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Race for the Arctic

WHO OWNS THE REGION'S UNDISCOVERED OIL AND GAS?

With oil prices soaring, revelations that the Arctic could contain up to 22 percent of the world's undiscovered oil and gas have given extra impetus to an international race to claim the region's $1 trillion in oil and other riches. Russia kick-started the race last summer when it stunned the world by planting its flag on the North Pole seabed — two miles below the Arctic Ocean. Global warming has dramatically shrunk the ice covering the ocean, raising the prospect of new, shorter transcontinental shipping routes and spurring the United States, Canada, Russia, Denmark and Norway to begin gathering data to prove they own large swaths of offshore Arctic territory. But environmentalists warn that tougher international rules are needed — possibly an Arctic treaty — to prevent energy exploration from exacerbating global warming and damaging the fragile region. The Inuit and other indigenous groups also fear their concerns will be ignored in the dash to extract riches from the region.

Icebergs dwarf a fishing boat near Ilulissat, Greenland, where officials from five Arctic nations met in May to discuss their claims to the Arctic Ocean seabed and its potential oil and gas reserves.

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RACE FOR THE ARCTIC

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Race for the Arctic

By Brian Beary

The Issues

Along with several other nations, Russia claims a vast swath of the oil-rich Arctic. But last summer the Russians got fed up with the glacial pace of international efforts to settle the claims. In a swashbuckling move that outraged other Arctic players, Russia sent a pair of submersible vessels more than two miles under the Arctic ice cap to plant a titanium Russian flag in the seabed.

"This isn't the 15th century," fumed Canadian Foreign Minister Peter MacKay. "You can't go around the world and just plant flags and say, 'We're claiming this territory.' " [1]

But while MacKay scoffed at Moscow's antics, Canada, albeit more discreetly, also has been asserting its sovereignty in the Arctic — as are Norway, Denmark and the United States — prompted by high energy prices and the melting ice cap.

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A young Nenets woman harnesses her reindeer in Siberia, Russia. Indigenous groups worry that the race for Arctic riches will affect their traditional way of life and deprive them of their fair share of the resources.

In recent decades the Arctic's climate has changed more dramatically than other parts of the world. Alaska, for instance, has warmed by 4.9 degrees Fahrenheit since 1950, compared to a 1.8-degree increase since 1908 in the rest of the United States. [2] Average Arctic air temperatures were 10.4 degrees higher in November 2007 than during the same period in the 1980s and '90s. More Arctic sea ice melted in 2007 than in any other year on record, with summer ice levels 20 percent lower than the previous record, set in 2005. [3]

"Many scientists who track Arctic change recognized that an abrupt decline in sea ice was possible, but nearly all were surprised that a dramatic sea-ice decline could occur so fast," according to James E. Overland, an oceanographer at the National Oceanic and Atmospheric Administration's (NOAA) Pacific Marine Environmental Laboratory in Seattle. [4]

Unlike Antarctica, which is a continent covered by mile-high glaciers, the Arctic is mostly an ocean covered with sea ice that has declined in minimum thickness from about 12 feet in the 1980s to eight feet today. *

But melting ice has been a boon in Greenland, a huge, glacier-covered Danish island located almost entirely within the Arctic Circle, making extraction of the rich resources beneath the ice simpler. "Climate change has a positive impact on Greenland," says Foreign Affairs Minister Aleqa Hammond. "But we are aware of severe impacts both globally and locally."

As the ice melts, Hammond says global warming's "winners and losers" are becoming obvious, such as the polar bear. Last May, the U.S. Department of Interior listed the iconic Arctic predator as a threatened species because it relies on sea ice as both a home and a feeding area. [5] For indigenous Arctic peoples, global warming has its advantages and disadvantages. On the one hand, the shrinking ice cap makes access to oil, gas and minerals easier, and warmer weather allows more agriculture. But the loss of sea ice also disrupts the habitats of seals and other marine mammals, threatening the livelihood of indigenous hunters.

