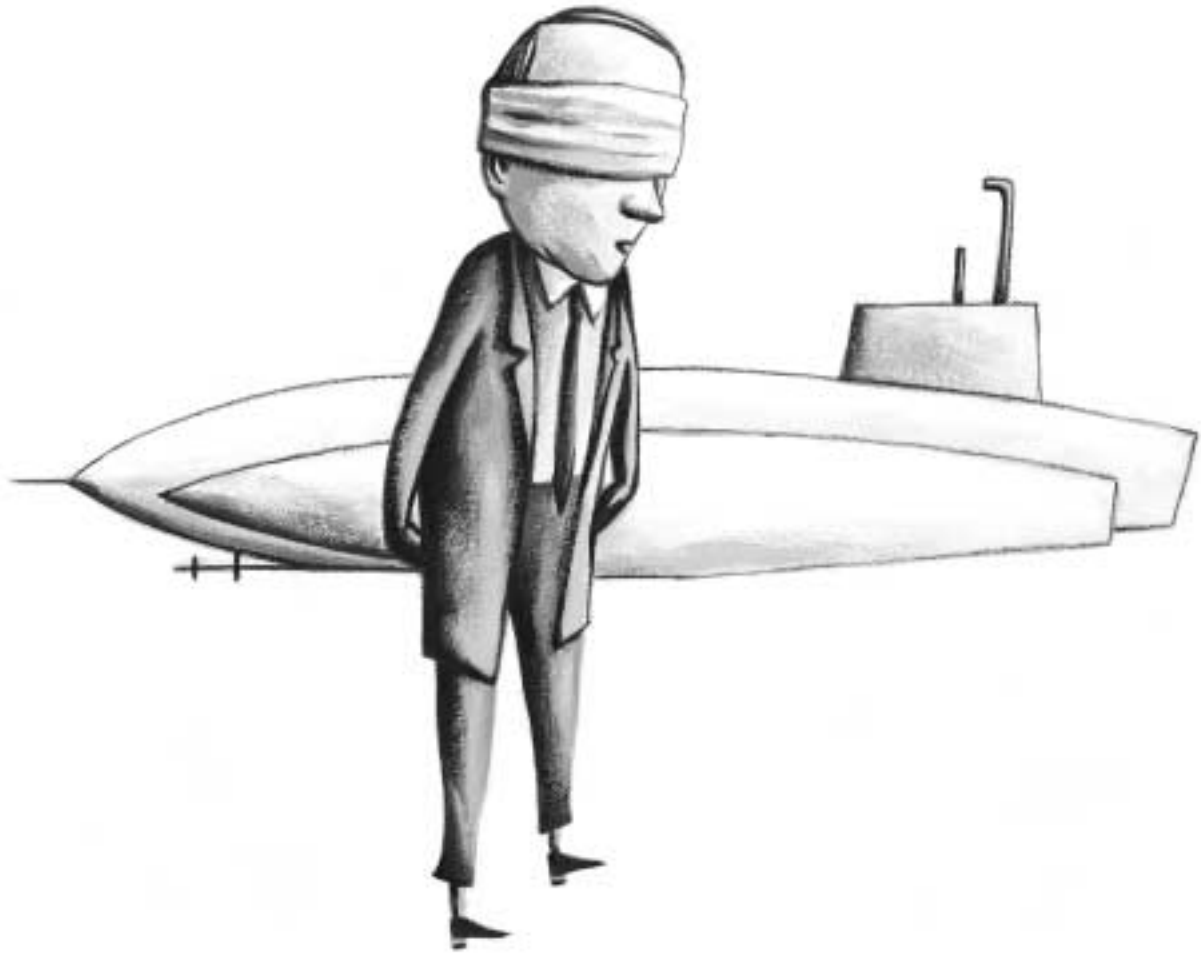
Climate Change

and Canadian Sovereignty in the Northwest Passage



BY **ROB HUEBERT**

ABSTRACT ► Climate change in the Arctic is a serious challenge to Canadian Arctic sovereignty and security. Climate change has already led to thinning of the ice cover in the Northwest Passage. If this continues, commercial international shipping and other forms of activity in the area will become more viable. If this happens, Canadian control of its Arctic will face two significant challenges. First, current efforts by the Canadian government to maintain Canadian sovereignty over the Northwest Passage are unlikely to succeed. Second, Canada will need to substantially rethink its enforcement and surveillance capabilities in the Arctic, which will require significant new expenditures in these areas.

