

Enabling the Coproduction of Inuit and Science Knowledge through Integrated Information Management

Project Leader

Scot Nickels (Inuit Tapiriit Kanatami)

Collaborators

Craig Clark, Carrie Grable, Karen Kelley, Martin Lougheed, Peter Pulsifer (Inuit Tapiriit Kanatami)

Undergraduate Students

James Kuptana (Inuit Tapiriit Kanatami)

Abstract

There is a growing need for knowledge sharing and coproduction among Inuit and Northern researchers as the Arctic continues to experience rapid and unprecedented changes and there is a plethora of new information and data becoming available. Initiatives such as the International Polar Year and ArcticNet have allowed for an enormous increase in Arctic research resulting in the production of large amounts of new information and data that are important for Inuit. Led by Inuit Qaujisarvingat (IQ): Inuit Knowledge Centre (IQNC), the research centre at Inuit Tapiriit Kanatami (ITK), the goal of this project is to develop and maintain an Inuit-specific integrated information management system (IIMS) that supports the ethical collection, discovery, preservation and use of Inuit knowledge and provide access to this information. This project would first identify Inuit needs for environmental, cultural, socio-economic, human health, and other data as well as requirements to develop new ways to manage, interact and share information. Members of the team will consult, develop options, and implement them to meet the needs of all stakeholders (including Northern researchers and Inuit). Feedback from partners, including the Inuit Qaujisarvingat National Committee (IQNC), along with ethical and technical considerations will drive decisions on selection of processes, informational needs, methodologies, and the design of tools. Recognizing that information resources are available from a wide range of sources and locations, and that establishing a 'central repository' may be neither desirable nor feasible because of the dispersed nature of Inuit communities and regional initiatives, we will focus on building a distributed model with interoperability at its core. IQ will initially focus on: (1) Procedural tools, (2) Database of funded Arctic research projects, and (3) Data sets including Bibliographic Databases, Inuit Health Data, Local Environmental Knowledge Data. These are areas identified as priorities by the IQNC, are in keeping with the interests of ArcticNet's mandate, address the priorities of Canada's Northern Strategy, and connect Inuit interests at the community,

regional, national, and international level. Success measures for this project would be the development of an appropriate platform for the preservation, curation, and sharing of information about Inuit and the Arctic for Inuit, northern researchers, educators, policy- and decision- makers at the community, regional, national and international levels. The development of this IIMS will give Inuit and Northern researchers in Canada and abroad the appropriate levels of data and information required to prepare for the changes to their world. Further, Inuit and Northern researchers will be brought together through the co-production of new and clearly articulated knowledge and processes to access and share information as well as through the production and use of new online tools and communication networks that would grow throughout and beyond the duration of ArcticNet.

Key Messages

- To improve connections between Inuit and Arctic researchers, this project has allowed us to expand and foster partnerships to take advantage of expertise in the areas of knowledge, training, data management, and the development of further funding proposals.
- Supporting Inuit-specific research and providing access to Inuit data and knowledge situates IQ as a focal point for knowledge sharing from which to inform sustainable arctic policy.
- Given the growing international data management movement, Inuit, and Inuit representative organizations, stand to benefit from being engaged through the development, use and maintenance of an Inuit-specific integrated information management system (IIMS) that supports the ethical collection, discovery, preservation and use in the coproduction of Inuit and scientific knowledge.
- IQ and the Polar Data Catalogue (PDC) team and management committee are committed to working together to ensure Inuit needs and interests are incorporated into a fully functioning PDC, including PDC-lite and search functionality.

- Through the IQ website and Resource Centre, we collect, preserve, share and connect complex data sets and documentation informed by Inuit knowledge and Arctic community-based research and supportive of key priorities of Inuit.
 - In an effort to make more Inuit-specific reports, publications and grey literature publicly available, IQ is establishing a bibliographic database and associated protocols as well as refining methods for conducting systematic literature reviews on subjects of importance to Inuit.
 - In direct response to the growing demand for Inuit involvement in arctic research, IQ is building a more effective and efficient system to streamline the research request process among Inuit organizations and arctic researchers.
 - As there is no central database that monitors and provides the specific details of funded arctic research projects, IQ is bringing forth Inuit interests to explore the feasibility of building such a platform.
 - Given the popularity of Naasautit as a user-friendly online resource, IQ will continue to investigate appropriate processes and systems that build on the technical framework in order to expand and make available important Inuit health data sets.
 - Using the Circumpolar Flaw Lead Team 10 data and the Inuit Land Use Occupancy Project (ILUOP) as case studies and in collaboration with Inuvialuit partners, IQ facilitates the exchange of Local Environmental Knowledge information analysis, access, preservation and discovery within and between Inuit Regions, as well as with the academic community to develop innovative forms of coproduced knowledge.
- technical network, and to operationalize these relationships (i.e., data sharing infrastructure and agreements, MoUs, develop methodologies and processes, etc.),
2. Conduct environmental scan and needs assessment with Inuit and non-Inuit partners, on the following: (a) service needs, (b) informational needs, (c) process needs, and (d) structural needs,
 3. Consult with Inuit and non-Inuit partners on the development and operationalization, in participation with ArcticNet researchers, of an Inuit-specific process for responding to outside information and research requests (including research support letters),
 4. Investigate feasibility of establishing a database of funded Arctic research projects, through discussions with representatives of larger Arctic research programs and PDC partners,
 5. Operationalize data discovery and documentation systems developed through previous ITK and IQ projects starting with: (a) bibliographic documentation, (b) Inuit Health Data (Naasautit informational database), (c) Local Environmental Knowledge Data (the International Polar Year funded Circumpolar Flaw Lead project, and the Inuit Land Use and Occupancy Project),
 6. Train IQ staff on information management techniques, tools, upload, and data manipulation. Training to come from external and internal IM/IT partner expertise, including the PDMC and our Research Fellow from Exchange for Local Observations and Knowledge of the Arctic (ELOKA),
 7. Establish selected data stores to move towards our goal of developing and maintaining existing systems - website, bibliographies, library and databases. Build on existing connections with the PDC and data/information resource documentation and sharing.

