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# Jurisdiction and Management of Arctic Marine Transportation[1]

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ABSTRACT. Although the United States and Canada have different views regarding jurisdiction over the waters surrounding arctic islands, both countries nevertheless share many concerns about marine transportation in high latitudes. Among these concerns are environmental protection, safety, impacts of development on northern peoples and third party transit of arctic waters. These common concerns suggest that there is much potential for cooperative activity and problem solving in the Arctic. Specific suggestions are made regarding possibilities for coordination of transit management activities. A range of options is presented for both the jurisdiction and management elements of a transit regime for the Arctic. It is the thesis of this article that, despite jurisdictional disagreements, the U.S. and Canada can develop a transit regime that satisfies the interests and concerns of both.

Key words: Arctic, jurisdiction, management, marine transportation, regime

RÉSUMÉ. Bien que les États-Unis et le Canada entretiennent de différentes perspectives quant à la juridiction sur les eaux entourant les îles arctiques, ces deux pays s'intéressent tout de même communément aux nombreux problèmes des transports maritimes dans les latitudes élevées. Leurs intérêts comprennent entre autres la protection de l'environnement, la sécurité, les conséquences du développement sur les peuples nordiques et les déplacements par de tierces parties dans les eaux arctiques. L'article présente des suggestions traitant en particulier des possibilités de coordination des activités de gestion des transits. On explique également un éventail d'options que pourraient suivre les éléments juridictionnel et gestionnaire d'un régime de transit dans l'Arctique. L'article stipule que même aux différences d'opinion juridictionnelle, les États-Unis et le Canada peuvent élaborer un régime de transit qui pourrait satisfaire les besoins de chacun tout en répondant à leurs inquiétudes.

Mots clés: Arctique, juridiction, gestion, transport maritime, régime

## INTRODUCTION

The potential for commercial marine transportation through United States and Canadian arctic waters has been evident since the tanker *Manhattan* transited the Northwest Passage in 1969. This same experimental voyage clarified the differences between these two countries over the principles that should govern jurisdiction in high latitude waters. The type of jurisdiction that can be claimed in arctic waters is important since it determines the type of control applicable to navigation. Theoretically, jurisdiction may range from absolute jurisdiction (inherent in the sector principle) to none at all (inherent in the notion of the freedom of the seas). It is the thesis of this article that, although the United States and Canada have taken fundamentally different positions regarding jurisdiction in the Arctic, they do share many concerns about marine transportation in high latitude waters, and, therefore, there are many promising alternatives for jurisdiction and management between the extremes of no control and absolute control by which both countries may satisfy their interests and concerns.

The probable growth of marine transportation in the Arctic suggests it is timely to begin serious consideration about resolving disagreements concerning jurisdiction and control over arctic navigation, as well as to design greater cooperative mechanisms for the management of marine transportation in the best interests of both countries. The purpose here is thus to identify and evaluate alternative jurisdiction and management regimes for the United States and Canada. Since the two countries share many mutual interests in a rational and workable transit regime, some of the options identified may appeal to both countries. No doubt, readers will be able to formulate variations of the basic alternatives presented here, perhaps by recombining elements of these alternatives, which one or both parties may find more appealing than those suggested.

The article will have served its purpose if the process of reaching a consensus is advanced. Consensus is less likely if both parties emphasize the strategic approach and thus bend every effort toward maximizing their own gains. It is more likely to be reached through a problem-solving approach that stresses recognition of conflicts as common or joint problems requiring efforts to accommodate several legitimate interests (Young and Osherenko, 1984). It is possible, of course, to argue about which country has the stronger position according to the principles of international law. The United States and Canada can both make persuasive arguments in support of their positions based on these principles. However, such a course is unproductive if the objective is to reach a consensus rather than to determine a winner. A workable navigation regime may require that both countries make some important compromises, but, based on the number of alternatives possible, both countries may be able to significantly advance their mutual and separate interests.

The impetus for consideration of jurisdiction and management of arctic marine transportation lies in accelerated oil and gas development within the arctic frontier areas of both the United States and Canada. Resource developers of both countries are spending billions of dollars in the search for new reserves. It is anticipated that some of the oil and gas expected to be found will be transported to southern markets by marine tankers. In the United States Arctic, huge reserves at the Prudhoe Bay and Kuparuk oil fields on the North Slope of Alaska are currently being produced. Oil from these fields is transported to the marine terminal in southern Alaska by way of the 1300 km Trans-Alaska pipeline.

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A number of smaller discoveries have also been made in the U.S. Arctic. Decisions to produce these smaller fields, particularly if they are remote from the existing transportation infrastructure, depend largely on the price of oil, which has been "soft" for some time. Nevertheless, the U.S. oil industry is optimistic about Arctic development, and the search for large, new deposits is continuing at a brisk pace. Exploratory activity is growing, both along the arctic coastal plain and offshore. Prospects are excellent for discoveries in the Beaufort and Bering seas (where lease sales have already been held) and in the Chukchi Sea (which is likely to be leased in the future). Transportation infrastructure in areas distant from the Trans-Alaska pipeline is nonexistent but will be required before any oil is marketed. Several marine transportation schemes for both oil and liquefied natural gas have already been studied.

Transportation of crude oil from arctic Canada began on a small scale in the summer of 1985 when Panarctic Oils Ltd. shipped 100 000 barrels of crude aboard the MV *Imperial Bedford* from its Bent Horn oil field on Cameron Island in the High Arctic. The Bent Horn field is estimated to contain 350-500 million barrels of oil, and Panarctic hopes it can continue and eventually expand this operation. Large quantities of natural gas have also been found in the High Arctic. A project — the Arctic Pilot Project — has been proposed to demonstrate the feasibility of moving gas from the Sverdrup Basin in the Queen Elizabeth Islands south by icebreaking liquefied natural gas (LNG) tankers. Exploratory activity is continuing in two other promising areas. The most important of these is the Beaufort Sea/Mackenzie Delta, where a number of oil and gas discoveries have been made. So far no single discovery has been large enough to justify the enormous production and transportation costs associated with operating in this region, but industry expectations remain high. Should large hydrocarbon discoveries be made, it is likely that at least a portion of the resource will be moved to market by tankers. Similarly, exploratory activity is occurring in the eastern Arctic, including activity in Baffin Bay and the Labrador Sea. Marine transportation is the primary option being considered to transport hydrocarbons found in this area.

The use of marine transport modes in the Arctic is currently limited to the short summer season when open water enables vessels not ice-reinforced to operate safely. During this season resupply vessels can visit remote settlements, ore from several High Arctic mines can be ferried south, and the drill ships, drilling rigs, and barges owned by the oil and gas industry can reach their high latitude work stations. The present scale of this transportation activity is small; however, the potential for greater use of arctic waterways is enormous. The United States oil industry has considered marine transportation alternatives for moving hydrocarbons that may be discovered in the Bering and Chukchi seas. Resources discovered in these areas would most likely be moved to Pacific Basin markets. Consideration has also been given to transporting U.S. Beaufort Sea oil and gas, if discovered in producible quantities, to eastern markets via the Northwest Passage. This scenario is most plausible if resources are discovered in excess of amounts that can be carried by the Trans-Alaska Pipeline or if the new resources are too remote from the pipeline.

