



Community Hydrography



Empowering Coastal Communities

Community Hydrography Program
Canadian Hydrographic Service (CHS)

» 2025



Fisheries and Oceans
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On the photo: Louis Cormier



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This report provides information on the Community Hydrography Program, a five-year initiative (2022-2027) under the Oceans Protection Plan 2 of the Government of Canada. While the report is scientific or technical in nature, it has not undergone formal scientific peer review.



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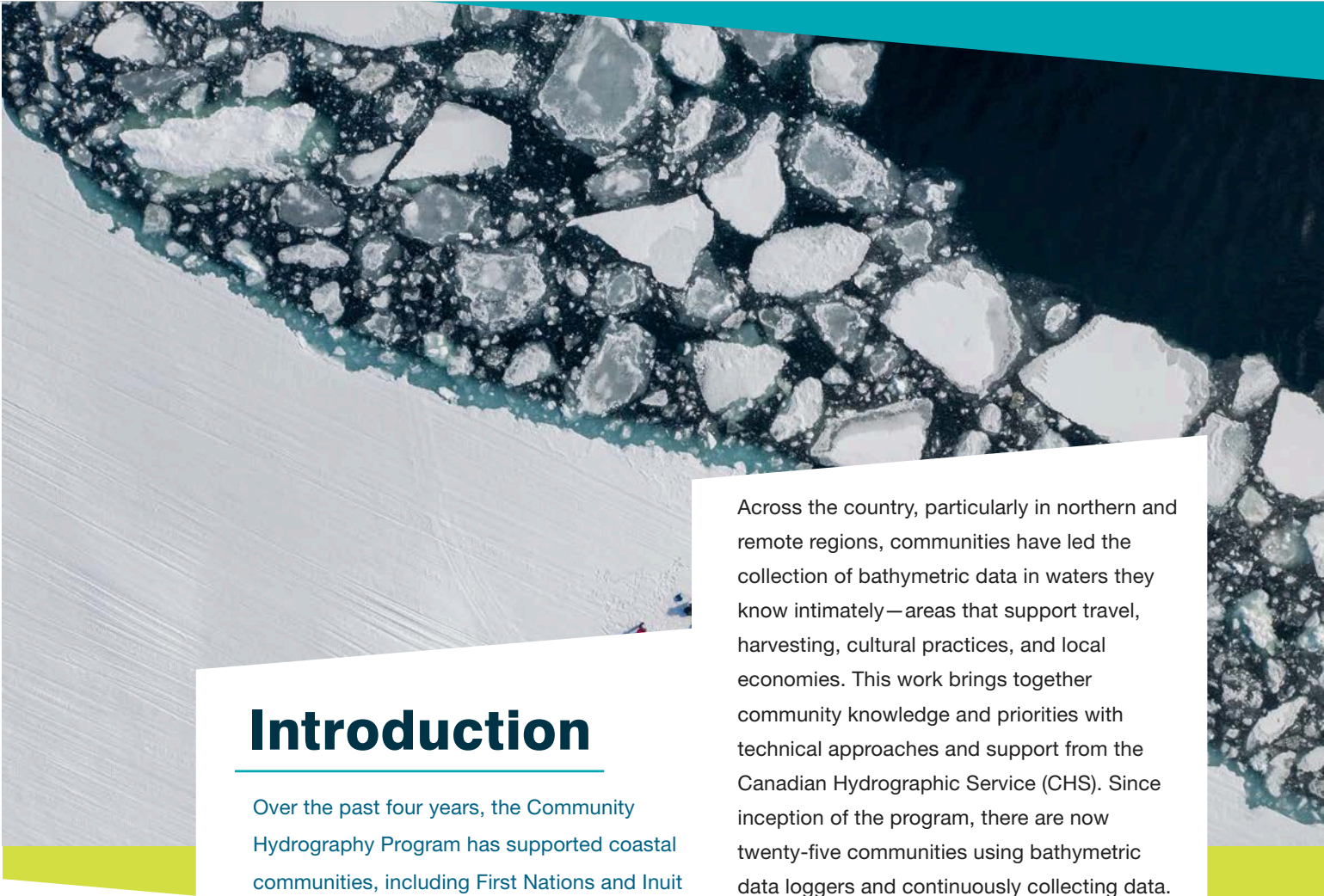
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Introduction

Over the past four years, the Community Hydrography Program has supported coastal communities, including First Nations and Inuit communities, in exploring and applying hydrographic tools and training to generate place-based knowledge.

Administered by the Canadian Hydrographic Service (CHS), the Program was launched to enable coastal and Indigenous communities in gathering and using important data about water depths and features. As part of the Ocean Protection Plan (OPP2), the program aims to enhance community knowledge of local aquatic environments, improve safety, and facilitate better planning for activities such as fishing and harvesting. With vast areas of Canada's nearshore waters—particularly in the North—remaining unsurveyed or charted with legacy data, the program helped bridge some data gaps affecting marine safety, search and rescue response, climate resilience, and community well-being.

Across the country, particularly in northern and remote regions, communities have led the collection of bathymetric data in waters they know intimately—areas that support travel, harvesting, cultural practices, and local economies. This work brings together community knowledge and priorities with technical approaches and support from the Canadian Hydrographic Service (CHS). Since inception of the program, there are now twenty-five communities using bathymetric data loggers and continuously collecting data.

