Food Security, Ice, Climate and Community Health: Climate change impacts on traditional food security in Canadian Inuit communities

Summary

Project Leaders

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Traditional/country foods are critical resources for physical, as well as mental, social and economic health of individuals and communities across the Arctic. Despite this, shifts in traditional/ country food consumption have been taking place over the past 15 - 20 years related to a variety of changes in northern ecological, social, political and economic systems. Those related to ecological shifts have been in part previously associated with reduced confidence in food safety due to identified threats from environmental contaminants such as mercury and PCBs, and more recently the changes in species availability and accessibility due to shifting climatic conditions. Specifically, climate related changes and variability in the North have been associated with changes in animal, fish and plant population health and distribution, while changes in ice, snow, precipitation regimes, and other environmental factors have the potential to influence human travel and transportation in the North, and thus Inuit access to these wildlife resources. As such, climate change and variability has the potential to influence nutrition and health status among Inuit via impacts on aspects (availability, accessibility and quality) of traditional/country food security. Earlier phases of this project identified both positive and negative changes in the traditional/ country food harvest of Inuit communities in relation to changes and variability in climatic conditions. It was documented that environmental changes are already having impacts on both the availability of wildlife species and hunters' access to them in all regions studied. In some regions, Inuit have reported some influence of climate and environmental change on wildlife access and availability in comparison with the same hunting season in previous years. However, the impacts are not homogenous among all hunters and communities and both individuals and households show differential ability to adapt successfully. Factors such as access to economic resources and equipment, experience, and the nature of the adaptive strategy used appear to influence the success of hunter adaptations. Yet, our current commonly used assessment tools looking at household food insecurity in Inuit regions do not represent this complexity well. As a result, we have decreasing confidence in the accuracy of results from these tools in capturing the full nature of the reality of Inuit food issues. This project has studied these issues through a variety of sub projects at the national, regional and community level including: a more holistic characterization of the Inuit food system through mixed quantitative-qualitative modeling approaches; methods to link and reconcile the contradictions between wildlife management and household food access; the review and development of new rapid assessment tools; the support of community-led food assessment processes and the development, implementation and evaluation of community-led interventions; the characterization of household food 'needs' and the impact of access to community food support mechanisms, such as community freezers, in addressing these needs.

People

Network Investigators

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Collaborators & Research Associates

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Partners

Aboriginal Affairs and Northern Development Canada
Aboriginal Affairs and Northern Development Canada - International Polar Year
Aboriginal Affairs and Northern Development Canada - Northern Contaminants Program
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Public Health Agency of Canada
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Publications

Articles Published in Refereed Publications

Dietz, R., Sonne, C., Basu, N., Braune, B., O'Hara,T., Letcher, R.J., Scheuhammer, T., Andersen, M., Andreasen, C., Andriashek, D., Asmund, G., Aubail, A., Baagøe, H., Born, E.W., Chan, H.M. et al., 2012, What are the toxicological effects of mercury in Arctic biota?, Sci Total Environ, v.7, no44C, 775-790, Published

Douglas, V., Chan, H.M., 2011, Inuvialuit Food and Cultural Security in Comparative Historical Context., Polar Record, , Submitted

Douglas, V., Chan, H.M., 2011, Inuvialuit Food and Cultural Security in Comparative Historical Context., Polar Record, , Accepted

Durkalec, A., Furgal, C., Skinner, M., Sheldon, T., 2014, Investigating environmental determinants of injury and trauma in the Canadian North, International Journal of Environmental Research and Public Health, 1536-1548, Published

Fillion, M., Blais, J.M., Yumvihoze, E., Workman, P., Nakajima, M., Osborne, G. and Chan, H.M., 2014, Identification of environmental sources of lead exposure in Nunavut (Canada) using stable isotopes analyses, Science of the Total Environment, , Submitted

Fillion, M., Laird, B., Douglas, V., Van Pelt, L., Archie, D., Chan, HM, 2014, Development of a strategic plan for food security and safety in the Inuvialuit Settlement Region, Canada, International Journal of Circumpolar Health, 73:25091, Published

Ford, J.D., Berrang-Ford, L., King, M., and C. Furgal., 2011, Vulnerability of Aboriginal health systems in Canada to climate change., Global Environmental Change, doi:10.1016/j.gloenvcha.2010.05.003, Published

Ford, JD, Cunsolo Willox, A, Chatwood, S, Furgal, C, Harper, S, Mauro, I, and T Pearce., 2013, Adapting to the effects of climate change on Inuit health, American Journal of Public Health, 26, Accepted