In the end, however, environmentalists say the Earth itself could be the biggest loser, as a vicious cycle plays itself out: Melting ice triggers more oil and gas drilling, causing more global warming when the carbon-based fuels are burned. [6]

The most sought-after Arctic area is the huge Lomonosov Ridge — an underwater mountain range as big as California, Indiana and Texas combined that straddles the North Pole.

* Arctic sea ice is melting much faster than Antarctic ice because the South Pole is protected somewhat by a hole in the region's ozone layer, Overland notes, which has caused winds to increase, keeping the warmer temperatures out.

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Huge Area at Stake in Race for Arctic Resources

Eight nations have territory within the Arctic Circle, a vast region that encompasses the Arctic Ocean, the North Pole, 24 time zones, 5 million people, 30 ethnic groups and three transcontinental shipping routes. A recent U.S. Geological Survey report estimated the area could contain 22 percent of the world's undiscovered oil and gas deposits. Of the eight Arctic countries, five with borders on the mostly ice-covered Arctic Ocean — Russia, Canada, the United States, Norway and Denmark (which owns Greenland) — are scrambling to extend their offshore boundaries beyond the traditional 200-mile limit in order to claim potential offshore resources.

Sources: Political Handbook of the World 2008, *CQ Press, 2008; Energy Information Administration, U.S. Department of Energy*

Continued from p. 215

When Russia planted its flag in the middle of the Lomonosov, it angered the Danes and Canadians, who also claim the area. In total, Russia claims sovereignty over half of the Arctic Ocean. [7] Norway and the United States — the other two countries with Arctic Ocean coastlines — claim more southerly Arctic waters. *

Under the United Nations Convention on the Law of the Sea (UNCLOS), countries can claim an area 350 nautical miles or more from their shores if they can prove the adjacent seabed is an extension of their continental shelves. [8] But the United States cannot file such a claim because the Senate has refused to ratify UNCLOS. Were such a claim filed and accepted, the United States would gain almost as much territory as it did when it purchased Alaska from Russia in 1867 for $7.2 million.

Many senators regret the Senate's refusal, including Sen. Lisa Murkowski, R-Alaska. "The Arctic is one of the last spaces on Earth whose borders are not set," she says. "The U.S. needs to be a player, not an outsider. We have an opportunity that is unparalleled around the world."

Meanwhile, the Arctic's indigenous communities fear being sidelined once again in the rush to develop the region's resources (*See sidebar, p. 220.*) "This is Inuit territory," says Aqqaluk Lynge, president of the Inuit Circumpolar Council (ICC) in Greenland, which represents the Arctic's 150,000 Inuit, once known as Eskimos. "While we are very loyal to our respective governments, they must assist us in helping build Inuit unity and help the Inuit use the resources in a sustainable manner."

With oil prices now topping $127 a barrel, gasoline at nearly $4 a gallon and global oil consumption rising, a rush to find new supplies in the Arctic has begun. [9] Unlike in Antarctica, where mining is banned until 2041, no international moratorium on Arctic drilling exists. Arctic states already extract "black gold" in large quantities and are stepping up their operations. (*See table above.*)

Some 90 billion barrels of undiscovered oil and 1,670 trillion cubic feet of natural gas could lie onshore and offshore within the Arctic Circle region, according to a July report from the U.S. Geological Survey (USGS). That represents 30 percent of the world's undiscovered gas reserves and 13 percent of the oil reserves. [10] The United States produces 1.85 billion barrels of oil each year and 19.3 trillion cubic feet of natural gas. [11]

Russia is already the biggest player in the Arctic, with 75 percent of the known Arctic oil and 90 percent of the gas — and validation of its territorial claims would only enhance its energy-kingpin status. [12] The Norwegians, who operate offshore fields in the North Sea, are moving operations north as old wells dry up. Petroleum, which represented 31 percent of Norway's revenues in 2007 and 48 percent of its exports, is key to Norway's wealth. [13] Greenland has quintupled the number of exploitation licenses it grants and expanded the area earmarked for oil and gas exploration from 2,657 sq. miles to nearly 39,000 sq. miles. [14] Meanwhile, both the United States and Canada are opening up their sections of the Beaufort Sea to drilling. (*See map, p. 216.*)

