

Arctic Climate Change: Observations of Inuit in the Eastern Canadian Arctic

Shari L. Fox

Department of Geography/CIRES
University of Colorado at Boulder
80309-0449

© Copyright Shari L. Fox. 2000.

Summary

For the past millennium, the [Inuit](#) have been living off the land in the Arctic. Through their experiences and observations they have accumulated a great wealth of understanding of environmental and ecological processes. This includes a vast amount of knowledge related to arctic climate and climate change. Maintaining an understanding of the arctic climate pervades many aspects of Inuit life from spiritual culture to hard skills. Many Inuit still employ traditional methods of weather prediction, identifying patterns of weather through a very complex seasonal cycle. Through their detailed knowledge of climate and weather patterns, the Inuit have been noticing changes. Inuit report changes in such things as seasonal characteristics, sky conditions, strength of the sun, snow and ice conditions, temperature, and plant growth.

Presented here is an overview of findings from a Master's thesis by the author entitled, *Inuit Knowledge of Climate and Climate Change*¹. This work is based on research undertaken in the communities of Igloodik and Iqaluit, [Nunavut](#), over several trips from 1995-1997. The purpose of the research was to draw attention to the valuable knowledge that the Inuit possess about climate and climate change, and to determine and document Inuit perceptions and understanding of arctic climate and climate change, and how they construct this knowledge. This piece focuses specifically on knowledge the Inuit conveyed regarding climate change. The knowledge was collected through interviews and conversations with Inuit hunters and [Elders](#) in these particular communities, as well as through analyses of archived oral histories. Note that knowledge is unique to individuals, communities, and regions. The knowledge presented here cannot represent the Inuit or Arctic as a whole.

Acknowledgements: I would like to give my sincerest thanks to all the Inuit hunters, Elders, and other community members who shared their knowledge and contributed to this research. Special thanks to the Igloodik Inullariit Elders Society for making the Igloodik Oral History Project possible. Thanks to the Nunavut Research Institute and the Igloodik and Iqaluit Research Centres. John MacDonald, Leah Otak, Shuvina Mike, and Becky Mike are deserving of special thanks as they helped tremendously with research design and translating. I am also very grateful to the Northern Scientific Training Program (Department of Indian Affairs and Northern Development, Canada) and the Royal Canadian Geographical Society

for funding this research. The National Science Foundation is also gratefully acknowledged for their support of continuing research (Award No. OPP-9906740).

© Copyright Shari L. Fox. 2000.

[Top](#)

[Summary](#)

[Acknowledgements](#)

[Introduction](#)

[Map of Nunavut](#)

[Inuit observations](#)

[Inuit Knowledge and Climate Research](#)

[Cooperation for Arctic Climate Research](#)

[Definitions](#)

[Endnotes](#)

[References](#)

Introduction

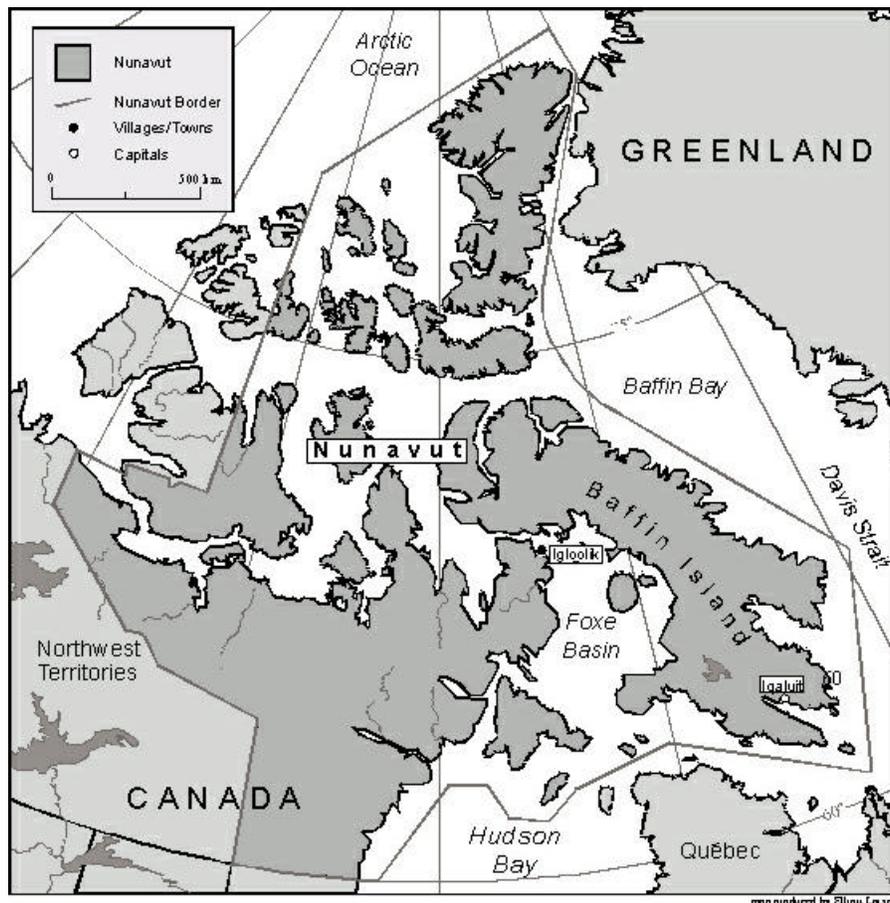
. . . there is no question about it, you can tell a big difference in weather patterns from the past. In years past there used to be long periods of fine weather. There would be a period of bad weather, which was usually pretty bad, but once it cleared up it would be a long time before another storm would get to us. Change in the weather patterns is very much noticeable. The earth and the natural environment are so much different now from what they were in the past.

