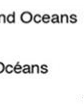
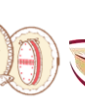


# FISHES

Fostering Indigenous Small-scale fisheries  
for Health, Economy, and Food Security

## Newsletter

April 2022



# Study context

Northern Canada is facing multiple challenges, including increased shipping, tourism, and mining exploration. In combination with climate change, those challenges pose serious risks for northern aquatic biodiversity and the fisheries it supports.

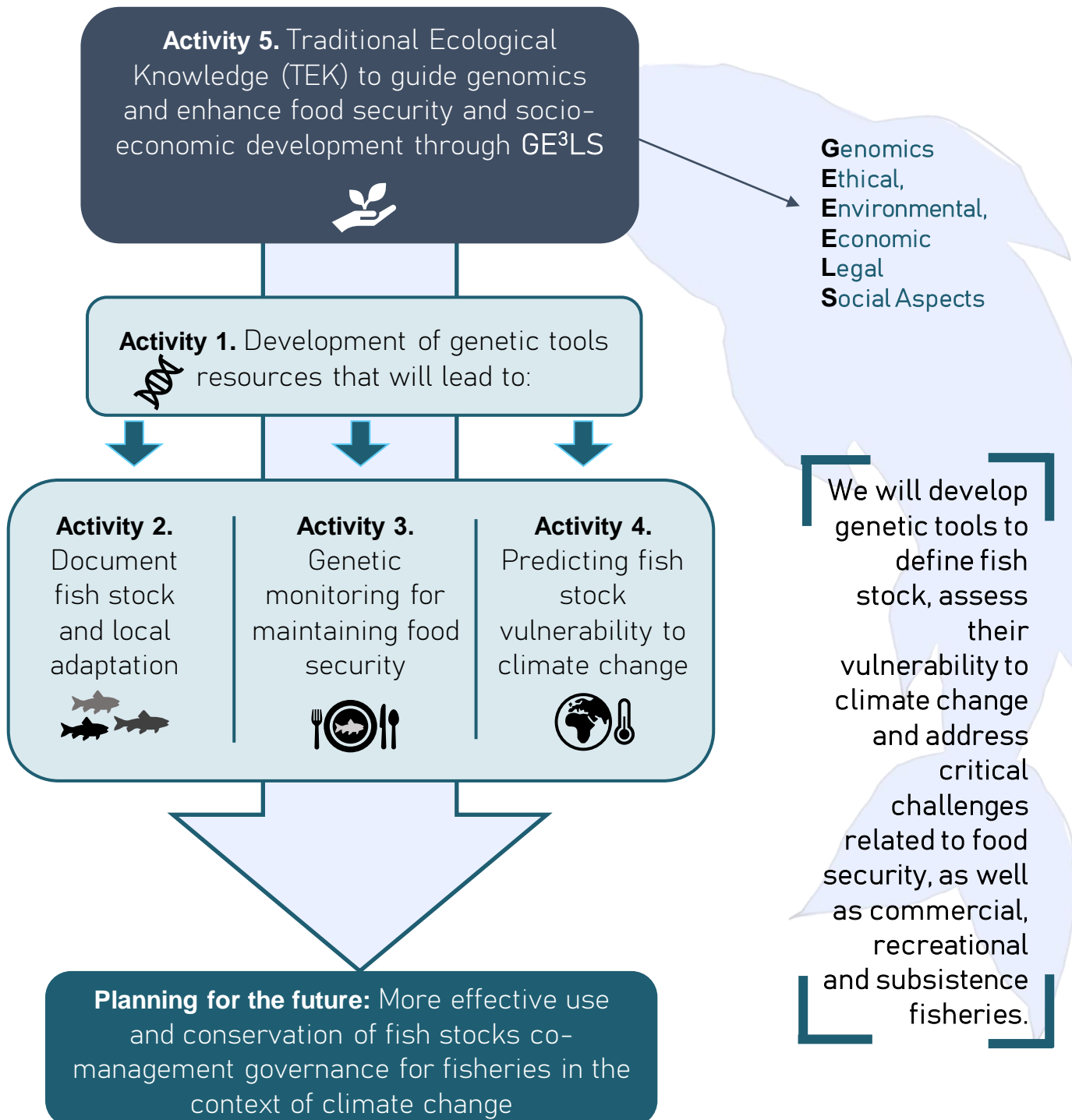
Changes in the geographic distribution and abundance of fish can threaten the economic and livelihoods of northern communities, their traditional harvesting practices as well as their ability to feed themselves and maintain access to healthy food.

