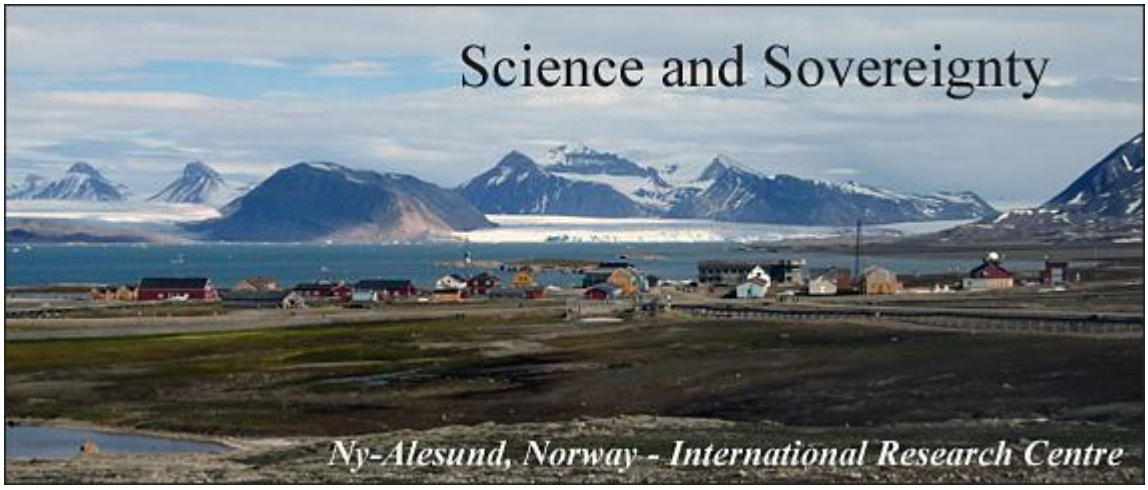
Arctic Sovereignty



Norway top of the class at the top of the world

On the site of a former coal mine, Norway has built an international research centre that Canada can only envy.

Ed Struzik, Edmonton Journal Published: Sunday, June 20 2010

The snowmobile trip from Ny-Alesund to the Kongsvegen Glacier is a one-hour ride along a razor-thin coastal plain that straddles the mountains and massive icefields of Spitsbergen in the Norwegian archipelago of Svalbard.

This is a relatively easy trip, I was told, except for one small section where the route squeezes through a narrow passageway between two cliffs that separate the snowy mountains on one side of the fiord and the icy sea on the other.

"There's a bit of a slope, so you have to really lean uphill towards the cliff on the mountainside as you pass through," said Jack Kohler, a glaciologist with the Norwegian Polar Institute. "Best to go slow and stick to the trail, which is pretty well tracked and hopefully not too icy. Otherwise, you could slide down and go off the other cliff straight into the water."

"It's not as bad as it sounds," he added. "Besides, you're Canadian. You guys snowmobile every day, don't you?"

Kohler looked at me and I looked at him without offering comment. I wasn't sure whether he was serious or just pulling my leg. But given the possibility that he might think twice about having me along to watch as he drilled a core into the heart of the glacier, I thought it best not to tell him that I hadn't mounted a snowmobile in two years.

It had been three days since I arrived in NyAlesund, a town of just 40 people who live in the most northerly permanent settlement in the world.

Small as it is, I was still having trouble deciding what to make of the former coal-mining village that was turned into an international Arctic research station.

Part of it, no doubt, had to do with jet leg; it took me more than two sleepless days of flying from Edmonton to London to Oslo and Longyearbyen in Svalbard before getting on the charter that flies into Ny-Alesund twice a week. The weather was also a lot warmer and snowier than what one might expect at the same latitude in Arctic Canada or Russia.

But mostly it was the culture of Ny-Alesund, and how it fits into Norway's Arctic vision and sovereignty strategy that puzzled me.