(Uqalik, 1991, IE-209)

For the Inuit, weather has generally been the principal determining factor of daily activity. Inuit survival has relied on an intimate knowledge of the environment, particularly the weather, its cycles and changes. Indeed, weather is perhaps the most closely observed of all natural phenomena (MacDonald, 1998; Fox, 1998). As a result, the Inuit have accumulated a great wealth of understanding about weather and climate, including an acute awareness of climate and weather processes, variability, and change. Impacts of climate change have not gone unnoticed at the community level and hunters are observing such environmental changes as: variations in air temperature; poor vegetation growth; increasing rain events in the winter; discolouration of sea ice; and changes to sea ice distribution and thickness (Inuit Circumpolar Conference, 1996; Fox, 1998). As a result, climate change and its present and potential impacts have become a growing concern for Inuit communities.

The Arctic has emerged as a focal point for climate and climate change studies. Scientific climate records and model projections show a unique enhanced sensitivity of the arctic climate which makes it particularly susceptible to human and non-human interferences (LeDrew, 1986; 1993). Although scientific research has made a great deal of progress in understanding arctic climate processes and the potential impacts of arctic climate change, there is a great body of knowledge that has remained virtually ignored. This is the knowledge of the Inuit who have been living in this environment for hundreds of years.

Map of Nunavut



Inuit observations²

The Inuit have a vast amount of knowledge on how the arctic climate has changed through time and impacted their environment³. These changes have been observed through such indicators as seasonal characteristics, temperature, sea ice, and the condition of the atmosphere.

Seasonal Characteristics

The Inuit identify a much more complex seasonal cycle than the astronomically and meteorologically based "four seasons" that are conventionally accepted by much of the rest of the world. The Inuit recognize six to eight seasons (depending on the region), which are closely associated with thirteen moons. Each season, and each seasonal change that occurs during each moon, is identified using a very specific set of characteristics. These involve observations of sea ice, animals, sky conditions, vegetation, and other elements of the environment (see Wenzel (1991), Fox (1998), and particularly MacDonald (1998) for a very detailed description from the *Iglulingmiut*⁴). With the Inuit able to identify extremely specific characteristics for each arctic season, it is not surprising that they would be sensitive to any changes in seasonal conditions. Changes that have been observed include: an increase in weather variability; more frequent sudden storms; a dramatic decrease in usually expected long calm weather periods; an increase in winds (stronger and more often); and increasing rain events in the winter season.

The increase in weather variability reported by Inuit in the study areas is associated with the weather being more unpredictable and less stable. Inuit and Cree in Hudson Bay, Hudson Strait, and James Bay regions have also observed an increase in weather variability (McDonald *et al.*, 1997). For example, in northwestern Hudson Bay, "there used to be more clear, calm days, winters were colder, and low temperatures persisted longer. By the early 1990's, weather changes were quick, unexpected, and difficult to predict. Blizzards, for example, would occur on clear days in the Chesterfield Inlet

area, but on days when environmental indicators suggested a blizzard, it would not materialize" (McDonald *et al.*, 1997:29).

Today the weather changes very quickly, unexpectedly, and in such a way that experienced Elders in Igloodik and Iqaluit find it difficult to predict:

* * * *

It appears now as if the weather has a different pattern than it did in the past which makes it even more difficult to predict the weather according to what we used to be told (Ulaajuruluk, 1991, IE-180).

* * * *

The weather is changing really quickly. He [Nataraluk] thinks on Sundays they never used to go animal hunting and today [Sunday] is not being respected anymore. Sunday is not being respected anymore and he thinks that the weather is reacting because it's not being respected. And so when it gets windy it happens quicker than before (Nataraluk, 1997).

It is interesting to note that these observations are being made in the Western Arctic as well. In interviews conducted with Inuvialuit of Sachs Harbour, Riedlinger (in press) found local hunters are not able to use their weather predicting skills – the weather is unusually unpredictable.