The European Union (EU) — which recently predicted the scramble for resources will intensify in the Arctic — will probably end up in the Arctic "loser" category, because it has no territory in the region. Although Denmark is a member, its Arctic province Greenland left the EU in 1985, and Norway stood on the threshold of EU membership twice, but referenda in 1972 and 1994 narrowly failed. [15]

Despite the attention being paid to the Lomonosov Ridge, USGS geologist Don Gautier, says it "is not an interesting place from the petroleum point of view" because the vast majority of Arctic oil and gas lies else-

Arctic Region at a Glance

Country	Population (in millions, 2006, unless otherwise indicated)	Area (in square miles)	Net petroleum exports/imports (-), 2007 (thousand barrels per day)
Canada	32.8**	3,855,081	1,026
Russia	142.4	6,592,800	7,018
Norway	4.7	149,282	2,321
Greenland (Danish)	0.06*	840,000	-4
United States	304.6**	3,732,396	-12,210
Iceland	0.3	39,768	-19
Finland	5.2	130,119	-224
Sweden	9.1	173,731	-357

** 2005 estimate*

*** 2007 estimate*

Sources: Political Handbook of the World 2008, *CQ Press, 2008; Energy Information Administration, U.S. Department of Energy*

* The Danes are involved because Greenland, which is located mostly within the Arctic Circle, is an independent Danish province.

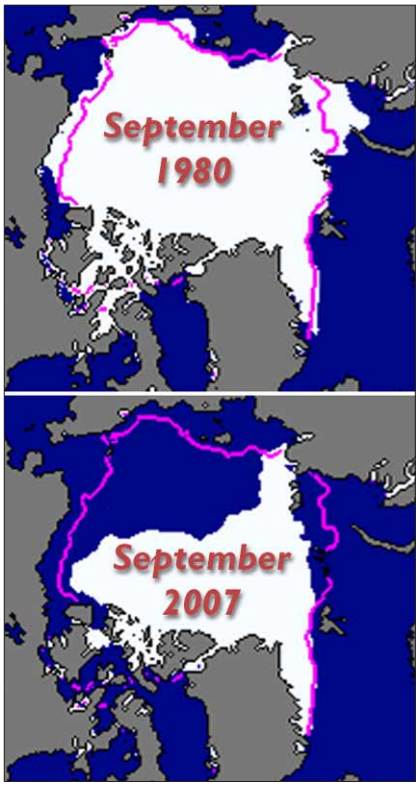
where. "Offshore Alaska is the most obvious place to look for oil, while the area with the most gas is the West Siberian Basin in Russia." Although the Lomonosov contains sedimentary rock — a critical component for petroleum reserves to be present — there is no evidence of a previous tectonic event that would have sealed reserves under the seabed, Gautier explains.

And, even if oil and gas are found, countries will drill closer to their coastlines first, Gautier says, because they have undisputed sovereignty over these areas and because it's easier to operate there than in the Lomonosov, which is hundreds of miles offshore.

The shrinking sea ice also is beginning to affect global shipping. In summer 2007 the legendary Northwest Passage through northern Canada, which connects the Atlantic and Pacific oceans, was ice-free for the first time in recorded history, raising the promise of new, shorter trans-Arctic shipping routes. By 2030 the Arctic may be entirely ice-free during the summer months, NOAA's Overland predicts.