RÉSUMÉ ► Les changements climatiques dans l'Arctique représentent un défi de taille à la souveraineté et à la sécurité de l'Arctique canadien. Ils ont déjà provoqué l'amincissement de la couche de glace dans le Passage du Nord-Ouest et, si cela continue, le transport maritime commercial international ainsi que d'autres activités deviendront plus viables dans cette région. Si cela se produit, le contrôle exercé par le Canada sur l'Arctique sera confronté à deux défis importants : d'abord, les efforts actuels que consacre le gouvernement canadien à maintenir la souveraineté canadienne sur le Passage du Nord-Ouest ont peu de chances de succès et, ensuite, le Canada devra repenser en profondeur ses capacités de surveillance et d'application de la loi dans l'Arctique, ce qui imposera un montant élevé de nouvelles dépenses. (Traduction : **www.isuma.net**)

ILLUSTRATIONS : MARIE LAFRANCE

THE MOST RECENT report from the Intergovernmental Panel on Climate Change (IPCC) reports that the Arctic region is especially sensitive to the dynamics of warming temperatures.[1] The most recent scientific evidence strongly suggests that the Arctic is experiencing warming at a rate greater than almost any other region of the globe. This is evidenced by the thickness of the ice cover; the occurrence of both the melting and freezing of the Arctic Ocean and its surrounding waterways; and from the samples of ice cores.[2] Observations made by northern Aboriginal peoples also lend credence to the evidence that the Arctic is warming up.[3] Insects have been reported much further north than is the norm. Changes in animal migration patterns have also been reported.[4] Both northern Aboriginal peoples and scientists have reported significant changes in the hunting patterns of predators such as the polar bear. For example, Ian Sterling, one of the world's leading experts on the North American polar bear has noted that the polar bear population inhabiting the Hudson Bay region has become smaller.[5] He attributes this to the earlier melting of the ice cover on Hudson Bay, which has made it more difficult for the bears to hunt seal. The Canadian Ice Services of Environment Canada has noted that the ice cover has decreased since the mid-1970s.[6] Satellite data show that the ice cover has steadily been decreasing.

The problem: Climate change and the ice cover

Not all scientists agree that climate change is the cause of these changes in the Arctic. Some researchers suggest that the ice is thinning because of fluctuations in wind patterns and not as a result of increased temperatures.[7] However, those who suggest that climate change and the resulting impact of global warming have not occurred or have not affected ice levels in the Arctic are in the distinct minority. The consensus is that climate change increases average temperatures in the Arctic regions which, in turn, causes the ice cover to melt.

Increased interest in the Canadian North

There are limited signs of renewed interest in shipping through the Northwest Passage. At the end of the Cold War, ecotourist voyages began to enter the Passage, but only between five and ten partial or complete voyages a year. To date, only icebreakers or ice-strengthened vessels have made the voyage in this capacity, and the companies responsible have requested the Canadian government's permission. Every company that used these vessels to transit the Passage has requested the Canadian Government's permission. Most of these voyages have been without incident. However, in 1996, the *Hanseatic* went aground on a sand bar near Cambridge Bay.[8] Although only a minor oil leak occurred, the grounding was severe enough to require the vessel's complete evacuation as well as the removal of most of its stores to facilitate its removal from the sand bar.

In 1999, the first non-American passage for commercial shipping purposes took place when a Russian company sold a floating dry dock based in Vladivostok. Its new owners decided to move the dock to Bermuda. With the aid of a Russian icebreaker and an ocean-going tug, the dry dock was successfully towed through the Passage. This use of the Passage to avoid storms in the open ocean demonstrated its advantage for international shipping should the ice be reduced. The fact that the dry dock was then almost lost in a storm off Newfoundland seemed to confirm the benefits of sheltered waters of the Passage route.

Climate change is a serious challenge to Canadian Arctic sovereignty and security.

Also in 1999, a Chinese research vessel visited Tuktoyaktuk. While the Canadian embassy in Beijing had been informed of the Chinese plan to send a vessel to the western Arctic, local Canadian authorities were not informed. Consequently, local officials were considerably surprised when the Chinese arrived in Tuktoyaktuk. The voyage of the Chinese vessel demonstrated the limited Canadian surveillance capabilities. Canadian officials did not learn of the vessel's entry into Canadian waters until it actually arrived.

The U.S. Navy has begun to examine the issue of conducting surface vessel operations in Arctic waters. In April 2001, the U.S. Navy organized a symposium on the subject. This strongly suggests that it perceives the possibility of an ice-free Arctic where it may be required to operate and has begun to give the subject serious thought.

New multilateral efforts to prepare for increased maritime traffic in the Arctic have also begun in the 1990s. An initiative of the Canadian Coast Guard led a group of Arctic coastal states and relevant international shipping companies to meet in 1993 to develop what is now known as the Polar Code.[9] The meetings were intended to develop a common set of international standards governing the construction and operation of vessels that would operate in Arctic waters. To a large degree, these talks represented the Canadian Coast Guard's effort to initiate discussions in anticipation of increased shipping in the region. Unfortunately, the United States State Department has attempted to derail the negotiations for reasons that are not clear. Substantial progress was made when the discussions involved

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officials from the various Coast Guards. However, as the talks began to lead to an agreement, the American State Department became involved, and several elements of the American position were altered, including initial acceptance of developing a mandatory agreement and accepting the inclusion of Antarctic shipping. Although the other participants have accepted the changes in the American position, the Americans have still been reluctant to advance the negotiations.

