

The Indigenous Health Adaptation to Climate Change (IHACC) project

IDRC project number 106372-003, 004, 005



McGill University, Makerere University, Universidad Peruana Cayetano Heredia, University of Guelph

Canada, Uganda, Peru

By:

Dr. James Ford (McGill University)
Dr. Alejandro Llanos-Cuentas (UPCH)
Dr. Shuaib Lwasa (Makerere University)
Dr. Lea Berrang-Ford (McGill University)
Dr. Sherilee Harper (University of Guelph)
Michelle Maillet (McGill University)
Alejandra Bussalleu (UPCH)
Jahir Anicama (UPCH)

Final Technical Report

November 28th 2016

© 2016 IHACC Research Team

Disseminated under Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>)

Final Technical Report

Section A: Program Information

| | | |
|---|--|----------------------|
| 1. Identification | | |
| IDRC File Number 106372-003, 004, 005 | Title: Indigenous Health Adaptation to Climate Change (IHACC) | |
| <i>Report completed by: (add rows)</i> | | |
| Family Name: Ford | Given Name: James | Initials: JDF |
| Organization: McGill University | | |
| Telephone number: 514-398-4960 | Primary E-mail: james.ford@mcgill.ca | |
| Family Name: Llanos Cuentas | Given Name: Alejandro | Initials ALC |
| Organization: Fundación Cayetano Heredia | | |
| Telephone number: 511-482-7739 | Primary E-mail: elmer.llanos@upch.pe | |
| Family Name: Lwasa | Given Name: Shuaib | Initials SL |
| Organization: Makerere University | | |
| Primary telephone: 256-414-513-261 | Primary E-mail: lwasa_s@arts.mak.ac.ug | |
| Family Name: Berrang-Ford | Given Name: Lea | Initials LBF |
| Organization: McGill University | | |
| Telephone number: 514-398-4344 | Primary E-mail: lea.berrangford@mcgill.ca | |
| Family Name: Harper | Given Name: Sherilee | Initials SH |

| | | |
|---|--|--------------------|
| Organization: University of Guelph | | |
| Telephone number: 519-824-4120 ext.58392 | Primary E-mail: harpers@uoguelph.ca | |
| Family Name: Maillet | Given Name: Michelle | Initials MM |
| Organization: McGill University | | |
| Telephone number: 514-398-4304 | Primary E-mail: ihacc.geog@mcgill.ca | |
| Family Name: Bussalleu | Given Name: Alejandra | Initials AB |
| Organization: Universidad Peruana Cayetano Heredia | | |
| Telephone number: 511-482-7739 | Primary E-mail: alejandra.bussalleu@upch.pe | |
| Family Name: Anicama | Given Name: Jahir | Initials JA |
| Organization: Fundación Cayetano Heredia | | |
| Telephone number: 511-482-7739 | Primary E-mail: janicama@fundacioncayetanoheredia.org | |
| Date Submitted (dd/mm/yyyy): 28-11-2016 | | |

Section B: Synthesis

2. Provide a one-page summary that describes the work conducted during the reporting period as it relates to the goals of the IRIACC competition (e.g., advancing research, influencing policies and practices, training and network development). As noted above, given the comparative nature of the research, please ensure that the report accurately reflects the work undertaken at each site.

The work conducted over the last year of the project consisted in finalizing data collection and analysis, evaluation of the IHACC research program through the Evaluating Indigenous Vulnerability and Adaptation Research (EIVAR) project, and dissemination of IHACC and EIVAR project findings to community members, project partners, local, regional and national governments, as well as to wider audiences including the academic/scientific community, students and civil society.

A larger Project Management Committee (PMC) meeting was held in Oxford in May 2015 and graciously hosted by the University of Oxford's Environmental Change Institute (ECI), the Alma Mater of Dr. Ford and Berrang-Ford. Smaller partial PMC meetings were held in Peru and Uganda throughout 2015 with Canadian team members to ensure consistency between all three regions for end of project activities.

Major knowledge translation (KT) / knowledge sharing workshops were held in all project locations (Peru in October 2015, Arctic in April 2016, and Uganda in June 2016), bringing together researchers, students, community members and leaders, partnering organizations and other civil society, as well as government officials and decision-makers. In all regions, efforts in this last year were largely focused on facilitating uptake of IHACC findings by relevant sectors and officials.

In terms of training and network development, the IHACC team has continued to build on the already strong ties between the regions through researcher visits and student exchanges and collaborations. In February 2016, the PMC secured a grant via CIHR to develop the full proposal for a 5 year follow-up project to IHACC (Climate Change-IFS3, led by Dr. Sherilee Harper at the University of Guelph). We were informed yesterday (November 30th) that we were successful in securing this team grant that will continue to build on IHACC work for the next five years (400,000\$/year for 5 years starting April 2017).

Finally, advances to research are reflected in the large amount of peer-reviewed publications published and submitted (n=40 for the 5 years of the project, including a paper from the EIVAR project evaluating IHACC and discussing the lessons learned), as well as academic and policy-relevant conference attendance and presentations by students, researchers, and community adaptation leaders.

Section C: Objectives & Research Problem

3. State the general and specific project objectives.

The overall objective of the Project is to apply scientific and Indigenous Knowledge to empower remote Indigenous populations to adapt to the health effects of climate change. Working in three remote regions in Canada, Peru and Uganda, the specific objectives of the Project are as follows:

- 1.** To characterize and compare the vulnerability of remote Indigenous health systems and the pathways through which climate affects the incidence and prevalence of food and water insecurity and vector-borne diseases;
- 2.** To estimate future vulnerability by analyzing how climate change might alter identified health risks and the adaptive capacity of health systems;
- 3.** To implement and monitor pilot interventions using Indigenous and scientific knowledge on health vulnerability and adaptation, and working closely with communities, stakeholders, and policy makers;
- 4.** To develop adaptation plans based on vulnerability assessment, and experience from pilot interventions and comparative analysis that will identify actions to reduce vulnerability and increase adaptability. Adaptation plans will be developed for local to national levels, and will involve close collaboration with relevant community and policy stakeholders at each level;
- 5.** To create adaptation leaders in the scientific community, partner organizations, and communities through training so they have the tools, experience and knowledge to develop and promote adaptation; and
- 6.** To develop an Indigenous Knowledge Bank to document Indigenous Knowledge on health, and implications for adapting health systems.

4. Briefly describe the a) original rationale for the research program and its scientific importance, b) the rationale for site selection and comparative research design, and c) societal/technical relevance.

a) Original rationale: Climate change is one of the biggest health threats this century, and health systems will have to adapt. Adaptation is particularly important for Indigenous peoples who, as the IRIACC Request for Applications noted, “are among the most directly affected by climate change.” Despite this, our pilot research, funded by the proposal development grant, highlighted limited understanding of the health dimensions of climate change and opportunities for adaptation among Indigenous populations, and a significant deficit in focus on Indigenous populations in adaptation planning. This deficit leaves Indigenous peoples and their health systems insufficiently prepared to identify the risks posed by climate change and develop and implement adaptations. Herein, IHACC established a multinational interdisciplinary team from Canada, Uganda, & Peru to develop an understanding of the health dimensions of climate change for Indigenous populations. Research goals underpin intervention objectives with the ultimate goal of empowering Indigenous peoples to adapt to the health effects of climate change.

b) Rationale for site selection & comparative research design: We have partnered with communities and representatives of Indigenous groups in 3 regions: Inuit of the Canadian Arctic, Shawi & Shipibo of the Peruvian Amazon, and Batwa Pygmies in Uganda. These populations and regions were selected because they are reflective of the diverse culture, livelihood, and health characteristics of remote Indigenous populations globally in high, medium, and low income nations, and the diversity of biophysical environments in which they live, thereby facilitating the development of broad insights on Indigenous vulnerability and adaptation. The selected regions also share similarities, including population size, socio-economic-health inequality, sensitivity to climate change, remoteness, dependence on the biophysical environment, nutritional transitions, and concerns over the erosion of Indigenous Knowledge. This contrast and similarity underpins the aim of IHACC to assess both the generalizability and the context-dependence of health vulnerability. Within the study regions, site selection was guided by communities identifying interest in the work on the basis of consultation with Indigenous organizations and pilot visits. Selected communities also had to capture the diversity of characteristics of settlements in the region to provide a lens with which to examine the processes shaping vulnerability at a broader level.

Comparative analysis within and between regions and study sites is an explicit goal of IHACC and will lead to broader generalizations of the vulnerabilities of health systems. Comparing the findings will also have direct practical importance, and examples of adaptation best practice that can be transferred are being identified. Comparative analysis is built into project design in a number of ways, including: the use of a consistent conceptual, methodological, and intervention approach throughout the project; and the design of the project with regional equity in PMC composition, and focus on cross regional field site and student/researcher exchanges.

c) Societal/technical relevance: Our research program is guided by community and partner organization priorities, and is designed to engage Indigenous partners throughout the project. The work has relevance in a number of areas: i). *Scientific relevance:* the

project is addressing a major research gap, informing scientific assessments on the vulnerability and adaptation of remote Indigenous health systems; ii). *Policy relevance:* Health policy in Uganda and Peru is generally silent about Indigenous populations, specifically in a climate change context. IHACC is the first initiative in these countries to examine the vulnerabilities of Indigenous health to climate change and identify adaptation opportunities, providing understanding essential for accessing international adaptation funds and to begin adaptation planning. In Canada, IHACC builds upon significant research conducted by the team already, expanding it to focus on AGI, more in-depth on food security, and developing an evidence base for adaptation; and, iii). *Partner benefits:* IHACC is guided by community and partner organization priorities, and is designed to engage Indigenous partners throughout the project. The work is providing an invaluable resource and training for supporting Indigenous peoples to manage the rapid changes affecting their peoples and lands.

Section D: Program Results and Dissemination

5. The Request for Applications identified potential ‘Anticipated Results’ across three domains 1) advancing knowledge, 2) shaping policy and informing practice, and 3) training and networking. Applicants were to design their research programs, including knowledge mobilization/translation strategies, to address some of the anticipated results listed in each domain (see Annex 4). Writing for a general audience, discuss your main results as they relate to each domain. Highlight notable examples and indicate who or what has benefited from your work. Additionally, indicate particular contributions made by your program to building the capacity of vulnerable communities / sectors?

Note: this text is informed by the results of a 18-month project evaluation of our IHACC program: Evaluating Indigenous Vulnerability and Adaptation Research (EIVAR), led by Mya Sherman. The full EIVAR reports are available as Supplemental Materials. References in this text to “evaluation”, “respondents”, and “interviews,” and quotations are taken from this report, and come from researchers, staff, students, institutional and local partners, and community members in Peru, Uganda, and the Canadian Arctic.

1) Advancing knowledge

IHACC’s contributions to advancing knowledge are based on the generation of rigorous and novel research findings, in some cases using innovative conceptual or methodological approaches and mixed methodologies to improve our understanding of how Indigenous communities globally are vulnerable to, and responding to, climate impacts on health. Academic excellence and outputs were reported as a key strength and outcome of IHACC by researchers, institutional collaborators, and partners. Several respondents during our evaluation noted that IHACC was *a “pioneer” in its interdisciplinary approach to cross-comparison of Indigenous vulnerability*. The IHACC project produced some of the first baseline data on the health of Indigenous peoples in 3 diverse regions of the world using comparative approaches. According to one respondent:

“In the Peruvian and Ugandan work, this is the first research that has been done to look at climate-related health outcomes in those

communities and there is very little information available to health system providers or government on the issues being faced, so IHACC is some of the first scientific research on these issues” (ID#170).

Our research in all regions led to an understanding of key climate-sensitive health concerns and cross-cutting themes. To date 40 peer reviewed publications have been produced by the IHACC Research Team, including integrating of peer-reviewed, grey and policy literature, and participatory consultation and co-authorship with communities and key informants. This includes articles in leading journals in different disciplinary outlets, including Nature Climate Change, American Journal of Public Health, PLOS One, the Malaria Journal, Social Science & Medicine, Epidemiology & Infection, and WIREs Climate Change, among others. Methodologically, IHACC has integrated rigorous, diverse, and innovative approaches to data analysis and synthesis, including PhotoVoice, participatory videography, community diaries, epidemiologic analysis, clinical health data collection, youth interpretation of results, and community mapping. IHACC outputs have included peer-reviewed articles, 2 on-line videos, interviews with national and local media outlets, articles in popular media, a PhotoBook entitled ‘*Indigenous Adaptation in a Changing Climate: Local Voices, Global Perspectives,*’ and a Digital Media and Storytelling Lab (*My World*) for the town of Rigolet.

The IHACC team has pioneered research in three key areas: 1) monitoring & evaluation of adaptation, globally and in developing contexts, 2) the development of best-practice approaches for community-based adaptation research, and 2) integration of social gradients into climate change and health research.

Though not identified *a priori* as a core objective of IHACC, the project has contributed to an underdeveloped and critical research gap in ***monitoring and evaluation of adaptation***. This contribution arose from our research team’s recognition early in the project that it would be difficult to *know when we were effectively promoting adaptation, to distinguish adaptation from development, to track adaptation progress, and indeed to define adaptation* for evaluation and monitoring. To this end, the IHACC team, working with the recently launched Tracking Adaptation to Climate Change Consortium (TRAC3), has produced a number of publications and analyses on adaptation tracking. These include systematic reviews of adaptation initiatives globally, sectorally, and in particular regions. IHACC team members in this context are recognized as leaders in methods for adaptation tracking (see Shaping Policy & Informing

Practice section). These publications include 4 papers outlining methodological approaches and guidelines for systematic adaptation tracking, including two in *Nature Climate Change*. We have additionally recently released a publication reviewing the challenging nexus of development and adaptation, tackling the question: *how do we distinguish adaptation from development in resource-poor contexts, and what does this mean for progress on global adaptation in LMIC?* Through the launch of TRAC3 and our self-evaluation project, EIVAR (Evaluating Indigenous Vulnerability and Adaptation Research), IHACC been a global leader in conceptual and methodological advancements for tracking and evaluating adaptation.

IHACC has been recognized for the ***development of best-practice approaches for community-based adaptation research***. This has been recognized by researchers and governments internationally (see Shaping Policy & Informing Practice section), and also by communities. For example, IHACC community-based participatory approaches, and reflexivity in trying to adapt these to each region, were identified as best practices by researchers, partners, and communities. Apart from impacts on policy and practice, therefore, IHACC's approaches have created an evidence base for empirical case studies of how research can be undertaken to achieve both research rigor, academic excellence, useable science, and community engagement or co-creation of knowledge. For example, IHACC publications include a paper on balancing Indigenous principles and institutional research guidelines for informed consent procedures in Indigenous health research, and a paper on successful approaches to knowledge translation in the Canadian north. One institutional respondent described IHACC as "*approachable and not too scientist-y. They were down to earth and that goes a long way here, especially in the community*" (ID#58). In Uganda, most community participants reported that IHACC has respected the Batwa by sharing a meal with them, visiting them consistently, and bringing their traditional foods from the forest, including meat, which demonstrated respect for their way of life.

Within quantitative and epidemiologic research, the IHACC team is ***pioneering new methodological approaches to integrating social gradients into climate change and health impact scenarios***. This has been driven by the strong interdisciplinarity of the research team, and the desire to holistically consider social drivers of climate change vulnerability. IHACC research and results highlight that social drivers are not only more influential than climatic drivers when evaluating climate vulnerability, but they also provide more feasible entry points for intervention and adaptation. Indeed, many of IHACC's papers have sought to qualitatively and quantitatively

integrate social and climatic determinants of health into combined modeling frameworks. This has included consideration of coping mechanisms for food security during extreme events in the Peruvian Amazon, and an assessment of the potential for livestock livelihoods as a viable adaptation option among Ugandan Batwa. Several pending publications explicitly compare health outcomes and vulnerability between Indigenous and non-Indigenous populations in our IHACC study areas, seeking to identify how existing social inequalities among Indigenous peoples are predisposing them not only to poorer health outcomes, but also to greater sensitivity of those health outcomes to changes in climate. These methodological developments, specifically investigating the role of social drivers as interventionable and modifiable entry points to reduce vulnerability under future climate scenarios, will be one of the foci of IHACC's next phase of research. That is to say: to what extent can interventions targeted at social gradients in health offset climate change impacts in highly vulnerable populations; what interventions would be most effective, and in what context?

We highlight a few examples of knowledge generation arising from IHACC research:

1. Free distribution of insecticide-treated mosquito nets (ITNs) reduced malaria transmission in the short term only. Among the Batwa, there was rapid attrition of nets 12-18 months following distribution, with rates of ownership reduced to pre-distribution levels within 18 months. This research suggests that combatting malaria among highly vulnerable populations through free ITN distribution may not be sufficient where poverty is very high. Support to monitor and address attrition would be a high priority in similar communities and contexts.
2. Rates of acute gastrointestinal illness were high among all Indigenous populations we studied, but were higher in the Canadian Arctic than in Uganda (though more severe in Uganda). We identified rates among the highest documented globally.
3. Prevalence of food insecurity in Uganda and Peru is among the highest reported globally. Prevalence was so high in Uganda that our team developed a new food security index, the *Adapted Vulnerable Populations Score (AVPS)* to assess severely food insecure populations. In Peru, 100% of households reported food insecurity. Arctic rates were lower but still well above the national Canadian average and indicative of high sensitivity of food systems to stress.
4. In Peru, we assessed the use and appropriateness of existing national food aid programs for remote Indigenous peoples. We are developing guidelines for the Peruvian national

government to inform reforms to food programs for these populations, to better meet nutritional needs, geographical context, and cultural preferences in a changing climate.

5. Our food security research has challenged the traditional approach of using the household (or individual) level as a comparable unit of analysis for food security. We argue for the use of multi-level analysis in climate change and food security research in order to expose broader socio-economic, contextual, climatic and institutional determinants of food security acting at the regional or national levels and only observable with broader-scale methodological comparisons.
6. In Uganda, we evaluated the appropriateness and feasibility of livestock livelihoods as an adaptation option for the Batwa. Our research highlights the substantial potential and appropriateness of livestock to support adaptive capacity, but documents very low feasibility to up-take such adaptation options in an ultra-poor contexts. We note that if livestock, a potentially ideal and no-regrets adaptation option, is not feasible for ultra-poor populations, targeted, customized and pro-poor approaches to sustained support will need to be conceptualized to avoid widening of existing social gradients in health.
7. Traditional knowledge (TK) was identified across the regions as helping communities deal with climate risk. With the aid of complimentary funding, the Arctic team examined key components of TK that support community resilience, and examined opportunities for community mobilization to strengthen TK systems.
8. In a pilot study reflecting plans for IHACC's next phase, we built future scenarios based on community-identified observations of what local weather conditions drive food security conditions in Panaillo, Peru. We were able to project into the near term (e.g. 2020) the likelihood of poor agricultural conditions for the community, deriving our modeling parameters from 'bottom-up' community reporting of what environmental conditions matter to them. Investigating what such projections mean locally will be a focus of future work.

2) Shaping policy & informing practice

Throughout the project, IHACC has focused on generation of research results, collaborations, and communication networks to lay the groundwork for our research to shape policy and inform practice on an ongoing basis. This means that we do not only consider number of events or publications or dissemination initiatives, but also the pathways of change and enablement of

adaptive decision-making within partner networks. We have drawn extensively on diverse communication tools for sharing of knowledge.

IHACC has had notable success in ***informing international policy and negotiations on Indigenous peoples and adaptation***. For example, as part of the Nairobi Work Programme (NWP) through the UNFCCC, the Subsidiary Body for Scientific and Technological Advice (SBSTA) requested the secretariat to prepare a technical paper on best practices and available tools for the use of Indigenous and traditional knowledge and practices for adaptation, with a view to developing relevant recommendations for practitioners to be presented at SBSTA session 40. In this technical report, IHACC is profiled as a best-practice case study for engaging Indigenous communities in adaptation research, with IHACC research widely cited as providing examples of how TK can underpin adaptation interventions. Following on from this, Dr Ford was invited to a joint meeting of the NWP and Adaptation Committee in Bonn to discuss the role of TK in adaptation, as a plenary presenter and facilitator. The report that will be produced from this meeting will directly influence adaptation programming for Indigenous peoples through the UNFCCC, and demonstrates high-level recognition and impact of IHACC. Given the dates of the IPCC Assessment Report 5, only the early research generated by IHACC researchers was eligible for inclusion; despite this, IHACC researchers' publications were extensively included in the IPCC AR5 (in 17 out of 30 chapters).

IHACC leadership in adaptation research has been recognized nationally and internationally. In recognition of IHACC's leadership in community-based participatory climate change and health research, an IHACC Principle Investigator was invited to the United States Centres for Disease Control (US-CDC) to share expertise in community-based research with Indigenous peoples, informing the CDC's Climate and Health Unit in developing adaptation collaborations with "tribes and territories." Recognizing IHACC's leadership within Canada in climate change adaptation research, IHACC PI's were the only external university researchers invited to an expert planning session (led by Dan Scott at Waterloo), '*The Adaptation 2035 Challenge*,' a core working group to develop a pan-Canadian proposal for a Network Centres of Excellence proposal on climate change adaptation for 2017. Nationally and locally, some institutions reported that IHACC's research has been important to provide the evidence and recommendations needed to adapt to climate change, and a few institutional partners also reported that the information gathered in IHACC has been able to directly inform their work.

