Indigenous Guardians Data Roundtable

Yellowknife, Northwest Territories
30-31 January, 2024

Executive Summary

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Indigenous Guardian programs within Canada support Indigenous environmental stewardship and land management through a network of over 85 First Nations, Inuit, and Métis-led programs across the country. Indigenous Guardian programs and funded harvesting programs directly support Indigenous self-determination and food sovereignty. While each program has unique objectives, the overarching goal is to support Indigenous environmental stewardship and land management.

The Northern Indigenous Stewardship Circle (NISC), Geomatics and Cartographic Research Centre (GCRC) at Carleton University, and Exchange for Local Observations and Knowledge of the Arctic (ELOKA) collaboratively organized the Indigenous Guardians Data Roundtable, with support from the MakeWay and Oak Foundations. This gathering was held January 30 and 31, 2024, on the traditional territory of the Yellowknives Dene on Chief Drygeese Territory, as part of Treaty 8, in Yellowknife, Northwest Territories. Mandee McDonald served as the facilitator for the gathering. Indigenous Guardians and program leads met to discuss data they collect during harvesting and land stewardship programs, use of these data, and needs and priorities relating to data management, including how data management and data sharing can help sustain Guardian programs. This gathering contributed to a broader effort to support direct exchange and learning among Guardian programs in northern Canada and beyond.

Over the two days, representatives from various programs shared broadly about their program goals and experiences with data management through a series of panels, presentations and group discussions. Although the workshop theme was focused on "data," the wide-ranging discussions illustrated the ways that data management practices are central to supporting program sustainability and longevity. For example, data are tied to program evaluation and communication of benefits and impacts, which is critical not only to engage funders but also to demonstrate to community members and decision-makers the important roles of Guardian programs.

Cover: In winter, wisps of heat appear as brush strokes above the skyline of Yellowknife, Northwest Territories, Canada. Courtesy of Jcca/iStock

Introduction & Background

While Indigenous peoples have been stewarding and caring for their traditional territories for millennia, a powerful new interaction of Indigenous land-stewardship has recently merged; one that encompasses Indigenous Guardian programs, land-based education programs, and hunting and harvesting programs. Indigenous stewardship of the land impacts economies, policies, health and wellness, research, and much more and on many levels.

Indigenous Guardian programs have grown exponentially across the country. In 2016, there were approximately 30 Indigenous Guardian programs in Canada, by the end of 2023, there were over 160 First Nations Guardian programs in operation (Indigenous Leadership Initiative 2024). Guardians are often described as the "eyes and ears" of their homelands, monitoring and managing their lands, waters, and wildlife, while preserving, strengthening, and passing on culture, language, and values. These programs are often connected to protected areas (e.g. Indigenous Protected and Conserved Areas (IPCAs), National Parks, and other protected areas) and official agreements recognize their critical roles (e.g. the Nauttiqsuqtiit Inuit Stewards of the Tallurutiup Imanga National Marine Conservation Area in Nunavut).

Hunters and harvesters are also part of the land stewardship movement and there is an increase in hunting and harvesting programs and activities across northern Indigenous communities. In Inuit Nunangat, for example, communities are exploring how local hunters can

Robert Kautuk drives a 4-wheeler with his son in Clyde River, Nunavut. Credit: Ruben Ramos/iStock

support food security and teach and mentor the next generation of hunters, and how they can create, scale-up, and sustain country food markets or fisheries (Hibbert et al., 2023). The Angunasuktiit full-time harvesting-instruction program in Clyde River, Nunavut, is one example (Ittaq Heritage & Research Centre, 2024).

Guardian programs also contribute to Indigenous self-determination and governance. Data collection and use for Guardian programs is directly linked to Indigenous data governance, which speaks to the importance of data to support governance of Indigenous nations, the gaps in relevant data needed to support Indigenous self-determination, and the ownership of data collected on Indigenous lands and about Indigenous peoples (Carroll et al. 2019). Indigenous data sovereignty reflects the inherent right of Indigenous nations and peoples to control how Indigenous data is collected, used, and shared. In Canada, the detailed, formally asserted concept of Indigenous data sovereignty emerged in the late 1990s and is most notably stated as the OCAP Principles (Ownership, Control, Access, Possession) (Schnarch, 2004; Mecredy, 2018, FNIGC 2024). More recently, Inuit in Canada have asserted their right to data sovereignty through the National Inuit Strategy on Research (ITK 2018). The