Objectives

1. Build on previous and ongoing consultations with Inuit and non-Inuit partners, including international aspects, to expand the information and

Introduction

The Arctic is rapidly changing from the effects of climate change, resource development, and globalization. These changes emphasize the need for knowledge sharing among Northern researchers and Inuit to identify strategies for adaptation, sustainable development, and governance to benefit all Canadians. ArcticNet's Strategic Plan for the second funding cycle (2011-2018) has evolved to forge the much-needed alliance between researchers and Inuit in the study of the changing Arctic. Inuit representatives on the ArcticNet Board of Directors, the Research Management Committee, the Inuit Advisory Committee, and support for the Inuit Research Advisors have ensured Inuit involvement in the Network. This alliance has also been ensured through the support of Inuit Qaujisarvingat (IQ), the research centre at ITK. The mission of IQ is to lead efforts to ensure an increasingly active role for Inuit in research that leads to the generation of innovative knowledge for improved research, science, and policy decision-making within a Canadian, circumpolar and global context. Immediate priorities of IQ are to invest in and build research capacity, and improve research connections within and between IQ, Inuit organizations and Northern researchers. This mission to support Inuit-specific research and improve access to Inuit data and knowledge will situate IQ as a focal point for knowledge sharing from which to inform sustainable arctic policy. Crucial to the IQ is establishing the infrastructure and data management needs in a strategic way, which includes mechanisms to assist Inuit and their representative organizations in identifying their information and research needs. The goal of this project is to develop and maintain an Inuit-specific integrated information management system (IIMS) that supports the ethical collection, discovery, preservation and use of Inuit knowledge and provides access to this information. Recognizing that information resources are available from a wide range of sources and locations, and that establishing a 'central repository' may be neither desirable nor feasible in all situations because of the dispersed nature of Inuit communities, and regional initiatives, we will focus on building a distributed

model with interoperability at its core. This project first identifies Inuit needs for environmental, cultural, socio-economic, human health, and other data sets as well as requirements to develop new ways to manage, interact and share information with each other. Members of the team will continue to consult, develop options, and implement the most appropriate option to meet the needs of all stakeholders. Feedback from partners, along with ethical and technical considerations drive decisions on selection of processes, informational needs, methodologies, and the design of tools. Previous ITK reports revealed many possible information resources of importance (Canadian Cryospheric Information Network, government sources, Inuit Organizational sources, Spatial Data Inventories, Polar Data Catalogue, etc.). IQ is, therefore, endeavoring to include a large number of sources and to make these resources available to a wide range of users while respecting access/consent models established by resource holders. This project is focused on developing information technology infrastructure (physical, policies, procedures, etc.) to support the overarching goal of making Inuit knowledge more accessible to science/policy-makers and making science/policy resources more accessible to Inuit and their representational organizations.

Activities

The following is a list of activities carried out by the project members this year that were funded through this ArcticNet project as well as related activities that, while funded by other sources, directly relate and contribute to this project and its objectives. The activities are broken down into five categories – Relationship Building, Integrated Information Management System, Procedural Research Tools, Database of funded Arctic research projects, and Data Sets:

Relationship Building

- Throughout the year the IQNC (including members from Nunatsiavut Government, Makivik Corporation, Nunavut Tunngavik Inc.,

Inuvialuit Regional Corporation, ICC-Canada, National Inuit Youth Council, Pauktuutit, and ITK) was engaged to provide feedback, comments and direction on the development of all aspects of this project. This included numerous teleconference calls as well as a face-to-face meeting in December 2013, in Halifax, Nova Scotia in conjunction with the ArcticNet Annual Scientific Meeting (ASM). Hosting this meeting with the ASM ensured that all IQNC members were in attendance and participated in the larger conference.

» An IQNC face-to-face meeting is scheduled for March 2014 in Ottawa where aspects of this project will be further discussed and input sought.