While each of these events by themselves can be dismissed as interesting but unimportant events, when considered as a whole they indicate an upward trend in interest in Canadian Arctic waters. Furthermore, it is expected that there will be an increase in activity associated with the development of oil and gas deposits in this region. All things considered, the Canadian Arctic is becoming busy, and as it becomes increasingly ice free, it will become even busier.

The Canadian claim

The melting of the ice that covers the Northwest Passage gives rise to questions about the impact this has on Canadian claims of sovereignty. There is no question about the status of the land territory that comprises the Canadian Arctic archipelago. All conflicting land claims were settled in the 1930s,[10] with the sole exception of a dispute over the ownership of a small island between Baffin Island and Greenland named Hans Island. The government of Denmark contests the Canadian claim of ownership. The only relevance of this claim is its impact on the determination of the maritime boundary line between Canada and Greenland in the Davis Strait. Canadian claims of sovereignty of its Arctic areas with respect to maritime boundaries have resulted in three disputes. Canada disagrees with both the United States and Denmark over the maritime boundaries that border Alaska and Greenland respectively. Neither dispute will be influenced by reduced ice conditions.

It is a third dispute, concerning Canada's claim over the international legal status of the Northwest Passage, which will be adversely affected by a reduction of ice cover in the Passage. The Canadian government's official position is that the Northwest Passage is Canadian historical internal waters. This means that Canada assumes full sovereignty over the waters and thereby asserts complete control over all activity within them. The Government of Canada's most comprehensive statement to this end was made by then Secretary of State for External Affairs, Joe Clark, in the House of Commons on September 10, 1985. In that declaration, he included the following statement:

> Canada's Sovereignty in the Arctic is indivisible. It embraces land, sea, and ice. It extends without interruption to the seaward-facing coasts of the Arctic Islands. These Islands are joined and not divided by the waters between them. They are bridged for most of the year by ice. From time immemorial Canada's Inuit people have used and occupied the ice as they have used and occupied the land.[11]

The Department of Foreign Affairs has not issued any further official statements regarding the Passage since 1985. Following the end of the Cold War, the department's main focus in the north has been the development of new international institutions. These include the Arctic Environmental Protection Strategy and the Arctic Council. Both bodies are important new developments, but their focus has been based almost exclusively on sustainable development.[12] In June 2000, the department issued a "new" Arctic foreign policy statement listing four main objectives. The second objective was to "assert and ensure the preservation of Canada's sovereignty in the North."[13] However, the document does not discuss how Canada will assert and enforce its sovereignty. The only statement on the topic is that the "public concern about sovereignty issues has waned" and that "globalization has also altered the exercise of state sovereignty, partly through the development of a web of legally binding multilateral agreements, informal agreements and institutions."[14] There is no explanation or justification as to how these assessments are reached.

The department has had little to say about the impact of climate change on Canadian claims. One of the few comments on the subject was made by an official from the Legal Affairs Bureau in a presentation in Whitehorse on March 19, 2001 regarding Canadian sovereignty in the Arctic. Much of his focus was on the impact of climate change. Although his discussion is not official policy, it nevertheless provides the most current understanding of the position of the Department of Foreign Affairs. He argued that Canadian sovereignty over the waterways of the Canadian Arctic did not depend on the ice cover of the region, but that

> Canada's view, then and now, is that since the 1880 deed transfer [of the Arctic archipelago from the U.K. to Canada], the waters of the Arctic Archipelago have been Canada's internal waters by virtue of historical title. These waters have been used by Inuit, now of Canada, since time immemorial. Canada has unquali-