Canada may also transport its arctic resources to east coast markets through the waters of the Canadian archipelago. Alternatively (or in addition), there is a possibility that Canada, perhaps in conjunction with Japan, may use tankers to transport oil and/or gas by way of the Bering Strait to Pacific markets. And finally, although not likely in the near future, third party use of the arctic alternative may begin. A direct northern transportation link between Europe and the Pacific, long sought by early explorers, may eventually become a reality.

Before widespread, year-round commercial navigation does become a reality in the Arctic, a number of technical problems must be solved. It is, however, an explicit assumption of this article that technical barriers to arctic marine transportation can be overcome, if the need to do so arises, and that the economics of marine transportation will, in specific instances, prove competitive with other transportation alternatives. A number of studies have been done showing that for some markets the price of oil need not rise much further for arctic marine transportation to be competitive with other options. These particular issues will not be considered further within this article.

No special coordination or cooperation is needed, of course, for the domestic transportation activities of the United States or Canada. But the potential exists for navigation through each other's exclusive economic zones and territorial seas, as well as for third party use of these waters. Further, since navigation through the often ice-covered areas of the Arctic may require special rules and regulations not applicable to ordinary marine transportation, cooperation and coordination is deemed a necessity.

## U.S. AND CANADIAN INTERESTS AND CONCERNS

The potential for increased navigation in arctic waters highlights a number of concerns shared by the United States and Canada and for which greater and/or more coordinated management may be required. Four mutual interests or concerns may be readily identified: 1) protection of the environment; 2) safety; 3) minimizing adverse impacts on northern peoples; and 4) concern about third party transit of arctic waters.

The impact of transportation accidents and the special environmental hazards encountered in the Arctic account for mutual concern about the environment. The presence of ice in many areas throughout most of the year, frequent storms, extremely cold temperatures and long periods of darkness combine to make navigation in the Arctic particularly difficult (Roots, 1979) and underscore the reasons for Canada's enactment in 1970 of special regulations for protecting the arctic marine environment. Although some of the provisions of the Canadian Arctic Waters Pollution Prevention Act are controversial, Canada's interests in preventing arctic pollution are in most ways mirrored by the United States.

Of particular concern is the possibility of an oil spill from one of the large tankers that may eventually be operating in arctic waters. Such a spill could cause substantial adverse environmental impacts. These impacts may include pollution of coastlines (especially destructive if breeding habitats are affected), contamination of marine mammals (such as bowhead whales) and waterfowl and destruction of fish and other marine organisms. Although the risk of catastrophic spills is low, if a tanker accident were to occur in moving pack ice, oil could be carried under the ice for literally hundreds of kilometres, making recovery or *in situ* burning of a significant amount of oil impossible. Moreover, the use of some chemical dispersants as an oil spill countermeasure may be as harmful to organisms in the water column as the oil itself. The increased level of noise that ships navigating through ice will generate is another possi-

ble adverse environmental impact. Studies have been conducted suggesting that the endangered bowhead whales, in particular, display flight responses in the presence of ship noise. The full impact on the bowhead population of noise disturbances, however, is not yet known. Finally, the artificial leads opened by ships moving through the ice could interfere with the movements of marine mammals and with the indigenous people who hunt in these areas.

Although the advocates of tanker proposals have made suggestions that would minimize the risk of a spill, the possibility of a tanker spill in the Arctic cannot be discounted. Such spills would be difficult to clean up for a number of reasons. Most importantly, it is impossible to predict the exact location of a tanker spill. Thus, countermeasures equipment could not be pre-positioned, and a response would be difficult to implement fast enough before extensive oil spreading and weathering occurred. Further, tanker spills generally result in the release of a large amount of oil in the marine environment during a short period of time. Responses to such spills require a considerable amount of equipment and manpower and adequate response preparation. The absence of infrastructure in most of the Arctic would make any oil spill countermeasures difficult.

The problem of safe navigation in arctic waters, which is made difficult by environmental hazards and lack of support services and facilities, is a second mutual interest. In general, safe navigation will require provision of extensive support services. Although some essential services are already provided on a limited scale, the scope of these activities will need to be expanded greatly. Communications, navigation aids, weather and ice forecasting, icebreaker support, repair facilities and search and rescue operations are some of the services required to ensure navigation safety in the Arctic. Indeed, safe, year-round transportation in arctic waters will be possible only if all support services and facilities to accommodate that transportation are provided.

A third concern of both countries, and particularly of those citizens who live in the far north, is the effect that marine transportation will have on speeding up the general development of the region. The Inuit in both countries value their distinctive native lifestyle, but development activities have already affected their culture. The increased accessibility implied by the opening of commercial navigation routes can work only to accelerate these changes. The Inuit are not averse to change, and some changes have had the effect of substantially improving Inuit living standards; nevertheless, the impact of greater activity in the Arctic is not entirely predictable or controllable. Inuit are particularly worried that opportunities for subsistence hunting will diminish as more onshore facilities are established, as offshore petroleum drilling increases, and as marine navigation grows. The Inuit in both countries are opposed to marine tanker operations and favor the development of pipelines to accommodate hydrocarbon exploitation. For example, the Arctic Pilot Project was actively opposed in 1982-83 by the Inuit Circumpolar Conference, an organization composed of Inuit from the United States, Canada and Greenland. The United States and Canada both face the problem of accommodating these Inuit concerns, yet still advancing resource extraction and transportation activities in the Arctic.

Finally, although problems associated with third party transit of arctic waters are not in theory different from those associated with U.S. or Canadian navigation, third party navigation would increase the amount of activity in the Arctic and would therefore tend to increase the possibility for adverse impacts. Moreover, the costs of management for both countries would be greater. Although the United States and Canada may be able to agree upon and enforce appropriate arctic navigation standards between themselves, enforcing any special arctic regulations over third parties that have not agreed to them is potentially more difficult.

Canada and the United States are both cognizant of the special difficulties involved in navigating arctic waters, yet neither country has indicated its intention to deny others access to transportation routes. It is in the interests of both countries to allow marine transportation to proceed if safe and environmentally sound navigation can be conducted. Canada has stated on more than one occasion that it intends to encourage, and not restrict, international transit through the Northwest Passage (Smith, 1978; Clark, 1985). However, the manner by which access is to be controlled in this area constitutes an important disagreement between the two countries. The central element of this disagreement is the difference of opinion between the countries regarding jurisdiction over the waters of the Arctic. The type of jurisdiction applicable will determine the kind of passage available to foreign ships and the extent of management that can be imposed.

Until 10 September 1985 Canada's position regarding jurisdiction over the waters of the arctic archipelago was ambiguous. On this date, Canada's Secretary of State for External Affairs issued an Order in Council establishing straight baselines around the perimeter of the Canadian arctic archipelago to be effective 1 January 1986 (Clark, 1985). This declaration was prompted in part by the August 1985 transit of the U.S. icebreaker *Polar Sea* through the Northwest Passage, which was interpreted by many Canadians as a challenge to their sovereignty in the area. Significantly, McRae had suggested as recently as 1982 that establishing internal waters would be an option to consider only if other efforts to exercise adequate control in arctic waters fail (McRae and Goundry, 1982).