Additionally, institutional partners noted that IHACC's research papers increased their credibility and publicity, which led to some new funding opportunities for partners.

In **Peru**, IHACC established the country's first *Indigenous Health Research Unit*, which leads research and outreach on Indigenous health in Peru and regionally. One of the most prominent impacts reported by researchers and institutional contacts in our project evaluation was the awareness that IHACC has raised on Indigenous health and climate change issues in the Peruvian Amazon. According to several institutional and researcher interviews, IHACC increased awareness and knowledge on vulnerability and climate change adaptation at the local, national, and international level, with some respondents discussing how IHACC helped to catalyze Peru's work on climate change and Indigenous peoples. This awareness has reportedly manifested through the introduction of climate change adaptation and health in the agendas of various Peruvian institutions. Respondents reported that IHACC's information increased the dialogue surrounding adaptation and Amazonian communities among the civil society group engaged with COP20; a former IHACC student trainee was the Official Youth and Gender Liaison for the UNFCCC for COP20, at which IHACC also had a strong presence, organizing a side event and booth. IHACC also led an investigation in 2014 into risk management and extreme weather in the health sector in the regions of Ucayali and Loreto. This investigation was conducted in partnership with representatives of the Regional Health Directorate of Ucayali region, the Regional Office of Civil Defense, Dean of the Medical School and the Dean of the College of Nurses of the Ucayali region, who indicated this as a priority to shape policies in their regions.

In **Uganda**, many institutional respondents mentioned the importance of the baseline information created through IHACC. Respondents discussed how IHACC's research has filled an important research gap on the Batwa and their health. Partner institutions reported that IHACC's research has been critical to increasing institutional credibility and publicity. Several researcher and institutional respondents also discussed how local institutional partners have learned the importance and utility of research. IHACC's information also reportedly raised awareness among local institutions about the Batwa, Indigenous health, climate change, and adaptation. Some researchers also noted how IHACC's work has been able to defy some negative stereotypes of the Batwa.

Additionally, institutional partners reported that the information gathered in IHACC has been able to directly inform their work. All institutions reported that IHACC's research has been important to provide the evidence and recommendations needed to adapt to climate change. Some partners interviewed reported that they now want to carry out their own research. For example, one respondent stated, "*because we have been doing surveys, I'm seeing it's very easy for me even to make a research*" (ID#24). Other institutional respondents discussed how they now have a framework for collaboration among partners for future research endeavors.

In the *Arctic* project evaluation, partners emphasized the importance of IHACC results in influencing policy and decision-making. Respondents noted that the IHACC survey in Iqaluit was the largest survey that had ever been conducted in the territory of Nunavut, health-related or otherwise. Several institutional collaborators were specifically interested in the actual rates of acute gastrointestinal illness (AGI) in Iqaluit. Other institutional respondents discussed how IHACC's work would be useful in providing Iqaluit-specific data, since the Inuit Health Survey and other large studies do not provide disaggregated data on specific communities. Several community members and surveyors interviewed reported that they learned the causes and preventative measures that can be taken for AGI, such as washing hands frequently and boiling water. One community member stated, "*I had never really thought about how we get diarrheas and stuff but after that [survey] I started watching out what my kids were eating, what they were drinking*" (ID#94). One institutional respondent similarly noted that, "you're being asked questions that you don't really think about, it gets your brain to start thinking about certain things, so even just the act of being interviewed about the topic probably got people thinking about it" (ID#32). Some surveyors also reported learning about food security, water quality, and climate change. The Arctic research team have also had an influential role in informing adaptation decision making in the North, working closely with Health Canada and the Government of Nunavut, with an Arctic PI a lead author on the Arctic Council's Adaptation Actions for a Changing Arctic (AACA) assessment and the northern chapter of NRCan's climate change and the coasts national assessment.

It is notable that members of *IHACC's Project Management Committee hold positions in national and regional governmental agencies* with jurisdictional relevance to environmental

health, including Dr. Victoria Edge (Public Health Agency of Canada), Mr. Didas Namanya (Uganda Ministry of Health, climate file liaison), and Dr Llanos (former Director of Transmissible Disease, Peruvian Ministry of Health and Dean of the Cayetano Heredia University School of Public Health). Key advisors on the IHACC project also include Dr. Sam Okware (Director, Ugandan National Health Research Organization), Dr Patricia Garcia (Former Chief of the Peruvian national Institute of health, and current Dean of the School of Public Health at Cayetano Heredia University) and Dr Jan Sergeant at the University of Guelph. These individuals regularly attend IHACC annual meetings and contribute to project development and results discussions. Their participation in the IHACC project is designed to integrate knowledge users into the research process, including formulation of research questions and methods, and interpretation of results. While the impacts of this co-development have started to emerge, we anticipate that the greatest outcomes will evolve as these adaptation leaders see opportunities to train further leaders and infuse developing priorities with knowledge and expertise acquired through IHACC collaborative networks. In Peru, for example, several institutions reported during our project evaluation that they were already using IHACC results directly in their own reporting and in planning health campaigns.

IHACC communities reported that one of IHACC's most significant contributions was ***promoting empowerment among Indigenous partner communities***. Some institutional respondents suggested that community members have higher expectations for future researchers after working with IHACC, and in particular referencing IHACC's valuing of traditional & Indigenous knowledge systems. In some cases, IHACC provided its institutional partners with a framework for collaboration with a large research program. In Uganda, respondents discussed how IHACC's approach has established a new way of doing research and working with the Batwa. Various respondents highlighted how IHACC interacted with the Batwa in a manner that made them feel respected and valued. One institutional partner stated that:

“IHACC let [the Batwa] know they have the right to a quality life, that they have the right to good food, that they have the right to protection against diseases like malaria and diarrhea, the right to good medical care, the right to land rights and to education. IHACC has empowered them in that” (ID#168).

Several researchers reported that as a result of this research collaboration, the Batwa are now more able to work well with others and express themselves. Several people noted that the Batwa communities' experience with IHACC has helped to teach them how to work well with outside groups without material compensation. One researcher discussed how IHACC has been *"contributing towards a transition from a dependent community with handouts to one which would be self-sustaining in terms of food and other requirements"* (ID#106). Similarly, in the Arctic, a few community members noted that the IHACC survey helped them to share their experience and have their voice be heard. One community member interviewed reported feeling *"lighter"* after completing the IHACC survey. A few community members also reported that they felt more confident and less shy to share their story as a result of participating in the IHACC survey. For example, a community member commented that, *"[the survey] was helpful so I can overcome my shyness and share my experience. It helps me build my confidence"* (ID#156). One surveyor explained that, *"people thought this is an opportunity for my voice to be heard because I think they believed that something would be done, not just, 'What's your name? Can you answer these questions? Bye.'"* (ID#70). Our project evaluation highlighted the importance of relationships and mutual respect in facilitating an effective project and generating useable science for collective impact:

"Sometimes those numbers-- I don't know how useful they are. I mean a lot of it's hard. The number of relationships that you've made throughout a project, how many smiles you get when you walk around the community and how many times people ask when you're going to come back and the people that invite you in for tea and all these things are really hard to measure" (ID#2).

The facilitation of ***adaptation interventions and shaping of community behaviours and practices*** by IHACC were also identified by communities as an important contribution across the regions. Several respondents reported that community education had led them to modify their livelihood activities to promote adaptation. In Uganda, for example, Batwa respondents reported learning how to plant and grow crops in such a way that they would have sufficient food at all times and under changing weather conditions. Similarly, in Peru, IHACC's discussion of climate change and health has motivated community members to reflect on these topics and some have modified their livelihood activities accordingly, for example, by expanding agricultural land to mitigate risk. Water quality was identified as a significant and climate-sensitive health concern in

Uganda; IHACC thus collaborated with engineers and the local Batwa Development Programme to implement community-run, sustainable water systems. In Uganda, IHACC has provided treated mosquito nets, basins, vegetable seeds, and gardening tools to all ten communities, as well as the construction of a rainwater harvesting system in Kihembe, and a protected spring in Rulangara. The IHACC team also tested the Batwa across settlements for malaria, coordinating with the BCH to provide treatment for positive cases. Additionally, the IHACC team led training and educational workshops in Bwindi and Kampala for all community chairpersons and educated youths from the Batwa settlements. In Peru, IHACC coordinated closely with local and regional authorities to liaise between institutions and communities in order to improve the health services that were provided in the communities. Many researchers stated that IHACC put the four IHACC communities “*on the map*” for institutions, both figuratively and literally. For example, IHACC team members alerted local health authorities that Panaillo is officially part of the district of Yarinacocha (not Callería) in an effort to hold the district government accountable for the services it is required to provide to the communities in its jurisdiction. Relatedly, IHACC researchers facilitated the provision of official national identification cards in the communities of Panaillo and Puerto Consuelo to ensure that community members could access the services provided to Peruvian citizens, including healthcare. IHACC additionally enabled the inclusion of Panaillo in the *Mi Agua* water program, and promoted health and wellbeing in the communities through efforts such as the construction of medicinal plant gardens in the Shawi communities, as well as multiple educational workshops on nutrition, sanitation, and other public health topics in the communities. IHACC is currently worked to develop guidelines and recommendations for national food aid programming in remote Indigenous populations in Amazonian Peru.

3) Training & networking

Training, networking, and capacity building were highlighted across regions and research partners as ***one of the most significant legacies of the IHACC project***. Community members, IHACC students and young researchers, and institutional partners reported acquiring a wide range of skills and knowledge through the IHACC research program, which has enhanced local research capacity and leadership in the three regions. As a result, respondents reported that IHACC has “*trained the next generation of experts*” and “*planted seeds of change*” through the IHACC research program. Networks and “*communities of practice*” were also reportedly created among IHACC researchers, institutional partners, and community surveyors, laying the

foundation for future collaboration and support. Another important and unexpected finding from the EIVAR data collection was the extent to which community members acquired knowledge on basic health behaviors, disease prevention strategies, climate change, and sustainable livelihoods through their experiences with IHACC. Learning reportedly occurred through discussions with team members, as well as the IHACC survey process itself, since community members began to think about the health behaviors asked about in the survey, such as boiling water to prevent diarrhea.

Several respondents commented that ***IHACC has empowered and trained the next generation of experts***. IHACC researchers reported gaining skills and knowledge in research, communication, climate change adaptation, and Indigenous health. Several researchers reported developing skills in project management, budget management, qualitative methods, and community-based fieldwork. By working with an interdisciplinary and multi-national team, several respondents also reported learning to work across cultures, disciplines, sectors and languages. Since the commencement of IHACC, 42 students have been, or are currently being, trained and mentored, including 13 undergraduate, 28 graduate students, 1 post-doc, 6 full-time staff, and a number of part-time or affiliated staff. The overall ratio of women to men among our Project Management Committee (PMC) is 4:5 and this representation of women is reflected even more strongly among our trainees (11 women: 3 men). One of IHACC's key indicators for training and networking outcomes is the extent to which trainees continue into positions or activities of relevance to climate change and health adaptation, and themselves generate new knowledge, shape policy and practice, and mentor others. We can identify a few early successes. IHACC MA graduate, Sara Statham, for example, went on to become the food security coordinator for the Government of Nunavut, a job she was invited to apply for while disseminating her research results (she has since moved to the Government of BC). Kaitlyn Finner meanwhile recently joined the Nunatsiavut Government as a policy analyst, with her duties covering food security and building upon on her MA work in Rigolet. IHACC BA graduate and staff member, Will Vanderbilt, went on from IHACC to build expertise in environmental organizing through the US Green Corps, and now works with the US Public Interest Research Network, with significant contributions to the network's advocacy, research, and policy analysis on climate change adaptation. Irene Hofmeijer who completed her honors thesis research in the Peruvian communities, was recruited by the UNFCCC as the Official Youth and Gender Liaison for COP20. Dr. Harper, IHACC PhD graduate, was hired in 2013 as a

faculty member at the University of Guelph, with IHACC research a core element of her research agenda. From the trainees at the University of Guelph, one past RA is now completing a Climate Change and Health focused MPH program at Columbia University in New York City (Josh Ostapchuk). Peruvian RA Jahir Anicama led a number of sessions at COP 20 and COP21, and has been involved in the development of a technical report on the Peruvian legislative initiatives on climate change which will serve to develop a new set of regulations on climate change at the national level.

Many community members and institutional collaborators reportedly gained important skills and knowledge in health research, cross-cultural communication, interviewing and translation, and building relationships with Indigenous communities. Several respondents reported that IHACC has contributed to ***research capacity and local ownership over research***. After the first survey in Rigolet, for example, community members independently implemented the remaining six surveys without an IHACC researcher on the ground. Several researchers also noted how IHACC has introduced several research tools that the community has applied to other situations. For example, community members from Rigolet applied for their own research grant. In the Arctic, one institutional respondent commented that, “[IHACC] really built some meaningful research capacity among people in Iqaluit, among people that had previously been excluded or not involved in the research” (ID#172). In Peru, respondents reported that IHACC had introduced local researchers and institutions to new disciplines, such as geography, as well as new methodologies and approaches to community-based research. Across regions, community members and local institutional partners have reportedly learned the importance and utility of research. Many institutional partners in the Peruvian Amazon and Uganda reported feeling an appreciation for the power of research as a result of their experience with IHACC. Some institutional respondents were also interested in pursuing their own research projects. One researcher interviewee highlighted how community members now view research as “*a new kind of strength*” (ID#92).

In light of this capacity development, respondents also discussed how IHACC has “***planted seeds of change***” (ID#37; ID#125). Several researchers noted that the IHACC experience increased many community adaptation leaders’ (CAL) confidence to pursue other opportunities. Some CALs from all regions reported being able to get other jobs after IHACC due to their research skills and experience. Other CALs from IHACC have assumed a leadership position within the

community or pursued higher education opportunities during and/or following their work with IHACC. Relatedly, IHACC also reportedly contributed to leadership in all three regions. Several community respondents in Peru and Uganda reported that they are now more organized and have stronger leadership in general. In Uganda, for example, some chairpersons reported that IHACC has helped them to become leaders. In the Arctic, several IHACC researchers discussed the case of one community member in Rigolet who has developed particularly strong leadership skills and confidence through IHACC. Accordingly, many respondents considered the most significant impact of IHACC to be its legacy on these individuals, with the exact legacy being revealed in the coming years after following the future paths of IHACC trainees.

IHACC was also reported to help ***build networks among researchers, community members, and institutional partners within and/or across the three regions***. For example, the CALs in Iqaluit described the community that formed during the surveys, including strong support, friendship, comradery, and a sense of belonging to a team. Several researchers also described the strong support network among students within IHACC. Institutional respondents across the regions similarly noted that a benefit of working with IHACC was to be able to network with other local institutions and the research community as a result of IHACC's coordination and communication with a diversity of actors. In Peru, for example, a few institutions discussed how IHACC has helped integrate diverse sectors through its coordination and communication with a variety of institutions. One institutional respondent in Rigolet commented that IHACC's KT workshops significantly impacted their organization by "*providing an opportunity to share information and bring people together because very typically we work in separation from each other*" (ID#32). Many respondents viewed IHACC as a "***community of practice***" that would continue to collaborate with each other on climate change and Indigenous health topics in the future. One respondent noted: "*There's a real interest in investing in the sustainability of the partnership with both each other as researchers but also the community*" (ID#93). Another respondent more critically stated: "*I believe that the [IHACC] project has not been that perfect, or even the best that it could be, but I think it has at least defined things well for the future, areas in which to work in the future*" (ID#148). Relatedly, IHACC reportedly provided institutional partners across regions with a framework for collaboration with a large research program.

Section E: Implementation and Management

6. How were non-academic partners (e.g., research users, community organizations, businesses) involved in the implementation of your Team's research program? For example, how did partner organizations contribute (in cash and/or in-kind and/or intellectual leadership) to research activities, support implementation, or provide feedback on research results?

Non-academic partners were integral to the design, implementation, and success of the IHACC project. Below we illustrate specific engagement of non-academic partners by region, largely based on last year's annual report as the same partners have continued to be engaged. Additional developments in 2015/16 include the hosting of multi-day knowledge translation workshops in all 3 regions (co-funded by SSHRC), during which we worked with non-academic partners to review what the findings mean to them and identify next steps for research; and extensive consultations undertaken with non-academic partners to examine the strengths and weaknesses of how they have been engaged through IHACC, seeking to inform the enhancement of collaborations and the community based research approach employed for future projects in the regions. Based on consultations with non-academic partners, capacity development, community education, network building, and establishing a new approach to research were identified as significant impacts of the IHACC research program.

Arctic: Non-academic partners (Rigolet & Iqaluit community partners, community and regional government representatives, Nunavut Research Institute, Public Health Agency of Canada for BOI study development, consultation and expertise) have been valued and essential contributors to IHACC research program planning, development, and implementation. These stakeholders have provided guidance and insight in developing the research goals, objectives, and methodologies. Stakeholders have also provided guidance for on-site logistics for data collection; assistance in hiring, supervising, and administering funds for local research assistants; support in research recruitment; direct assistance in community outreach and education; edited abstracts for conference presentations; support in completing research ethics applications; co-developed water sampling procedures and protocols; pre-testing of all questionnaire research

tools for content (e.g. covering all appropriate topics in questionnaires) and context (e.g. language); and providing letters of support for complimentary funding.

Peru: At the national level, we have developed working groups with the Ministry of Environment and the Ministry of Health to work on disaster risk management in the context of climate change and extreme weather events. We have also developed partnerships with a network called "Humanitarian Network", which is made of up of organizations of the united nations (UNICEF, PAHO / WHO) as well as international and national NGOs. IHACC Peru has been asked to play the role of the technical secretary for this network. At the governmental regional level, our partnerships with the health representatives (*Red de Salud Alto Amazonas*, the *Dirección Regional de Salud* and the regional laboratories) have led to coordinated field trips to the communities, where health campaigns were carried out simultaneously. There is a constant exchange of information to review protocols and the content of workshops, in order to develop a best practice approach to the fieldwork with remote indigenous groups. At the municipal level, IHACC has worked with the *Municipalidad de Coronel Portillo* sharing information and collecting information and samples from one of the IHACC Shipibo communities. Their work is mainly focused on diarrheal diseases, water quality, and multivitamin supplements. With NGO's, IHACC has worked with *Terra Nuova*, an Italian organization with more than 40 years of experience working in Peru. Pedro Pizango, our Shawi IHACC promoter, was trained by Terra Nuova under the Intercultural Health program. It has several studies and publications on medicinal plants and indigenous health in Shawi and Shipibo communities and IHACC representatives has held several meetings with the director. IHACC has also worked with *Takiwasi*, a Peruvian organization that promotes the use of medicinal Amazonian plants. Its overall aim is to restore human and natural resources of traditional medicine. Takiwasi has given us invaluable feedback and advice on one of our principal adaptation strategies: the building of a medicinal plant garden. They have offered to help us during the development and implementation of this strategy. Finally, the team has worked with the *Centro Sachamama*, an educational, research, and experimental center that regenerates the Amazonian pre-Colombian black earth with biochar in order to achieve food sovereignty for the small farmers. It aims to offer a simple and accessible alternative to slash and burn agriculture. It has shared with IHACC its technique to cultivate different vegetables, fruits and medicinal herbs and has offered to help us review the protocol for the medicinal plant garden. This will be especially useful for the development of the medicinal plant garden, and potentially the development of community

gardens with vegetables. Our partnerships with independent researchers (Gerardo Seminario - anthropologist and John Eddowes - psychologist and *curandero*) have provided invaluable wealth of information and experience on working with Indigenous populations and have reviewed our protocols.