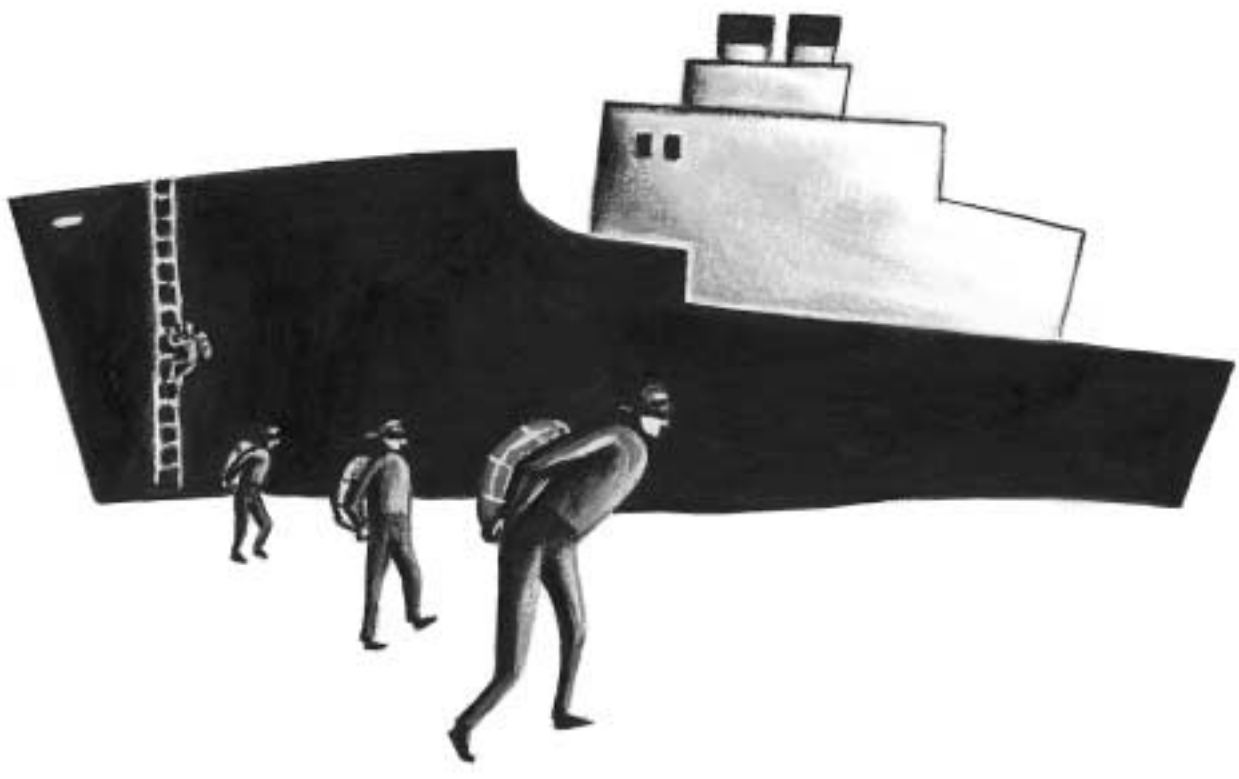
fied and uninterrupted sovereignty over the waters. [15]

The official also noted that Canada has not relied on the concept of "ice as land" to support its claim of sovereignty. This is due in part to the differences between pack ice and shelf ice. Pack ice is "dynamic and ever-changing" and is therefore "unsuitable for legal analysis as being dry land." Shelf ice, while potentially more useful in determining boundaries is not particularly useful to Canadian claims in that the four main ice shelves of the Canadian Arctic are on the northern border of Baffin Island, and therefore, are not pertinent to the issue of the Northwest Passage. Thus, he concluded that "even if the ice were to melt, Canada's legal sovereignty would be unaffected."[16] In conclusion, he argues "[S]overeignty over the marine areas is based on law, not on the fact that waters in question frequently are covered by ice. The waters between the lands and the islands are the waters of Canada by virtue of historical waters."[17]

There are several problems with this line of argument that are unrelated to the issue of ice use. First, the claim that these waters are internal by virtue of historical title is in doubt. A study by one of the leading Canadian legal jurists, Donat Pharand, has demonstrated the weakness of the use of this line of argumentation. In his major study of the issue he concludes that "[i]t is highly doubtful that Canada could succeed in proving that the waters of the Canadian Arctic Archipelago are historical internal waters over which it has complete sovereignty."[18] Pharand supports this conclusion with two sets of arguments. First, the use of the legal concept of historical waters has diminished in recent years. It is unlikely that it would be persuasive in an international court. Second, the requirements for proving historical waters are exacting. These include "exclusive control and long usage by the claimant State as well as acquiescence by foreign States, particularly those clearly affected by the claim."[19] Pharand argues this has not been the case for Canadian Arctic waters. Canada has not dedicated the resources to demonstrate exclusive control, and the foreign States with an interest, i.e., the United States and the European Union, have not acquiesced. Although Canada may make a claim that the Arctic waters are historical waters, Pharand convincingly argues that this claim would likely not withstand an international challenge.

The Canadian foreign affairs official also argued that the Government of Canada's decision in 1986 to enclose the Canadian Arctic Archipelago by straight baselines ensures that the waters within the straight baselines are internal. The weakness of this argument lies in the timing of the Canadian declaration. Canada implemented straight baselines around the Arctic on January 1, 1986. However, in 1982, it had signed the United Nations Law of the Sea Convention (UNCLOS), in which article 8(2) states that a State cannot close an international strait by declaring straight baselines.[20] Therefore, the Canadian government's claim that drawing straight baselines gives it the international legal right to claim jurisdiction over international shipping in these waters is also unlikely to withstand an international challenge.

