

4.2 Reducing Human Vulnerability to Environmental Changes in the Canadian Arctic

Summary

Project Leader(s)

Smit, Barry

Project 4.2 builds on work in the climate hazards literature which conceptualizes vulnerability as a function of the exposure of a community to risks and the adaptive capacity of the community to deal with the exposure ($V_{sij} = f(E_{sit}, A_{sit})$). This approach begins with an identification of the conditions the community identifies as risks and the community's abilities to prepare for, avoid, moderate and recover from the effects of exposure to changing conditions. This adaptive capacity is identified through systematic iterative participatory methods involving community members. Traditionally, indigenous peoples in the Arctic have been highly adaptive in the face of stresses, including environmental changes. However, there is evidence that the nature and speed of some changes, beyond the control of Arctic people, may already be approaching or exceeding adaptive capacity thresholds. In its first phase, this project assesses vulnerability of coastal Inuit communities through empirical documentation and analysis of communities' experiences with environmental (including climatic) exposures and risks, and identifies adaptive options and resource management strategies to deal with these risks. Inuit representatives are active partners, through facilitation, field research design, key informant selection, translation and interpretation. This phase incorporates TEK/IQ with other data sources from ethnographic methodologies and government and scientific records. In the second phase, changes in environmental conditions (including climate) will be estimated (future exposure) from climate science and scenarios (4.3 and 4.1), as the basis for characterizing the nature of risks estimated to be faced by communities in the future. Further community fieldwork will be undertaken to determine the degree to which the adaptive capacity of the communities can accommodate these risks and what changes in policy or management might facilitate improved future adaptive capacity, and consequently decrease future vulnerability.

People

Network Investigators

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Partners

IPY Federal Program Office
University of Guelph - Department of Geography
Government of Canada Program for International Polar Year
Indian and Northern Affairs Canada - Environment and Renewable Resources Directorate
Climate Change Impacts and Adaptation Program
Aurora Research Institute
Meteorological Service of Canada - Climate Research Branch
Canadian Climate Change Impact and Adaptation Research Network - North
A.D. Latonnell Endowment Fund
Inuit Tapiriit Kanatami
Northern Research Forum
Hamlet of Arctic Bay
Indian and Northern Affairs Canada - Northern Scientific Training Program
Qikiqtani Inuit Association
Hamlet of Igloolik
Nunavut Research Institute

Publications

Articles Published in Refereed Publications

Ford, J.D. and Smit, B., 2005, A framework for assessing the vulnerability of communities in the Canadian Arctic to risks associated with climate change, *Arctic*, 57(4), 389-400, Published

Ford, J., Smit, B. and Wandel, J., 2006, Vulnerability to climate change in the Arctic: a case study from Arctic Bay, Canada, *Global Environmental Change*, v.16, no.2, 145-160, Published

Smit, B., and Wandel, J., 2006, Adaptation, Adaptive Capacity and Vulnerability, *Global Environmental Change*, v.16, no.3, 282-292, Published

Ford, J., MacDonald, J. Smit, B. and Wandel, J., 2006, Vulnerability to climate change in Igloolik, Nunavut: What we can learn from the past and present, *Polar Record*, v42, no.22, 127-138, Published

Laidler, G., 2006, Inuit and scientific perspectives on the relationship between sea ice and climate: the ideal complement?, *Climatic Change*, v. 78, 407-444, Published

Ford, J., 2006, Changing exposure to environmental hazards in Nunavut, *Northern Review*, 1, Submitted

Laidler, G., and Elee, P., 2006, Sea ice processes and change: exposure and risk in Cape Dorset, Nunavut, *People and Environmental Change: The Next Step*, 1, Submitted

Duerden, F. and Beasley, E., 2006, Assessing community vulnerabilities to environmental change in the Inuvialuit Settlement Region, NWT, People and Environmental Change: The Next Step, 1, Accepted

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Ford, J., Smit, B., Wandel, J., Allurut, M., Shappa, K., Ittusurjuat, H., and Qrunnuts, K., 2008, Climate change in the Arctic: current and future vulnerability in two Inuit communities in Canada, The Geographical Journal, v.174, no.1, 45-62, Published

Other Refereed Contributions

Ford, J., 2006, Sensitivity of hunting to hazards associated with climate change: Iglulingmiut perspectives, People and Environmental Change in the Hudson's Bay Region: Beginning the Next Step, 1, Accepted

Ford, J., 2006, Hunting on thin ice: changing risks associated with the Arctic Bay narwhal hunt, People and Environmental Change in the Hudson's Bay Region: Beginning the Next Step, 1, Accepted

Non-Refereed Contributions

Ford, James, 2004, Human Implications of Climate Change in the Canadian Arctic: a Case Study of Arctic Bay, Nunavut, Proceedings ArcticNet 2004 Annual Scientific Meeting, 30, Accepted