Via the joint collaboration between Indigenous organizations, Search and Rescue units, academic institutions, and the use of platforms such as SIKU, the Program has fostered trust, reciprocity, and shared stewardship. Data gathered are visualized and used by the communities who helped generate them.

As climate change accelerates coastal transformation and marine traffic continues to expand in northern waters, the need for hydrographic information will only increase.

As the Community Hydrography Program sunsets in March 2027, the Canadian Hydrographic Service is considering ways to integrate coastal hydrography in its national planning.

**Michel Breton, Manager,
Community Hydrography Program**



Landscape of Community Based Bathymetric Data Collection in Canada

After four years of operation, 25 Northern communities have been equipped with bathymetric data loggers and these are continuously collecting bathymetric data. So far, community-collected data have identified 31 depths requiring Notices to Mariners. With these data loggers deployed across Canada, coastal communities are demonstrating their vital role in improving local knowledge and filling critical information gaps.



DFO Ecosystems and Oceans Science Contribution Framework

Through Fisheries and Oceans Canada's (DFO) Ecosystems and Oceans Science Contribution Framework, the Community Hydrography Program funded two new projects in 2025. One project provided funding and resources directly to the community of Kugluktuk in Nunavut. This project supports the development of community-based bathymetric data acquisition by enhancing local knowledge of the seabed and strengthening resilience to climate change through a better understanding of local coastal dynamic. The second project provides funding to academia to develop training materials aimed at building community knowledge and capacity in hydrography.

Projects	Timeframe	Funding
Participative and community-led coastal bathymetric surveying in Kugluktuk, Nunavut Recipient: <i>Kugluktuk Angoniatit Association</i>	2025-2027	\$210,000
Hydro-Access: Promoting hydrography among communities with accessible hydrography training resources Recipient: <i>Qikiqtaaluk Corporation</i>	2025-2027	\$225,000



Marble Island, Hudson Bay. Credit: Louis Cormier

Understanding What Lies Beneath: Data Confidence

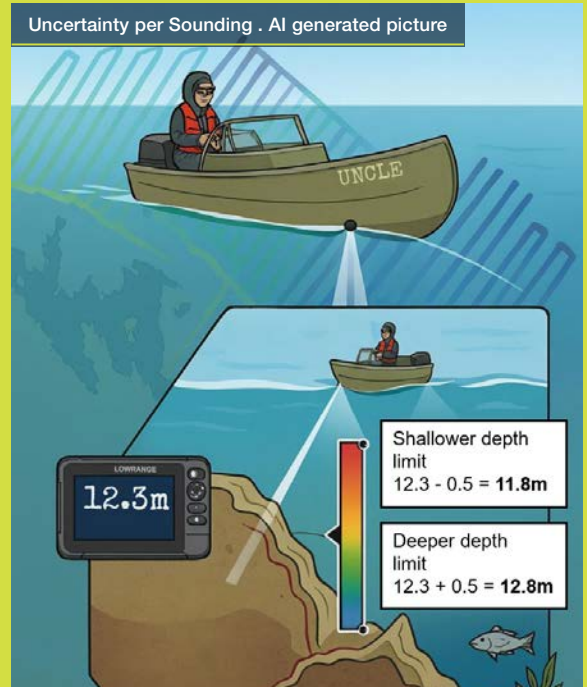
Since the beginning of the program, tools have been developed to support communities with processing and visualizing the data that they collected. This year, the processing tool to allow for estimation of the uncertainty (or confidence) associated with each depth measurement has been improved.

In hydrography, accounting for uncertainty means recognizing that a depth value is never perfectly exact. Some level of error, no matter how small, is always present. This uncertainty can arise from several factors including type of sensors used, environmental conditions at the time of measurement, and the processing of tidal reduction.

Bathymetric data collected by communities under the Community Hydrography Program demonstrates a favorable level of agreement with data historically acquired by the Canadian Hydrographic Service (CHS) in the 1990s. This comparability reflects recent technological transfer to the recreational marine sector, enabling the use of off-the-shelf equipment, and is supported by adherence to four fundamental hydrographic principles: proper sensor offset measurements, systematic survey line patterns, survey speeds below 15 knots, and appropriate corrections for tides and sound speed during data processing.

» You can read the article in the International Hydrographic Review - Volume 32:

<https://ihr.iho.int/articles/the-potential-of-inuit-communities-to-map-the-canadian-arctic-nearshore/>



» Rather than stating, “This channel has a depth of 12.3m,” it is more accurate to say: “This channel has a depth of approximately 12.3m, with an uncertainty of $\pm 50\text{ cm}$.”

This added information helps determine whether navigating the channel is safe or potentially risky.

» Prefer mobile?
Simply scan the QR code.