Most of the inhabitants of Ny-Alesund are foreigners. The German, French and Chinese scientists are here pretty much year-round with the Norwegians. The Japanese had left the day I arrived and some of the Italians were packing up to go. The Dutch, the British, the Koreans and the scientists from India would be here for the summer.

Each one, I soon learned, brings with them something from home -- food, drink, coffees, teas, language, attitudes and research priorities that set them apart. Norway's interests in the Arctic are not uppermost on their minds.

Yet, when they all come together in the dining room to eat three times a day, there is a clear sense that they are here for a common purpose. And that is to study atmospheric phenomena and the largely unexploited ecosystem in the Arctic that is rapidly changing in an increasingly industrialized and warming world.

Norway's generous facilitation of this research was inspired in part by the 1920 treaty that gave the country absolute and unlimited sovereignty over Svalbard, which was up until that time a "no man's land."

"In addition to obliging Norway to preserve the natural environment of the region, the Svalbard Treaty prohibits the establishment of military fortifications in the archipelago. That stated, all 39 signatories to the treaty, Canada being one of them, have the right to hunt, fish and undertake maritime, industrial or mining activities so long as they adhere to Norwegian laws.

While the treaty provides no specific rules for scientific research, Norway has given most everyone the right to set up a field station at Ny-Alesund so long as they are willing to pay rent and follow some basic rules.

The rent, however, does not come near to paying the costs associated with running the facilities, which include everything from a state-of-the-art marine laboratory and a diver decompression tank to a liquid nitrogen maker. As a result, the government of Norway spends tens of millions of Norwegian kroners each year to maintain the infrastructure and subsidize some of the science.

This is the price that Norway is willing to pay to uphold the integrity of its sovereignty in the region. Unlike the situation in Canada, which has left most polar scientists begging for funding, science is one the cornerstones of this country's Arctic strategy.

Evidently, the deal is a good one. Today, there are ten countries operating 14 research stations in and around the town. Norway has another research station in Longyearbyen and the Poles and Russians operate their own in other parts of Svalbard.

Given the growing international interest in the Arctic these days, the number of research stations in Ny-Alesund is likely to rise in the coming years if a way can be found not to compromise the local ecosystem.

"The Russians have applied to come," Kim HolmEn, the research director for the Norwegian Polar Institute told me earlier that day. "The Americans have got a foot in the door through the National Science Foundation. I find it odd that Canada is notably absent. I've had several of our people on your icebreaker Amundsen, but to date none of your scientists have come here."

It's not the first time this has been pointed out to me on my trip through Norway. Most people here see Canadians as they see themselves -- an Arctic or northern people whose view of the world has been shaped by snow, ice, long summer days and short winter nights. Both are energy superpowers. While the Norwegians have the Sami to instil a sense of soul into their culture, the Canadians have the Inuit, the Inuvialuit and the Gwich'in to remind them of the human dimension to this part of the world.

That's also why some Norwegians can't figure out why Canada can sign research agreements on the Arctic with Great Britain and South Korea and show little interest in setting up shop in Ny-Alesund. If the Canadians knocked on the door to get a foothold in Svalbard, HolmEn suggested, he'd gladly find a way of opening it.

"We need all hands on deck," he told me. "The challenges that climate change, energy development and tourism bring to the Arctic are not going to be solved by one country."

"Canada is a giant in the Arctic, and many of us look to it for leadership on many issues," says Morten HOglund, who chairs Norway's Arctic parliamentary delegation.

"But we are getting the sense that Canada wants to go it alone. Increasingly, we're finding it easier to get agreements on the Arctic with the United States than with Canada. In the past, on most other issues, it was the reverse situation."

Hoglund emphasized that this is more his perception than it is perhaps fact. But he says the parliamentary delegation deems it important enough to look at how the relationship might be improved.

Jack Kohler is a beneficiary of this open-door policy in Norway. Born and raised in the United States, he and his Swedish wife came here eleven years ago when the Norwegian Polar Institute was scanning the globe searching for scientists to work at their new base in TromsO on the northwest coast of the Norwegian mainland.