Laidler, Gita J., 2004, Preliminary Results of Collaborative Research to Learn About Sea Ice, Through Inuit Eyes, Proceedings ArcticNet 2004 Annual Scientific Meeting, 39, Accepted

Pearce, Tristan, 2004, Community Vulnerability and Adaptive Capacity: Coastal Resources in the Western Arctic, Proceedings ArcticNet 2004 Annual Scientific Meeting, 49-50, Accepted

Ford, J., 2005, Living with climate change in the Arctic, World Watch Magazine, 18-21, Published

Smit, B., 2005, Climate Change Impacts, Adaptation, Vulnerabilities, Adapting to Climate Change 2005 (Conference), 1, Published

Ford, J., Smit, B. and Wandel, J., 2005, Vulnerability of Arctic Communities to Risks Associated with Climate Change: Two Case Studies from Nunavut, Adapting to Climate Change in Canada 2005 (Conference), 1, Published

Wandel, J., 2005, The Vulnerability Approach: Cross-Cutting Themes and Common Results from Culturally Diverse Contexts, Adapting to Climate Change in Canada 2005 (Conference), 1, Published

Smit, Barry and Wandel, J., 2005, Vulnerability of Arctic Communities, Proceedings ArcticNet 2004 Annual Scientific Meeting, 15, Published

Pratley, Erin, 2005, The Changing Inuit Diet in Arctic Bay: Implications for Food Security, Proceedings ArcticNet 2004 Annual Scientific Meeting, 50-51, Published

Wandel, J. and Smit, B., 2005, The Vulnerability Approach in Action: ArcticNet 4.2, Proceedings ArcticNet 2004 Annual Scientific Meeting, 58-59, Published

Smit, B. and Wandel, J., 2005, Vulnerability of Human Communities to Environmental Change Across the Arctic, Arctic Council CAFF Working Group Meeting (presentation), 1, Accepted

Smit, B., 2005, Vulnerability in the Canadian Arctic: ArcticNet 4.2, ArcticNet ASM 2005, 96, Published

Turner, J., 2005, Assessing the Vulnerability of Coastal Infrastructure in Inuvialuit Communities to Environmental Change, ArcticNet ASM 2005, 100, Published

Pearce, T., Duerden, F., Loring, E., Wandel, J., Smit, B., Ford, J., Laidler, G., Turner, J. and Beasley, E., 2005, Local Perspectives: Working with Communities in the Arctic, ArcticNet ASM 2005, 84-85, Published

Pearce, T., Katoyak, F., Inuktalik, R., Goose, A., Smit, B., Duerden, F. and Beasley, E., 2005, Living with Climate Change in Ulukhaktok, ArcticNet ASM 2005, 85, Published

Laidler, G., Dialla, A., Pootoogoo, E., Joamie, E., and Ikummaq, T., 2005, Sea Ice Variability and Change: Exposure and Risk in Three Nunavut Communities, ArcticNet ASM 2005, 69, Published

Ford, J., 2005, Responding to Climate change in the Arctic: A Photographic Display, ArcticNet ASM 2005, 54, Published

Duerden, F. and Beasley, E., 2005, Community Characteristics and Pre-Disposition to Environmental Change Impacts in the Inuvialuit Settlement Region, ArcticNet ASM 2005, 49, Published

Beasley, E., Duerden, F. and Pearce, T., 2005, The Role of Community Dynamics in Assessing Vulnerabilities to Climate Change in the Western Arctic, ArcticNet ASM 2005, 35, Published

Ford, J., 2005, Hunters in a Changing World: Inuit Perspectives on Vulnerability to Climate Change, ArcticNet ASM 2005, 21, Published

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Duerden, F., 2005, Working with First Nations Communities, Climate Change and Canadian Society Meeting, London, Ontario, 1, Accepted

Duerden, F., 2005, Relations Between Traditional Knowledge and Western Science (Review), Arctic, 1, Published

Pearce, T., Goose, A., Inuktalik, R., Katoyak, F., Smit, B., Wandel, J. and Duerden, F., 2005, Living with climate change: arctic community vulnerability and adaptation, Poster presented at ICARP II, 1, Accepted

Pearce, T., 2005, Managing change: environmental change, risks and infrastructure in Ulukhaktok (Holman), NT, Poster presented at Rapid Landscape change and Human Response in the Arctic and Sub-Arctic conference, 1, Accepted

Pearce, T. and Katoyak, F., 2005, Working in Collaboration with Community Partners, 2005 ArcticNet Annual Conference Proceedings, 14, Published

Ford, J., 2006, These changes are causing problems: living with climatic and environmental change in Nunavut, Above & Beyond, 1, Accepted

Turner, J., 2006, Adaptation Policy Frameworks for Climate Change: Developing Strategies, Policies and Measures. Book Review., Arctic, 96-97, Published