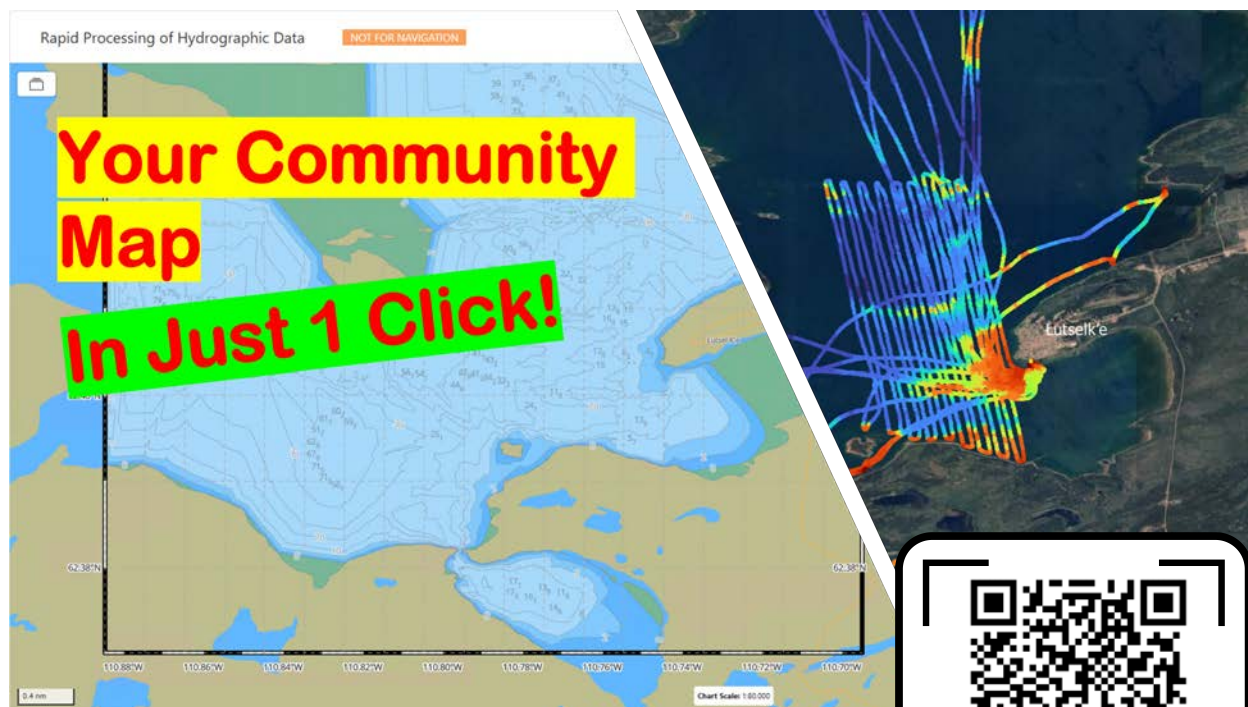


Your Community Map in Just One Click!

[UMap](#), presented in the [Empowering Coastal Communities 2023](#) publication, was the first program attempt in providing communities with a tool to build their own maps using the bathymetric data they had collected.

With the Web Service presented below, a step further has been taken—making it even easier for communities to transform a bathymetric elevation model into a community map.

The [Rapid Processing of Hydrographic Data Web Service](#) has been co-developed with the University of New-Hampshire and currently operates in Canadian waters only.



[Demo video of the 1 click Community Map Web Service](#)



Scan the QR code to watch a short video demonstration of the tool in action.

Communities mapping locations across Canada on the EMSA and SIKU apps.

Community Maps type

📍 EMSA

📍 SIKU

Expanding Access to Community-Collected Hydrographic Data - Part I

The 2024–2025 period marked an important milestone for the Program by expanding how and where community collected bathymetric data can be visualized and shared. Through collaboration with SIKU: The Indigenous Knowledge App, bathymetric data visualization is now available to all 40,000+ SIKU users, significantly increasing access to community generated hydrographic information. This builds on the [2023 Empowering Coastal Communities](#) publication, which described how communities could input and use their data through the Enhanced Maritime Situational Awareness (EMSA) geoportal for consulting depth and water data in the field using community maps.



Examples of Community maps displayed in the SIKU App. Inukjuak (bottom) and Rankin Inlet (top)

Expanding Access to Community-Collected Hydrographic Data - Part II

SIKU is being used by over 100 community-driven projects across the north to collect and share data, and it has a strong organic following because of the many services it provides directly to northern Indigenous land users including maps, weather products, satellite imagery, and derived products. It also allows users to track their land use, harvesting and share knowledge such as ice safety and wildlife observations to their communities. While it has a social media style feed that allows sharing knowledge, it isn't an open data platform. Users own their data, and choose their privacy settings and if they want to share posts to the projects they are members of.

Kangiqiniq (Rankin Inlet), Nunavut



Through collaboration with the CHS, SIKU is allowing community collected bathymetry to be accessible on their basemap and offline GPS, putting it back into the hands of community members who helped collect it. In 2025, several partners expressed interest in sharing their data for the benefits of all SIKU users.