Friendship, K and Furgal, C., 2012, The Role of Indigenous Knowledge in Environmental Health Risk Management in Yukon, Canada, International Journal of Circumpolar Health, vol: 71, : http://dx.doi.org/10.3402/ijch.v71i0.19003., 1-13, Published

Furgal, C., and Rajdev, V., 2011, Review of existing methods and tools for the assessment of food (in)security in the Canadian North, Canadian Medical Association Journal, , Submitted

Furgal, C., and Rajdev, V., 2012, Review of existing methods and tools for the assessment of food (in)security in the Canadian North, International Journal of Circumpolar Health, , Submitted

Furgal., C, Rajdev, V., 2011, A systematic review of the circumpolar food security literature: focus and trends uncovered., Journal of Food Ecology and Nutrition, , Submitted

Furgal., C, Rajdev, V., 2012, A systematic review of the circumpolar food security literature: focus and trends uncovered., Journal of Food Ecology and Nutrition, , Submitted

Gauthier, Y., Tremblay, M., Bernier, M., Furgal., C., 2011, Adaptation of a radar based river ice mapping technology to the Nunavik context., Canadian Journal of Remote Sensing, 36(S1):S168-S185, Published

Juillet, C and C. Furgal, 2015, Food Insecurity in Inuit Communities: Supporting decision making through Bayesian Modeling., International Journal of Circumpolar Health, , Submitted

Juillet, C. and C. Furgal, 2015, Arctic Food Security and Human Development : New Perspectives for Stakeholders, Policy Makers and Scientists, Frontiers in Ecology and the Environment, , Submitted

King, U and Furgal, C., 2014, Is Hunting Still Healthy? Understanding the Interrelationships between Indigenous Participation in Land-Based Practices and Human-Environmental Health, , International Journal of Environmental Research and Public Health, 5751-5782, Published

King, U., Furgal, C., 2014, Is hunting still healthy? Understanding the interrelationships between Indigenous participation in land-based practices and human-environmental health, International Journal of Environmental Research and Public Health, 25, Submitted

Krey, A., Kwan, M., Chan, H.M., 2012, Mercury speciation in brain tissue of polar bears (Ursus maritimus) from the Canadian Arctic, Environ Research, v.114, 24-30, Published

Laird, B.D., Goncharov, A.B., Egeland, G.M., Chan, H.M., 2013, Dietary advice on Inuit Traditional Food Use needs to Balance Benefits and Risks of Mercury, Selenium, and (n-3) Fatty Acids, Journal of Nutrition, Accepted, Accepted

Organ, J., Castleden, H., Furgal, C., Sheldon, T., 2014, Socio-ecological change and implications for wild food accessibility for residents of Nain, Nunatsiavut, Health and Place, 24, Submitted

Organ, J., Castleden, H., Furgal, C., Sheldon, T. and C. Hart, 2014, Contemporary programs in support of traditional ways: Inuit perspectives on community freezers as a mechanism to alleviate pressures on wild food access in Nain, Nunatsiavut, Health and Place, 5751-5782, Published

Organ, J., Furgal, C., Castleden, H., Sheldon, T., 2013, Contemporary programs in support of traditional ways: Inuit perspectives on community freezers as a mechanism to alleviate pressures on food security in Nunatisavut, Arctic, 35, Submitted

Owens, S, DeWals, P, Egeland, G, Furgal, C, Mao, Y, Minuk, GY, Peters, PA, Simard, M and Dewailly, E., 2012, Public health in the Canadian Arctic: contributions from International Polar Year research, Climatic Change, DOI 10.1007/s10584-012-0569-3., 1-23, Published

Pardhan, Al., Wilson, J., Edge, V., Furgal, C., Reid-Smith, R., Santos, M., McEwen, S., 2013, Community-level risk factors for notifiable gastrointestinal illness in the Northwest Territories, Canada, 1991-2008, BMC Public Health, 1471-2458, Published

Pardhan-Ali A., Furgal C, Wilson J, Edge VL, Reid-Smith R., Santos M, McEwen, SA., 2013, Evaluation of the Northwest Territories Communicable Disease Registry through Notifiable Gastrointestinal Illness Notifications: An Exploratory Case Study of a Northern Public Health Surveillance System, 1991-2008., International Journal of Circumpolar Health, 23, Submitted

Parlee, B and Furgal, C., 2012, Well-being and environmental change in the Arctic: a synthesis of selected research from Canada's International Polar Year program, Climatic Change. DOI 10.1007/s10584-012-0588-0, 1-22, Published

