

## LEARNING TOGETHER:

Science and Inuit Qaujimajatuqangit join forces to better understand iqalukpiit / Arctic char in the Kitikmeot region



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### Abstract

Arctic char (iqalukpiit) have been central to the identity, livelihood, and culture of the Inuit of Ekaluktutiak/Iqaluktuuttiaq<sup>1</sup> (Cambridge Bay) for thousands of years. Since the 1960s, this important subsistence source has also supported commercial fisheries, thereby providing income and opportunity to many in the community. In 2013, a collaboration between Fisheries and Oceans Canada and the Ocean Tracking Network was initiated to use acoustic telemetry to track the migrations of Arctic char in both the marine and fresh waters of the region. Input from local Inuit was key to the success of this major scientific initiative, and prompted a POLAR-funded collaborative effort with the Ekaluktutiak Hunters and Trappers Organization (EHTO) to document the Inuit Qaujimajatuqangit (IQ), traditional knowledge, of Arctic char. For this project, local youth were trained to conduct semidirected ethnocartographic interviews to document the IQ of nine individuals of the community. Interview findings then guided the scientific work and contributed to an IQ database managed by the EHTO. This initiative culminated in an Elder-youth knowledge exchange camp for a week in August 2016. It took place beside the

Ekaluk River at Iqaluktuuq, an archaeological site used for over 4,000 years. During this camp, Elders and youth from the community, as well as fisheries biologists and social scientists, exchanged their knowledge and stories related to iqalukpiit. Overall, the community-led project contributed to the recording and preservation of IQ through reports and a video documentary, built capacity and bridges between generations and disciplines, provided an opportunity for healing on the land, and allowed new insights into iqalukpiit, all of which are instrumental in managing a redefined relationship between people and fish in a changing Arctic.

### Résumé

L'omble chevalier (iqalukpiit) est au cœur de l'identité, des moyens de subsistance et de la culture des Inuits d'Ekaluktutiak/Iqaluktuuttiaq<sup>1</sup> (Cambridge Bay) depuis des milliers d'années. Depuis les années 1960, cette importante source de subsistance a également soutenu la pêche commerciale, procurant ainsi des revenus et des possibilités à de nombreux membres de la collectivité. En 2013, une collaboration entre Pêches et

<sup>1</sup> There are two orthography systems for Inuinnaqtun, a dialect of Inuktitut used in the Kitikmeot Region. In this paper, we use the new system, in keeping with Government of Nunavut practice.

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Océans Canada et l'Ocean Tracking Network a été lancée afin d'utiliser la télémétrie acoustique pour suivre les migrations de l'omble chevalier dans les eaux marines et douces de la région. La participation des Inuits locaux a été essentielle au succès de cette importante initiative scientifique et a suscité un effort de collaboration financé par POLAIRE avec l'Organisation des chasseurs et des trappeurs d'Ekaluktutiak (EHTO) pour documenter l'Inuit Qaujimajatuqangit (IQ), le savoir traditionnel, de l'omble chevalier. Dans le cadre de ce projet, des jeunes de la région ont été formés pour réaliser des entrevues ethnocartographiques semi-dirigées afin de documenter l'IQ de neuf membres de la collectivité. Les résultats des entrevues ont ensuite orienté les travaux scientifiques et contribué à une base de données de l'IQ gérée par l'EHTO. Cette initiative a abouti à un camp d'échange de connaissances entre aînés et jeunes pendant une semaine en août 2016. Ce dernier a eu lieu à côté de la rivière Ekalluk à Iqaluktuuq, un site archéologique utilisé depuis plus de 4 000 ans. Au cours de ce camp, des aînés et des jeunes de la collectivité, ainsi que des biologistes des pêches et des spécialistes en sciences sociales, ont échangé leurs connaissances et leurs histoires sur l'iqalukpiit. Dans l'ensemble, le projet mené par la collectivité a contribué à l'enregistrement et à la préservation de l'IQ au moyen de rapports et d'un documentaire vidéo, a renforcé la capacité et les liens entre les générations et les disciplines, a fourni une occasion de guérison sur le territoire et a permis de nouvelles connaissances sur l'iqalukpiit, tous des éléments essentiels à la gestion d'une relation redéfinie entre les gens et les poissons dans un Arctique en évolution.

### Introduction

Iqalukpiit (Arctic char; *Salvelinus alpinus*) is one of the most harvested species in Inuit Nunangat (Priest and Usher 2004; Lemire et al. 2015), and it has supported Inuit food security for thousands of years (Balikci 1980; Thompson 2005). Given the importance of Arctic char fisheries, sustainable management in the face of a rapidly changing Arctic will require the best available evidence from multiple perspectives.