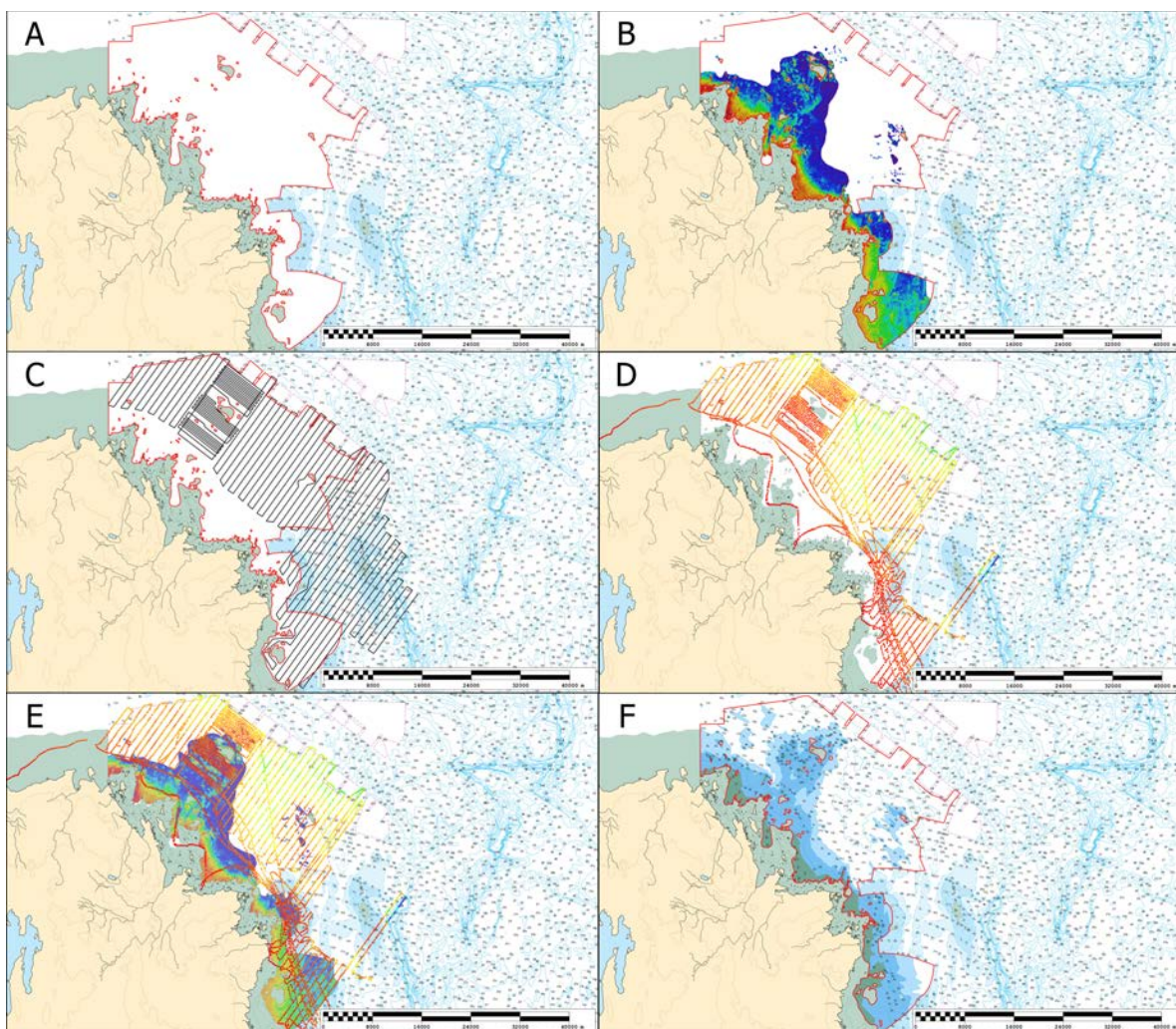
Hunters near Sanikiluaq involved in community-driven research programs. (Credit: SIKU)



Community Knowledge & Innovation to Map Asuqaaq Waters

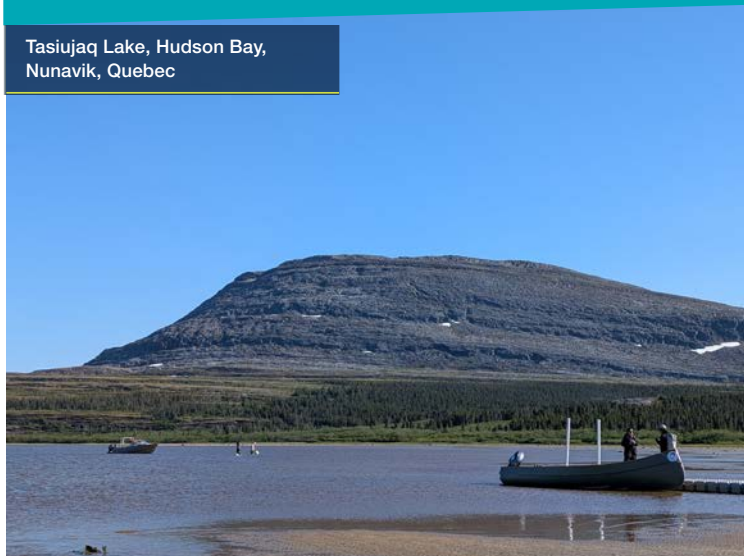
Asuqaaq point lies within South Ungava Bay, between Koksoak River and Leaf basin. The area is unsurveyed and subject to conditions that warrant operational awareness by Search and Rescue units. The region is characterized by extreme tidal ranges (larger than 10 meters), strong tidal currents, seasonal sea ice, and highly dynamic seabed conditions with movement of sediments and boulders.

To address these concerns, the Niquiit Wildlife Committee, in partnership with Community Hydrography Team, equipped two community boats with Wireless Inexpensive Bathymetry Loggers (also known as WIBL). The boats conducted surveys along predefined line patterns that had been de-risked through a Satellite-Derived Bathymetry (SDB) reconnaissance survey. The collected data was subsequently processed, and a community map was produced. Two months after the survey, the map became available on the SIKU app and will support the Ungava Bay communities.



(A) Area of interest outlined in red (240km²) shown as unsurveyed/uncharted on the CHS official product ; (B) SDB reconnaissance survey ; (C) Risk-assessed systematic survey grid ; (D) Bathymetric data collected by the 2 local survey crews ; (E) SDB and Community-Sourced Bathymetry overlaid ; (F) Community map overlaid on the CHS official product.

