Climate Change and the Inuvialuit of Banks Island, NWT: Using Traditional Environmental Knowledge to Complement Western Science

By Dyanna Riedlinger

INTRODUCTION

THE impacts of future climate change are expected to be felt earliest and most keenly at Arctic latitudes (Maxwell, 1997). Significant environmental changes observed in the last decade, such as late freeze-ups, melting sea ice, shrinking permafrost layers, and evidence of northern range expansions for some species, suggest that climate change is already having effects in the Arctic.

Compared to other regions of the world, the North probably has the greatest uncertainty concerning the rate and the extent of climate change. Much of our current knowledge is based on scientific findings, largely from modeling, climatology, and biology. Climate change data are often limited both seasonally and by a lack of historical baseline information. Western science, while a valuable means of acquiring knowledge, represents only one set of approaches to knowledge and inquiry. An exclusive focus on scientific data may limit our understanding of climate change and its impact on western Arctic communities. Can other approaches to knowledge and inquiry enhance our understanding?

One way to broaden this understanding is to explore the contribution of traditional environmental knowledge. As an example of how to bridge the gap between scientific and traditional knowledge, I will describe how Inuvialuit environmental knowledge, or local expert knowledge of the land, can enhance research on climate change. Recorded here are my first impressions of a project to document climate change as it is seen through the eyes of the Inuvialuit of Banks Island.

THE PROJECT

The extensive use and knowledge of the land found in Inuvialuit communities provide a distinctive source of environmental expertise—expertise that is guided by generations of experience. Environmental change associated with variations in weather and climate has not gone unnoticed by Northerners who are experiencing such change firsthand. Many Inuvialuit feel that current environmental changes are without precedent, and are fundamentally different from normal changes in the weather. Climate change research provides a rich setting for the study of the dynamic relationship between humans and the environment. A study of this relationship, as expressed through the medium of traditional environmental knowledge, can be used to complement, enhance, and help make sense of science-based understandings of the impact of climate change on western Arctic land and communities.

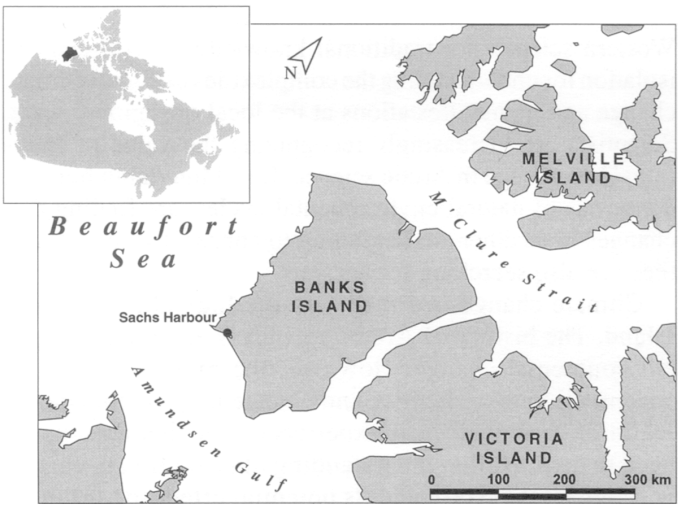
The contribution of traditional environmental knowledge and local observation to Arctic research is increasingly recognized as a means not only to enhance understanding of complex environmental phenomena, but also to meaningfully involve local communities. Traditional knowledge and Western science can complement each other (Berkes, 1999) and have often been used together to improve such areas as resource management and environmental assessment. However, almost no research to date has explored the value of traditional knowledge related to climate change in the Arctic (Cohen, 1997).

The work described here is my graduate research as part of a current collaborative project between the International Institute of Sustainable Development (IISD) and the western Arctic Inuvialuit community of Sachs Harbour (*Ikaahuk*), Banks Island (Fig. 1). The project, called *Inuit Observations of Climate Change,* has two goals. The first is to produce a video to show southern audiences and decision makers how climate change may be affecting the western Arctic. The second is to bring scientists and local experts together to explore how traditional environmental knowledge and local observations can enrich scientific research on climate change.

I have been honoured with the opportunity to participate in this project, which has allowed me to address the methodological challenges and questions of using traditional environmental knowledge and local observations to both complement Western science and provide a role for northern people in Arctic research.