By proposing to establish baselines in this manner, Canada has made it clear that it considers the waters between its arctic islands to be internal and, thus, under absolute Canadian sovereignty. However, according to Article 8(2) of the Law of the Sea Convention (which Canada supports), where the establishment of straight baselines has the effect of enclosing internal waters areas not previously considered as such, a right of innocent passage shall exist in those waters (United Nations, 1982). Thus, even if Canada's straight baseline claim is upheld, this may not in itself be sufficient to prohibit innocent passage. Canada would have to prove that its internal waters were acquired through historic title (demonstrated by "long and consistent dominion accepted by a majority of nations") in order to prohibit, if it desired to do so, innocent passage through the arctic archipelago. Canadian claims regarding historic use have not been clear or consistent (Beauchamp, 1984).

Even prior to the 10 September declaration, however, the intent of Canadian assertions and legislation regarding its northern waters has been to exert control to the maximum extent possible. One of the initial mechanisms established for asserting control in this region was the Arctic Waters Pollution Prevention Act (AWPPA) of 1970. Although the explicit purpose of the AWPPA was to enable Canada to control pollution in predominantly ice-covered waters, the implicit purpose of the legislation was to advance Canadian claims for sovereignty "in such a manner so as not to provoke official denials from other

nations'' (Reid, 1974). The jurisdiction that Canada asserts under the act includes the power to legislate and to enact regulations governing all shipping that comes within the areas to which the legislation extends, as well as the power to enforce the standards imposed by the legislation. The establishment of this pollution legislation was seen by Canada as a ''functional approach whereby Canada will exercise only the jurisdiction required to achieve the specific and vital purpose of environmental preservation'' (Beesley, 1972). The three major elements of the AWPPA are establishment of a 160 km pollution control zone around Canadian coasts north of 60°, prohibition of ''waste'' disposal within this zone, and establishment of strict construction, manning, navigation, and cargo standards and financial responsibility requirements for all vessels operating within the zone.

If Canada's arctic waters are not judged to be internal, then jurisdiction is limited to a 12-mile territorial sea and an exclusive economic zone extending off the mainland and around each of the arctic islands. Canadian territorial seas established by opposite land masses would overlap in two places along the Northwest Passage, in Barrow Strait and in the Prince of Wales Strait. Article 17 of the Law of the Sea Convention specifies that foreign shipping has the right of innocent passage within territorial seas; however, foreign ships must comply with all coastal state laws and regulations in conformity with other provisions of the treaty and other rules of international law. The coastal state may regulate, among other things, environmental protection, conservation of living resources and scientific research. Under normal conditions, the coastal state may not regulate design, construction, manning or equipment of foreign ships unless regulations are giving effect to already established international standards. The coastal state may suspend innocent passage only if a ship's passage constitutes a threat to the coastal state's security (United Nations, 1982).

The authority contained in Article 234 of the Law of the Sea Convention allowing adoption of special marine pollution control regulations in ice-covered areas appears to enable arctic rim countries to exercise the type of navigation control necessary in ice-covered areas, including most of Canada's northern waters at least part of the year. In general, however, Canada's ability to control activities within its territorial seas is more limited than in its internal waters, but possibly less limited (depending on how Article 234 is interpreted) than if the Barrow and Prince of Wales straits were considered to be ''international'' straits.

It is the contention of the United States and other maritime countries that transit through straits of the arctic archipelago should be governed by the regime of international straits. If the Barrow and Prince of Wales straits are considered international, then there exists a nonsuspendable right of innocent passage for foreign vessels. In a straits regime the balance between the prerogatives of coastal states and those of other states interested in navigation is tilted toward navigation. Moreover, the United States has consistently held that ''all questions of territorial definition and rights in the Arctic must be resolved through the application of general law of the sea regimes . . . defined by the international community'' (Smith, 1978) and that, therefore, the promulgation of such laws as the Arctic Waters Pollution Prevention Act and possibly the more recent declaration of straight baselines encompassing such a large area are impermissible unilateral extensions of international law.

Unlike Canada, the United States has not held that the harsh environmental characteristics of the Arctic justify special rights and responsibilities for arctic coastal states (Beesley, 1972). However, the weight of international opinion on this issue, as expressed in Article 234 of the Law of the Sea Convention (the ''Arctic exception clause''), has been shifting toward the Canadian position. The extent of environmental control that Article 234 allows is, however, still debatable. The primary concern of the United States regarding special forms of jurisdiction in the Arctic is that, if allowed, a precedent would be established that might then be imitated in other areas of the world and that could affect U.S. security and commercial interests, specifically with regard to measures the Soviet Union might take in its own vast arctic domain.

## OPPORTUNITIES FOR COORDINATION AND COOPERATION

The common concerns of the United States and Canada cited above and, in particular, the common need for environmental protection and safety suggest there are many opportunities for the two countries to coordinate their activities in the Arctic. Although the United States and Canada already share information and cooperate far more than generally realized, opportunities exist for more comprehensive coordination of navigation activities.

Support services are essential if navigation is to be expanded in the Arctic. These include provision of navigation aids, weather and sea ice forecasting, search and rescue assistance, pilotage services, pollution prevention equipment, icebreaker support and land-based support facilities. In addition, it would be practical to standardize regulations for pollution prevention and control, ship construction specifications and training and manning standards and to agree upon the extent of liability for pollution caused by vessels of either country within the exclusive economic zone of the other. Some examples of ways to achieve greater coordination follow.

Coastal states provide navigational aids as they deem fit. Most states adhere to internationally accepted customs (where formal conventions do not exist) for providing navigation aids such as buoys, lighthouses, and direction-finding beacons. Organizations, such as the International Maritime Organization (IMO) and the International Association of Lighthouse Keepers, provide a forum wherein states can discuss matters of navigation and safety. Information concerning aids the United States and Canada may wish to install or provide in the Arctic is disseminated in local notices to mariners and later marked on navigational charts and published in the Admiralty List of Lights and other relevant admiralty and state publications. Therefore, the need for greater cooperation in this area is probably minor. However, some new types of navigational aids have been developed in recent years.

Canada is very interested in the United States' Global Positioning System (GPS) as an aid to navigation in the Canadian Arctic. If the Northwest Passage, for instance, is opened for year-round navigation, the Global Positioning System could become a key navigational aid, supplementing other systems currently in use in the region. The Global Positioning System is two tiered: the more precise position fixing system is reserved for Department of Defense requirements, whereas the less precise system may be used by commercial vessels as an aid to navigation. Eventually, the United States and Canadian coast guards may wish to determine jointly how best to use the Global Positioning System as an aid to navigation in arctic waters.

The two states could coordinate pilotage services in the

region. Pilots are engaged by shipmasters for their in-depth navigational knowledge of a local area. Each state will promulgate pilotage regulations for entering and leaving its ports in the Arctic. Since arctic waters will be unfamiliar to most shipmasters, it may initially be advisable to provide merchant shipping with pilots for transiting the Arctic in areas under U.S. or Canadian jurisdiction. Since a transarctic voyage may extend several thousand kilometres, the region will probably have to be divided into pilotage districts, and a transiting vessel may have to use the services of several pilots. For entering and leaving arctic ports, the use of pilots may be mandatory. Where the pilotage district of one state adjoins the district of another, coordination in boarding and disembarking may be desirable in terms of cost effectiveness. For instance, the same helicopter from a shore base or a common pilot vessel could be used for the pilots of both countries.