Tasiujaq Lake, Hudson Bay,
Nunavik, Quebec



Community map of the northern
portion of the Tasiujaq Lake



Unveiling the Depths of Lake Tasiujaq

The Tursujuq National Park, located on the eastern coast of Hudson Bay in Nunavik, is the largest protected area in the province of Quebec. The park is home to two of Canada's most remarkable and scientifically intriguing bodies of water. Inland lies Lake Wiyâshâkimî (Clearwater Lake), a rare geological formation created by a double meteor impact. Closer to Hudson Bay, and accessible only through a narrow 350 metre channel, is the vast triangular basin known as Lake Tasiujaq. This impressive lake is framed by the Hudson Cuestas, striking geological escarpments that dominate the surrounding landscape.

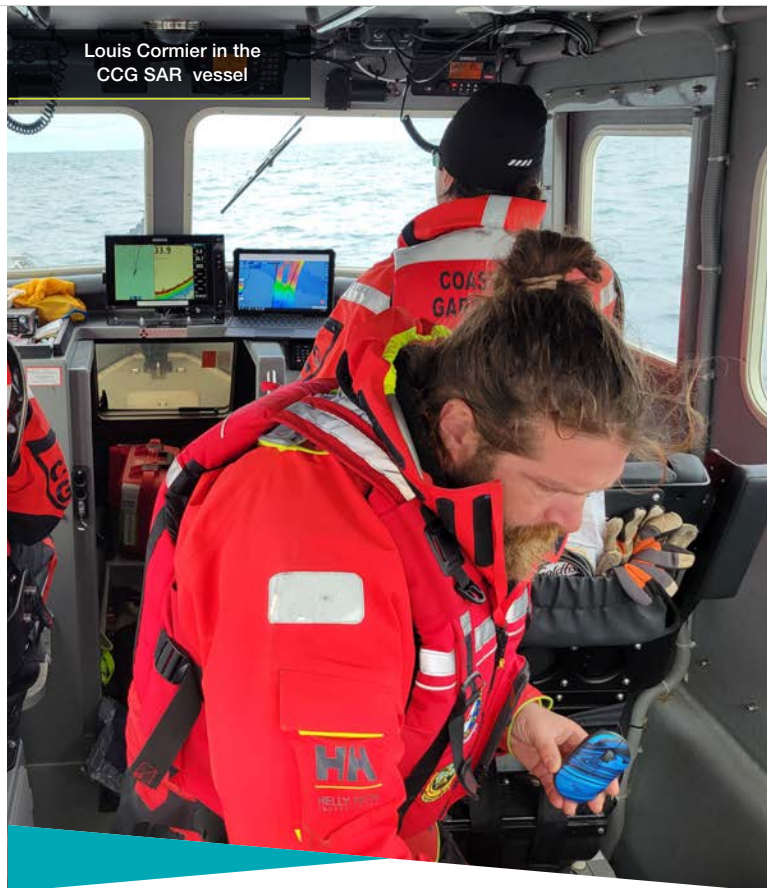
Lake Tasiujaq is a brackish environment, influenced by the periodic inflow of seawater from Hudson Bay. As a result, it supports a dynamic ecosystem where freshwater and marine species coexist, creating a unique habitat of ecological and cultural significance.

For the nearby Nunavik community of Umiujaq, Tasiujaq Lake is an essential area for hunting, fishing, and harvesting, and it also serves as a key driver of local tourism. To support both environmental stewardship and sustainable development, a project was launched to produce the first comprehensive bathymetric map of the lake. This initiative was carried out in partnership with the Kativik Regional Government (KRG), which oversees the management of Nunavik's parks.

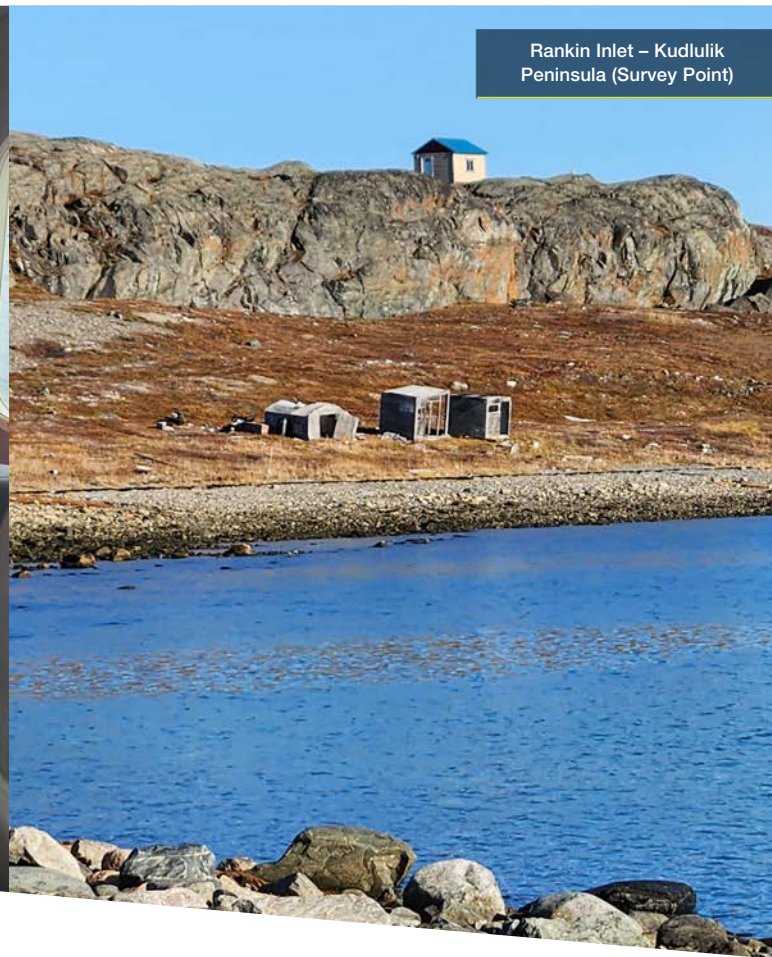
During the summer of 2025, a representative from the Program travelled to Umiujaq to assist the local survey team. A bathymetric data logger was installed on the park's vessel, allowing bathymetric data to be collected seamlessly during on water operations. Throughout the season, the Tursujuq Park survey team followed a pre planned set of transects, gradually building the first detailed bathymetric dataset for Lake Tasiujaq.