The Foreign Affairs official offered a strong argument that the condition of the ice is not an important element of the Canadian claim. However, this is not entirely true. As stated earlier, the September 10, 1985 statement by Joe Clark clearly connects ice conditions to sovereignty. The statement provides that the islands of the Arctic are "joined and not divided by the waters between them. They are bridged for most of the year by ice." The statement continues that "[f]rom time immemorial Canada's Inuit people have used and occupied the ice as they have used and occupied the land." [21] The intent of the Government of



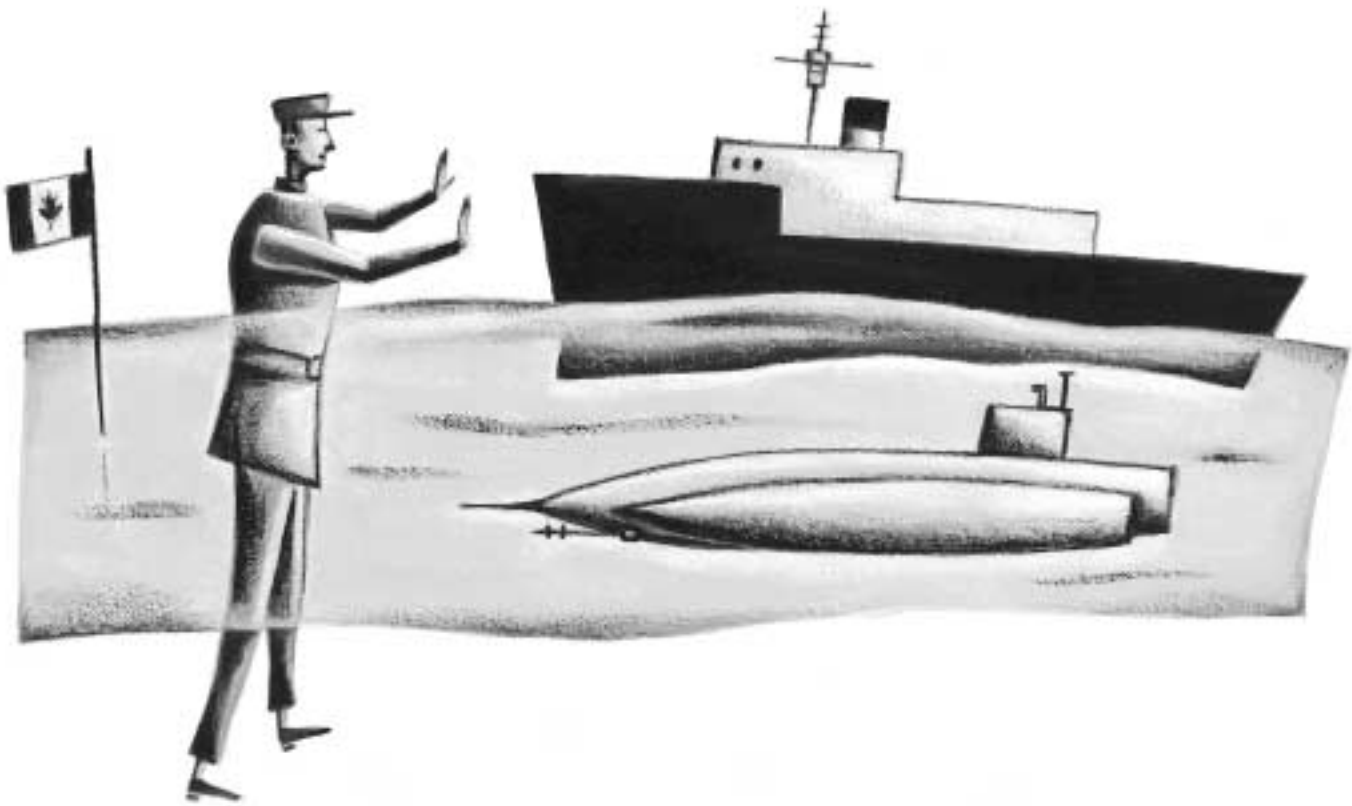
Canada in issuing this statement is clear. The ice cover makes the Northwest Passage unique by virtue of the inhabitation of the Inuit on the ice. Thus, the ice can be considered more as land than water. Following this logic, the Government is obviously making the case that international law as it pertains to international straits does not apply. Since this statement remains as the definitive statement on Canadian Arctic sovereignty, it is clear that any new statements to the contrary are not accurate.