The job, he told me, has given him and his colleagues the long-term support and security they would have difficulty finding in the United States and certainly not in Canada.

"My wife and I have thought of leaving to pursue new opportunities," he concedes. "But where could we both go to do this kind of research in one place?" Kohler's research in Svalbard really isn't much different from the kind of work that Canadian scientists such as Martin Sharp of the University of Alberta are doing in the Arctic. He uses similar tools to determine how quickly the glaciers in the region are receding.

But unlike Sharp, who spends a considerable amount of his time filling out endless research funding applications for limited dollars, Kohler generally needs to go no further than HolmEn to get the resources he requires.
Kim HolmEn is a tall, 54-year-old man with a balding head and a long, scraggly grey-white beard.

The dark sunglasses he wears outside makes him look like a member of the American blues-rock group ZZ Top. The beard, he told me, grew out of a bet he made with a machinist working at Ny-Alesund ten years ago over who could grow the longest.

"Who won?" I asked when he offered the explanation.

"Nobody yet," he said, stroking his beard. The beard was flying in the wind when he arrived on snowmobile to join me and Kohler later that day on top of the glacier.

It was snowing and blowing by this point, and the fog that had descended to the ground turned everything into an eerie pastel of grey and white.
Kohler was testing the drill system for NPI colleagues in Antarctica while HolmEn and I looked on.

The Norwegian Polar Institute is Norway's central institution for research, environmental monitoring and mapping of the polar regions.

The organization traces its roots back to 1906, when the first Norwegian scientific expedition took place in Svalbard. Its geographic scope was expanded in 1948, when Norway staked its claim in Antarctica. Since 1979, it's been operating under the auspices of the Ministry of the Environment.

In addition to the research stations at Ny-Alesund and Dronning Maud Land in Antarctica, the Institute has its own research vessel, "Lance," which operates mainly in Arctic waters

Today, some 110 scientists and management officials work for the Institute. Many of them rotate in and out of Ny-Alesund year-round, some to conduct their own research, others to provide logistics for Norwegian and international activities.

"Ny-Alesund is not without flaws," HolmEn told me. "There are gaps in the research that we need to fill. We also need to work together in collecting the data so that we can all benefit from what is being done here."

HolmEn was late in joining us because he was polishing a ten-year, $200-million proposal that would address that issue and further the research interests in Svalbard.

An ambitious plan like his wouldn't have a chance in Canada, where scientists are in tough. Among them is James Drummond of Dalhousie University, who is struggling to keep his High Arctic atmospheric research station at Eureka alive.

Drummond got money to refurbish his station, but because the Canadian government is ending its support for the Canadian Foundation for Climate Change and Atmospheric Research, he is going to be hard pressed to keeping it going.

The Canadian Polar Continental Shelf Program, which provides lodgings, logistics and field support for scientists like Drummond also got infrastructure cash. But its budget is so small that it has been having serious trouble providing scientists with the air support they need to get their work done.

To be fair, Norway has a number of advantages over Canada. Not least among them is the fact that the country is one of the richest in the world, thanks to all the

oil and gas it owns in the Norwegian and Barents seas. It also has the ability to tap into the European Union for support.

And while a substantial amount of Arctic research in Norway is undertaken by the Norwegian Polar Institute, a greater share of the work in Canada is done by university scientists.

Initially, I was surprised to discover that HolmEn is Swedish, not Norwegian. I had assumed that Norwegians would have wanted one of their own to oversee an international station that has attracted the attention of high-profile people like Hillary Clinton, John McCain and royalty from both Norway and Sweden. Not a month goes by, it seems, without some prominent figure or delegation passing through.

In many ways, HolmEn is perfect for a job that involves working with so many different nationalities.

The son of a globe-trotting father who worked for Ericson, the Swedish telecommunications giant, he lived in 20 countries by the time he was 16 years old.

"It was not as difficult as you might think because I knew no other life," he said. "But I admit that it was sometimes confusing. Going from a Muslim country, for example, to a place like Rio de Janeiro when I was a teenager did pose some interesting challenges."