Consequently, reducing the potentially negative impacts of these threats on northern fisheries is crucial for ensuring food security and cultural benefits.



The project FISHES is developing and applying genetic approaches in concert with local knowledge to address challenges related to food security and fisheries of northern Indigenous Peoples in Canada (Inuit, Cree and Dené communities).

# What is FISHERS?



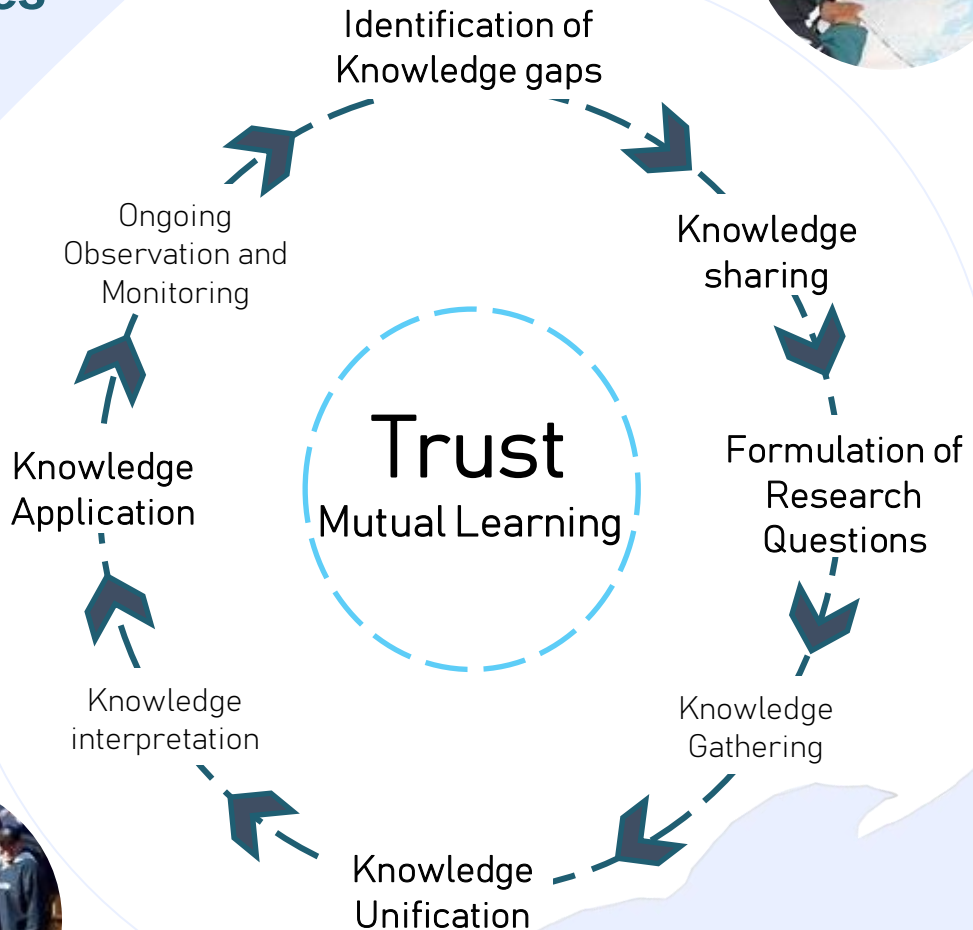
# What is FISHES?

***A Knowledge co-evolution framework involving researchers and Indigenous communities***

***Mutually beneficial research questions***



@Stephan Schott Lab



@Stephan Schott Lab



***Mutually beneficial knowledge transfer***



# An overview of the project

## Which species?

Fish species that are important for commercial, recreational and subsistence fisheries in Northern Canada.