INUVIALUIT OBSERVATIONS OF CLIMATE CHANGE

The project was initially based on anecdotal and other evidence from several sources that climate change effects were already being observed in the western Arctic. This evidence included observations of late freeze-ups and early spring breakups of sea ice, which had interfered with annual caribou migrations. As well, there were suggestions that permafrost layers were deepening, making fall travel more difficult. Storage caches dug into the permafrost were observed to be increasingly unreliable, as permafrost thawing resulted in meat spoilage. Changes had been observed in what the Inuit call "drinkable ice": multiyear ice in which salt pockets have drained out. Local observers have noted increasingly frequent and severe thunderstorms with lightning, possibly attributable to a northward shift of the western Subarctic storm track. And



Map of Sachs Harbour, Banks Island, N.W.T.

The community of Sachs Harbour, June 1999. Photo by Graham Ashford.

finally, Inuit hunters have reported more frequent cloudy days, and fewer clear, cold days when they could hear the sea ice crack.

The purpose of our first trip to Banks Island, in June 1999, was mainly to explore the extent of local observations of climate change and to organize and plan how and when the video would be filmed. We had several days of discussion and workshops, as well as much visiting and all of the tea drinking that we could fit in. The community workshops were organized around a participatory methodology designed to ensure that the project results would accurately reflect Inuvialuit viewpoints, observations, and traditions. The workshops enabled the community to share observations of climate change, organize the phenomena into categories, explain their observations according to traditional knowledge and experience on the land, and discuss adaptive strategies that they might have developed to cope with change. The workshops also allowed the community to guide the process by identifying key periods, indicators, and local explanations of change that should be filmed.

Our first visit to Sachs Harbour substantiated and added to the initial observations that had provided the basis for the project. It was clear that environmental change had not gone unnoticed. In the first day of workshops, the community discussed the accumulating evidence of changes occurring in the landscape around them. They described freeze-ups that were three to four weeks late and severe storms with wind, thunder, lightning, and hail. They discussed intense, unpredictable weather and fluctuations in seasons. Hunters described not seeing ice floes in the summer anymore, *umingmak* (muskox) being born earlier, geese laying eggs earlier, and *nanuq* (polar bears) coming out from their dens earlier because of warming and thaw. They also described catching species of Pacific salmon (identified by the Department of Fisheries and Oceans as sockeye *Oncorhynchus nerka* and pink *Oncorhynchus gorbuscha*) in their nets, when traditionally such occurrences were unheard of. Too much open water in the winter was making harvesting animals difficult, as was the lack of snow in spring, the lack of sea ice in summer, increased freezing rain, and thinner ice.

Three future trips to Banks Island will build upon and enhance the work of the first visit through interviews and interactions between scientists and local community members and filming of traditional activities that have been affected by climate changes occurring on the Island. Researchers will schedule the trips at times of the year determined by the community, in order to experience, explain, and record seasonal climate change phenomena. Additionally, as part of my role in the research team, I will be remaining in the community after the project team leaves, to follow up on filming, interviews, and workshops. Semidirected interviews with individuals and small groups within the community will allow further documentation of climate-related traditional knowledge as explained and understood by the Inuvialuit.

LINKING INUVIALUIT OBSERVATIONS AND WESTERN SCIENCE

The kinds of observations discussed by the Inuvialuit of Sachs Harbour can enhance our understanding of the effects of climate change in the western Arctic. My research specifically explores how traditional knowledge and local observations can be linked with Western science. Traditional knowledge and Western science, as Berkes (1999) asserts, are rooted in different worldviews and unequal in power, and are therefore not easy to combine. Linking them provokes questions like these, which ultimately provide the methodological foundation for the research: *How do we study traditional knowledge? How do we apply this knowledge to our research? How does traditional knowledge research occur without taking the knowledge out of its cultural context, without merely abstracting it for our own purposes by fitting it into our own research paradigms?*

My research statement, within the context of this project, addresses the methodological challenges and questions associated with traditional knowledge research. I am looking at how traditional environmental knowledge and Western science can be used together as distinct, yet complementary, sources of understanding. My research focuses specifically on the formulation of scientific hypotheses and the role and the ability of local experts on the land to contribute to this process. Scientists formulate hypotheses based on the possibilities of which they are aware: they choose their questions from the set of concepts available to them (Keddy, 1989). Traditional knowledge may provide a means to broaden the extent and scope of available possibilities and concepts, and allow us to place what we learn in a local context. Choosing our questions and formulating our hypotheses is considered the most important part of the scientific process (Keddy, 1989); it is also its most subjective aspect. Can local experts on the land contribute to the formulation of hypotheses, thus participating in a meaningful and complementary way in Arctic climate research?