Schmaltz, L. E., Juillet, C., Tinbergen, J. M., Verkuil, Y., Hooijmeier, J. C. E. W. and T. Piersma, 2015, Apparent annual survival of staging ruffs during a period of population decline: insights from sex and site-use related differences *modeling approach used and enhanced through food security project*, Population Ecology, 1, Submitted

Verkuil, Y., Juillet, C., Lank, D. B., Widemo, F., and T. Piersma, 2014, Genetic variation in nuclear and mitochondrial markers supports a large sex difference in lifetime reproductive skew in a lekking species *statistical approach replicated in this food security study*, Ecology and Evolution, 3626-3632, Published

Other Refereed Contributions

Fillion, M., Blais, J.M. and Chan, H.M., 2013, Identification of environmental sources of lead exposure in northern Canada, 29th Annual International Conference on Soils, Sediments, Water, & Energy, October 19-24, Amherst-MA, USA, NA, Published

Fillion, M., Blais, J.M., Yumvihoze, E., Nakajima, M., Workman, P., Osborne, G. and Chan, H.M., 2013, Identification of environmental sources of lead exposure in Nunavut, Canada., ArcticNet Annual Scientific Meeting, December 9-13, Halifax, Canada, NA, Published

Fillion, M., Blais, J.M., Yumvihoze, E., Nakajima, M., Workman, P., Osborne, G. and Chan, H.M., 2014, Identification of environmental sources of lead exposure in Nunavut, Canada, Arctic Frontiers, January 19-24 2014, Tromso, Norway, NA, Published

Fillion, M., Egeland, G., Young, K., Chan, L., 2012, Food insecurity is compounded by increased mercury and lead exposure among Inuit in the Canadian Arctic, EcoHealth Conference, Kunming, China, Talk, Published

Fillion, M., Laird, B., Douglas, V., Van Pelt, L., Young, K. and Chan, L., 2013, Adaptation planning in the Arctic: Experiences from a workshop on food security and food safety, Canadian Public Health Association 2013 Annual Conference, June 9-12, Ottawa, Canada, NA, Published

Juillet, C., 2013, Inference in Population Dynamics of Arctic Migrants., Department of Biology, Eastern Washington University, Cheney, WA, USA (Invited Talk), 1, Published

Juillet, C. and Furgal, C., 2013, Sécurité alimentaire dans l'Arctique canadien : une perspective intégrée., Colloque du Chantier Arctique Français : "Arctique, les grands enjeux scientifiques". C.N.R.S. / Collège de France, Paris, France (Oral Presentation), 1, Published

Juillet, C. and Furgal, C., 2013, Social, Cultural, Economic and Ecological Determinants of Food Security in Northern Communities, ArcticNet Annual Scientific Meeting, Halifax, NS, Canada (Oral Presentation), 1, Published

Kenny, T.-A. and Chan, H.M., 2014, Computational Model of Inuit Food System in Canada, Arctic Frontiers, 19-24 January, Tromso, Norway, NA, Published

Kenny, T.-A., Egeland, G. and Chan, H.M., 2013, Estimation of Harvest Need of Wildlife for Consumption among Inuit Regions In The Canadian Arctic, ArcticNet Annual Scientific Meeting, 9-13 December, Halifax, Canada, NA, Published

Philibert, A., 2014, Nuts & bolts of EcoHealth research: sharing data integration strategies for EcoHealth studies – Part 1, Special session at the EcoHealth 2014, Montréal, August 11-15, , Submitted

Philibert, A., 2014, Nuts & bolts of EcoHealth research: sharing data integration strategies for EcoHealth studies – Part 2, Special session at the EcoHealth 2014, Montréal, August 11-15, , Submitted

Non-Refereed Contributions

Boulet, V., Chouinard, B. (Furgal, C and Dewailly, E Producers), 2013, Utsuk/Urqsuk A story of fat, Documentary film production, 1, Published

Chan, H.M., 2012, Global environmental changes and food security in the Arctic, EcoHealth Conference, Kunming, China, Keynote speech, Published

Davis, K. and C. Juillet, 2014, Impact of Military Operations on Arctic / Northern Communities, International Congress of Arctic Social Sciences (ICASS) VIII, 1, Published

Ellsworth, L., Bennett, L. and, T.-A., 2014, Addressing Food (In)security in the Arctic, Arctic Change 2014 International Conference, December 8-12, Ottawa, Canada, 1, Published