Around the region of Iqaluit there has been an increase in winds (stronger winds and more often) particularly in the winter season (*Ukiuq*). This has been happening since the early 1990s (Joamie, 1997). In spring, ice is broken up by the winds, whereas in the past, older hunters and Elders report that the ice would melt first, and then break up. Ice would "turn black" as it melted to such a thin layer as to show the dark ocean water beneath before it began to break apart. Now, strong winds crack the ice apart during the process of break-up.

Perhaps the observed change in the seasons that has caused the most concern for Inuit is rain in the winter. It did rain in the past, but these were considered very unusual weather events (Ijjiangiaq, 1990, IE-081; Piugaattuk, 1989, IE-051). Now, hunters are reporting that they are observing it much more often (Awa, 1997; Joamie, 1997). Hunters and others recount the impacts of past events of rain in the winter and express concern over increasing occurrences of this precipitation:

* * * *

The time of the year was upon them [referring to parents] to start hunting seals, but it snowed and a rain followed. With the glazed coating from the rain, the deep snow will not be blown away. That was the case at that particular time. . . Weather conditions get bad once in a long while, this was the case when the surface of the ground was glazed which resulted with many deaths [presumably of caribou]. The worst hit might have been *Salliq* [Southampton Island]. Our home, Igloodik, has less rainfall than that area, the area on Baffin Island towards *Uqurmmiut* [South Baffin, inner coast]. The *Pangnirtuuq* [Pangnirtung] and *Kangir&&ugaapik* [Clyde River] areas have greater rainfall. That is the reason why sometimes caribou die off. This happened in more recent times when *Qanaattiaq* was just getting married [late 1950's]. This time a few caribou were affected with starvation, there were a few that died from starvation. This is the case now. This has always happened (Piugaattuk, 1989, IE-051).

* * * *

Q. The scientists are also predicting more rain in the winter time, do you think there will be a problem if that happens?

A. There would be a problem if that happens because even a thin layer of ice on the snow would cause the rabbits, ptarmigans, and the caribou to be unable to feed in the winter time . . . The caribou are able to keep feeding even in a deep snow for they can smell where the food is. But the ice is very bad for their feeding. I remember there was rain in the winter time when we had taken a trip over to *Agu* [place name NW of Igloodik area]. I forget exactly how long it rained, not many hours. During that time there was no sun because it was in the month of December, but after the

rain, the rabbits disappeared and there were none for years following the incident. It took years before the population was back, I don't remember what year it was now, but some other people would remember what year it was. I was old enough to hunt at the time, it rained so hard that the meat that we had for dogs all melted and there was a thick ice layer afterwards (Iyerak, 1997, IE, 401).

It was very interesting to discover that a new term in Inuktitut had been created to describe the increasing incidence of rainfall going on in recent years (Otak, personal communication, 1997). An Igloodik Elder used "*Misullijjuq*," a new word, during an interview in 1997 in order to help describe a mix of rain and snow that had been falling during that spring (Kappianaq, 1997 IE-397). The word was apparently created to describe an increase in the amount of rain in winter.

Temperature

In the study area, the majority of people interviewed agreed that they had been experiencing a cooling trend over approximately the last 10 years. This has manifested in both cooler temperatures in summer months (*Aujuq*) and colder temperatures in later winter months (*Ukiuq/early Upingaksajaaq*). Inuit hunters, Elders, and other community members gave evidence for their judgment that air temperatures have been in a cooling trend. For example:

* * * *

I know this [that it is cooler] because before, traveling at night our kamiks [seal skin boots] would get wet if we were traveling through the night and then during the day the kamiks would get really dry . . . now they don't dry out anymore because its not warm enough (Nowdlak, 1997)

* * * *

I think the weather has changed. It is cooler than before. That's what I'm observing. The temperature at the floe edge used to be quite hot, but it's not like that anymore. It's cooler. I'm not blaming *qalunaat* [Europeans] for the kind of research they do [in ref. to global warming studies], but sometimes the research that has been done isn't always accurate (Nutaraluk, 1997).

Inuit and Cree reports of observed temperature change in Hudson Bay, James Bay, and Hudson Strait indicate a cooling as well. Here, residents report fall weather is different from the past, changing very fast with cold weather arriving earlier. In Eastern Hudson Bay, since 1984, winds in the Belcher Islands have blown mostly from the north in April and May, which prevent Canada geese from arriving in large flocks, and slows down the spring melting. The summers are cooler and it is colder later in the winter as well. In the past, Inuit report there were "breaking points" as the temperature rose and fell throughout the winter. Constant cold weather since 1989 has extended the freezing period by keeping temperatures at minus 20 to 40 degrees Celsius from mid-December to early April (McDonald *et al.*, 1997:30).

Other indications that temperatures are cooler can be found in the Igloodik Oral History Project. In several interviews, related to various subject matter, interviewees would use references such as, "at the time when it was warmer . . ." or, "when it was warmer I was a child . . .". Even though most interviews were not on the subject of climate or temperature, oral histories give evidence that present temperatures are indeed cooler than in the past and some Inuit use the warmer period as a frame of reference.

