

The Canadian Studies Program
International & Area Studies
University of California at Berkeley



CONFERENCE

***The Ice Is Melting:
Climate Change in the Canadian North***

***Clark Kerr Campus, UC Berkeley
Krutch Theater (Building 14)***

Friday, March 07, 2008

co-sponsored by the Law of the Sea Institute

The Canadian Studies Program, of International and Area Studies at Berkeley, invited academic and government leaders and members of the public to the Berkeley campus in March 2008. The conference focused on two issues:

- An overview of the current situation in Canada's North. The effects of climate change on the sea, land, and peoples of the Canadian Arctic. Potential energy resources.
- Legal and political issues arising over what may become open water in the relatively near future. The questions of sovereignty and freedom of navigation, examining in particular the economic and military ramifications for Canada and the United States.

All conference sessions free and open to the campus community, public, and press with advance registration.

[Schedule and Participants](#)

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Schedule and Participants

0900 Coffee, registration

0930 Welcome John Lie, Dean of International and Area Studies, UC Berkeley

1000 Morning session Nelson H. H. Graburn, chair

The Ice Is Melting: Overview; energy resources, effects on the peoples of the North

Michael Hanemann (Chancellor's Professor of Environmental Economics and Policy; Director, California Climate Change Center, Berkeley) "Climate Change in the North"

Gregory Croft (Energy consultant; Ph.D. candidate, Department of Civil and Environmental Engineering, Berkeley) "Potential Energy Resources in the Arctic"

Greg Henry (Geography, University of British Columbia) "Arctic Tundra Environment"

1100-1115 Coffee break

George Wenzel (Geography, McGill University) "Inuit and Polar Bear in a Time of Global Climate Change"

Nelson Graburn (Anthropology, Berkeley) "*Sila*: Some Inuit Thoughts on the Weather"

1230 Buffet lunch for all attendees in The Garden Room (Building 10)

1400 Afternoon session Thomas G. Barnes, chair

Contested waters: Sovereignty, Security, Strategy

Wendell Sanford (Director for Oceans and Environmental Law, Department of Foreign Affairs and International Trade, Government of Canada) "Arctic Sovereignty: Myths and Reality"

J. Ashley Roach (Office of the Legal Advisor, U.S. Department of State) "Contested Waters: the US View"

1500-1515 Coffee break

Lawson Brigham (Chair, Arctic Marine Shipping Assessment of the Arctic Council, Anchorage) "Arctic Marine Shipping Assessment: Responding to Changing Marine Access"

Rob Huebert (Political Science, University of Calgary; Associate Director, Centre for Military and Strategic Studies) "Climate Change and Geopolitics in the Arctic"

Commentator: David Caron (Boalt School of Law: Co-Director, Law of the Sea Institute)

Keynote address by Wendell Sanford, Director, Oceans and Environmental Law Division, Department of Foreign Affairs and International Trade Canada

Summary (Stephen Pitcher, *rapporteur*) with links to speakers' presentations where available

Opening Remarks

Participants and audience members were welcomed by **John Lie**, Dean of International and Area Studies at UC Berkeley, the parent body of the Canadian Studies Program. He underlined the importance of the topics being addressed by the conference and said that it was a good example of the interdisciplinary work carried out by the all the units of International and Area Studies.

Morning Sessions: The Ice is Melting: Overview; energy resources, effects on the peoples of the North

Nelson Graburn, Chair

Michael Hanemann

Gregory Croft

Greg Henry

Dr. **Rita Ross**, Assistant Director and Academic Coordinator of UC Berkeley's Canadian Studies Program, introduced **Nelson Graburn**, Professor of Anthropology, Co-Director of the UC Canadian Studies Program and the first holder of the Barnes Chair in Canadian Studies, and (among other fields) a world-renowned specialist on the Inuit.

Nelson Graburn

Professor Graburn remarked that he has been doing research on the Inuit for nearly fifty years and has seen a great deal of climate change, and not just recently. He proceeded to introduce Michael Hanemann, the first speaker.

Michael Hanemann (*Chancellor's Professor of Environmental Economics and Policy; Director, California Climate Change Center, Berkeley*) "*Climate Change in the North*" Note: this is a longer summary than most due to its importance in explaining the climatic context) [Hanemann presentation \(PDF\)](#)

Professor Hanemann noted that the level of CO₂ in the atmosphere is not only unusually elevated but is rising at an unprecedented rate. While for the last half million years the level has been between 200 and 280 parts per million (ppm), it is now 380 ppm and is likely to rise to 500, 600, 700, 800, or even 900 ppm by the end of the century, with an attendant rise of temperature. The rate of temperature change has been speeding up by a factor of 5 since 1970. The change is demonstrably due to anthropogenic elements, notably emissions of greenhouse gases. Germane to today's discussion is the fact that warming is greater away from the equator, toward either pole, so Canada is especially affected.

Impacts of climate change are mixed. Warming brings benefits to some areas and disadvantages to others. Hanemann, for instance, grew up in Manchester in northern England, where it was cold, damp, and miserable; it will be increasingly warmer, though still damp and quite possibly still miserable. One obvious benefit to shipping and commerce of climate change is the opening of the Northwest Passage with the reduction of sea ice. In agriculture, cooler areas will profit by a greater range of crops, a longer growing season, and improved crop yields. Yet some crops—tree crops, for instance—require a chill in winter and early spring. Agriculture is the sector most directly exposed to the climate. A cold climate may benefit from warming, but if it gets *too* warm plants burn and die, so there's no yield. Clearly there are general gains in cool places and losses in warm places, a relationship hitherto assumed to be generally symmetric: the gains and the losses cancel out. However a study done by two UCB students, using an extensive data set of 50,000 fields growing corn for 50 years in the USA and employing the most sophisticated statistical analysis, has challenged this assumption. They found that there is a gain from warming but it is far less dramatic, while beyond a certain threshold the losses become increasingly sharp: the two *don't* cancel out.

With health, there's mortality from cold in winter and heat in summer, but again the relationship is not a simple, balanced one. Mortality from cold tends not to be caused by raw exposure (with the exception of the odd drunk who passes out in the open in Anchorage in January) but by flu and similar diseases. Summer mortality is far more associated with the body heating with direct exposure. There are also increases in air pollution—an issue of particular significance in California and parts of Canada.

Effects on forests also involve complex interactions. A higher CO₂ rate in the atmosphere fertilizes crops and results in increased yields to a point, but the increase doesn't last indefinitely. There are also effects on pests and on fire, and overall there can be significant stresses. An exhaustive study done on the US West from 1970 to the present shows a marked increase in wildfires, both in sheer numbers and intensity. There's also a change in the type of vegetation: one type of plant will decline and be replaced by another type. This affects the ecosystem and which animals can live, because they mayn't be able to move as quickly as the biome is altering. The effects of the intersection between changing land use with changing vegetation can be very grave for certain terrestrial species.

As to water, a great deal of discussion and analysis has focused to date on precipitation as a key statistic: it's assumed that increased precipitation results in an increase in the water supply. This is a profound miscalculation: what matters is the *timing* of the precipitation, not the amount. The west coast of Canada and the USA relies on the snow-pack to store water; in California the snow-pack provides about a third of the storage. With warmer winters you get more rain and less snow in the winter, and the snow melts sooner, so you lose some of the storage; while if it's warm in spring more of the precipitation evaporates, so you get less stream flow. The estimated effect of warmer temperatures on the Colorado Basin involves a 20% reduction in stream flow, with a 50% chance of Lake Mead drying up as a result. There's also evidence, although it's still speculation, that warming could produce more extreme storms in winter, with more precipitation coming in the form of violent rains rather than snow and therefore not being captured and stored. The Great Lakes levels are projected to fall quite significantly with an array of impacts. And of course changes in temperature affect fish and other aquatic creatures—the highly important salmon, for instance. Many forms of wild life will be tremendously affected. The US is considering listing the polar bear as an endangered species, but that's only one example.