Savings on shipping costs could be enormous if the Arctic routes were to become usable for longer periods. A ship sailing from New York to Tokyo, for instance, could shave 2,600 miles off its journey by taking the Northwest Passage instead of a conventional route through the Panama Canal. Vessels traveling from London to Tokyo could reduce their journey by some 5,000 miles by taking the Northern Sea Route — also called the Northeast Passage — through Russian waters instead of the Suez Canal. (*See map, p. 223.*) [16]

And even partly ice-covered passages are navigable now with new "double acting" ships, which sail through ice-free waters using their V-shaped bow, and then turn around when they hit icy waters and navigate with their U-shaped stern, eliminating the need for an accompanying icebreaker.



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Satellite images of the top of the Earth show how the polar ice cap has shrunk dramatically over the past 27 years. Scientists say more Arctic ice melted in 2007 than in any other year on record, with summer ice levels 20 percent lower than the previous record — set in 2005.

Initially, with expanded offshore energy exploitation and warmer waters attracting more warm-water fish, most of the increased trans-Arctic sea travel would probably be petroleum-laden tankers or commercial fishing vessels. The jury is still out, however, on whether trans-Arctic shipping of consumer goods will be commercially viable anytime soon — because savings in distance would be offset by other expenses, such as building more ice-resistant ships.

In any case, Russia — which already has 18 icebreakers that escort cargo ships along the Northern Sea Route — seems best positioned to exploit new opportunities. [17] A rise in commercial traffic along North America's Northwest Passage seems less likely, because the route is more difficult to navigate, and the United States and Canada disagree about its legal status. The United States says the passage is an international strait open to all; Canada says it is Canadian waters.

As the race for Arctic treasure intensifies, here are some of the key questions political leaders are grappling with:

Is an Arctic treaty needed?

"This is an absolute necessity," says Rob Huebert, a politics professor and Arctic expert at the University of Calgary. "We have no multilateral system of governance for the Arctic. The U.S. is not a party to UNCLOS, and the treaty does not deal with certain things — for example the rights of indigenous peoples."

Huebert insists a new treaty should be concluded between all eight states with territory within the Arctic Circle — Canada, Denmark, Russia, the United States, Norway, Iceland, Sweden and Finland — rather than just the five whose coastlines border the Arctic Ocean (Canada, Denmark, Russia, the United States and Norway), who were invited to a ministerial meeting in May in Greenland to discuss territorial issues. A treaty should also contain a conflict-resolution mechanism and provisions on navigation, fishing and tourism, he says.

"Right now, everyone is going it alone," he continues. "We need a champion like Malta was in the 1960s for UNCLOS. It would be nice to see Canada assume this role." (*See p. 227.*)

Craig Stewart, director of the World Wildlife Fund's (WWF) Ottawa Bureau, adds, "We need a framework convention on resource extraction that sets environmental and oil and gas recovery standards. This should enshrine the 'integrated management planning concept' under which the impact of all activities — fishing, shipping, oil drilling — are assessed, all stakeholders are involved and resource extraction is banned in certain areas."

He says Canada's 1996 Oceans Act would be a good model for such a convention.

Britain's Diana Wallis, vice president of the European Parliament, says an international Arctic treaty would be "appropriate," especially now. "The timing is good, with 2007-2008 being International Polar Year."

So far, she says, at least "people are honoring the legal frameworks" of the UNCLOS territorial-claims procedure. "If it works, OK. But in the long term we should think about drafting an Arctic Charter and strengthening the political dimension of the Arctic Council."

Set up in 1996, the Norway-based council includes representatives from all eight Arctic states plus indigenous community organizations. Yet so far, it has not been much of a player: A U.S. secretary of State has never attended one of the council's biannual ministerial-level meetings. [18] And when asked to outline the council's vision for development of the Arctic, a spokesman said he was "not in position to speak to political issues on behalf of its eight member states."

Environmental groups are favorably disposed to such a treaty and to beefing up the council's role. "The council has not developed policies yet — it just releases studies, although this is useful, too," says Chris Krenz, Arctic Project Manager in Juneau, Alaska, for the Oceana environmental group. "UNCLOS may be useful for deciding territorial rights, but there needs to be something else just for the Arctic."