Those early experiences in life shaped HolmEn's view of the world, as did the war in Vietnam and others that followed. Neither he nor his American wife could be described as radical. But she became a conscientious objector of sorts when she convinced her father to let her stay in Sweden nearly 40 years ago rather than go home to go to school in the United States. That's when she met HolmEn.

Ironically, the long journey to the Arctic began in the desert sands of Egypt, where HolmEn's mother did some volunteer work with Vivi Tackholm, a celebrated Swedish botanist who wrote several books on botany, travel, and culture.

Tackholm was so well respected in this part of the world, she was appointed professor in the science faculty of the University of Cairo in 1946, at a time when women in science were a rarity, even in North America.

"It was an incredible experience discovering plants in the desert that hadn't been seen in decades," he said. "Vivi Tackholm instilled in me that joy can be found in all knowledge about the world around us."

In university, HolmEn gravitated to the atmospheric sciences. His mentor, Bert Bolin, was a giant in the field of meteorology. He was one of the first scientists to alert the world to the dangers of climate change. In addition to playing a leading role in creating a number of international research organizations, Bolin was the first chairman of the Intergovernmental Panel on Climate Change.

Accomplished as he was, says HolmEn, Bolin remained humble to his dying days.

"I remember asking him once how many great ideas he came up during his long career," he recalls. "He thought about this for a moment and then said 'three and a half.' "

The point of this, of course, is that no one person is going to come up with an idea that is going to solve the problems of the world.

Serious as some of those problems are, HolmEn can sound radical, at least by Canadian standards, in discussing the need for governments to take action. "Maybe I am (a radical)," he said. "But I certainly have tried to adopt a diplomatic approach to changing the world. I see science as a means of creating dialogue regarding difficult global environmental issues."

Because Ny-Alesund is very much like a mini-United Nations, it was no surprise to hear that Ban Ki-moon, the secretary general, spent two days touring Svalbard and the research station last year.

Here, the Swedes collaborate with the Norwegians who own an atmospheric research station on Zeppelin Mountain 475 metres above sea level. Because the station is above the inversion layer, it experiences little contamination from the settlement below. The station has a dizzying array of sensors that can detect 160 chemicals and contaminants.

Down below at sea level, the French work with the Germans to study the polar stratosphere.

They have a variety of optical instruments installed on the roof of one of their buildings. An infrared spectrometer, for example, measures type and quantity of trace Gases; A Photometer uses the sun and the moon as light sources to evaluate the optical depth of atmospheric aerosols throughout the year. The concentration of ozone and aerosols in the atmosphere is determined by a laser-radar.

The Germans are "old school" when it comes to running their station. Marcus Schumacher, the base manager of the Alfred Wegner Research Institute, for example, signed a two-year contract to come here. He hadn't been out in nearly twenty months when I met him.

The isolation tests the limits of mental endurance, he admits. But he says he will go away in July with memories that he will cherish forever.

"It is a remarkable place not only for science. but for the society," he told me on the day the German divers arrived to collect samples from the oceans.

"Last Christmas was especially interesting. For nine days, we lost virtually all communication with the outside world when the telephone and Internet system went down. Then, on Christmas Eve, the main power generator went down.

That's when we had to start thinking seriously about what we would do if the backup system went down as well. We are very, very isolated here. But it was fun gathering together each night."

Not surprisingly, the Italians are a little more laid-back in Ny-Alesund. Roberto Sparapani, the base manager, was on his way out to take a much-needed vacation in Prague. Busy as he was packing, he insisted on making me a cappuccino before showing me around.

"The food here is OK, but the coffee is not coffee," he scoffed. "It is ... I don't know what. Mud, black liquid. It is not coffee!"

Like HolmEn, who first visited Ny-Alesund 27 years ago, Sparapani is a seasoned visitor. He says the research station he was introduced to nearly 20 years ago hardly resembles the one that is here now.