Also significantly affected are two sources of flooding: wetter winters and winter storms will cause more runoff in winter and spring; and with sea rise, the danger of flooding in coastal areas will increase. With more intense winter storms there is also greater danger of landslides—on the slopes of Berkeley, for instance. Some of the existing US analyses of the sea rise due to melting sea ice assume that no real damage will ensue until the sea level rises enough to inundate the land. But the sea level rise is problematic even if the sea level is below the land level, since there are tides and there are storms, and the waves can be several feet higher than the sea level—a major issue for California and other coastal areas.

Policy issues have been twofold—reducing emissions, and dealing with the changes of climate which are already locked in and will be a problem whether we succeed in reducing emissions or not. Canada has the dubious honor of having the second highest per capita emission rate globally—an ironic achievement given Canada's great vulnerability to the effects of climate change. It is inevitable that within ten years, Canada, the US, and all major governments will have to adopt a policy about controlling emissions, and that will effectively put a price directly or indirectly on emissions. An oil company or resource company contemplating development in Canada would have to factor in some sort of cost of emissions in deciding whether such investments are prudent. In US policy there's considerable complacency about the probable magnitude of the damage to which the US is vulnerable, and I suspect the consensus regarding this estimate is too low by a factor of 4 or 5 or even more. Two or three years ago it was generally agreed that a sufficient carbon price, should one be initiated, would be \$8 a ton; that has now shifted to about \$12 a ton. I think that's way too low: it is more like \$30 or \$40, which is roughly the price it is in the EEU today.

A couple of weeks ago the village of Kivilina in Alaska filed a lawsuit for damages from climate change. This village is suing major polluters—Exxon, one coal company, nine oil companies, and fourteen power companies. Three of the companies—Exxon, BP, and Conoco Phillips—operate on Alaska’s Northern Slope. The village is going to have to be relocated, as due to sea rise it is subject to inundation by storms in winter. Last year many of the residences were evacuated during a big storm; it didn’t wipe out the town but it could have and sooner or later this will happen. The federal government has recognized that the village will have to be relocated inland at a cost of between \$95 and \$400 million, so Kivilina is suing major greenhouse gas contributors for compensation for the loss they expect to suffer. This is an unusual suit and it’s been likened to the tobacco suits, which were also unusual but which in the end resulted in major changes.

Let me make a few remarks about adaptation. Adaptation is essentially bottom-up, in that vulnerability varies from location to location and therefore is essentially local; yet it needs coordination from above. Urban water agencies in California have for the last fifteen years been required to file five-year urban water management plans, including a chapter on drought management—were the worst droughts your area has ever experienced to recur in the next twenty years, would you be able to manage and what would you do? I think the same sort of exercise needs to be undertaken with climate change, with detailed, location-specific scenarios being supplied by the federal government, since coordination is required, even though response is local. Many of the issues involve land use and the US does a spectacularly bad job of controlling land use—I think the situation is somewhat better in Canada—but a lot of this involves infrastructure—sea walls, sea defenses, roads, coastal facilities, pipelines, all that. Infrastructure is expensive; it’s longlived, which means you have to construct it, but the people who are going to benefit from it may not show up for another fifty years while you have to pay for it now.

Let me end with a story of New Orleans, just a little history. In 1955 the army corps of engineers recognized that New Orleans faced a risk of flooding and began a study of flood defense for the city. It took seven years and in 1962 it had a plan. Nothing happened. Then in August 1965 there was Hurricane Betsy, causing major damage, and within ten weeks Congress authorized the construction of the flood system at a cost of \$80 million to be completed by 1987. In August 2005, when Katrina hit, the budget was \$700 million and the expected completion date was 2013, but nobody really thought it would be done by then. So that’s an example of adaptation: the problem was recognized in 1955, in 2005 the “expected” date of completion is 2013 at a vastly inflated cost. New Orleans has distinctive problems but the point about adaptation is it will happen sooner or later, but if it happens later, and it’s imperfectly done, and it’s incomplete, the damages are far greater, whereas if it happens earlier and is more effective, the damages are much less. So the name of the game is figuring out how to do adaptation effectively.

Q: Is there any difference between the effect Kyoto will have and the situation now?

A: Kyoto is only going to have a small effect; it’s only a little first step. I showed you the difference between the charts of B1 and A2. B1 requires on the order of 60 to 80% reduction of emissions below 1990; Kyoto had reduction of emissions to what would have been 1990. To put that in perspective, California passed legislation in 2006 requiring a reduction of emissions by 2020 to what they were in 1990; that’s about a 25% reduction of what they would have been in 2020. But to get to something like B1, California would need something like a 60 to 80 percent reduction *below* 1990. If nothing happens beyond Kyoto there will be a minute effect on climate change.

Gregory Croft (*Energy consultant; Ph.D. candidate, Department of Civil and Environmental Engineering, Berkeley*) “*Potential Energy Resources in the Arctic*” [Croft presentation \(PDF\)](#)

Global warming will have a number of effects on Canadian Arctic oil and gas operations. Onshore operations will become more difficult, while offshore becomes easier. New shipping routes will open.

The greatest effects on oil and gas exploration will be in the Barents and Beaufort Seas.

In terms of engineering for sea ice, there is pack ice, which is continuous, and forms pressure ridges, and raft ice, the thickness of which can be doubled with overriding. Steel or concrete platforms can be designed to withstand ice rafts several meters thick. Gravel islands, used in shallow water, can withstand multi-year ice.

[Several images of *Molikpaq*, an offshore oil rig platform now in the Sea of Okhotsk for Shell, are shown.]

Petroleum basins in Canada include: the Western Canada Sedimentary Basin; the Cordilleran Basin, the Beaufort Sea–MacKenzie Delta; Arctic Islands; Eastern Canada Offshore; and Paleozoic Basins, Eastern Canada. The Arctic Islands contain the largest resources found to date in the Canadian Arctic, mostly of natural gas. But it is far from markets and melts late, if at all. Bent Horn so far is the only development taking place.

Most of the oil in the Beaufort Sea–MacKenzie Delta is found offshore, but onshore gas is the core of proposed development. The Paktoa oil discovery is the first activity in 15+ years. Melting ice could aid offshore development.

[Maps of the MacKenzie Delta, the Tuktoyaktuk Coast and the Beaufort Sea are displayed.]

The Alaska North Slope has larger resources—most undeveloped natural gas—than the Canadian Arctic. Combined gas pipeline routes have been proposed. The Beaufort Sea is highly prospective, while the Chukchi Sea lease sale received \$2.66 billion in high bids.

In conclusion, the melting of sea ice will create new oil and gas opportunities in the Arctic offshore, while onshore Arctic operations will become more difficult in permafrost areas. The potential to ship oil could reduce the market power of pipeline owners. Finally, the Beaufort and Chukchi Seas are likely to have much more activity.

Q: What's happening with the current Alaskan governor—there seem to be contradictory statements—and gas hydrates.

A: Gas hydrates are ice crystals that store methane in solid form, but there's difficulty of extraction: if you warm them up and release the methane it's a serious problem.