The Canadian legal position has been challenged. Both the United States and the European Union have indicated that they do not accept Canadian claims of sovereignty over the waters of the Canadian Arctic archipelago. However, neither the United States nor the European Union pushed their challenge as long as ice conditions precluded any economically viable international shipping. This hesitation will likely diminish as the ice melts, and this is the crux of the problem facing Canada.

The American and European position

The United States and the European Union position is that, contrary to Canadian claims, the Northwest Passage is an international strait. The Americans in particular do not accept the argument that ice cover makes a difference for the international legal definition of an international strait. The Americans have always maintained that the International Court of Justice's ruling in the Strait of Corfu case is applicable for the Northwest Passage. In that case, the Court ruled that an international strait is a body of water that joins two international bodies of water, and has been used by international shipping.[22] The United States argues that the Northwest Passage joins two international bodies of water and has been used for international shipping, albeit a very small number of transits.

Historically, the United States has posed the greatest challenge to Canadian claims of sovereignty. In 1969 and in 1970, the *Manhattan*, on behalf of Humble Oil, transited the Northwest Passage without seeking the Government of Canada's permission. The *Manhattan* was an ice-strengthened super tanker which could transit the Northwest Passage only with the assistance of icebreakers, and even then, ice conditions made the voyage very difficult and expensive.[23] In 1985, the American icebreaker, *Polar Sea*, was sent through the Passage without the Canadian government's permission. Though not designed to challenge Canadian claims of sovereignty, the voyage led to a significant diplomatic dispute.[24] However, to maintain good American-Canadian relations, an agreement was reached regarding future transits by American icebreakers. The 1988 agreement on Arctic co-operation between the Government of the United States of America and the Government of Canada required the United States to request Canadian consent for any future transit of the Passage by American government icebreakers.[25] However, both governments agreed to disagree on the actual status of the Passage. When the agree-



ment was reached, the United States had only two icebreakers capable of such a passage. Since then, the Americans have built one more icebreaker, which invoked the agreement to transit the Passage in 2000.

In addition to the United States, the United Kingdom, acting on behalf of the European Community, issued a diplomatic protest against Canadian efforts in 1985 to enclose its Arctic waters as internal waters by using straight baselines.[26] The Europeans have kept their protests low key, preferring to allow the Americans to take the more active position. But by issuing a demarche against the Canadian claim, they have given notice that they have not acquiesced to Canadian claims of sovereignty.

All things considered, the Canadian Arctic is becoming busy, and as it becomes increasingly ice free, it will become even busier.

Significance of the dispute

The difference between the Canadian position and that of the United States and the European Union is in the issue of control. If the Passage is Canadian internal waters as maintained by Canada, Canada has sovereign control over any activity, both foreign and domestic, that occurs in those waters. On the other hand, if the Northwest Passage is an international strait, then Canada cannot unilaterally control international shipping in it. Therefore, Canada would be unable to deny passage to any vessel that meets international standards for environmental protection, crew training and safety procedures. As these standards are set by the International Maritime Organization (IMO), Canada cannot set different standards, especially those which impose more demanding requirements.

However, Canada could invoke more exacting environmental standards through the United Nations Law of the Sea Convention (UNCLOS). Article 234, the ice-covered waters clause, allows a State to pass legislation that exceeds international standards for any ice-covered waters within its 200-mile Exclusive Economic Zone (EEZ). The Canadian clause, as it is referred to since Canada was its main proponent, states

> Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the preservation, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence.[27]

It is important to note that the article does not give the coastal State the right to deny passage. Rather it bestows the right to the coastal State to pass its own domestic legislation for environmental protection rather than being bound by international standards. Such legislation can be more demanding than that of existing international agreements.

It is interesting that despite the fact that Canada drafted the clause and was originally a strong supporter of the entire Convention, it has not ratified the Convention.[28] The Government of Canada has stated that it accepts most of the Convention as customary international law. However, while it has continued to issue vague statements that it someday intends to ratify the Convention, there is no evidence as to when or if this will actually happen.

Although the issue of sovereignty invokes strong nationalistic feelings for Canadians, the reality is that after Canada and the United States signed the Arctic Cooperation Agreement in 1988, which controls the passage of American icebreakers, and continued to officially ignore the transit of American nuclear-powered submarines through Canadian northern waters, there was little incentive to revisit the issue. As long as ice conditions remained hazardous to commercial shipping, there was little incentive for any country, the United States included, to challenge the Canadian position. However, if ice conditions become less hazardous, then this situation changes drastically. The main attraction of the Northwest Passage is obvious. It substantially shortens the distance from Asia to the east coast of the United States and Europe. It is more than 8,000 kilometres shorter than the current route through the Panama Canal, and would significantly shorten the voyage for vessels that are too large to fit through the Canal and must sail around the Cape Horn. The voyage of the *Manhattan* demonstrated that the Passage can accommodate supertankers of at least 120,000 tons. The shorter distance means substantial savings for shipping companies, which translates into reduced costs for the products that are shipped. It is easy to see why an ice-free Northwest Passage, even for a limited time, would be of tremendous interest to major international shipping companies as well as the countries that avail themselves of their services.