"When I first came in 1992, I was the only non-Norwegian, except maybe one German scientist" he recalled. "I remember it well because it was November, dark and cold, and when I went into the old mess house to eat for the first time, there was a picture of the King and Queen of Norway above a table. So I got my food and sat down to eat at this place.

"I realized then that everyone was watching me nervously. Eventually, some of them urged me to join them. I didn't know what to think until I saw the Norwegian base manager come in and sit down at that table I had just left. He was a retired military officer and I could see that a crumb that I left behind troubled him. The next day, there was a sign on the table that said 'Reserved.'

"Of course, it is very much different now," he noted. "This is truly an international research station with a very strong scientific program. Normally, we work independently of each other, but if there is a need, like the truck I required to move things yesterday, for example, I could call on the Koreans or someone else to borrow theirs."

All this international interest in the Arctic from so many non-Arctic countries may seem strange, but the history of Svalbard offers a partial explanation.

The German Hansa or Hanseatic League, for example, dominated trade in the Baltic Sea region between the 12th and 15th centuries. Hansa was an organization founded by north German towns and merchants to protect their trading interests abroad. In a very short time, they were able to deal with pirates that had disrupted trade.

Hansa's domination continued almost unchallenged until Holland grew into a formidable maritime force.

The Dutch were ambitious about expanding their Empire into northern Russia and China. Like the British who sent out Martin Frobisher, John Davis and Henry Hudson in search of a Northwest Passage between 1576 and 1607 to expand their empire, the Dutch dispatched several explorers to find a Northeast Passage to China around the same time.

A third of these expeditions was led by Wilhelm Barents and Jan Corneliszon Rijp.

The Dutch ships reached Svalbard in June of 1596, naming the islands "Spitsbergen," which means "steep mountains." The voyage was remarkable not only for its discoveries -- Spitsbergen and Novaya Zemlya were put on the map -- but also for the fact that it was the first European-based expedition to survive an Arctic winter. It ended in disaster.

Not all was lost in this unsuccessful attempt to sail through the Northeast Passage, however, at least not from a commercial point of view.

The warm Spitsbergen current that keeps the west coast of Svalbard ice-free and nutrient-rich is ideal habitat for shrimp, capelin, herring and cod, as well as seals, walrus and whales.

Sailing through these waters in 1612, British captain Jonas Poole reported that there were so many whales in the sound that he could not count them.

"All this day whales lay so thick about the ship, that some ran against our Cables, some against the Ship, and one against the Rudder. One lay under our beakhead and slept there a long while."

Poole and his crew returned to Britain that year with 180 tons of oil from the seventeen bowhead whales and two walruses they killed.

The discovery of so many whales in the region captured the attention of other countries.

In the beginning, the hunts at Svalbard were seasonal. Most of them took place in the fjords or close to shore around small whaling stations where the blubber was boiled into oil in large copper pots.

In time, they grew to be more permanent. Larger ships replaced small boats. Primitive hunting tools became more sophisticated and deadly.

By the middle of the 17th century, there were as many as 300 whaling ships in the region. By the end of the century, it was all over. The stocks of most whales, especially that of the Greenland right whale, were almost gone.

The exploitation of Svalbard's natural resources did not end there, however. When the British and Dutch whalers left, the Russians moved in, focusing largely on walrus from 1704 to sometime around 1850.

When they left, coal miners took over. Between 1898 and 1920 more than a hundred claims were made in the region. Inevitably, many of these overlapped. With no rules and regulations in place, disagreements led to rancorous legal disputes.

Although the 1920 treaty brought some order to the free-for-all in Svalbard, all mining activity ended during the Second World War when the Germans invaded Norway and evacuated the entire archipelago.

In the meantime, Svalbard became a jumping-off point for Arctic explorers like Roald Amundsen, who along with Fridtjof Nansen, Otto Sverdrup and Oscar Wisting, is one of Norway's greatest explorers. Amundsen had skied to the South Pole and sailed through the Northwest Passage. In the 1920s, he had set his sights on flying to the North Pole.