Greg Henry (*Geography, University of British Columbia*) “*Arctic Tundra Environment*” [Henry presentation \(PDF\)](#)

All climate models have indicated that the impacts of climate change will take place earlier and with greater intensity in high latitude systems than elsewhere. Primary among these impacts is warming, which will have profound effects on the flora and fauna of the regions and result in the decrease and possibly the ultimate disappearance of the sea ice. More precipitation, with an associated increase in cloud cover, is generally predicted. In addition to the observations of scientists and of northern indigenous populations, a number of independent indices confirm these predictions, among them the records kept since 1856 of global air temperatures and documented change in vegetation cover.

In order to assess the ways in which the Arctic region will adapt to these changes, an acute understanding of the features of the affected biomes, both in the present and on a comparative scale as time goes by, is imperative. The International Tundra Experiment (ITEX) was formed in 1990 as an International Polar Year (IPY) Core Project to respond to this need. Working in both polar regions and in

the Alpine region of Northern Europe, and coordinated with a number of other IPY projects, it is developing a unique and comprehensive synthesis of species and community responses to climate variability. All aspects of the Arctic land mass—vegetation cover, soil organic matter, nutrient stock, unoccupied space, and periglacial processes—are being analyzed and compared on an ongoing basis at more than two dozen circumpolar sites, with the goal of enabling an accurate projection of the region's phenological response to upcoming alterations in the climate. A variety of experiments, involving temperature increases of 1–3°C and other manipulations, is regularly performed and the results compared, using standardized protocols and making careful distinction between the numerous, highly distinct Arctic biomes. It is apparent based on these experiments that massive and widespread change in the quantity and composition of the vegetation cover will occur, involving different species and growth periods. The ability of the regional fauna to adapt to such changes in habitat as radically different aboveground biomass and air temperature are difficult to quantify, but the dependency of many species on specific vegetation is firmly established. If the sedge meadows vanish and the moss and lichen populations dwindle, can the caribou survive?

Another feedback being investigated is the relationship between increased vegetation and warming. A more herbaceous tundra is predicted; increased atmospheric heat could transform tundra to shrub or even forest. Such change in vegetation could cause warming on the same order of magnitude as doubling CO₂.

Second morning Session

***George Wenzel
Nelson Graburn***

Nelson Graburn

Professor Graburn introduced George Wenzel, saying he was quite well known to him since he works with Inuit ecology, economy, and social life, which are all very much bound up together.

George Wenzel (Geography, McGill University) “*Inuit and Polar Bear in a Time of Global Climate Change*” (no document; overheads associated with this talk will be posted shortly)

Began with story about a summer night in Clyde River on Baffin Island with a friend of his—they spotted a pod of narwhals in mid-July; no person in Clyde could remember open water, let alone narwhal appearing, so early along the east coast of Baffin Island. His friend, Jamasee, remarked, “If this is global warming, we’re going to love it.” There has been whaling in the first two weeks of July every year since 2000.

His talk dealt less with hunting per se than with the Inuit subsistence system, which is basically what people do with the animals after they catch them. Subsistence is an economic system, and it has rules like every economic system has rules.

There are estimated to be around 30,000 to 35,000 polar bears in the circumpolar world in any given year, about 50% to 65% in Canadian territory, including the Northwest Territory just to the west, the Labrador coast, and a few even down in northern Ontario. Canada has a very well-developed management plan for polar bears that’s been in place since 1969. In the 1960s there were somewhere in the order of 5,000 to 8,000 polar bears in the world, mainly because of rapacious Norwegian hunting (that’s what we like to think anyway). There are five countries in which polar bears are found: Norway, Russia, Greenland (Denmark), Alaska (the US), and Canada. Canada has a quota of about 400 polar bears that can be hunted. Nobody knows the overall population but it may be in the order of 15,000 to 20,000 animals, and the Canadian Arctic is broken up into a number of populations—it’s come to be recognized

over the years that there are subpopulations of polar bears. Polar bears move; they literally can traverse the circumpolar world, some traveling as far as 1,000 km in a few months.

The US does not allow the importation of polar bear hides from certain zones—the McClintock Channel for instance—because it's estimated that the polar bear population there has decreased somewhat. In Canada, no polar bear can be hunted without a tag, whether by Inuit or non-Inuit hunters, and the penalties are substantial for hunting without that tag. In any case, a number of population areas are open for importation to the States, at least until the US decides to list the polar bear as endangered, which would have some consequences on the Inuit economy.

Polar bear sport hunting is carried out in three communities: Clyde River on the east coast of Baffin Island, Resolute Bay, and Taloyoak. Clyde River has a quota of 45 bears, Resolute Bay's quota is 35 bears, and Taloyoak's quota is 20. Referring to an earlier citation of a US Humane Society protest of Nunavut's expanded polar bear hunting quota, Wenzel said that there was a misperception that sport hunting was the primary cause for this: in fact sport hunting makes up a very small percentage of the overall polar bear harvest. It's never been higher than 22% and in fact only began to increase in 1982, when the Europeans banned the import of seal skins and most small Nunavut communities lost their main form of economy, in terms of cash. The scarcest resource in the Canadian Arctic for the Inuit is money. Money is important because in government social policies beginning in the 1950s, Inuit were centralized into a number of communities. Almost all the communities one would see on a map today are post-World War II artifacts—there may have been trading posts or mission stations but the Inuit did not live in these places. The government moved people in to provide services, education, the benefits of citizenship, but this meant the people went to the services, rather than the doctors and nurses going to the hundreds of small indigenous communities. In any case while polar bears were certainly being hunted in large numbers, prior to 1982 there was essentially no sport hunting. It began to grow in part because of the absence of cash. Canada has an exemption under the international convention on conservation of polar bears and is allowed a portion of its harvest should the Inuit choose to avail themselves of it. It is an interesting research question why they do not sell more bears. Annual per capita income in Nunavut for Inuit is about \$14,000 a year. A sport hunter brings into the community \$20,000 for each sport hunting event. The average ecotourist brings in about \$250.

There's been a lot of discussion about the impact that climate change, or climate dynamics if you will—perhaps a more appropriate term - would have on the Inuit food system, or food economy, including food sharing and traditional food. Clyde River is a community of 850 people that produces approximately \$3 million worth of food; comparing the edible biomass the Inuit produce from hunting, if you had to buy it in the local store you'd be paying perhaps 10 dollars a kilo.

The Inuit have a very sophisticated economy, although on the one hand perhaps it is very simple. Basically it's a social economy, based very much on rules of kinship. There are certain behavioral directives taking a variety of forms, which allow food to be spread from one's own nuclear family, to one's extended family, to whole communities, based on the mechanisms and the amounts of food that are available. A graphic was shown depicting the movement of food in a two-week period around one extended family in Clyde River, focusing on seal, caribou, fish being traded around; there are no exchanges of money. The Inuit are appalled by the idea of paying for food—they believe food is to be freely given. Speaking ethnologically, food was and is the currency of the economy. Other commodities are not treated in the same way.

