



# MERIDIAN

## IN THIS ISSUE

A Milestone in Conservation – The Fortymile Herd Crosses the Yukon River for the First Time in 50 Years	1
Interview: Janet McGrath on IQ	5
Investigating Cultural Adjustments to Environmental Change in the Arctic	10
What's New	12
C-CIARN North Online Conference	13
European Research: Sixth Framework Program (FP6)	14
Letters	14
Book Review: Muskox Land	15
Horizon	16

## A MILESTONE IN CONSERVATION – THE FORTY MILE HERD CROSSES THE YUKON RIVER FOR THE FIRST TIME IN 50 YEARS

*Richard Farnell*

*A hundred here, a thousand there  
A score down in the hollow  
Spread far and wide in countless bands  
As far as glass could follow*

*Three days we camped there in their midst  
Our work around completing  
Though all northwestward held their course  
We noticed no depleting.*

– H.S. Bostock, 1979<sup>1</sup>

The history of the Fortymile herd is a legacy of human abuse, mistaken assumptions, and successful recovery efforts. From the Yukon gold rush days to the present, the herd went from hundreds of thousands to near extirpation due mainly to the frontier attitudes of the time. Today, with modern wildlife management techniques and new conservation attitudes, we are witnessing the return of this magnificent caribou herd.

During the early part of the 20th century the Fortymile herd was one of the largest and most important caribou herds in North America and perhaps the world. In 1920 one

of the north's first wildlife biologists, Olaus Murie, tried to estimate its size<sup>2</sup>. While crude by today's scientific standards, Murie's account of the migrating herd showed that it was immense: "The southeast migration of the herd covered a strip approximately 60 miles wide, 40 miles representing the part traversed by the main body and 20 miles that was covered by scattered bands. The herd took 20 days to pass one spot. During eight of the 20 days about 1,500 animals in the main herd passed each day over a one-mile strip, and during the remaining 12 days about 100 a day." Based on these observations, Murie estimated the herd contained 568,000 caribou, with the following caveat: "In light of the subsequent experience, this figure seems conservative and it is safe to say that the herd numbered well over half a million, possibly much nearer a million." Clearly the herd must have been as large as some of the arctic herds we see today when it ranged over a massive (240,000 km<sup>2</sup>) area between Whitehorse, Yukon, and Fairbanks, Alaska.

The herd is named after the Fortymile River – a tributary forty miles downstream from Ft. Reliance on the Yukon River, the only supply post for prospectors in the region before the gold rush and growth of Dawson City. During this time the Fortymile herd fueled a subsistence economy in a

1 Excerpts from "The Caribou", a poem recounting one of the great migrations of the Fortymile herd in 1933. Packhorse Tracks. Canadian Geological Survey, Open File 650.

2 O.J. Murie, 1935. Alaska-Yukon caribou. *North American Fauna*, 54. U.S. Department of Agriculture, Washington, D.C., USA. 93pp.

part of the world where supplies were infamously scarce and expensive. It was also a wildlife spectacle that amazed thousands of people. The accounts of the migrations across the river were legendary. The waterway became so thick with caribou that riverboats plying the Yukon often had to tie up to the riverbank and let them pass, for fear of getting the animals caught up in their paddlewheels.

But in more recent times a tragic set of events including severe weather, predation and over-harvest led the herd to decline to about 5,000 animals by 1973. As the herd diminished so did its range use, until it no longer migrated from its summer habitats in Alaska to Yukon wintering areas. For many,

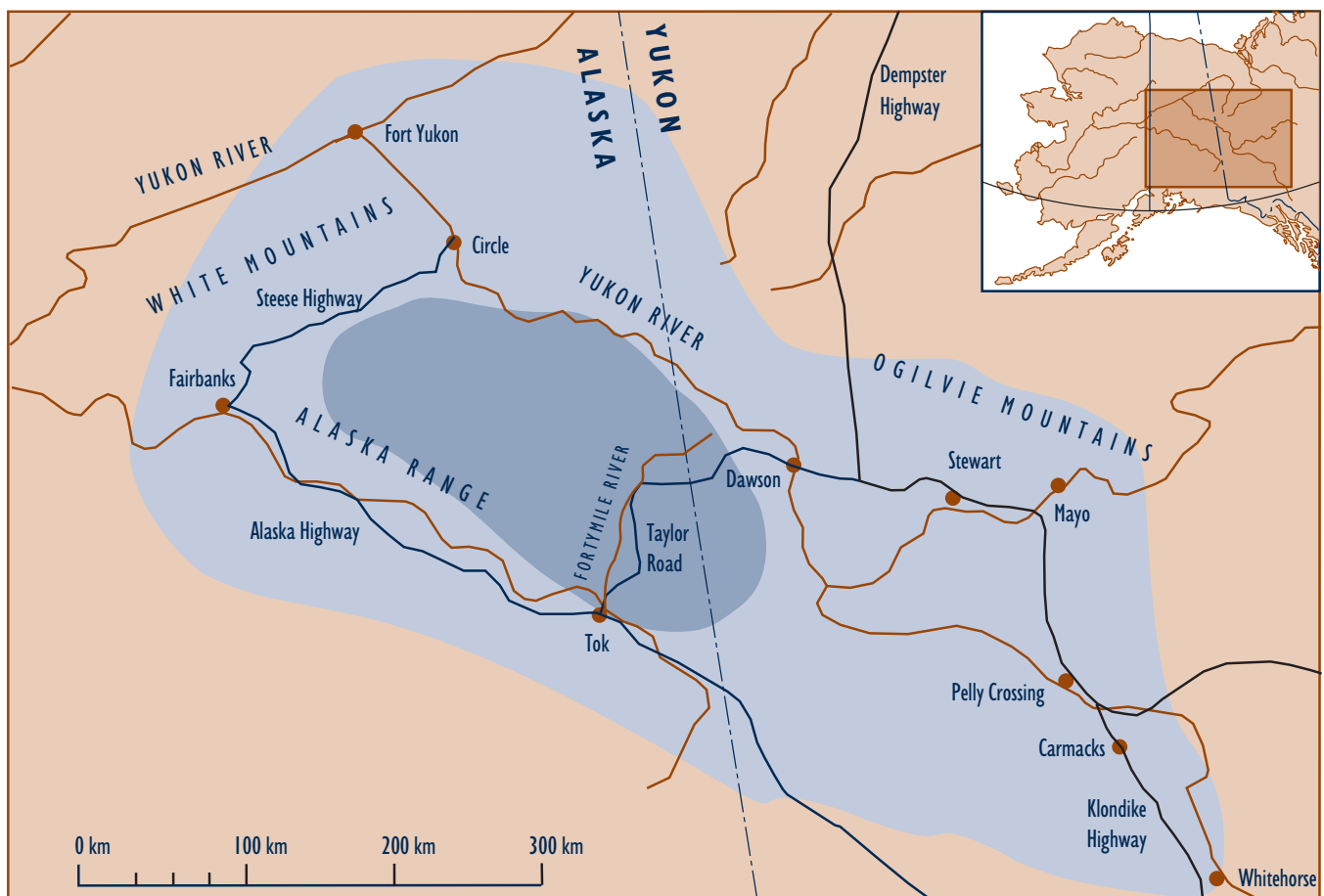
the Fortymile Caribou Herd became a distant memory.

