

# Environmental Health in the Canadian Arctic of Nunavut

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## **In Inuktitut, Nunavut means Our Land & Inuit means Our People**

The Canadian Arctic territory of Nunavut, established on April 1, 1999, is immense. It is as large as Europe and stretches above the tree line across more than two million square kilometers of land, water and ice. Its people, the Inuit, were previously identified by the Algonquin Indian term "Eskimo", meaning "eaters of raw flesh". The Inuit were proud to accept this designation and to identify themselves as practicing the principles arising out of Inuit Qaujimajatuqangit (IQ). IQ encompasses all aspects of traditional Inuit culture, including values, world-view, language, social organization, knowledge, life skills, perceptions and expectations.

Most Inuit communities would not have encountered white people until the European explorers of the 19<sup>th</sup> century went looking for a navigable channel - the Northwest Passage – from the Atlantic to the Pacific Ocean through the Canadian Arctic Islands and the Bering Strait. American and Scottish whalers regularly visited later in that century, eventually wintering on the east coast of Baffin Island and at Marble Island on the west side of Hudson Bay. The whalers were followed by the fur traders, who exchanged guns, flour and other supplies for animal furs. The move from traditional hunting practices in favour of trapping, by many Inuit, resulted in creating a dependency on the global fur market. With the collapse of fur prices in the 1940s a source of income for trade goods was lost. In the 1950s some inland Inuit starved to death when caribou herds changed their migration route.

When southern Canadians became aware of the plight of the Inuit in the 1950s, the Canadian government, after some delay, moved to send relief supplies to the starving and supported the establishment of settlements around existing trading posts. Within a single decade many Inuit gave up their nomadic way of life, moving from igloos and skin tents to settle into wooden houses. Additionally, government, having shown little interest in the needs of the Inuit previously, introduced education and health care services, while promoting the establishment of community councils and local government. A benevolent, yet paternalistic and bureaucratic government system, was now introduced to the Inuit way.

In the space of a single decade, nearly all of Canada's Inuit gave up a nomadic lifestyle that had

endured through millennia, to become village dwellers. Camps of two or three families were combined into settlements of 50 families or more. Previously, family groups would have moved from place to place as the seasons and food animal migration patterns dictated. Much time was spent by the sea, hunting whale, walrus and seal; and inland journeys were made to hunt caribou, which provided food and skins for warm winter clothing. Inland lakes and rivers were fished and migrating ducks and geese were stalked in the spring.

Nunavut's population now live in some 28 fly-in communities:

Total population of Nunavut (2004): 29,000 (est)

Inuit population of Nunavut: 24,650 (est)

Inuit population as ratio of overall population: 85%

Population per square kilometer in Nunavut area: 0.01

Languages spoken: Inuktitut, Inuinnaqtun, English, French

Largest community: Iqaluit, population: 6,000 (est)

## **Climate**

The mean 10°C isotherm in July is a frequently used mappable Arctic climatic boundary limit. Other boundaries often referred to are the southern limit of continuous permafrost and the tree line, both of which extend further south in the eastern Canadian Arctic than in the west. The tree line in Canada varies from 69° north latitude near Inuvik to 55° in Northern Ontario, and runs diagonally from the Beaufort Sea to a point just north of Churchill, Manitoba, and continues through the Ungava Peninsula in Quebec and Labrador. Those areas north of the tree line, which includes the Territory of Nunavut, experience mean temperatures of less than 10°C in the warmest month, less than minus 30°C in the coldest month, and below minus 10°C average for six or more months of the year.

Mean temperatures, however, do not tell the full story. On January 12, 2004 the dry bulb temperature at Rankin Inlet, Nunavut, where I live, was minus 43°C. With an extreme chill factor, because of the wind, the effective temperature was minus 71°C. And this is not as cold as it gets! During other days of that week, the effective temperature was in the minus 50s – 60s range!

Having arrived in the territory, for the first time, in May 2003, I had hoped the sea temperature would warm significantly so that I might try out my new wetsuit. The sea ice did not go out until well into July, and the sea, I am told, never warms above 3°C. Regardless, I swam in the sea from mid July until September 12, 2003!