## Where?

Nunavik, Nunavut, Eeyou Istchee and Northwest Territories

## Collaboration



FISHES is supporting the co-generation of knowledge with Inuit, Cree and Dené



Arctic Char



Atlantic salmon



Brook trout



Lake trout



Walleye

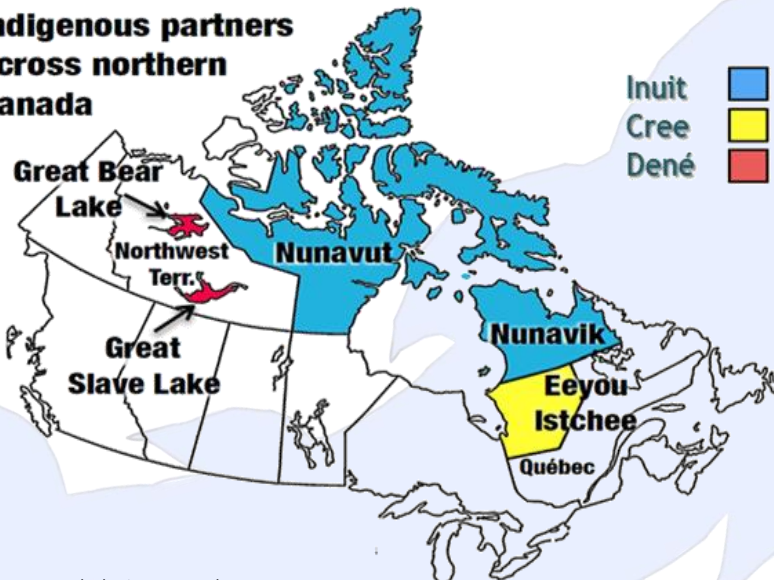


Whitefish



Lake cisco

## Indigenous partners across northern Canada



Note: This map does not necessarily depict accurately the extent of each group's traditional lands and only shows areas relevant for FISHES.

# What's new in... Nunavik

## Consultations

FISHES team consulted local representatives in Kangiqsualujjuaq to ensure that the project responds to local fisheries priorities. Also, latest results of the completed BriGHT project were shared, as they open new research avenues to study links between Arctic Char nutritional quality, Inuit preferences for fish and Char feeding habits. Furthermore, Marianne Falardeau went to Tasiujaq to inform upcoming research at the RNUK (the regional hunters, fishers, and trappers' organization).

## Imalirijiit camp

In August 2021, the Nunami Sukuijainiq camp ("Our science on the Land"), which is part of the Imalirijiit community-based environmental monitoring program), hosted two collaborators from FISHES team. The camp aimed to promote the exchange of traditional and scientific knowledge and to collect environmental samples with youth and fisher guides. We were invited to join the 2022 edition.

## Fish sampling

In August 2021, in collaboration with community members from Inukjuak and Puvirnituq, we sampled Whitefish, Cisco and Brook trout. The adipose fin will be used to evaluate the vulnerability of fish to climate changes, by using genetics. Moreover, we met with various local stakeholders in Kuujuaq to collect Atlantic salmon samples, which will be used to determine fish stocks, and origin of salmons caught in the estuary.

## Support for a hatchery project

A FISHES member went in Inukjuak in August 2021 to meet local organisations (LNUK and NMRWB) about a project concerning an Arctic Char hatchery.



## Focus group on Arctic Char

We will conduct groups of discussion in Kangiqsualujjuaq in June 2022 about the dietary preferences and the community importance of Arctic Char to Inuit in Kangiqsualujjuaq. A cognitive mapping activity will also be used to address the impact of global changes on fish quality.

## Research outputs

FISHES members contributed to a vast Collaborative Assessment of Polar Knowledge Canada that brought together scientists and Indigenous Knowledge holders from across the country. They contributed to the chapter on Arctic Char in the rapidly changing North, which should be published soon by Polar Knowledge Canada.

# What's new in... Nunavut

## Consultations

In fall 2021, FISHERS team met the managers of the Spence Bay Hunters and Trappers Association, as well as the board. They presented their involvement in the IQaluk project, led by the Department of Fisheries and Sealing (Nunavut). They also presented how and why to do genetic sampling.

We also presented an overview of the harvest study and technology in a Weather and Society Workshop in March 2022.

## Food Security workshops

The FISHERS team has partnered up with GN Health and the Kitikmeot Inuit Association to assist with the implementation of The Kitikmeot 2020-2030 Health & Food Security Action Plan and the creation of an Inuit Food System & Knowledge Hub in the Kitikmeot region. The first workshop will be host between May 3rd-5th 2022.

In preparation for the workshop, we have invited key actors from each of the five Kitikmeot communities and Hunters and Trappers Organizations (Gjoa Haven, Taloyoak, Cambridge Bay, Kugaaruk, and Kugluktuk) to attend virtual meetings to begin a conversation around food security and food sovereignty. To date, four of the five communities have joined for a lively interactive discussion about experiences, challenges and desired goals. From these meetings, we were able to identify important topics to discuss at the workshops and flag ideas for further discussion and information provision.