#### WHAT HAPPENED?

Biologists theorize that the once-large herd may have overgrazed its range. This shortage of food, coupled with high predation rates and unfavourable weather conditions may have caused a natural population decline not unlike the natural fluctuations seen in many of North America's large caribou herds. However in this case a poor understanding of these dynamics during a decline in the 1960s and greater human access brought about by changes to the herd's range served to drive numbers to a tragic low point. Construction and upgrading of the Taylor and Steese highways in Alaska,

and the Top of the World and Klondike highways in Yukon marked a switch in emphasis from water routes to roads. The new roads bisected the herd's migration routes in places the animals could not avoid. Hunting was very popular. Easy road access, and liberal seasons and bag limits combined to produce years of excessive harvest. Wounding losses associated with crowded hunting conditions along the highways were high and could have equalled the reported harvest. The hunting season was not closed by emergency order until 1973 when the herd had dwindled to an unprecedented low of 5,000 caribou.

Past and present range of the Fortymile caribou herd.



- Boundary of Past Range
- Present Range



While the herd survived the gold mining boom and market hunting that accompanied it, it could not withstand heavy modern mechanized hunting during a natural decline. Some biologists theorize that the 1960s hunting reduced the population to a level well below where it would have bottomed out during a natural decline, and to a point where the force of predation prevented the

Fortymile caribou crossing the Yukon River, a common scene during the early part of the 20th century. The photo was taken from a riverboat. Photo: Yukon Archives.

herd from ever increasing again – a condition called a “predator pit”. This may have been the case, because after a limited wolf control program on part of the herd’s range in Alaska in the early 1980s, numbers

rebounded to 22,000. This program was suspended, however, because of public disapproval of lethal wolf control. The herd consequently remained static until the early 1990s, when calf mortality studies carried out by the Alaska Department of Fish and Game demonstrated that predation was in fact the main limiting factor keeping the herd down. Wolves in particular killed between 2,000 and 3,000 calves annually during this study, and between 1,000 and 2,300 older caribou.

It was thought that if the herd could only increase to about 50,000–60,000 caribou it might escape the suppressing force of predation and return to more representative numbers. Seventy percent of its former range had been unused for many decades and could clearly support a greater herd. This would be significant because recovery of the herd would also strengthen the biodiversity

Market hunters at the turn of the 20th century. Fortymile caribou were an important source of food for people during the gold rush era. Photo: Rasmussen Library Archives, University of Alaska.



of this large ecosystem – an area where predators, scavengers, and other prey species had declined coincident with the loss of the herd.

Moreover, the Fortymile herd has the highest potential of any other to satisfy non-consumptive use by the North American public. Few people are able to witness the great migrations of the arctic herds because of their inaccessibility, while the very feature that nearly destroyed the Fortymile herd, the transportation corridors, would facilitate unique public access for viewing them. Lastly, it became obvious to those concerned that if we do not do something about the herd, the next generation may become complacent and accept the animals as a relic population – assuming a smaller herd to be their natural expression as a species. After all, what do the Labrador duck, passenger pigeon, and great herds of plains bison mean to our generation, who have never experienced them?

It was at this point that the International Fortymile Planning Team, representing Yukon and Alaska communities, environmentalists, hunters, and government agencies developed a holistic recovery plan for the herd. The primary goal was simply ‘to begin restoring the herd to its former range in Yukon and Alaska’. The Team judged the most manageable way to stimulate herd growth was by reducing wolf predation using socially acceptable methods, and to prevent hunting. While it was relatively easy to prevent hunting through regulation, wolf treatment action required a challenging and experimental approach. The Team recognized that criteria such as improved calf survival and increased population growth would be good indicators of success; but more importantly, it was thought that if the herd crossed the Yukon River once again a major milestone would have been reached.

#### A D E L I G H T F U L S U R P R I S E

In spring 1997 a wolf fertility control program was implemented. Dominant pairs were surgically sterilized and about 140 subordinate and subadult wolves were translocated to other parts of Alaska. In all 16 wolf packs comprising all the wolves in the herd’s calving area were treated in this way. Wolf control went on for five years, until spring 2002. During this time dominant pairs remained and defended their pack territories, but did not reproduce. The sterilized wolves lived longer on average, likely because they did not suffer the stress of reproducing and feeding offspring. Other ecological conditions such as herd nutritional condition and weather factors remained favourable for growth, and the Fortymile herd increased to about 50,000.

In late October 2002 a marvellous sight was seen for the first time in about 50 years: some 30,000 Fortymile caribou migrated into Yukon, and crossed the Top of the World Highway. While expected, it still came as a delightful surprise for those who have followed the fate of this great herd. Many thousands of these caribou moved eastward down the Fortymile River following a historical migration route, and crossed the Yukon River to winter on range not occupied in the living memory of most Yukoners. The survey biologist who first viewed this great scene, by aircraft, reported that a cow and a calf were leading this element of the herd – the first of a new generation of caribou that have found their ancestral home.

The Fortymile wolves will now rebound in numbers, and will likely play a lesser role in the dynamics of the larger herd. If population trends continue, the herd could get to a hundred thousand by the end of the decade and reoccupy much more of its former range.

We’ve learned from this experience that with patience and cooperation, conservationists working together can correct the mistakes of the past and achieve significant goals.



Alaska Department of Fish & Game biologist Rodney Boerje weighing a Fortymile calf during a calf mortality study. Forage and nutrition indices like calf weights were favorable, indicating that range and weather conditions were not limiting the herd; predation was the limiting factor. Photo: Craig Gardner, Alaska Department of Fish & Game.