It is impossible to know who will make the first challenge. While it is reasonable to suspect that it might be either an American or a European vessel, it could also be from another country. For example, Japan has shown considerable interest in Arctic navigation in the 1990s. It was a major partner in a multi-year million-dollar study of navigation through the Russian Northern Sea Route (also known as the Northeast Passage).[29] The Japanese also were interested in buying the Canadian ice-strengthened

oil tanker, *Arctic*, when the Canadian government put it up for sale. Perhaps even more telling is the amount of money that the Japanese put into polar research and development that is now substantial and continues to increase.[30] While the Japanese have never issued a statement of their view of the status of the Northwest Passage, it is clear that they would gain if it became a functioning international strait. Oil from both Venezuela and the Gulf of Mexico would then be cheaper to ship to Japan.

Canadian efforts to assert and maintain sovereignty

It would appear that Canada should be now giving serious thought to how it can best respond to the prospects of any future challenges. Unfortunately there is little indication that this is happening. Instead, it appears that the Government continues to downgrade its existing limited capabilities. The two main government agencies with important roles in the protection and maintenance of Canadian international interests in the Arctic are the Department of National Defence (DND) and the Canadian Coast Guard (CCG). Both are continuing to see their northern capabilities reduced.

While the Department of National Defence has begun to consider the impact of a diminished ice cover, budget cuts forced it to eliminate most of its activites devoted to northern sovereignty. The previous Commander of Northern Area initiated a working group of relevant federal and territorial departments, called the Arctic Security Interdepartmental Working Group, which has been meeting twice a year since May 1999. The group shares both information and concerns and has raised the issue of climate change several times. However, it has almost no resources of its own and can only act as a means of co-ordination and networking.

Also at the initiative of the former Commander of Northern Area, DND recently assessed its capabilities in the north. The assessment found that Canada had limited resources that could be used in the northern area, and that the cost of any equipment and programs to remedy this shortcoming would be extremely expensive. The department concluded that given its constrained budget, resources would be allocated to more immediate priorities. It did note that projects could be developed to improve surveillance capabilities if funding was available.[31]

Financial cutbacks to the department have resulted in the elimination of most programs that gave Canada a presence in the North. Northern deployments of naval assets to Canadian northern waters, termed NORPLOYS, ended in 1990. Northern sovereignty overflights by Canadian long-range patrol aircraft (CP-140/CP140A Aurora and Arcturus) were reduced in 1995 to one overflight per year and will soon be totally eliminated. The recently acquired Victoria class submarines do not have the capability to operate in Arctic waters. In fact, none of the Canadian naval units can operate in northern waters due to their thin hulls and the risk of ice damage.

The one exception to the cutbacks is the recent expansion of the number of Ranger Patrols. The Canadian government is increasing the number of serving Rangers from 3,500 to 4,800 by 2008.[32] However, although the Rangers can assert a presence in the north, they are a militia unit comprising northern inhabitants who can travel a moderate distance with snowmobiles.

In short, the ability of the Department of Defence to demonstrate a presence in the North is severely limited. The recently concluded defence study does suggest that it may be possible to improve surveillance with future technological developments including High Frequency Surface Wave Radar, rapidly deployable undersea surveillance systems and the use of UAVs (unmanned aerial vehicles-drones). While each system would prove useful for surveillance and presence in the North, none is currently being considered for deployment and all are still in the research and development phase. These technologies are unlikely to be purchased anytime soon.

The Canadian Coast Guard has the greatest responsibility for the monitoring the Arctic region. Recently moved from the Department of Transport to the Department of Fisheries and Oceans, the CCG operates a fleet of icebreakers in the Arctic, consisting of two heavy icebreakers and three medium icebreakers. The most recent icebreaker, the *Henry Larsen* was added in 1987, but the fleet is heavily tasked and is ageing. A prolonged refit between 1988 and 1993 resulted in the extension of the operating life of the largest icebreaker, *Louis St. Laurent*. However, the vessel will soon be reaching the end of its operational life. There are no plans to build any new icebreakers in the immediate future.

Following the 1969-1970 voyage of the *Manhattan,* the Trudeau Government enacted the *Arctic Waters Pollution Prevention Act,*[33] creating a 100-mile environmental protection zone within Canadian Arctic waters. AWPPA regulations forbid the discharge of any fluids or solid wastes into the Arctic waters and sets design requirements for vessels. Upon entering Canadian Arctic waters, vessels are requested to register through NORDREG, a voluntary, not mandatory, reporting system operated by the coast guard that all vessels (Canadian and otherwise) are requested to use when operating in Canadian Arctic waters. While such a system works reasonably well when few vessels enter the Northwest Passage, it is clear that it will not work when the number of voyages increases due to ice reduction. Consideration has been given to make NORDREG mandatory, but there has been no further action on this front.