The process begun by the government in the 1950s and completed in the 1970s of centralizing the Inuit population of the North has been alluded to; none of these communities were situated for ease of hunting, but for ease of bringing in infrastructure, and for the convenience of a non-Inuit population. The problem for the Inuit is the communities are not situated in close proximity to good hunting. At Clyde

River the nearest good hunting area for seal, which is the mainstay of the food economy from roughly October until probably July, is about 30 km away. When Wenzel began working there, all transportation was by dog team. A dog team could move at about 5 km an hour—a pretty good clip if you could keep them at it. So the Inuit were spending a lot of time traveling. So the population was faced with a problem: how to get in as much hunting time as possible at the least possible cost in terms of natural capital, that being the amount of time you would be away from your family. If you were looking at a 6- or 8-hour round trip that left very little time for hunting. The Inuit are very oriented toward their kin, and to be away for extended periods is a hardship for them. The introduction of the snowmobile revolutionized what people could do. It's generally seen as a bad thing: we all know it's noisy, it's polluting, it breaks down. But it's also faster. It introjected money into the community. It's cheaper to feed a snowmobile than it was to feed a dog team, because dog teams ate seal meat, and snowmobiles "ate" seal skins, in the sense that the revenue derived from the sale of the skins went into vehicle maintenance. Then the seal market collapsed in 1982–83 due to the outcry over baby harp seal pups, which became an icon for certain animal rights groups. So the Nunavut government was faced with the problem of how to get money into the communities. There's a limited amount of employment available in these communities—no large mega-projects. There's 45% unemployment and underemployment in most small Inuit communities—there are just so many sewage truck drivers, clerks, and so on needed in these communities. On the other hand, large amounts of food would have to be subsidized were they imported. One solution was to encourage various aspects of tourism, and the most effective one has been sport hunting, particularly polar bear sport hunting. This industry has attracted a number of Inuit who have become professional, licensed guides and outfitters, using traditional techniques (dog teams), who facilitate visitors from the south interested in sport hunting. And the large amount of money this generates is particularly welcome as there's no immediate leakage—that is, most of the money goes into the hands of the Inuit.

Typically people who guide are well-trained, middle-aged Inuit men who lack the skills that may be needed to hold wage employment, i.e. the ability to read and write English. It's possible for a polar bear guide to earn anywhere from \$12 thousand to \$18 thousand per hunt season—an interesting sum in an area where the average income is about \$14,000.

Data were presented from a two-year research project involving six men who worked for four to ten years in the polar bear sport hunting industry. When the sport hunting started, hunters came north for a fee of \$12,000. Today they're paying \$35,000, of which \$20,000 is getting into the communities. Ten years ago some of these guides were getting a thousand dollars for a 10-day trip; today most of them are getting \$5–6 thousand for a maximum 10-day trip, and if you get really lucky your hunter gets his bear on day one, and you've knocked down six thousand dollars in 24 hours. Data were shown for money re-invested in hunting equipment and for average annual amounts of edible biomass each man estimated they produced in their own hunting—seals, caribou, narwhals. He converted their numerical estimates to kg of edible biomass—for instance about half of a ring seal is edible (for an Inuit; it's more like 20% for a non-Inuit). Then he made comparisons with the three cheapest meats available in local retail stores and converted the terms into dollars, and concluded that 2,950 kg of seal, caribou, and narwhal convert into about \$29,500 spent on imported meat at the store. Calculated with the money poured back into the snowmobiles (which have a life span of only about 2.5 years and can cost as much as \$12,000 in a northern community), the total income they earned from sport hunting, and the food they produced, the rough ratios are that for each dollar earned they got anywhere from \$4 to \$8.5 in food produced. This is not food for that individual, nor even for his extended family: this is money spent for the community. (It would be very difficult even for a fairly large extended family to consume 4,000 kilos of meat a year.)

So the absence of polar bear hunting has huge implications: the money has to come from *somewhere* to feed that system, which means that it will come from those people who are in wage employment positions, which has a tremendous impact on the maintenance of the hunting system. Jobs diversify,

people move out, there are fewer and fewer amounts of money earned within, and for, local communities.

Going back to what Jamasee said, about if this is global warming we'll love it, what he meant was: well, I may not be able to go out and hunt seals on the ice in June or July, but I can catch a much bigger package of energy, like narwhal. The problem is that there are already movements afoot to legislate against hunting cetaceans. The global politics of climate change or climate dynamics are as much a part of the environmental change the Inuit are experiencing as what is happening in the natural system. The Inuit will find a way to adapt—through their own devices they've survived two major changes in the last thousand years, the Medieval Warming and the Little Ice Age. But we may see a cascade effect in terms of what becomes an icon for what. Certainly cetaceans, especially narwhal and beluga—white whales, which are already something of an icon for some people—will garner the same political reaction in terms of Inuit harvesting, especially as that harvest goes up, as we see with polar bear and as we saw with seals back in the 1980s. If the climate changes, must the Inuit?

Nelson Graburn (Anthropology and Canadian Studies, Berkeley) "Sila: Some Inuit Thoughts on the Weather" (no document available)

To talk a little more generally about climate change and its impact on the Inuit, the Inuit have a term, "sila," which means "weather"—but it also means the outside, it means in a sense nature; "sila sila" means the whole world, the universe. There may be no other Inuit word for climate but "sila"—weather. "Sila" can also mean "wealth"; it can mean "reason, sensible things," all wrapped up in the same organic set of meanings that are all interconnected. It is also interesting that ["hao"] means "light," "morn," "dawn"—[hao hao] means "tomorrow"—but it also means "knowledge, the acquisition of knowledge: throwing light on things." So you can't detach the physical aspects of weather and light from the animate aspects of "sun, knowledge, being, circulation of thoughts."

When Graburn first lived in the Arctic in 1959, rumors were going around that the world—"sila sila"—was becoming an old man. Asked what that meant, people replied that the world was kind of running out, it was getting worse—like an old man, it wasn't working so well anymore. And the symptoms of this were partly change in the weather, but it wasn't that it was hotter or colder but that it was getting cloudy at times when it wasn't expected to. So the most important thing by far, connected with this animate view of the world, was that the caribou were getting further and further away. It was getting to the point where only two dog teams could hunt caribou that summer and they went over 200 miles inland to hunt them, and the dogs had eaten nearly all the meat by the time they got back.

Anyhow the idea of *change* is the most important thing in the Inuit attitude toward climate. The idea of change is threatening: it is upset life. Much of the Inuit adaptation has been in terms of periods of stability followed by periods of change. At the end of the Dorset Period, the period of the people before the actual ancestors of the Inuit, archaeologists tell us there was a huge production of art, particularly shamanic art. This was around a thousand years ago, and people have hypothesized that something was getting more difficult, climate change or something else: the world was threatened and the only appeal was through the shamans to the spirits to enable life to go on. So climate change is something the Inuit have been aware of, even if not in specific terms of how many degrees or how many years. Then the ancestors of the present Inuit, the Thule people, came in, moving very fast across from Alaska, overtaking the Dorset people in Greenland and the East Arctic, about 1100–1300 AD, and they were better equipped technologically and more numerous than the rather poorly adapted original hunters and gatherers. But the climate deteriorated on them, the same as it deteriorated on the Norse who were coming across the Atlantic from the other direction, and then things got worse, such that sea transportation to Greenland was cut off, and the Norse there perished. The Thule Inuit were better adapted.

And then there came the Little Ice Age as some people call it, though probably for the Inuit this was

sort of normal: they had adapted. The snow house probably wasn't invented until this period—people lived previously in subterranean houses with bone roofs with skins on top of them, more like tents. Snow houses are a very special adaptation to a really cold climate, such that you don't see it in Greenland or Alaska, which are a little more subarctic than Canada. So the Inuit seem to have a view of history and change. Interestingly the word for change [“sohuyou”?] means the same as it does for us, but for the Inuit the implication is always that things are getting *worse*; getting better isn't change, change is something different and therefore worse. So the Inuit have always been very concerned with change and stability, and until recently, maybe even very recently, they've drawn upon spiritual resources to deal with challenges they were not able to deal with by direct adaptation.