concept of Indigenous data sovereignty "derives from tribes' (or Nations) inherent right to govern their peoples, lands, and resources" (Native Nations Institute, 2024) and in this context, Indigenous Peoples' data refers to "data generated by Indigenous Peoples, as well as by governments and other institutions in and about Indigenous Peoples and territories" (Carroll et al., 2020). Historically, Indigenous communities and nations have been excluded from the data management process, even if they were involved in data collection. Non-Indigenous institutions largely stored and managed Indigenous data, without the involvement of Indigenous Peoples (Carroll et al., 2020). Indigenous data sovereignty shifts this dynamic and allows Indigenous Peoples to decide how their data is collected, managed and shared.

Bottom left: An inukshuk marks the Arctic Circle in Auyuittuq National Park, Nunavut, Canada. Courtesy Isaac Demeester/Unsplash; Bottom right: An Inuit woman carries her child in Clyde River, Nunavut, Canada. Courtesy Peter Prokosch/Grid-Arendal/Flickr; Opposite: A satellite image captures the Mackenzie River Delta, where snow-and-ice-covered waterways contrast the green of pine-covered land. Courtesy of NASA

DATA COLLECTION

Throughout the meeting, participants discussed data collection, management, and challenges related to their Guardian or stewardship programs. While the specific focus and activities of Indigenous Guardians varies across programs, many programs collect data and observations as part of environmental monitoring and land management. Through presentations and group discussions, we heard from programs about data collection, data management, and utilizing local knowledge as well as digital tools and applications for data management and sharing. Data collected includes and is not limited to:

* Harvesting data such as species harvested and timing and locations of harvests, health and condition of animals;

* Environmental data such as sea ice thickness and salinity, water quality, wind and weather observations, permafrost depth, and erosion of coastal regions and riverbeds;

* Monitoring invasive and native species, tracking migration patterns, and monitoring species health.

Many programs share these data to inform a range of activities including resource management, land use planning, travel safety, and search and rescue.