Uganda: In Uganda, several non-academic partners have participated in the implementation of the project. These include the official partners of the 10 settlements of Batwa with whom the team has established a cordial relationship: BDP, BCH, the District of Kanungu, and the Ministry of Health of Uganda. Other official partners are the other community members and a few organizations that have supported the implementation of research activities. These include the Uganda Wildlife Authority (<http://www.ugandawildlife.org>), which has enabled the team access weather data for the area since 2011, the Gorilla Clinic operated by Conservation Through Public Health (CTPH) <http://www.ctph.org> that also has a weather station that the team was able to collect data from. In addition personnel from the health centers spread throughout the research site area have provided valuable support during data collection by participating in sample collection as well as accessing medical records. These health centers include Kihembe, Byumba and Mpungu. The project has trained and engaged 18 community members in data collection and survey administration who have worked since inception. As regards the official partners, BDP has been instrumental in mobilization of the Batwa before and during the surveys. The mobilization has been for administering questionnaires and conducting of FGDs. BDP has also been instrumental in the implementation of some of the early adaptations implemented under IHACC. These adaptations include distribution of treated mosquito nets to all Batwa households, distribution of flyers and explanations about early findings of the research, and the construction of water projects in two of the settlements of Kihembe and Rulangara. BCH on the other hand is the biggest hospital in the region and was initially established for the Batwa. It has expanded spatial coverage and services over time to now treat Batwa and non-Batwa alike. BCH participated in the project implementation to provide leadership on the 8 household and individual surveys conducted since inception. The training of survey enumerators was led by BCH committing staff time to the training and actual conducting of malaria tests. BCH also worked in conjunction with BDP in the organization of logistics for fieldwork during the surveys. The Kanungu District local government (KLG) has played roles of logistical planning, fieldwork transportation mobilization of communities. KLG has also mainstreamed some of the findings related to water provision into the planning for water infrastructure in the areas with

study sites. Staff from KLG also participated in the water quality assessment. The involvement of the KLG staff in the profiling of the individual settlements has informed this mainstreaming into KLG policy. KLG has also shared data and information regarding Batwa with IHACC. The lands and planning offices shared information about the land available for the Batwa in the 10 settlements. This data has been used to analyse the resource and asset base of the Batwa.

7. Thinking about the opportunity to collaborate with team members across boundaries (e.g., disciplinary, organizational, and country), critically assess whether the design of your collaboration and the competition has added value to your efforts to advance knowledge, shape policy and inform practice.

Overall, working across boundaries within the IHACC team has positively contributed to IHACC's ability to advance knowledge, shape policy, and inform practice. Team members generally considered the interdisciplinary and international nature of IHACC to be one of its key strengths, enabling the research program to maintain a holistic approach and enhancing IHACC's academic contribution. Working across disciplines provided IHACC with a diverse pool of expertise to draw from. By working with an interdisciplinary and multi-national team, early researchers and students also learned to work across cultures, disciplines, and sectors.

Research partnerships across countries and disciplines were relatively more challenging than collaboration within the same country or discipline. Efforts to maintain and improve communication between team members across large distances was challenging due to technological difficulties, different time zones, language, and scheduling. Communication technology was largely ineffective to have meetings across all three regions in part due to the unreliable nature of group Skype calls with multiple countries. In-person annual meetings were thus considered important for productivity and relationship-building. Additionally, team members expressed the difficulty of working cohesively across regions given the regional autonomy inherent in IHACC's structure. For example, while IHACC researchers still highly value the regional autonomy within IHACC's structure, team members have discussed how increased accountability and transparency between regions, particularly with financial matters,

would enhance the coordination of activities and oversight across regions. Lastly, IHACC team members from different disciplines also used distinct terminology and often had different approaches to stakeholder engagement in community-based participatory research. Some team members also had different methodological approaches and valuations of types of data. For this reason, it was important to dedicate sufficient time to familiarize the researchers with disciplinary terminology and methodological approaches, foster a shared vision, and develop strong relationships within the research team to create a strong foundation for collaboration.

IHACC's approach to building research partnerships and its flexible approach significantly helped to minimize the difficulties that arose from working across boundaries. Fostering trust, respect, and friendships among researchers, as well as having the "right" individuals on the IHACC research team were key enablers to the partnerships between researchers. Many IHACC researchers demonstrated strong cultural competency and excellent interpersonal and communication skills, which were important for IHACC to maintain the integrity of its collaborative work. Additionally, since many of the researchers on the IHACC team had not previously worked with each other, it was considered important to have a "slow start" to build research relationships and establish a common vision within the research program. A shared vision among team members substantially enabled interdisciplinarity and research partnerships in IHACC. Flexibility was also an important guiding principle for IHACC's work, which was leveraged to enhance researcher partnerships and collaboration. For example, exchanges among higher-level research team members were not initially planned in IHACC, although researcher exchanges between regions became integral to maintaining team cohesion and interdisciplinary collaboration. It was also important for student researchers to adjust their research approach and methods in response to local research partners' feedback. Lastly, partnership development was also enabled in IHACC by having a longer time frame (i.e. five years) and sufficient funding.

Section F: Other

8. Looking forward, please briefly outline active or planned activities involving team members or partner organizations that build on the results of your work.

The IHACC Research Team intends to continue as a collaborative research group, and has taken steps towards a second phase of research (IHACC 2.0). During our Y4 annual meetings, we convened a special workshop for team members to identify grand challenges in Indigenous health adaptation and climatic change, and prioritize next steps. From this meeting, we decided to seek funds to pursue priorities arising from phase 1 of the research. In lieu of team grant funds, we will continue as a research consortium, seeking multiple and diverse funding sources, but united under the IHACC consortium umbrella. In Y5, we applied for two sources of major funding: 1) CIHR Foundation Grant (led by Berrang-Ford at McGill), which was not successful, and 2) CIHR Environments & Health Team Grant (led by Harper at Guelph). The latter was successful during the LOI stage, and we are now developing a full proposal, focusing on food systems, safety, and security in the next phase of research.

Over the past year, the IHACC Research Team has convened several internal meetings, and begun extensive external consultations, to identify next steps, research priorities, and grand challenges. IHACC 1.0 established strong networks and partnerships with researchers, organizations, and communities, and built a baseline of knowledge on the health risks, climate vulnerability, and adaptive contexts in our three regions. For the next phase (IHACC 2.0), our priorities build on the knowledge and expertise generated over the past 5 years.

We will continue to work with the *communities* engaged in research in IHACC 1.0. We have identified potential network collaborations with other research teams and Indigenous communities interested in facilitating a larger network of sentinel adaptation communities. These include communities in the Peruvian Andes, South Africa, Australia, and Alaska. We will thus contribute to the development of a broader network and community of practice, to build comparative analysis opportunities, share lessons and experiences, and identify entry points for collective research impact for Indigenous health adaptation to climate change.

IHACC 2.0 will remain focus on its three primary *health outcomes*: food security, water security, and vector-borne disease, yet be flexible to funding opportunities and regional priorities. Our CIHR Environments & Health Team Grant, for example, will focus on developing collaborations related specifically to Indigenous Food Systems, Food Security, and Food Safety (Climate Change IFS³). In Uganda, we are building expertise in climate impacts on respiratory illness and maternal/child health. In the Canadian Arctic, we have collaborators building expertise in climate and mental health. In Peru, we have expanded beyond malaria to consider dengue, and also explored in more depth nutritional aspects of Indigenous food security.

IHACC 2.0 will increase emphasis even more on a *forward-focus* and *solutions-oriented* research. In particular, we will build on pilot collaborations with Dr. Mark New's climate modelling group in Cape Town (S. Africa). This focus and collaboration was under-developed in IHACC 1.0, but has been identified by our team as a core priority moving forward. As such, M. New has joined as a member of the Project Management Committee (PMC) for IHACC 2.0 planning.

Where IHACC 1.0 provided breadth of knowledge and established strong networks and collaborations, IHACC 2.0 will seek depth within key priority areas. To date, we have identified the following priority themes moving forward:

1. ***Integrated community-based surveillance systems***: The need for enhanced surveillance is the most commonly identified health-related adaptation strategy, and widely referenced to by the *Lancet* Commission on climate & health. Surveillance is an important component of climate change adaptation because it builds on existing infrastructure, skills, and capacity; however, existing systems often are not intended for, or adequately equipped to, detect and respond to climate change. *How can we adapt surveillance approaches to act as early warning systems for climate-health events? How can we engage communities in the development and implementation of surveillance and early warning systems?* We seek to grapple with these questions by developing an integrated participatory, community-based surveillance system to collect data to understand, respond to, and reduce the climate-health outcomes related to food systems, security and safety in Indigenous communities in Canada, Uganda, & Peru. In IHACC 1.0, we found, for example, that sporadic data collection was unsuited for ongoing, longitudinal tracking of climate vulnerability, and that many indicators and milestones of adaptive capacity are

neither climatic or environmental, but rather social and community-identified. We also realized that some of the most adaptive interventions we implemented were through heuristic co-development of data collection mechanisms with communities (i.e. adaptive capacity arising from the *process* rather than the *results*). There are repeated calls for surveillance that uses *novel approaches*, integrates *new types of data*, and includes *multiple knowledge sources*, including IK. This is important for Indigenous communities, who are often inadequately engaged in surveillance systems, leading to low participation, relevance, and data quality. Despite Canada's international leadership in integrated environment and health surveillance, research on this topic in Indigenous communities in Canada and abroad are sparse. Our surveillance systems will use participatory methods, involving the development of "networks of human observers" to make systematic observations, and to place these into cultural context. The surveillance systems created in each region will differ to reflect local context & IK. Through the surveillance program, we will also develop *novel surveillance tools*, collect high quality longitudinal data to characterize climate-health associations, and work with end-users to co-develop and prioritize culturally-appropriate, locally-relevant, and sustainable response plans.

2. ***Climate change adaptation scenario planning:*** Traditionally, studies examine retrospective associations to understand climate change vulnerability; however, an important component of adaptation is the ability to look forward and plan in light of projected climate impacts. But, *what proportion of food-related health outcomes will be attributable to changes in climate in the near future, and how do these interact with existing and changing socio-economic gradients?* We respond to this question by estimating, for the near future (10-20 years), the frequency, magnitude, distribution, and determinants of health outcomes associated with climate change impacts on Indigenous health in partner regions and communities. Scenario planning is an approach for longer-term planning that, in this research, will project how future climate changes might impact food-related health outcomes. To conduct this pioneering work, we will use participatory, mixed qualitative and quantitative methods to create scenarios that model future climate change impacts on health, using 4 steps. **(1)** We will use participatory, qualitative methods to capture IK to characterize what specific weather trends are locally important in agri-food (e.g. specific temperature or precipitation trends important for food systems, and health). **(2)** We will then identify spatio-temporal associations between weather and health outcomes using quantitative modeling. **(3)** Using these associations and IK, we

will interrogate downscaled climate models to project how these specific weather patterns might change in the short-term (10-20 years). (4) These climate models will be used to co-develop climate-health scenarios with communities and partners, and co-produce adaptation options that integrate IK. Importantly, we will integrate consideration of social determinants of health (and effect modification of climate signals) into scenarios to identify socio-economic entry points for intervention to reduce vulnerability, allowing us to answer (quantitatively and qualitatively) questions such as: to what extent can social interventions offset the predicted impacts of climate on health?

3. ***Place-based pathways to adaptation***: Challenges to Indigenous health are projected to increase with climate change, and communities will have to adapt. But, *what adaptation strategies are feasible, acceptable, sustainable, equitable and appropriate?* IHACC 1.0 had intended to identify and implement adaptation options in partnering communities. Our first 5 years, however, was only able to begin this process, and we spent a substantial amount of time exploring the challenge of *how to monitor and evaluate adaptation, how to define adaptation vis a vis development, and what does adaptation look like on the ground?* We also struggled with, and reflected on, the role of research (vs. development organizations) in facilitated adaptation policy, practice, and tracking, particularly in LMIC. Thus, while IHACC 1.0 contributed substantially to our conceptual understanding what our research team can achieve, IHACC 2.0 will focus in depth on developing these tools with partners and communities. In particular, we do not necessarily seek to “implement adaptation projects”, but rather to evaluate existing policies, programs and practices, assess and facilitate consideration of optional adaptation pathways, and monitor adaptation initiatives moving forward. This focus is thus forward-looking and solutions-oriented. We also seek to foster long-term partnerships in all three regions to create a network of communities exploring track adaptation efforts, experiences, and lessons (sentinel adaptation communities).

| Annex 1: List of Current Team Members | | | | | |
|--|---|---|---------|------------------|--------------------|
| Name (Last, first) | Name of Organization (for universities please include the department) | Role (e.g. Principal investigator, co-applicant, partner organization representative) | Country | Joined (mm/yyyy) | Departed (mm/yyyy) |
| Principal Investigators | | | | | |
| Berrang-Ford, Lea (Dr) | McGill University, Department of Geography | Principal investigator | Canada | 03/2011 | - |
| Ford, James (Dr) | McGill University, Department of Geography | Principal investigator | Canada | 03/2011 | - |
| Llanos, Alejandro (Dr) | Instituto de Medecina Tropical Alexander von Humboldt, Universidad Peruana Cayetano Heredia | Principal investigator | Peru | 03/2011 | - |
| Lwasa, Shuaib (Dr) | Makerere University, Geography Department | Principal investigator | Uganda | 03/2011 | - |
| Co-Investigators | | | | | |
| Cárcamo, César (Dr) | Universidad Peruana Cayetano Heredia, School of Public | Co-applicant / investigator | Peru | 03/2011 | - |

| | | | | | |
|--------------------------|--|---|--------|---------|---|
| | Health and Administration | | | | |
| Edge, Victoria (Dr) | Public Health Agency of Canada | Co-applicant / investigator | Canada | 03/2011 | - |
| Harper, Sherilee (Dr) | University of Guelph | Investigator/Project Management committee | Canada | 10/2013 | - |
| Namanya, Didacus | Government of Uganda, Ministry of Health | Co-applicant / investigator | Uganda | 03/2011 | - |
| Key Collaborators | | | | | |
| Furgal, Chris (Dr) | Trent University, Indigenous Environmental Studies Program | Investigator | Canada | 09/2013 | - |
| Garcia, Patricia (Dr) | Universidad Peruana Cayetano Heredia, School of Public Health and Administration <i>Peruvian Minister of Health since July 2016</i> | Co-applicant / investigator | Peru | 03/2011 | - |
| Gotuzzo, Eduardo (Dr) | Universidad Peruana Cayetano Heredia, School of Medicine | Co-applicant / investigator | Peru | 03/2011 | - |

| | | | | | |
|---|---|--|-----------------|---------|-------------------------------|
| Kulkarni, Manisha | University of Ottawa, Dept Epidemiology and Community Medicine | Investigator | Canada | 09/2013 | - |
| New, Mark (Dr) | University of Cape Town | Investigator | South Africa | 04/2013 | - |
| Okware, Sam (Dr) | Uganda National Health Research Organization (UNHRO) | Co-applicant / investigator | Uganda | 03/2011 | - |
| Pedersen, Duncan (Dr) | McGill University, Department of Psychiatry | Co-applicant / investigator | Canada | 03/2011 | 01/2016 <i>passed away</i> |
| Partner Organization Representatives | | | | | |
| Bigaruka, Sam (Father) | Buhoma Community Hospital (BCH) | Partner organization representative | Uganda | 03/2011 | 08/2016 <i>passed away</i> |
| Chatwood, Susan | Director, Institute for Circumpolar Health Research | Partner organization representative | Canada | 03/2011 | - |
| Elliot, Gwen | Director of Environmental Health, Labrador Grenfell Health | Partner organization representative | Canada | 03/2011 | - |
| Fernandez, Fernando | Red de Salud Alto Amazonas | Partner organization representative | Peru | 03/2011 | - |

| | | | | | |
|--------------------------|--|-------------------------------------|--------|---------|---------|
| Halsey, Eric | Head of the Virology Program, Naval Medical Research Center Detachment in Peru (NMRC Peru) | Partner organization representative | Peru | 03/2011 | - |
| Healy, Gwen | Director, Qaujigiartiit Health Research Centre | Partner organization representative | Canada | 03/2011 | 03/2012 |
| Kinney, Michelle | Deputy Minister of Health and Social Development, Nunatsiavut Government | Partner organization representative | Canada | 03/2011 | - |
| Kinnon, Dianne | Director, Inuit Tuttarvingat, National Aboriginal Health Organization (NAHO) | Partner organization representative | Canada | 03/2011 | 06/2012 |
| Leveau, Cayo | Regional Health Department of Ucayali (DIRESA Ucayali) | Partner organization representative | Peru | 03/2011 | - |
| Magezi, Richard | Batwa Development Program (BDP) | Partner organization representative | Uganda | 03/2011 | - |
| Manrique de Lara, Carlos | Regional Health Department of Loreto (DIRESA Loreto) | Partner organization representative | Peru | 03/2011 | - |
| Marihuani, Jamner | Regional Coordinator of the Indigenous Peoples of San Lorenzo (CORPI-SL) | Partner organization representative | Peru | 03/2011 | - |
| Montoya, Maria Virginia | Peruvian Amazon Research Institute (IIAP) | Partner organization representative | Peru | 03/2011 | - |

| | | | | | |
|--------------------|---|-------------------------------------|--------|---------|---------|
| Ogden, Nicolas | Centre for Foodborne, Environmental, and Zoonotic Infectious Diseases, Public Health Agency of Canada | Partner organization representative | Canada | 03/2011 | - |
| Paredes, Marco | National meteorological and hydrological services of Peru (SENAMHI) | Partner organization representative | Peru | 03/2011 | - |
| Pizabgo, Segundo | Federation of Native Communities of Chayahuitas (FECONACHA) | Partner organization representative | Peru | 03/2011 | - |
| Rodriguez, Alfredo | Interethnic Association for the Development of the Peruvian Amazon (AIDESEP) | Partner organization representative | Peru | 03/2011 | - |
| Saenz, Luis | Environmental Health Department of Ucayali (DESA Ucayali) | Partner organization representative | Peru | 03/2011 | - |
| Shiwak, Daryl | First Minister, Nunatsiavut Government | Partner organization representative | Canada | 03/2011 | - |
| Silvano, Esderas | Regional Organization of AIDESEP in Ucayali (ORAU) | Partner organization representative | Peru | 03/0211 | - |
| Statham, Sara | Territorial Food Security Coordinator Department of Health Government of Nunavut | Partner organization representative | Canada | 08/2012 | 11/2015 |
| Thomas, Kate | Epidemiologist, Public Health Agency of Canada | Partner organization representative | Canada | 08/2011 | - |

| | | | | | |
|------------------------------------|---|-------------------------------------|--------|--------------------|--------------|
| Thomas, Mary-Ellen | Director, Nunavut Research Institute | Partner organization representative | Canada | 03/2011 | - |
| Trumble Waddell, Jan | Director, Population Health Assessment and Scenarios Team, Public Health Agency of Canada | Partner organization representative | Canada | 03/2011 | - |
| Turner, Gail | Director, Department of Health and Social Development, Nunatsiavut Government | Partner organization representative | Canada | 03/2011 | - |
| Turyahikayo, Silver | Kanungu District Administration | Partner organization representative | Uganda | 03/2011 | - |
| Wolfrey, Charlotte | Rigolet Inuit Community Government | Partner organization representative | Canada | 03/2011 | - |
| Project Manager/Coordinator | | | | | |
| Errazuriz, Consuelo | McGill University, Department of Geography | Project Manager - Central | Canada | 04/2011 | 12/2012 |
| Kasumba, Jamen | Makerere University | Project Coordinator - Uganda | Uganda | 06/2011 | - |
| Lardeau, Marie-Pierre | McGill University, Department of Geography | Project Manager - Central | Canada | 10/2013 | 01/2015 |
| Maillet, Michelle | McGill University, Department of Geography | Project Manager - Central | Canada | 01/2015 01/2013 | - 10/2013 |
| Zavaleta, Carol | Universidad Peruana Cayetano Heredia | Project Coordinator - Peru | Peru | 04/2011 | 07/2013 |

| | | | | | |
|--|--|----------------------------|--------------|----------|---------|
| Bussalleu, Alejandra | Universidad Peruana Cayetano Heredia | Project Coordinator - Peru | Peru | 06/2012 | 09/2014 |
| Anicama Diaz, Jahir | Fundación Cayetano Heredia | Project Coordinator - Peru | Peru | 09/2014 | - |
| Researchers and Research Assistants (Full time) | | | | | |
| Bussalleu Caveno, Alejandra | Universidad Peruana Cayetano Heredia | Researcher | Peru | 11/2015 | - |
| Anicama Diaz, Jahir | Fundación Cayetano Heredia | Researcher | Peru | 06/2013 | - |
| Bishop-Williams, Kate | University of Guelph | Research assistant | Canada | 06/2014 | 08/2014 |
| Brodrick, Christopher | University of Cape Town, South Africa | Research assistant | South Africa | 012/2014 | - |
| Bunce, Anna | McGill University, Department of Geography | Research assistant | Canada | 09/2012 | 09/2013 |
| Cardenas, Clara | Universidad Peruana Cayetano Heredia | Researcher | Peru | 08/2013 | - |
| Fernandez, Connie | Red de Salud Alto Amazonas | Researcher | Peru | 09/2011 | 12/2012 |
| Gamboa, Dionicia | Universidad Peruana Cayetano Heredia, Alexander von Humboldt Insitute of Tropical Medicine | Researcher | Peru | 09/2011 | - |
| Hofmeijer, Irene | Universidad Peruana Cayetano Heredia | Researcher | Peru | 04/2011 | 09/2013 |
| Huet, Catherine | University of Guelph, Department of Population Medicine | Research assistant | Canada | 05/2012 | - |
| Lardeau, Marie-Pierre | McGill University, Department of Geography | Research assistant | Canada | 04/2011 | 10/2012 |