As an alternative to pilotage districts, the creation of arctic "ice zones" has been suggested (C. Stephenson, pers. comm. 1984). If ice zones are established, vessels will carry "ice navigators" who will specialize in local knowledge of ice formation and of ice characteristics such as thickness, strength and rate and direction of drift. Whether pilotage districts or ice zones are created, there is potential for coordination between adjoining districts or zones. A memorandum of understanding (MOU) between the U.S. Department of Transportation and the Canadian Ministry of Transport (MOT) states that duplication of parallel national efforts should be reduced. Thus, it may be possible to work out a cost-sharing formula between the two local authorities.

Timely weather and ice forecasts are of great operational value for navigation. Such forecasts are essential if marine transportation is to expand in the Arctic. They are also essential as an aid in combatting oil spills. Both the United States and Canada are involved in gathering, forecasting and disseminating weather and ice data. In the United States, for instance, the National Oceanic and Atmospheric Administration (NOAA) maintains an observatory in Barrow, Alaska, to monitor atmospheric constituents important to climate change. NOAA's National Weather Service (NWS) is doing research in Alaska regarding local climatic and oceanographic phenomena, and NOAA's National Environmental Satellite Data and Information Service (NESDIS) satellites provide information to the Navy/NOAA Joint Ice Center, which analyzes ice occurrences and forecasts ice limits.

Arctic navigation would benefit if the weather and ice forecasting activities of all public agencies and private enterprises of the United States and Canada could be coordinated. In order to determine how such cooperation can be promoted, the United States and Canada might consider establishing a formal, bilateral advisory body. Among subjects for discussion could be the issues of: how and at what radio frequency weather forecasts should be made available to mariners in the Arctic; whether or not vessels plying arctic waters should be required to carry automatic picture transmission (APT) satellite imagery as an aid to ice navigation; and how to share costs of providing information among all entities involved.

Harmonization of ship construction standards for ships that navigate arctic waters is another promising area for coordination. Canada has developed comprehensive ship construction specifications for the Arctic under the authority of its Arctic Waters Pollution Prevention Act. The United States, on the other hand, has not developed special standards for merchant vessels navigating the Arctic, and little information has been exchanged between the two countries (L. Brigham, pers. comm. 1984). If the United States develops specifications different from those of Canada, ships complying with the regulations of one country may not be able to transit the waters of the other. Therefore, it is in the interests of both countries to cooperate in establishing mutually acceptable construction regulations.

Establishment of a binational body that has both advisory and regulatory authority may provide a solution to the problem. Such a body might be composed of personnel from the U.S. Coast Guard, the U.S. Maritime Administration and the Canadian Ministry of Transport. Before adopting a ship construction standard, the body could assemble a task force of experts from Canada and the United States to define problems, issues and alternatives related to the standard; analyze each alternative identified; draft and release a discussion memorandum; hold public hearings; and evaluate and analyze public responses.

Canada has also established personnel training and manning standards for vessels plying arctic waters. So far, the United States has not promulgated any such special standards. Uniform standards jointly established could be more readily complied with and would be more acceptable to all shipping in the U.S. and Canadian Arctic, including third country vessels. A joint body, similar to the one suggested for ship construction standards, could be established to exchange information and set training and manning standards for arctic shipping. In any case, the United States will probably wish to consider special standards at some point, given the nature of arctic shipping, and if it does so, will likely borrow from the Canadian experience.

An essential arctic navigation service is search and rescue capability. Since 1949, the United States and Canada have had a bilateral agreement concerning air search and rescue. There are no major problems regarding coordination of search and rescue activities between the United States and Canada, but the potential for coordinated response decreases as the distance from the maritime boundary between the two states increases. Moreover, industry carries out most of its own search and rescue activities. Nevertheless, a joint effort to improve search and rescue capability in the Arctic would benefit both countries. For example, if coordination in adjacent pilotage districts/ice zones is established, equipment such as the helicopters used for ferrying pilots/ice navigators could be used in search and rescue missions.

There are many ways in which icebreaker support is necessary or useful in the Arctic. Icebreakers are involved in search and rescue activities, are used by the petroleum industry to provide assistance for exploration and development projects, are employed to supply isolated communities and, most importantly, will be needed to assist commercial navigation. There is no specific bilateral agreement or MOU covering icebreaker support, but there are many MOUs that promote cooperation in this field. A formal bilateral advisory and/or regulatory body could be established to coordinate the icebreaking needs of all end users (government and private, Canadian and American), to develop construction standards and to establish criteria for user fees. Such coordination would help rationalize the existence of an icebreaker fleet and avoid duplication between the fleets of the two countries.

As one more example of the many opportunities for better coordination of navigation activities, one might consider the coordinated establishment of fuel supply depots. It is customary for vessels to call at only selected ports for their bunkering needs. Establishment of one bunkering and watering facility in

the eastern Arctic and one in the western Arctic could serve the needs of the United States, Canada and (in the future) other maritime nations.

## ALTERNATIVE TRANSIT REGIMES

For the purpose of this essay a regime may be defined as the norms, rules and procedures agreed to by cooperating countries in order to regulate behavior within an issue area. Regimes may vary according to functional scope, areal domain and membership. Regimes may also vary according to the number and restrictiveness of their rights and rules, the extent to which agreements are formalized and the manner and degree to which pressure is exerted on members (and nonmembers) to act in conformity with some clear-cut goal (Young, 1980). Thus, an almost unlimited number of different regimes may be conceived for regulating arctic marine transportation. It is neither feasible nor productive to consider all possible regulatory alternatives, but perhaps it is worthwhile to try to identify some of the major types of navigation regimes that might be considered by either the United States or Canada or by both countries.

The assumptions are easily made that only a small number of options exist, that these options are already well known and that there is little room for moving toward more mutally acceptable solutions. By providing a conceptual framework that identifies a reasonably full range of options with respect to both the jurisdiction and management elements of a transit regime, it can be shown that these assumptions are untrue. Table 1 shows a two-dimensional matrix laying out the alternatives to be considered below. The major reason for considering jurisdiction and management dimensions separately is that workable management options are not dependent on the type of jurisdiction. Thus, any of the management options may be combined with any of the jurisdiction options. Readers should be able to identify intermediate alternatives along both dimensions, some of which may be more acceptable to both countries. It is intended that the matrix and the remainder of the essay serve as a point of departure in the consideration of an acceptable regime to govern arctic marine navigation.

With the exception of the first alternative to be considered, the jurisdiction dimension in Table 1 examines regimes along a continuum ranging from most exclusive to most inclusive. The most exclusive class of regimes are those in which the jurisdiction of one country is absolute. The most inclusive class are those in which many members participate on a more or less equal basis. The management dimension is considered along a continuum that specifies the degree of cooperation and coordination of activities. The "no coordination" option has been placed at one end of the scale; however, as we have seen, a considerable amount of coordination of navigation-related activities already exists between the United States and Canada. At the other end of the scale are the class of management options characterized by great independence of regulatory authority. In between are management options characterized by increasing degrees of coordination and cooperation.

## SOME LESS PROMISING ALTERNATIVES

Theoretically, the United States and Canada and/or other arctic rim countries could decide that arctic waters are not subject to jurisdiction of any type and that throughout the applicable area of the Arctic Ocean complete freedom of the seas would prevail. The rationale for this decision might be the collective belief that the Arctic is remote and unimportant and that, therefore, no special controls are necessary. Historically, the regime of freedom of the seas for navigation has been the norm for many centuries. It is still applicable beyond the limits of internal waters, territorial seas or exclusive economic zones. Within the exclusive economic zone freedom of navigation applies, subject only to specific, narrowly defined jurisdictional grants to coastal states. Beyond this zone, countries may exercise jurisdiction only over ships flying their flag; otherwise, the freedom of navigation is unrestricted. In its extreme form this type of regime would be one in which, for all practical purposes, there would be no controls over navigation or any other maritime activities.