Although there was a general consensus from respondents that there has been a cooling trend occurring in the study areas, it should be noted that a few reports of warming were found. Evidence cited include: the permafrost has melted further down (Innuksuk, 1997, IE-399); not as much ice fog is seen out on the ice or as much vapour when one urinates outside in winter time; and dog teams are no longer covered in vapour when they go out in the winter (Kunnuk, 1997, IE-402).

Sea Ice and Aniuvak

According to Inuit, the amount, distribution, and physical characteristics of both snow cover and sea ice have changed in Igloodik and the southern Baffin Region. For hunters, being knowledgeable about the processes of sea ice and snow is vital to survival. The ability to travel safely and hunt successfully in the Arctic requires an intimate knowledge of the way sea ice moves and forms, and of when various processes are supposed to occur. When asked about their knowledge of any changes in snow or ice conditions that they could relate to climate or environmental change, the most common answer reflected concern over changes to sea ice formation, and break-up and freeze-up timing.

Hunters and others interviewed did not agree as to whether break-up or freeze-up timings were consistently sooner or later than usual. In Iqaluit, hunters observed break-up occurring sooner (Awa, 1997; Mike, personal communication 1997). Indeed, the 1997 break-up came two weeks earlier than usual in Koojesse Inlet (Iqaluit) (Earle, personal communication, 1997). The timing of freeze-up in Iqaluit is reportedly later:

* * * *

He's also noticed, even though he's been in Iqaluit a long time, that even freeze-up times are different, are much later than usual. That's been over the years it's later. Since it doesn't freeze-up at that same time anymore they have to be aware of the ice.

Q. Can he say when the usual time is and when the later time now is?

A. Usually, the normal time for freeze-up is towards the end of November and freeze-up for sure third week of December, but it doesn't always freeze up at that time anymore (Papatsie, 1997).

As Wenzel (1995) stated, a few unusually early or late break-ups or freeze-ups certainly do not prove the existence of global warming (or global climate change), however, a string of timing differences in either direction causes concern among Inuit. In Iqaluit, later freeze-up can be good for hunters who utilize boats to travel to areas of seal hunting, thus prolonging the hunting season (Mike, personal communication, 1997). Yet, for those people waiting for freeze-up in order to hunt on the sea ice or travel by snow machine to visit friends or relatives in communities otherwise inaccessible the rest of the year, the long wait for freeze-up can be frustrating (Mike, personal communication, 1997).

In addition to concerns over the timing of ice break-up and freeze-up, are concerns about changes in the processes involved in ice formation and decay. The break-up process itself is very different to hunters and Elders in Igloodik and Iqaluit than they have observed in the past. As noted in previous sections, changes in wind strength and frequency have changed the process of ice break-up:

* * * *

Q. Has he noticed any changes in the ice?

A. It has changed now, it breaks up more quickly, like all of a sudden. Before it used to have a start up, a slower process. But now it goes all at once, at the same time and sooner. And [there have been changes in] the areas where there would be ice when they traveled at certain times of the year but now it sometimes breaks up too soon, sooner than expected (Awa, 1997).

Others have observed less sea ice near shorelines in Iqaluit (Joamie, 1997), and that the floe edge in Igloodik was farther out than normal in the last few years, particularly in the years 1992-1994 (Parker, personal communication, 1995; Makkik, 1996, IE-356).

In Iqaluit, interesting observations regarding snow cover were found. Some snow patches in the hills near Iqaluit usually remain all year round, however, these areas have been melting in recent years, even though cooling air temperatures have been observed:

* * * *

He's noticed there's always been patches of snow on the hills, there have always been patches of snow that have never melted. Now he's noticed, some time ago, they now melt. There are areas where there is snow like that [points to example out window], not that one because he knows that one is always going to melt, but in areas where there's snow like that one on the hills that usually

never melts; now it melts. And he's noticed that the sun has more heat than before.

Q. Stronger?

A. Eiii [yes]. They've [hunters] noticed the changes especially with the ones that never usually melt, its called *Aniuvak* [those that never melt], and they're starting to melt (Papatsie, 1997).

Sun and Sky

Almost all interviewed participants, as well as community members engaged in casual conversation, remarked on the noticeable differences in the strength of the sun and colour of the sky. Although these changes in sun and sky cannot be directly associated with climate, it is important to address these observations since they emerged as a very clear concern of the Inuit and should be given attention as a serious environmental change in the Arctic:

* * * *

The sun is at present much stronger than observed by elder Inuit earlier in their lifetimes, . . . the heat of the sun is sharper than before. The sun seems to give more heat now than it did before but maybe that is just my thought I don't know what other people think . . . I thought to myself that maybe it was warmer all over because I thought while I was outside that it was too warm for the season, since there was still plenty of snow and the sun should not really be that warm yet. Then I believed in my thoughts, of how the warmth of the sun actually felt stronger than usual (Iqallijuq, 1997, IE-398).