*Richard Farnell is a caribou biologist for the Yukon Department of Environment. He has worked with the public and with other professionals for many years to recover the international Fortymile herd.*

## INTERVIEW: JANET MCGRATH ON IQ

*Janet McGrath is an Inuit language and culture specialist with a strong interest in improving understanding between Inuit and Southern Canadians. She is currently working on the challenge of weaving Inuit practical wisdom and world view – what has become known as Inuit Qaujimajatuqangit (IQ) – into the institutional fabric of Nunavut.*

*Kindly describe the circumstances that led you into this kind of work.*

I grew up in Taloyoak (correctly spelled Talurjuaq and formerly Spence Bay) in what is now Nunavut, during the 1970s. At the end of the 1960s the territorial government was looking for alternative economic bases for the communities. My parents had experience in the fisheries and arts – my father as a sea captain from Newfoundland and my mother as an artist and educator from Northern California – and decided to go north with their five children. And so we moved to this strange and wonderful environment where my siblings and I became the first Southern Canadians to attend the school.

At the time many communities in the north were still in the process of being settled. Families were arriving from their seasonal camps on the land and sea ice and moving into the new government-built “matchbox” houses equipped with oil-burning stoves and electric lights. The settlement of Taloyoak was very young, the schools and other buildings were still relatively new – and the subsistence economy based on hunting, fishing, and trapping was still thriving. So was the Inuit traditional way of life, with many families still living semi-nomadically.



Janet McGrath in Arviat with Rosalie Aqqiksaut Sinnisiak (left) and Helen Aggaaqtuq Konek (centre). Photo: Janet McGrath.

I was enthralled with this new world. As I learned the language I began to realize that although its population was small, life in and around Taloyak was enormously rich – in stories, creativity, practical wisdom, and ingenuity. It was also a world in transition.

I felt a sense of urgency in the way life around was changing so dramatically. I think it came from the messages that the elders of the day conveyed. They didn't seem to approach change negatively, but rather with gentle messages of caution about what it was important to retain. I began to feel a sense of responsibility – that I was involved in some way, that I had a part to play in what was occurring.

This comes in part from a tragedy our family experienced. One of my brothers died at the age of eight from a rare strain of flu. Although we were strangers to them, the Inuit reached out to help and comfort our family, giving us what in their eyes we badly needed: an extended family to rely on. This had a profound effect on us, and cemented our connection with the community. As for myself it strengthened the sense of responsibility I felt toward elders like Anaijjaq, Uluulaaq, Inugaq, Ijittuaq, and the others who had shown us such kindness.

My parents had a great deal of respect for the Inuit elders and their world view. They were curious, and open. Instead of going to the parties at the other Southerners' homes, to which only select Inuit were invited, they would go to gatherings the whole community attended. After I learned the language they often asked me to help them understand one thing or another. I didn't always have an answer, but I learned to see my world for what it was: a place of two cultures – opposed in some ways, clashing in other ways, and simply not communicating with each other in key areas.

So that's the root of my interest in improving understanding between the two cultures. When I finished high school I worked as an interpreter for the government of the Northwest Territories. I travelled for language projects and met people from all over. I discovered that because I knew the two dialects spoken in Taloyoak (the local Nattilingmiut dialect and the South Baffin dialect

of the Kinngarmiut, people originally from Cape Dorset) I had little difficulty understanding people from east Greenland to Alaska.

I left the government in the early 1980s and began working freelance in oral history and community development projects with Inuit organizations. I have worked on Inuktitut language school curriculum development, legends and myths, art exhibitions, Inuktitut language training for adults, terminology development for science and medicine, community wellness, and restorative justice. Recently I began researching Inuktitut terminology for conflict dynamics and resolution. I was also fortunate to have the opportunity to teach Inuktitut language at Carleton University for two years. At forty I feel I've lived a very full life!

*We often hear the term Inuit Qaujima-jatuqangit (IQ) used to represent Inuit knowledge. The Nunavut Government, for instance, has committed itself to making IQ the context in which it operates; but many in the north and the south are unclear as to what IQ is.*

This is true, and the lack of a definition – and even disagreement over what it is – can be very problematic. The absence of clarity is also becoming a source of conflict between Inuit and Southern Canadian cultures in some instances. But I see this emerging debate simply as a manifestation of the two sides struggling to find words to name their

experience – that of blending with another culture, and of creating a new culture together. On one hand it's not surprising that the relevant Inuktitut vocabulary isn't understood – this reflects how the Inuit world view is generally not well understood by Southerners. It's also not surprising that there are differences among Inuit, as there are differences in experience and in history from region to region – but it's the similarities that are most important.

IQ is a dynamic, evolving entity. It's not a fixed commodity. In fact, it's not possible to come up with a firm definition of IQ. Trying too hard to do so would be a pointless struggle, and foreign to IQ itself. But what is possible – and necessary – is to look at which aspects of it relate to the system familiar to Southerners, and which do not.

There are many Southerners who genuinely want to learn more about the Inuit world view. They need a way of exploring the differences through something familiar, but without trying to understand it by trying to make it fit into the Western world view.

An example of what I mean is the way the term “traditional knowledge” has come to mean *information* passed on by elders. To move away from a definition that made sense to Southerners but not to Inuit, Inuit at some point decided that so-called traditional knowledge should be called *Inuit qaujima-jatuqangit*, a term that could stand on its own. They defined the concept this way: Inuit ways of knowing, ways of being, and world view – past, present and future.

People unfamiliar with Inuit culture began to pressure Inuit to define what those ways of knowing, being and world views were, are, and will be! Below the surface of this lies the need for building trust, and for weaving links back and forth between cultures.

E T Y M O L O G Y  
O F I N U I T  
Q A U J I M A J A T U Q A N G I T

*Qaujimajatuqangit* is broken down like this:

*qauq* is the noun meaning “forehead”; it is at the root of the following two verbs:  
*qauji-* is the verb stem for “become aware”;  
*qaujima-* is the verb stem “to know”;  
*qaujimaniq* is the noun for “knowledge” or “way of knowing”;  
*qaujimajaq* is the noun for “what is known” or “inherent/intuitive knowledge”.

*Note:* there is some division among Inuit as to whether the best term is *qaujimajatuqangit* (most commonly used) or *qaujimanituqangit*. Some say these two are interchangeable. Others say *qaujimajaq* is what a person is born with (“instinctual knowing”) while *qaujimaniq* is acquired knowledge. Inuit *Qaujimajatuqangit* refers to acquired knowing.

*-tuqaq* is a noun ending meaning “for a long time” or “ancient”.

*-ngit* indicates the possessive: in other words, the *qaujimajatuqaq* of Inuit.

*You have said that in general Southern Canadian society functions in the context of an “information-based system,” while Inuit society works on a “relationship-based system.”*

Yes, I developed this idea when I was working with an elder’s advisory group in Nunavut. I was searching for a way of defining the dynamics so that people on both sides can have some tools to create links and understand their experiences of each other. IQ springs from a view of the world that is based on relationships. Our modern Western capitalist culture, economy, and education systems are based on information. The interplay between these two contrasting world views is a fact of life where Inuit and Southerners live and work side by side. If they could be understood, then a lot of frustration and conflict could be eliminated. Let me give you some examples of how they operate. I’ll use government as a template to illustrate the information-based system.