Neither the United States nor Canada is advocating such a regime, and it is not seriously suggested that they should. An "open use" regime is feasible only so long as the activities that take place within the uncontrolled region do not adversely affect the interests of either country. This is clearly not the case within the exclusive economic zones of any arctic rim country, where, among other things, navigation activities may be harmful to arctic ecosystems. Both the United States and Canada have clearly stated that environmental protection, even in remote arctic waters, is an important goal, and this goal would not be

TABLE 1. Jurisdiction and management options

| | Management | | | | | |
|---|---|---|---|---|---|---|
| Jurisdiction | No coordination | Information exchange only | Limited functional coordination | Formal bilateral advisory body | Combination advisory/ regulatory body | Independent commission |
| No control | U | U | N/A | N/A | N/A | N/A |
| Single control (sector theory) | U | UUS | UUS | UUS | UUS | UUS |
| Internal waters (no special accommodation) | U | UUS | UUS | UUS | UUS | UUS |
| Internal waters (limited jurisdiction: Svalbard) | U | P | P | P | P | P |
| Article 234 (broadly construed) | U | P | P | P | P | P |
| Article 234 (narrowly construed) | U | P | P | P | P | P |
| Recognized int'l rules (pre-LOS ratification) | U | UC | UC | UC | UC | UC |
| International control | N/A | U | U | U | U | U |

U: Unlikely to be considered by either country.
UUS: Unacceptable to the United States.
UC: Unacceptable to Canada.
P: Promising.
N/A: Not applicable.

well served in a regime that lacked regulations to control environmental degradation. However, it is useful to consider the open use regime in relation to others that will be presented. While open and uncontrolled access is unacceptable to either country, there is at least one advantage to this type of regime that other alternatives do not have: no appreciable costs for administration and enforcement of navigation activities.

At the other end of the spectrum of alternatives is international jurisdiction over arctic waters, an option similar in its practical consequences to the open use option. Conceivably, arctic waters may have characteristics that qualify them for consideration as part of the "common heritage of mankind." This type of jurisdiction would vest authority to regulate activities within arctic waters in an international organization, perhaps modeled after the International Seabed Authority, which has been established by the Law of the Sea Convention to control seabed mining beyond the limits of national jurisdiction. Consequently, although the United States and Canada would probably be members of the organization, they would not have any special jurisdiction in the area. The likelihood is negligible that any Arctic rim country would be willing to give up jurisdiction it now possesses to an international organization. The United States does not accept the concept of the common heritage of mankind as applying to the Arctic. Thus, this second option is also presented, not because it is likely to be adopted, but because it helps set the limits within which more promising jurisdictional options may be considered.

It is questionable whether any international regime can adequately address the arctic navigation concerns of the United States and Canada. Weaker, least-common-denominator solutions are a typical result when large numbers of countries are involved in establishing a regime. In this sense the international regime is similar to the open use regime. Moreover, the relatively greater difficulty of reaching agreement among many countries often produces a cumbersome regulatory framework. On the other hand, because of the number of parties directly involved, international solutions may be more equitable. Does the international community have a strong enough stake in arctic navigation that they should be included in deliberations for an arctic transit regime? Regarding the authority to control marine pollution, Canada and the United States have frequently argued for the strongest possible international environmental safeguards. In the Arctic, Canada's AWPPA contains provisions that go well beyond provisions any international organization would be likely to establish. The more exclusive regimes are likely to provide better environmental protection.

Less inclusive than international jurisdiction but nevertheless still inclusive, and unlikely to be acceptable to any arctic rim country, is some type of regional jurisdictional arrangement. One such option would be to establish a condominium among all arctic rim countries to govern activities within arctic waters. The provision of a regional framework for environmental protection could be an especially important benefit of this type of regime, since pollution problems are often transnational in nature. Again, this option would require participating countries to waive some types of exclusive authority they now possess in exchange for joint authority. Although this idea may appeal to some and, in fact, might be a rational way to proceed among countries with common arctic concerns, the practical difficulties of persuading countries such as the United States and the Soviet Union to pool their authority are probably insurmountable (Johnston, 1982). There is more potential for regional management of navigation activities while retaining continued *separate* jurisdiction.

Some types of jurisdiction that would be acceptable to the United States may be unacceptable to Canada. The United States has generally taken the position that the Arctic should not be treated as a special region and therefore no need exists for special international laws. Smith has noted that the consistent position of three of the circumpolar states, the United States, Norway and Denmark (Greenland), has been that all questions of territorial definition and rights in the Arctic must be resolved through the application of general law of the sea regimes. Under this view, the only legitimate claims of the circumpolar states would include the continental land mass, islands, inland waters, territorial seas and the several contiguous zones defined by the international community. The United States does not have any special regulations governing tanker pollution in the Arctic. U.S. regulations contained in the Port and Tanker Safety Act and the Clean Water Act are, for the most part, consistent with existing international laws, which do not consider special rules for ice-covered areas. The Law of the Sea Convention, if ratified, will allow states to make additional rules for ice-covered areas, but it is not currently in force. If only generally accepted and ratified international regulations governed activities in the Arctic, no country would have special authority or jurisdiction to control pollution or transit. In this case Article 234 would not be applicable, and any regulations that were based upon the view that the Arctic is special and, therefore, requires special pollution control regulations would be illegal. This position has been associated with the United States and is unacceptable to Canada.

On the other hand, there are several types of jurisdiction that might be acceptable to Canada but unacceptable to the United States. In general, the more exclusive types of jurisdiction are the least acceptable to the United States, and of these the most exclusive of all that has been suggested is jurisdiction based on the sector principle. The sector principle proposes that arctic rim countries automatically fall heir to all the territory lying between their continental coastlines and the North Pole in a sector shaped like a pie slice, delimited by the boundary lines of longitude that converge at the North Pole (Reid, 1974). In its most extreme form, sovereignty is extended not only over land territory but to all water and ice within the sector as well. There have been many supportive statements of varying degrees for the sector principle in Canada, but this approach has not been incorporated into official Canadian policy (Smith, 1978). No justification exists for this principle in international law, and the United States has neither accepted the claims advanced at various times by both Canada and the Soviet Union nor ever given any public consideration to establishing a sector claim of its own.

With respect to transit through sectors, as we have seen, there are many reasons why the United States and Canada would want to cooperate and allow ships to transit through each other's sector; however, since each country would have absolute sovereignty within its sector, there would be no guarantee that transit rights would always be respected. Other countries could be excluded from transit, and sector countries would have complete authority to promulgate and enforce any and all regulations they deemed necessary. U.S. opposition to the sector theory is based on its general belief that creeping jurisdiction over ocean space is unacceptable and that greater jurisdiction will inhibit the freedoms maritime powers have traditionally enjoyed. The United States is concerned that establishing sectors would set a

precedent for further enclosure claims. Also, one of the principal beneficiaries would be the Soviet Union. Soviet sovereignty within its huge arctic sector would effectively deny access to any U.S. activity in about 60% of the Arctic Ocean. Enclosure of the entire Arctic Ocean would similarly be unacceptable to the international community, since the community's "rights" beyond the present limits of national jurisdiction would be considerably diminished.