- At the request of the IQNC at the March 2013 meeting, IQ collaborated with the Department of Environment and Wildlife (DEW) and ICC-Canada including Kendra Tagoona and Pitsey Moss-Davies to develop a discussion piece on Highly Qualified Inuit Personnel (HQIP) to be discussed at the ArcticNet Board Meeting. This document was reviewed and commented on by the IQNC and the Inuit Research Advisors (IRAs). Based on the outcome of the ArcticNet Board meeting, IQ will continue to collaborate and work closely with Kendra Tagoona on HQIP.
- April, September, 2013, January 2014: Prior to each ITK Board of Directors meeting IQ developed Briefing Notes to update the Board on many facets of this larger project.
- Throughout the year, IQ partnered with Université Laval professor Thierry Rodon, and Carleton students to work on Tukitaarvik: Inuit Student Centre (www.tukitaarvik.ca). This is a component of a larger ArcticNet funded education project (Improving Access to University for Inuit Students), and IQ is responsible for administering the website. On November 14, 2013 IQ in collaboration with Université Laval, Carleton University, Amaujaq National Centre for Inuit Education and Nunavut Sivuniksavut hosted the official launch for the website. Tukitaarvik was presented at the ArcticNet ASM in Halifax under Education and Outreach (Part II) with the title *Tukitaarvik: Mobilizing Knowledge and Experience to Support Inuit Students in Post-Secondary Education* (Lougheed, 2013).
- Throughout the year IQ has collaborated on the ArcticNet funded project - IRIS Process as a Science-Policy Mechanism: A Case Study of IRIS 4 in Nunavik and Nunatsiavut. This involved reviewing and drafting interview guides as well as conducting interviews. This also involved contributing towards a poster presentation at the ASM (Furgal et al., 2013).
- June – September 2013: IQ assisted in fostering a partnership between the Amaujaq and ArcticNet. This included drafting a joint call for Expressions of Interest for Research on Inuit Education to be issued collaboratively by Amaujaq and ArcticNet. IQ also assisted Amaujaq in preparing two Abstracts for the ArcticNet ASM – for an Education Research Roundtable Session (Simon, 2013a) as a follow up to the previous ASM’s Session, as well as for an Opening Plenary (Simon, 2013b).
- August – September 2013: IQ in connection with the IQNC took the lead role in helping to secure ITK Nominations for the Arctic Inspiration Prize.
- At the request of the IQNC, IQ collaborated with DEW and ICC-Canada to draft a joint ITK/ ICC-Canada response to the recently published Lakehead Manifesto in the journal ARCTIC.
- September 2013: Scot, Carrie, Martin and Karen attended the Northern Contaminants Program Results Workshop in Ottawa as an opportunity to connect further with the Inuit Research Advisors (IRAs) and to network. Further, IQ collaborated with the IQNC and the IRA to submit a proposal to the Northern Contaminants Program to review and update the messaging of the Niqit online contaminants course. The IQNC and IRAs have agreed to be partners on this project.

- September – December 2013: IQ assisted Kendra Tagoona, the ITK lead Project Coordinator of the ArcticNet ASM, on logistics and planning support leading up to the ASM by helping to review the package for Inuit participants and being a main point of contact for Inuit participants while in Halifax.
- November 2013: IQ hosted a presentation by Tom Sheldon and Professor Trevor Bell on: SakKijânginnatuk Nunalik: an integrated action plan for thriving Nunatsiavut communities as part of its “Food For Thought” lecture series. This presentation informed all ITK staff about this important initiative and best practice, in order to build knowledge and connections within specific staff files.
- December 2013: Scot, Carrie, Martin and Karen attended the ArcticNet ASM. This was an opportunity for us to become more familiar with ArcticNet as well as build upon existing and establish new research relationships.
 - » IQ collaborated with Eric Loring to develop a small research project to gather Inuit perspectives on research to be carried out at the ASM. IQ and ITK Communications Department’s Teevi Mackay video interviewed Inuit participants of the ASM about their interest in research and why research is important to them and their communities.
 - » IQ staff were present at the ITK Booth to inform participants about the Centre and about the work we are doing under this project.
 - » IQ staff attended the SAON Canada face-to-face meeting on in conjunction with the ASM: IQ staff assisted ICC- Canada in making a presentation on the development of a Community-based Monitoring web-based tool. Special presentation by Dr. Jill Watkins on the Circumpolar Biodiversity Monitoring Program’s Marine Biodiversity work, where she mentioned IQ’s ILUOP work (partly funded by DFO) focusing on lessons-learned in building an integrated monitoring plan and network.
- » IQ staff attended the first Annual General Meeting of the Canadian Network of Northern Research Operators(CNNRO), at Dalhousie University, Halifax
- » IQ staff attended the Polar Data Management Committee Meeting as part of the ArcticNet ASM.
- Through networks fostered by this project, IQ continued to partner on the Networks of Centers of Excellence ConnectNorth initiative. Partners included Ellsworth F. LeDrew and Julie E. Friddell (University of Waterloo, Polar Data Catalogue); Warwick Vincent (Université Laval, Centre D’Etudes Nordiques); Fraser Taylor and Amos Hayes (Geomatics and Cartographic Research Centre); Gita Ljubicic (Carleton University); Vincent L’Herault (ARCTICConnexion), Chris Furgal (Trent University, Nasivvik); Martin Fortier (ArcticNet); Nick Xenos, Shealagh Pope and Russel Shearer (Aboriginal Affairs and Northern Development Canada), as well as the members of the IQNC. IQ hosted the partners for a proposal writing workshop at the ITK offices early in the year, participated in numerous teleconference calls to draft and finalize the project ideas, and played a key role in connecting the project to the Inuit Regional Organizations through the IQNC. IQ helped to organize Letters of Support from Inuit Regional Organizations as well as ITK. While this initiative was not funded, a positive outcome was to strengthening the partnership between Carleton University and ITK by signing an Ethics Agreement that was a necessary requirement for ITK obtaining Institutional Eligibility with the Social Sciences and Humanities Research Council (SSHRC).
- IQ continued to connect and build partnerships with numerous bodies and attended meetings such as:

- » May and December 2013: CNNRO in-person meeting
- » August 2013: National Inuit Youth Council Summit (IQ hosted a booth as part of the Careers Showcase)
- » October 2013: Polar Continental Shelf Board in-person meeting
- » October 2013: Summit on Canada's North 2013 in Whitehorse, Yukon, presentation on Nilliajut project, and other research.
- » October 2013: Polar Continental Shelf Advisory Board, to provide Inuit perspectives on research and support.
- » October 2013: From Promise to Practice: Community Based Monitoring in the Arctic Workshop in Cambridge Bay, Nunavut led by Oceans North Canada, to identify opportunities at the community, regional, national, and circumpolar levels for starting, enhancing, supporting, and sustaining community-based monitoring efforts in the Canadian Arctic.
- » November 2013: Maritime and Arctic Security (MAS13) Conference in St. John's Newfoundland where Scot presented on the work of IQ, and Inuit perspectives on issues of Security, Sovereignty, and Shipping, and further research needed in these areas.
- » January 2014: Centre for Global and Community Engagement meeting to discuss volunteer opportunities.