| | | | | | |
|-------------------|--|--|--------|---------|---------|
| Lewnard, Joseph | McGill University, Department of Geography | Undergraduate research assistant | Canada | 08/2012 | 08/2013 |
| Maillet, Michelle | McGill University, Department of Geography | Research & administrative assistant | Canada | 05/2010 | 08/2011 |
| Markwick, Nicole | University of Guelph, Department of Population Medicine | Research assistant | Canada | 05/2012 | 12/2012 |
| McKay, Courtney | McGill University, Department of Geography | Research assistant | Canada | 01/2012 | 09/2012 |
| Nakoneczny, Lesya | McGill University, Department of Geography | Research assistant | Canada | 09/2012 | 08/2015 |
| Nambassi, Moses | Makerere University | Research Assistant | Uganda | 02/2011 | - |
| Ostapchuk, Joshua | Department of Population Medicine, University of Guelph | Research assistant | Canada | 01/2013 | 08/2013 |
| Rosas, Angel | Universidad Peruana Cayetano Heredia, Alexander von Humboldt Insitute of Tropical Medicine | Researcher | Peru | 09/2011 | - |
| Sherman, Mya | McGill University, Department of Geography | Researcher <i>Evaluating Indigenous Vulnerability and Adaptation Research (EIVAR) project</i> | USA | 04/2014 | 05/2016 |
| Silvera, Rosa | Fundación Cayetano Heredia | Researcher | Peru | 09/2014 | - |
| Steele, Vivienne | University of Guelph | Research assistant | Canada | 09/2014 | 09/2015 |

| | | | | | |
|-----------------------------|--|---------------------|--------|---------|---------|
| | | | | | |
| Sullcapuma Guillen, Nancy | Universidad Peruana Cayetano Heredia | Research assistant | Peru | 12/2013 | 12/2012 |
| Valdivia, Maria José | Universidad Peruana Cayetano Heredia, Indigenous Health Unit | Researcher | Peru | 06/2012 | 10/2013 |
| Vanderbilt, Will | McGill University, Department of Geography | Research assistant | Canada | 04/2011 | 07/2012 |
| Vriezen, Rachael | University of Guelph | Research assistant | Canada | 04/2014 | 09/2014 |
| Wolff, Rebecca | University of Guelph | Research assistant | Canada | 04/2013 | 09/2013 |
| Other Collaborators | | | | | |
| Cunsolo Willox, Ashlee (Dr) | Labrador Institute, Memorial University | Director | Canada | 08/2013 | - |
| Farahbakhsh, Khosrow (Dr) | University of Guelph, School of Engineering | Associate Professor | Canada | 07/2012 | - |
| McEwen, Scott (Dr) | University of Guelph, Department of Population Medicine | Professor | Canada | 04/2011 | - |

| Annex 2: Main Research Components/Projects | | | | |
|--|--|---|--|--|
| Project title | Theme or Location of research (if geographically located) ² | Project Lead(s), Affiliation ¹ | Specific project-level research objectives <i>Selected citations [#] refer to research outputs listed in Annex 3</i> | Status (start/finish, mm/yy) |
| A. QUANTITATIVE CHARACTERIZATION OF HEALTH VULNERABILITY TO CLIMATE | | | | |
| 1. Burden of Illness (BOI) study (<i>Regional</i>) <i>Key research questions:</i> <ul style="list-style-type: none"> • What is the prevalence of priority health outcomes? • Who is at risk (individual, household, community)? • What are the key risk factors for poor health outcomes? | Arctic Canada | Edge & Harper (UG) | Estimate the prevalence and determinants of priority health outcomes (food security and AGI). | Completed (09/11-05/13) |
| | Peru | Llanos (UPCH) | Estimate the prevalence and determinants of priority health outcomes (food security and AGI). Note that no malaria incidence has been found in partner communities. | First phase completed (03/13), second phase first survey completed (07/14), second phase second survey completed (11/15) |
| | Uganda | Lwasa (MAK) & Berrang Ford (MG) | Estimate the prevalence and determinants of priority health outcomes (malaria, food security and AGI). | All surveys completed |
| 2. Comparative BOI analysis study (<i>Across regions</i>) <i>Key research questions:</i> <ul style="list-style-type: none"> • To what extent does prevalence of health outcomes differ between regions or sub-populations (e.g. based on socioeconomic status or indigenous status)? • To what extent are risk factors comparable across regions? • Are there comparable elements of health vulnerability across regions? | Food security (all regions) | Ford & Berrang Ford (MG) | Compare prevalence and determinants of health outcomes between regions and sub-populations (e.g. socioeconomic status, Indigenous versus non-Indigenous). | Quantitative analysis complete, qualitative planned (01/13-ongoing) |
| | Water security (all regions) | Edge & Harper (UG) | Identify key similarities and contextualize differences. | Quantitative analyses complete for all regions (09/13-03/16) |
| | Vectorborne disease (malaria) | n/a | Malaria prevalence found in Uganda only. There are therefore no cross-regional analyses planned. | n/a |
| 3. Seasonality of health outcomes study <i>Key research questions:</i> <ul style="list-style-type: none"> • Does prevalence of priority health outcomes vary by season (used as a proxy for climate)? • What is the relative magnitude of the climate 'signal'? How important is seasonality as a driver of prevalence? | Food security across all regions | Berrang Ford (MG) | Evaluate the significance of seasonality as a predictor of health outcomes in all regions and communities for each health outcome. <i>For vector-borne disease, this research will be conducted for malaria in Uganda only since zero malaria prevalence has been found in our Peruvian communities and vectorborne diseases were not identified as a priority in the Arctic.</i> | Manuscript in review for Uganda. Manuscript published for Arctic. Analyses in progress for Peru (06/13-ongoing) |
| | Water security | Harper (UG) | | Analyses complete for Uganda. Manuscript published for Arctic. Analyses in progress for Peru. (09/13-ongoing) |

| | | | | |
|---|--|---|---|--|
| | Vectorborne disease (malaria, Uganda only) | Lwasa (MAK), Llanos (UPCH) Berrang Ford (MG) | Evaluate the extent to which variation in health outcomes are associated with variation in meteorologic variables (temperature, precipitation). <i>This analysis will use different datasets (local clinic records) to conduct more temporally specific analyses of weather impacts on health outcomes.</i> | Analysis complete for Uganda. |
| | Other health outcomes, Peru and Uganda | Carcamo (UPCH), Lwasa (MAK), Berrang Ford (MG), Harper (UG) | Evaluate the extent to which variation in health outcomes not identified as highly climate sensitive (e.g. maternal mortality) are associated with variation in meteorological variables. <i>Using local clinic records (daily, weekly) as above.</i> | Manuscripts prepared for Uganda (maternal health, pediatric, malnutrition). Analyses in progress for Peru (01/15-ongoing) |
| 4. Comparative analysis of climate signal (Across regions) Key research questions: <ul style="list-style-type: none"> • Are some health outcomes more strongly influenced by climate (using seasonal variation as a proxy for climate)? • Do some regions experience stronger seasonal dependence (variation) for the same health outcome than others? • Is seasonal variation for the same health outcome magnified in particular sub-populations? I.e. are vulnerable populations more sensitive to climate variation? | All regions & health outcomes | Berrang Ford (MG) & Harper (UG) | Empirically estimate the magnitude of climate-sensitivity (the climate 'signal') for health outcomes, based on the size of the odds ratio for seasonality across models. <i>Here, we use seasonal variation as a proxy for climate dependence.</i> Compare the magnitude of the climate 'signal' between health outcomes and regions. Identify sub-populations, regions, health outcomes, and other risk factors for heightened climate sensitivity. | Methodologies and framework developed, first-round models complete. Systematic review in progress. (01/15-ongoing) |
| B. QUALITATIVE CHARACTERIZATION OF HEALTH SYSTEMS & VULNERABILITY | | | | |
| 5. Health systems analysis Key research questions: <ul style="list-style-type: none"> • What key mechanisms exist within current health systems (community, regional, national) to increase or decrease adaptive capacity? • In what ways does these mechanisms (policies, programs, practice) promote or constrain adaptation and affect sensitivity? • To what extent are current health systems prepared for changing climate impacts on health? • What strengths exist within current health systems that provide entry points to promote adaptation? • Are there particular individual, institutional, or programmatic 'adaptation champions' that can be identified and supported? • At which scale(s) do the key drivers and entry points for vulnerability and adaptation occur? | Arctic Canada | Ford (MG) & Harper (UG) | Characterize existing consideration and integration of climate change provisions within the national health infrastructure. Identify local health support systems with response capacity or support for climate-sensitive health outcomes. | Data collection completed with ongoing work through collaborations with CIHR CBPHC Innovation Grant |
| | Peru | Llanos & Carcamo (UPCH) | Identify key constraints within existing national health programming relevant for enhancing adaptive capacity and reducing vulnerability. | Completed with regular qualitative field work collected. |
| | Uganda | Lwasa (MAK) & Namanya (MHU) | Identify potential 'adaptation champions' that can be promoted or supported | Completed with regular qualitative field work collected. |
| 6. Characterizing vulnerability & adaptive responses study Key research questions: | Arctic Canada | Ford (MG) & Harper (UG) | Characterize the lived experience of AGI in Arctic communities in the context of changing climatic conditions. Characterize changing hunting patterns and food behaviours in the context of a changing climate. | AGI: Data collection complete (10/12 and 03/13), data analysis complete (12/13), results sharing and interpretation complete (04/16) |

| | | | | |
|--|-----------------|---|---|--|
| <ul style="list-style-type: none"> What are the causal mechanisms by which determinants of health burden affect sensitivity to climate change? How do individuals/households/communities respond to seasonal variation and associated impacts on food security, AGI, and malaria? | Peru | Llanos & Carcamo (UPCH) | <p>Characterize changes in food security and food production between seasonal extremes.</p> <p>Identify and characterize behavioural responses to changing food access, availability, and quality during seasonal extremes.</p> <p>Characterize the lived experience of AGI, as well as the relationship Indigenous people have with water (including perceptions, beliefs, and behaviours) in the context of climatic changes and variability.</p> | Groundwork phase completed (09/12-01/14) Second phase ongoing. |
| | Uganda | Lwasa (MAK) & Namanya (MHU) | <p>Characterize vulnerabilities and adaptation responses.</p> <p>Piloting adaptations and monitoring through participatory evaluation meetings with communities and partners</p> | Analysis of qualitative data ongoing. |
| C. ESTIMATING FUTURE VULNERABILITY | | | | |
| <p>7. Key environmental and climatic drivers of health vulnerability</p> <p><i>Key research question:</i></p> <ul style="list-style-type: none"> What are the key environmental trends that affect community-identified perceptions of 'good' and 'bad' years with respect to climate-sensitive priority health outcomes? | Canadian Arctic | This research has already be conducted for the Canadian Arctic within the ArcticNet program | | |
| | Peru | Carcamo (UPCH), New (UCT) | Identify and rank recent historic years based on community perceptions of what constitutes a 'good' or 'bad' year in the context of food security, AGI, and malaria, respectively. | Completed (01/15) |
| | Uganda | Lwasa (MAK), New (UCT), | <p>Identify what aspects of the environment (e.g. early flooding, not enough rain, too hot) is perceived to contribute to improved or deteriorating health outcomes, based on community perceptions.</p> <p><i>This project is intentionally designed to inform future projection analyses in Project 8, below.</i></p> | Beginning, with student identified & assembling data (04/15-ongoing) |
| <p>8. Climate projections of priority environmental changes relevant to health outcomes – regional studies (Peru, Uganda), scenario analysis (Arctic)</p> <p><i>Key research question:</i></p> <ul style="list-style-type: none"> Given community-identified key environmental triggers of changing health burden, what are the future climate change projections for these variables in study regions? | Canadian Arctic | Ford (MG), Harper (UG) | This research has already be conducted for the Canadian Arctic within the ArcticNet program. | n/a |
| | Peru | Carcamo (UPCH), New (UCT) | Interrogate climate projection models to assess project impact of climate change on community-identified environmental variables with relevance to health outcomes. | This objective will be deferred to our next funding cycle, and is one of the 3 key foci of our next IHACC grant. We recently met in Montreal with Dr Mark New to develop this focus as a priority. One case-study completed in Peru. |
| | Uganda | Lwasa (MAK), New (UCT) | Qualitatively produce scenarios of potential impact of future climatic changes on key climate-sensitive health outcomes (food security, AGI, and malaria) in study regions. | |

| | | | | |
|--|-------------|--|---|--|
| | | | | <i>Climate modeling is in collaboration with Dr. Mark New, U. Cape Town.</i> |
| D. EVALUATING ADAPTATION SUCCESS | | | | |
| 9. Monitoring & Evaluation <i>Key research question:</i> <ul style="list-style-type: none"> • <i>What is successful adaptation?</i> • <i>What potential methods (or combination of methods) can be used to measure successful adaptation outcomes and processes?</i> | All regions | Sherman (MG) Lwasa (MAK), Llanos (UPCH), Berrang Ford (MG) Ford (MG) | Identify methodological options and opportunities for evaluating and monitoring adaptation. Define and characterize transitional pathways to move towards adaptation goals, drawing on a <i>theories of change</i> approach. | Full evaluation project in progress: data collection completed; draft results currently being reviewed by team. (01/14-ongoing). Several manuscripts on adaptation M&E published and more ongoing. |
| 10. Local interventions <i>Key research question:</i> <ul style="list-style-type: none"> • <i>How might successful adaptation be feasibly achieved at the community level? What is a potential pathway to successful adaptation given the current context?</i> | All regions | Lwasa (MAK), Llanos (UPCH), Berrang Ford (MG) Ford (MG) | Define and characterize transitional steps to move towards adaptation goals in research communities. Monitor and evaluate existing and ongoing pilot interventions in communities to assess the extent to which interventions are consistent with pathways of change towards adaptation Identify and recommend priority interventions (policies, programs, projects) that would promote pathways of change for improved adaptation in the short and long-term for research communities. | 3 pilot interventions completed in Uganda, 2 on-going in Peru, and community-based decision-making tools developed for water treatment infrastructure planning. Collaborations with the Food Security Network of Newfoundland & Labrador in Arctic. Evaluations and monitoring ongoing and linked to Obj. 9. (06/12-ongoing) |

Annex 3: Research Output Bibliography

Indicate the number of items per category (3.1 to 3.11) and list research outputs below.

| <i>Research Outputs</i> | <i>Number</i> |
|---|---------------|
| <i>3.1 Journal Articles (published/accepted)</i> | <i>39</i> |
| <i>3.2 Journal Articles (submitted)</i> | <i>1</i> |
| <i>3.3 Conference Papers/Presentations</i> | <i>81</i> |
| <i>3.4 Presentation (non-academic)</i> | <i>43</i> |
| <i>3.5 Book Chapters</i> | <i>1</i> |
| <i>3.6 Books</i> | <i>6</i> |
| <i>3.7 Theses</i> | <i>15</i> |
| <i>3.8 Databases (GIS, and other information systems)</i> | <i>2</i> |
| <i>3.9 Websites, social media (Facebook, Twitter), multimedia (YouTube, others)</i> | <i>9</i> |
| <i>3.10 Media coverage. Articles in local or international media</i> | <i>37</i> |
| <i>3.11 Other</i> | <i>11</i> |

Research Output Bibliography

*Citation: author(s), date, title, publisher /weblink if available)

3.1 Journal Articles (published/accepted):

Submitted/In Review:

1. Ford, J., Sherman, M., Berrang-Ford, L., Carcamo, C., Harper, S., Llanos, A., Lwasa, S., Namanya, D., Marcello, T., Maillet, M., and Edge, V. (In Review) Preparing for the health impacts of climate change in Indigenous communities: The role of community-based adaptation. *Global Environmental Change*.

Published 2016:

1. Patterson, K., Berrang-Ford, L., Lwasa, S., Namanya, D.B., Ford, J., Twebaze, F., Clark, S., Donnelly, B., and Harper, S.L. (2016) [Seasonal variation of food security among the Batwa of Kanungu, Uganda](#). *Public Health Nutrition*, doi:10.1017/S1368980016002494
2. Ford, J.D., Maillet, M., Pouliot, V., Meredith, T., Cavanaugh, A., IHACC Research Team. (2016) [Adaptation and Indigenous peoples in the United Nations Framework Convention on Climate Change](#). *Climatic Change*. 1-15.
3. Donnelly, B., L. Berrang-Ford, J. Labbe, S. Twesigomwe, S. Lwasa, B.D. Namanya, S.L. Harper, M. Kulkarni, N.A. Ross, IHACC Research Team, and P. Michel (2016) [Prevalence and risk factors of Plasmodium falciparum malaria parasitemia among Indigenous Batwa and non-Indigenous communities of Kanungu District, Uganda](#). *Malaria Journal* 15:254.
4. Clark S, Berrang-Ford L, Lwasa S, Namanya D, Twesigomwe S, IHACC Research Team, et al. (2016) [A Longitudinal Analysis of Mosquito Net Ownership and Use in an Indigenous Batwa Population after a Targeted Distribution](#). *PLoS ONE* 11(5): e0154808. doi:10.1371/journal.pone.0154808
5. Bunce, A., Ford, J.D., Harper, S., Edge, V., and IHACC Research Team (2016) [Vulnerability and adaptive capacity of Inuit women to climate change: a case study from Iqaluit, Nunavut](#). *Natural Hazards*, 83(3), 1219-1441.
6. Sherman, M., Ford, J.D., Llanos-Cuentas, A., José Valdivia, M., and IHACC Research Group (2016) [Food system vulnerability amidst the extreme 2010–2011 flooding in the Peruvian Amazon: a case study from the Ucayali region](#). *Food Security*, 8(37), 1-20.
7. Ford, J.D., Cameron, L., Rubis, J., Maillet, M., Nakashima, D., Willox, A.C., and Pearce, T. (2016) [Including Indigenous knowledge and experience in IPCC assessment reports](#). *Nature Climate Change*. 6, 349-353.
8. Labbé, J., Ford, J.D., Berrang-Ford, L., Donnelly, B., Lwasa, S., Namanya, D.B., Twesigomwe, S., IHACC Research Team, and Harper, S.L. (2016). [Vulnerability to the health effects of climate variability in rural southwestern Uganda](#). *Mitigation and Adaptation Strategies for Global Change*. 21(6), 931-953

9. Clark, D.G., **Ford, J.D.**, Pearce, T., Berrang-Ford, L. (2016) [Vulnerability to unintentional injuries associated with land-use activities and search and rescue in Nunavut, Canada](#). *Social Science and Medicine*. 169: 18-26.
10. Clark, D.G., **Ford, J.D.**, Berrang-Ford, L., Pearce, T., Kowal, S., Gough, W.A. (2016). [The role of environmental factors in search and rescue incidents in Nunavut, Canada](#). *Public Health Journal*. DOI 10.1016/j.puhe.2016.06.003.
11. McDonald, M.E., Papadopoulos, A., Edge, V., Ford, J., IHACC Research Team, Sumner, A., Harper, S.L. (2016). [What do we know about health-related knowledge translation in the Circumpolar North? Results from a Scoping Review](#). *International Journal of Circumpolar Health*, 75: 31223.
12. Sherman, M., Berrang-Ford, L., Lwasa, S., Ford, J., Namanya, D.B., Llanos-Cuentas, A., Maillet, M., Harper, S., and the IHACC Research Team (2016) [Drawing the line between adaptation and development: a systematic literature review of planned adaptation in developing countries](#). *WIREs Climate Change*, 7(5), 707-726.

Published 2015:

13. Harper, S.L., Edge, V.L., Ford, J., Thomas, M.K., IHACC Research Group, Rigolet Inuit Community Government, and McEwen, S.A. (2015). [Lived experience of acute gastrointestinal illness in Rigolet, Nunatsiavut: “Just suffer through it”](#). *Social Science & Medicine*, 126: 86-98.
14. Harper, S., Edge, V., Ford, J., Thomas, K., Pearl, D., IHACC, Rigolet Community Government, and McEwen, S. [Healthcare utilization in two Inuit communities: Acute gastrointestinal illness in Rigolet and Iqaluit, Canada](#). *International Journal of Circumpolar Health*.
15. Ostapchuk, J., S.L. Harper, A. Cunsolo Willox, V.L. Edge, and the Rigolet Inuit Community Government. (2015). [Exploring Elders’ and Seniors’ Perceptions of How Climate Change is Impacting Health and Well-being in Rigolet, Nunatsiavut](#). *International Journal of Indigenous Health*. 9(2), 6-24.
16. Pearce, T., Ford, J., Cunsolo Willox, A., and Smit, B. (2015) [Inuit Traditional Ecological Knowledge \(TEK\) Subsistence Hunting and Adaptation to Climate Change in the Canadian Arctic](#). *Arctic*. 68(2), 235-245
17. Harper, S., Edge, V., Ford, J., Thomas, K., Pearl, D., IHACC, Rigolet Community Government, and McEwen, S. (2015). [Acute gastrointestinal illness in two Inuit communities: Burden of illness in Rigolet and Iqaluit, Canada](#). *Epidemiology and Infection*.
18. Statham, S., Ford, J., Berrang-Ford, L., Gough, W., Siewierski, R., Lardeau, M.P. (2015). [Anomalous climatic conditions during winter 2010/11 and vulnerability of the traditional Inuit food system in Iqaluit, Nunavut](#). *Polar Record*, 51(3), p301-317.
19. Sherman, M., Ford, J., Llanos-Cuentas, A., Valdivia, M.J., Bussalleu, A., IHACC Research Group. (2015). [Vulnerability and adaptive capacity of community food systems in the Peruvian Amazon: a case study from Panaillo](#). *Natural Hazards*.
20. Harper, S.L., Edge, V.L., Ford, J., Cunsolo-Willox, A., Wood, M., IHACC Research Team, RICG and McEwen, S.A. (2015). [Climate-sensitive health priorities in Nunatsiavut, Canada](#). *BMC Public Health*. 15:605

21. Guo, Y., Berrang-Ford, L., Ford, J., Lardeau, MP., Edge, V., Patterson, K., the IHACC Research Team, and Harper, S. (2015). [Seasonal prevalence and determinants of food insecurity in Iqaluit, Nunavut](#). *International Journal of Circumpolar Health*.