But Norway's ambassador to the United States, Wegger Strommen, says an Arctic treaty is superfluous. "UNCLOS has worked well," he says. "If disputes arise from overlapping claims, it is best to resolve them through bilateral negotiations. Once we have the technical data, I am confident they will be resolved."

Norway's Foreign Minister Jonas Gahr Store agrees. "We do not exclude future new regulation in particular fields," he said, "but only if real needs have been identified with precision. The actual challenges related to the legal regime in the Arctic may have more to do with a lack of implementation of existing rules than a lack of rules." [19] As evidence, a Norwegian embassy official responsible for fisheries policy cites agreements Norway concluded with other countries in 2005 setting fishing quotas for blue whiting and herring. [20]

The Norwegian view was endorsed in May by Canada, Denmark, the United States and Russia when ministers met in Ilulissat, Greenland, to discuss

Moving the "Gold"

The huge oil facility at Prudhoe Bay, on Alaska's Beaufort Sea coast, sits next to the largest oil field in the United States (top). With gasoline prices at nearly $4 a gallon and global oil consumption rising, Arctic countries are racing to develop the region's "black gold" — both onshore and offshore. Canada is building a 750-mile natural gas pipeline to transport natural gas from its Northwest Territory fields to southern markets. And in Norway, drilling rigs are being moved northward toward the Arctic as its North Sea wells dry up (bottom).

this issue. A post-meeting joint declaration said UNCLOS provides a "solid foundation for responsible management by the five coastal states and other users of this ocean." It concluded: "We therefore see no need to develop a new, comprehensive international legal regime to govern the Arctic Ocean." [21]

Given such opposition from the key governments, an Arctic treaty looks politically unfeasible.

Oran Young, a professor of environmental science and international governance at the University of California, Santa Barbara, dismissed the idea of an Arctic treaty as "utopian — both politically and legally. Legally binding agreements are hard to negotiate, often lacking in substance, and commonly slow to enter into force. They are clumsy instruments that are apt to cause trouble in highly dynamic settings." [22]

And although Young supported enhancing the Arctic Council's role somewhat, he also recommended "keeping its decision-making authority and organizational capacity to a minimum." [23]

Gunnar Sander, Arctic adviser at the Copenhagen-based European Environment Agency (EEA), a network of EU environmental agencies, suggests something slightly more modest than

Arctic's Indigenous People Fight for Their Resources

Big nations are rushing to exploit offshore gas, oil.

Exploitation of the Arctic's resources is ancient history to its indigenous peoples, says Aqqaluk Lynge, president of the Inuit Circumpolar Council (ICC), which represents 150,000 Inuit. When Arctic-area ministers met recently in breathtakingly picturesque Ilulissat, Greenland, to discuss sharing the region's natural resources, he reminded them the debate stretches back to the 1600s, "when the first foreign whaling ship came to hunt our big whales and decimate our stocks, from which they have never recovered." [1]

Today Arctic governments have their sights set on offshore oil and gas and new shipping and fishing opportunities. And indigenous communities want to know whether they will be winners or losers in the new race for Arctic resources.

"All this is nothing new for us," says Gun-Britt Retter, a member of the indigenous Sami community's parliament in Norway.* "We used to have to pay taxes to four different kings — Sweden, Norway, Denmark and Russia. Today we have governments making nice speeches about indigenous peoples having the right to their culture. But they do not give us the basis for that culture — our land. We have no right to veto drilling operations and no right to revenues from oil and gas extraction on our land."

Indeed, throughout modern times indigenous Arctic peoples have fought to preserve their language, culture and way of life as neighboring colonial powers encroached on their turf. In 1953, for instance, Canada pushed the Inuit in Nunavik, Quebec, into the High Arctic in an effort to assert Canada's sovereignty over the region. The same year Eskimos were forced out of their homes in northwestern Greenland to make room for a Danish-backed U.S. Air Force base in Thule.