Integrated Information Management System

- IQ has established a metadata sharing link with the Polar Data Catalogue (PDC). Using software developed and reported in previous years, IQ can now readily harvest metadata records from the PDC.
- Sharing of information between the PDC and IQ infrastructure has been enabled through the use of the Open Archiving Initiative Protocol

for Metadata Harvesting (OAI-PMH). This is a widely adopted protocol that allows for data exchange with hundreds of possible metadata catalogues using OAI-PMH. The protocol supports the transport of many metadata formats including FGDC (used by the PDC), and ISO 19115 (used by many polar data centres). With the technology developed to harvest records from the PDC, IQ is now in a position to harvest metadata records from other relevant catalogues.

- IQ Staff are working internally and with PDC staff to establish a set of PDC records that are of specific interest to ITK and its partners. Only this subset of records will be harvested from the PDC. Additionally, as part of the design process, a template has been developed to display appropriate fields of information from PDC records on the IQ website.
- The IQ website is built using a content management system (Drupal). The software developed to harvest from the PDC creates information objects within Drupal that can be reused throughout the website, for example in display forms. We are currently designing and testing display forms to ensure the best possible experience for IQ site users.
- The OAI-PMH harvesting tool is standards-based and flexible and thus metadata can be harvested from many catalogues. Right now, the harvesting is done manually by staff but there is hope to have the system developed to be able to retrieve records automatically. The next target for harvesting is the ELOKA catalogue hosted at the National Snow and Ice Data Center.
- December 2013: The Polar Data Management Committee (PDMC) had a meeting at the ArcticNet ASM in Halifax. IQ supplied a report with information on improving PDC metadata to enhance Inuit use. IQ suggested that Metadata should be reviewed and updated to add Inuit-specific information. IQ suggested Geographic locations can especially be improved, for example, adding "Nunavik" and "Inuit Nunangat"

to the PDC Keywords list, and suggested there may be several technical solutions, such as drop-down lists to constrain metadata entry and ensure that recommended fields are included – but given that this is not a straight-forward task, as it would impact non-Inuit-related metadata, there will be a need to discuss this with the CCIN developers to determine options. It was suggested that Funding to support this activity should be investigated by the PDMC.

- Building on previous years, Peter led the development of the geographic information infrastructure housed at IQ. This included ongoing server and software maintenance and the deployment of new GIS, web mapping, and geographic ontology tools. Work on adding value to the Circumpolar Flaw Lead (CFL) System study Team 10 data set continued.
- In his role as Visiting Research Fellow, Peter represented IQ in the ArcticNet funded “Inuit Knowledge and Geospatial Ontologies in Nunatsiavut” project (Chris Furgal, Tom Sheldon leads). In this project, knowledge models, visualization and geographic information tools are being developed to represent Inuit knowledge of the Nunatsiavut region. During this reporting period, the technology infrastructure at IQ was configured to allow ready deployment of the tools being developed through the Geospatial Ontologies project. Specifically, semantic web (i.e. CMap Ontology Edition, Protégé ontology editor), visualization (D3.js visualization library), and mapping (Nunaliit Atlas development framework) tools have been installed. IQ will be ready to deploy solutions developed by the Geospatial Ontology project when they become available.
- October 2013: Peter attended the joint International Forum with the general theme of ‘Polar Data Activities in Global Data Systems’ in Tokyo, Japan. While presenting at this meeting, Peter highlighted work being done at IQ. Subsequently, Peter and Scot, along with a number of other authors (Including Julie Friddell of the ArcticNet funded PDC and Warwick Vincent of Laval/ArcticNet) submitted a manuscript to a special issue of the CODATA Science Journal focused on the Polar Data Forum. The manuscript has been accepted and is expected to be published in mid-2014.
- Internal and external IT experts assisted in reviewing the IQ website framework, known as a Wireframe, to develop an overarching site map and infrastructure to better situate the deliverables of this project (i.e., bibliographies, resources, maps etc.). IQ has been working to prioritize the website components to be updated first, as we make the larger upgrade to Drupal 7. IQ staff focused efforts on developing content for sections of the website which were deemed to be priorities, such as Research requests, and Collaboration Centre. The processes and procedures developed through this project work on the IQ website are being applied to Tukitaarvik.
- As part of the daily operations of IQ, we are building expertise for Microsoft SharePoint for document storage and project management. IQ have met numerous times with internal IT specialists to discuss the usefulness and challenges of SharePoint, as well as made presentations to ITK Management (June 2013), ITK staff and Know History for the Library Assessment (October 2013).
- August 2013 – February 2014: IQ led a Request for Proposals (RFP) process to select a firm to conduct a Library Needs Assessment and Options Report. Know History was contracted to carry out the work based on their expertise. In order to obtain the necessary information Know History held departmental focus groups, carried out external research, and examined the current ITK holdings. The final report was presented to ITK staff December 2013, and implementation of the recommendations is beginning. The development of library processes and protocols are intricately tied to the larger ITK IIMS. This work included connecting with the Inuit Early Childhood

Working Group, Amaujaq as well as numerous ITK departments, through presentations and discussions.