Published 2014:

22. Sherman, M., and Ford, J. (2014). [Stakeholder engagement in adaptation interventions: an evaluation of projects in developing nations](#). *Climate Policy*.
23. Ford, J., Cunsolo-Wilcox, A., Chatwood, S., Furgal, C., Harper, S., Mauro, I., and Pearce, T. (2014). [Adapting to the effects of climate change on Inuit health](#). *American Journal of Public Health*, 104(S3): e9-e17.
24. Clark, S., Berrang-Ford, L., Lwasa, S., Namanya, D.B., Edge, V.L., IHACC Research Team, and Harper, S. (2014). [The burden and determinants of self-reported acute gastrointestinal illness in an Indigenous Batwa Pygmy population in southwestern Uganda](#). *Epidemiology and Infection*, [Epub ahead of print].
25. Lewnard J, Berrang-Ford L, Lwasa S, Namanya D, Patterson, K Donnelly B, Kulkarni-Woodstock M, Harper S, Ogden N, Carcamo C, Indigenous Health Adaptation to Climate Change Research Group. (2014). [Relative undernourishment and food insecurity associations with Plasmodium falciparum among Batwa pygmies in Uganda: evidence from a cross-sectional survey](#). *American Journal of Tropical Medicine & Hygiene*, 91(1): 39-49.

Published 2013:

26. Ford, J. (2013). [Ford responds. Letter in response to Macpherson and Akpinar-Elci comment on Ford \(2012\) Indigenous Health and Climate Change](#). *American Journal of Public Health*, 103 (1), 6-7.
27. Sherman, M., and Ford, J. (2013). [Market engagement and food insecurity after a climatic hazard](#). *Global Food Security* 2(3), 144-155.
28. Petrasek MacDonald, J., Ford, J., Cunsolo-Wilcox, A., and Ross, N. (2013). [A review of protective factors and causal mechanisms that enhance the mental health of Indigenous Circumpolar youth](#). *International Journal of Circumpolar Health* 72.
29. Ford, J. and King, D. (2013). [A framework for evaluating adaptation readiness](#). *Mitigation and Adaptation Strategies for Global Change*.
30. Maillet, M., and Ford, J. (2013). [Climate Change Adaptation, Indigenous Peoples and the United Nations Framework Convention on Climate Change \(UNFCCC\)](#). *Health Diplomacy Monitor*, 4(2): 10-14.

Published 2012:

31. Berrang-Ford L, Dingle K, Ford J, Lee C, Lwasa S, Namanya D, Henderson J, Llanos A, Carcamo C, and Edge V (2012) Vulnerability of Indigenous health to climate change: a case study of Uganda's Batwa pygmies. *Social Science and Medicine*. 75(6):1067-1077. <http://www.sciencedirect.com/science/article/pii/S027795361200370X>
32. Ford J (2012) Indigenous health and climate change. *American Journal of Public Health*. <http://www.jamesford.ca/wp-content/uploads/2012/06/Ford-AJPH-2012.pdf>
33. Ford J, and Pearce T (2012) Climate change vulnerability and adaptation research focusing on the Inuit subsistence sector in Canada: Directions for future research. *The Canadian Geographer* 56(2):275-287. <http://onlinelibrary.wiley.com/doi/10.1111/j.1541-0064.2012.00418.x/abstract>
34. Ford J, Vanderbilt W, and Berrang-Ford L (2012) Authorship in IPCC AR5 and its implications for content: Climate change and Indigenous populations in WGII. *Climatic Change* 113(2):201-213. <http://link.springer.com/article/10.1007%2Fs10584-011-0350-z>
35. Ford J, Bolton KC, Shirley J, Pearce T, Tremblay M, and Westlake M (2012) Research on the Human Dimensions of Climate Change in Nunavut, Nunavik, and Nunatsiavut: A Literature Review and Gap Analysis. *Arctic* 65(3):289-304. <http://arctic.synergiesprairies.ca/arctic/index.php/arctic/article/view/4217>
36. Ford J, Bolton KC, Shirley J, Pearce T, Tremblay M, and Westlake M (2012) Mapping human dimensions of climate change research in the Canadian Arctic. *Ambio* 41(8):808-822. <http://www.ncbi.nlm.nih.gov/pubmed/22829324>
37. Harper, S.L. 2012. Review of B. Friedrich, J. Hacker, S. E. Hasnain, T. C. Mettenleiter, and J. Schell 'Climate Change and Infectious Diseases.' *Epidemiology and Infection*, 140(4): 765
38. Hofmeijer I, Ford JD, Berrang-Ford L, Zavaleta C, Carcamo C, Llanos E, Carhuaz C, Edge V, Lwasa S, and Namanya D (2012) Community vulnerability to the health effects of climate change among Indigenous populations in the Peruvian Amazon: A case study of from Panaillo and Nuevo Progreso. *Mitigation and Adaptation Strategies for Global Change*. <http://link.springer.com/article/10.1007%2Fs11027-012-9402-6>
39. Sherman M, Berrang-Ford L, Ford J, Lardeau MP, Hofmeijer I, and Zavaleta Cortijo C (2012) Balancing Indigenous Principles and Institutional Research Guidelines for Informed Consent: A case study from the Peruvian Amazon. *American Journal of Bioethics: Primary Research* 3(4):53-68. <http://www.tandfonline.com/doi/abs/10.1080/21507716.2012.714838#.Ux4J9j-wItE>

3.3 Conference Presentation/Papers:

Conferences 2016:

1. Bunce, A. (2016) Vulnerability and adaptive capacity of Inuit women to climate change: a case study from Nunavut. Adaptation Futures Conference, Rotterdam, Netherlands, May 10th2016.

Conferences 2015:

2. Tjensvoll Kitching, K. (2015) Tuktu and Climate Change: Inuit Hunting on Southern Baffin Island. ArcticNet Annual Scientific Meeting, Vancouver, BC, December 9th 2015.
3. Finner, K. (2015) Food From Here There, From Us and Them; Characterizing the Food System of Rigolet, Nunatsiavut. (In a session chaired by IHACC alumni Sara Statham). ArcticNet Annual Scientific Meeting, Vancouver, BC, December 10th 2015.
4. Saini, M. (2015) Participatory Methods in Rigolet: Evaluation of Inuit Health Programs and Collaborative Development of a Whiteboard Video for Health Promotion. ArcticNet Annual Scientific Meeting, Vancouver, BC, December 10th 2015.
5. Wright, C. (2015) Drinking Water Consumption Patterns and Changes Over Time in Rigolet, Nunatsiavut. ArcticNet Annual Scientific Meeting, Vancouver, BC, December 10th 2015.
6. Harper, S. (2015) Foodborne, Waterborne, and Zoonotic Enteric Disease: EcoHealth Surveillance for Environmental Health. ArcticNet Annual Scientific Meeting, Vancouver, BC, December 11th 2015.
7. Anicama, J. (2015) Experiences from Peru: Indigenous Health Adaptation to Climate Change Project. Presentation part of the “Our Health In Times of Changes” Official UNFCCC COP 21 side event at the Peruvian Pavilion, Paris, France, December 10th 2015.
8. Ford, J. (2015) The Adaptation Challenge in the Arctic. Our Common Futures Under Climate Change Conference, Paris, France, July 8th 2015.
9. Bunce, A., and Ford, J., (2015) Is gender being meaningfully engaged in climate change adaptation, resilience, and vulnerability research? Our Common Futures Under Climate Change Conference, Paris, France, July 9th 2015.
10. Berrang-Ford (2015) Can we quantify climate change sensitivity? Modeling social determinants as effect modifiers for the relationship between weather and infectious disease in southwestern Uganda. 16th International Medical Geography Symposium, Vancouver, BC, July 7th 2015.
11. K. Patterson, L. Berrang- Ford, S. Lwasa, D. Namanya, F. Twebaze, S. Clark, IHACC Research Team, S.L. Harper (2015) Analyzing longitudinal food security in an indigenous African population: Comparing determinants and predictors from quantitative and qualitative methods. 16th International Medical Geography Symposium, Vancouver, BC, July 7th 2015.
12. S. Clark, L. Berrang- Ford, S. Lwasa, D. Namanya, IHACC Research Team, and M. Kulkarni. (2015) Inequalities after equitable distribution: a longitudinal analysis of bed net coverage and use in an Indigenous Batwa population. 16th International Medical Geography Symposium, Vancouver, BC, July 7th 2015.
13. Bunce, A. (2015) “Inuit Women’s Berry Picking: Lessons on Gender, Procurement, Well-Being and the Environment/La cueillette de petits fruits chez les femmes inuites: leçons sur le genre, l’approvisionnement, le bien-être et l’environnement”. Canadian Anthropological Society Annual Meeting, Quebec City, May 13th 2015.
14. Ford, J. (2015). The Evaluating Health Adaptation to Climate Change (EvHACC) Research Program. CIHR meeting, Ottawa, March 23rd, 2015.

15. Berrang-Ford, L., and S. Harper (2015) Can we quantify climate change sensitivity? Modeling social determinants as effect modifiers for the relationship between weather and infectious disease in southwestern Uganda. *Impacts of Environmental Change on Infectious Diseases*, Sitges, Spain, 23-25 March 2015.
16. Goldfarb, D., Yansouni, C., Harper, S.L. (March 2015). "Setting a Northern Enteric Illness Agenda." Session Co-Organizer and Co-Chair. Challenges in Infectious Disease Up North. Iqaluit, NU.
17. Patterson, K. (2015) Avenues for adaptation: Sustainable Food Security among the Batwa Pygmies of Kanungu, Uganda. McGill Sustainability Research Symposium, Montreal, QC, March 13th 2015.

Conferences 2014:

18. Ford, J., Lwasa, S., Llanos, A., Maillet, M., Balawag, G., Rivera Zea, T., and Ole Riamit, K. (December, 3 2014) Indigenous peoples, health, and community-based monitoring systems. UNFCCC COP20 Side Event, Lima, Peru.
19. Ford, J. and Pearce, T. (2014). A review of vulnerability research in the Arctic. ArcticNet Annual Scientific Meeting, December 2014, Ottawa.
20. Ford, J. (2014). Adaptation to climate change in the Canadian Arctic. Invited presentation at Griffith University, Australia, May 9th 2014.
21. Bunce, Anna (December, 9 2014). Inuit women and climate change: Perspectives and Experiences regarding climate change and adaptation in Iqaluit Nunavut. *Arctic Change*. 8-12 December 2014, Ottawa, ON, Canada.
22. Petrasek MacDonald, J., Shiwak, I. (December, 11 2014). Youth-Identified Protective Factors for Mental Health and Well-being in a changing climate: Perspectives from Inuit youth in Nunatsiavut, Labrador. *Arctic Change*. 8-12 December 2014, Ottawa, ON, Canada.
23. Tjensvoll Kitching, K. (December, 10 2014). The dynamics of climate change vulnerability in the Southern Baffin region, Nunavut. *Arctic Change*. 8-12 December 2014, Ottawa, ON, Canada.
24. Finner, K. (December, 10 2014). Context Matters: Developing an approach for food systems research in Rigolet, Nunatsiavut. *Arctic Change*. 8-12 December 2014, Ottawa, ON, Canada.
25. Bishop-Williams, K.E., L. Berrang-Ford, V.E. Edge, J.D. Ford, M.K. Thomas, RICG, IHACC Research Team, S.L. Harper (2014) Seasonal Changes in Prevalence of Acute Gastrointestinal Illness in Rigolet, Nunatsiavut, Canada. *Arctic Change*. 8-12 December 2014, Ottawa, ON, Canada.
26. Jamieson, R., Farahbakhsh, K., Truelstrup Hansen, L., Harper, S.L. (December 2014). "Planning, Design and Assessment of Water Resources Systems in Northern Communities." Session Co-Organizer and Co-Chair. *Arctic Change Conference*, Ottawa, ON.
27. Harper, S.L., Cunsolo Willox, A. (May 2014). "Aboriginal Health Round Table." Global Development Symposium, University of Guelph, Guelph, ON.

28. Bishop-Williams, K.E.; Berrang-Ford, L.; Edge, V.L.; Ford, J.; Thomas, K.; Shiwak, I.; Rigolet Inuit Community Government; Indigenous Health Adaptation to Climate Change Research Group; Harper, S.L. *Arctic Change*, Ottawa, ON, Canada (Dec 8-12, 2014). "Seasonal Changes in Prevalence of Acute Gastrointestinal Illness in Rigolet, Nunatsiavut, Canada."
29. Wright, C., Shiwak, I., Ford, J., Farahbakhsh, K., Edge, V., the Indigenous Health Adaptation to Climate Change research team, the Rigolet Inuit Community Government, and Harper, S.L. *Arctic Change 2014*. (Dec 8-12, 2014). "Contamination of Stored Drinking Water and Associations with Acute Gastrointestinal Illness in a Canadian Inuit Community."
30. Wolfrey, C., Cunsolo Willox, A., Harper, S.L. (August 2014). "Community-led Research as an Adaptation Strategy." International Association for Ecology and Health: EcoHealth 2014. Montreal, QB.
31. Wolfrey, C., Cunsolo Willox, A., Harper, S.L. (May 2014). "Community-led Research as an Adaptation Strategy." Global Development Symposium, University of Guelph, Guelph, ON, May 2014.
32. Labbé, J., Ford, J.D., Berrang-Ford, L., Donnelly, B., Lwasa, S., Namanya, D., Twesigomwe, S., IHACC, Harper, S.L. (May 2014). Health and Vulnerability to Climate Change: A Case Study of the Bakiga of Southwestern Uganda. Oral presentation, Global Development Symposium, Ontario Veterinary College, University of Guelph, Guelph, ON.
33. Llanos-Cuentas A. Infectious Diseases and Climate Change. International Forum "The climate change in Peru and Latin America: current situation, prospects and challenges. Universidad Señor de Sipán, Chiclayo, Peru, 16-18 may 2014.
34. Bussalleu, A., Sherman, M., Anicama, J., Maillet, M. (2014) Opportunities and Barriers for Indigenous People's Adaptation to Climate Change: Considering Institutional Arrangements at Different Scales. Canadian Association of Geographers Annual Meeting 2014, IDRC Special Session (May 27th 2014), Ste-Catherines, ON.
35. Llanos-Cuentas A. (2014) Annual symposium. One Health: the intersection of animal health, human and environment. Universidad Peruana Cayetano Heredia, Lima, Peru. 16 September 2014.
36. Sherman, M. (2014) Stakeholder engagement in adaptation interventions: an evaluation of projects in developing nations. 2nd International Conference on Evaluating Climate Change and Development, Washington, D.C. United States. November 2014. (Sponsored participant).
37. Sherman, M. (2014) Vulnerability and adaptive capacity of community food systems in the Peruvian Amazon: a case study from Panaillo. Climate and Health Summit, Lima, Peru. December 2014. New Investigator Competition, Winner of People's Choice for Best Presentation.
38. Harper, S.L., Cunsolo Willox, A. (August 2014). "Research as a Strategy for Climate Change and Health Adaptation." Session Co-Organizer and Co-Chair. International Association for Ecology and Health: EcoHealth 2014. Montreal, QB.
39. Lemire, M., Fillion, M., Harper, S.L. (August 2014). "Indigenous health and well-being in Canada." Session Co-Organizer and Co-Chair. International Association for Ecology and Health: EcoHealth 2014. Montreal, QB.

Conferences 2013:

40. Bunce, A. (2013). Perceptions of the Causes and Cures Surrounding Acute Gastrointestinal Illness among Residents of Iqaluit, Nunavut. ArcticNet Halifax, December 2013
41. Berrang-Ford, L. (2013) Tracking adaptation: climate change and the methodological ‘messiness’ of the adaptation challenge. *McGill 3rd Annual Sustainability Research Symposium (Adapting to a Changing Climate)*. 14 March 2013, Montreal, QC.
42. Cunsolo Willox, A., S.L. Harper, V. Edge, the ‘My Word’: Storytelling and Digital Media Lab, and the Rigolet Inuit Community Government. October 2013. Re-Storying Research: Using Digital Storytelling as a Participatory Method for Climate-Health Research. *Qualitative Health Research Conference*, Halifax, Canada.
43. Farahbakhsh, K., A.C. Gordon, S.L. Harper, C. Goldhar, R. Marshall, T. Sheldon, Rigolet Inuit Community Government. December 2013. Applying Post-Normality to Engineering Design: Implications to Engineering in the North. *ArcticNet Annual Scientific Meeting*, Halifax, Canada.
44. Finner, K., I. Shiwak, C. Flowers, J. Ford, C. Furgal, Rigolet Inuit Community Government. Including the Intangible: Photo-Cards as a method for analyzing the social and cultural importance of food in Rigolet, Nunatsiavut. ArcticNet, December 2013, Halifax.
45. Finner, K., J. Ford, C. Furgal, Rigolet Inuit Community Government. Inuit food sharing Practices as a means of reducing the negative effects of social, economic and environmental change in Rigolet, Nunatsiavut, Labrador. NGGS (IAPH – CIHR), June 2013, Vancouver
46. Ford, J. (2013). Climate change, traditional knowledge and Inuit health. ArcticNet, December 2013, Halifax.
47. Ford, J (2013). Climate change, adaptation, and Indigenous populations. Invited presentation at “Acting on what we know and how we learn for climate and development policy” meeting at IDS, Brighton, UK. March 2013.
48. Gordon, A.C., K. Farahbakhsh, R. Marshall, V.E. Edge, S.L. Harper, C. Goldhar, T. Sheldon and the Rigolet Inuit Community Government. December 12, 2013. Evaluating Emerging Tools to Address Uncertainties and Complexities of Engineering Design in Northern Communities. *ArcticNet Annual Scientific Meeting*. Halifax, Canada.
49. Harper, S.L. Oct 2013. EcoHealth in Action: Climate Change and Diarrheal Disease in the Canadian Arctic. *Geospectives* seminar series, Invited Oral Presentation. Montreal, Canada.
50. Marshall, R., K. Farahbakhsh, Rigolet Inuit Community Government, S.L. Harper, A.C. Gordon, J. Lawless. December 2013. Developing a functioning model for meaningful transdisciplinary interaction to promote sustainable water systems in Indigenous communities. *ArcticNet Annual Scientific Meeting*, Halifax, Canada.
51. Petrusek MacDonald, J, J. Konek, C. Konek, J. Ford, A. Cunsolo Willox, M. Baikie, I. Shiwak, C. Mitchell and the Rigolet Inuit Community Government. (2013). From the Minds of Youth: Engaging and Involving Inuit Youth in Climate Change Adaptation Research Through Participatory Video. ArcticNet, December 2013, Halifax.
52. Sherman, M., Berrang-Ford, L., Ford, J., Lardeau, M., Hofmeijer, I., & Zavaleta, C. (2013). Balancing Indigenous Principles and Institutional Research Guidelines for Informed Consent: A Case Study from the Peruvian Amazon. AAG Annual Meeting, April 2013, Los Angeles.

53. Wolfrey, C., A. Cunsolo Willox, and S.L. Harper. December 2013. From Community-Based to Community-Led: Understanding Research as a Climate Change Adaptation Strategy for Public Health. Special session on Climate Change and Health Adaptation. *ArcticNet Annual Scientific Meeting*, Halifax, Canada.