## Sharing results and workshop

In April 2022, two FISHERS members will visit Taloyoak to meet with local fishers and partners from the HTO.

The objective is to share preliminary results (see *How can genetic help fisheries management ? - page 8*) and to help organizing a community-led sampling of Arctic Char for genetic analysis. During this visit, workshops will be organized with local fishers and community members to explain our research and the objectives of the FISHERS project. Furthermore, they will engage the contribution of women in a specific "women's knowledge workshop".

## Harvest Study

Harvest studies activities were led in the fall of 2021 with people of Gjoa Haven and Taloyoak. Researchers aimed to document the economic and social environments impacting harvest activities, and how it impacts country food harvesting and fishery development.

We also intend to learn about how climate change impacts the success and safety of harvesting experiences. We also hope to conduct research while creating local capacity in biomonitoring and providing valuable information for hunters' support programs and local and regional food security and sovereignty strategies.

# What's new in... Nunavut



## Results on Arctic Char diversity

By Anne Beemelmans (Université Laval)



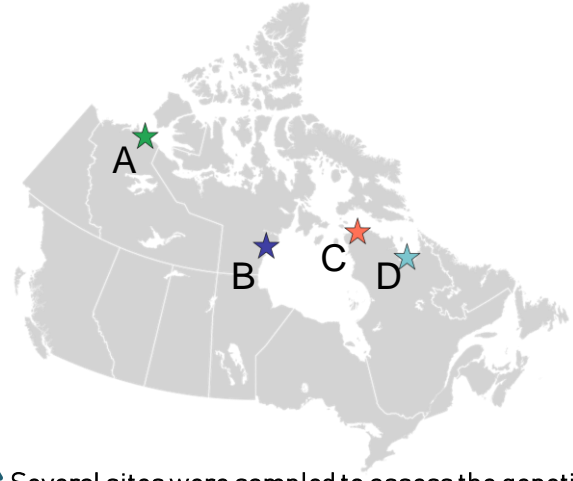
Within the FISHES project, my goal is to develop and provide low-cost genetic tools that will help to support

Indigenous-led management of northern fisheries. These genetic tools will be important for the sustainable management of harvesters, recreational and commercial Indigenous fisheries.

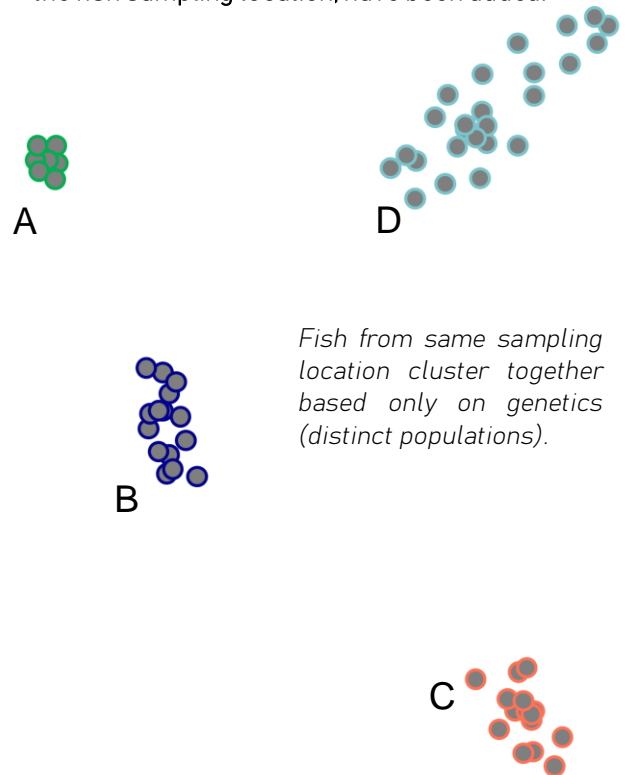
One of my research objectives is to explore the structure, genetic diversity and migration patterns of Arctic Char. Here, the two picture show interesting preliminary results.

How can this information help us to improve fisheries management?

Arctic Char have a very distinct population structure based on their DNA code. This aspect will become of great importance because, in the future, we will be able to assign a fish caught in the open sea to its original source population using genetic tools that we are developing. Knowing that will ultimately help to take better management decision based on fish population information.