Procedural Research Tools

- IQ has been developing a more formalized internal process at ITK for dealing with outside requests (i.e. review documents, letters of support, become involved in projects) with the goal of helping to connect and coordinate Inuit at the community, regional, national and international levels.
- IQ led efforts in evaluating ITK's involvement in external Arctic Inspiration Prize submissions by utilizing this process and protocol and engaging the IQNC (August 2013 teleconference call).
 - » ITK nominated the Arctic Eiders Society and the Northern Games Society.
 - » ITK provided Letters of Support to the Inuit Circumpolar Council-Canada; Université du Québec à Trois-Rivières; and the Nunatsiavut Government.
- December 2013: Carrie presented this tool and process at the ArcticNet ASM. The presentation was during Community Adaptation & Vulnerability in Arctic Regions (Part I) and titled "Research Request Process to Address Inuit-Specific Research Needs and Policy Development" (2013).
- IQ has been working with internal IT experts to develop an online form which allows anyone to submit a request through the ITK website. This streamlines the request through one point of contact for the whole organization and has allowed decisions to be made more efficiently by gathering information in this standardized manner.
- The online form has been presented to ITK staff individually with training, to the organization as a whole and to ITK president Terry Audla.

- Feedback from IQ and ITK partners, IQNC, committees, and other stakeholders are ongoing in order to improve the request process and its tools such as the online form, ensuring information needs and expectations of a streamlined approach are met.

Database of funded Arctic research projects

- It has been a long-standing interest of the IQ to develop a database of funded Arctic research projects. Through discussions with ConnectNorth partners, it was determined that there is interest, and it would be feasible, to construct such a database. Securing funding to develop the appropriate partners, discuss the prototype, and conduct the work would assist all research programs, researchers and Inuit. This proposed project was written into the ConnectNorth proposal, a National Centre of Excellence submission, as a "Research Compendium" project. It was determined that it would be key to have a Network like this carry out the project with the academic partners, research funders, northern licensing offices and Inuit Regional Organizations all contributing to its development. Extensive planning was put into this project idea including that it would involve developing appropriate tools for handling and streamlining research information and results improve links between, or streamlined access to, community-based monitoring initiatives across the North; provide secure yet accessible local repositories for research results, especially related to ethical practices for preserving and sharing local and traditional knowledge; and develop streamlined ways to access, search, and disseminate information related to research proposals, licensing approvals, and results reporting. Unfortunately the project team was notified in November that ConnectNorth was unsuccessful. However, the documents, resources and relationships established throughout the proposal submission process will be leveraged in developing future proposals.

Data Sets

Bibliographic Databases

- In an effort to make more Inuit-specific reports, publications and grey literature publically available, IQ has been working on establishing a bibliographic database and associated protocols, as well as methods for conducting systematic literature reviews. The bibliographic protocol using existing software (EndNote) was developed by Martin and the team from McGill University for use in the Climate Change Adaptation Gap Analysis funded by Aboriginal Affairs and Northern Development Canada in 2011.
- This protocol has been adapted and further revised by Martin with support from other IQ staff. Over the summer 2013, Martin worked closely with IQ Summer Student to train them on the systematic literature review protocol and process.
- Summer 2013: Summer students compiled a list of Inuit-specific early childhood education resources which can support education and learning in classrooms.
- Based on the same protocol, literature reviews and bibliographic retrievals were also completed in Endnote on the topics of Inuit Tobaccos use, Food Security, Health and the Environment, and Language.
- All of these bibliographies were informed by the IQ protocols and are available and accessible to support the work of ITK staff.

Inuit Health Data

- Since Fall 2013, IQ and the Department of Health and Social Development at ITK have been having regular collaborative meetings to discuss linkages between the departments. A large component of these meetings is Inuit Health Data.
- September 2013: meeting to discuss analysis and dissemination of data from the 2012 Aboriginal Peoples Survey (APS) with Statistics Canada,

leading to the signing of a contract between the organizations.

- January 2014: Began developing information products and disseminating data from the 2012 APS through Naasautit, our online statistics website, and other products this work will be completed June 2014.
- Coordinated an Inuit-specific review and provided input into two separate publications from Statistics Canada relating to Inuit health. Expected publication to be released end of February 2014.
- IQ continued to support and encourage DHSD, NICOH and the Inuit Regions in moving forward activities on the Inuit Health Survey, including the establishment of the Inuit Health Survey Working Group.
- Identified by NICOH as a priority, Martin worked on developing an Inuit Health Indicators discussion paper that is an overview of the current status (Inuit Qaujisarvingat, 2014). This paper has been finalized internally at ITK and will be presented to NICOH for discussion. NICOH, for their March 2014 meeting, will be provided with recommendations for decision making around developing national Inuit health indicators.
- With expertise developed through Local Environmental Knowledge mapping, IQ has helped to support discussions on E-mapping for other ITK priorities focusing around health and utilizing health data.

Local Environmental Knowledge Data

- In collaboration with the Department of Environment and Wildlife and our Visiting Research Fellow from ELOKA, IQ assisted in the development of an Interactive Polar Bear Mapping tool. This tool maps the 13 sub-populations of polar bears in Canada and includes population characteristics and identifiers. The preliminary tool was presented at the ArcticNet

ASM in the Arctic Marine Mammals Session with the title “Web Information Map Tool on Canada’s 13 Polar Bear Subpopulations” (Cheechoo, 2013).