## Sermons in Stones and Good in Everything

### Duke Senior

*Now, my co-mates and brothers in exile,  
Hath not old custom made this life more sweet  
Than that of painted pomp? Are not these woods  
More free from peril than the envious court?  
Here feel we but the penalty of Adam,  
The seasons' difference, as the icy fang  
And churlish chiding of the winter's wind,  
Which, when it bites and blows upon my body,  
Even till I shrink with cold, I smile and say  
'This is no flattery: these are counsellors  
That feelingly persuade me what I am.'  
Sweet are the uses of adversity,  
Which, like the toad, ugly and venomous,  
Wears yet a precious jewel in his head;  
And this our life exempt from public haunt  
Finds tongues in trees, books in the running brooks,  
Sermons in stones and good in every thing.  
I would not change it.*

Shakespeare "As You Like It", Act 2, Scene 1

Duke Senior's address in the Forest of Arden in *As You Like It* has, for over 45 years now, much impressed me, and continues to resonate in my understanding of how we can apprehend the environment, such that its elements and totality 'feelingly persuade' us of who we are. **The reference to 'sermons in stones' has taken on an additional meaning with my recent introduction to the *inuksuit* (singular: *inuksuk*), the standing stones of the Canadian Arctic. Throughout the world, where ancient peoples have settled, standing stones, such as dolmens, apashektas, chortens, stupas, seites; and ancient megalithic structures, speak to cosmologies that tap into the wisdom of the ages. In Inuktitut, *inuksuk* means *acting in the capacity of a human being*, and this is what these structures have done and continue to do on the Nunavut landscape to this very day. An excellent account of their meaning is provided in Norman Hallendy's book: *Inuksuit: Silent Messengers of the Arctic*, published in paperback in 2001 ISBN 0-295-98172-5.**

**The Inuit, in this vast land, have truly depended on inuksuit for physical survival since time immemorial; equally, they have revered them as sacred objects that mark out places where spirits and shamans exercise their powers for good or ill. They act as direction markers used for sighting and aligning, or for indicating a valuable caribou hunting or fish**

gathering area, to identify food caches, or the safety of an ice route. They are also used as a means to direct, herd and capture animals. The construction and shapes of inuksuit, and their arrangements are many and varied and follow patterns that convey varieties of meaning and utility in physical and spiritual realms. As Hallendy, who spent some forty years consulting with the Inuit elders and their oral tradition, notes:

*“I came to appreciate these seemingly simple stone constructions as a nuanced and once vital form of communication, a language as rich yet more elementary than the one in which I am communicating now. An inuksuk is a proxy for a human in every sense of the word; it provides comfort to the travel weary, life-saving advice to the disoriented, a focus of veneration to the spiritual seeker. It is a timeless language of the land for a people who existed on the land. As one Inuit elder told me, “This attaches me to my ancestors and to this place.” (p.44)*

### Knowledge Through Connaturality

*The great sea has set me adrift.*

*It moves me as a small plant in the running river.*

*Earth and the mighty weather move me,*

*Storm through me,*

*Have carried me away.*

*And I tremble with joy. Uvavnuk, Inuit Shaman*

As historical beings our human inclinations, behaviours and beliefs have developed and been expressed in the course of time. They have taken shape in local environments and social contexts possessing features and characteristics that we can apprehend, because, being connatured with all of creation, they are accessible to us. In our relationships of person to person; person to animate and inanimate beings; and in our explorations of spiritual realms we can be moved and carried such that reality resonates in us. Uvavnuk has expressed it very well indeed.

### Inuit Qaujimagatuqangit (IQ)

Unique features of the Canadian Arctic required that the Inuit, over millennia, adapt to the realities and patterns of an ecosystem little appreciated or understood in its full implications by the European explorers of the 18<sup>th</sup> and 19<sup>th</sup> centuries. The scourge of scurvy and the disastrous consequences of relying on technologies developed in the south might

have been avoided had a science, informed by traditional local wisdom, been accessible to the travelers. The Government of Nunavut is committed to ensuring that Inuit culture, values and knowledge are incorporated in its decision making and have established structures and mechanisms to bring this about. IQ principles have been reflected in the new Wildlife Act; Inuktitut language courses are available to non-native speakers; an IQ activities day is available to government employees; and an external council, the Inuit Qaujimajatuqangit Katimajit, has been established to advise government on IQ.

The objects of the IQ Committee are to:

- Provide advice in developing public policy to reflect IQ;
- Provide advice, as requested by government departments, on their efforts to develop and deliver programs and services within the context of IQ;
- Provide advice to departments on their efforts to demonstrate traditional Inuit values through their day-to-day operations;
- Provide advice to departments on the viability of suggested approaches to IQ issues.