Conferences 2012:

54. Berrang-Ford, L. (2012) Tracking adaptation: climate change, global health, and the methodological ‘messiness’ of the adaptation challenge. *University of Toronto School of the Environment Seminar Series*. 25 October 2012, Toronto.
55. Berrang-Ford, L. (2011) Tracking adaptation: Can we track adaptation and is there evidence that we are adapting? *Climate Change Adaptation Community of Practice Webinar*, May 2011.
56. Cunsolo Willox, A., Harper, S., Ford, J., Edge, V., and the Rigolet Inuit Community Government. (2012). *Examining the Climatic and Environmental Determinants of Mental Health: A Case Study from Nunatsiavut, Labrador, Canada*. 18th Annual Inuit Studies Conference, Washington, DC, USA, October 2012
57. Cunsolo Willox, A., Harper, S., Ford, J., Edge, V., and the Rigolet Inuit Community Government. (2012). *Examining the Climatic and Environmental Determinants of Mental Health: A Case Study from Nunatsiavut, Labrador, Canada*. 15th International Congress on Circumpolar Health, Fairbanks, Alaska, August 5-10, 2012.
58. Cunsolo Willox, A. Harper, S., Edge, V., ‘My Word’: Storytelling and Digital Media Lab, and the Rigolet Inuit Community Government. (2012). Re-Storying Research: Digital Storytelling as a Participatory Indigenous Method for Climate-Health Research. For special session Image-ining Change: Using Participatory Visual Research Methods to Explore Social, Health, and Ecological Change as part of the Canadian Association of Geographers, as part of the Canadian Federation of Humanities and Social Sciences Annual Congress, Waterloo, Ontario, Canada, May-June 2012.
59. Cunsolo Willox, A., Baikie, M., and Shiwak, I. (March 27, 2013). *(Re)Storying Research: Digital Storytelling as a Participatory Method for Environment and Health Research*. For ‘New’ Media and the Art of Integration Knowledge-to-Action Workshop, University of Northern British Columbia.
60. Cunsolo Willox, A. (January 28, 2013). *Climate Change and Aboriginal Health*. Invited speaker for McGill Interprofessional Global Health Course, McGill University, *Montreal, Quebec*.
61. Cunsolo Willox, A. (January 25, 2013). *Climate Change and Health: Local Voices, Global Opportunities*. Invited keynote speaker for meeting of the Supporters of Environmental and Societal Activities (SENSA) group. *Guelph, Ontario*.
62. Cunsolo Willox, A. (September 14, 2012). *Climate Change and Inuit Mental Health: Local Voices, Global Implications*. Invited speaker for GeoSpectives Seminar Series at McGill University. *Montreal, Quebec*.
63. Cunsolo Willox, A. (June 14, 2012). *Lament for the Land: On the Landscapes, Mindscapes, and Healthscapes of Global Climate Change*. Invited keynote speaker, Annual General Meeting of the Diocese of Niagara Development and Peace Council. *Hamilton, Ontario*.

64. Ford, J. (2012). Can we adapt to climate change in the Canadian Arctic. Centre for International Peace and Security Studies, McGill University, 15th November 2012.
65. Ford, J. and Statham, S. (2012). Food Security. ArcticNet Eastern Arctic Regional Science Meeting. Iqaluit, November 2012.
66. Ford, J. (2012). What we know (and don't know) about climate change and Indigenous health. Invited talk at CIHR's Institute of Aboriginal Peoples Health, May 1st 2012.
67. Ford, J. et al (2012). Mapping human dimensions of climate change research in the Canadian Arctic. IPY Conference, Montreal, April 23rd 2012.
68. Ford, J. (2012). What we know (and don't know) about climate change and Indigenous health. Invited talk at CIHR's Institute of Aboriginal Peoples Health, May 1st 2012.
69. Ford, J. (2012). The Indigenous Health Adaptation to Climate Change (IHACC) project. Invited talk from Public Health Agency of Canada and Nunavut Research Institute, Iqaluit March 2012.
70. Harper, S.L., V.L. Edge, J. Ford, M. Wood, A. Cunsolo Willox, S.A. McEwen. May 2012. "Indigenous Health Adaptation to Climate Change: Climate-Related Health Priorities in Nunatsiavut, Canada." *Global Development Symposium*, Oral Presentation. Guelph, Canada
71. Harper, S.L., V.L. Edge, J. Ford, M. Wood, A. Cunsolo Willox, and S. McEwen. June 2012. Indigenous Health Adaptation to Climate Change: Climate-Related Health Priorities in Nunatsiavut, Canada. *Canadian Public Health Association Conference*, Oral Presentation. Edmonton, Canada.
72. Harper, S.L., V.L. Edge, J. Ford, M. Wood, A. Cunsolo Willox, and S. McEwen. May 2012. Indigenous Health Adaptation to Climate Change: Climate-Related Health Priorities in Nunatsiavut, Canada. *Global Development Symposium*, Oral Presentation. Guelph, Canada.
73. Harper, S.L., V.L. Edge, J. Ford, S.A. McEwen. July 2012. "Using Scenario Analysis to Prepare for Climate Change Impacts on Waterborne Disease in Nunatsiavut, Canada." *WorldFuture 2012 Conference*, Oral Presentation. Toronto, Canada.
74. Henriques, G., L. Lamanna, D. Kotowski, H. Hlomani, D. Stacey, P. Baker. March 2012. "An Ontology-Driven approach to Mobile Data Collection Applications for the Health-Care Industry." *Advances in Health Informatics Conference*, Oral Presentation. Toronto, Canada.
75. Llanos EA "Impacto del Cambio Climático en la salud: el caso de las enfermedades transmitidas por vectores". Oral presentación a 2da Conferencia Regional de Comunidades Seguras para las Américas, 17 – 19 October 2012, Lima Peru
76. 'My Word': Storytelling and Digital Media Lab, Cunsolo Willox, A., Harper, S., Edge, V., and the Rigolet Inuit Community Government. (2012). *Storytelling in a Digital Age: Digital Storytelling for Climate-Health Research*. 15th International Congress on Circumpolar Health, Fairbanks, Alaska, August 5-10, 2012.
77. Zavaleta, C. "Working with remote Amazonian Communities in Peru to design a research model for determining the current and future vulnerability to Climate Change". Oral presentation at the *Global Development Symposium*, University of Guelph, May 2012.

Conferences 2011:

78. Berrang-Ford, L. (2011) Climate change and human health. *GEC3 Centre Day*, 4 May 2011, Montreal.
79. Ford, J. (2011). Indigenous health and climate change: a review. Indigenous Peoples, Marginalized Populations and Climate Change: Vulnerability, Adaptation and Traditional Knowledge, Mexico City, 19-21 July
80. Ford, J. (2011). Why are Indigenous populations vulnerable to the health effects of climate change? ICARUS II meeting, Ann Arbor, May 5th 2011.
81. Ford, J. (2011). Are we adapting to climate change? Invited talk at the Environmental Change Institute, University of Oxford, 9th December 2011.

3.3.1 Poster Presentations:

1. Wolff, R., Harper, S.L., Carcamo, C., Bussalleu Cavero, A., IHACC Research Team, and Llanos-Cuentas, A. "Its spirit is strong:" Shawi Spirits, Healers & Diarrhea in the Amazon. Consortium of Universities for Global Health 2016 Conference, San Francisco, USA, April 2016.
2. Saini, M., Shiwak, I, Roche, S., Papadopoulos, A., Wood, M., RICG, Nunatsiavut Government, IHACC Research Team and Sharper, S. [Participatory methods in Rigolet: Evaluation of Inuit health programs ad collaborative development in a whiteboard video for health promotion](#). ArcticNet Annual Scientific Meeting, Vancouver, BC, Canada, December 2015.
3. Wright, C., Shiwak, I., Sargeant, J., Edge, V., Ford, J., Farahbakhsh, K., RICG, IHACC Research Team, and Harper, S. [Drinking Water Consumption Patterns and Changes Over Time in Rigolet, Nunatsiavut, Canada](#). ArcticNet Annual Scientific Meeting, Vancouver, BC, Canada, December 2015.
4. Bunce, A., and Ford, J. [Vulnerability and adaptive capacity of Inuit women to climate change: A case study from Iqaluit, Nunavut](#). ArcticNet Annual Scientific Meeting, Vancouver, BC, Canada, December 2016.
5. Wolff, R., Harper, S.L., et al. "Its spirit is strong: Shawi healers, spirits and diarrhea in the Peruvian Amazon". Canadian Conference of Global Health, Montreal, QC, 5-6 November 2015. [Student poster winner, "Most innovative research"]
6. Wolff, R., Harper, S.L., Carcamo, C., Bussalleu Cavero, A., IHACC Research Team, and Llanos-Cuentas, A. "Its spirit is strong: Shawi healers, spirits and diarrhea in the Peruvian Amazon" Qualitative Health Research Conference, Toronto, ON, October 19th 2015.
7. K. Patterson, L. Berrang- Ford, S. Lwasa, D. Namanya, F. Twebaze, S. Clark, IHACC Research Team, S.L. Harper. Because eating is life': A qualitative approach to analyzing food security and malnutrition in the Batwa pygmies of Southwestern Uganda. 16th International Medical Geography Symposium, Vancouver, BC, July 2015.

8. S. Clark, L. Berrang- Ford, S. Lwasa, D. Namanya, F. Twebaze, K. Patterson, IHACC research team, S. Harper. Acute gastrointestinal illness in an Africa Indigenous population: the lived experience of Uganda's Batwa. 16th International Medical Geography Symposium, Vancouver, BC, July 2015.
9. Bishop-Williams, K., Harper, S., Berrang-Ford, L., Edge, V., Thomas, K., Ford, J., Shiwak, I, and IHACC Research Team. Seasonal changes in prevalence of acute gastrointestinal illness and concurrent respiratory symptoms in Rigolet, Nunatsiavut, Canada. International Conference on the Impact of Environmental Change on Infectious Diseases, Sitges, Spain, March 22nd 2015.
10. Anicama J. Collaborative processes for governance on climate change. World Resource Forum 2014, Arequipa-Peru.
11. Carrasco-Escobar, G. Modeling the climate impact in the incidence of malaria in the Peruvian Amazon Region of Loreto, a retrospective analysis of 11 years. ASTMH 63rd Annual Meeting, New Orleans, 2014.
12. Carrasco-Escobar, G. District level influence of climate on the incidence of infectious diseases in the Peruvian amazon region of Loreto. Climate and Health Summit, Swiss-Hotel, Lima, 2014.
13. Bussalleu, Alejandra. Health and Environment: How does Climate Change affect our Health? Fifth Annual Consortium of Universities for Global Health. Washington DC, 2014
14. Bussalleu, Alejandra. The use of formal and traditional health care in remote indigenous communities: a comparison of two Shawi communities of the Peruvian Amazon. Fifth Annual Consortium of Universities for Global Health. Washington DC, 2014
15. S. Clark, L. Berrang-Ford, S. Lwasa, D. Namanya, V.L. Edge, IHACC Research Team, and S. Harper. The burden and determinants of self-reported acute gastrointestinal illness among an Indigenous Batwa-Pygmy population in southwestern Uganda. *The 5th Biennial Conference of the International Association for Ecology & Health*, Poster presentation, Montreal, Canada, August 2014.
16. S. Clark, L. Berrang-Ford, S. Lwasa, D. Namanya, F. Twebaze, K. Patterson, IHACC Research Team, and S. Harper. The lived experience of acute gastrointestinal illness for and Indigenous African population: A case study of the Batwa-Pygmyes in southwestern Uganda. *The 2014 Global Health Poster Fair at McGill University*, Poster presentation, Montreal, Canada, November 2014.
17. Labbé, J., Ford, J.D., Berrang-Ford, L., Donnelly, B., Lwasa, S., Namanya, D., Twesigomwe, S., IHACC, Harper, S.L. (December 2014). Comment les changements climatiques affectent-ils la santé d'une communauté rurale en l'Ouganda? Une évaluation de la vulnérabilité à la malaria, l'insécurité alimentaire et les maladies gastro-intestinales et de capacité d'adaptation. Poster presentation, 6^{ème} Symposium Ouranos, Québec, QC.
18. Bishop-Williams, K.E.; Berrang-Ford, L.; Edge, V.L.; Ford, J.; Thomas, K.; Shiwak, I.; Rigolet Inuit Community Government; Indigenous Health Adaptation to Climate Change Research Group; Harper, S.L. Impact of Environmental Changes on Infections Disease (March 23-25, 2015). "Seasonal Changes in Prevalence of Acute Gastrointestinal Illness in Rigolet, Nunatsiavut, Canada."

19. Bishop-Williams, K.E.; Berrang-Ford, L.; Edge, V.L.; Ford, J.; Thomas, K.; Shiwak, I.; Rigolet Inuit Community Government; Indigenous Health Adaptation to Climate Change Research Group; Harper, S.L. Global Health Innovations- Yale. (March 28-29, 2015). "Seasonal Changes in Prevalence of Acute Gastrointestinal Illness in Rigolet, Nunatsiavut, Canada."
20. Bishop-Williams, K.E.; Berrang-Ford, L.; Edge, V.L.; Ford, J.; Thomas, K.; Shiwak, I.; Rigolet Inuit Community Government; Indigenous Health Adaptation to Climate Change Research Group; Harper, S.L. Arctic Change 2014. (Dec 8-12, 2014). "Seasonal Changes in Prevalence of Acute Gastrointestinal Illness in Rigolet, Nunatsiavut, Canada."
21. Day, L.; Cunsolo Willox, A.; Castleden, H.; Martin, D.; Harper, S. Arctic Change (Dec 8-12, 2014). "Where two rivers meet: Integrating Indigenous and Western knowledge systems for improved water management in the North."
22. Wright, C., Shiwak, I., Ford, J., Farahbakhsh, K., Edge, V., the Indigenous Health Adaptation to Climate Change research team, the Rigolet Inuit Community Government, and Harper, S.L. Arctic Change 2014. (Dec 8-12, 2014). "Contamination of Stored Drinking Water and Associations with Acute Gastrointestinal Illness in a Canadian Inuit Community."
23. McDonald, M.E.; Harper, S.L.; Edge, V.L.; Thomas, M.K.; Ford, J.; Indigenous Health Adaptation to Climate Change Research Team; Papadopoulos, A. "The Burden of Acute Gastrointestinal Illness for Inuit in Iqaluit, Nunavut, Canada". The 5th Biennial Conference of the International Association for Ecology & Health, Montreal, QC, Canada (Aug 11-15, 2014).
24. Bishop-Williams, K.E.; Berrang-Ford, L.; Edge, V.L.; Ford, J.; Thomas, K.; Shiwak, I.; Rigolet Inuit Community Government; Indigenous Health Adaptation to Climate Change Research Group; Harper, S.L. Environmental Sciences Symposium- Guelph. (Feb 7, 2015). "Seasonal Changes in Prevalence of Acute Gastrointestinal Illness in Rigolet, Nunatsiavut, Canada."
25. Bishop-Williams, K.E.; EHCoI Guelph. Infographics Research Symposium- Guelph. (Jan 16th, 2015). "What is EcoHealth?"
26. Bishop-Williams, K.E.; Berrang-Ford, L.; Edge, V.L.; Ford, J.; Thomas, K.; Shiwak, I.; Rigolet Inuit Community Government; Indigenous Health Adaptation to Climate Change Research Group; Harper, S.L. Infographics Research Symposium- Guelph. (Jan 16th, 2015). "Seasonal Changes in Prevalence of Acute Gastrointestinal Illness in Rigolet, Nunatsiavut, Canada."
27. Day, L.; Cunsolo Willox, A.; Castleden, H.; Martin, D.; Harper, S. Environmental Sciences Symposium (Feb 7, 2015). "Where two rivers meet: Integrating Indigenous and Western knowledge systems for improved water management in the North."
28. Wright, C. Shiwak, I., Ford, J., Farahbakhsh, K., Edge, V., the Indigenous Health Adaptation to Climate Change research team, the Rigolet Inuit Community Government, and Harper, S.L. Environmental Sciences Symposium- Guelph. (Feb 7, 2015). "Contamination of Stored Drinking Water and Associations with Acute Gastrointestinal Illness in a Canadian Inuit Community."
29. Masina, S., Bishop-Williams, K.E., Edge, V.L., Ford, J., Thomas, K., Shiwak, I., RICG, Harper, S.L. A.D. Latornell Conservation Symposium, Alliston, ON. (Nov 19, 2014) "Environmental Health Risks in the Canadian North: Acute and Chronic Gastrointestinal Illness in Rigolet, Nunatsiavut".
30. McDonald, M.E.; McDonald, J.G. "Tips & Tricks for a Successful Infographic". Infographics Symposium, Guelph, ON, Canada (Jan 16, 2015).

31. McDonald, M.E.; Harper, S.L.; Edge, V.L.; Thomas, M.K.; Ford, J.; Indigenous Health Adaptation to Climate Change Research Team; Papadopoulos, A. Global Development Symposium, Guelph, ON, Canada (May 4-7, 2014). "The Burden of Acute Gastrointestinal Illness for Inuit in Iqaluit, Nunavut, Canada".
32. McDonald, M.E.; Harper, S.L.; Edge, V.L.; Thomas, M.K.; Ford, J.; Indigenous Health Adaptation to Climate Change Research Team; Papadopoulos, A. Canadian Society of Epidemiology and Biostatistics National Students Conference, Hamilton, ON, Canada (May 9-10, 2014). "The Burden of Acute Gastrointestinal Illness for Inuit in Iqaluit, Nunavut, Canada".
33. Harper, S.L., V.L. Edge, J. Ford, K. Thomas, and S. McEwen. June 2012. Indigenous Health Adaptation to Climate Change: Burden of Self-Reported Acute Gastrointestinal Illness in Canadian Inuit. *Canadian Public Health Association Conference*, Poster Presentation. Edmonton, Canada.
34. Harper, S.L., V.L. Edge, J. Ford, K. Thomas, and S. McEwen. May 2012. Indigenous Health Adaptation to Climate Change: Burden of Self-Reported Acute Gastrointestinal Illness in Canadian Inuit. *Global Development Symposium*, Poster Presentation. Guelph, Canada.
35. Harper, S.L., V.L. Edge, J. Ford, and S. McEwen. May 2012. Indigenous Health Adaptation to Climate Change: Using Scenario Analysis to Prepare for Climate Change Impacts on Waterborne Disease in Nunatsiavut, Canada. *Global Development Symposium*, Poster Presentation. Guelph, Canada.
36. Harper, S.L., V.L. Edge, J. Ford, K. Thomas, and S. McEwen. April 2012. Indigenous Health Adaptation to Climate Change: Burden of Self-Reported Acute Gastrointestinal Illness in Canadian Inuit. *International Polar Year Science Conference*, Poster Presentation. Montreal, Canada.
37. Harper, S.L., V.L. Edge, J. Ford, M. Wood, A. Cunsolo Willox, and S. McEwen. April 2012. Indigenous Health Adaptation to Climate Change: Climate-Related Health Priorities in Nunatsiavut, Canada. *International Polar Year Science Conference*, Poster Presentation. Montreal, Canada.
38. Harper, S.L., V.L. Edge, J. Ford, and S. McEwen. April 2012. Indigenous Health Adaptation to Climate Change: Using Scenario Analysis to Prepare for Climate Change Impacts on Waterborne Disease in Nunatsiavut, Canada. *International Polar Year Science Conference*, Poster Presentation. Montreal, Canada.
39. Cunsolo Willox, A., Harper, S., Ford, J., Landman, K., Houle, K., Edge, V., and the Rigolet Inuit Community Government. (2012). *Climate Change and Mental Health: An Exploratory Case Study from Rigolet, Nunatsiavut, Labrador*. 8th Annual Scientific Meeting for ArcticNet, Vancouver, BC, December 2012.
40. Ford, J., Cunsolo Willox, A., Chatwood, C., Furgal, C., Harper, S.L., Mauro, I., and Pearce, T. (2012). *Mobilizing Inuit Traditional Knowledge for Adapting to the Health Effects of Climate Change*. 8th Annual Scientific Meeting for ArcticNet, Vancouver, BC, December 2012.

41. Pearce, T., Cunsolo Willox, A., Ford, J., Furgal, C., Harper, S.L., Mauro, I., Chatwood, C., Jasiuk, L., and Parker, C. (2012). *IK-ETHICS: Ethical considerations for documenting and disseminating Inuit knowledge using multi-media platforms*. 8th Annual Scientific Meeting for ArcticNet, Vancouver, BC, December 2012.
42. 'My Word': Storytelling and Digital Media Lab, Harper, S., Cunsolo Willox, A., Edge, V., and the Rigolet Inuit Community Government. (2012). *'My Word': Storytelling and Digital Media Lab: The Evolution of an Inuit-Owned Digital Media and Research Organization*. 8th Annual Scientific Meeting for ArcticNet, Vancouver, BC, December 2012.
43. 'My Word': Storytelling and Digital Media Lab, Harper, S., Cunsolo Willox, A., Edge, V., and the Rigolet Inuit Community Government. (2012). *'My Word': Storytelling and Digital Media Lab: The Evolution of an Inuit-Owned Digital Media and Research Organization*. 18th Annual Inuit Studies Conference, Washington, DC, October 2012.