The voluntary nature of NORDREG poses an obvious challenge to Canada's commitment to its claims. If Canada is serious about its statements that the waters of the Arctic Archipelago are internal waters, then there should be no question about its ability to enforce its rules and requirements. Yet, by making the system voluntary, the message internationally is that Canada questions its own ability to enforce its claim.

Canada does not have the capability to demonstrate a meaningful presence in its Arctic waters. So long as ice

conditions in the north do not change, then this is not a significant problem. However, as the ice melts, it will become a serious problem.

The internationalization of the Northwest Passage

Would it really matter if Canada lost an international challenge to its claim of sovereignty? The Canadian government is on record as stating that it does support international shipping through the Passage as long as Canadian regulations are followed.[34] The issue, then, is the type of regulations to be followed. Canada could claim that regardless of the status of the Passage, it retains the right to pass environmental regulations based on article 234 of UNCLOS. The problem with this argument is that the Canadian Government has not ratified the Convention. Therefore, the question is whether Canada could claim the rights provided by the article without ratifying the Convention.

The Canadian Coast Guard's efforts to formulate a Polar Code to govern the construction and operation of shipping in Arctic waters are designed to ensure that any international rules will have significant Canadian input. Canada, along with Russia, has played a key role in developing the technical requirements contained in the code.[35] On the other hand, these efforts may send the message that Canada expects to lose the ability to develop regulations unilaterally. Thus, there are signs that a new regime for regulating the international system is developing beyond Canada's control. Such a regime is likely to leave Canada facing tremendous challenges if, and when, shipping develops.

First, traditional security problems of an international waterway will arise. An examination of waterways in southeast Asia indicates that increased shipping can result in increased smuggling and other associated crimes. The deserted coastlines of northern Canada could be used for a host of illegal activities such as drug and human smuggling. It is also likely that smuggling of other goods, such as diamonds and fresh water could also take place. To control such potential problems, Canada will have to improve its surveillance and policing capabilities substantially.

The spread of new and exotic diseases is also a potential problem. Crews of most vessels come from southern countries and may carry strains of diseases to which northern Canadians have a low tolerance or to which they have not been exposed. Thus the risk of a disease outbreak could increase as shipping increases.

Even if Canada implements strong environmental regulations, the probability of an accident will increase with the corresponding increase of ship traffic. As the *Exxon Valdez* accident demonstrated, the grounding of a large vessel in northern waters will produce an ecological disaster. Currently, Canada is ill-equipped for even a moderate grounding, as was clearly demonstrated in 1996 when the *Hanseatic* grounded off Cambridge Bay.[36] The *Hanseatic* was successfully evacuated due only to the favourable weather conditions and the availability of local commercial pilots and planes. It is doubtful the grounding could have been responded to as successfully in a more isolated location and with severe weather conditions.

The lifestyle of Canada's northern Aboriginal people will be substantially affected by international shipping. Traditional hunting and trapping will be severely dislocated by the twin impact of global warming and the passages of large vessels. The influx of large numbers of foreigners associated with the new shipping will also affect their traditional way of life. Opportunities for employment will be available, but only for northerners with the right skills.

Nevertheless, there are some advantages to the melting of the Northwest Passage. Singapore has demonstrated that with the proper planning, geographical location on an international strait can bring substantial economic benefits. Vessels transiting the Passage would require certain services that could be provided by Canadian settlements. For example, Tuktoyaktuk and Iqaluit could conceivably become important ports of call if their port facilities were substantially improved.

The United States and the EU do not accept Canadian claims of sovereignty over the waters of the Canadian Arctic archipelago.

Conclusions

Will climate change result in the melting of the Northwest Passage for some parts of the year? Will international shipping interests then attempt to take advantage of the more benign conditions? Will the Canadian status regarding the Passage be challenged? Will Canada be prepared? The evidence for the first is mounting. The question that remains is how fast these changes will occur and when the Passage will become economically viable for shipping interests. It is logical that international shipping interests will wish to take advantage if and when this happens. Canada can expect to face a challenge when this occurs. It is becoming apparent that the Canadian position will probably not be successful given the current low levels of Canadian activity in the region. But even if Canadian claims of sovereignty are upheld, pressure to allow the passage of international shipping will remain. Regardless of the nature of the international status, it is clear that Canada will face tremendous challenges in adapting to the opening of the Passage. The challenge that now faces Canada is to become aware of these possibilities and to begin taking action to prepare for them.

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