that respectfully braids together Indigenous, local, and scientific knowledge. This approach recognizes that evaluating knowledge *within* rather than *across* knowledge systems leads to greater understanding and new insights and innovations for knowledge co-creation. There are five elements associated with knowledge co-production:

- Mobilization includes articulating knowledge in forms that can be shared with others.

- Translation implies interactions between knowledge systems based on mutual comprehension of the shared knowledge.

- Negotiation means joint assessment of convergence, divergence and conflicts across knowledge contributions.

- Synthesis shapes a broadly accepted common knowledge that maintains the integrity of each knowledge system, rather than 'integrating' one into another.

- Application emphasizes knowledge that is useful for decision-making that in turn feeds back into respective knowledge systems.

An MEB approach creates the groundwork for the respectful and equitable inclusion of traditional knowledge in monitoring and governance in CBM (see more details in Raygorodetsky and Chetkiewicz 2017).

More recently, the Indigenous Circle of Experts in their report[7b] recommended that this approach to knowledge co-production must take place within an **Ethical Space** – a neutral zone of dialogue (Ermine 2007) – between the Indigenous and Non-Indigenous worldviews where respect for culturally appropriate processes, time frames, and protocols have been proposed.

Reporting and Sharing the Information

Once the information is assessed and evaluated, it is up to the community to determine how to report and share the information. To do this, consider:

Who is your audience?

- Community

- Outside researchers

- Partners or collaborators

- Government, industry, others

- Funding sources

[7b] https://static1.squarespace.com/static/57e007452e69cf9a7af0a033/t/5ab94aca6d2a7338ecb1d05e/1522092766605/PA234-ICE_Report_2018_Mar_22_web.pdf

What are some of the ways of reporting and presenting the information to these audiences? These can include formal and informal reports, shorter briefings, posters, visual recordings and video presentations, PowerPoint and multi-media presentations, and web-based materials.

Participants brought up a number of points in this session through conversation and round-table discussions around the "how" of monitoring:

- **Ownership, control, access, and possession (OCAP) of First Nations cultural knowledge, data, and information**. Any CBM project involves the gathering of information. The ownership of this information requires careful consideration, especially Traditional Knowledge since current legal systems do not offer comprehensive protection of intellectual property rights related to TK. OCAP are a set of principles that reflect First Nation commitments to use and share information in a way that brings benefit to the community while minimizing harm.[8] It is also an expression of First Nation jurisdiction over information about the First Nation.

Mike Morris, Kasabonika Lake First Nation, shared his thoughts about how to manage traditional knowledge within First Nations communities.

- **Territorial integrity of First Nations homelands.** First Nations use the land and the land belongs to the people. Some First Nations have decided that before they talk about protecting and taking care of the land, they need to talk to the Creator and put their trust in the Creator to look after the land. Elders are very clear that the land is their homeland and every individual has a responsibility to take care of the land and that there are consequences for people who do not take care of the land or respect each other. Words such as "Ontario's Far North" as well as some of the attitudes of government towards First Nations in land-use planning often fail to consider this level of territorial integrity that is necessary for CBM.

- **The importance of traditional knowledge.** Participants talked about the importance of place names and the fact some people are very active on the land and applying this knowledge regularly. While the shift toward more focus on Indigenous knowledge is good, there is a need by First Nations to talk about how to move this process on their own terms and avoid this knowledge being considered "secondary" or "not measuring up to white-man's knowledge." Some of the ways this information has been collected includes talking to Elders about what the world was like when they were young and considering baseline data.

[8] http://fnigc.ca/sites/default/files/docs/ocap_path_to_fn_information_governance_en_final.pdf

Anisa O'Nabigon, Long Lake No. 58 First Nation, talks about youth engagement in her community.

- **The importance of cultural awareness for First Nation youth.** Some participants noted that communities need to "get their people back first," meaning efforts to address drugs and addictions, including to electronic media. The effect on youth was described as one of an "identity crisis" where youth do not know their place in this world or Creation. There have been many efforts in communities to get youth back on the land as a way to address these social issues. In some programs, like the Guardians, youth go through rites of passage before they are able to help with the work. Language is an important way for young people to connect with the land and who they are as Indigenous people. Some communities are engaged in efforts to teach the language.

- **The need for a regional network.** As a way to continue working together and learning from one another, a regional network could help people track various species, such as invasive species. They could also provide important hubs for learning from each other as well as sharing information about funding and approaches to collecting data and information on both social and ecological indicators.

