

4.3 Vulnerabilities and Adaptation to Meteorological and Related Hazards

Summary

Project Leader(s)

Stewart, Ronald

This project is concerned with the analysis of meteorological and related hazards, how they impact on the local communities, and how these hazards will change with the climate. This project will proceed through three steps. First, it will identify some of the meteorological extremes that occur in the present climate that lead to significant impacts on humans. This includes, for example, blizzards, blowing snow, strong winds, severe wind chill and reduced visibility, as well as storms producing snow and mixed phase precipitation with significant accumulation. Second, it will identify the key factors leading to such extremes. This will include atmospheric as well as surface conditions. Third, it will examine whether the contributing factors and their associated extremes are expected to occur in the future and, if so, whether their frequency, magnitude and location may change. In collaboration with others in ArcticNet (mainly projects in Theme 4), we will carry out discussions with the local communities to identify hazards from their perspective. We will also discuss this issue with forecasters at the Arctic Weather Centre in Edmonton and the Canadian Ice Service in Ottawa. We will compile and examine climatologies for various weather phenomena at different locations in Nunavut. As feasible, we will also discuss this issue with the transportation, insurance and other industries. During the first and second years, we will conduct small pilot field projects as preparation for a more extensive field study during year three. The purpose of these field projects is to gather more data on the nature of the above mentioned and other meteorological hazards.

People

Network Investigators

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Collaborators & Research Associates

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Partners

National Research Council of Canada
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Publications

Articles Published in Refereed Publications

Nawri, N., and Stewart, R.E., 2006, Climatological Features of Orographic Low-Level Jets within Frobisher Bay, *Atmosphere-Ocean*, v.44, no.4, 397-413, Published

Nawri, N., and Stewart, R.E., 2007, Short-Term Temporal Variability of Atmospheric Surface Pressure and Wind Speed in the Canadian Arctic, *Climatic Change*, 1, Submitted

Roberts, E., and Stewart, R.E., 2007, On the occurrence of freezing rain over the eastern Canadian Arctic, *Atmospheric Research*, 1, Accepted

Gearheard, S., Pocernich, M., Stewart, R.E., Sanguya, J., and Huntington, H., 2007, Linking Inuit knowledge and meteorological station observations to understand changing wind patterns at Clyde River, *Climatic Change*, 1, Submitted

Roberts, E., N. Nawri and R.E. Stewart, 2007, On the storms passing over southern Baffin Island during Autumn 2005, *Arctic*, 1, Accepted

Nawri, N., and Stewart, R.E., 2008, Channelling of high-latitude boundary-layer flow, *Nonlinear Processes in Geophysics*, v.15, 33-52, Published

Other Refereed Contributions

Roberts, E., N. Nawri and R.E. Stewart, 2006, High impact weather at high latitudes: a Nunavut perspective, *ArcticNet Newsletter*, v.1, no.2, 11-12, Published

Non-Refereed Contributions

N. Nawri and R. E. Stewart, 2005, Orographic low-level jets: A climatology for Iqaluit, *Proceedings of the 39th Annual Meeting of the Canadian Meteorological and Oceanographic Society*, 1, Published

R. E. Stewart and N. Nawri, 2005, Hazardous weather conditions in the eastern Canadian Arctic, *Proceedings ArcticNet 2004 Annual Scientific Meeting*, 17, Published

- Nawri, N., Roberts E., Gibson S., and Stewart, R.E., 2005, Hazardous Weather Conditions in the Canadian Arctic, 2005 ArcticNet Annual Conference Proceedings, 25-26, Published
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- Nawri, N., Stewart, R. E., and Roberts, E. , 2006, Climatology and forcing of strong boundary-layer winds in mountainous regions of the eastern Canadian Arctic, Proceedings, Second International Green Energy Conference, June 25-29, 1, Published
- Nawri, N., Stewart, R., and Roberts, E. , 2006, Climatology and forcing of strong boundary-layer winds at coastal communities of Nunavut, Proceedings, Coastal Zone Canada Conference, Tuktoyaktuk, NWT, 1, Published
- Stewart, R.E., 2006, Severe weather and related hazards over Arctic Canada, Arctic Thorpex Workshop, Bergen, Norway, 1, Published
- Nadeau, D, Nawri, N., and R.E. Stewart, 2006, Understanding high winds in the eastern Canadian Arctic, 3rd ArcticNet Annual Scientific Meeting in Victoria, 2006, 1, Published
- Nawri, N., and R. E. Stewart, 2006, Strong winds over high-latitude coastal terrain, 3rd ArcticNet Annual Scientific Meeting in Victoria, 1, Published
- Roberts, E. Nawri, N., Gibson, S., and R.E. Stewart, 2006, The structure and evolution of extreme winter storms over Baffin Island, European Geosciences Union General Assembly, Vienna, 1, Published
- Roberts, E. Nawri, N., and R.E. Stewart, 2006, On the storms passing over southern Baffin Island during autumn 2005, 40th annual Canadian Meteorological and Oceanographic Society Congress , Toronto, 1, Published
- Roberts, E., Nawri, N., Carmichael, H., Nadeau, D., Evans E., and R.E. Stewart, 2006, Synopsis of simultaneous rawinsonde launches at two locations on southern Baffin Island November 7 - 8, 2006, 3rd ArcticNet Annual Scientific Meeting in Victoria, 1, Published
- Hanesiak, J., R. E. Stewart, K. Moore, P. Taylor, D. Barber, G. McBean, B. Kochtubajda and D. Hudak, 2007, Storm Studies in the Arctic (STAR) – A CFCAS Major Initiative, Annual Meeting of the Canadian Meteorological Society, Toronto, Ontario, 1, Published
- Nadeau, D., Nawri, N., and Stewart, R.E., 2007, Understanding High Wind Events in the Eastern Canadian Arctic, The Fourth Interdisciplinary Graduate Student Research Symposium (IGSRS), McGill University, 1, Published
- Stewart, R.E., 2007, Planning for the Storm Studies in the Arctic field experiment, Environment Canada, 1, Published
- Stewart, R., McBean, G., Carmichael, H., Gearheard, S., Nadeau, D., Nawri, N., Roberts, E., 2007, Hazardous Weather Conditions in Nunavut: an Overview of ArcticNet Project 4.3, 2007 ArcticNet Annual Conference Proceedings, 30, Published
- Folliott, J., 2007, Weather Observations, Perceptions and Related Impacts: A Case Study of Aklavik, NWT and old Crow, YT: 1996-2006, 2007 ArcticNet Annual Conference Proceedings, 52, Published

Gascon, G., Stewart, R., Henson, W., 2007, Major Cold Season Precipitation Events in Iqaluit, 2007 ArcticNet Annual Conference Proceedings, 55, Published