No country currently formally advocates that arctic sectors be established. Thus, it would appear that this alternative need not be considered further. However, Canada does consider the waters between its northern islands to be internal, and although the claim is not widely accepted, in a practical sense the internal waters claim is not much different from a sector claim. In either case, the underlying idea of sole control seems to dominate Canadian thinking. If Canada's archipelagic waters were considered to be internal by historic title, Canada would have the strongest possible authority, just as if the area were part of a Canadian sector, to make and enforce any regulations it wished. The only difference is that Canada would not have jurisdiction in the area of the North Pole, but for practical navigation purposes (at least until commercial submarine tankers begin to use the polar route), jurisdiction in this area would be unimportant. (However, sovereignty in this area may be important for other purposes. Among other things, Canada would obtain jurisdiction over the Alpha Ridge, a subsea rise that may contain resources that might some day be commercially exploitable.)

The United States opposes the claim that these waters are internal and, for reasons similar to those cited above, is not likely to acquiesce to this form of jurisdiction. Much more promising are those types of regimes in which absolute sovereignty in the area is limited but in which rules and regulations can be applied that recognize the special problems associated with arctic activities. Several of these alternatives are considered below.

## SOME PROMISING ALTERNATIVES

Jurisdiction of a state over territory normally carries with it a right of absolute political control, whether over land, water or air. There are, however, many exceptions to absolute jurisdiction in which territory may be subject to restrictions favoring other states without encroachment upon the formal sovereignty of the state whose jurisdiction is restricted. These exceptions to absolute jurisdiction are known as servitudes and are further defined as obligations on the part of the state in possession of the territory to permit a certain use to be made of it by another state or states. The corresponding right on the part of other states to make use of the territory of the first state may be designated as an easement (Fenwick, 1965).

Servitudes have existed upon rivers, straits and canals expressly for the purpose of enabling freedom of navigation. This type of servitude is illustrated by the following examples: 1) Navigation of the St. Lawrence River was first opened to U.S. vessels (in exchange for special privileges by British subjects to navigate Lake Michigan) by the Reciprocity Treaty in 1854. This treaty was superseded in 1871 by the Treaty of Washington, which provided that the St. Lawrence River, "from the point where it ceased to be the international boundary, should remain 'forever free and open for the purposes of commerce to the citizens of the United States' " (Fenwick, 1965). The Treaty of Washington also provided that major rivers in Alaska should be open to the commerce of British subjects. A more recent boundary convention between the United States and Canada will be discussed in some detail below. 2) The Kiel, or Prince William, Canal, entirely in German territory, connects the Baltic with the North Sea. In 1919 the Treaty of Versailles provided that "the Kiel Canal and its approaches shall be maintained free and open to the vessels of commerce and of war of all nations at peace with Germany on terms of entire equality." Further provision was made that the nationals, property and vessels of all powers should be treated in respect to charges and facilities of traffic upon a footing of equality with the nationals, property and vessels of Germany (Fenwick, 1965).

A different type of servitude, but one important as an arctic example, is the restriction of the absolute sovereignty of Norway over the Svalbard Archipelago, a group of islands in the Arctic Ocean north of Norway. Until 1920 the islands were unclaimed and unwanted, but increasing economic activity on the islands in this period created the need for some form of administrative jurisdiction. Accordingly, sovereignty was awarded to neutral Norway at the Versailles Peace Conference at the end of World War I. However, under the terms of the treaty all forty signatories were entitled to free access to the resources within the treaty area. Thus, signatories have the freedom to fish, hunt, mine and carry on other commercial activities equally with Norway, subject only to a common set of regulations that apply to all contracting parties (Westermeyer, 1984).

Clearly, there may be some promise for creating a servitude or servitudes with respect to transit through arctic waters. Smith, for one, has raised the issue of whether it would be "beneficial, in light of economic and strategic factors, [for the United States] to make a compromise concession of the special internal status of the Canadian Arctic's archipelagic waters in exchange for a yielding of the sector claims and formal guarantees of U.S. navigation rights" (Smith, 1978). The details of the compromise might spell out pollution control and other navigation regulations acceptable to both countries. The easement could also apply to other countries that intend to use the Northwest Passage and that are willing to accept the terms of the compromise. Such a compromise would benefit Canada in that the United States would recognize, once and for all, Canada's jurisdiction over both islands and water in the Arctic. U.S. recognition is clearly important if general international acceptance of Canada's claim is to be obtained. On the other hand, Canada may have difficulty accommodating some restrictions of its ability to regulate navigation through the Northwest Passage. It remains unclear whether Canada is more concerned about securing formal sovereignty over arctic waters or about controlling all the activities that take place in these waters. No doubt, Canada would prefer both absolute sovereignty and control, but if the United States and Canada can agree on mutually acceptable navigation regulations, this compromise might find favor in Canada. In this case, the benefits Canada would receive would outweigh the concessions it would have to make.

The United States would have its interest in the freedom of navigation satisfied by this compromise; however, the problems with this alternative would be the same as the problems the United States would have in creating arctic sectors or recognizing without compromise the internal status of archipelagic waters — that is, the compromise could be used as an excuse by

other countries to extend jurisdiction into other zones. This would not be in the interest of the United States in limiting constraints worldwide on the freedom of navigation. In addition, the United States does not want to be in the position of having to negotiate bilateral agreements with all coastal nations who identify "special" circumstances. Nevertheless, if the Canadian case is considered unique, the United States has nothing to lose with such a compromise.

If control of transportation activities *per se* is deemed by arctic coastal states a more important issue than the jurisdictional status of arctic waters, then there is promise for regimes based upon special jurisdiction to control marine pollution, which Article 234 of the Law of the Sea Convention confers. The article states that

> coastal states have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, 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 [United Nations, 1982].

The United States has not signed the Law of the Sea Convention. However, United States rejection of the convention was based largely on objections to its seabed mining provisions. The remaining sections of the convention are generally acceptable to the United States, and Article 234, in particular, has not been controversial. Even if the United States never signs the convention, it could enact special regulations to control marine pollution in its arctic waters consistent with the provisions of Article 234.

Canada played a major role in drafting this article during the Law of the Sea negotiations. The general international acceptance of Article 234 has lent some legitimacy to the 1970 Canadian Arctic Waters Pollution Prevention Act. Nevertheless, the question remains whether the jurisdiction asserted by Canada under its arctic waters legislation constitutes an exercise of jurisdiction that Canada as an arctic coastal state is permitted under international law (McRae and Goundry, 1982).

The authority that Article 234 confers upon Canada to control navigation in the Northwest Passage is less absolute than if its archipelagic waters were deemed to be internal. Specifically, any laws applicable to its exclusive economic zone that Canada is enabled to make pursuant to Article 234 must have due regard for navigation. Thus, the article implies that some navigation must be allowed and that regulations cannot have the effect of restricting innocent passage of ships. Moreover, it does not seem likely that Law of the Sea negotiators intended arctic coastal states to have more pollution control authority within their exclusive economic zones than in their territorial seas. In addition, Article 236 exempts military vessels from the provisions of the convention applicable to environmental protection. Nevertheless, the provisions of Article 234 enable Canada and other arctic rim countries to assert substantial control over navigation activities.