The foundation of the information system is, as the name implies, having quality information. Knowledge is power; you are what you know. But in the relationship-based system you are, in a sense, *who* you know – because it’s based on quality relationships. The term is *inuuqatigiingniq*. It refers to those who are able to establish quality relationships with others, whose actions benefit others, and who are unselfish.

Symbolic authority in the information-based system comes from paper, the written word – policies, laws, contracts, decrees, paper money, and so on. In the relationship-based system the spoken word is invested with authority: a promise made, counsel given by parents, older relatives, elders, oral histories.

In the information-based system, elected officials and senior public servants make the decisions. It’s an exclusive process. In the relationship-based system natural leaders guide a process of consensus-building that relies on advice from community members who have relevant experience and expertise. It’s an inclusive process.

*What do you mean by “natural leaders”?*

Natural leaders are, quite simply, those who have proved their competence. A leader is someone whose capabilities are known, and is considered to have the required qualities – someone who naturally draws on the resourcefulness of individuals in the community. To choose a leader for a particular role or task, those involved get together – the gathering might include a feast – and someone suggests a potential leader. If no one opposes the suggestion, there is immediate consensus; otherwise, discussion continues until they all agree on a choice. The information system uses a structured voting system, with nominations, platforms, campaigning, and a written ballot. The organizational structure is hierarchical: those at the top of the organizational pyramid give direction, and those below carry it out. Structure in the relationship-based system is not hierarchical – it’s circular.

Communication in the information-based system focuses on the written word, whether on paper or a computer screen: reports, documents, summaries etc; and modern media. The relationship-based system relies on the spoken word – word of mouth and community radio.

The information-based system values accountability, efficiency, effectiveness, value for money, and customer service; the relationship-based system values service to others, consensus building, skill building, working collectively, environmental stewardship, and creativity in problem solving.

The information-based system tends to view things in terms of their component parts; the relationship-based system looks at how they’re connected to each other.

Clocks, calendars, and the fiscal cycle – the linear time the Greeks referred to as *kronos* (as in “chronological”) – dominates in the information-based system. Timing is external. The other Greek word for time is *kyros*, which relates to several factors working together, “when the time is right”. The relationship-based system uses *kyros*. Its timing is more internal, based on the general feeling in a group. It is partly intuitive, relying on observation and on the ability of group members to pick up on signals from each other.

Communication is direct in the information-based system: deadlines, “directives”, and so on. The relationship-based system uses indirect communication, and so it avoids direct questions and orders.

*How does all this play out in the way people relate to each other?*

I have found Vern Neufeld Redekop’s theories of deep-rooted conflict helpful in looking at this. He has developed a model that shows human identity needs fitting into five categories: meaning, connection, security, recognition, and action (From *Violence to Blessing: How an Understanding of Deep-Rooted Conflict Can Open Paths to Reconciliation*. Novalis, Ottawa, 2002). While all people share these five basic needs, how they satisfy them differs from culture to culture.

It occurred to me that the Inuit satisfy all these needs through the need for connection. It is like a primary need, or a “door” though which all others are met. Through *inuuqatigiingniq*, people are secure. Often

action takes place in the collective; sometimes if others are not acting it is not appropriate to act alone. The value of action is measured by how it serves others – and is praised accordingly. A capable hunter provides meat for the community; a capable seamstress makes warm clothes for her family. Recognition is sought through connection too. If others say you are good, then you are.

But it is highly taboo to promote oneself, or to seem to flaunt something that makes you better than another. This of course runs counter to the information system's culture of "putting your best foot forward". It seemed to me that Western culture has a system where the primary need through which the other needs are met is "recognition". Wealth and social status are forms of recognition, as is higher education. These things are sought out to provide security, the power to act on one's own behalf, connection, and so on.

Perhaps all Southerners would not define their own culture that way; but this is indeed how our culture is experienced by many Inuit. Southern people living and working in the north possess these powerful forms of recognition, which they were encouraged by their society to acquire. If recognition is the door for Southerners and connection is the door for Inuit, when the two encounter one another, their doors are either already closed, or close as a result of the encounter. A word often used by Inuit elders to describe their early encounters with white people was *ilira*. The word is very complex, as it describes a very complex emotion, but feeling intimidated and being inclined to defer to another are aspects of *ilira*.

And so, each culture, in determining appropriate ways to satisfy the universal human needs, has created filters through which we experience others.

What I know from experience is that the main way in which the Inuit and Southern Canadian cultures clash lies in how they satisfy those needs. When a Southerner comes to town and refers to his achievements (as a way to assure the listener that he is someone worth connecting to), it actually works against him, as often Inuit would prefer to know about his family—how he is connected to others. Sometimes the self-effacing way in which Inuit operate – even highly respected elders and very competent professionals – leads Southerners to overlook their qualities.

There's a term in management called "response to ambiguity". The general southern response to ambiguity is to ask questions: to inquire, and clarify. The Inuit response is to withdraw and observe: to figure things out, to learn more of the context, and so on. Asking too many questions, or a lot of direct questions, is taboo in Inuit culture. It's not respectful. It's also inappropriate to seek recognition for oneself directly; this recognition should come from others. Here's an example of what I mean.

An ambiguous matter came up between an Inuk manager and his Southern employee. The Southerner went to his boss to reassure him that he indeed had all the credentials needed to handle the matter. The Inuk boss interpreted this as self-promotion – and so instead of reassuring him, it created more discomfort and more ambiguity. The manager worried whether this employee would be accepted by his Inuit colleagues, or instead would cause him embarrassment.

The employee's reaction to his boss's response was to become more anxious. He asked some direct questions: "Have I offended you? You seem to be withdrawn from me – is there a reason?" This created more discomfort and caused the boss to withdraw even further. Fortunately the two were taking cross-cultural training at the time, and had a safe place to explore and resolve their differences. As you can see, cross-cultural

training benefits both cultures. The more knowledge we can have of ourselves and of others, the better the chance of coming together for mutual benefit. It's not enough to just tolerate each other.

As I am a Southern Canadian myself, I understand what it feels like to arrive as a stranger in an unfamiliar Inuit community, or to meet with unfamiliar people who may assume that I do not have Inuit interests at heart. I also understand where this reaction comes from – how oppressive the first years of living under government administration were for Inuit. I also know there are ways of easing the tension that my strangeness creates.