During the panel: "From the Ground Up: Community-ty-led Monitoring programs" Petter Jacobsen with the Tlicho Government's Ekwo Naxoehdee K'e—Boots on the Ground caribou monitoring program, Mike Low with Dehcho First Nation's Aboriginal Aquatic Resources and
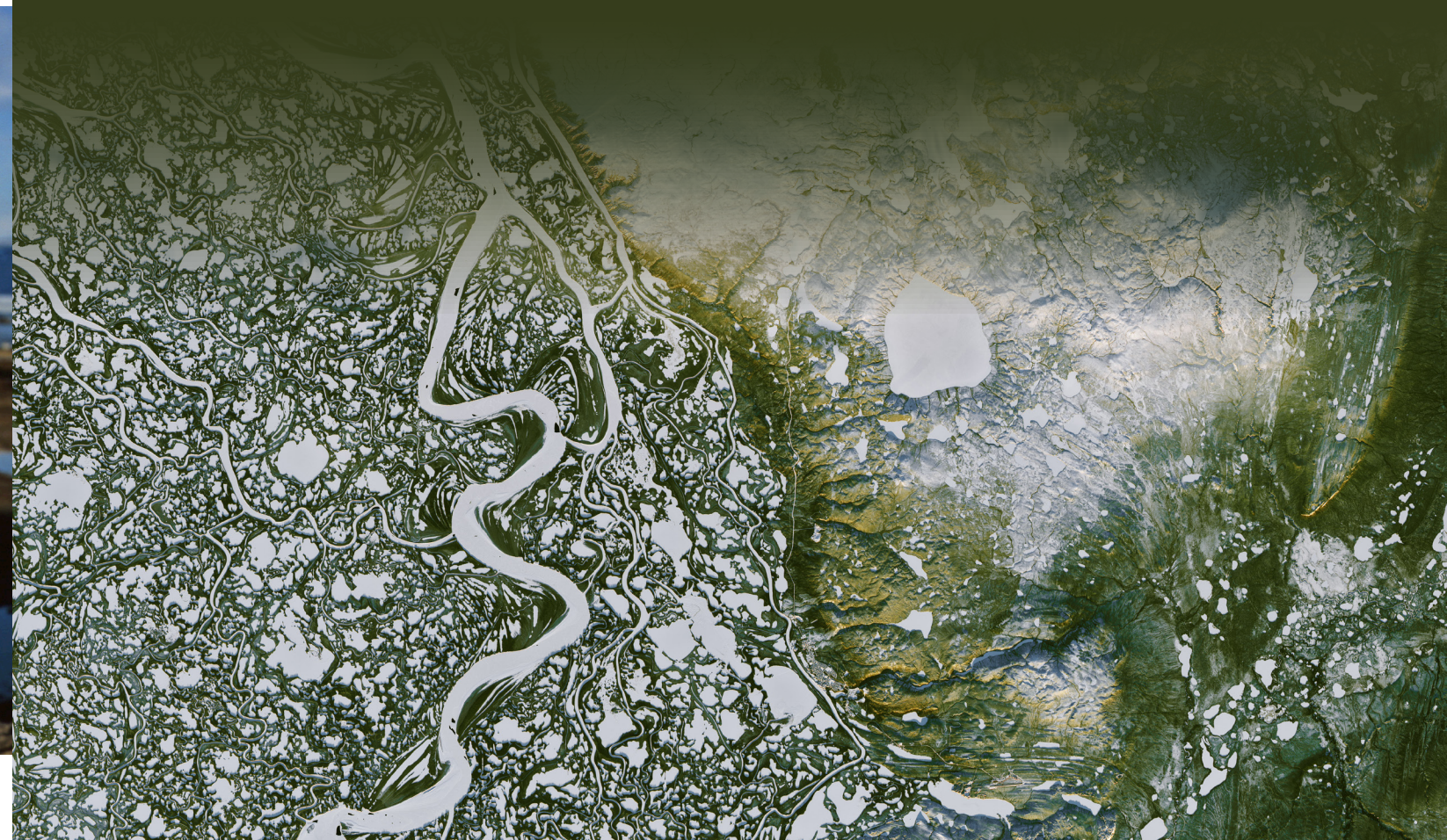
Oceans Management (AAROM) program, and Morgan Voyageur from the Athabasca Chipewyan First Nation shared the history and evolution of their programs and how they collect and manage data.

Mike was raised in Hay River and is Métis and Inuvialuit. He works with the Dehcho First Nation AAROM Monitoring Program. Initially, the community had questions about contaminants, fish health, and water. They began a community-based research project that evolved into a Guardian program. Now, they are looking to expand their funding and partnerships to answer many other questions that the community has.

Morgan is the community-based monitoring manager for the Athabasca Chipewyan First Nation. His program is located on the Peace Athabasca Delta and they are monitoring pollution coming from the Athabasca Delta and floods from the Peace River. The project started when community Elders decided they needed their own data, rather than relying on government data, given time delays and other challenges in accessing government data. Their approach mirrors a western approach to data collection, while still including traditional knowledge. They now have two programs, one is a guardian program that is based on youth and Elder exchanges on the land, and the other program is a community-based monitoring program. They developed a database to host collected data and to help inform future objectives. Much research from visiting researchers is conducted in Peace Athabasca Park, but often these data are not shared and many researchers end up doing overlapping data collection. They also became co-managers of Peace Athabasca park, so they can help choose which external research permits to allow. They are creating a server to hold the data for the network of nations. The server should be running within two years.

Petter has been working for the Tłıchǫ government for eight years. He helped develop a "boots on the ground" caribou program that was initiated in response to the decline of caribou and lack of trust in government biologists among the Elders and community. The program reflects the community's desire to reconnect with the land and started with Tlicho chiefs, Petter, and three other Tlicho men. When they first started going out on the land, Petter would ask the Elders "what are we doing". The Elders responded, "We Watch Everything," which is what they decided to name the program. Now they have a large group of up to 50 people that go out on the land each year.

Designing a program to watch everything is challenging, Petter shared. How do you record information? Since there weren't any field books that already existed, they created a field book specifically for this program. Their field book has space to what people are seeing on the land as well as Elders' observations and stories, and they are constantly changing and editing the field book. Through this method, they can record everything from vegetation, to mining; anything that is happening on the land. One of the purposes of this program is to share the results from being out on the land. Since they have data in various formats, they are thinking about data management and how to present the data in a usable and simple way.