* * * *

The direct heat from the sun is warmer, it is not the same anymore and you can't help but notice that. It is probably not warmer overall, but the heat of the sun is stronger (Kappianaq, 1997, IE-397).

Inuit residents discussed the fact that they were sustaining sunburns, something that they had not experienced in the past. Older hunters who had spent long periods of time out on the sea ice in 24-hour sunshine for much of their lives rarely had their skin burn. Sunburns seem to be a relatively new phenomenon of the last five years or so. Many now describe the sun feeling like it is "stinging" or "sharp feeling", but at the same time temperatures are not rising (Mike, personal communication, 1997; Otak, personal communication, 1997; Utigak, personal communication, 1997). Due to increased public health information about sunscreen and skin cancer, the Inuit may be more aware of sunburns, however, it was evident in interviews and conversations that the burns were either a new experience, or that burns were more severe than they had known before.

The change in the atmosphere that hunters refer to is indicated by a distinct change in the colour of the sky. Inuit report a "haze" or "layer" in the sky:

* * * *

He knows about the ozone layer. He thinks that because the stars aren't as clear as they used to be before, there's some kind of a layer around the earth that's making it unclear. And it's probably that ozone layer he was mentioning. . . [pause]. He's clarified about the ozone layer. He believes it's the pollution that's making it not so clear as it used to be. It's the pollution . . . if there wasn't any layer in the air the skies would be more blue, but there's a bit of white layer around it. Its not as clear as it would normally be (Nataraluk, 1997).

* * * *

A. Right now for example, its nice and clear, before it used to seem more clear, like more blue sky. But there seems to be a bit of a layer in the sky.

Q. What does he think that's from?

A.. He thinks maybe it's just from . . . like from down south you see that fog, like . . .

Q. Like smog?

A. Yes. He thinks their smog has come up here (Papatsie, 1997).

The change in the atmosphere is consistent with reports from Inuit and Cree in Hudson Bay and Hudson Strait who have also noticed the sky has changed colour. Today, the sky is light blue and there is a yellowish colour when it is clear (McDonald *et al.*, 1997:27). In the past, the sky was darker blue and Inuit could look directly at the sun. In the early 1990s, a white, misty-like haze blocked the sun's heat in the higher atmosphere and caused poor growth and development of insects and vegetation in these regions (McDonald *et al.*, 1997:27).

Inuit Knowledge and Climate Research

The Inuit have a tremendous amount of knowledge to contribute to the understanding of arctic climate. Their close connection to the land makes Inuit input into the design of arctic climate research and monitoring of arctic climate change extremely important.

The Inuit Circumpolar Conference (1996) has made it clear that Inuit want to be involved in climate research. Kassi (1993), a native of the Western Arctic and member of the Yukon Legislative Assembly, expressed disappointment in the lack of attention given to local knowledge in scientific studies of arctic climate and climate change even though there is a willingness on the part of Inuit to share knowledge. An Inuit Elder in Igloolik conveyed to me the importance of recognizing the depth of Inuit climate knowledge, the need to record it, and the need for the new Nunavut government to be aware of it (Kappianaq, 1997), as there will be new policies created by this government that deal with issues related to climate change. Inuit communities are concerned about the potential impacts of climate change and want to make efforts to understand the process of this change and how they may be able to prepare and adapt (Inuit Circumpolar Conference, 1996; Cohen, 1997).

Inuit climate knowledge has the potential to augment scientific knowledge significantly. For example, the record of ice conditions in the Canadian Arctic has only been monitored from aircraft beginning in the late 1950s (Barry, 1986). Sea ice charts and atlases contain information only as far back as 1958 (Barry, 1986). The Distant Early Warning (DEW)-line weather stations were not installed until 1958, (although a few major stations have records beginning in 1942-43 at Clyde River and Iqaluit; 1921-1965 at Pond Inlet; and 1937-1976 at Arctic Bay) (Rae, 1951; Maxwell, 1980). Hence, Inuit recollection of anomalous conditions prior to these dates could amplify our picture of changes in climate and sea ice regimes. Given the recent anomalous climatic trends in the Arctic, such a long-term perspective would be especially valuable.

Also, Jacobs (1989) discusses the spatial representativeness of scientific climatic data in the Arctic, addressing Baffin Island specifically. Jacobs (1989:50) states that climatic records from often widely scattered arctic stations are commonly used to draw conclusions about such matters as wildlife habitat and distribution, yet little is known about the validity of extrapolating from such limited data. Jacobs (1989) found through statistical tests that temperature data correlated highly across the region, however, large extrapolation errors occurred with rainfall, snowfall, and depth of snow cover data. Inuit hunters who regularly travel the areas between observation stations may be able to offer more accurate information than the extrapolated data, as well as reports on the status of wildlife. Inuit knowledge is based on direct observation and can cover long periods — as opposed to the extrapolations made by climatologists or the inferences of wildlife biologists.