Native peoples have scored some successes, however. In 1971, under the Alaska Native Claims Settlement Act, the U.S. government gave the Inuit $962.5 million and 44 million acres of land in Alaska after complaints that oil developers were robbing locals' land and destroying the environment. [2] In 1999 Canada created the Inuit-dominated Territory of Nunavut by splitting the Northwest Territories in two. Greenland, which is 90 percent Inuit, gained home rule from Denmark in 1979, after nearly three centuries of domination. A referendum this November would give the Inuit in Greenland further autonomy and divide up future oil and gas revenue between the Greenlandic and Danish governments.

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Nenets reindeer herders meet with gas company officials in Yamal, Siberia, to discuss how oil development is affecting their community.

But Edward Itta, the mayor of Alaska's North Slope Borough, is critical of how the U.S. government is conducting its current policy review of the Arctic.

"We have not been formally involved in the review," says Itta, an Inuit. "We have lived here for 10,000 years, yet the bureaucrats in Washington think they know it all."

Besides fighting for a seat at the table, indigenous peoples are trying to forge a strong and unified stance among them-

* The Sami were formerly known as Laplanders.

selves. Inuit from Russia, Alaska, Greenland and Canada will meet in Nunavik in November to devise a common position, which is vital to resisting the Arctic powers' "divide-and-conquer approach," says Lynge. [3]

In addition to the Inuit, the 70,000-strong Sami — residing in Norway, Sweden, Finland and Russia — are the second-largest Arctic indigenous group. Other smaller groups include the Aleut, who live on the Pacific Aleutian islands between Russia and Alaska, the Athabaskans and Gwich'in from Alaska and Canada plus 41 indigenous groups who live in Arctic Russia.

The rights of indigenous peoples vary widely. For example, the Sami have their own parliaments in Norway, Sweden and Finland, but not in Russia. "Our people face their biggest challenge in Russia," says Retter. "The government there draws up maps for pipelines and mining development, ignoring the people who live there. Reindeer herding is a huge part of our culture, but because of this new infrastructure, the reindeer, which move homes between summer and winter, become blocked."

Now global warming is forcing indigenous communities to adapt quickly. According to Kenneth Hoegh, Greenland's agriculture adviser in Qaqortog, climate change has been a mixed blessing in southwest Greenland. The reduction in drift ice has hurt Inuit hunters because the ice calms the sea, enabling the hunters to shoot seals.

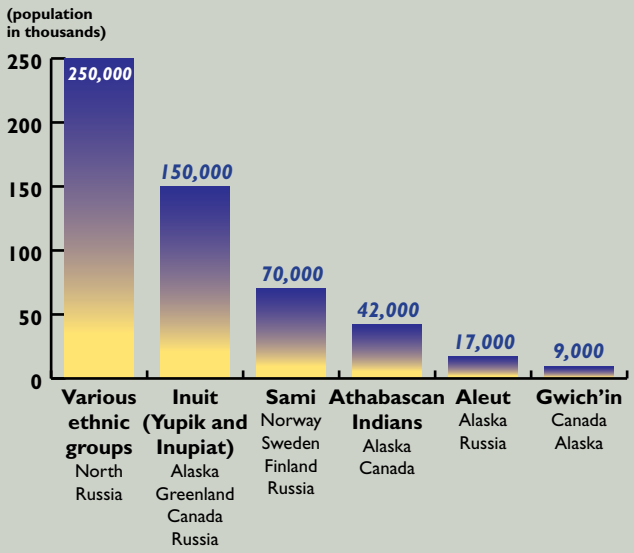
"If this continues, they will need to find other livelihoods — maybe fishing, eco-tourism or ethnic tourism," he says.

On the other hand, warmer seas have attracted more cod, which fetch good prices. Fishermen have had to invest in new gear and boats, however, since they previously fished mainly for shrimp, which are eaten by the cod. Global warming also has given a boost to farming, allowing more grazing and hay, silage and vegetable cultivation.