- James underwent training by Peter on information management techniques, tools, and data upload information particularly for the CFL project data.
- CFL data was moved and consolidated from previous locations to a newly acquired IQ server. All data has undergone a general review for consistency and quality control and has been verified.
- The Inuvialuit Settlement Region (ISR) organizations, IQ and the Aboriginal Aquatic Resource and Oceans Management Program (AAROM) of the Department of Fisheries and Oceans Canada struck an agreement to develop a marine mammal pilot project for the six Inuvialuit communities of Aklavik, Inuvik, Tuktoyaktuk, Paulatuk, Ikaahuk (Sachs Harbour) and Ulukhaktok (Holman Island). This agreement outlined the first phase of a longer term program of work to facilitate the development of a comprehensive Inuvialuit knowledge data base and a GIS system to manage the information in the data base. The project is titled A Pilot Project for the Inuvialuit Settlement Region for the Development of a Digital Atlas and GIS Database for Marine Mammals From the Inuit Land Use and Occupancy Project (1974) Archived Maps and Supporting Documents.

Results

Relationship Building

- Continued to build strong connections among partners, enhancing the incorporation of regional, national and international Inuit perspectives into evolving research agendas connecting across Inuit Nunangat as well as Arctic research broadly.
- IQ is actively pursuing negotiations to build partnerships with Academic institutions,

particularly those involved in Arctic and Inuit research.

- Worked closely to foster Inuit engagement with the IQNC and IRAs to meet their interests in relation to Research and Information Management.
- Moved forward a number of partnerships between ITK and ArcticNet on important topics like Research in Inuit Education and Highly Qualified Inuit Personnel.
- November 14, 2013 Tukitaarvik website was launched resulting in approximately 12 new members. The launch solidified the partnerships between Academic researchers, Nunavut Sivuniksavut, Amaujaq, NIYC, ITK, IQ and Inuit students.
- Amaujaq and ArcticNet have partnered and announced a call for Expressions of Interest for Research on Inuit Education at the ArcticNet ASM, allowing Inuit to be more actively involved in directing funding and research priorities.
- A joint ITK/ICC-Canada response to the recently published Lakehead Manifesto in the journal ARCTIC has been submitted to the journal in February 2014 for March publication. This emphasized Inuit-specific processes which researchers need to be aware of and respect as they conduct their work.
- Through networks fostered, submitted research proposals that complement the work under this project, such as Northern Contaminants Program. This included Letters of Support from Inuit representative organizations.

Integrated Information Management System

- Expanded the PDC IQ dialogue to include ASTIS.
- IQ has successfully harvested over 120 Inuit-specific records from the PDC.
- Further explored with PDC partners a project to verify the PDC-lite version and search

functionality is seen as successful in Inuit regions and communities.

- Further developed geographic information infrastructure being used to host data from IPY CFL Team 10 activities.
- IQ website Site Map and Wireframes was finalized using the information architecture to better situate the deliverables of this project.
- Following the recommendations of the Needs Assessment and Options Report, IQ is moving forward internally to mobilize a Resource Centre Committee, developing a Resource Centre mandate, and hiring a Resource Librarian/ Information Professional.
- Given the technical expertise developed through this project, IQ has been brought in to assist internal IT experts in Information Management systems such as Microsoft Outlook and SharePoint.

Procedural Research Tools

- Research request template was developed and further adapted into an online form. The tool was made accessible online one year earlier than initially planned for this project.
- All ITK staff are being encouraged to follow the same procedure. All researchers who approach ITK are being directed to submit their request at <https://www.itk.ca/rfi>.
- Effectively and efficiently implemented a system from the regional to national level to review and assess potential Arctic Inspiration Prize Nominations, resulting in several ITK Nominations, and assisting us in building a more robust process.
- ITK staff have begun using this tool based on individual training sessions, staff presentations, ArcticNet ASM presentation and promotion by IQ.
- Expanded process to Inuit Regions through

IQNC members in order to increase regional use and uptake, resulting in improved information exchange.

- » May 2013: meetings with Nunavut Tunngavik Inc.
- » June 2013: meeting with Makivik Corporation
- » December 2013: meeting with all members of the IQNC

Database of funded Arctic research projects

- While IQ has determined that there is an interest and that this could be feasible, there is a need to bring together the appropriate partners (academic, funders, government, Inuit organizations etc.), to have significant dedicated funds, and to have a dedicated body to house and maintain the information.
- Stemming from these discussions, potential future databases were identified as being useful for Inuit priorities and could include a directory of researchers by topic and field.

Data sets

Bibliographic Databases

- Having a systematic literature review protocol and process assisted ITK staff in addressing further research issues and projects that are of interest to Inuit.
- IQ staff are well versed in collecting bibliographic references and have shared these expertise with summer students and other ITK file leads.
- Successfully created and informed the development of bibliographies on Education and Residential Schools (19), Food Security (25), Tobacco (45), Language (22), and Health and Environment (59).

Inuit Health Data

- Some progress has been made determining the identification of what and where Inuit health data sits, which data sets are most important to make available, and what the process will be to make these determinations.
- Contribute to the dialogue of the Inuit Health Survey (including participating in the Inuit Health Survey Working Group) as it relates to the broader research implications around ethics, agreements, and data sharing.
- A final Inuit health Indicators paper was developed to assist the ITK DHSD and NICOH to better understand the collection of health indicators to be used to better assess health status and health determinants. Paper will be discussed at NICOH March 2014.