Then another set of changes took place, starting with people like Frobisher. I don't know whether the Inuit remember the Norse; they do in Greenland but not I think in the Canadian Arctic, even though the Norse may have been there. But with Frobisher and other explorers, up until maybe 50 years or maybe 40 years ago, most of these contacts were looked upon as an advantageous change. The world was interesting, having these people come (except when the Inuit decided to kill them all, which they did occasionally) but mainly they traded, gaining interesting things, like metal—nails to make harpoon points out of for instance. Then a big period of change came about when fox furs became in great demand, and the Inuit were able to trade more and became quite rich—not by our standards, but by theirs. They were able to buy not just guns, ammunition, and chewing gum but big boats, like the kind white people had, with gasoline motors and all, and they completely abandoned their umiaks in favor of these things. So in a sense there was a time when the Inuit were technologically advantaged but remained socially under their own control, free to move from camp to camp and hunting site to hunting site, free for Big Men to exercise power over their followers, etc. This was looked on as a kind of Golden Age, when they were able to live better but were not restricted to all the things that happened once the attempt to sedentarize and educate them, etc., came about. The sedentarization has obviously been one of their biggest shocks in the last 1,000 years—the idea that Inuit people should stay in villages and live somewhere and not just follow the annual routes. People said “Oh, but they're free to hunt, to leave their village!” but of course most men don't like to leave their wives with a lot of white people around. In some places they were told they would have to leave their children, or that their children would have to go off to boarding school: this was a deeply shocking change. The Canadian government may have acted for the best of reasons, but still how to accomplish their aims has been a difficult thing.

People settled more and more and generations grew up in towns not learning to hunt, not learning to live on the land as part of their life, not able to subsist. The higher proportion of Inuit are not now able to support themselves on the land, even if they have all the equipment. They are not trained for it—either they didn't learn from their parents, or, in an increasing number of cases, many mothers have children who have no fathers, so there's no one in the family to show them the way. There's also the possibility held out that if you work hard in school you can become employed like white people and rich like white people and buy the best snowmobiles and guns and GPS systems, and of course the ironic thing is in many places the only people who can afford to hunt are full-time workers. This is really drastic. Money is not shared the same way food is. If somebody comes in with a 2,000-pound whale, they have to share it with everybody. But if somebody comes in with a \$2,000 paycheck, they're not expected to share it at all. Many people do, of course, especially with their own family, but there is a huge inequality there.

So as to change, we might now almost divide the contemporary Inuit population into some of the political leaders, who are extremely well-educated, multilingual, read the scientific literature, know how to evaluate what's in the newspapers, and then there are the other people, who haven't had the advantage of going to the university. And one reaction, particularly in the 1990s and around 2000 (not so much recently), was that people were noticing changes that were actually improvement. A lot of the caribou came back, perhaps it got a bit warmer, fogs went away, but there was a period when the Inuit were able to do an awful lot of harvesting even if they didn't have the best equipment, because one of the changes

was that there was a great overlap of the seasons with the warming climate. You could get winter birds at the same time as you would get spring seals, so there were more times of year when there were more resources to draw upon, which made maybe not for more biomass but for a more *interesting* diet—nice big clams alongside slabs of walrus, for instance. And if you have snowmobiles you don't have to spend a lot of time hunting walrus, which in some areas is the major food for dog teams. So we had a trade-off there: you actually got more time to spend on the food animals if the climate could stand it.

But in terms of climate change one of the major factors discussed is the thinning of the sea ice and the river flows under the ice getting faster, which makes hunting more dangerous; and people are getting lost where they didn't used to. And the flip side of snowmobiles is that if you go by dog sled, and the dogs go through the ice, you, the driver, won't because you've got 30 or 40 feet of traces, whereas if *you* go through the ice, the dogs can pull you out. And dogs can usually find their way home even if there's a whiteout, or blizzard, snow, and so on, and furthermore in the end if necessary you can always eat the dogs. So giving up the dogs is seen as a huge blow by many Inuit. So climate change as we see it is way down on the scale of problems the Inuit have nowadays. They have all sorts of other problems: economic problems, unemployment problems, problems of family instability and unsatisfactory education. Some of the leading Inuit, like Sheila Watt (whom Graburn invited to the conference, but as she had been nominated for a Nobel Peace Prize she wished to finish a book she was working on and graciously declined), are very educated: Sheila latched onto something that most Inuit wouldn't know, which is the precipitation of enormous amounts of POPs—persistent organic pollutants—into the Arctic, not through anything the Arctic is doing but because as DDT and other insecticides and herbicides are released all over the world they circulate round the world and the climate causes them to be deposited with the snow into the Arctic. They go down into the lichen and the sedges eaten by the caribou, into the rivers; in fact when they started to do tests on Inuit food they found that if an Inuit mother's milk were on sale in Safeway it would be illegal, its level of PCBs and other organic pollutants is so high. So this was seen as a larger issue than global warming, as you can imagine, and Sheila's been working on this, forming alliances with other minorities—the Maya, the Maori—and going to the United Nations to present a treaty which will hopefully reduce such emissions.

The important thing the Inuit see about climate change is not so much “Is it getting warmer” or “is it getting wetter”: the *change itself* and the rate of change is threatening, because if the change gets faster than a certain amount, people are not going to be able to predict when the ice is getting too thin, to predict when the big storms are coming, to find their way home based on familiar configurations of ice for that time of year. They can't predict the movements of animals or the weather, and they notice certain things—biting flies moving into the Arctic, different kinds of birds, changes in the migration patterns of geese. There are fewer seals in some places, elsewhere it's drier, impacting fish populations. There are now animal-borne diseases that were previously unknown in the Arctic. The Inuit are really worried about the fact that they are unable to continue to live life in a predictable way, a safe way, because of these changes. So it isn't so much the *direction* of change, it's inability to live a stable life. It's almost like those poor Dorset People, who must have seen *something* happen—partly the stress might have been weather change, it might have been these technologically superior Thule people moving in—and they didn't know what to do about it. Maybe the Inuit are in a similar situation now, with all sorts of people moving in, causing dramatic changes to their way of life, causing the kind of insecurity where religion of course is one thing to hang on to, but an insecurity that is too much for some people, which ends up in suicide as you know and many other forms of self-destructive behavior. And now more than 10% of Inuit people are moving out of the Arctic, for all sorts of reasons; more and more they're going to live in the big cities, where at least they'll share their problems with us.

Q: What's the situation with fuel prices? Hunting equipment? Are they subsidized?

GW: Fuel is one of the things that's still subsidized—a liter of unleaded is cheaper in Clyde River

than it is in Montreal. But with most other things, included imported foods, the subsidies are either completely off or have been reduced. Hunting equipment is not subsidized; in Clyde River at the hunting store there's a 300% mark-up on ammunition. The private businesses are in the business of profit—it's a carryover from the old Hudson Bay Company days. It ain't cheap.

NG: And the price of food is absolutely *fantastic*. The prices are just incredible. My people complain like hell even though they get northern allowances and big salaries.

Q: If people made a quarter a million dollars a year, what is the income from the 30 remaining bears?

GW: There's a cash income—they go out to auction. There's very little domestic use for a polar bear. It'd be nice but, at auction a polar bear's worth about \$125 to \$150 a foot, so a bear could represent \$1500. Plus there's the meat, and there's about 200 kilos of edible to a polar bear, which in fact people get from the sport hunters: hunters don't take any meat back, they're out for a trophy. They're not out for tidbits. In a rational economic world, you should be selling all these 400 polar bears, and not sending the skins out to auction where you're getting much less money.