Most Southerners, when they go north for meetings or work, use the time after hours to "re-group" and be alone in their hotel. It would be wiser to find out what is happening in the community – where Inuit are going, where can you tag along. I have been to things I don't normally seek out, like bingo and church services, but there I have really felt like a part of the community, and the community has had a chance to observe me.

I remember a wedding dance in Arviat where I got caught up in a square dance I knew nothing about. People laughed pretty hard at my confusion, and I laughed at myself too, coming from Taloyoak where our square dances are very different. People stopped to chat with me after that, showing they were interested in getting to know me.

It's important to encounter Inuit culture and adapt in any way that suits you, but not try and change who you are or try to be Inuk if you are not. What is more valuable to Inuit is that you have a genuine respect for them, and that you are aware of the impact that the culture you represent has had on their history. Can you imagine your own grandparents having their first children and then



foreigners coming to take them away, saying that they will learn a new culture and language and come back in a few years? Say those children who were taken away were your own parents, and they came back one day unable to communicate or relate to their parents and their community. Over years of reintegration and a great deal of suffering, they regained lost ground and raised you. What would your relationship be like to the institutions, the government system, and the culture that created them? This is why I don't feel badly about occasionally being judged or stereotyped at first by my Inuit contemporaries. We all want to be accepted – but the need for reconciliation is real.

*What practical effect would adoption of IQ principles by institutions mean to everyday life in Inuit communities?*

The primary effect would be that Inuit would feel validated and recognized. These institutions would become something that Inuit could relate to. Something about them would resonate: they would inspire a connection and co-ownership. Without IQ values and principles, the government building is the “*Qallunaat* (Southerners’) place” and represents a unidirectional relationship, not a mutual one. Even in a government workplace where there is no front-line service contact with the community, it is still important to validate the culture and experience of Inuit that work there, as well as the Southerner's desire to participate in building Nunavut or whatever other region, together with Inuit. The communities in general are so small that it's quite feasible to work together.

*What effect would it have on Southerners living in the north or working temporarily with Inuit?*

I think they would experience their trip differently if they were open to this other way of being. Their work would be different too. The kinds of decisions they make and how they make them would be altered slightly, but these small changes could help them really connect to the Inuit way, and by extension the communities they're working in. For instance, if there is an opportunity to go fishing or hiking or making tea on the land with Inuit and they take the time to do it, they will learn a lot about what is valuable to Inuit. If they feel slightly outside of their comfort zone, linguistically or culturally, they will have learned something of what Inuit experience with our culture. These experiences are important in weaving links of respect, appreciation and empathy.

*How can you see IQ being used by institutions in the north?*

If we define IQ for now as a way of relating to the world and to others, then institutions in the north must become very people oriented. Not only people oriented, but *relationship* oriented. If they remain *information* oriented, there will not be a place for IQ to exist, because it requires relationships to be valued. Health centres, education facilities, government services and programs will need to adapt to the context of the community. Each profession has its own well-developed culture and set of norms, which it tends to impose on the people it serves. The problem in the north is that the people these professions serve don't have the same world view, and their need to connect needs to be validated. It will take a lot of courage and creativity to change, to adapt to IQ, but the results will be very rewarding for those who take on the challenge.

*Do you have suggestions for those who wish to understand and use IQ?*

Spend time with Inuit. Do things together – especially land-based activities. Listen and observe intently; avoid asking a lot of questions. Trust that a shift in power could mean more for each side. Examine your assumptions (“Why do I have this judgment, and where does it come from?”). Sometimes IQ thinking demands an open-ended approach to a problem, and much repetition over the same ground until a solution begins to appear. Move away from viewing and treating IQ as a system of information (from our information-based culture, economy and system) to seeing it as a way of relating to society, individuals, and the land we depend on (for our collective culture, economy and system).

*What inspires you to do this work?*

I get a lot of satisfaction out of seeing people being able to decode their own experiences, and deepen their respect for the Inuit way. I'm inspired by how much more each side has when they're linked together. It's exciting to see new bridges built between cultures, through language, ideology, programs, services, and new institutions. There's a long way to go still, but what encourages and inspires me is the level of dedication I see to pioneering through the unknown.

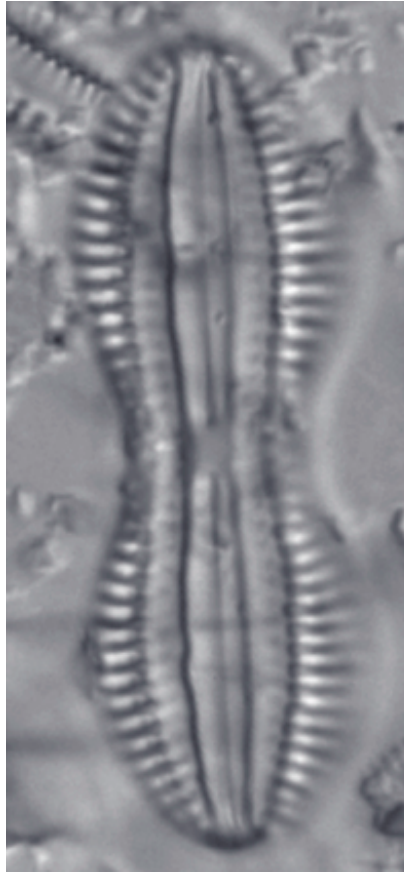
There was an era in colonial history when the north was explored physically – and the explorers who succeeded were open to learning the Inuit way of doing things. Now, we are embarking on a new kind of exploration, one that entails an equal partnership with Inuit. Together, we are now exploring a new way of being, one that is enriched by *Inuit Qaujimagatuqangit*. This is enormously inspiring, and goes well beyond North-South relationships, to new ways for post-colonial era governments to relate to indigenous people around the globe.

# INVESTIGATING CULTURAL ADJUSTMENTS TO ENVIRONMENTAL CHANGE IN THE ARCTIC

Julie Ross

Many Canadians today are only superficially aware of weather and even less aware of climate, the inter-annual variability in weather. However, we are becoming more so as we learn about climate change and its potential effects on our lives. Will we need to adapt – by making changes in our diets, our transportation, the type of houses we build, and where we live? In arctic prehistory, changes in food, technology, architecture and settlement locations may all have been affected, at one time or another, by climate change.

Anthropologists have debated the extent and nature of cultural adaptations to climate since the early 20th century. Research in the arctic has great potential to further understanding of this question, because the arctic ecosystem is exceptionally sensitive to change, and palaeoclimate records from the



*Diploneis interrupta* (Kützing Cleve 1894) (marine).  
Photo: Julie Ross.

regions can help reveal what kind of climate change has occurred. Also, the Palaeo- and Neoeskimo occupation of the Arctic caused no large-scale impacts on the environment that would have interfered and complicated the climate signals seen in the palaeoenvironmental records.