The Umiujaq team meets to examine the bathymetric data collected over the previous few days. Discussions focus on shoals, the safest passages and areas to cover on the next trip. Credit: Kativik Regional Government.



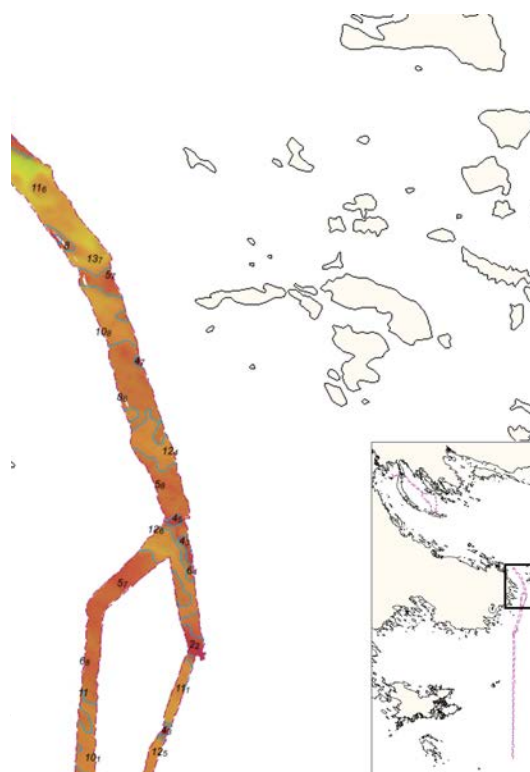
Louis Cormier in the CCG SAR vessel



Rankin Inlet - Kudlulik Peninsula (Survey Point)

From Data to Response: Opening Nearshore Corridors in Rankin Inlet

The Community Hydrography Program team partnered with the Canadian Coast Guard's Arctic Marine Response Station in Rankin Inlet—the only station serving the Arctic region—to carry out a 21 day field mission. Over the course of the deployment, the team spent fourteen days on the water collecting bathymetric data and updating measurements of the local tidal prediction network. This work resulted in the opening of two coastal navigation corridors and the extension of an anchorage area west of the community. The newly mapped sectors covered areas that had not previously been charted on official products. The Diane River corridor should provide a safer route for community members and Search and Rescue teams to access this heavily used area. The Pangertot corridor, which passes through an island chain, should significantly improve access between Rankin Inlet and Whale Cove, reducing search and rescue response times by more than 30 minutes for incidents in the area.