It became very clear to me during my visit to Sachs Harbour that *how* traditional knowledge research is done is as important as what is accomplished. The contextual nature of traditional knowledge presents researchers with a unique challenge. Methods for collecting and documenting traditional knowledge need to preserve the context and the content of the knowledge. Traditional knowledge research must both involve and benefit local communities rather than just providing information for outsiders.

The organization of the project relies on accurately reflecting the perspectives of the community and their knowledge. The project recognizes that meaningfulness and accuracy rely heavily on ensuring direct participation of the community. The use of film as a medium for recording and documenting traditional environmental knowledge may serve as an appropriate methodology to preserve the context of the knowledge and ensure that climate change is explained according to Inuvialuit perspectives.

CONCLUSION: TWO WAYS OF KNOWING

I keenly observed and absorbed as much as I possibly could during my first visit to Sachs Harbour. I worked hard at keeping an open mind, conscious of the need to hear about change from the perspective of the Inuvialuit as they understand and explain it, free from my own impressions and interpretations. As the days progressed, I found myself as interested and challenged (and sometimes perplexed) by the scientists as I was by the Inuvialuit! I was reminded of a social scientist working in the North who commented that two groups of people were enriching her knowledge of the Arctic: Inuit elders and Arctic scientists. She found that both were often difficult to understand, and both had difficulty communicating their knowledge (Bielawski, 1992).

This project has given me the opportunity to gain insight into two ways of knowing, two ways of understanding, which—while distinct—can also be complementary. Neither Western science nor traditional knowledge is sufficient in isolation for understanding the complexities of global climate change and its manifestations at the local or regional scale. Scientists are increasingly recognizing the value of traditional knowledge in Arctic science. Local Inuvialuit hunters, conscious of natural environmental cycles, are finding that changes in weather are beginning to appear permanent, and they are also searching for answers.

Climate change is a reality to the Inuvialuit of Banks Island. The history of Arctic peoples is about adapting to environmental change. However, the rate and extent of current climate variability and change may be outside the realm of their historical experience. For this reason, we need to gain a fuller understanding of how climate change will impact the North and its potential effects on northern livelihoods. One way to do this is by linking traditional knowledge of the North with Western scientific expertise.

ACKNOWLEDGEMENTS

My thanks to the people of Sachs Harbour for making me feel so welcome in their community and giving me the opportunity to experience the warmth of the western Arctic. Thanks also to Rosemarie Kuptana, Neil Ford, Graham Ashford, Norm Snow, Terry Woolf, and Stan Reuben for making such a great project team. I am indebted to my advisor, Dr. Fikret Berkes, for ongoing support and encouragement. Thanks to Chris Hannibal-Paci for challenging my straw men, and to Theresa Nichols for her cartographic expertise. My contribution to this project would not have been possible without the financial support of the Walter and Duncan Gordon Foundation and the Lorraine Allison Scholarship from the Arctic Institute of North America. Many thanks to both.

REFERENCES

BERKES, F. 1999. Sacred ecology: Traditional ecological knowledge and resource management. London and Philadelphia: Taylor and Francis.

BIELAWSKI, E. 1992. Inuit indigenous knowledge and science in the Arctic. Northern Perspectives 20(1):5–8.

COHEN, S.J. 1997. What if and so what in northwest Canada: Could climate change make a difference to the future of the Mackenzie Basin? Arctic 50(4):293–307.

KEDDY, P.A. 1989. Competition. Population and Community Biology Series. London: Chapman and Hall.

MAXWELL, B. 1997. Responding to global climate change in Canada's Arctic: Volume II of the Canada Country Study: Climate impacts and adaptation. Downsview, Ontario: Environment Canada.

Dyanna Riedlinger is the recipient of the 1999 Lorraine Allison Scholarship. She is currently enrolled in the Master's Program in Natural Resources Management at the Natural Resources Institute, University of Manitoba, in Winnipeg, Manitoba.