- ▲ Several sites were sampled to assess the genetic variation of Arctic Char across northern Canada.
- ▼ Each gray point represent the “position” of a fish based only on genetics. Coloured outlines, corresponding to the fish sampling location, have been added.





# What's new in... Eeyou Istchee

## Consultations

**Wemindji:** Interviews on Cree knowledge related to fish and fishing have been conducted in Wemindji. The Cree language interviews, with enthusiastic approval from the knowledge holders will be archived in and accessible through Wemindji's Knowledge Center so that future (and present) generations can learn from the elders. The focus is mainly on cultural connections to fishing and to fish including stories, legends, traditional practices such as snaring fish in winter and a traditional fish-finding tool, values around sharing, and changes to traditional ways that are developing today. We are also documenting the importance of fish as a reliable source of food and the role of local fishing derbies in Wemindji life today. More sessions are planned for April and July 2022.

**Waskaganish:** We are designing a new study on the gendered dimensions of fishing and food security in Waskaganish. Fieldwork and interviews are planned for May/June 2022 when women fishers and knowledge holders will be invited to share their expertise and experiences. This will be an opportunity to learn more about the cultural contributions of harvesting, preparing, processing and sharing fish for food security and wellbeing, as well as to identify barriers and strategies to improve consumption and participation in fishing.

The interviews will be recorded, transcribed and made available (subject to the approval of those interviewed) to the Waskaganish community to support inter-generational knowledge transmission. This study will also support the recognition and inclusion of the perspectives and priorities of women within the larger FISHES program of research.

**General:** A FISHES team, with support from Natasha Louttit and Stephanie Varty (CTA-EMR), are designing a 4-day workshop to build and strengthen research capacity within Cree communities. The workshop, which is currently scheduled to happen in Val D'Or in early June 2022, will provide wildlife officers with an opportunity to evaluate culturally appropriate research protocols, practices and methodologies, with particular attention to the use of storytelling in engaging and empowering both community members and community researchers.



@Dylan Fraser

# What's new in... Eeyou Istchee

## Fish sampling

CTA-EMR hosted a U. Laval FISHES' team in Eastmain to carry out a sampling campaign of the three anadromous species that are studied on the James Bay coast (brook trout, lake whitefish, cisco). In Waskaganish, another U. Laval FISHES team visited Waskaganish on two occasion during summer 2021. The objective was to take advantage of the community catches of ciscoes. Fin clips samples were collected for genetic analysis, and pictures were taken to describe the morphological uniqueness of the *early run* and *late run* cisco types in Rupert and Nottaway river.

CTA-EMR team has been active both during winter and summer in coordinating a major sampling effort in all communities along the James Bay Coast.

In 2021, Concordia University worked collaboratively with the Cree Nation of Mistissini, Cree First Nation of Waswanipi and the Nibiischii Corporation to collect hundreds of walleye, speckle (brook trout) and lake trout samples across four large lakes and ten of their tributaries. Fin clips (for genomic analysis) and biological data are currently being analyzed to investigate source population and mixed stock structure, as well as temporal changes for all three species. In 2022, Concordia FISHES team members is looking forward to once again sample in partnership with local fishing guides, community members and sport fishers.

## Interested about FISHES genomics activities in Eeyou Istchee?

<http://fishes-project.ibis.ulaval.ca/wp-content/uploads/sites/16/2022/05/Genomic-Research-Highlights-in-the-Eeyou-Istchee-fall-2021-winter-2022-May2022.pdf>

## North American Indigenous Fishing Tourism Survey

The Carleton University FISHES team is designing a North America wide survey with recreational anglers on their interest to visit Northern Indigenous communities for fishing tourism. This survey will gauge the economic potential for Northern Indigenous communities to participate in the fishing tourism industry. The research will also involve focus groups (group interviews) in several Cree communities (and potentially other FISHES partner communities) about the perceived risks and opportunities of fishing tourism.

## Fishing Derby Survey

The Carleton University FISHES team together with local partners are designing a survey about fishing derbies in Eeyou Istchee.

The survey, which has been discussed at the February 2022 Eeyou Istchee Research Advisory Board, will inquire about views and motivations to attend derbies, preferences for diverse types of derbies and their contribution to Cree communities in Eeyou Istchee. The research team also plans to interview the derby organizers about the history, target audience, and goals of their derbies.