The first attempt on an Italian-built airplane failed. The second attempt with Umberto Nobile, the Italian aeronautical engineer who designed a semi-rigid airship for the purpose, succeeded. In 1926, the airship took off from Ny-Alesund and flew over the Pole before landing in Teller, Alaska after a storm prevented them from reaching Nome.

"The Rome to Nome" flight was a milestone in aviation history. But the story ended in tragedy when Amundsen went missing the following year after Nobile and his crew crash-landed on a second expedition to the region.

Today, the Norwegians operate a mine at Svea and Longyearbyen and the Russians have one at Barentsburg. The Russians shut down most of their production in Svalbard in dramatic fashion in 1998 when they sailed unannounced into the community of Pyramiden and ordered all 1,000 people to

get on board. The evacuation was so swift that there are still plates on the tables of some of the homes and a grand piano in the community hall.

The mine at Ny-Alesund closed in 1963 after an explosion, the last of many, killed 21 people. The following year it became a research outpost and a facility for the European Space Research Organization.

It's highly unlikely that mining in Svalbard will ever be re-established in any serious way. Today, more than half of the Svalbard archipelago is protected by a national park, national reserve, and various plant and animal reserves.

The Norwegians are so committed to the protection of the area that a proposed gold mine north of Ny-Alesund never got out of the starting blocks a few years ago. The Norwegians decided that science and education trumped monetary gain.

"Fishing and shrimp trawling was prohibited here in 2007," says HolmEn. "In 2013, tour boats that burn heavy oil will not be permitted to come into Ny-Alesund."

Norway is so committed to conservation in Svalbard that no one is allowed to go to the Kong Karls Land, which is a critical breeding habitat for the region's 3,000 polar bears. Hunting of these animals is also strictly prohibited.

It's difficult to imagine something like this happening in Canada. In spite of the dramatic changes that have been occurring in the Arctic, the legal status of the polar bear has not changed since 1991. Nor will it likely any time in the near future.

While there are some signs that the biological hot spots in Lancaster Sound in the Northwest Passage may soon be protected by a marine park, most of the rest of the Canadian Arctic is open to business. Before Lancaster Sound is legally protected, a mineral assessment of the area must be done to make sure that there are no significant resources in the region.

To be fair, Canada has not been sitting by idly as events unfold in the Arctic. Design work continues on the world-class Arctic research station that Prime Minister Stephen Harper promised nearly three years ago.

Canada's Department of Foreign Affairs has also been busy in Oslo.

Giles Norman heads the newly established Canadian International Centre for the Arctic Regions. And last November, senior officials from Canada and Norway held workshops to discuss issues such as the future of the Arctic Council, an intergovernmental forum which was created in 1996 to address issues facing indigenous people and the eight Arctic states.

Here in Canada, $85 million has also been spent to refurbish 18 research stations across the Arctic.

But now that the International Polar Year is over, a year in which Canada spent $150 million, many Canadian scientists find they can no longer afford to go into the field.

The plain truth is Canada cannot hold a candle to Norway when it comes to matters concerning the Arctic. Part of it has to do with money. Most of it has to do with culture and politics.

Where most Canadians know nothing of homegrown Arctic explorers such as Joseph Elzear Bernier, Henry Larsen or the controversial Vilhjalmur Stefansson for that matter, the Norwegians honour theirs in every imaginable way.

A bust of Roald Amundsen sits in the centre of Ny-Alesund. Two cairns commemorating him and Umberto Nobile are located on the outskirts of the town.

Gjoa, the boat Amundsen used to sail through the Northwest Passage between 1903 and 1905, is dry-docked at the entrance of the Fram Museum in Oslo. The Fram was the ship that took Amundsen, Nansen, Sverdrup and Wisting on various scientific and exploratory expeditions throughout the polar world.