Recent research has considerably augmented available data, revealing significant regional differences in prehistoric culture and climate across the Arctic; but the relationship between climate and culture across the Arctic has not been examined in detail since the late 1970s. The goal of my research is to evaluate the connection between arctic environmental change and cultural change, in light of both the regionalism evident in the Canadian Arctic, and the new data from the past three decades of palaeoclimatic and archaeological research. I am looking at macro-adjustments in human behaviour, such as abandonment of different regions; and meso-adjustments, such as regional cultural changes, to explore possible links with environmental changes.

The study consists of two sections: a major literature review and a case study. The first is a synthesis of the environmental and archaeological literature for the Canadian Arctic. Preliminary results from the published cultural and climatic records for Ellesmere Island provide evidence for a correlation between climate and cultural change in some instances, while in other cases the evidence is inconclusive.

Two Neoeskimo groups, the Thule Ruin Island Phase and the Classic Thule, occupied Ellesmere Island at AD 1200 and AD 1300 respectively. This corresponds to the so-called Medieval Warm Period (approximately AD 900–1350). Despite the name, the climate record does not reveal whether





The author and Dermot Antoniadis taking core samples from Lake 4, near Cambridge Bay. Photo: Julie Ross.

Ellesmere Island actually became warmer during this period. By 700 years ago, however, there does seem to have been a slight warming, indicated by the increase in melt layers on the ice caps. The arrival of the Thule at Ellesmere Island cannot necessarily be tied solely to local climate conditions, as social factors are also possible reasons. The climate cooled 1.5–2.5°C from AD 1570 to 1850, and this was in fact the coldest period of the Holocene. In the middle of it – and very likely because of it – the Thule abandoned the island.

The second part of my research consists of an environmental archaeology case study from south-eastern Victoria Island, Nunavut. The archaeological data comes from the Iqaluktuuq Project, which was started in 1999 when the Kitikmeot Heritage Society of Cambridge Bay contacted the University of Toronto to initiate archaeological exploration of the Ekalluk River region, northwest of the community. The environmental data will derive from two environmental proxy indicators: diatoms and pollen grains, in lake cores from the Cambridge Bay region.

Diatoms (*Bacillariophyceae*) are a class of unicellular algae with a silica cell wall (frustule) that preserves well. This, coupled with the diatoms' ubiquity in aquatic settings, sensitivity to ecological variables, and short lifespan, makes them an ideal environmental proxy indicator. Factors that influence the abundance of diatoms include light, pH, nutrients, trace metals, and conductivity.

Pollen can be used as a proxy indicator for July summer temperature, precipitation, and occasionally wind direction. Like diatoms, pollen grains are distinctive in shape, size, and sculpturing. Depending on the level of corrosion, they can generally be identified to the genus and sometimes to the species level.

This research is in progress, but some preliminary results are available. In order to obtain a palaeoclimate record for the Cambridge Bay area a range of lakes were cored. The cores from a lake designated "Lake 4" (69°09N, 104°42W) were chosen for two reasons. First, because of its elevation, the lake should record at least the past 5,000 years of environmental change. It lies at approximately 55m ASL and although its exact emergence date is unknown we can

hypothesize that Lake 4 would have become isolated from the sea between 6,000–7,000 years BP. Shells from a raised beach at approximately 30 m ASL have been dated to 4920 ±100 BP (GSC-4254), and shells from another raised beach at 157 m ASL to approximately 8020 ±100 BP (GSC-4313 shells). Based on this evidence the hypothesis is reasonable. Also, a Lake 4 core contained laminated sections, which can provide additional environmental data.

A preliminary scan of the diatom samples indicated that the cores recorded the marine emergence event, and thus about 6,000–7,000 years of environmental data. The cores are 200 cm in length, with the marine diatoms approximately 120 cm below the surface. The preliminary scan results suggest pollen concentration may be too low to analyse. Since the analysis of the cores are still being conducted, it is too early to tell whether a possible occupation hiatus in the

Ekalluk River Region between 2800–2500 BP correlates with climate change.

The Arctic is considered particularly sensitive to current trends in global warming and considerable research is being conducted to understand current and future impacts on northern communities. My research will place these issues into a longer-term framework, in which millennia of climatic changes and cultural adjustments will provide a backdrop for present events.

#### *Acknowledgements*

This project was funded directly by the Canadian Polar Commission Scholarship (Association of Canadian Universities for Northern Studies), the William Taylor Award (Canadian Museum of Civilization), The Kappa

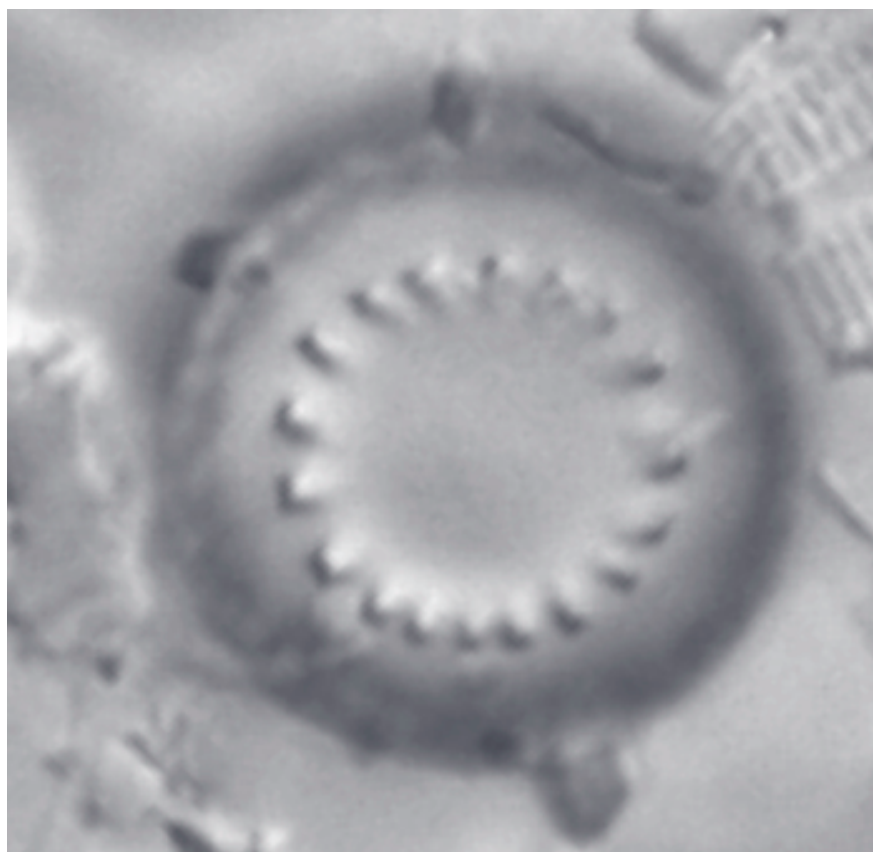
Kappa Gamma Foundation Scholarship, a Social Science and Humanities Research Council (SSHRC) Doctoral Fellowship, and the Northern Scientific Training Program (Department of Indian Affairs and Northern Development). Additional support came from Max Friesen's SSHRC Grant and the Polar Continental Shelf Project in support of the Iqaluktuuq Project. I would also like to thank the Kitikmeot Heritage Society and the community of Cambridge Bay.