Fillion, M., Egeland, G., Young, K., Chan, L., 2012, Food insecurity is compounded by increased mercury and lead exposure among Inuit in the Canadian Arctic, ArcticNet Annual Scientific Meeting, Vancouver, Canada, Talk, Published

Fillion, M., Kenny, T-A., Wesche, S., O'Hara, S. and Chan, L. H. M., 2014, Documenting food security interventions in the Inuvialuit Settlement Region: Participatory evaluation of community freezer initiatives, Arctic Change 2014 International Conference, 1, Published

Fillion, M., Laird, B., Douglas, V., Van Pelt, L., Young, K., Chan, L., 2012, Adaptation planning in the Inuvialuit Settlement Region: Summary and recommendations from a workshop on food security and food safety, ArcticNet Annual Scientific Meeting, Vancouver, Canada, Talk, Published

Finner, K, I. Shiwak, J. Ford, C. Flowers, C. Furgal and the Rigolet Inuit Community Government., 2014, Context matters: Developing an approach for food systems research in Rigolet, Nunatsiavut,, Arctic Change 2014 International Conference, 1, Published

Ford, J., J. Petrasek MacDonald, S. Chatwood, A. Cunsolo Willox, V. Edge, K. Farahbakhsh, C. Furgal, S. Harper, I. Mauro, T. Pearce, E. Stephenson, 2014, Inuit Traditional Knowledge for adapting to the health effects of climate change, Arctic Change 2014 International Conference, 1, Published

Ford, J., T. Pearce , F. Duerden , C. Furgal , B. Smit., 2012, Climate Change Policy Responses for Canada's Inuit Populations: The Importance of and Opportunities for Adaptation, International Polar Year Conference, From Knowledge to Action, Montreal, April 2012, Talk, Published

Furgal, C., Chan, L., Tremblay, M., Rajdev, V., Barrett, M., Sheldon, T., 2012, Impacts of climate change on food security in Nunavik and Nunatsiavut, ArcticNet Integrated Regional Impact Study : IRIS Region 4, , Accepted

Furgal, C., Chan, L., Tremblay, M., Rajdev, V., Barrett, M., Sheldon, T., 2012, Impacts of climate change on food security in Nunavik and Nunatsiavut, Chapter 5 In, (Allard and Lemay Eds), ArcticNet Integrated Regional Impact Study : IRIS Region 4, 157-166, Published

Furgal, C., Douglas, V., Fleming, L., 2012, Factors Influencing Adaptation to Climate Change in Nunavik and Nunatsiavut, ArcticNet Integrated Regional Impact Study: IRIS Region 4, , Submitted

Goldhar, Christina, T. Sheldon, T. Bell, C. Furgal, I. Allice, J. Knight, D. Kouril and R. Riedlsperger., 2012, SAKKIJÂNGINNATUK NUNALIK PHASE I: UNDERSTANDING OPPORTUNITIES AND CHALLENGES FOR SUSTAINABLE COMMUNITIES IN NUNATSIAVUT – LEARNING FROM THE COAST, ArcticNet Annual Scientific Meeting, December 2012, Vancouver BC, Poster, Published

Juillet, C and C. Furgal, 2014, Determinants of Food Security in Northern Communities: Qanuippitaa? How Are we?, Presentation to Nunavik Nutrition and Health Committee, June 5, 2014, Kuujjuaq, Nunavik., 1, Published

Juillet, C., 2015, The Arctic : An Integrated Perspective, In, Arctic Security Whole of Government, , Submitted

Juillet, C. and C. Furgal, 2014, The Arctic : An Integrated Perspective, Arctic Security Whole of Government Workshop. Royal Military College, Kingston, ON, Canada. Invited presentation., 1, Published

Juillet, C., and Furgal, C., 2014, Food insecurity in Inuit communities: Supporting decision making through Bayesian modeling, Arctic Change 2014 International Conference, 1, Published

Juillet, C., Rajdev, V. and Furgal, C., 2012, Arctic food security and climate changes: towards a quantitative integrated approach to enhance decision-making capacity., ArcticNet Annual Scientific Meeting, Vancouver, BC, Talk, Published

Kenny, T-A., Chan, LHM, 2014, Modeling the Inuit Food System in Canada, National Gathering of Graduate Students. CIHR Institute of Aboriginal People's Health. Burnaby, BC., 1, Published

Kenny, T-A., Chan, LHM., 2015, Computational Model of the Inuit Food System in Canada, Arctic Frontiers: Humans in the Arctic. Tromsø, Norway., 1, Published