It's difficult to imagine anything quite as grand and singularly Arctic as the Fram Museum being built in Canada. There are three levels surrounding the big boat. The walls on each of them are covered with old photos and newspaper articles commemorating the trips of the explorers. On the third level, you can board the ship and walk through its entirety just as Nansen, Amundsen, Sverdrup and Wisting had done so many times.

"It's all about pride," explained Bendik Eithun Halgunset, the science adviser for Kings Bay, the Norwegian non-profit corporation that runs the show at Ny-Alesund. "These are the men who shaped our history and the history of the world."

On the surface, Norway's investment in science in Ny-Alesund seems to have little connection to the country's sovereignty over the region. That sovereignty is indisputable, especially now that the Norwegian and Russian governments have settled on a boundary line in the High Arctic.

But if sovereignty and security are dependent on the integrity of environment and culture, as many experts believe, then Norway has done the right thing in investing so much in science.

At any point in the future, the Norwegian government will be able to call on the Norwegian Polar Institute to advise on any number of issues, be it the impact of oil and gas or shipping on marine life or the sustainability of fisheries.

At this point, Canada cannot do the same. I was reminded of this on my last day in NyAlesund when Canadian polar bear scientist Andrew Derocher of the University of Alberta sent me an e-mail from Tukotyaktuk on the coast of the Beaufort Sea. He was studying the movement of polar bears in the oil-and-gas-rich region.

Derocher knew what it was like to be in NyAlesund because he had worked with Jack Kohler and other scientists at the Norwegian Polar Institute for seven years.

Because the Canadian government shut down the Polar Continental Shelf research facilities in Tuktoyaktuk several years ago, Derocher and his students had to cram themselves into a rented trailer.

"Good to hear you've landed," he told me in that e-mail. "Nice place ... We can't put the heat on here because it smells like leaking fuel oil ... We have the stove on. The furnace here backfired last week so it has been 'repaired' -- we just moved in yesterday.

"I should have never left Norway," he added. "The idea that Canada was going to get serious about the Arctic is a joke."

Back in Edmonton a couple of weeks later, Derocher pointed out that he is doing better than most of his colleagues securing the funding that he needs to do his work.

Nevertheless, he wasn't about to take anything back from that e-mail he had sent me.

"The difference between Canada's approach to the Arctic and that of Norway is like chalk and cheese," he said. "Norwegians operate as a collective. Here in Canada, most scientists go hat-in-hand begging for what little money there is out there. Then they're sent off on their own. It's a very fractured approach.

"I was lured back to Canada by the From Crisis to Opportunity report that was done by the National Science and Engineering Research Council ten years ago. As far as I can tell, very few of the recommendations of that report were acted upon."

Back in September 2000, the task force laid it all on the table for the Canadian government. Canada's sovereignty over the Arctic, the experts stated, is inextricably tied to science.

"Research in the North is needed to honour international obligations and protocols like the Montreal Protocol, the United Nations Framework Convention on Climate Change and the Kyoto Protocol on climate change, and to give input on research issues of global importance.

"Other countries are more advanced than Canada in their northern research initiatives, and are actively pursuing northern research agendas on Canadian territory. In contrast, Canadian research activity in its own northern territories has been declining. Research in the North is needed for the purpose of 'being seen to be active in the North,' thereby reinforcing Canada's sovereignty in the region."

It was University of Alberta scientist John England who used the word "crisis" in 1998 to describe Canada's approach to the Arctic. His indictment of Canada's Arctic vision at the time was one of the reasons why the task force was assembled.

The editors of the venerable scientific journal Nature recently asked England to revisit the issue.

Once again, England noted that the underlying problem in Canada is the lack of comprehensive national polar policy.

"Numerous other northern nations, including Norway, Sweden, Finland and Russia, have integrated government support for polar research that leaves Canada trailing," he said in noting as well how the United States is also far head of Canada in this regard.

"Only a national polar policy can provide the commitment, integration and continuity that will ensure world-class research."

Note: A veteran journalist and northern adventurer, Ed Struzik is the award-winning author of several books on the Arctic, the latest of which is The Big Thaw, Travels in the Melting North.