Q: What do they do with their quota, and what do the women get from it? How do they deal with this quota, or lottery?

NG: The most interesting thing about the whole polar bear thing is to be in the community when they're trying to decide what to do with their quota each year. They have meetings and each community decides different ways: well, we have 40 bears, let's sell 10 of them, because most Inuit like to go out and hunt too. Or they'll say, well we'll have a lottery for who gets a license, or some communities do it another way, they'll say okay, once we've killed our quota we won't be able to kill any more, *whoever* gets them. One of the most drastic, terrible things that happens is sometimes *women* get bears from the quota, and the men say, We never thought *women* would do this! You mean they're taking bears from *us*?! In one community I was in, there was a guy who lived out in an outpost camp (which is a very rare phenomenon—they used to subsidize people to live in outpost camps to keep them away from the community, which is probably terribly expensive for the government), and he got *seven* of the ten bears, because he was out there, and the whole rest of the community only got three! So it's very interesting. The Inuit, democratically or otherwise, make up their own mind in each community or area, how they're going to deal with this lot, whether they're going to sell them and get a lot of income and reduce their own harvest, or whether there's going to be a free-for-all, or there's going to be a first-come, first-served, or there's going to be a lottery, or whatever. So that part of the economics and the politics of it is equally interesting.

Well, let's go eat some polar bear liver!

(LUNCH BREAK)

Afternoon Sessions: Contested waters: Sovereignty, Security, Strategy

Thomas G. Barnes, Chair

Wendell Sanford

J. Ashley Roach

Thomas Barnes

Professor Barnes introduced the five panelists and the second half of the conference with a look back at a previous conference convened by Canadian Studies (quoted here directly):

"This afternoon's panel will discuss *Contested Waters: Sovereignty, Security, Strategy*. Of the five panelists, four are lawyers who have served at sea, one in the Canadian Navy, one in the U.S. Navy, and two as U.S. Coast Guard officers—and the fifth panelist has written extensively on naval affairs from a Canadian perspective.

Perhaps it is appropriate to provide what the Michelin Guide calls *un peu d'histoire!* The Canadian Studies Program's interest in these issues began eighteen years ago this month with a three-day *Conference on Canadian and United States Strategic Concerns in the Arctic*. Three of us here today—Nelson Graburn, David Caron, and I—participated then in topics posited in the call:

"This conference will center on strategic concerns, though very broadly understood. The USSR's vast presence in the Arctic raises the principal strategic defensive issues facing Canada and the United States in the area. . . . But the term "strategy" is meant to go far beyond defense considerations directed toward a hostile third party."

It was our intention to hold another symposium in two to three years, based upon the questions opened in the 1990 symposium. It did not happen. In great part because the strategic concerns were "Glasnosted!"

The boundaries of that symposium were not more restricted than the topics posed for this conference. A new urgency to what have been long-standing concerns grows principally from the simple fact that Arctic commercial surface transit is now reasonably foreseeable with consequences to environment and peoples. Indeed, even the strategic concern remains: the Russian Federation has replaced the USSR but the new Russia is asserting its Arctic ambitions with increasing vigor.

Permit a legal historian of the seventeenth century to remark that the fundamental question of maritime transit facing the panel grew from the diametrically opposed polemical postures of the Dutchman, Hugo Grotius, *Mare Liberum*, 1609 (The Free Seas) and the Englishman, John Selden, *Mare Clausum*, written c.1618 (The Closed Seas). Grotius saw that a minor state with a small coastline but large trading and fishing fleets must rely on free passage to survive. Selden argued that the long coastline of England projected seaward constituted English territory, especially in the Narrow Seas of the English Channel. Out of the conflict, which touched all European maritime powers, grew a workable limitation to territoriality on the seas put forth by Cornelius Bynkershoek in 1702, the three-mile limit. On the premise of Alfred Thayer Mahan, USN, in 1890, that control of the vast trackless ocean by the extension of seapower afforded control of the landmass, was built both the great navies and the wide commerce of the Twentieth Century. And the postulate remains the foundation for seapower for the maintenance of peace and the free passage of commerce on the seas—including the Arctic Ocean—which are becoming increasingly *mare clausum*."

Wendell Sanford (*Director for Oceans and Environmental Law, Department of Foreign Affairs and International Trade, Government of Canada*) "*Arctic Sovereignty: Myths and Reality*" [Sanford presentation \(PDF\)](#)

The Arctic is an emerging region on the verge of major change. [A map of the Arctic was shown.] There is no threat to ownership of lands, islands, and waters of the Arctic: they are Canadian and will remain so. Regarding Canadian sovereignty in the Arctic, a comment by US President Bush at the August 2007 Montebello Summit is quoted: "The US does not question Canada's sovereignty over its Arctic islands. And the US supports Canadian investments that have been made to exercise its sovereignty." So there is no question about Canadian ownership or sovereignty here.

Canada does, however, have disputes in three discrete areas: with Denmark in the Lincoln Sea; with

Denmark again about Hans Island, and with the US about the Beaufort Sea.

The maritime boundary of Hans Island was settled by a 1973 agreement; the dispute pertains only to the 1.3 square km island. Respecting the Lincoln Sea, the dispute is over two tiny maritime zones of 31 and 35 square nautical miles respectively. And it is the seaward border of the Beaufort Sea that is the locus of the dispute with the US.

The North Pole is “on the High Seas”—beyond any state’s sovereignty. But the soil and subsoil beneath might be on the extended continental shelf. Canada is currently mapping the outer limit of the shelf and moving toward resolution of the dispute with Russia. The MOU with Denmark, participation with the US in surveys, and meetings with Russian scientists all attest to Canada’s willingness to cooperate with its neighbors.

There is some dispute between Canada and the US over *use* of the Northwest Passage (not ownership *per se*); Canada regards these waters as Canadian internal waters, whereas the US regards them as Canadian *territorial* waters with an international strait running through. President Bush again: “Yes, we will manage the differences. Because there are differences on the Northwest Passage. We believe it is an international passageway.”

There has been a significant decrease in the extent of sea ice in Canada since 1968. This will result in a decrease in cost of shipping in the Canadian Arctic, although it is not foreseen that routine transit shipping will be attracted to the Passage until late in the century. In terms of implications for Canada, this reduction means increased access to Hudson Bay, and increased economic accessibility of Arctic resources. Canada encourages navigation in its internal waters including the Northwest Passage, provided Canadian regulations and controls relating to security, the environment, and Inuit interests are respected.

J. Ashley Roach (*Office of the Legal Adviser (L/OES) U.S. Department of State*) “*Contested Waters: the US View*” [Roach Word document](#)

One result of the melting of polar ice is that large-scale navigation will soon become feasible in the region. It is vital that consideration and clarification of terms and issues surrounding sovereignty, territoriality, and maritime passage in the Arctic Ocean be reached before that occurs. There is considerable variation regarding the employment of terminology: the term “Arctic” itself is subject to considerable debate. Some use the term to refer to all land, even submerged land, and water north of the Arctic Circle. The US Arctic Research statute, however, employs a broader definition, encompassing the Bering Sea and some Alaskan land below the Arctic Circle. The Canadian Arctic Waters Pollution Prevention Act calls all Canadian land and waters north of 60°N “Arctic,” while others merely use the definition, “where the permafrost begins.” The Arctic Ocean is subject to a like array of disparate interpretations, and the extent of the continental shelf remains a matter of dispute.