We wrapped up this part of the workshop, by noting that we had gone through some of the key questions that are asked in advance of establishing a community-based monitoring project. We also learned about other types of CBM projects and approaches such as the Guardians, Tracking Change, and monitoring around development projects and climate change. We also learned about some of the potential funding opportunities through INAC[9] and the Indigenous Leadership Initiative.

[9] https://www.aadnc-aandc.gc.ca/eng/1512489182833/1512489213839

Next Steps:

- Participants were interested in continuing the conversation and working towards a CBM project in their community where possible.

- Participants suggested a listserve be established to share information on funding and resources. Cheryl agreed to establish this e-mail process based on the contact information for those in the room.

- Some participants wanted copies of the report, the recording, and other materials that were available during the workshop. Cheryl agreed to make the presentation available at the Up North ON Climate Change website[10] and would mail materials to those individuals who requested them.

- Some participants were interested in applying for funding and/ or were waiting to hear about funding proposals. Cheryl offered to support proposal development and writing where requested.

- Cheryl will also lead the development of a simple toolkit or guide on CBM to support communities interests in northern Ontario.

[10] https://www.up northonclimate.ca/ 2018-conference/

Figure 3. Summary of Day 2 of the CBM workshop.

Appendix 1. Participants in the CBM Workshop

Name	Title (Work Position, Elder, Youth, etc.)	First Nation or Organization
Molly Morse	Environmental Policy Analyst, Indigenous Community-Based Climate Monitoring Program	CIRNA (INAC)
Wayne Neegan	Communications	Constance Lake First Nation
Xavier Sagutch	CBLUP Coordinator	Eabametoong First Nation
Beedahbin Desmoulin	Education and Training Coordinator	Four Rivers, Matawa
Jason Chapais	Environmental Monitor GFN	Ginoogaming First Nation
Sasha Michano	TK data collector	Ginoogaming First Nation
Christey Allen	Climate Specialist	Grand Council Treaty #3
Mike Morris	Councillor - Education, Governance, Major/Minor Projects	Kasabonika First Nation
Dan Duckert	Consultant	Keewaytinook Okimakanak (KO)/ Laurentian University
Roger King	Traditional Teacher	Kiashke Zaagin Anishinaabek (KZA)
Wayne King	Elder	Kiashke Zaagin Anishinaabek (KZA)
Lana Ray	Assistant Professor	Lake Helen/Lakehead University
Lindsay Galway	Researcher, Lakehead	Lakehead University
Frank Mallory	Professor	Laurentian University
Anisa O'Nabigon	Mine Liaison, Economic Development	Long Lake No. 58 First Nation
Gale Desmoulin	Administration Assistant	Long Lake No. 58 First Nation
Cheynna Gardner		Migisi Sahgaigan
Karen Tom		Migisi Sahgaigan
Juliet Rickard	Community Planning and Liaison Officer	MoCreebec Eeyoud
Mark Dunn	Manager, Relationships and Collaborations Projects	MOECC
Pamela Lamba	Senior Advisor	MOECC
Isabell Souliere	Environmental Steward	Mushkegowuk Council/Missanabie Cree First Nation
Rory Joseph	Governance	Naotkamegwanning First Nation
Debbie King	Environmental Technician	Pays Plat First Nation
James (Jim) Suggashi		Poplar Hill First Nation
Tom Anderson	Consultation Coordinator	Shoal Lake Band #40

Name	Title (Work Position, Elder, Youth, etc.)	First Nation or Organization
Helen Leask	Writer-Journalist	University of Toronto
Bill Petiquan	Elder	Wabauskang First Nation
Terri Meekis		Wabauskang First Nation
Robert Parenteau	Resource Director	Wabigoon Lake Ojibway Nation
Doris Wabasse	Programs Assistant	Webequie First Nation
Sam Hunter	Environmental Steward	Weenusk First Nation
Bellamie Bighead	Translator	Wunnumin Lake First Nation
Clarence Anderson	Councillor	Wunnumin Lake First Nation
Curtis Martin	Youth	Wunnumin Lake First Nation
Joel Bighead	Elder	Wunnumin Lake First Nation
Tommy Sainnawap	Climate Change Coordinator	Wunnumin Lake First Nation
Tanya Chung-Tiam-Fook		York University

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