3.4 Presentation (non-academic):

1. Wolff, R., Harper, S.L., Carcamo, C., Bussalleu, A., IHACC Research Team, Llanos, A. (June 2015). "Its spirit is strong:" Shawi Spirits, Healers & Diarrhea in the Amazon. Presentation with Estrategia Sanitaria Nacional de los Pueblos Indígenas (ESPNI). Ministerio de Salud: Lima, Peru.
2. Wolff, R., Harper, S.L., Carcamo, C., Bussalleu, A., IHACC Research Team, Llanos, A. (June 2015). "Its spirit is strong:" Shawi Spirits, Healers & Diarrhea in the Amazon. "Reuniones de Investigación" del Instituto de Medicina Tropical "Alexander von Humboldt". Universidad Peruana Cayetano Heredia: Lima, Peru.
3. Wolff, R., Harper, S.L., Carcamo, C., Bussalleu, A., IHACC Research Team, Llanos, A. (June 2015). "Its spirit is strong:" Shawi Spirits, Healers & Diarrhea in the Amazon. Presentation with the Centro Amazónico de Antropología y Aplicación Práctica (CAAAP): Lima, Peru.
4. Wolff, R., Harper, S.L., Carcamo, C., Bussalleu, A., IHACC Research Team, Llanos, A. (March 2015). "Its spirit is strong:" Shawi Spirits, Healers & Diarrhea in the Amazon. Presentation to Engineers without Borders: Guelph, Canada.
5. Ford, J. (2014). Prevalence and Determinants of Food Security in Iqaluit, Nunavut: A seasonal analysis. Presentation at the IHACC results sharing workshop, Iqaluit, June 16th 2014.
6. Ford, J. (2014). 2014 IPCC Report: What does it say about current and future impacts and vulnerabilities in the Arctic? Presentation at the IHACC results sharing workshop, Iqaluit, June 16th 2014.
7. Harper, S.L. (June 2014). "AGI in Iqaluit: A Discussion of Results and Next Steps". Meeting Co-Organizer and Speaker. Indigenous Health Adaptation to Climate Change Annual Workshop. Iqaluit, NU.
8. Harper, S.L. (June 2014). "AGI in Nunatsiavut: A Discussion of Results and Next Steps". Meeting Co-Organizer and Speaker. Indigenous Health Adaptation to Climate Change Annual Workshop. Goose Bay, NU.

9. Bishop-Williams, K.E., Berrang-Ford, L., Steele, V., IHACC, Harper, S.L. (March 2015). "Bwindi Community Hospital Medical Records System: Preliminary Evaluation Results and Next Steps." Buhoma, Uganda.
10. Ford, J. 2014. "Indigenous knowledge an adaptation: An Arctic example," UNFCCC NWP and Adaptation Committee meeting, Bonn, April 1st -2nd 2014.
11. Harper, S.L. (November 2014). "EcoHealth as a KTEE Strategy." Invited speaker. Behind the Acronyms: Knowledge Mobilization in Action. University of Guelph, Guelph, ON.
12. Harper, S.L. (November 2014). "Science in Canada's North: How Will Climate Affect Health?" Invited panelist. ScienceNorth Science Café Series. Sudbury, ON.
13. Harper, S.L. (November 2014). "Science in Canada's North: How Will Climate Affect Health?" Invited panelist. ScienceNorth Science Café Series. Thunder Bay, ON.
14. Harper, S.L. (September 2014). "Emerging Commonalities: Laying Foundations for Future Work." Invited speaker. Convergence of Indigenous and Scientific Knowledge Systems Speaker Series. University of Guelph, Guelph, ON.
15. Harper, S.L., V.L. Edge, J. Ford, K. Thomas, and S. McEwen. March 2013. Burden of Acute Gastrointestinal Illness in Iqaluit: Preliminary Research Results. *Indigenous Health Adaptation to Climate Change Project Meeting*. Oral presentation. Iqaluit, Canada.
16. Baker, P. March 2012. "Indigenous Health Adaptation to Climate Change Program". Oral presentation for students of the Environmental Technology Program at the Nunavut Arctic College. Iqaluit, Nunavut, Canada.
17. Bussalleu, Alejandra. 2013. "Climate Change, Vulnerability and Adaptation" Annual Meeting in Pucallpa, Peru.
18. Bussalleu, Alejandra. 2013. "Climate Change, Vulnerability and Adaptation" Annual Meeting in Yurimaguas, Peru
19. Cunsolo Willox, A. (March 28, 2013). *Climate Change and Inuit Health in Canada: A Case for Considering 'Development Work' at Home*. For IDEV 2500, Introduction to International Development, taught by Caizhen Lu.
20. Edge, V.L., S.L. Harper, and J. Ford. March 2013. Oral presentation. Indigenous Health Adaptation to Climate Change International Project. Burden of Acute Gastrointestinal Illness in Iqaluit: Preliminary Research Results. *Indigenous Health Adaptation to Climate Change Project Meeting*. Iqaluit, Canada.
21. Edge, V. March 2012. "Scenario Analysis in Public Health." *Waterborne Illness and Climate Change in Inuit Communities – A Research Discussion*, Oral Presentation. Iqaluit, Canada.
22. Harper, S.L., V.L. Edge, J. Trumble-Waddell. February 2012. "Drinking Water & Community Health: Long-term Visioning for Planning." Oral presentation for representatives from Nunatsiavut Government and Labrador Grenfell Health Authority. Goose Bay, Canada.
23. Harper, S.L., V.L. Edge. May 2011. "Indigenous Health Adaptation to Climate Change Program." Oral presentation for representatives from Nunatsiavut Government and Labrador Grenfell Health Authority. Goose Bay, Canada.
24. Harper, S.L., M. Baikie, and I. Shiwak. March 2012. Indigenous Health Adaptation to Climate Change Project. Community Open House Presentations. Rigolet, Canada.

25. Harper, S.L., M. Baikie, and I. Shiwak. March 2012. Indigenous Health Adaptation to Climate Change Project. Oral presentation for the Torngat Secretariat. Rigolet, Canada.
26. Harper, S.L., V.L. Edge, J. Ford, and S. McEwen. March 2012. Linking Water, Health, & Weather: Insights from Community Led Research in Labrador. *Waterborne Illness & Climate Change in Inuit Communities*, Oral Presentation. Iqaluit, Canada.
27. Harper, S.L., V.L. Edge, and J. Trumble-Waddell. February 2012. Drinking Water & Community Health: Long-term Visioning for Planning. Oral presentation for Nunatsiavut Government & Labrador Grenfell Health Authority. Goose Bay, Canada.
28. Harper, S.L., and V.L. Edge. May 2011. Indigenous Health Adaptation to Climate Change Program. Oral presentation for representatives from Nunatsiavut Government and Labrador Grenfell Health Authority. Goose Bay, Canada.
29. Harper, S.L., M. Baikie, I. Shiwak. March 2012. "Indigenous Health Adaptation to Climate Change Project." Community Open House Presentations. Rigolet, Canada.
30. Harper, S.L., M. Baikie, I. Shiwak. March 2012. "Indigenous Health Adaptation to Climate Change Project." Oral presentation for the Torngat Secretariat. Rigolet, Canada.
31. Harper, S.L., V.L. Edge, J. Ford, S.A. McEwen. March 2012. "Linking Water Quality, Community Health and Climate Change - Insights from Community Led Research in Labrador." *Waterborne Illness and Climate Change in Inuit Communities – A Research Discussion*, Oral Presentation. Iqaluit, Canada.
32. Hofmeijer, I and Esdras Silvano, July 12, 2011. Announce approval of the program in Ucayali, Puerto Consuelo. Oral presentation to community members and authorities.
33. Hofmeijer, I., Esdras Silvano, Carol Zavaleta. July 5, 2011. Announce approval of the program in Panaillo, Ucayali. Oral presentation to community members and authorities.
34. Hofmeijer, I. , Ing Aldo Cabrera, Bgst Maria Teresa Santa Cruz, Adelina Altamirano , Carol Zavaleta, Segundo Pizango. July 9, 2011. Announce approval of the program in Puerto Porvenir. Loreto. Oral presentation to community members and authorities
35. Hofmeijer, I. , Ing Aldo Cabrera, Bgst Maria Teresa Santa Cruz, Adelina Altamirano , Carol Zavaleta, Segundo Pizango. July 12, 2011. Announce approval of the program in Puerto Porvenir. Loreto. Oral presentation to community members and authorities
36. Hofmeijer, I., Esdras Silvano, Jose Perez. October 29, 2011. Oral presentation to community members and authorities of Panaillo. Ucayali the methodology of vector capture and monitoring every three months.
37. Hofmeijer, I., Esdras Silvano, Jose Perez. November 2, 2011. Oral presentation to community members and authorities of Puerto Consuelo. Ucayali, the methodology of vector capture and monitoring every three months.
38. Hofmeijer, I. Peruvian pilot: Climate Change and Indigenous Health. Twelve oral presentations to representatives from community organization
39. Llanos, A., Valdivia, MJ, Fernandez, C. (October 9th, 2012) Presentation of the IHACC Project to the new authorities of DIRESA in Pucalpa, Peru.

40. Llanos, Alejandro .2013. “Indigenous Health Adaptation to Climate Change: Project Overview” Annual Meeting in Yurimaguas, Peru
41. Llanos, Alejandro. 2013. “Indigenous Health Adaptation to Climate Change: Project Overview” Annual Meeting in Pucallpa, Peru
42. Perez, J., Carol Zavaleta, Marie Pierre Lardeau. November 15, 2011. Oral presentation to community members (3) and authorities (1) of Nuevo Progreso, Loreto, the methodology of vector capture and monitoring every three months.
43. Pizango, Pedro . 2013. “Indigenous Health Adaptation to Climate Change: My experience as an indigenous promoter” Annual Meeting in Pucallpa, Peru.
44. Sargeant, J. March 2012. “Zoonotic diseases and public health.” *Waterborne Illness and Climate Change in Inuit Communities – A Research Discussion*, Oral Presentation. Iqaluit, Canada.
45. Sherman, M., and Sherman S. (December 14, 2012) “Analysis of the feasibility of future research on food security and extreme climatic events, rapid observation of agriculture activities in shawis”. Presentation of research to the community of Puerto Porvenir, Peru.
46. Silvano, E., Carol Zavaleta, Eric Rojas and Alina Torres. February 24, 2012. Oral presentation to community members (20) and authorities (1) of Puerto Consuelo, Ucayali, the Burden of illnesses protocol.
47. Silvano, E., Carol Zavaleta, Eric Rojas, Connie Fernandez and local coordinators (Guiovanna Ancon, Nery Inuma, Isaac Torres, Ercicka Ancon). March 2, 2012. Oral presentation to community members (30) and authorities (1) of Panaillo, Ucayali the Burden of illnesses protocol.
48. Thomas, K. March 2012. “Overview of waterborne diseases in Canada.” *Waterborne Illness and Climate Change in Inuit Communities – A Research Discussion*, Oral Presentation. Iqaluit, Canada.
49. Urquía, Henry . 2013. “Indigenous Health Adaptation to Climate Change: My experience as an indigenous promoter” Annual Meeting in Yurimaguas, Peru
50. Valdivia, MJ., Fernandez, C., and Pizango, P. (October 24, 2012) “Consolidation of coordination to implement a medicinal plant garden in the community”. Presentation on future activities in the community of Nuevo Progreso, Peru.
51. Valdivia, MJ., Fernandez, C., and Urquia, H. (October 13, 2012) “Reinitiating activities in the communities and strengthening community relationships”. Presentation to the community on Panaillo, Peru.
52. Valdivia, María José. 2013. “IHACC Results dissemination” Annual Meeting in Yurimaguas, Peru
53. Valdivia, María José. 2013. “IHACC Results dissemination” Annual Meeting in Pucallpa, Peru.
54. Zavaleta, C., Valdivia, MJ., Bussalleu, A., and local coordinators Pedro Pizango, Tito Chanchari, Elvis Lancha (July23, 2012) Presentation of the blood simple results to the community of Nuevo Progreso, Peru
55. Zavaleta, C., Valdivia, MJ., Bussalleu, A., and local coordinators Isac Torres, Erick Rojas, and Esdras Silvano (July 4, 2012) Presentation of the blood simple results to the community of Puerto Porvenir, Peru

56. Zavaleta, C., Connie Fernandez, Rosa Valera, and local coordinators (Tito Marden, Tito Pua, Elvis Chanchari, Toribio Cahuaza). March 23, 2012. Oral presentation to community members and authorities of Nuevo Progreso, Loreto the Burden of illnesses protocol.
57. Zavaleta, C., Connie Fernandez, Rosa Valera, and local coordinators (Tito Marden, Tito Pua, Elvis Chanchari, Toribio Cahuaza). March 29, 2012. Oral presentation to community members and authorities of Puerto Porvenir, Loreto the Burden of illnesses protocol.

3.5 Book Chapters:

1. **Ford, J.** and Adams, P. (2013). Remote Indigenous Populations and Climate Change: Reducing the Impacts on Health and Well-Being. Chp 13 in “Ensuring a Sustainable Future: Making Progress on Environment and Equity,” Heymann, J et al (eds), Oxford University Press.

3.6 Books:

1. Arctic IHACC Research Team (2015) Understanding Diarrheal Disease in Northern Canada Uganda (IHACC project summary of emerging results booklet)
2. Ugandan IHACC Research Team (2015) Diarrheal disease among the Batwa of Kanungu, Uganda (IHACC project summary of emerging results booklet) http://issuu.com/fordlab/docs/ihacc_uganda_agi_pages?e=0/14409008
3. Wolff, R., and IHACC Research Team (2015) El espíritu es fuerte: Diarrea en la Amazonia Peruana (IHACC project summary of emerging results booklet) http://issuu.com/sherilee.harper/docs/folleto-rebecca_wolff.pptx/8?e=0/13560168
4. Sherman, M. (2014) Floods, Markets, and Institutions: What’s changing food security in the Peruvian Amazon? (IHACC project summary of emerging results booklet) <http://issuu.com/fordlab/docs/perufsenglish?e=3108674/11690016>
5. Ugandan IHACC Research Team (2014) Indigenous Health Adaptation to Climate Change (IHACC) –Uganda: Summary of emerging research results. (IHACC project summary of emerging results booklet) http://issuu.com/fordlab/docs/ihacc_uganda?e=3108674/11690061
6. IHACC project (2012) Indigenous Adaptation in a Changing Climate: Local Voices, Global Perspectives. (IHACC Pilot Project Photo Voice results compiled in a hardcover book) <http://www.flickr.com/photos/118809137@N03/sets/72157642660851475/>

3.7 Theses:

1. Clark, D. 2016. [Vulnerability to Injury: assessing biophysical and social determinants of land-user injuries in Nunavut, Canada.](#) MSc thesis. Department of Geography, McGill University, Montreal, QC.

2. MacVicar, S. 2016. [The impacts of meteorological exposures on perinatal health: A mixed methods study of Kanungu District, Uganda](#). MSc thesis. Department of Geography, McGill University, Montreal, QC.
3. Donnelly, B. 2016. [Indigenous health, livestock, and climate change adaptation in Kanungu District, Uganda](#). PhD thesis. Department of Geography, McGill University, Montreal, QC.
4. Finner, K. 2016. [Food from here and there, from us and them: Characterizing the food system of Rigolet, Nunatsiavut, Canada](#). MA thesis. Department of Geography, McGill University, Montreal, QC.
5. Bunce, A. 2016. [Gender and the human dimensions of climate change: Global discourse and local perspectives from the Canadian Arctic](#). MA thesis. Department of Geography, McGill University, Montreal, QC.
6. Patterson, K. 2015. [Prevalence, determinants and seasonal variation of food security among the Batwa of Kanungu District, Uganda](#). MA thesis. Department of Geography, McGill University, Montreal, QC.
7. Clark, S. 2015. [The Burden and Lived Experience of Acute Gastrointestinal Illness in an Indigenous Batwa Population in Southwestern Uganda](#). BA Honours thesis. Department of Geography, McGill University, Montreal, QC.
8. Alejandra Bussalleu. 2015. Health beliefs and health-seeking behaviours among two Shawi communities of the Peruvian Amazon. Ruprecht-Karls Universität Heidelberg, Germany.
9. Petrsek MacDonald, J. 2015. [From the Minds of Youth: Exploring Inuit Youth Resilience within a Changing Climate and Applications for Climate Change Adaptation in Nunatsiavut, Labrador, Canada](#). MA thesis. Department of Geography, McGill University, Montreal, QC.
10. Maillet, M. 2015. [Is the United Nations Framework Convention on Climate Change an effective \(or appropriate\) institution to support indigenous peoples' adaptation to climate change?](#) MA thesis. Department of Geography, McGill University, Montreal, QC.
11. Gordon, A. 2014. [Tools and Strategies to Address Uncertainties and Complexities of Infrastructure Design in Remote Northern Canadian Communities](#). MSc thesis. School of Engineering, University of Guelph, Guelph, ON.
12. Sherman, M. 2014. [Vulnerability and adaptive capacity of community food systems in the Peruvian Amazon: A case study from Panaillo](#). MA thesis. Department of Geography, McGill University, Montreal, QC.
13. Anicama, J. 2013. Analysis of Collaborative Processes for Governance to Climate Change in the Ucayali Region, Peru. M.Sc. Thesis. Geographisches Institut, Ruprecht-Karls-Universität Heidelberg, Germany.
14. Harper, S.L. 2013. [Gastrointestinal Illness in Canada's North: Implications of Climate Change on Current and Future Inuit Health](#). PhD thesis. Department of Population Medicine, University of Guelph, Guelph, ON.
15. Statham, S. 2012. [Anomalous climatic conditions during winter 2010/11 and vulnerability of the traditional Inuit food system in Iqaluit, Nunavut](#). MA thesis. Department of Geography, McGill University, Montreal, QC.

3.8 Databases (GIS, and other information systems):

1. Sheikh N (2012-2013) Patterson K. (2014-2016) Burden of Illness compiled study database. McGill University & University of Guelph
2. IHACC Photo Bank (2015) Password protected flickr account. McGill University

3.9 Websites, social media (Facebook, Twitter), multimedia (YouTube, others):

1. IHACC website (www.ihacc.ca) and Twitter (@IHACCproject)
2. Dr. James Ford's website (www.jamesford.ca) and Twitter (@ccadapt)
3. Dr. Lea Berrang Ford's website (www.leaberrangford.ca) and Twitter (@GeoEnviroEpi)
4. Dr. Sherilee Harper's website (www.sherileeharper.com) and Twitter (@Sherilee_H)
5. IHACC documentary film (27:57): <https://www.youtube.com/watch?v=2CxJdw4zbnw>
6. IHACC short film (English): <https://vimeo.com/54772398>
7. IHACC/SIACC Short Film (Spanish): <https://vimeo.com/55129181>
8. Food is Belonging (Short film by Dylan Clark): <https://vimeo.com/148531299>
9. Video of Rosa Silvera's IHACC/SIACC presentation at UNFCCC COP20: <https://www.youtube.com/watch?v=okd9pGD0Bq4>

3.10 Media coverage. Articles in local or international media:

1. *Adjacent Government*: [Profile: The gender dimensions of climate change and mental health](#), By Cunsolo, A., and Bunce, A. February 2016.
2. *La Republica*: [James Ford: "Los humanos somos más adaptables de lo que creemos"](#), *La Republica*, October 22nd 2015.
3. *Correo*: [Mya Sherman: "Producimos información no solo para los libros"](#), *Correo*, October 21st 201.
4. *Diario Uno*: ["Salud de las comunidades shipibas en peligro por cambio climático"](#), October 21st 2015.
5. *SciDevNet*: [Spotlight: Joint Action on Climate Change, Getting local voices to global talks on climate change](#), IHACC project and M. Maillet featured in SciDevNet, October 14th 2015.
6. *UPCH*: [Diagnostico Climatico 2015: Lecciones aprendidas y prospectivas de trabajo en comunidades indigenas y campesinas](#). IHACC Peru KT event planed for October 15-16 featured in UPCH website news, September 29th 2015.
7. *Ministerio del Ambiente de Peru*: [Conversatorio sobre Lecciones aprendidas y prospectivas de trabajo en comunidades indigenas y campesinas](#). IHACC/SIACC team featured on Peruvian Minister of Environment website. September 15th 2015.
8. *National Geographic*: [Amazonian biodiversity protects health, livelihoods](#), IHACC Peru featured in National Geographic, July 15th 2015.