Ford, J. and Smit, B., 2006, Human implications of climate change in the Canadian Arctic: a case study of Arctic Bay, Nunavut, Proceedings of the Northern Research Forum Conference, 1, Accepted

Ford, J., 2006, Adapting to climate change in the Canadian Arctic, Annual Meeting of the Association of American Geographers, 1, Published

Wandel, J., Smit, B. and Hovelsrud, G., 2006, Community Adaptation and Vulnerability in Arctic Regions (CAVIAR), ArcticNet ASM 2005, 102, Published

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Smit, B., 2007, Community Adaptation and Vulnerability in Arctic Regions CAVIAR: Lessons for future policy, *UNFCCC Side Event, Bali, Indonesia*, 1, Published

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Smit, B., Hovelsrud, G. and Wandel, J., 2007, Community Adaptation and Vulnerability in Arctic Regions, *UNFCCC Workshop on Adaptation Planning and Practices, under the Nairobi Work Plan, Rome, Italy*, 1, Published

Pearce, T., Ford, J. and Smit, B., 2007, How is Climate Change Affecting the North; How is it Changing the Way Business is Done?, *The Canadian Institute's Arctic Logistics for Energy and Mining Project Development*, Calgary, AB, 1, Published

Pearce, T., Smit, B., Ford, J., Memogana, J., Okheena, T., Omingmak, G., Kataoyak, H., Kataoyak, F., Akoakhion, J. Jr., Nigiyok, S., Inuktalik, R., Inuktalik, K., Bryant, C., Lebourdais, M., and Wandel, J., 2007, Inuvialuit Youth and Adaptation to Climate Change. *Indigenous People and Climate Change in Canada*, *American Association of Geographers (AAG) Annual Meeting, San Francisco, California*, 1, Published

Duerden, F., Pearce, T., Ford, J., 2007, Community Vulnerability in the Canadian Arctic: From Assessment to Action, *2007 ArcticNet Annual Conference Proceedings*, 19, Published

Laidler, G., Manseau, M., Karetak, E., Johannson, K., Moulard, G., 2007, Inuit Knowledge in the Management and Research Activities of Auyuittuq National Park, *2007 ArcticNet Annual Conference Proceedings*, 25, Published

Andrachuk, M., 2007, Sensitivity and Adpatation to Climate Change in Tuktoyaktuk, *2007 ArcticNet Annual Conference Proceedings*, 35, Published

Borsy, E., Duerden, F., 2007, Impacts of Climate Change on the Availability of Granular Resources in the Inuvialuit Settlement Region, NWT, *2007 ArcticNet Annual Conference Proceedings*, 38, Published

Fleming, L., 2007, Adaptation Policy and Environmental Change in the Canadian Arctic, 2007 ArcticNet Annual Conference Proceedings, 51, Published

McKenna, M., Reid, M., 2007, Youth-Led Research: Assessing the Vulnerability of Inuit Youth in Arctic Bay to Social and Environmental Change, 2007 ArcticNet Annual Conference Proceedings, 77, Published

Moss-Davies, P., McKenna, M., 2007, Negotiating Research Relationships with Inuit Communities, 2007 ArcticNet Annual Conference Proceedings, 80, Published

Pearce, T., Smit, B., Ford, J., Laidler, G., Duerden, F., Allarut, M., Andrachuk, M., Baryluk, S., Diaila, A., Elee, P., Goose, A., Ikummaq, T., Inuktalik, R., Joamie, e., Kotaoyak, F., Loring, E., Meakin, S., Shappa, K., Shirley, J., Wandel, J., 2007, Community Collaboration and Environmental Change Research in the Canadian Arctic, 2007 ArcticNet Annual Conference Proceedings, 83, Published

Pearce, T., Akhoaksion, J. Jr., Bryant, C., Duerden, F., Ford, J., Inuktalik, D., Inuktalik, K., Inuktalik, R., Irish, B., Joss, F., Kataoyak, F., Kataoyak, H., Kudlak, E., Lebourdais, M., Memogana, J., Nigiyok, S., Ogina, G., Okheena, T., Omingmak, G., Smit, B., 2007, Inuvialuit Youth and Environmental Change Research in Ulukhaktok, 2007 ArcticNet Annual Conference Proceedings, 84, Published

Smit, B. and Wandel, J, 2008, Science and Indigenous Knowledge in Resource Management in the Canadian Arctic, AAAS Annual Meeting, San Francisco, California, 1, Published

Specialized Publications

Ford, J. and McLeman, R., 2005, Wanted: Climate for change , Toronto Star, Editorials & Opinions, Published

Pratley, E., 2005, Changing Livelihoods/Changing Diets: the Implications of Changes in Diet for Food Security in Arctic Bay, Nunavut, MA Thesis, 1, Published

Ford, J., 2006, Climate Change is Threatening Canada's Game, Guelph Mercury, 13, Published

Ford, J. and Pearce, T., 2007, Adapting to Climate Change, Toronto Star, 1, Published