Tanya Ball from the Stewards Circle gave a presentation about her work to assist the launch of a pilot Guardian program, Dane Nan Yé Dāh, which is supported by the Kaska Dena Council and is based in British Columbia. The program is designed to instill traditional knowledge and knowledge of the Kaska language and create opportunities for greater presence and time on the land. Guardians lead wildlife monitoring, community meetings, collaboration with neighboring First Nations, join game checks and mining inspections, and use hides for cultural projects in the community. In 2023, the Dane Nan Yé Dāh Guardians:

* Conducted moose and sheep surveys;
* Installed data loggers that collect data every 10 minutes for water temperature monitoring;
* Collected data to monitor wildlife health;
* Developed an invasive species management plan;
* Participated in climate station training and installation;
* Collected data near mine remediation sites;
* Participated in community and youth engagement events.

This year, they will host Hadi and Tlingit Guardians from Alaska. They also have plans for a bison collaring program, which will help address community safety issues, and bird monitoring, which includes training, creating a story map, and helicopter access to install recorders.

Top left: An Elder catches an inoccu on the Mackenzie River, Northwest Territories (NWT). Courtesy Alan Emery/Unsplash; Middle left: Arctic fireweed adds color to the tundra around Sam Ford Fjord on northern Baffin Island, Nunavut, Canada. Credit: David Stanely/Flickr; Bottom left: Remnants of a glacier appear between mountain peaks in Auyuittuq National Park, Nunavut. Courtesy of Isaac Demeester/Unsplash; Bottom: Weathered and experienced hands handle a gill net on the Mackenzie River, NWT. Courtesy Alan Emery/Unsplash

Data Use

Data collected by Indigenous Guardian programs is used to support individual program and community needs. Mike Jaypoody, Assistant Director of the Ittaq Heritage and Research Centre in Clyde River, Nunavut, presented the Clyde River Knowledge Atlas. This digital atlas collects information from community research projects such as place names, trails, and stories of the region, in one place. Mike explained that this enables young hunters to learn these place names, which is important for safety reasons and navigation. Like so many other communities, Clyde River is losing Elders who are knowledgeable about these place names. The atlas allows them to have a digital record so that the community won't lose these names. The atlas also incorporates other information of in-

terest to the community, such as the Nunavut Coastal Resource Inventory.

Lara Hoshizaki from Nature United shared about the Coastal Guardians Network. The Coastal Guardians Network is a network of stewardship and Guardian programs in British Columbia. They use one common monitoring system, but all of the programs are managed by individual nations. The data themselves are owned by the individual nations, but are held together in a central database. The network began when they came together to discuss issues related to shipping, bears, and tourists. Within the areas where the programs operate, there isn't a lot of presence from government agencies so the programs began collecting

their own data to influence policy and decision makers. They developed an app inspired by an app used in Australia, and began collecting data in such a way that scientists and government agencies could use the data. Now, there are 17 nations that are part of this effort, and the data is collected consistently by each nation. This data will be used for marine planning and changes across the network. Within the app there are different permissions for privacy and access, and each nation has access to their own portal, where they can add and make changes to the data directly. During the development of the app, they held a series of workshops that were supported by lawyers, to develop data sharing agreements amongst the nations within the system. They clarified what and how the data would be shared, and defined language.

Data collected and documented in the app is used for a myriad of purposes, including:

* Nations use it to report to chiefs and tribal councils;

* Harvesting reports such as for crabs and prawns;

* Illegal forestry: photos were documented and shared with agencies to investigate the problem;

* Crab surveys: data collected was used to prove to DFO that certain areas should be closed to public crabbing;

* Bird surveys: monitoring and tracking how invasive species are impacting birds;

* Showing the presence of engagement of Guardians on a map, and this was included by The Narwhal to show how often Guardians are out on the land;

* Showing the value of "public service" of Guardians to argue for sustained funding.

These powerful examples show the value and importance of data collected by Indigenous Guardian programs, and the impact that working as a network can have.