9. *CBC's Northbeat* and *Nunatsiaq online*: The climate is changing, and so are Arctic berries: Researcher explores how Iqaluit women are adapting to "bad" berry seasons. Anna Bunce profiled on CBC's Northbeat and Nunatsiaq online. December 2014. <http://www.jamesford.ca/archives/3124>
10. *CBC Radio*: Interview with James Ford on CBC: Climate change effects on northern health. CBC Radio. April 30th 2014
11. *Poder Magazine*: Una batalla sin fondos. Features Dr. Alejandro Llanos and the IHACC Project. December 2014. <http://www.actualidadambiental.pe/wp-content/uploads/2015/01/Revista-PODER-Especial-COP20.pdf>
12. *Sesame magazine*: The Shawi Expedition: Restoring Ancient Wisdom. By Alejandra Bussalleu in Sesame magazine of the Scientific Exploration Society. Spring 2015.
13. *Africa Portal*: Managing Climate Change Impacts on Waterborne Disease in Uganda. By Harper, S.L. March 2012. <http://dspace.cigilibrary.org/jspui/bitstream/123456789/32685/1/Backgrounder%2025-Managing%20Climate%20Change%20Impacts%20on%20Waterborne%20Disease%20in%20Uganda.pdf?1>
14. *Africa Portal*: Social Determinants of Health for Uganda's Indigenous Batwa Population. By Harper, S.L. June 2012: 32.
15. <http://dspace.cigilibrary.org/jspui/bitstream/123456789/32876/1/Backgrounder%20No.%2032.pdf?1>
16. *Le Devoir*: Profile of James Ford's work in Le Devoir. January 4th 2014. <http://www.ledevoir.com/environnement/actualites-sur-l-environnement/396481/a-toutes-les-latitudes-chercher-a-s-adapter>
17. *The Globe and Mail*: "The unfrozen earth, circa 2067," by Ivan Semeniuk in The Globe and Mail profiles James Ford's Arctic research. April 12th 2014.
18. *Nunatsiaq News*: "Climate change hurts access to country foods in Iqaluit: study," by Jane George in Nunatsiaq News profiles James Ford's work on food security in Iqaluit. May 15th 2012. http://www.nunatsiaqonline.ca/stories/article/65674climate_change_wreaks_havoc_with_access_to_country_foods_in_iqaluit_st
19. *National Geographic News*: "Climate Change Linked to Waterborne Diseases in Inuit Communities," in National Geographic by Ker Than profiles James Ford's work and IHACC. April 2012. <http://news.nationalgeographic.com/news/2012/04/120405-climate-change-waterborne-diseases-inuit/>
20. *Onearth Magazine*: "Climate Change Health Costs Add Up to One Big Bill" by Sharon Begley in Onearth Magazine profiles James Ford's work. November 2011.
21. *The Scientist*: "Adapting to climate change," by Jef Akst in The Scientist profiles the IHACC project. September 1st 2011.
22. *Montreal Gazette*: "Our earth's a hot potato" by Peggy Curran in the Montreal Gazette profiles James Ford's work on adaptation. April 15th 2011.
23. *CBC Radio, Labrador Morning*: Interview with Dr Sherilee Harper. January 2014.
24. *CBC Radio, Iqaluit*: Interview with Dr Sherilee Harper. March 2013.
25. *CBC News Northbeat*: TV Interview with Dr Sherilee Harper. March 2013.
26. *CBC Radio, Iqaluit*: Interview with Dr Sherilee Harper May 2013.

27. *Radio Noticias, Yurimaguas, Peru*: Interview with Dr Llanos, Alejandra Bussalleu and Maria Jose Valdivia. July 2013
28. *Rigolet Community Radio Station*: Multiple Interviews with S.L. Harper. 2012-2013.
29. *CBC Radio, Iqaluit*: Interview. Interview with S.L. Harper. March 2013.
30. *CBC Radio, Iqaluit*: Interview. Interview with S.L. Harper. September 2012.
31. *CBC Radio, Iqaluit*: Interview. Interview with J. Ford and P. Barker. March 2012.
32. *CBC Radio, Iqaluit*: Interview. Interview with S.L. Harper. March 2012.
33. *Australian Broadcasting Corporation Radio National's "The Science Show"*: "Climate change Affects Inuit". Interview with S.L. Harper. February 2012. <http://www.abc.net.au/radionational/programs/scienceshow/climate-change-impacts-inuit/3851372>
34. *Vancouver Redeye – Coop Radio*: "Health Effects of Climate Change in Canada's North". Interview with S.L. Harper. March 2012. <http://www.radio4all.net/index.php/program/58670>
35. *Voice of America Radio*: "Indigenous People Vulnerable to Climate Change". February 2012. Interview with S.L. Harper. <http://www.voanews.com/english/news/africa/decapua-climate-indigenous-21feb12-139822693.html>
36. *CBC News Northbeat*: TV Interview. March 2013. Interview with S.L. Harper.
37. *CBC North*: TV Interview. September 2012. Interview with S.L. Harper.

3.11 Other:

1. Namanya, D. (2015) Access to health care in the context of malaria among Uganda Batwa indigenous people: A Geospatial Analysis. Invited Guest Speaker at Geography in Action! Brown Bag Seminar Series, McGill University, Department of Geography (February 27th 2015).
2. Berrang-Ford, L. (2014) Spatial epidemiology, global health, and environmental change. Invited presented at the London School of Hygiene and Tropical Medicine Malaria Centre. 18 December 2014.
3. Berrang-Ford, L., J.D. Ford, S. Austin, M. Araos-Egan, J. Labbé, and M. Flynn (2015) Adaptation tracking: grand challenges. *Ouranos*, Montreal, 8 Apr 2015.
4. Wolff, R. March 2015. Keynote Speaker. "Sustainability in designing a global society", University of Guelph's Engineers without Borders club networking event. March, 24 2015. Guelph, ON.
5. Harper, S.L. March 2013. Invited Guest Lecture. "Water and Aboriginal Communities: Ecosystem Approaches to Health." *Critical Investigations in Indigenous Peoples Health & the Environment (INDG 4740)*, taught by Dr. Chris Furgal. Trent University, Peterborough, ON.
6. Harper, S.L. March 2013. Invited Guest Lecture. "Waterborne Disease in Indigenous Populations." *Indigenous Peoples, Health and the Environment (ERST 3730)*, taught by Dr. Chris Furgal. Trent University, Peterborough, ON

7. Harper, S.L. March 2013. Invited Guest Lecture. "Climate Change and Health: Waterborne Disease in Indigenous Populations." *Concepts in Environmental Public Health (POPM 6540)*, taught by Dr. Scott McEwen. University of Guelph, Guelph, ON.
8. Harper, S.L. February 2013. Invited Guest Lecture. "Climate Change and Health: Waterborne Disease in Indigenous Populations." *Environmental Epidemiology for Public Health (PHS 606)*, taught by Dr. Shannon Majowicz. University of Waterloo, Waterloo, ON.
9. Harper, S.L. February 2013. Invited Guest Lecture. "Climate Change and Health: Waterborne Disease in Indigenous Populations." *Healthy People, Healthy Animals, Healthy Environment (UNIV 1200)*, taught by Dr. Cate Dewey. University of Guelph, Guelph, ON.
10. Namanya, D. Invited Guest lecturer in Dr Ford's class Geography 200: World Environmental Problems. McGill University, October 2012
11. Presentation, Brown Bag Lunch Series "Fieldwork in Photos", McGill University, Department of Geography, 14 Feb 2014: http://www.jamesford.ca/wp-content/uploads/2014/02/Joanna-et-al-poster.final_.gif

Annex 4: Additional Information

Anticipated Results (from Call for Proposal)

Teams were asked to design their research programs, including knowledge mobilization/translation strategies to address **some** of the anticipated results listed in each of the three general domains: advancing knowledge, shaping policy and informing practice, and training and networking. This list is not exhaustive and teams are **not** expected to address all results under each domain. These topics do represent potential outcomes that research programs should identify and report progress on.

| <i>Anticipated Results</i> | <i>Indicators</i> | <i>Baseline</i> | <i>Change noted during the reporting period</i> | <i>Data Sources</i> |
|--|---|--|---|---|
| 1. Advancing Knowledge | | | | |
| Pilot research and state-of-knowledge literature reviews | | | | |
| Knowledge synthesis integrating existing literature and community-based participatory perspectives to identify state of existing knowledge and priorities for research ^{1,2} | N. of review publications and extent to which content stimulates priority research. | Limited understanding of links between climate change and Indigenous health (particularly in Peru and Uganda) and research needs for adaptation. | 9 review and state of knowledge publications Results have directly informed focus of IHACC research. E.g. focus on responses to extreme events in Peru, comparative research in neighbouring non-Indigenous communities in Uganda. Profiling of results papers in numerous IPCC AR5 WGII chapters | Peer-reviewed literature Grey literature Qualitative community-based participatory research during pilot phase and early project consultations Consultation with research partners and key informants IPCC AR5 WGII |
| A. Quantitative characterization of health vulnerability to climate | | | | |
| Novel research findings to enhance understanding of how health systems are responding to climate stimuli, and consideration of interlinked scales and social-economic and demographic drivers of vulnerability. ^{2,3} <i>Projects 1-2: Burden of Illness (BOI) study</i> | Key findings from longitudinal health surveys, individual and comparative analyses. N. of publications and significance/relevance of results. | Negligible empirical data on baseline health status, risk factors, and key drivers of vulnerability in research communities. | Estimates of prevalence for key health outcomes in all three regions. Pubs (n=1) Identification of risk factors for key health outcomes in all three regions. Pubs (n=8) | IHACC longitudinal health survey data (Burden of Illness, BOI, study) |

| | | | | |
|---|--|--|---|---|
| | | | Commencement of comparative analyses across regions for each health outcome | |
| Novel research findings and development of innovative methodologies to enhance our understanding of how different health outcomes and social contexts respond to climatic variation. Results inform future interdisciplinary approaches and promote innovative methods for adaptation vulnerability research. ^{1,2,3,4} <i>Projects 3-4: Seasonality of health outcomes study</i> | Key findings from Projects 3-4 related to the magnitude of the climate 'signal' for health outcomes, and the extent to which this is driven by structural disadvantage, geographic location, health outcome, policies or programs, and demographics at different scales. | No research (to our knowledge) has developed a conceptual and methodological model for empirically applying the vulnerability approach. | Development of a conceptual and methodological approach to integrate data from all three regions and empirically estimate the extent to which sensitivities affect vulnerability to climatic exposures. | IHACC longitudinal health survey data (Burden of Illness, BOI, study) Regional and local meteorological records |
| B. Qualitative characterization of health systems & vulnerability | | | | |
| Integration of different types of knowledge to generate novel research findings using mixed-methods to improve our understanding of how social systems adapt to climate change. ^{2,3,5} Collaborative approaches to identifying strategies for adaptation. ^{4,5} <i>Projects 4-5: Health systems analysis, and qualitative characterization of vulnerability</i> | Key findings from qualitative studies, identifying current characteristics of vulnerability, and identifying opportunities for increasing adaptive capacity. | Negligible research (particularly in Peru and Uganda) regarding pathways of climate change vulnerability within health systems. | Case-studies and qualitative research findings published, in progress, or planned. 8 students engaged in qualitative field research using a vulnerability framework and employing a community-based participatory research approach. | Qualitative data collected by various students and staff during field work, and ongoing community engagement: - Key informant interviews - PhotoVoice - Semi-structured interviews - Workshops - Community events Peer-reviewed and grey literature |
| C. Estimating future vulnerability | | | | |
| Novel research findings, employing innovative collaborative methodologies, to synthesize knowledge from communities, health surveys, and climate projection data to project future changes in key climatic variables driving health vulnerability. ^{2,4,5} | N. and utility of climate projection models based on community-identified drivers of health vulnerability. Integration of climate projections into policies and/or programs for health in partner nations, regions, or communities. | Negligible information on climate projections downscaled for partner communities/regions. Negligible integration of community-identified drivers and perspectives in climate models in general, and none for our partner regions in particular. | Development of key collaborations (Dr. Mark New) and a research framework for community-informed and health-specific projections down-scaled for Uganda and Peru. Preliminary synthesis of diverse data to develop temporal health rankings to inform climate projection models (Peru & Uganda). | IHACC longitudinal health survey data (Burden of Illness, BOI, study) Qualitative data from fieldwork from Projects 4-5 Existing grey literature documenting historic health and environmental trends Regional and local meteorological records |

| | | | | |
|---|--|--|---|--|
| | | Limited research on projections specific to health impacts in regions. | Student identified to conduct projection research (Dr. New's lab, U. Cape Town) | |
| D. Evaluating adaptation success | | | | |
| Novel research findings using innovative and collaborative approaches, and integrating different types of knowledge to improve our understanding of strategies for monitoring and evaluating adaptation. ^{2,4,5} Knowledge synthesis to inform future research directions and interdisciplinary approaches for adaptation monitoring & evaluation. ¹ | General conceptual development of strategies, challenges, and opportunities for monitoring & evaluating adaptation in practice. Case-studies of adapting monitoring & evaluating, both of pilot interventions and opportunities for mainstreaming adaptation into existing policies & programs. Adaptation visioning and development of policy briefs and adaptation plans/priorities. | Monitoring & evaluating what constitutes 'successful adaptation' in practice is a grand challenge within adaptation literature and knowledge. Conceptual developments are herein needed to inform future research and practice. Few comparative case-studies have applied and tested consistent M&E approaches in developing regions. | Hiring of a full-time staff member (starting 04/14) over 2 years to develop conceptual and methodological approaches for adaptation M&E across all three partner regions: Mya Sherman and EIVAR project (full report in attachment) Implementation of preliminary adaptation pilot interventions in all regions. | IHACC longitudinal health survey data (Burden of Illness, BOI, study) Qualitative data from fieldwork from Projects 4-5 New qualitative and participatory data to be collected in Years 4-5. Community engagement workshops |
| ¹ Knowledge synthesis to inform future research directions and new interdisciplinary approaches . ² Novel research findings utilizing both qualitative, quantitative and mixed methods, as appropriate. ³ Enhanced understanding of how social and natural systems are adapting to climate change considering interlinked scales and drivers of adaptation, including physical constraints, social and political processes and sources of structural disadvantage. ⁴ Development of advanced technologies, innovative tools, and collaborative approaches that complement autonomous and planned adaptations to climate change. ⁵ Integration of different types of knowledge that improves the understanding of changing social and natural systems as well as strategies for adaptation. | | | | |
| 2. Shaping Policy and Informing Practice | | | | |
| Development of new conceptual and methodological tools for understanding how adaptation can be defined, measured, and monitored ^{3,4} | N. publications, policy briefs, presentations advancing policy-development strategies for adaptation. | Absence of guidelines or tools on adaptation assessment and prioritization in Indigenous contexts in general and regions in particular | Position paper by Arctic team in <i>Am. Jrn. Public Health</i> Full-time staff member hired. | n/a |
| Evaluation of existing health and development policies/ programs/ practice (PPP) at multiple scales (including sub-national) for each region to identify enabling or maladaptive PPP ^{1,2} | N. and nature of changes in existing PPP in response to IHACC evaluations or knowledge generation. Reference to IHACC research by decision makers / high level adaptation bodies Requests for IHACC researchers to brief decision | Existing health and development policy and programming in regions. Absence of climate change lens in PPP across the regions Limited focus on Indigenous peoples in UNFCCC, national | Majority of participants in Arctic results sharing workshops noted they were 'likely' or 'very likely' to implement some results IHACC profiled in UNFCCC technical paper as best practice example of how to work with Indigenous communities in adaptation research | |

| | | | | |
|---|---|--|--|---|
| | makers / high level adaptation bodies | adaptation plans (e.g. NAPAs, NAPs) and reporting (e.g. NCs) | Briefing of the NWP and Adaptation Committee to UNFCCC on role of traditional knowledge in adaptation | |
| Development and validation of adaptation interventions that respect traditional Indigenous knowledge. ⁶ | N. and type of initiatives implemented and evaluated. Support for initiatives at various levels of decision making (e.g. co-funding of initiatives, profiling by decision makers) | Absence of adaptations in regions Limited knowledge base on how and what adaptations can reduce vulnerability | 2 adaptation initiatives implemented in Uganda, several planned and in discussion. 2 adaptation projects implemented in Peru. 3 adaptation projects implemented or planned in the Arctic. | n/a |
| Development of communication tools and strategies to enhance public understanding of climate change and health adaptation challenges and opportunities among remote Indigenous peoples globally. ^{5,6} | N. and type of communication outputs and projects generated. Volume of traffic and interest in outputs New networks, initiatives, student or partner interest, or otherwise generated adaptation activity and knowledge arising from communication outputs. | Limited focus in public sphere on Indigenous adaptation, especially for Uganda and Peru | Significant use of audio-visual tools in research, partner engagement and results dissemination, including: <ul style="list-style-type: none"> - Two IHACC videos (5 min, 27 min) available on-line (including in Spanish). - IHACC website (>1300 visits/yr), - Team member websites (e.g. jamesford.ca >8000 visits/yr) with regular 'notes from the field' blog - Development of a Photobook integrating results of pilot research in <i>all</i> regions, and disseminated to communities and partners. - Rigolet Storytelling project - Multi-day 'open house' results sharing events held in the Arctic (inc. feasts, interactive results sharing games): 85% of surveyed attendees 'really liked' the event in Rigolet, 2014, and 88% learned 'something new;' a similar response in Iqaluit. - Publications in media (e.g. National Geographic, Le Devoir) - Radio and TV interviews | User viewing traffic for website & videos (google analytics, twitter) www.ihacc.ca http://vimeo.com/54772398 http://www.youtube.com/watch?v=2CxJdw4zbnw Rigolet storytelling project |
| ¹ Adaptation policies addressing socio-ecological vulnerabilities are developed, assessed and validated | | | | |

² Strengthened policy-development processes related to adaptation options with a focus on local/sub-national scales

³ Development, enhancement or use of decision-making tools such as risk assessment and acceptance studies, modeling, and cost benefit analysis

⁴ Greater inter-jurisdictional awareness and exchange of practices or tools for adapting to climate change

⁵ Development of communication strategies to enhance public understanding of climate change adaptation strategies and their potential impacts

⁶ Effective approaches and interventions that respect traditional knowledge are developed

3. Training and Networking

| | | | | |
|--|---|-----|--|---------|
| Training of students and young/new scholars in a multi-disciplinary setting ^{1,2} | <p>N. of students (undergraduate, graduate, post-doctoral) trained and mentored within the IHACC project using a multi-disciplinary approach (gender & regional diversity considered)</p> <p>N. of research staff or assistants trained and mentored within the IHACC project using a multi-disciplinary approach (gender & regional diversity considered).</p> <p>N. continuing in positions and activities related to adaptation following IHACC.</p> | n/a | <p>13 undergraduates trained or in progress</p> <p>28 graduates trained or in progress</p> <p>1 post-docs trained or in progress</p> <p>6 full-time staff trained or in progress</p> <p>4 part-time or affiliate staff trained or in progress</p> <p>High ratio females:males among trainees and 4:5 among PMC</p> <p>9 continuing in adaptation-related positions or activities</p> | See Q22 |
| Training of Adaptation Leaders (AL) ^{4,6,7} | <p>N. of adaptation leaders trained and mentored within partner <i>communities</i> on health and climate adaptation (gender and age diversity considered).</p> <p>N. of adaptation leaders trained and mentored within partner <i>countries/regions</i> on health and climate adaptation (gender and age diversity considered)</p> <p>N. continuing in positions and activities related to adaptation.</p> <p>Engagement in networking or initiatives on adaptation arising from AL initiative.</p> | n/a | Intensive workshop(s) on adaptation to climate change for policy-makers at national and regional levels. | n/a |

| | | | | |
|--|--|-----|--|-----|
| Cross-fertilization of expertise and comparative analysis between regions ^{3,5} | <p>N. of inter-region exchanges and collaborations.</p> <p>New projects, initiatives, or collaborations arising from inter-region exchanges.</p> | n/a | <p>Numerous events and exchanges between regions, including participation of PIs in research and analysis in other regions, student co-mentorship. E.g. Guest lectures: e.g. Dr Ford in Peru, Mr Namanya at McGill.</p> <p>Climate change and human health course given at UPCH by Dr Ford</p> | n/a |
| Training and enhanced engagement of non-academic partners and networks ^{4,6,8} | N. of events (workshops, training) involving training or mentorship of non-academic partners. | n/a | <p>Two multi-day results sharing open house events in the Arctic</p> <p>Two day-long results discussion workshops with decision makers in Arctic</p> <p>How to work with communities session given by Inuit filmmaker collaborators Konek Productions at McGill</p> <p>Numerous, ongoing, and mainstreaming engagement of partners and key national/regional networks.</p> | n/a |
| <p>¹ Mobilization and engagement of young and established researchers</p> <p>² Graduate students and new scholars trained in a multi-disciplinary setting</p> <p>³ Complementary linkages made with related initiatives across sectors and disciplines</p> <p>⁴ Partnership and collaboration with non-academic partners (e.g., private sector, non-profit organizations, community-based organizations)</p> <p>⁵ Enhanced collaboration between researchers from Canada and eligible countries</p> <p>⁶ Established or strengthened local, regional, national and/or international climate change adaptation networks that cross academic and non-academic boundaries</p> <p>⁷ Engagement of community-based and indigenous researchers in climate change adaptation research</p> <p>⁸ Demonstrated and strengthened commitment of multi-stakeholder groups to achieving adaptation to climate change</p> | | | | |