Indeed, the long-term perspective of Inuit knowledge is one of its most striking attributes, and one of the most interesting to those who study climate. Inuit knowledge spans generations. Inuit today can still recount stories of nineteenth century British explorers that match historical documentation (Woodman, 1991). In Iqaluit, Elders still retain oral histories relating

to the voyages of Frobisher in the 1570s (Eber, 1996). In their work with Inuit traditional ecological knowledge of caribou, Ferguson and Messier (1997) found Inuit could accurately recall information about caribou populations from decades earlier. For the Inuit, all knowledge has traditionally been retained in memory because Inuktitut is not originally a written language. Since much of the knowledge relates to survival in the arctic environment, keeping and relaying information correctly has often been a matter of life and death. The ability of Elders to recount weather events could be extremely useful to climate researchers as they may be able to build climate histories in regions that have only had weather-recording devices for less than 20 or 30 years. Many Elders have memories that accurately retain first-hand observations from at least 30 years ago, in addition to the knowledge they learned from their parents and grandparents. This could provide important knowledge that science may otherwise not be able to determine.

Inuit knowledge, especially that knowledge which is rooted in the past, is in danger of disappearing. The number of Inuit Elders who remain are few (Otak, personal communication, 1997), and quickly decreasing. In addition, dramatically changing social conditions in the North have changed the way younger generations of Inuit live, and the knowledge of their parents and grandparents is not being passed on to them due to communication problems, lack of interest, decline in available time for family contact, decline in traditional activities, and other reasons. There are efforts, both local and national, to preserve Inuit culture and language, but it is true that many young Inuit are not learning the rich traditional knowledge of their ancestors. Therefore, there is an urgency to document Inuit knowledge and interpret it through discussions with them. Also, by encouraging Elders and other members of the community to share their knowledge, there may be a possibility of saving the knowledge not only through documentation, but also through in-situ preservation. Bringing attention to Inuit climate knowledge may revive community interest in it and information may be transmitted among residents as a result; thus passing the knowledge on. Documenting Inuit knowledge is important, but if we can preserve it in-situ as well, there is even a better chance to foster working relationships between Inuit and scientists on matters of climate and climate change in the Arctic.

Cooperation for Arctic Climate Research

The merit and extent of Inuit climate knowledge are clear, but so are many of the obstacles to the cooperation of this knowledge with scientific research. Many scientists still recognize indigenous knowledge only as 'anecdotal' or lacking tangible, valid proof. Many Inuit are tired of being researched and not given credit for their knowledge or input. However, there is hope. With the Inuit having gained their own government through the creation of Nunavut, communities are taking more control over what kinds of research they wish to allow on their lands and waters, and which projects they want to actively participate in. Some researchers are beginning to recognize indigenous knowledge and are putting forth an effort to incorporate it in their project design. Large research oriented groups such as the National Science Foundation and NASA are beginning to encourage a serious look into how indigenous knowledge can inform and be incorporated into sponsored work (for example, Moreno, 2000). Some projects are trying to create a framework within which science and indigenous knowledge can work *together* – where each group benefits, and the outcome is a common goal achieved. What could result is an "un-learning" and "re-thinking" on the part of science, and a new meaningful place in research for indigenous people who want to share their knowledge and skills.

As it was stated earlier, Inuit knowledge has great potential to augment scientific research, however, this must be approached as a reciprocal relationship. Inuit are interested in seeing how scientific knowledge can enhance their understanding of what is happening to the arctic climate. Inuit climate knowledge should not be understood as simply a resource for informing science, but recognized as a place where equal research partnerships can be found.

Although it is legitimate that in many ways science and indigenous knowledge are two different ways of knowing, one way is not better than the other. It is time to move beyond the dichotomy and truly address the potential for working together, as partners; a team for a common concern. In this case, a better understanding of arctic climate and climate change and its impacts on the ecosystems and people of this unique part of the world.

Definitions

Inuit

For a long time, outsiders called the people inhabiting arctic regions "Eskimos." Inuit prefer to go by the name they have always known themselves, Inuit, which means "the people" in Inuktitut, their own language. The Inuit are one of three Aboriginal peoples in Canada, as defined by the Canadian Constitution (the others being First Nations and Métis). The Inuit population has grown rapidly in recent years and presently there are approximately 55,700 Inuit living in 53 communities across the North. The Inuit culture, which has origins in Canada that date back at least 4,000 years, is deeply rooted in the land they live on. Inuit have developed finely tuned knowledge and skills that have helped them survive in this environment. Today, Inuit still participate in many traditional activities like hunting and sewing, which they combine with work they do in other sectors of the present economy such as construction, tourism, and government services (see DIAND, 1998).