Arctic char exhibit a complex migratory strategy shaped by environmental factors, a cycle long observed and planned around by Inuit. Most of the Arctic char populations targeted for harvest are anadromous,

meaning that they migrate between fresh water and the ocean (Johnson 1980). Inuit continue to camp across Nunavut at well-known rivers where these dependable fisheries run. In the past, accurate predictions of migratory cycles were required for survival, whereas today, harvesting iqalukpiit contributes to the ongoing connection between Inuit and country food in a time of great cultural change.

### Arctic char in the Cambridge Bay region

Iqalukpiit has been central to the life of the Tuniit and Inuit at Iqaluktuuq, an important fishing site near Cambridge Bay, for thousands of years (Friesen 2002, 2009; Pelly 2002; Friesen and Keith 2006; Norman and Friesen 2010), and subsistence harvesting continues to be an important part of the economy for many families that take advantage of abundant and readily available Arctic char nearby (Kristofferson and Berkes 2005; Avalak 2016; J. Ekpakohak 2016; R. Ekpakohak 2016).

*[In the 1960s] ...there were maybe four families living there, but in the summertime, it was just like a tent city over in Iqaluktuuq because there was a lot of people that went from here [Iqaluktuuttiaq] to Iqaluktuuq to go fishing for themselves or to commercial fish. It was good in those days, there was a lot of fish. When people gathered over in Iqaluktuuq, it was a fun time. (R. Ekpakohak, May 4, 2016)*

Since the 1960s, the rivers of the region have also supported the most important Arctic char commercial fishery to operate in Canada (Day and Harris 2013). With commercial landings averaging more than 41,000 kg per year, this economic activity provides an income to many fishers as well as to numerous part-time and full-time workers in the fish processing plant operating in Cambridge Bay. While subsistence harvests are exclusively managed by Inuit, as per the Nunavut Land Claims Agreement (1993), Fisheries and Oceans Canada (DFO) has joint jurisdiction over the co-management of commercial fisheries (Kristofferson and Berkes 2005). Consequently, scientific data on harvests and biological parameters of Arctic char have been collected more or less continuously since the inception of the fisheries, and there is a long history of scientists collaborating with local experts in the region (e.g., Kristofferson and Berkes 2005; Day and Harris 2013; Knopp 2017).