As in other maritime environments, the Arctic Ocean is divided into exclusive economic zones (EEZ), continental shelves, and the deep seabed beyond national jurisdictions (the “Area”). Each of the five nations (Canada, Denmark, Norway, Russia, and the US) bordering the Arctic Ocean has claimed an EEZ in the region. Maritime boundaries are notoriously subject to dispute, and five now involve the Arctic region. Nevertheless, a degree of cooperation exists as well, with joint scientific investigation being performed and a measure of diplomatic concession.

One area not amenable to diplomatic concession appears to be the Northwest Passage—particularly germane to the theme of this conference as it is the widening of this passage, and its consequently expanded utility, as a result of climate change that is a particular locus of conflict. A primary disagreement is the assertion of many countries that the waters are an international conduit, as opposed to that of Canada that they are internal waters of her own, requiring Canadian consent for passage and

adherence to Canadian regulations and controls.

Applicable to the Arctic Ocean are a host of unrelated legal instruments, including the “law of the sea” (regularized by the Law of the Sea Convention), various International Maritime Organization (IMO) agreements, and various air-related agreements to which some of the nations involved belong and others do not. The US participated in the development of, and supports, the IMO Guidelines, and supports the Arctic Council Guidelines on off-shore oil/gas activities. Many of the features addressed by both sets of guidelines are concerned primarily with issues of human safety—Search and Rescue [SAR] agreements and conventions, for instance—and environmental protection rather than legality or jurisdiction. A number of agreements, controls, and stipulations are designed to enhance the safety of commercial vessels and to prevent the occurrence of pollution by oil. There is also the Arctic Council, the only diplomatic forum focused on the Arctic, whose members include Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the US, with six indigenous organizations serving as “permanent participants,” and six observer states (France, Germany, the Netherlands, Poland, Spain, and the UK). The Council is focused on environmental protection and sustainable development, with subsidiary bodies addressing Arctic scientific, environmental, and social issues.

Lawson Brigham (Chair, *Arctic Marine Shipping Assessment of the Arctic Council, Anchorage*) "*Arctic Marine Shipping Assessment: Responding to Changing Marine Access*" [Brigham presentation \(PDF\)](#)

The Arctic Council is an inter-governmental forum of the 8 Arctic states. The Council’s Arctic Marine Shipping Assessment (AMSA) is being conducted by the technical working group Protection of the Arctic Marine Environment (PAME). Several key points of AMSA follow.

AMSA is a natural ‘follow-on’ to the Council’s Arctic Climate Impact Assessment (ACIA) and the Arctic Marine Strategic Plan. AMSA is circumpolar in scope, yet must consider regional and local levels where social, environmental and economic impacts will be greatest. AMSA, focusing on marine safety and marine environmental protection, recognizes that the global maritime industry is composed of many non-Arctic actors and stakeholders. AMSA is led by Canada, Finland and the United States, and involves the commitment and data from all Arctic states.

The extent of Arctic sea ice decrease has been largest during the summer and the current decrease is the largest since the late 1980s. Decreases in extent for all seasons have been observed since the 1950s. The ACIA climate model simulations for Arctic sea ice extent indicate decreases through 2100. The recent observed record of Arctic sea ice decline has not been matched by the simulations of the latest Global Climate Models. There has been a loss of sea ice coverage throughout all Arctic coastal seas and this trend should continue. The extent trends for the Northwest Passage have been negative since the late 1960s, but inter-annual variability of the coverage has been large and this year-to-year uncertainty is a challenge to the insurers and investors of future marine transport systems.

The AMSA database will contain all types of ships operating in the Arctic Ocean early in the 21st century: tankers, bulk carriers, fishing vessels, icebreakers, research vessels, ferries, offshore supply/support vessels container ships and tug-barge combinations. The survey year is 2004 and the effort is designed to provide an accurate assessment of how many ships are actually operating in the Arctic Ocean throughout a selected, calendar year. There are multiple Arctic routes and several modes of transport ~ regional or destination, trans-Arctic, and intra-Arctic (for example, Churchill, Manitoba to Murmansk). For the period 1977-2007 there have been 72 transits of icebreakers to the North Pole (60 Russia, 5 Sweden, 3 USA, 2 Germany, 1 Canada and 1 Norway); only a single voyage was in early spring (voyage of the Soviet nuclear icebreaker *Sibir* in the central Arctic Ocean May-June 1987) with the remaining conducted in summer. There have been 7 trans-Arctic icebreaker voyages in history, all in summer (1991, 1994, 1996 and 2005). Highly capable icebreakers have voyaged in all regions of the

Central Arctic Ocean and gained complete access throughout the basin in summer.

AMSA in a scenarios development effort has identified resources & trade and governance as the two key factors influencing the future of Arctic navigation. Other key uncertainties include: Arctic sea ice retreat, polar marine disasters, changes in global trade dynamics, limited windows of Arctic operation, the maritime insurance industry, transit fees, new resource discoveries, global agreements on safety and environmental protection rules, new Arctic ship technologies and escalation of Arctic maritime disputes.

One scenario, Arctic Race, involves continued high demand for resources under an era of unstable governance in the Arctic Ocean. The Arctic Saga scenario, or plausible future, is driven by high demand with a stable governance that features a healthy rate of development including concern for the preservation of Arctic ecosystems and cultures.

For the Canadian Arctic the future development of regional fisheries and hard minerals, as well as oil & gas, and growth in marine tourism are highly plausible. One of the key questions is whether transits of the Northwest Passage will take place in summer, or that the vast majority of traffic will be regional and destinational, but perhaps not year-round. The high variability of sea ice in the Canadian Arctic will continue to be a challenge for all marine transport systems. The potential adoption of the IMO-developed Arctic Guidelines and a future Polar Code for this marine region will be closely watched by the other Arctic states. The future of icebreaker convoying in the Northwest Passage will also be a future challenge for the Canadian Government ~ how much traffic will be facilitated by Government icebreakers vice commercial icebreakers and icebreaking carriers?

Rob Huebert (*Political Science, University of Calgary; Associate Director, Centre for Military and Strategic Studies*) "*Climate Change and Geopolitics in the Arctic*" [Huebert presentation \(PDF\)](#)

The Arctic is in a state of massive transformation, involving climate change; resource development; geopolitical transformation/globalization; domestic governance transformation; and the numerous speculations and opportunities regarding the future.

Canada's challenges with respect to the region include a firm determination of Canadian northern borders and determination of what Canada and others can or cannot do within its borders. These are potent issues with far-reaching consequences. There are currently several maritime border disputes, one waterway status dispute, and one land dispute under consideration in the Canadian North.

Sovereignty and security are identified as interdependent concepts, for all that a tendency exists (academic, policy, and public) to attempt to separate them. Sovereignty for Canada by itself is meaningless. It must be used to provide security for Canadians, and to allow for the provision and promotion of Canadian well-being.

Issues pertaining to the changing North include climate change, resource development, geopolitics, and domestic governance. With respect to the first of these, the retreating ice is a particularly grave issue. Geopolitically, the relations with "the New Russia," with its renewed assertiveness and its petrodollars, and the US, the "remaining Superpower," are of particular concern. A number of acts of cooperation between Canada and its neighbors are encouraging developments in this regard. Nevertheless, disputes over waterways (notably the Northwest Passage), the Beaufort Sea, and boundaries remain unresolved, with possible new disputes arising in the near future. As has been mentioned previously, attempts are being made to establish some agreed-upon measurement of the extent of the polar continental shelves, now subject to considerable debate.

Domestically, the changing North entails political transformation, the loss of traditional lifeways, and

increasingly young population, and a host of other social and environmental issues.