Local Environmental Knowledge Data

- Polar Bear Mapping tool was presented at ArcticNet ASM informing the ArcticNet research community about this priority and the value of this source of information.
- James was trained by Peter on information management techniques, tools, and data upload information particularly for the CFL project data. This represents a successful exchange of knowledge and mentoring from external and internal partner expertise.
- CFL data was moved from previous locations to IQ server and verified. Thus, the CFL data are now in a form that can be used to begin exploring the appropriate sharing mechanisms of data with the broader academic community. While the data set is being continuously improved, the infrastructure needed to manage and preserve the data is now in place. Specifically, this includes a dedicated, geospatially enable relational database, geospatial web services available on the ITK Intranet, networked geographic information system tools (a number of GIS Clients), a web mapping framework, and a set of geographic concept mapping and knowledge modeling tools.

- The technical systems developed for the CFL data are now in place which can be used for other data sets and projects, including the ISR ILUOP project.
- The ILUOP project has built capacity by fostering a young Inuvialuk researcher – James Kuptana – in assisting with GIS work through on the job training, providing for field work time at the Library and Archives Canada for Inuit Qaujisarvingat staff and connecting Inuvialuit youth to traditional Inuvialuit knowledge from elders and ancestors dating back to the early 1900s.
- The ILUOP project is returning Inuvialuit traditional knowledge in a useable format back to the region in which it was generated and will help to build capacity in the next generation of Inuvialuit youth and in the ISR.
- Mapping and Emapping have been identified as priorities for displaying and disseminating information. With expertise developed, IQ has facilitated meetings with IT experts and DHSD to evaluate possible options.

Discussion

Relationship Building

Through the activities of this project and the relationships developed, Inuit are better positioning themselves to direct research and respond collaboratively. One key success, fostered through this project was connecting the IQNC to researchers and research networks including the IRAs. As with all activities undertaken at IQ, we strive to consult and seek direction from this committee to meet their interests in relation to research and information management. An example of this was the letter to the editor concerning the recently published Lakehead Manifesto which was championed by the IQNC and has been submitted for publication in ARCTIC. This letter emphasized Inuit-specific processes which researchers need to be aware of and respect as they conduct their work.

Integrated Information Management System

The continued development of an Inuit-specific IIMS will give Inuit and northern researchers in Canada and abroad the appropriate levels of data and information required to prepare for the changing Arctic. IQ has made progress to meet the outlined measures of success for this project by developing an appropriate platform for the preservation, curation, and sharing of information about Inuit and the Arctic for Inuit, northern researchers, educators, policy and decision-makers at the community, regional, national and international levels. Through work and connections to the PDC, we have a greater understanding for the challenges associated with IIMS and are better positioned than ever to become stewards of data for Inuit in Canada.

Procedural Research Tools

Inuit organizations are inundated with requests to engage in research at various levels. Simultaneously Inuit are better positioned than ever to be able to coordinate and effectively lead and direct research. One method that has allowed for this increasing success is the process to evaluate incoming requests to ITK. Tools developed include an online form, a word document and a criteria and considerations guide. One key successful use of this procedure and tool was its use to evaluate the Arctic Inspiration Prize Nominations and requests. Without the support from this procedure and tool, the amount of requests received would have overwhelmed ITK and the IQNC and would not have allowed for effective and efficient evaluations.

Database of funded Arctic research projects

There is a clear interest expressed for a centralized database of funded Arctic research projects. Through this project we brought forth Inuit interests to explore the feasibility of building a composite index of arctic research funded projects to the ConnectNorth project team. It was determined that there is an interest and that this could only be feasible with significant dedicated funds, buy-in from research

funding institutions, and a dedicated body to house and maintain the information. With ConnectNorth unsuccessful in its funding proposal, we will continue to explore other possibilities for this activity to go forward.

Data sets

Given the scope and complexity of the information and data sets aligned with Inuit priorities, we have learned setting up systems are complicated and requires a significant investment of time and effort. This project has increased our capacity and understanding of working with data especially with respects to bibliographic databases, Inuit health data and local environmental knowledge data. Specifically tools and processes have been created and improved to support our ability to generate, manage and distribute Inuit-specific data. This includes key successes such as systematic literature review protocol and process, coordinating Inuit input into important health data sets, and developing a Polar Bear mapping tool of the 13 Canadian subpopulations.

Conclusion

IQ in collaboration with its partners (academic, Inuit organizations, and government) is leading efforts in innovation with respect to creating an Inuit-specific integrated information management system and frameworks for accessing information relevant to decision-makers to inform policy and strategy development. This work will also allow us to foster the development of the next generation of competent, qualified Inuit researchers and leaders. Given the unique information that ITK deals with, as a national organization, this project is allowing ITK to improve our integrated approach to store, access, archive and share information.

While certain challenges are evident (e.g. limited access to Inuit students and funding pots, competing interests between Inuit priorities and funding priorities, and a lack of access to subscription journal), the

support ArcticNet provided for this project, gives IQ the flexibility to build and maintain sound research relationships and address Inuit priorities as they arise (e.g. working on the concept Highly Qualified Inuit Personnel, being a nominator for the Inspiration Prize, and assisting in the development of an ArcticNet call for Expressions of Interest for Research on Inuit Education).

Support for this project represents an achievement, putting ArcticNet at the forefront of a lasting and meaningful institutional legacy that advances Inuit and Inuit knowledge for sustainable Arctic science and policy. This project establishes Canada as a world leader in recognizing the value of indigenous knowledge and collaborating proactively with Inuit to identify, preserve and actualize this knowledge for the lasting benefit of Arctic communities, regions, Canadians and global citizens.