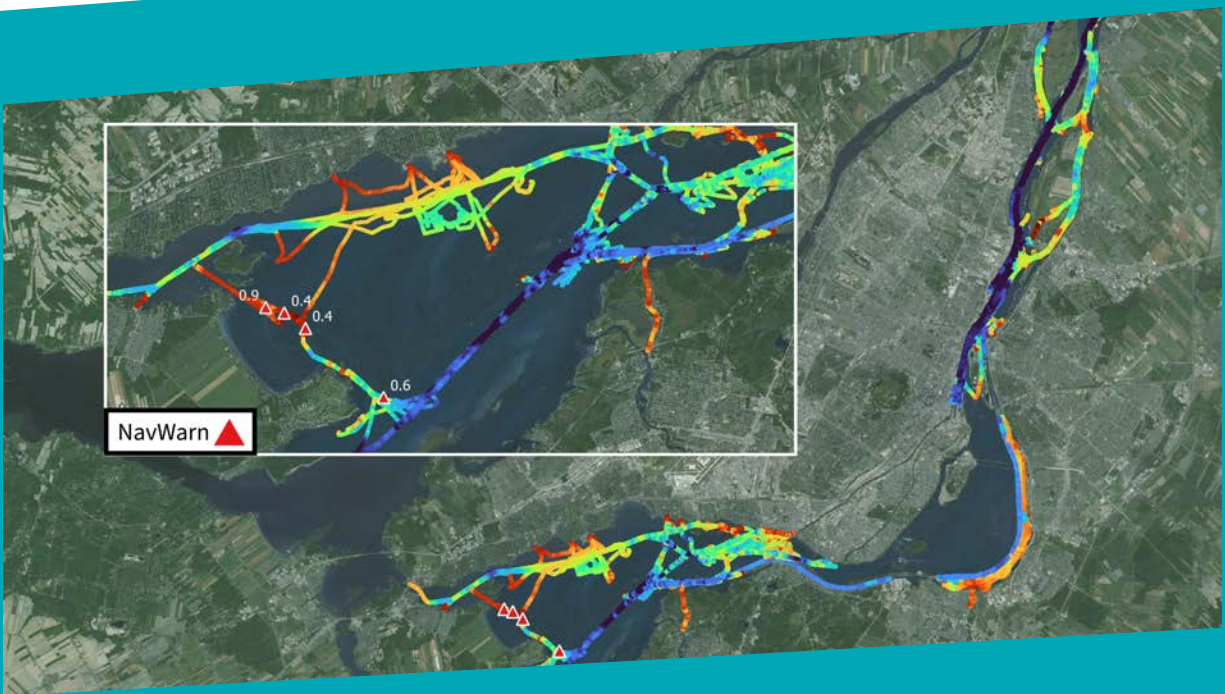


Close up of the northern section of the Pangertot Corridor

Canadian Coast Guard Auxiliary: Citizens in Action

The Canadian Coast Guard Auxiliary (CCGA) is a not-for-profit organization and a registered charity made up of volunteer resources throughout Canada. The CCGA has existed since 1978 and provides support to the Canadian Coast Guard and the Department of National Defence with search and rescue and environmental response. Following the 2024 Rivière-du-Loup project (featured in the Empowering Coastal Communities 2023 publication), CCGA showed interest in collecting bathymetric data.

After a full season of opportunistic data collection, the depth measurements were processed and analyzed, clearly demonstrating the value and potential of these datasets. As a result, three navigational warnings were issued in the Lac-Saint-Louis basin, and previously uncharted areas south of the Seaway in the St. Lambert sector, were surveyed for the first time. The newly acquired data will be integrated into CHS databases to support future updates to nautical charts and related products.



Bathymetric data collected by GCAC Unit 43 (Lachine), Unit 48 (Longueuil), and Unit 56 (Saint-Lambert). The colors provide information on depths ranging from 0 m (red) to 30 m (purple-blue).

Exploring the seafloor of Phillips Arm – The Kwiakah First Nation Project

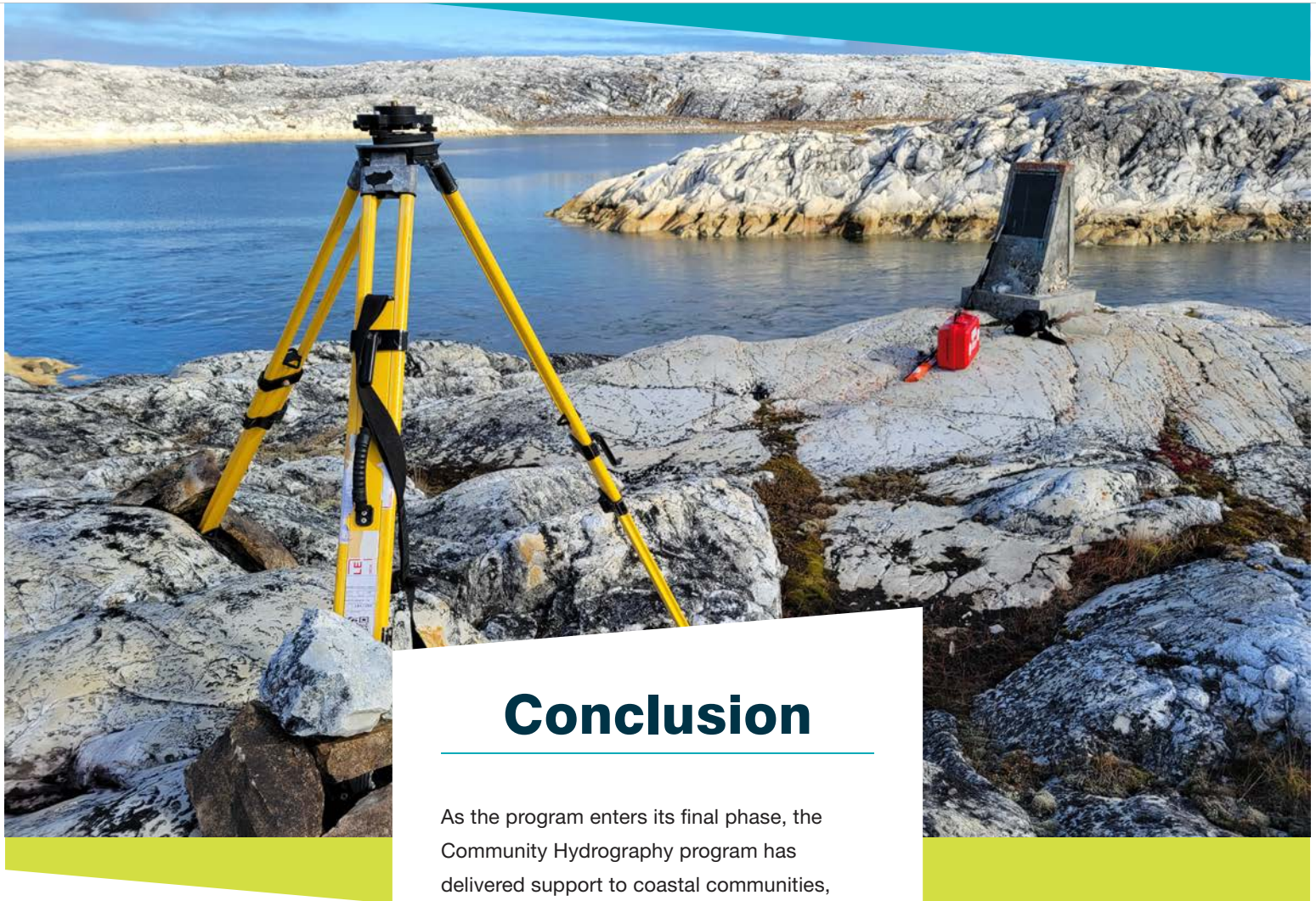
In early summer 2025, a collaborative multibeam survey was conducted in a previously uncharted inlet of Cordero Channel. Phillips Arm lies within the traditional territory of the Kwiakah First Nation and has supported the livelihood of its people for centuries. Today, the Kwiakah First Nation is undertaking significant efforts to restore and protect this unique cultural and ecological heritage.