### **IQ Activities Day Trip To Marble Island**

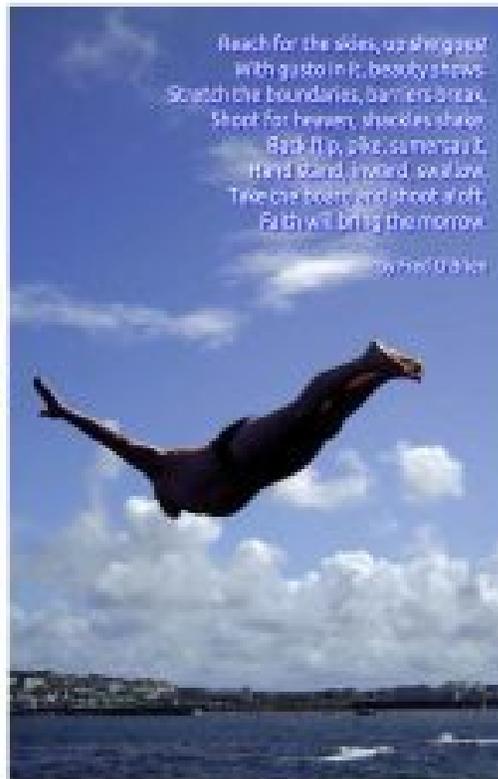
In August of 2003 I traveled on an IQ trip with a group of government staff to Marble Island, Nunavut. [Check out the history at: [www.marbleisland.ca/history03.html](http://www.marbleisland.ca/history03.html)]

I was thrilled, honoured and privileged to swim, dive and snorkel there and to see, circle and touch (I took off one glove of my wetsuit in freezing water) one of the two vessels from 1719 at some 7 metres depth! I viewed the carpentry detail through my facemask. The rectangular hatch opening was intact with bevelling nicely surrounding it. The wood is relatively well preserved, considering it sank nearly 300 years ago! In fact it is pretty solid, except at the ends where it was, perhaps, broken before sinking! Awesome! If I had had an air tank and lead belt I would have spent more time down there. It would be wonderful to get some underwater pictures/video. Additionally, on the trip, I visited the remains of Captain Knight's house and visited Dead Man's Island and the cairn graves of the 19<sup>th</sup> century whalers. Maybe I will get another chance to dive and also to view the second vessel! We traveled on the yacht Avinnaajuk, captained by Yvo Airut. Our guide on the island was Nick Tattuinee.

Have Confidence

Have Confidence

Have Confidence



I would like to talk to the ship's architect/builder. Perhaps James Knight, leader of the expedition and a carpenter, had a hand in building it! Should you shake my hand from now on, or look in my eyes you will be in touch with amazing history, the carpenter & former employee of the Hudson Bay Company, James Knight, and part of the story of Nunavut and the North West Passage! We also visited Deadman's Island and took in much of the historic landmarks. Captain James Knight was 79 years old when he sailed from England in 1719!

With some help from the travellers, Yvo Airut, the captain, cooked up some caribou and beluga whale (muktuk) for us, we had a very satisfying meal and received an important introduction to IQ. Since the trip I have eaten raw frozen and fresh caribou meat, frozen raw arctic char, raw walrus igunaq (aged/fermented meat) and other traditional foods. I am looking forward to trying out the stomach contents of caribou, for a 'tossed salad' (with some trepidation!) which I have not yet found available at any of the four community feasts I have attended. In fact, the stomach contents of animals can be a food 'treasure-trove' for the Inuit [photo of walrus stomach with de-shelled shellfish]

### **Traditional Knowledge and Some Lessons for Environmental Health**

Nunavummiut (people of Nunavut) have thrived on eating a varied diet of animals, fish and marine mammals, which are rich in the essential nutrients necessary for healthy living. Raw seal blubber, fish eggs, and seaweed provide the people of the arctic with an ample source of vitamin C. Native

mammals and fish provide omega-3 fatty acids that give significant protection from coronary artery disease. The scurvy and possible serious lead poisoning experienced by Sir John Franklin and his 128 men appears to have contributed significantly to their premature deaths in the ill-fated Arctic expedition of 1845-48. Failures in environmental health quality assurance in relation to filling the polar victualling contract of 1845 are well outlined in Chapter 22 of Scott Cookman's book, *Iceblink: the tragic fate of Sir John Franklin's Lost Polar Expedition* (Pub: John Wiley, 2000 ISBN 0-471-37790-2). Additionally, with the exhumation of the astonishingly well-preserved bodies of Franklin's crew members Petty Officer John Torrington, Able Seaman John Hartnell and Private William Braine of the Royal Marine some 20 years ago, the arctic cold allowed the secrets of the men's deaths to be stored and then disclosed at autopsy. The story is recorded in Owen Beattie and John Geiger's book: *Frozen in Time: Unlocking the Secrets of the Franklin Expedition* (ISBN 0-88833-253-X). Solder on the inside of food cans from the 1840s (the technology of the time) had leached into the foods causing serious lead poisoning to the sailors. It is interesting to note, also, that a viable *Clostridia* serotype was isolated and cultured from the bowel of William Blaine some 140 years after his death. (p159). Beattie and Geiger provide some very interesting observations:

*The health risks imposed by the use of lead-tin solder were simply not appreciated at that time. It was not until 1890 that government legislation in Britain finally banned soldering on the insides of food tins*

*There is often a terrible price to pay in human exploration reliant upon new technology. The fact was vividly demonstrated again... by the failure of the space shuttle Challenger.* (ibid. p 162-163)

It is not long since Nunavummiut were introduced to meats produced from the intensive agricultural technology based industry of the south. Such technology requires the use of antibiotics and relies on the use of other 'growth promoters'. Housing and transportation of animals in large numbers and the bringing together of animals from many locations, in addition to the large throughput of meat in large slaughterhouses, results in an increase in the prevalence of disease causing bacterial strains and in elevated background microbial levels in the raw and frozen meats produced. Additionally, it causes an increase in the prevalence of antibiotic resistant strains and the occurrence of sensitivities to antibiotics among the general public. In Nunavut, where it is traditional for many people to eat meat raw, imported raw meat can pose particular health risks.

*The structure of animals is the work of a Master who is wise and who loves the living.* Niels Stensen (Nicolaus Steno) 1638-1686

The body building and defense mechanisms of animals serve to provide wholesome food; and traditional hunting and harvesting practices are geared to ensure that the food is safe and healthy. The 1997 Canadian Arctic Contaminants Assessment Report (CACAR) indicated that, from a sample of 27 arctic beluga whales, the mercury level on the outer skin layer was some five times that of the levels in the dermis; and that approximately 20% of the total mercury in the whale skin was lost annually through molting. Skin forms the largest excretory organ of the mammal body and

higher levels in outer layers indicate normal skin function. Traditional Inuit practice in preparing muktuk (whale skin) is to remove and discard this outer layer.

Levels of cadmium found in the livers and kidneys of the Porcupine, Finlayson and Tay caribou herds of the Yukon Territory of Canada in the 90's were considered high. The 'elevated' levels were attributed, initially, to trans-boundary aerial pollution and caused a great deal of concern to First Nations communities relying on these food supplies. Further research, however, indicated that the levels were entirely natural, affirmed the proper functioning of livers and kidneys, and were as a result of high mineralization and uptake through lichens and other forage.

An elder Inuit hunter from the community of Sanikiluak confirmed to me that, to protect against trichinosis Inuit avoid hunting old male walruses. This is entirely consistent with the facts that: the incidence of trichinosis is higher among scavengers; the predominant diet of young walrus is shellfish; and the highest rate of scavenging is practiced by the old males.

The arctic variant of the 10 known genotypes of *Trichinella* is, *T. nativa*, which can survive several years deep frozen, and its local ecology and human pathology have unique features. I was pleased to help with the introduction of a double separatory funnel digestion procedure for the efficient and reliable testing of walrus meat for *Trichinella* to our local laboratory in Rankin Inlet last summer. It was developed by the Centre for Animal Parasitology (CAP), Canadian Food Inspection Agency Laboratory, Saskatoon, and CAP provided the training and back-up support to incorporate the procedure, which rapidly screens wild meat prior to consumption, into our environmental health program.

Our People – Our World

*I see his face in every flower;*

*The thunder and the singing of the birds*

*Are but his voice – and carven by his power*

*Rocks are his written words.*

Joseph Mary Plunkett

The 8<sup>th</sup> World Congress on Environmental Health in Durban, South Africa in February 2004 witnessed the gathering of peoples of many races, cultures, faiths and traditions from around the

globe. The wisdom of the ages is found in peoples of diverse origins and the local environment from which they come shapes and informs their understanding. Commitment to caring for the environment in the interest of world health helps unite those gathered at the world congress, and, whatever their origins - the paradigm, cosmology, faith or tradition that mark their path – they are precious keepers of each other, and keepers of a whole fragile world that keeps us all.

The original article *Environmental Health in the Canadian Arctic of Nunavut* was published in 2004 by IFEH and can be viewed at pps 6-10, with cover photos & credits at pps. 1 & 2 of the following link: [http://www.ifeh.org/magazine/ifeh-magazine-2004\\_v6\\_n1.pdf](http://www.ifeh.org/magazine/ifeh-magazine-2004_v6_n1.pdf)

For a cross-sectional view on the contribution of environmental health science research from the 'South' to the people of Nunavut check out:

<http://www.tunngavik.com/documents/publications/2005-02-15-Contaminants-in-Nunavut-Inuit-Capacity-Building-Workshop-English.pdf>