Left: From left, Mike Low, Morgan Voyageur, and Petter Jacobsen introduce their different harvesting and Guardians programs. Courtesy of Noor Johnson; Bottom: King Crabs display their orange-red color in this catch. Courtesy Alvin Matthews/Unsplash

Data Management & Indigenous data sovereignty

Data management and Indigenous data sovereignty
The theme of Indigenous data sovereignty emerged during the meeting discussion. This concept is inherently related to self-governance and land management. Throughout the meeting, many programs shared that a goal of their program is to use the data from their monitoring programs to change policies related to land and resource use in their region. Some programs shared successful stories of using data from their Guardian program to make a case to DFO (Department of Fisheries and Oceans) to limit resource extraction in specific areas. Other programs shared that they would like the capacity to achieve something similar, and more training in data management would help achieve this goal.

Noor Johnson (ELOKA) and Peter Pulsifer (Geomatics and Cartographic Research Centre) delivered a presentation about data management systems and how they related to governance and data sovereignty. In this presentation, Noor introduced the connection between Indigenous Knowledge and information systems, elements that make up data management systems, and how data management systems can be tailored for Guardian and similar programs. There are special considerations to be taken into account when creating data management systems, and many current information systems are designed for Indigenous Knowledge. This is especially apparent when considering data from community-based monitoring programs. There are many different kinds

A hunter prepares to strike a seal with a harpoon.
Courtesy of Shari Fox
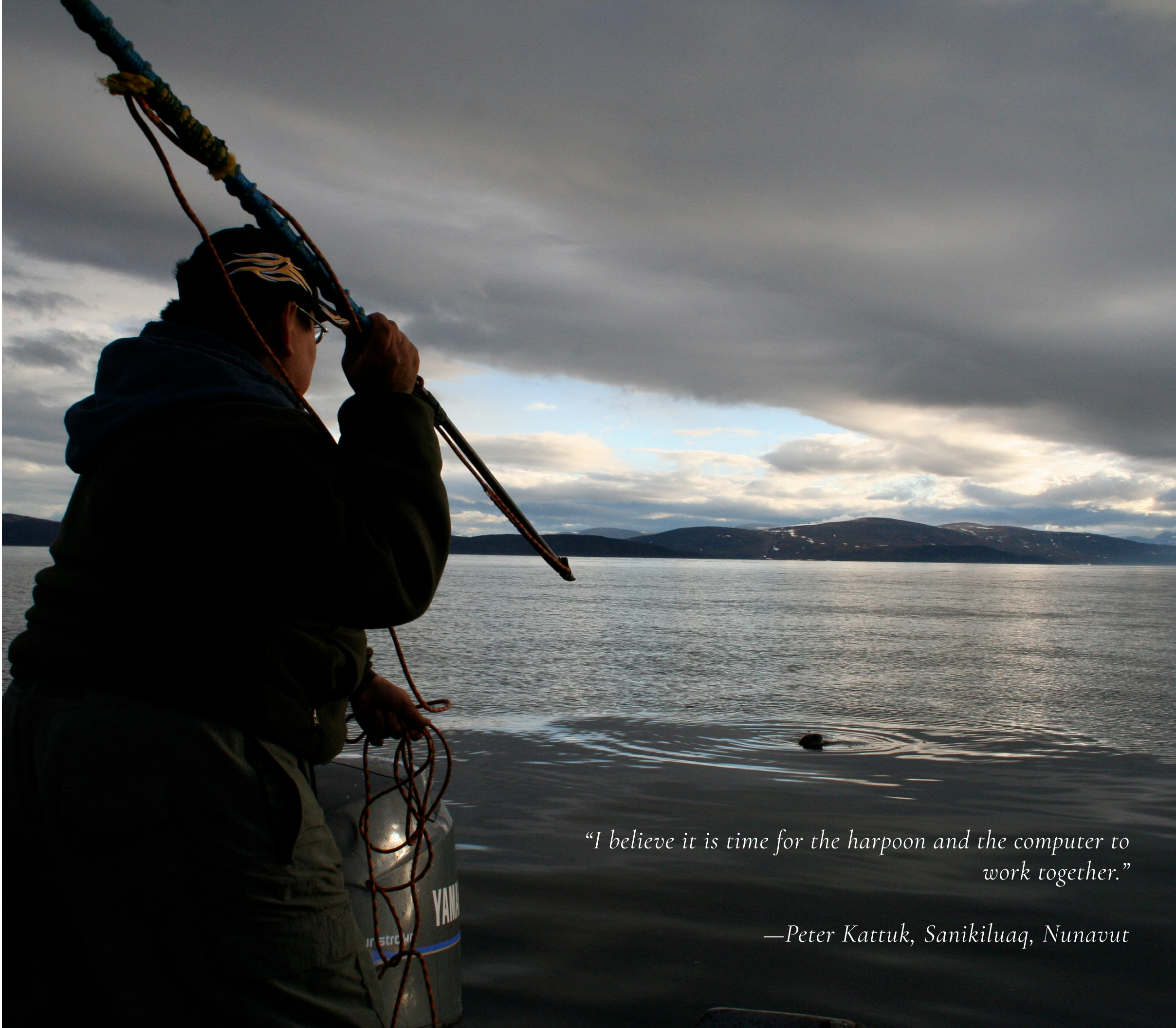
"I believe it is time for the harpoon and the computer to work together."