Kenny, T-A., Fillion, M., Wesche, S. Chan, L. H. M., 2014, Inuit food system and environmental change: Results from a multisectoral community workshop in the Inuvialuit Settlement Region, 19th Inuit Studies Conference, 1, Published

Kenny, T-A., Wesche, S., Fillion, M., MacLean, J., O'Hara, S. and Chan, L. H. M., 2014, Participatory food costing as a strategy to understand the Inuit food system and the changing Inuit diet, Arctic Change 2-14 International Conference, 1, Published

Laing, R., Furgal, C and Sheldon, T., 2012, Characterization, Impact and Adaptation Assessment of an Anomalous Winter in Nain, Nunatsiavut, Canada, International Polar Year Conference, From Knowledge to Action, Montreal, April 2012, Talk, Published

Laing, R., Furgal, C., Sheldon, T., Gagnon, M., and Barrett, M., 2012, Community-based Sea Ice Monitoring and Surveillance in Nunavik and Nunatsiavut, Canada, International Polar Year Conference, From Knowledge to Action, Montreal, April 2012, Poster, Published

Lemire, M., Fillion, M. and Harper, S., 2014, Working together towards improving Indigenous health and well-being: an interactive story-sharing session with those that we have a lot to learn from, EcoHealth 2014 Conference – Connections for Health, Ecosystems and Society / The Fifth biennial conference of the International Association for Ecology and Health, August 11-15 2014, Montréal, Canada., 1, Published

McTavish, K., C. Furgal, S. Popp, V. Rajdev, K. Jameson., 2012, Learning Guides as Knowledge Translation Tools for Food Security in Inuit Communities, International Polar Year Conference, From Knowledge to Action, Montreal, April 2012, Poster, Published

McTavish, Kristeen, C. Furgal, S. Popp,, V. Rajdev and K. Jameson, 2012, LEARNING GUIDES AS KNOWLEDGE TRANSLATION TOOLS FOR FOOD SECURITY IN INUIT COMMUNITIES, ArcticNet Annual Scientific Meeting, December 2012, Vancouver BC, Poster, Published

Meakin, S., Kurvits, T., Fillion, M., 2014, The State of Food (In)security in the Arctic, Arctic Change 2014 International COnference, December 8-12, Ottawa, Canada., 1, Published

Murray, M.S., Eicken, H., Bock N., Epstein H., Evengård B., Gearheard S., Gerlach S.C., Graben S.,Grimwood B., Juillet C., Karcher M., Labonte D., McLennan D., Pletnikoff K., Schlosser P., Scott Neil, Sommerkorn M., Starkweather S, Vardy M., Vitale V., Wagner J. and J. Wandel., 2012, Science for society in the Arctic and beyond., Planet Under pressure 2012: New Knowledge Towards Solutions. London, United Kingdom., Poster, Published

Murray, M.S., Eicken, H., Starkweather, S., Gerlach, S.C., Evengård, B., Gearheard, S., Schlosser, P., Karcher, M., P., McLennan, D., Epstein, H., Bock, N., Juillet, C., Graben, S., Grimwood, B., Labonté, D., Pletnikof, K., Scott, N., Sommerkorn, M., Vardy, M., Vitale,V., Wagner, and I. Wandel., 2012, Responding to Arctic Environmental Change: Translating Our Growing Understanding into a Research Agenda for Action., International Study of Arctic Change, Stockholm/Fairbanks, 36, Published

Organ J, Furgal, C, Castleden, H, Sheldon, T., 2012, Future considerations for community freezer management: Perspectives from residents of Nain, Nunatsiavut, International Polar Year Conference, From Knowledge to Action, Montreal, April 2012, Poster, Published

Rajdev, V., Furgal, C., Ford, J. and Lardeau, M-P. in cooperation with the Nunavik Nutrition and Health Committee., 2012, Identification of Knowledge and Program Gaps to Support Food Security in Nunavik., International Polar year Conference, From Knowledge to Action, Montreal, Qc April 2012, Poster, Published

Willson, E., Furgal., C., Skinner, M., NiKigijavut Hopedalimi Committee and the NiKigijavut Nunatsiavutinni project team, 2014, Addressing the “need” for sustainable food security initiatives: Exploring Inuit perspectives of food needs in Hopedale, Nunatsiavut, Arctic Change 2014 International Conference, 1, Published

Specialized Publications

Dewailly, E and Furgal, C., 2012, Knowledge translation in Arctic health research, Editorial, International Journal of Circumpolar Health 71: 19265, http://dx.doi.org/10.3402/ijch.v71i0.19265, 1-3, Published