Arctic 234 is, however, subject to both a broad and narrow interpretation (McRae and Goundry, 1982). These interpretations can be considered as distinct jurisdiction options. Broad interpretation of the article would enable coastal states to enact laws and regulations in any *area* "where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions and exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance," without regard to the environmental conditions existing at the time. Thus, the power of the coastal state to legislate or to enforce regulations would not be restricted by the absence of severe climatic conditions or ice in the area at the time but would apply throughout the year.

The case of passage through international straits is a specific exception to the rules normally applicable to navigation. For international straits a nonsuspendable right of transit passage applies. Whether the Northwest Passage is now or is capable of becoming an international strait has been disputed; however, a broad interpretation of Article 234 renders this issue irrelevant because the provisions of the article can be interpreted to override the restrictions on coastal state jurisdiction that apply in the international regime governing straits (McRae and Goundry, 1982). Therefore, the broad interpretation places no limitations on the coastal state to enact special pollution control regulations in areas, including international straits, which for at least part of the year are covered by ice or otherwise are subject to severe environmental conditions.

On the other hand, according to the narrow interpretation of Article 234, special laws and regulations would apply only when the circumstances defined in the article are present. That is, regulations would apply only when ice is present or when problems arise from severe climatic conditions, but measures to deal with marine pollution unrelated to these situations would be governed by normal rules applicable to the exclusive economic zone (McRae and Goundry, 1982). In effect, two legal regimes would operate, depending on conditions. When special hazards are present, regulations enacted pursuant to Article 234 would apply. In the absence of special hazards, regulation of marine pollution would be governed by the usual regime operable in the exclusive economic zone, and in this latter case, therefore, the international regime governing straits, where applicable, would be relevant. Thus, the question of whether the Northwest Passage is an international strait becomes relevant. If so, Canada would be unable to suspend innocent passage or to impose design, construction or manning standards at times of the year when the area is not ice covered (McRae and Goundry, 1982).

The broad interpretation of Article 234 unquestionably gives coastal states more authority to control navigation activities within their exclusive economic zones than does the narrow interpretation. Nevertheless, the practical difference between the interpretations may be minimal, and control over special hazards appears to be adequate in either case. The Canadian Arctic Waters Pollution Prevention Act is based upon a broad rather than narrow interpretation of Article 234, since the act does not distinguish between regulating for the hazards that derive from the ice-covered nature of the area and regulating to prevent other kinds of environmental harm. However, McRae and Goundry point out that the narrow interpretation is consistent with the "special measures" proposals (regarding the authority to enact more stringent regulations in certain areas) by Canada and other states made at the 1973 IMCO Conference and with Canada's position at the earlier sessions of the Law of the Sea Conference (McRae and Goundry, 1982).

Whether or not the United States would object to the narrow interpretation of Article 234, in light of the general international acceptance of the article, is questionable. The broad interpretation, however, would surely give the United States more of a problem, since the United States considers the Northwest Passage to be an international strait and does not at this time subscribe to the view that the special regulations in ice-covered areas allowed under Article 234 apply to international straits. Moreover, the United States apparently does not believe that the additional authority granted by the broad interpretation is necessary. At some point, the interest of the United States in holding the line on greater limitations to the freedom of navigation overtakes its interest in the protection of the environment. Regarding the AWPPA, there seems little reason for the United States to oppose the act's construction and equipment standards applicable when special hazards apply, as long as they are not unnecessarily rigid or overly costly, but the United States is unlikely to back off its opposition to the act's special 100-mile pollution control zone.

## MANAGEMENT ALTERNATIVES

Thus far, only options for jurisdiction have been considered. However, as indicated in Table 1, a range of transit management alternatives exists that can be considered independent of the jurisdiction options. Even if the United States and Canada cannot formally agree about the extent of jurisdiction that coastal states have in arctic waters, there are numerous ways by which to coordinate and rationally manage navigation activities.

Dismissing from further consideration the unrealistic alternative of not coordinating any navigation-related activities, the least comprehensive type of management regime is one in which interaction is limited to collecting and exchanging information. The purposes of this type of regime are simply to inform each country of what the other is doing and to exchange scientific and environmental data pertinent to the operations of each country. The United States and Canada already engage in information exchange concerning a wide variety of arctic issues. For instance, similar agencies, such as the U.S. and Canadian coast guards, regularly exchange information about such things as weather and sea ice conditions. The forum Annual Review of Hydrocarbon and Related Developments in the Beaufort Sea and Environs is a particularly interesting and relevant example of information exchange between the United States and Canada. This forum, organized by the foreign affairs agencies of both countries, has been in existence for eight years. It brings together representatives from U.S. and Canadian agencies that have responsibilities in the Arctic to discuss the current Beaufort Sea activities of each country. Such a forum could evolve into a useful model for a more comprehensive transit management regime as necessity arises.

In addition to simple information exchange, limited functional coordination may be considered. The purpose of this type of regime is to standardize the behavior of the participants by imposing common routines. As noted in section III, there are a number of ways in which the United States and Canada do coordinate navigation-related activities, and opportunities exist for additional functional coordination. An important navigation-related example of functional coordination is the Canada-United States Joint Marine Pollution Contingency Plan. The plan provides a framework for cooperation in response to pollution incidents that may pose a significant threat to the waters or coastal areas of both countries or that are of such magnitude, although only affecting the waters of one country, as to justify a call on the other party for assistance (United States Coast Guard and Canadian Coast Guard, 1983). Among other things, the plan establishes alerting and notification procedures, a command structure, post-cleanup requirements and arrangements for assuming the responsibility for the cost of operations. Responsibilities for the Beaufort Sea are specified in Annex IV of the plan.

Several other navigation-related bilateral agreements are also in force between the United States and Canada. Of note is an agency-to-agency agreement between the United States Coast Guard and the Department of the Environment of Canada concerning research and development cooperation in oil spill response technology. A major purpose of this agreement is to study the behavior of spilled oil in ice-infested waters and to develop appropriate oil spill countermeasures for use in the Arctic. Non arctic-related agreements also exist. For instance, in 1979 the United States and Canada signed an agreement for a cooperative vessel traffic management system for the Juan de Fuca region. The two countries established in 1909 the International Joint Commission to help prevent and settle disputes regarding the use of boundary waters. The commission is discussed in more detail below.

Given the potential dramatic increase in navigation through arctic waters, consideration of a more comprehensive management structure may make sense. Options may be considered along a continuum including establishment of a formal bilateral advisory body to address arctic navigation issues, establishment of a body with not only advisory functions but some regulatory authority as well and establishment of a completely independent bilateral regime for regulating transit in ice-covered areas.

The Arctic Policy Forum, for which this paper was prepared, is an excellent example of the type of advisory body that could be formalized to address navigation issues. As currently constituted, the Arctic Policy Forum brings together respected citizens from the United States and Canada to discuss, in a purely private setting, arctic issues of mutual concern. The forum has been organized to establish, through informal discussions, new management and regulatory techniques to handle arctic problems: by identifying the full range of interests and policy options for any problem of mutual concern, by understanding how these interests and options relate to one another and by comparing the preferred options of each country. Where options overlap or where the differences between options can be resolved, forum members as one body would make recommendations to both governments.