—Peter Kattuk, Sanikiluaq, Nunavut

of data that communities are supporting, including language data and place names. There are many elements that make up a data management system, including infrastructure, governance, software, database, platforms, and the team that maintains and uses the data. Data management systems support storytelling, governance and ethics, and technical capabilities. Noor also connected Indigenous data sovereignty to tools that can be implemented in a data management system, such as data sharing agreements and MOUs (Memorandum of Understanding). Throughout the presentation, Noor stressed the crucial roles that governance and data sovereignty play in data management systems and data sharing.

Becky Segal, the Maps Manager for SIKU, introduced SIKU, an app produced by and for Indigenous communities by the Arctic Eider Society. Goals of SIKU include promoting equity in government decision-making, supporting research and climate monitoring, and fostering independence in research for northern communities. The development of SIKU was guided by the four following principles:

* Respect for Indigenous rights and knowledge
* Self-determination
* Protection of intellectual property
* Maintaining integrity

The concept of SIKU was started in Sanikiluaq, Nunavut, where hunter and Elder Peter Kattuk observed changes in seal diets and wanted to document these changes. Now, SIKU allows users to log and document observations, including hunting stories, ice observations, and other environmental observations using Indigenous Knowledge frameworks. Becky shared that many Guardian programs use SIKU as a tool to document observations and data, and that it can be adapted for program needs. Guardians who use SIKU gain access to a wide range of safety and navigation services, which leads to both increased harvester safety and long term retention of project members. Additionally, SIKU can be used for multiple projects, so providing training on SIKU builds overall capacity for community-driven research. SIKU was designed with Indigenous Sovereignty in mind, meaning that any data that is added to SIKU is owned by the person who uploaded it. The data is kept on Canadian servers, so it is subject to Canadian laws.

Bottom: A storm rolls in over rocky cliffs near blue waters in Baffin Island, Canada. Courtesy of Jennifer Latuperisa-Andresen/Unsplash; Opposite left: SIKU training using mobile phones takes place with Aqviqtuuq Guardians in Taloyoak. Courtesy ?; Opposite right: Mike Jaypoody from Clyde River, Nunavut, presents the Clyde River Knowledge Atlas. Courtesy of Noor Johnson

Challenges & Barriers

Overall, the biggest barrier to consistent data collection, use and management is a lack of consistent funding. While each of the programs has individual needs unique to their program, unanimously, funding was expressed as an overarching need. Some programs expressed needing more funding for training. Petter expressed that while they have a training program, it is hard for Guardians to take off 4-5 weeks off of work to participate in a training. Funded training opportunities and funded Guardian positions would help remove this barrier. Related to this, more funded opportunities would reduce the high turnover rate. Others expressed the need for more capacity in terms of software development and to create and manage a database. Many of the programs are required to share the data collected to funders via a report. Morgan's organization developed a software that automatically funnels the data into a report. Many programs collect data in Excel spreadsheets or through hand written notes, so transferring this into a report takes a lot of time. Other programs expressed the need for funding to support full time employees, and the desire to do year-round monitoring however they lack the funding to support this.