Inuit will continue to be brought together through the development of new and clearly articulated processes to access and share information as well as through the production and use of new online tools and communication networks that will grow throughout and beyond the duration of ArcticNet.

Acknowledgements

We are grateful to the IQNC with membership from the Nunatsiavut Government, Makivik Corporation, Nunavut Tunngavik Inc., the Inuvialuit Regional Corporation, the National Inuit Youth Council, Pauktuutit Inuit Women of Canada, and Inuit Circumpolar Council-Canada for their overarching direction, technical guidance, and recommendations. We would like to thank each of our academic partners who provide feedback, expertise, guidance and encouragement throughout the year. We would also like to thank Steve Etlinger at Wirespeak for his technical expertise and assistance connecting to the PDC, improving the functioning of the IQ website, and work on Naasautit. We thank Julie Friddell at the University of Waterloo for assistance in connecting

with the PDC. We also thank Peter Pulsifer, our Visiting Research Fellow, for his expertise and energy in assisting us with our information management interests. This project was funded by ArcticNet and ITK.

References

- Cheechoo, J. 2013. ArcticNet Annual Scientific Meeting. Web Information Map Tool on Canada's 13 Polar Bear Subpopulations. [topical session presentation] December 13. Halifax: World Trade and Convention Centre.
- Furgal, C., D. Hik, S. Nickels, S. Meakin, M. Buckham, K. Kelley, P. Moss-Davies and L. Braithwaite. 2013. ArcticNet Annual Scientific Meeting. ArcticNet's IRIS Process as a Science-Policy Mechanism: A case study of IRIS 4 in Nunavik and Nunatsiavut. [poster presentation] December 11-12. Halifax: World Trade and Convention Centre.
- Grable, C. 2013. ArcticNet Annual Scientific Meeting. Research Request Process to Address Inuit-Specific Research Needs and Policy Development. [topical session presentation] December 11. Halifax: World Trade and Convention Centre.
- Inuit Qaujisarvingat. 2011. Implementation of an IPY Data Assembly Centre: Inuit Integrated Information Management System Needs Assessment (Phase 1). A report to International Polar Year Federal Program Office. Ottawa.
- Inuit Qaujisarvingat. 2012. Implementation of an IPY Data Assembly Centre: Inuit Integrated Information Management System Needs Assessment (Phase 2). A report to International Polar Year Federal Program Office. Ottawa.
- Inuit Qaujisarvingat. 2014. The Development of Inuit-Specific Health Indicators: An overview, past challenges and lessons learned, as well as suggestions

for developing indicators. Working discussion paper. Inuit Tapiriit Kanatami.

Know History. 2013. Inuit Qaujisarvingat Library Needs and Assessment Report. A report to Inuit Tapiriit Kanatami. Ottawa.

Lougheed, M. 2013. ArcticNet Annual Scientific Meeting. Tukitaarvik: Mobilizing Knowledge and Experience to Support Inuit Students in Post-Secondary Education. [topical session presentation] December 12. Halifax: World Trade and Convention Centre.

Simon, M. 2013a. ArcticNet Annual Scientific Meeting. Future Directions in Research in Inuit Education. [roundtable session] December 11. Halifax: World Trade and Convention Centre.

Simon, M. 2013b. ArcticNet Annual Scientific Meeting. Future Directions in Research in Inuit Education. [opening plenary] December 12. Halifax: World Trade and Convention Centre.

Publications

(All ArcticNet refereed publications are available on the ASTIS website (<http://www.aina.ucalgary.ca/arcticnet/>).

Cheechoo, J., 2013, Web Information Map Tool on Canada's 13 Polar Bear Subpopulations, Topical Session Presentation, ArcticNet Annual Scientific Meeting,

Furgal, C., Hik, D., Nickels, S., Meakin, S., Buckham, M., Kelley, K., Moss-Davies, P. and L. Braithwaite., 2013, ArcticNet's IRIS Process as a Science-Policy Mechanism: A case study of IRIS 4 in Nunavik and Nunatsiavut., Poster presentation, ArcticNet Annual Scientific Meeting,

Grable, C., 2013, Research Request Process to Address Inuit-Specific Research Needs and Policy

Development., Topical Session Presentation, ArcticNet Annual Scientific Meeting,

Inuit Qaujisarvingat, 2014, The Development of Inuit-Specific Health Indicators: An overview, past challenges and lessons learned, as well as suggestions for developing indicators, Working discussion paper, Inuit Tapiriit Kanatami,

Know History, 2013, Inuit Qaujisarvingat Library Needs and Assessment Report, A report to Inuit Tapiriit Kanatami. Ottawa.,

Lougheed, M., 2013, Tukitaarvik: Mobilizing Knowledge and Experience to Support Inuit Students in Post-Secondary Education, Topical Session Presentation, ArcticNet Annual Scientific Meeting.,

Pulsifer, P.L., Yarmey, L., Godøy, Ø., Friddell, J., Parsons, M., Vincent, W., DeBruin, T., Manley, W., Gaylord, A., Hayes, A., Nickels, S., Tweedie, C., Larsen, J.R., and Huck, J., 2013, Towards an International Polar Data Coordination Network, CODATA Science Journal, special issue on the Polar Data Forum, held October 15-16, 2013,

Simon, M., 2013, Future Directions in Research in Inuit Education., Roundtable Session, ArcticNet Annual Scientific Meeting,

Simon, M., 2013, Future Directions in Research in Inuit Education., Opening Planery, ArcticNet Annual Scientific Meeting.,