Nunavut

On April 1, 1999, the map of Canada was changed when the Northwest Territories was divided into two. One part remained the Northwest Territories, the other became Nunavut, which means "our land" in Inuktitut. Nunavut is the result of much hard work on the part of the Inuit, beginning with requests by the Inuit Tapirisat of Canada, (a group representing Inuit across Canada) to the federal government in 1976 to map east and west boundaries of the Northwest Territories as part of Inuit land claims. In 1993, the Inuit, the government of Canada, and the government of the Northwest Territories signed the Nunavut Land Claims Agreement (NLCA), the largest aboriginal land claim agreement in the history of Canada. The Inuit make up 85% of the population in Nunavut and see the new government as fulfillment of a dream to take control of their future.

Nunavut Facts: Area - 2,000,000 km² (approx. 1/5 of Canada's land mass), Population - approx. 27,000, Capital - Iqaluit (population approx. , 4,500), Communities - 28, with Iqaluit being the largest (see DIAND, 1999).

Inuit Elder

Elders are people who have great amounts of experience, sometimes only in one specific area of knowledge. Elders are people that the Inuit go to if they need to know something, or need advice. One cannot declare themselves an Elder. "Elder" is a word assigned to a person by their community, recognizing that person as having the most knowledge in one or more areas of expertise. "Elder" does not necessarily imply someone who is very old, however, it happens that by the time one gets good at something one has put on many years. Many times, Inuit Elders are very old with very rich life experiences. Any useful skill or talent could qualify somebody as an Elder, as long as they were at the pinnacle of that activity or knowledge. Elders often communicate their knowledge through stories and song (see Qitsuali, 1998).

Footnotes

¹Fox, S.L. 1998. *Inuit Knowledge of Climate Change*. Master of Environmental Studies Thesis (Geography), Department of Geography, University of Waterloo, Ontario.

²Inuktitut terms will be noted in italics.

³Quotes from Inuit are written as they were translated from interviews, or as they appear in the Igloodik Oral History Project (those quotes with "IE" notations). Only misspellings and grammar have been carefully corrected.

⁴Here "Iglulingmiut" refers to Inuit living in Igloodik.

References

Agrawal, A. 1995a. Dismantling the Divide Between Indigenous and Scientific Knowledge. *Development and Change*. 26:413-439.

Awa, P. 1997. Interview by S. Fox and S. Mike, Iqaluit, NWT.

Barry, R.G. 1986. The sea ice data base. In *The Geophysics of Sea Ice*. N. Untersteiner, ed. Plenum, New York, pp. 1099-1134.

Berkes, F. and Henley, T. 1997. Co-Management and Traditional Knowledge: Threat or Opportunity? *Policy Options*. 182:29-30.

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.

DIAND (Department of Indian Affairs and Northern Development) 1998. *Inuit*. Publications and Public Inquires, DIAND, <http://www.inac.gc.ca/pubs/information/>

DIAND (Department of Indian Affairs and Northern Development) 1999. *Nunavut*. Publications and Public Inquires, DIAND, <http://www.inac.gc.ca/pubs/information/>

Earle, Y. 1997. Science License/Research Liaison, Nunavut Research Institute, Iqaluit, Northwest Territories, personal communication.

Eber, D.H. 1996. Rumours of Franklin: The Strength of the Inuit Oral Tradition. *Beaver*. June/July issue: 4-13.

Ferguson, M.A.D. and Messier, F. 1997. Collection and Analysis of Traditional Ecological Knowledge about a Population of Arctic Tundra Caribou. *Arctic*. 50, 1:17-28.

Fox, S. L. 1996. *The Potential Impacts of Arctic Climate Change on Inuit/Wildlife Relationships: A Case Study of Igloodik NT, and the Atlantic Walrus (Odobenus rosmarus rosmarus)* (Waterloo: Bachelor of Environmental Studies Thesis; Department of Geography, University of Waterloo).

Fox, S. L. 1998. *Inuit Knowledge of Climate and Climate Change*. (Waterloo: Master of Environmental Studies Thesis, Department of Geography, University of Waterloo).

Howard, A. and Widdowson, F. 1996. Traditional Knowledge Threatens Environmental Assessment. *Policy Options*. 17, 9:34-36.

Hudson Bay Programme. 1995. *Traditional Ecological Knowledge of Environmental Changes in Hudson and James Bays; Part II*. (Sanikiluaq: Municipality of Sanikiluaq and Natural Resources Secretariat, Manitoba Keewatinowi Okimakanak, Inc.)

Ijjangiaq, M. 1990. IOHP File #IE 081.

Inglis, J.T. ed. 1993. *Traditional Ecological Knowledge; Concepts and Cases* (Ottawa: Canadian Museum of Nature).

Inuit Circumpolar Conference (ICC). 1996. *Inuit Statement Regarding COP2 Conference in Geneva*. ECO Newsletter, Issue #7.