Shari Fox and Mike Jaypoody from the Ittaq Heritage and Research Centre shared about the Angunasuktiit, a full-time hunting-instruction land program, and the Clyde River Knowledge Atlas. Ittaq started with the

primary focus to support Inuit-led research and self-determination, and to connect research with community economic development. Angunasuktiit, the full time land program, started as a pilot project when they funded one hunter with a full-time salary for a year, and collected data to measure the impacts and benefits. By collecting data from the hunting trips, they began to build a case showing the economic value of hunting. While economic value does not fully represent the full value of hunting, as there is cultural, environmental, and other impacts and benefits from hunting, being able to come up with a number that showed how impactful having a full time salaried hunter to the community was helped them prove the value of the program to funders. Now, there are five full time salaried hunter-instructors in the Angunasuktiit program. Hunters use their time to hunt, plan hunting trips, teach, and maintain gear and equipment. Ittaq has not been able to secure long term funding and they are funded on a grant by grant basis. Working with partners, Ittaq continues to do research on and about the program, strengthening quantitative and qualitative data that show its impacts and benefits to diverse audiences. Mike and Shari are hopeful that with increased positive impacts from the program to share, they will be able to secure sustainable funding in the future.

Throughout the meeting, many participants shared the common need for more data management training. Specifically, they would like to learn more about how to increase accessibility and efficiency. Other programs had recently digitized their data collection methods and were ready to share about the software they use, and the process of adopting a new technology. All of the programs represented at the roundtable collected specific data related to their program objectives, however many lacked a data management system. Some programs use an app to collect data, while others use Excel sheets or pen and paper. Regardless of the collection method, the forms in which the data are collected often don't match the form that they will be shared in via a report, or for a further use by the program, band, Nation or community. Other challenges expressed by program leads include issues related to infrastructure. Internet capabilities are still not widely accessible and consistent between villages, however Starlink is helping with this.

Caribou rest on barren land in northern Canada.
Courtesy of Amos Scott

Needs & Action Items

On the final day of the meeting, participants gathered in breakout groups and discussed action items to address the challenges listed above. Recommendations from the meeting fall into these general themes:

* **Meetings**: Organizing more meetings for greater connection and coordination

* **Technical capacity**: Holding more trainings, especially at the community level, and include topics such as Indigenous data sovereignty and legal rights

* **Funding**: Identifying and supporting greater access to sustainable funding

Overall, the groups reported back that gatherings help create connections and identify common challenges and goals between programs. They recommended organizing meetings based on the types of work or monitoring that programs are doing, as well as regional meetings based on geographical location. They also recommended organizing community to community exchanges, where Guardians from two communities could spend time in their respective communities, learning about the programs and connecting with others within the community.

Another recommendation is to support and offer more trainings at the community level. Specifically, pro-

grams requested more training related to governance, legal rights, and Indigenous data sovereignty. They also recommended more training at the community level to build technical capacity, and to "train the trainer" in the community. This would enable greater internal independence in terms of data management and technical capacities. Related to this, many programs stated that having more resources about data security and sovereignty would be helpful for data management. This could include a curated list of five questions to ask data platforms regarding security and sovereignty. Another example of a resource is a list of all of the available apps and data platforms comparing basic pros and cons. There are many apps available, and a list would help data and program managers distinguish which apps are right for their needs.

Programs also shared a need for specific community research protocols as a guide and resource for researchers working with Guardians/land managers. Some participants shared that there is still advocacy work needed in terms of research relationships between community researchers and external researchers. While there are many research protocols available, there currently none that are specifically for Guardian programs.

A recommendation for other Guardian programs is to pair youth and Elders during data collection. Pairing Elders and youth during data collection would create more opportunities for youth to learn from their Elders, and for Elders to pass on their knowledge.

Finally, an overarching need expressed by all of the participants was the need for more sustainable, long-term funding. This would help staffing capacity, as many programs require Guardians to have many roles, including data management and reporting. Long term funding would also secure the future of many of these programs, and would also help support more, full time Guardian positions.