# What's new in... Northwest Territories

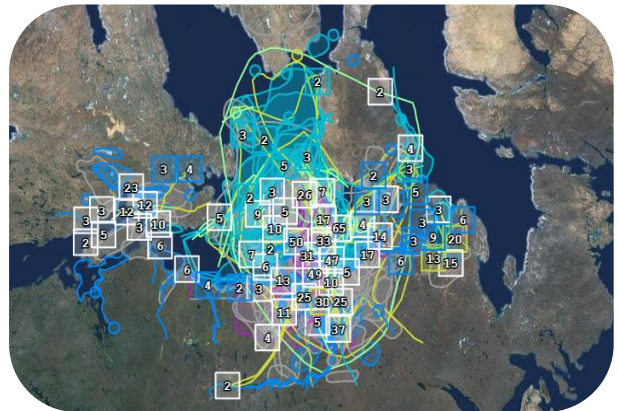
## Sahtú Dene ts'į́ł FISHES Partnership

In summer 2021, we started the process for validating past and current work which is a necessary component of any research or monitoring process that accesses Dene (ts'į́ł) knowledge. At the same time, we started participating in the regional Nę K'á Dene Ts'į́ł (Living on the Land) Forum meetings.

We are currently updating a report and manuscript based on DFO-led research with Délı́nę knowledge holders that took place ten years ago. The team is planning to meet in Délı́nę this summer to validate this work with the Délı́nę Ɂekwé hé Łue he Working Group prior to its publication. We are also planning summer 2022 fieldwork and workshop activities focused on community harvesting, DFO monitoring, and *Atlas* development. The *Atlas* will be a community-owned interactive, user-friendly online tool in which knowledge holder observations, stories, and perspectives will be stored and spatially communicated. We will hold a workshop to train youth and other members from the community on how to enter and protect data.



Other activities planned for 2022 include co-development of a data sharing agreement, conference presentations at the 4WFSC North America and ArcticNet, and a Carleton PhD thesis proposal defence. Throughout 2022 and beyond we will continue to summarize and validate existing data for the knowledge synthesis report and digital atlas and facilitate knowledge exchange across a variety of formats and venues.



▲ Towards a Sustainable Fishery for Nunavummiut  
is an Atlas to store and share local knowledge.

# What's new in...

## All regions

*We would like to thank fishing guides, from the Cree Nation of Mistissini for their invaluable assistance with sampling Brook (Speckled) Trout in spawning rivers last fall. The samples collected in the rivers will allow our team to assess climate change adaptation and estimate the proportion of Brook Trout harvested each year throughout Mistissini Lake that originate from each river.*

- Dylan Fraser

*Thanks to local researchers in Wemindji who are conducting interviews on Cree knowledge related to fish and fishing. Much of our success in recruiting interviewees and in having meaningful conversations is thanks to the participation of local researchers who are facilitating and translating the interviews, which are being conducted in Cree.*

- Monica Mulrennan

*The contribution of local fishers and fishing guides across all regions, sharing fin clips for the genetic part of the project, was vital for the realization of the FISHES project! Even more considering the pandemic situation.*

- Louis Bernatchez

**Thanks to all FISHES  
local partners!**

*Carleton University researchers wish to extend a special thanks to all our research collaborators in the 'Sahtú (Great Bear Lake) Dene Ts'ı́lı (Knowledge) FISHES Project', partners in the Kitikmeot region of Nunavut, in Eeyou Istchee and around Great Slave Lake. We thank our partners in the Déłı́nē ʔq̄hda K'áowə Kə (Elders Council), the Déłı́nē ʔekwé hé Łue hé (Caribou and Fish) Working Group, the Déłı́nē ʔehdzo Got'ı́nē (Renewable Resources Council), the ʔehdzo Got'ı́nē Gots'é Nákedı́ (Sahtú Renewable Resources Board), all the HTOs and HTAs in the Kitikmeot region, GN Fisheries and Sealing, GN Health, KIA, Fisheries and Oceans Canada, the Cree Trappers Associations, the Cree Nation Government, the Eeyou Marine Region, the Norwegian University of Life Sciences, Concordia University, and Université Laval for their time spent meeting with us and being open to sharing guidance and knowledge, without which the project would not be possible. We are grateful for the relationships and knowledge we are building together as we learn from each other in the research process.*

- Stephan Schott

*We are grateful that the objectives of the FISHES project found an echo in local fishers, commercial fisheries and communities. We are excited to share the results as the project continues and contribute to improve food security in northern regions.*