Inuksuk, Z. 1997. Interview by S. Fox and L. Otak, Igloodik, NWT, IOHP File #IE 399.

Iqallijuq, R. 1997. Interview by S. Fox and L. Otak, Igloodik, NWT, IOHP File #398.

Iyerak, A. 1997. Interview by S. Fox and L. Otak, Igloodik, NWT, IOHP File #401.

Jacobs, J.D. 1989. Spatial representativeness of climatic data from Baffin Island, NWT, with implications for muskox and caribou distribution. *Arctic*. 42:50-56.

Joamie, A. 1997. Interview by S. Fox and S. Mike, Iqaluit, NWT.

Kappianaq, G. 1997. Interview by S. Fox and L. Otak, Igloodik, NWT, IOHP File #IE 397.

Kassi, N. 1993. Native Perspective on Climate Change. in *Impacts of Climate Change on Resource Management in the North*. Mitchell, B. ed. (Waterloo: Department of Geography, University of Waterloo) pp. 43-49.

Knudston, P. and Suzuki, D. 1992. *Wisdom of the Elders*. (Toronto: Stoddart Publishing Co. Ltd.).

Kunnuk, P. 1997. Interview by S. Fox and L. Otak, Igloolik, NWT. IOHP File #IE 402.

LeDrew, E.F. 1986. Sensitivity of the Arctic Climate: A Factor in Developing Planning Strategies for Our Arctic Heritage. *Environmental Conservation*. 13, 3: 215-228.

LeDrew, E.F. 1993. Climate Variability, Change, and Sensitivity. in *Canada's Cold Environments*. French, H.M. and Slaymaker, O. eds. (Montreal and Kingston: McGill-Queen's University Press) pp. 271-290.

MacDonald, J. 1998. *The Arctic sky: Inuit astronomy, star lore, and legend*. (Toronto and Iqaluit: Royal Ontario Museum and the Nunavut Research Institute).

Makkik, G. 1996. Interview by S. Fox and L. Otak, Igloolik, NWT. IOHP File #IE 356.

Maxwell, J.B. 1980. Atmospheric and Climatic Change in the Canadian Arctic: Causes, Effects, and Impacts. *Northern Perspective*. 15:2-6.

Mike, S. 1997. Interpreter. Iqaluit, NWT, personal communication.

Monero, F. 2000. In the Arctic, Ice is Life and it is Disappearing. *Native Americas. Special Issue on "Global Warming, Climate Change and Native Lands"*. See issue for information on partnership between NASA and the Akwe:kon Press.

Nataraluk, L. 1997. Interview by S. Fox and S. Mike, Iqaluit, NWT.

Nowdlak, L. 1997. Interview by S. Fox and S. Mike, Iqaluit, NWT.

Otak, L. 1997. Interpreter, Igloolik, Northwest Territories, personal communication.

Papatsie, J. 1997. Interview by S. Fox and S. Mike, Iqaluit, NWT.

Parker, B. 1995. Renewable Resources, Government of the NWT, Igloolik, personal communication.

Piugaattuk, N. 1989. IOHP File #IE 051.

Qitsuali, R.A. 1998. Commentary: What, exactly, is an elder? *Nunatsiaq News: Opinions and Columns*. June, 25, 1998.

Rae, R.W. 1951. *Climate of the Canadian Arctic Archipelago*. (Toronto: Department of Transport).

Riedlinger, D. (in press) Looking in new directions to understand Arctic climate change: Contributions of Inuvialuit knowledge to climate change research in the Western Arctic. *Issues in the North 1999-00*.

Stevenson, M.G. 1996. Indigenous Knowledge in Environmental Assessment. *Arctic*. 49, 3: 278-291.

Stevenson, M.G. 1997. Ignorance and Prejudice Threaten Environmental Assessment. *Policy Options*. 18, 2:25-28.

Ulaajuruluk, A. 1991. IOHP File #IE 180.

Uqalik, Z. 1991. IOHP File #IE 209.

Utigak, C. 1997. Igloolik, NWT, personal communication.

Wenzel, G. 1991. *Animal Rights, Human Rights: Ecology, Economy and Ideology in the Canadian Arctic* (Toronto: University of Toronto Press).

Wenzel, G. 1995. Warming the Arctic: Environmentalism and Canadian Inuit. in *Human Ecology and Climate Change; People and Resources in the Far North*. Peterson, D.L. and Johnson, D.R. eds. (Washington: Taylor and Francis) pp. 169-182.

Wenzel, G. 1999. Traditional Ecological Knowledge and Inuit: Reflections on TEK Research and Ethics. *Arctic*. 52, 2: 113-124.

Woodman, D.C. 1991. *Unravelling the Franklin Mystery: Inuit Testimony* (Montreal: McGill- Queen's University Press).

© Copyright Shari L. Fox. 2000.