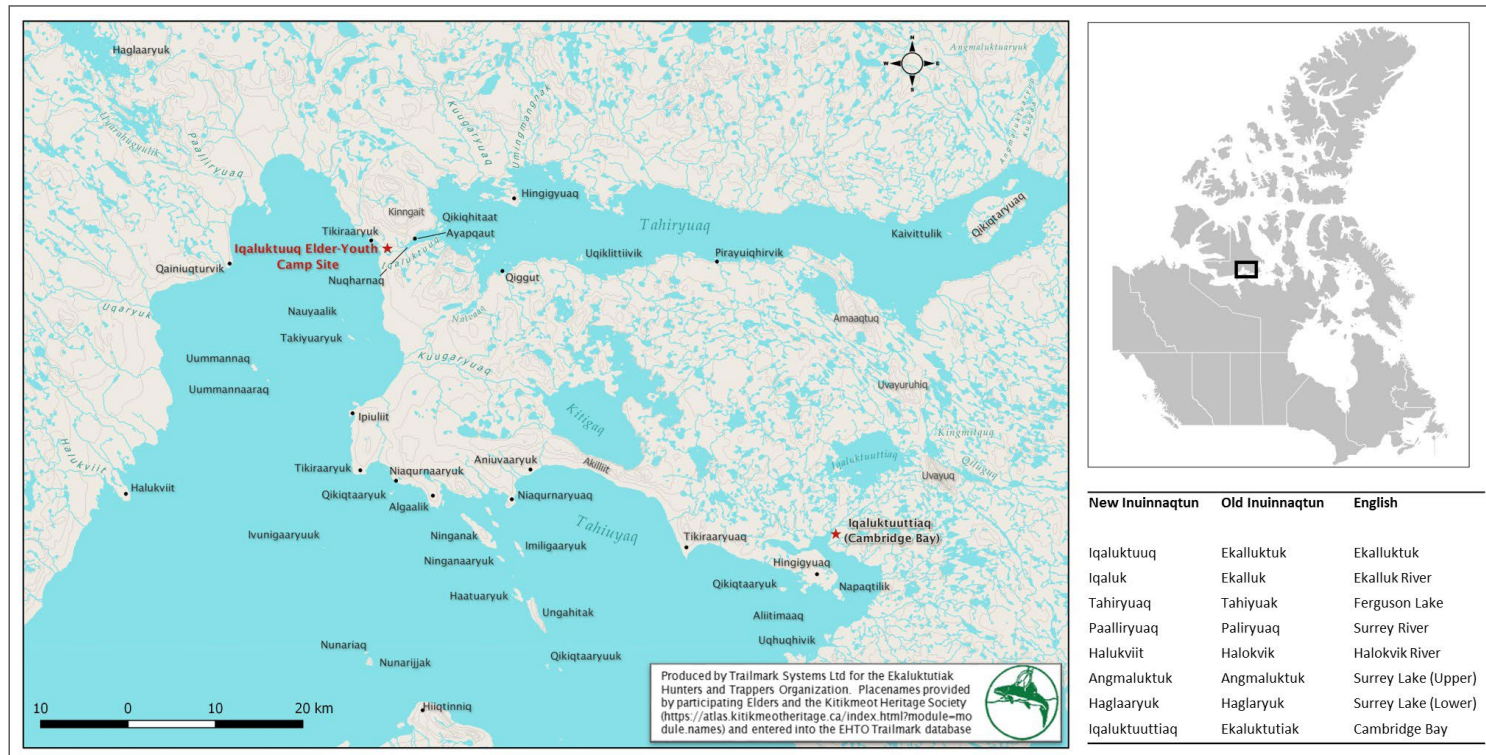


Figure 1: Map of the Cambridge Bay region on southern Victoria Island, Nunavut, Canada. The location of the Elder-Youth Camp, Iqaluktuuq, is shown by a star.

## Context of the project

In 2013, the Ocean Tracking Network (OTN) partnered with DFO to initiate a scientific project to study the marine migrations of anadromous Arctic char in the region. The study involved the use of acoustic telemetry, a technology that tracks movements of fish that are surgically equipped with acoustic transmitters, with the help of moored acoustic receivers deployed throughout the region (see Moore et al. 2016 for details of the methodology). This project not only received the approval of the community following pre-project engagement, but also benefited greatly from the input of key resource users through informal meetings both before and during the work. Most notably, input from local experts helped alleviate one of the major limitations of acoustic telemetry approaches: the use of fixed acoustic receivers to describe movements. Indeed, the movement of tagged fish can only be inferred from their detection on receivers that are deployed at specific locations. If fish frequent an area but no receivers are deployed at that location, inferences will be misleading. The OTN-DFO study, therefore, greatly benefited from insights by local experts who suggested the importance of several areas that were not included in the initial study design. As knowledge exchanges continued, it

became clear that the scientific project, while providing important insights into Arctic char behaviour, was only telling half the story. Interactions between researchers and community members became the impetus for a community-led IQ project to better understand iqalukpiit from the perspective of Iqaluktuurmiut, the people of Iqaluktuuq.

## Methodology and approach

The project took place in three phases that balanced researcher- and community-driven questions, objectives, and approaches. Throughout all phases, many project elements were unplanned and ultimately adapted in response to community input. Methods, results, and reflections are detailed in EHTO and Trailmark (2017).

### Phase 1: Scoping

While researchers provided the initial impetus to develop this project, the initiative only proceeded after community engagement took place and direction was given. A scoping phase was initiated by N. Thorpe in April 2015 through in-person meetings with the EHTO and community members (particularly Elders) to gauge



Figure 2: The Iqaluktuuq Elder-Youth Camp. (a) The camp was located at the mouth of the Iqaluktuuq (Ekalluk) River, where it empties into Wellington Bay. (b) Participants process and prepare the day's catch.

interest and discuss what people wished to achieve. Acting on the strong support received for the initiative, monthly discussions with the EHTO followed (via phone or email) for the remainder of 2015 and 2016, with a focus on developing specific project goals, objectives, desired outcomes, logistics, and securing funding.

## Phase 2: Training and interviews

The EHTO selected two community researchers to participate in a five-day training course focused on interviewing techniques, mapping, and database management. In May 2016, training continued as the researchers interviewed nine IQ experts with an interpreter present when needed. These semidirected and ethnocartographic interviews focused on iqalukpiit. These interviews were audio recorded and reviewed within an online map-based database developed by Trailmark Systems Ltd. Community researchers transcribed interview recordings and validated them with the interviewees shortly thereafter. Interview results not only populated the EHTO database, but also informed the Elder-Youth Camp and factored into the methods and findings of the project.