Opposite: Participants meet in breakout groups to discuss recommendations to address the challenges discussed throughout the meeting. Courtesy of Noor Johnson: Top right: Ernie Moses, Sonya Cayen, David Konisenta, and James Konisenta perform Wilderness First Aid training. Courtesy of Mike Low; Middle right: Joe Lacorne, long time Deh Gah Gotie Guardian and Dehcho K'ehodi community Guardian, is helping to build a small cabin at Deep Lake for fish sampling and future use by harvesters. Courtesy of Mike Low; Bottom right: Participants on an Enk Trip take a photograph in 2023. Courtesy of Petter Jacobsen

Follow Up Since the Roundtable

Drone training in Fort Good Hope

After the presentation by Ittaq at the workshop, which included examples of drone applications by Robert Kautuk and Ittaq staff, Ittaq was contacted by workshop participants from Fort Good Hope, NWT about the possibility of delivering drone training workshops in their community. Robert, along with long-time drone partner RavenWest, co-delivered two introductory drone workshops for the K'ahsho Got'ine Foundation in Fort Good Hope in April 2024. Each workshop had eight participants and was delivered by co-instructors Robert Kautuk and Alex Taylor. The first workshop consisted of members of the K'ahsho Got'ine Guardians program and the second was attended by interested members of the community. Topics included familiarization with drone equipment, drone regulations, and safe flying skills with progression for the use of drones in field applications. Drone kits were provided to the Guardians for use in their program.

Survey 1, 2, 3 and ArcGIS training

Following the Northern Indigenous Guardians Data Roundtable, the Northern Indigenous Stewardship Circle (NISC) decided to support NISC's Guardian Coordinator, Tanya Ball, to deliver Survey 123 and ArcGIS online workshops for Guardian programs. Tanya has already delivered one workshop in Dawson City for the Tr'ondëk Hwëch'in Government and there are other programs in the Yukon requesting the workshop. NISC is also supporting Tanya to do additional training and to undertake a workshop review to see where it can be further developed. This may also include collaboration with the Arctic Eider Society to create a training on SIKU, which is a direct result of the connections made at the Guardians Roundtable. Currently the workshop includes the following overview:

* Training on Survey123 Connect to create surveys (created 6 surveys)

* Training on Survey123 app for data collection in the field

* Training on ArcGIS Online to review and compile data collected. Exporting to KMZ and shapefiles

Indigenous data sovereignty and data sharing at the Arctic Observing Summit

ELOKA team members Noor Johnson and Tash Haycock-Chavez co-hosted several sessions on Indigenous data sovereignty as part of the "Data Sharing" working group at the Arctic Observing Summit in Edinburgh, Scotland, on March 27th and 28th. The sessions featured perspectives from community-driven monitoring programs in Alaska and coastal Sami communities in Norway, as well as others working in the field of Indigenous data sovereignty and the development of data sharing tools and resources. The two panels were recorded and are available to view online (linked below). Panelists and participants expressed an interest in more exchange at the program level to share approaches to implementing Indigenous data sovereignty.

* AOS 2024 Panel on Indigenous Data Sovereignty - Capacity Sharing

* AOS 2024 Panel on Indigenous Data Sovereignty - Technical Capacities

Opposite left: Workshop participants practice piloting drones at the drone workshop in Fort Good Hope. Courtesy of Alex Taylor; Opposite right: Workshop participants practice landing drones at the drone workshop in Fort Good Hope. Courtesy of Alex Taylor; Below: Town walls surround Edinburgh, Scotland. Courtesy of Abhishek Banik/Unsplash

Conclusion

Overall, the meeting created an opportunity for Guardians and similar programs to share about their programs, learn from each other, and come up with solutions to current data issues. Through these connections, participants also discussed how their work fits into and supports broader movements to support self-determination. The rise of support for the roles of hunters and harvesters, and Indigenous land-based education and Guardian programs is closely linked to economic development opportunities for northern communities. Jobs as Guardians, harvesters, land-based educators, and environmental monitors are some direct employment examples. Beyond jobs, these programs bring a suite of other direct and indirect impacts and benefits to communities including capacity building (e.g. training and certifications in areas such as research and safety), information (e.g. ongoing expert knowledge generation and data collection), and infrastructure (e.g. environmental monitoring collection, research and monitoring stations).

As the "eyes and ears" of their lands and waters, collecting environmental and other data is one critical component of these land-based programs, as well as the management and use of these data. This meeting set the foundation for future meetings between Guardians and monitoring programs and highlighted several areas of interest for future discussion, including data sovereignty and data management training.

A vehicle is visible on the horizon driving on the Mackenzie River Ice Road in Northwest Territories, Canada. Courtesy of Ian Mackenzie/Wikimedia Commons

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