Commentator: David Caron (*Boalt School of Law: Co-Director, Law of the Sea Institute*) Mr. Caron's commentary will be posted shortly.

END OF CONFERENCE SESSIONS

CONFERENCE KEYNOTE DINNER and KEYNOTE ADDRESS (*by invitation only, hosted by The Canadian Studies Program of International and Area Studies at Berkeley and the Consulate General of Canada, San Francisco/Silicon Valley*)

Hotel Durant, 6:30

« Le discours le plus court est le meilleur »

« The Ice is Melting – Climate Change in the Canadian North »

Canadian Studies Program and Law of the Sea Institute

University of California Berkeley

7 March, 2008

Keynote Address

Wendell Sanford

Director, Oceans and Environmental Law Division

Department of Foreign Affairs and International Trade Canada

Let me begin by saying how useful an exercise today's seminar has been. My remarks this evening will consist of a recap of what I believe to be the key points made during today's sessions. Then, I will provide a few personal thoughts, not Government of Canada positions, on where I believe we are headed with respect to this important international issue.

Here is what I think we learned today.

- Experience IS a great teacher. In a world full of instant analysis and examination of evolution of the world's climate based on exceptionally brief data sets, it was refreshing beyond belief to listen to people with 30, 40, or 50 years personal experience of the North, its people, and its climate. Their views are more subtle and thoughtful.
- It's always about temperature. Because we live in heated and air conditioned worlds this salient point is not as well understood as one might expect.
- Kyoto will only have a small effect because it is only a small step, "a minute reduction". Even if trend setter California manages by 2020 to return to 1990 levels this will only represent a 25% reduction in emissions in a situation where we would need 60-80% to stabilize. We must therefore concentrate on adaptation as reduction is simply not going to suffice.
- Alaska, the Arctic frontier for America, is affected by market power of pipeline owners. They call

the shots in the state and establish its position on environmental as well as resource issues. The Alaskan Arctic has 15-18 TCF of natural gas. Accordingly there is no incentive to go looking for the “one big field.” The offshore Russian Arctic has more hydrocarbon potential than all of the New World combined.

- As climate change results in a warming of the North, vegetation expansion has the same effect as doubling the CO₂ output in atmosphere. Does this mean we should clear cut the boreal forest to “save” the atmosphere? The logic involved escapes me.
- An Inuit hunter on an unusually temperate winter’s day was heard to remark, “If this is global warming we will love it.” But the global politics of climate dynamics are central to the Inuit. They have survived the medieval warming and the Little Ice Age. Accordingly, they will survive climate change. But if the narwhal and beluga decline in numbers and become “icons” the Inuit will suffer as a consequence.
- “Change” in the Inuit tongue means that things are getting worse – the Dorset Inuit were out-competed by Thule Inuit to rule the North. Meanwhile most contacts with outsiders from Frobisher in the 1500s until 40 years ago were seen as good. The common nail to the people of the North was a marvel. Fox fur made them rich by their standard permitting snowmobiles, big boats, and a village (rather than nomadic) lifestyle. Indeed “sedentarisation” is the biggest shock in 1000 years.
- From a nation state perspective we must focus on long term common interests.
- UNCLOS, IMO including its guidelines for Ice Covered Waters, SOLAS, MARPOL, London Dumping Convention, Montreal Protocol, Kyoto, and the Arctic Council Oil & Gas provisions all represent areas where real effective cooperation exists and can be enhanced.
- The United States believes that Canada’s environmental regulation is circumscribed by Article 233 of UNCLOS and wonders if Article 234 will apply when the Northwest Passage is no longer covered by ice for long periods of time.
- Canada responds that the Northwest Passage is Canadian internal waters which are open to navigation by vessels which respect Canadian security, environmental, and Inuit interests.
- Of the four possible outcomes for the future the “Arctic Saga” is our goal. With a high demand for Arctic resources and stable government leading to a healthy rate of development while including concern for the preservation of Arctic ecosystems and cultures.
- “We must not be complacent or pessimistic” about the Arctic. It is becoming a centre of interest in world affairs.
- The 1992 image of impassable Arctic fixed on the periphery of the world has evaporated as quickly as the ice.

Now shifting to a few personal observations of where we might be headed. One must begin by observing before a sophisticated audience on a major American university campus that the “North” as seen by the Canadian population is absolutely central to who we are. By American standards think of the Boston Tea Party and the Alamo. The idea of the North for Canadians has the exact same psychological and national impact. In consequence, all Canadian governments are expected to strongly defend Canadian interests. In addition, we are slighted by any foreign comment which is not pro-Canadian. Journalists in Canada are repeatedly attracted to any action, the Russian flag at the North Pole being this past year’s example, which they see as demonstrating a lack of government resolve and a “threat” to our sovereignty. You will not be surprised that they do not bother to assess “facts” which run counter to a conflict scenario. In addition they readily take any comment from experts which accentuate danger while ignoring more temperate remarks. I encourage you to keep these thoughts in mind when the phone rings this summer.

That having been said, the current government has been out in front of this issue from the first week of the mandate when Prime Minister Harper countered a comment by the American ambassador with a strong statement. Since then our diplomatic discourse has become more nuanced, as I noted with respect to President Bush’s comments at Montebello regarding the issues of sovereignty of Canada over

its Arctic lands and the utilization of the Northwest Passage. You will observe that, as this was not a confrontational exchange, it did not draw media coverage. That day the “lead” was about Surité Québec policemen infiltrating a group of anti-NAFTA protestors.

The Prime Minister’s approach, and he has held this file very closely, has been reflective of the Prairie Populism of John Diefenbaker, Prime Minister of Canada in the late 1950s, who last placed an emphasis on the North in his national policy.

It rings true with Canadians and is extremely popular at the polls. Opposition politicians find themselves only able to criticise at the margins.

On a multi-lateral basis the news is positive as well. Increased ship and aircraft activity within the Canadian Arctic calls for NAVAREAS and METAREAS to be implemented. In consequence UN mandated Canadian programs are being developed in each instance.

Finally, there is the question of regional cooperation, where the glass is filling rapidly. The Arctic Council which includes the 5 Arctic Ocean states – Canada, US, Russia, Denmark and Norway – plus the other Arctic states – Finland, Sweden and Iceland – is involved in the real resurgence of activity ranging from indigenous peoples to Search and Rescue.

Meanwhile, Denmark on behalf of Greenland is leading an effort to organize a meeting of foreign ministers of the Arctic Ocean States in Greenland in May to reaffirm our joint commitment to UNCLOS as a basis for progress within the Arctic region.

In both of these fora it is recognized that the Arctic is not the Antarctic requiring a specialized regime and decades of negotiating. Existing systems, principally UNCLOS, are in place which states will use to manage the growth of activities in the region.

With all of these positive developments coming to the fore it is evident that, as “The Ice is Melting”, the glass (contrary to Archimedes principle) is becoming more than half full.

Venue and directions: *Clark Kerr Campus, UC Berkeley*

The CKC is at 2601 Warring Street (at Parker). It is close to but not actually on the main Berkeley campus (less than a mile from Bancroft & College). There is a parking lot which is valid for campus "C" permit holders, to the right of the main building (# 14). There's also street parking if you don't have a campus permit. The # 7 bus stops right in front of CKC (it also stops at both Berkeley and Rockridge BART). Do NOT park in the horseshoe driveway - a towaway zone!

Map http://conferenceservices.berkeley.edu/images/2c_BerkeleyStreetMap.gif

Driving directions: http://conferenceservices.berkeley.edu/conf_dirto_CKC.html

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