*Julie Ross, winner of the 2002 Canadian Polar Commission Scholarship, is doing doctoral research in the Department of Anthropology at the University of Toronto.*

## WHAT'S NEW

### NEW BUDGET SUPPORTS NORTHERN RESEARCH

The recent Budget provides \$16 million over the next two years to expand federal northern research programs. An additional \$6 million over the next two years will help the Polar Continental Shelf Project provide air transport and land-based infrastructure to Arctic researchers. A further \$10 million over two years for the Targeted Geoscience Initiative will permit extension of the program's mission to the energy sector, including related activities in the North. The granting councils will also be asked to increase their support for northern research as part of the increased funding they receive in this budget.



*Cyclorella* sp. (marine). Photo: Julie Ross.

## C - CIARN NORTH ONLINE CONFERENCE

*Claire Eamer*

In January 2003, 67 people from Canada, the United States and Europe took part in a workshop on the impact of climate change on northern infrastructure – and not one of them had to leave home.

They exchanged ideas through the Internet in an online workshop organized by the North region of the Canadian Climate Impacts and Adaptation Research Network (C-CIARN North) and hosted on the Canadian Polar Commission's CPIN web service.

The idea of an online workshop was born of necessity. C-CIARN North is committed to linking researchers and stakeholders involved in climate change impacts and adaptation in northern Canada. Delivering on that commitment within a very modest budget requires imagination.

Face-to-face meetings are prohibitively expensive in the North, both in money and time. Moreover, many of the people involved in northern research are based outside the North, further increasing the cost and difficulty.

In searching for a solution, C-CIARN North looked at a series of online workshops run last year by the Arctic Research Consortium of the United States (ARCUS) and decided to try a similar approach.

The major barrier was online hosting, which requires specialized software and expertise. That's where the Canadian Polar Commission's web service came to our rescue.

CPIN webmaster Jean-Marie Beaulieu was interested in experimenting with an online workshop and donated both web space and a great deal of time and enthusiasm to the project. In the course of designing and running the workshop, we all learned a great deal – not least, that the medium works quite well for this type of event.

More time and enthusiasm came from our workshop co-chairs, Karen Bergman of Transport Canada in Edmonton and Karen Henry in Hay River, a project manager with the Government of the Northwest Territories. They helped develop the workshop's very simple structure, drummed up participants ahead of time, and kept a gentle guiding hand on the discussion during the workshop.

We advertised the workshop primarily by e-mail, newsgroups, and through the C-CIARN North website ([taiga.net/c-ciam-north](http://taiga.net/c-ciam-north)). Since the primary audience was people with easy access to the Internet and some familiarity with its workings, we felt web-based advertising would be the most effective approach.

The workshop ran for two days, during which the workshop website was open for posting. Since participants spanned nine time zones, from Norway to the Yukon, we were concerned about keeping a wide enough time window that everyone could participate.

Most discussion took place during the mid-morning to mid-afternoon period when office hours in North America overlap. A few contributions came in overnight, mainly from people who were catching up on the day's discussion at home.

Over the course of the two days, more than 80 messages were posted to the workshop. Participants also posted background documents and links to websites where more information was available. The exchange was generally lively, informed, and productive. A number of action items for C-CIARN North came up, and some useful contacts and alliances were created among participants.

The online format allowed people who might never have the opportunity to meet

face to face to meet and exchange ideas and information on equal terms. Active participants in the workshop came from places as diverse as Haines Junction and Pelly Crossing in the Yukon, Fort Simpson and Yellowknife in the NWT, Cambridge Bay in Nunavut, Vancouver, Edmonton, Toronto, Ottawa, and Montreal. Their backgrounds were equally diverse, from northern community leaders and managers to academics and officials who participate on the international stage.

A full transcript of the workshop is available on the C-CIARN North website at [taiga.net/c-ciam-north/online1.html](http://taiga.net/c-ciam-north/online1.html). The workshop website itself can be seen on the CPIN Forum at [orchestrabycrossdraw.com/polarcom/](http://orchestrabycrossdraw.com/polarcom/).

C-CIARN North's first online workshop was an experiment, and a successful one. Although we've found ways to improve the model, at both a technical and an organizational level, both C-CIARN North and CPIN are pleased with how well the format worked. One participant said that, given the cost to the environment of flying people to meetings, online workshops should be the first choice in future for this sort of gathering.

C-CIARN North's second online workshop, Climate Change and Resource Development, took place in early February. We plan to hold more online workshops on other topics, such as wildlife and habitat management, in the future. Keep an eye on the C-CIARN North website or the C-CIARN North newsgroup on CPIN for dates and details.

*Claire Eamer is Yukon coordinator for C-CIARN North.*

## EUROPEAN RESEARCH : SIXTH FRAMEWORK PROGRAM (FP6)

*Steven C. Bigras*

The European Research 2002 conference was held in Brussels, November 11–13, to launch the European Union's Sixth Framework Program (FP6) for Research, Technological Development and Demonstration (RTD) Activities. Between 2002–2006, FP6 will channel 17.5 BEuro in EU funds into transnational, multi-year European research consortia. Over 8,000 participants and 200 speakers from 61 countries attended the conference.

Canada achieved a significant presence at the FP6 launch. The Canadian delegation included 49 government, academic, non-profit and industry representatives, who were on site to raise Canada's profile, to explore opportunities for Canadian participation in FP6 consortia, to learn about FP6's specific thematic work programs, rules for participation and call for proposals, and to hold bilateral meetings with Research and Development (R&D) officials from various nations.

A "Partner with Canada" booth in the conference exhibition, and the three-hour "Canada Session" were designed to increase European awareness of Canada's R&D capacities, including Canada's polar research capabilities, and facilitate partnering between Canadians and Europeans vis-a-vis FP6 research consortia.