In partnership with the A Tlegay Fisheries Society, the Kwiakah First Nation and CHS, partnered to equip a community vessel with a high-end portable multibeam system. Over the course of one week, a survey team composed of First Nation members and CHS personnel conducted the first-ever high resolution mapping of the inlet.

The resulting data will enable the Kwiakah First Nation to gain a deeper understanding of the marine environment of Phillips Arm and to develop tailored, community-driven management strategies. In addition, the CHS will be able to use these modern, standards-compliant survey data to update official nautical charts, thereby enhancing marine safety in the area.



Jessica Heke setting up the GNSS base station at the Cordero Islands



Conclusion

As the program enters its final phase, the Community Hydrography program has delivered support to coastal communities, including First Nations and Inuit communities, through the development of tools, partnerships, and place-based knowledge over its four-year duration.

Final year activities will focus on consolidating results and documenting key learnings. Data collection efforts will be scaled back, with attention directed toward capturing the approaches and capacities established through the program.

Through these efforts, participating communities are positioned to continue using hydrographic knowledge and data to support safety, planning, and local priorities beyond the program's conclusion. The program has strengthened community capacity, contributed to local stewardship of waterways, and advanced community-led approaches to hydrographic activity.

» Acknowledgements

This year, we have maintained and developed a working relationship with many people from Communities, Governments, Universities, Private sectors, And NGOs. The Community Hydrography team at the CHS extends our kind thanks to all of them.



In alphabetical order, they are:

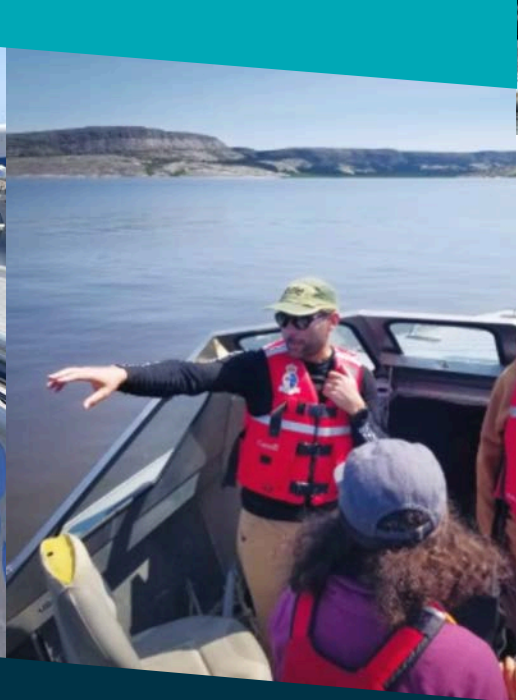
- Arctic Eider Society/SIKU
- A-Tlegay Fisheries Society
- Arqviiliit IPCA
- Canadian Coast Guard Arctic Marine Response Station of Rankin Inlet
- Canadian Coast Guard Auxiliary Search and Rescue units in Kuujuaq, Lachine, Longueuil, Naujaat, Pangnirtung, Salluit, and St-Lambert
- Center for Coastal Ocean Mapping of University of New Hampshire
- CIDCO: Interdisciplinary Centre for the Development of Ocean Mapping
- Community of Sanikiluaq
- Cree Nation Government
- Essipit Innu First Nation Band Council
- Ka:yu:'k't'h' / Che:k'tles7et'h First Nations
- Kativik Regional Government
- K'ómoks First Nation
- Kwiakah First Nation
- Mamalilikulla First Nation
- Marine Institute of Memorial Newfoundland University
- Nanwakolas Council Society
- Niskamoon Corporation
- Northern Village of Inukjuak
- Ocean Mapping Group at the University of New Brunswick
- Orange Force Marine
- Paulatuk Hunters and Trappers Committee (PHTC) Qikiqtaaluk Corporation
- Tlowitsis Nation
- Transport Canada, EMSA
- Wei Wai Kum First Nation
- Tuktoyaktuk Hunters and Trappers Committee (THTC)

We also extend thanks to our colleagues:

- From the DFO Ecosystems and Oceans Science sector Winnipeg and Yellowknife
- From Parks Canada
- From the Royal Canadian Mounted Police
- Everyone at the CHS across the country.

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Captions: Top ; From left to right: Chris Bianco, Steve Nakoolak, Rob Melnyk, Gabriel Montpetit-Allard, Louis Cormier. Left-middle: Putulik Tooktoo from Umiujaq. Middle: Jessica Heke. Right-middle: Gabriel Montpetit-Allard.



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