- Jean-Sébastien Moore

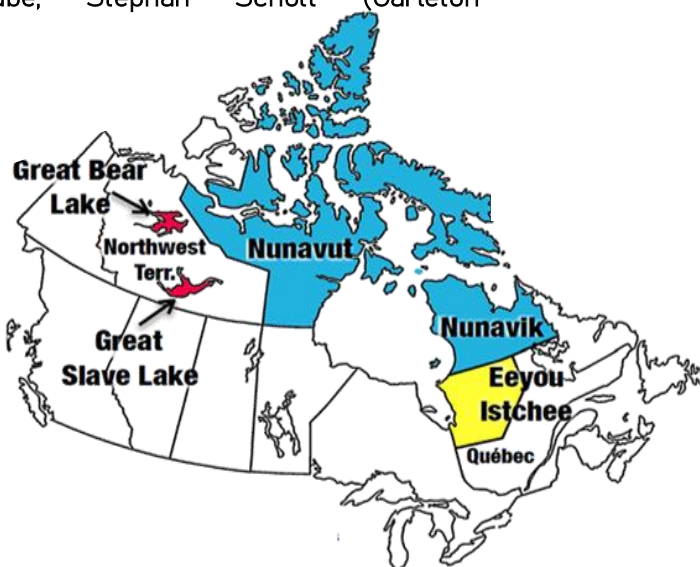


# FISHES

## collaborators

### Northwest territories

Walter Bezha Déḻnē ʔehdzo Got'ine (Elders Council) Déḻnē Got'ine Government, Edward Reeves Déḻnē ʔehdzo Got'ine (Renewable Resources Council), Déḻnē ʔekwē hé Łúé hé (Caribou and Fish) Working Group Déḻnē ʔehdzo Got'ine (Renewable Resources Council), Ben Dosu ʔehdzo Got'ine Gots'é Nákedí, Catarina Owenʔehdzo Got'ine Gots'é Nákedí, Deborah Simmons ʔehdzo Got'ine Gots'é Nákedí (Sahtú Renewable Resources Board), Louise Chavarie (Norwegian University of Life Sciences), Kimberly Howland, Yamin Janjua (Fisheries and Oceans Canada) Grace Martin, Johann Strube, Stephan Schott (Carleton University).



### Eeyou Istchee

Katherine Scott, Natasha Louttit, Stephanie Varty, Naomi Trott, Jeremy Hester, Sanford Diamond, Darryl Steve Hester, Harrison Stephen, Bernard Diamond, Eeyou Marine Region Wildlife Board, Cree Trappers' Association, Waskaganish Cree Nation, Chisasibi Eeyou Resource and Research Institute, Cree Nation of Mistissini, Nibiischii and Cree First Nation of Waswanipi

### Nunavut

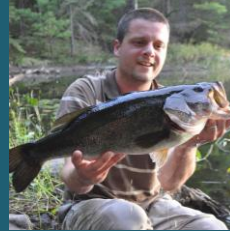
Chantal Langlois RD, Dr. Johann Strube, Dr. Martine Dorais, Marianne Falardeau-Cote, Emma Wood, Dr. Jacqueline Chapman, Emmelie Paquette, Brent Puqignak, James Qitsualik, Simon Okpakok, Jimmy Oleehatik, Peter Aqqaq, John Bryan Idlout, Gjoa Haven Hunters and Trappers association, Taloyoak Hunters and Trappers Association, partners in the Kitikmeot communities, and the Carleton Geomatics and Cartographic Research Center

### Nunavik

Imalirijiit camp, Lucy Grey, Kangiqsualujjuaq community representatives, Paulusie & Jean-Marie Novalinga, Michael Williams, Noah and Anna Pov, RNUK, LNUKs (Daniel Annanack and David Annanack).



# FISHES team



## The FISHES project is led by the following researchers:

Louis Bernatchez (U. Laval), Jean-Sébastien Moore (U. Laval), Dylan Fraser (U. Concordia), Stephan Schott (U. Carleton), Mélanie Lemire (U. Laval), Monica Mulrenann (U. Concordia), Louise Chavarie (Norwegian U.) & Tiff-Annie Kenny (U. Laval)

**Other researchers:** Emily Sinave, Janelle Kennedy, Lilian Tran, Mark O'Connor, Julien April, Les N. Harris, Xinhua Zhu, Kimberly Howland, Ross Tallman, Ionnis Ragoussis

## Questions? Want to know more? Wish to collaborate? Please contact us!



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