## Phase 3: The Elder-Youth Camp

During the scoping phase of the project, one of the major community goals expressed was to have an opportunity for hands-on learning and knowledge-sharing through

an Elder-youth camp. For this event, the EHTO chose a traditional site named Iqaluktuuq, meaning “a place of many fish” in Inuinnaqtun. It is no wonder that this site has been used for over 4,000 years, given that the Arctic char population at the Ekalluk River is the most abundant (McGowan 1990) and supports the most important commercial fishing quota in the region (Day and Harris 2013). Several families called this area home until a combination of family tragedy and government policy meant they left for nearby communities in the late 1960s and early 1970s (TRC 2015).

The camp was designed to supplement the interview phase by providing an opportunity to “ground-truth” the findings and have Elders share IQ through demonstration and practical instruction in a hands-on environment, thereby providing youth with the opportunity to learn by doing. The main focus was to promote meaningful interactions among youth and Elders, where the outdoor environment and events prompted memories and instructive stories to be freely recalled and shared, allowing key insights contributed during the interviews to be directly applied in the field. In addition, both youth and Elders engaged with a fisheries scientist who demonstrated techniques to collect data on the health of fish stocks (e.g., how to measure and weigh fish, how to extract otoliths and read the age of the fish).



Figure 3: The Elder-Youth Camp was designed to foster meaningful interactions among Elders, youth, and researchers. (a) M. Avalak teaches A. Omilgoetok how to filet a fish with an ulu. (b) J.-S. Moore teaches basic fisheries science techniques to N. Ekapkohalak and the other camp participants.

## Results: Learning together

While a key goal of the interviews and the Elder-Youth Camp was to document detailed understandings of Arctic char, a more significant objective revealed itself in Phase 3 once the group was on the land: Iqaluktuurmiut experienced a profound and emotional homecoming upon arriving at Iqaluktuuq, such that discussion about fish became secondary. Not only did coming to this important area trigger powerful memories for several Elders, but there was also a strong realization that this way of living — subsisting off the land as the Inuit way — is increasingly challenging today, given the many competing pressures. Accordingly and respectfully, discussion about iqualukpiit became less important than the healing process of simply “coming home” and being together on the land. This critical aspect of the research, with implications for stand-alone IQ projects as well as collaborative research, was elaborated in EHTO and Trailmark (2017). In the following discussion of results, we present one example of collaborative learnings.

## Example of insights gained from learning together

It is beyond the scope of this paper to provide an exhaustive list of insights gained from both scientific approaches and IQ throughout all phases of the project. Here we present an example where combining IQ and science provided new knowledge that would have been impossible to realize through one approach alone. Several interviewees mentioned that Arctic char tended to stay close to shore early after ice breakup, but moved farther

offshore later in the season. Local experts hypothesized that fish were either tracking prey or avoiding warm waters.

*Every year we get lots of Arctic char out at the Gravel Pit, but as soon as the shore gets warm, there are no char. We see big schools of char way out. It makes me curious; maybe the char don't like that warm water along the coast. Or maybe their feed is gone from along the coast because of the warmth. I have no idea. If our temperatures are going to keep rising like they have for the last 30 years, what is going to happen to our char? I want to know. (Anonymous, April 27, 2015)<sup>2</sup>*

This insight prompted scientists to look at their telemetry data differently and observe that Arctic char swam at increasingly greater depths as the summer progressed (Harris: pers. comm. 2018). Sensors contained in some of the tags also allowed measurement of the body temperature of tagged fish (fish are ectotherms, so body temperature closely matches water temperature) and showed that their temperature remained constant throughout the summer, thereby providing corroborating evidence that the use of deeper waters may be linked to temperature regulation (Harris pers. comm. 2018). Here, a crucial observation by a local expert made scientists explore their data differently, which led them to insights

<sup>2</sup> Public meeting with EHTO, Elders, and N. Thorpe; Arctic Islands Lodge Boardroom; Cambridge Bay. The authors would have preferred to give credit to each speaker that contributed insights during the project meetings that were held in advance of the research. However, given that participants did not sign informed consent forms, this quotation is provided from meeting notes, which provide key insights without acknowledging sources.

into the mechanisms driving the observed behaviour (here, temperature regulation), thus providing an answer to a question asked by this local expert. It is therefore a strong example of synergies that can be created from the iterative sharing of information from different perspectives that are placed on equal footing.

## Conclusion

In this time of rapid environmental and social change, co-management in Inuit Nunagat requires innovative approaches to collaboration, where IQ and scientific knowledge can come together to provide enhanced understandings of land and resources. Indeed, such collaboration may contribute not only to better understandings, but also to reconciliation and healing between disciplines, generations, and peoples.