Young and Osherenko have proposed the establishment of a somewhat more formal deliberative body "whose role would be to encourage the emergence of a problem solving atmosphere regarding Arctic resource conflicts" (Young and Osherenko, 1984). Their proposed Arctic Resources Council (ARC) would be a representative body composed of members of all interest groups with a legitimate stake in the Arctic, including industry, native and environmental groups and local, regional and national government representatives. The ARC would stress problem-solving approaches (as opposed to the adversarial approaches prevalent in legislative bodies or courts) such as mediation, controlled communication, simulation exercises and future imaging. Correspondingly, the ARC would not hand down binding judgments, but would weigh the relative merits of different approaches and attempt to accommodate competing

interests. It is further envisioned that the council might supervise research related to issues under consideration. For this and other purposes a permanent secretariat would be established at an appropriate arctic location. Young and Osherenko hope that the council will eventually evolve into a region-wide mechanism for resolving arctic resource conflicts, but they suggest that councils first be established as national deliberative bodies. Thus, a binational U.S.-Canadian ARC would be an intermediate step, with Arctic transportation issues under the purview of such a binational council.

A yet more comprehensive regime that might serve as a model for arctic transit management is the International Joint Commission (IJC) (International Joint Commission, 1983). The IJC was established under the provisions of the Boundary Waters Treaty of 1909 as a permanent binational body. The commission not only advises but has some regulatory authority as well. It consists of three U.S. and three Canadian commissioners. The U.S. and Canadian co-chairmen serve full time; the other commissioners serve part time. Business is conducted as a single body. The purpose of the IJC is to prevent disputes regarding the use of boundary and transboundary waters and to settle questions arising between the United States and Canada along their common border (International Joint Commission, 1983). The IJC provides a framework for cooperation regarding water and air pollution and the regulation of water levels and flows. The basic rationale for the IJC is that solutions to problems in which the United States and Canada have different or opposing interests should be sought not by the usual bilateral adversary negotiations but in the joint deliberations of a permanent tribunal. In this sense, it is similar to the proposed Arctic Resources Council.

The IJC has three roles. In one capacity it functions as an advisory body to the U.S. and Canadian governments. In this role the commission investigates matters of difference along the common border and then reports the facts in a single commission report. Recommendations are made in these reports, but decisions are left to the respective governments. A second role is to monitor and coordinate implementation of commission recommendations that have been accepted by both governments. The third function of the IJC is quasi-judicial in nature. The commission can approve or disapprove applications to use or divert water on one side of the boundary that would affect the natural water level or flow on the other side. Regarding other types of decisions, both governments *may* refer questions on differences of opinion to the commission for resolution, although this has never been done. To help carry out its functions, the commission is aided by 25 binational advisory boards. These boards are responsible for technical studies or field work that may be necessary.

A proposed Arctic Waters International Joint Commission (AWIJC), with jurisdiction throughout U.S. and Canadian arctic waters, might operate in a similar manner. For matters of a purely operational nature the AWIJC could be granted quasi-judicial authority. For matters wherein jurisdiction or the allocation of rights might be involved, it could function as a purely advisory body. In either case the AWIJC could monitor navigation activities and make recommendations on such matters as ship-related pollution. With respect to pollution, the Great Lakes Water Quality Agreement, under which the IJC has a number of specific responsibilities, could serve as a model for a joint arctic water quality agreement.

The management of the St. Lawrence Seaway is an example of a comprehensive navigation-related regime that may have special relevance for the Arctic. The Seaway, which connects the Great Lakes to the Atlantic Ocean, was opened to deep draft shipping in 1959. It is jointly operated and maintained by the St. Lawrence Seaway Development Corporation (SLSDC) of the United States and by the St. Lawrence Seaway Authority (SLSA) of Canada. The SLSDC is a wholly owned government corporation and has been an operating administration of the U.S. Department of Transportation since 1966. The SLSDC owns all its property and is self-sustaining. Operations, maintenance and capital improvement costs are paid from the U.S. share of the tolls for use of the Montreal to Lake Ontario section of the Seaway. The United States operates two of the seven locks in this section and is therefore entitled to 29% of the tolls. The SLSA is a crown corporation under the direction of Canada's Minister of Transport. Its organizational structure is similar to that of the SLSDC, and it is likewise self-sustaining. The SLSA collects tolls for both the United States and Canada.

Together, the agencies operate all seaway locks and channels and provide vessel traffic control assistance between Montreal and Lake Erie. They also jointly manage the Seaway International Bridge, publish transit regulations, establish tolls, set opening and closing dates (related to ice conditions — new ice navigation technology used by both countries has enabled the navigation season to be lengthed from 7.5 to 8.5 months), participate in the St. Lawrence River Board of Control (an adjunct of the International Joint Commission) and work together daily on operational matters. Requests for permission to transit the St. Lawrence Seaway are initiated by the ship owner or agent, who fills out a pre-clearance form for both agencies establishing that the ship meets financial and safety requirements. Altogether, there is a significant amount of coordination between the two separate national agencies.

At least two of the features of the St. Lawrence Seaway regime have special significance for an arctic transit regime: user fees, apportioned perhaps according to the proportion of kilometres transited in each territory, and establishment of financial and safety requirements for ships. However, there is an important difference between St. Lawrence Seaway and Arctic Ocean navigation. The United States and Canada share a common boundary along part of the St. Lawrence Seaway. Where the St. Lawrence River is entirely within Canadian territory, an easement exists, widely recognized as applying to "international" rivers, which enables the United States to have access to its own waters. In the Arctic the United States and Canada are adjacent, rather than opposite, states. Clearly, cooperation has been much easier in the opposite state situation, where waters are shared, than in the adjacent situation, even if navigation and other interests are essentially the same.

More comprehensive bilateral regimes might be considered. Thus, a fully independent commission with extensive regulatory authority for matters relating to marine navigation can be envisioned. There are few examples of binational commissions with such a degree of independence (the Mixed Commission of the Danube, discussed by Fenwick, was perhaps unusual in that it was given the power to reach decisions by majority vote and to impose and enforce penalties for the violation of its regulations [Fenwick, 1965]). However, one might argue that the problems associated with navigation in the Arctic are so unique, the potential for environmental harm so great and the technology so costly and specialized that a highly innovative regime is in order. For instance, perhaps a joint but independent authority

should own and be responsible for the operation of all arctic vessels. As an analogy, some have argued that due to the exceedingly difficult economic, social and safety issues associated with nuclear energy development, the nuclear industry would be in better shape today if it had been operated from the beginning by the government rather than by private industry (R. Stockman, pers. comm. 1984). Arctic marine navigation may well fall into that class of activities undertaken more rationally by the public sector than by the private sector.

## CONCLUSION

This paper has demonstrated that there are a variety of options for both jurisdiction and management of arctic marine navigation. It is also evident that Canada and the United States already coordinate navigation-related activities in a wide variety of ways and in a number of geographic areas. If both countries are willing to come together and listen to what each is saying, there should be no significant barriers to resolving arctic jurisdictional issues and to devising rational management regimes. One of the most important mutual interests of the United States and Canada is pursuit and maintenance of the friendly ties that bind them together. In some areas relations have been strained in recent years. The issue of arctic marine transportation is potentially divisive, but, with political will, it could be an issue that helps to reinforce the friendly relations between two longstanding allies.

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