FP6 seeks to structure and integrate European R&D, and to realize the concept of a European Research Area (ERA). In addition to strong horizontal priorities, it focuses research effort through seven thematic priority areas:

- Genomics and biotechnology for health
- Information society technology
- Nanotechnologies, intelligent materials, and new production processes
- Aeronautics and space
- Food safety and health risks
- Sustainable development
- Citizens and governance in an open European knowledge-based society.

For more information on how to participate in the FP6, the European Commission has prepared a detailed "Guide for Applicants under the Sixth Framework Program". It can be obtained by contacting the Director-General for Research Information and Communications Unit, European Commission, B-1049 Brussels, Belgium or on the internet at [europa.eu.int/comm/research/contact-en.html](http://europa.eu.int/comm/research/contact-en.html).

*Steven C. Bigras is Executive Director of the Canadian Polar Commission.*

The use of natural gas during the last century has contributed about 15% of the present enhanced carbon dioxide content of the atmosphere and oil about 45%. The use of gas hydrates might replace natural gas and oil when these resources gradually become increasingly costly to exploit over the course of the 21st century. In the light of large resources that seem to exist, these might then become a major source of primary energy for the world, perhaps to some extent even replacing the use of coal. There would be some advantage to the latter, because of the larger amount of energy provided per unit of emitted carbon dioxide. But the use of carbon dioxide-emitting energy resources at that time in the future seems most questionable because of the continuing enhancement of the atmospheric carbon dioxide concentrations that would be experienced and therefore the further increase of global warming. This would certainly be very much against the intentions as expressed in the UN Framework Convention on Climate Change, that Canada has ratified.

It should also be noted that the amount of methane in the atmosphere, also a powerful greenhouse gas, has increased by about 150% during the 20th century and leakage from natural gas exploitation has probably contributed some 20% to this increase. Precautionary actions might perhaps be taken to avoid the emissions of methane when exploiting the gas hydrates, but whatever is emitted would contribute to enhanced methane concentrations in the atmosphere, in spite of the rather limited lifetime of a methane molecule in the atmosphere.

An extensive use of gas hydrates as a source of primary energy is certainly going to be most controversial.

*Bert Bolin*

*Bert Bolin is Emeritus Chair of the Intergovernmental Panel on Climate Change (UN).*

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## LETTERS

Your article "Exploring for gas hydrates in the Arctic" in the last issue of the *Meridian* is interesting but very misleading when it comes to the discussion of environmental consequences – particularly climate change – of exploitation of this natural resource. The reserves are huge, "conservative estimates place the world-wide amount of total

carbon bound in gas at approximately 2,000 to 7,600,000 trillion cubic metres of gas, twice the amount in all known reserves of natural gas, oil and coal". This resource might of course be exploited in the future for its own intrinsic value and not merely to replace natural gas.

## BOOK REVIEW :

Graham Rowley

# MUSKOX LAND

*Ellesmere Island in the Age of Contact*

LYLE DICK

*Muskox Land: Ellesmere Island in the Age of Conflict.* By Lyle Dick. Calgary: University of Calgary Press, 2001, xxv + 615 pages.

Muskox Land is the English translation of Umingmak Nuna, the name the Inuit gave to Ellesmere Island, the largest and most

northern of the Queen Elizabeth Islands of Canada. The book is a detailed study of many aspects of the area, including the geology, geography, biology, population, and cultural history, and will appeal to all those interested in the Arctic. Arctic historians and others covering the exploration of the Arctic tend to conclude their research with the many Franklin search expeditions, which did so much to explore the northern islands, and to neglect the later work that filled in the gaps. Those concerned with the preparation of more complete versions of the exploration of Canada will find this book particularly valuable.

In such a careful and comprehensive work I was surprised to find no reference to Gerard Kenney's *Arctic Smoke and Mirrors*, either in the text or in the detailed bibliography, and Dr. Dick appears unaware of it. As a result he appears to have accepted the account of the Royal Commission on Aboriginal Peoples including its views on the Inuit relocations to Grise Fiord, despite the many shortcomings of this Commission, its procedures, and conclusions, which are often opposite to those reached in Kenney's carefully researched book. For example he quotes various Inuit criticisms of the relocation made years after when they were seeking compensation from the government, and the reader is left unaware of the many Inuit letters written at the time thanking the government.

With this reservation I have no hesitation in recommending *Muskox Land* to all with an interest in this area and its inhabitants that it describes so well.

*Graham Rowley is an explorer, archeologist, and retired public servant.*

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## **Third Biannual Conference on Assessment and Remediation of Contaminated Sites in Arctic and Cold Climates (ARCSACC)**

4–6 May 2003

Edmonton, Alberta, Canada

[civil.ualberta.ca/arcsacc](http://civil.ualberta.ca/arcsacc)

Chair: [kwbigger@civil.ualberta.ca](mailto:kwbigger@civil.ualberta.ca)

Technical Program Coordinator:

[michael.nahir@pwgsc.gc.ca](mailto:michael.nahir@pwgsc.gc.ca)

Phone: (403) 492-2176

Fax: (403) 492-8198

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## **3rd International Mammoth Conference**

24–29 May 2003

Dawson City, Yukon, Canada

[yukonmuseums.ca/mammoth/index.htm](http://yukonmuseums.ca/mammoth/index.htm)

John Storer

Yukon Palaeontologist

Fax: (867) 667-8007

Email: [John.Storer@gov.yk.ca](mailto:John.Storer@gov.yk.ca)

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## **Yukon International Wind Conference**

25–28 May 2003

Whitehorse, Yukon, Canada

[yec.yk.ca/wind/index.php](http://yec.yk.ca/wind/index.php)

J.P. Pinard

Phone: (867) 393-2977

Email: [jppinard@polarcom.com](mailto:jppinard@polarcom.com)

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## **International Conference on Arctic Margins (ICAM IV)**

30 September – 3 October 2003

Dartmouth, Nova Scotia, Canada

[ICAMIV.org](http://ICAMIV.org)

Abstract deadline is 31 May 2003

Dr. H. Ruth Jackson

Natural Resources Canada, GSC Atlantic

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Phone: (902) 426-3791

Email: [rujacks@nrcan.gc.ca](mailto:rujacks@nrcan.gc.ca)

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## **7th Student Conference on Northern Studies**

24–26 October 2003

Edmonton, Alberta, Canada

[scns.onware.ca](http://scns.onware.ca)

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## **8th Circumpolar Universities Cooperation Conference**

7–10 November, 2003

Whitehorse, Yukon, Canada

[yukoncollege.yk.ca](http://yukoncollege.yk.ca)

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