Collaboration between the EHTO, DFO, and OTN throughout this project demonstrated that insights can come from comparing knowledge acquired through different perspectives. Through our work, participants and researchers alike showed that learnings from both ways of knowing could combine to provide a more comprehensive understanding of Arctic char in Iqaluktuuq. Through IQ, Elders taught youth about Arctic char. Moreover, this led to some enlightening observations on various aspects of iqualukpiit biology, which in many cases, will help scientists to frame hypotheses that can lead to new understandings or

alter their research methods. Reciprocally, the scientific data gathered in response to IQ observations can enrich existing knowledge through the use of technology not previously available to community members and resource users.

Perhaps the greatest learning, with application and relevance across the north, is that all success depends on the willingness of outsider researchers to lose some control of their research and relinquish some key objectives in the face of a more relevant imperative. In our experience, this meant that just as iqualukpiit return to their natal lakes from the ocean, Iqaluktuurmiut similarly return home to Iqaluktuuq, where memories and ties to both ancestors and history abound. If IQ holders and western scientists are going to collaborate meaningfully in Nunavut, outsiders and scientists must continually adapt to integrated community research, even when this means their research goals may float downstream.

## Community considerations

As an IQ initiative, the work presented in this project was grounded in strong involvement from community members who contributed to all aspects of the work. The project is relevant for the communities in the north and in other parts of Canada as an example of how science and IQ, or traditional knowledge, can work hand in hand to generate novel insights on species of importance.

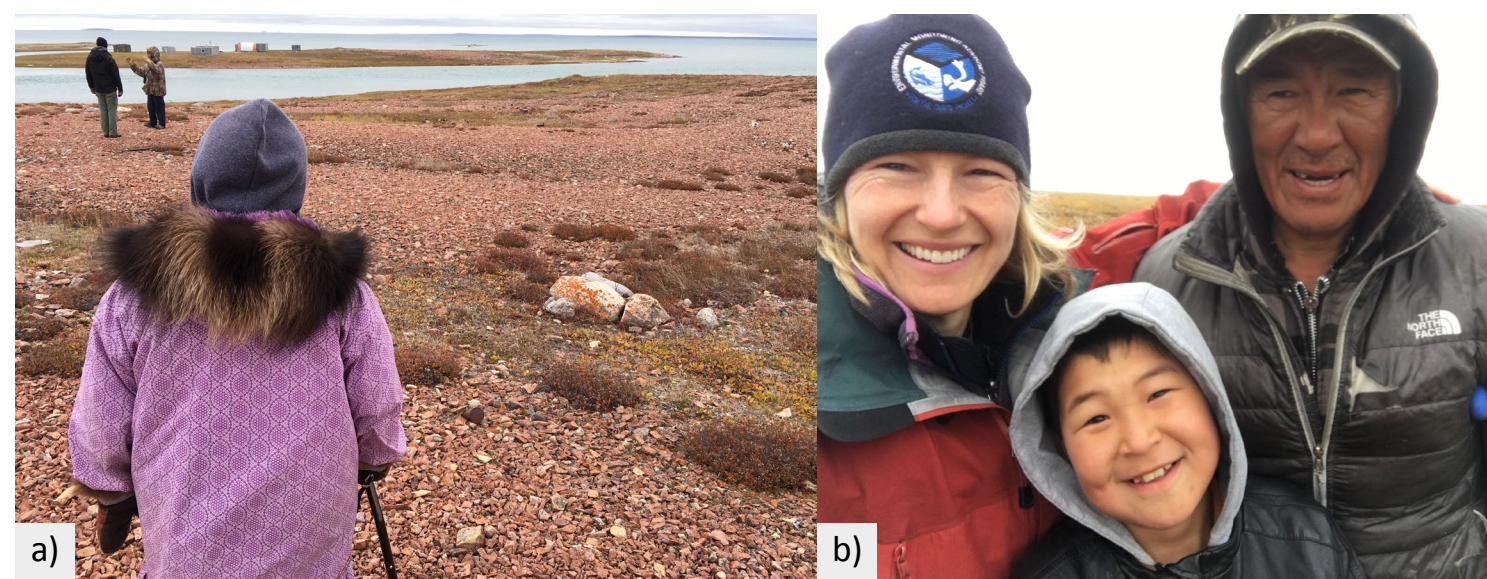


Figure 4: While the initial focus of the camp was on iqualukpiit, the human and social aspects of coming home, healing, and experiencing meaningful interactions became central. (a) M. Avalak returns to where she grew up after nearly 50 years away. (b) N. Thorpe, A. Anavilok, and G. Angohiatok enjoy a selfie together.

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