Meanwhile, industrial pollution from faraway regions threatens indigenous peoples' health. Inuit mothers' breast milk has become dangerous because the polar bears, seals, walruses, fish and whales they eat are contaminated by heavy metals, PCBs and other industrial compounds found in seawater and stored in the animals' fat. [4]

While much is known already about the environmental challenges, more research is needed for policymakers to make the right decisions, according to Mayor Itta. "Our ocean is getting more acidic," he says. "We need more baseline data to understand the impact on the entire food chain — from the krill to the bowhead whale."

Indigenous People of the Arctic



Sources: Inuit: www.inuitcircumpolar.com; Sami: www.galdu.org; Aleut: www.apiai.com; Athabaskan: www.arcticathabaskancouncil.com; Gwich'in: www.gwichin.org; Russian indigenous: www.raipon.org.

[1] Aqqaluk Lynge, president, Inuit Circumpolar Council (ICC) Greenland, address to the Ministerial Summit of Arctic Oceans, "Issues relating to the local inhabitants and indigenous communities," May 28, 2008, Ilulissat, Greenland, www.inuit.org/index.asp?lang=eng&num=3 (Inuit version)

[2] *Encyclopaedia Britannica Online*, www.britannica.com.

[3] Lynge, *op. cit.*

[4] Colin Woodard, "Oceans in Crisis," *CQ Global Researcher*, October 2007, pp. 237-264.

an Arctic treaty: a regional protocol for the Arctic Ocean within the UNCLOS framework. Twelve regional-seas conventions already have been adopted under the UNCLOS framework, including a 1992 treaty for protecting the North-East Atlantic. [24] Yet, with the five key Arctic governments clearly favoring bilateral and sector-specific pacts, even this modest suggestion looks to be a long shot.

Should Arctic oil and gas reserves be exploited?

While environmentalists are more enthusiastic than governments about an Arctic treaty, the situation is reversed on the question of oil and gas drilling: Governments are much more enthusiastic than environmentalists on the issue.

International mineral and oil companies "are flocking to Greenland," says Foreign Affairs Minister Hammond. "I would, too, if I were in their position." Greenland, with a population 56,000, would get a massive windfall if major oil or gas deposits are found, notes Hammond, who is also minister for finance.

Claudia A. McMurray, the U.S. State Department's assistant secretary for oceans, environment and science, supports exploration if it is done "in a sustainable manner." Guidelines are needed on how to conduct operations and

© B&C Alexander/Arcticphoto.com

Life is treacherous these days for Arctic polar bears — like this one at Cape Churchill, Canada — as Arctic ice melts away due to global warming. The U.S. Department of Interior in May listed the iconic predator as a threatened species because it relies on sea ice as both a home and a feeding area. The listing could block or delay development of Alaskan oil reserves.

contingency plans for spills, she says, but "the U.S already has rules for this."

Environmentalists are more fearful. "The rush to exploit Arctic resources can only perpetuate the vicious cycle of human-induced climate change," said Greenpeace International spokesman Mike Townsley. [25] Extracting oil and gas will only lead to more fossil fuels being burned, which will trigger further global warming and more melting of the ice caps, he explained.

But Danish Ambassador to the United States Friis Arne Petersen says, "We cannot give up on oil and gas. We want to drill offshore for oil in western Greenland and gas in eastern Greenland."

Oceana's Krenz worries about the impact exploration will have on the surrounding environment, noting that Alaskan beaches still have not recovered from the 1989 *Exxon Valdez* oil spill. [26] "If you dig a hole, you can still see oil seeping its toxic compounds into the ocean," he says. "This has been very detrimental to pink salmon. Herring stocks have never really recovered either."

Oil spills are especially lethal for seabirds and seals, because the oil covers their feathers and fur, making it harder for them to escape from predators, causing seals to drown by sticking to their flippers and causing hypothermia in seal pups and birds. "Placing wells, pipelines and vessels in the remote Arctic creates a substantial risk of a catastrophic oil spill, and there is no proven method to clean up an oil spill in the icy conditions often found in the Arctic," Oceana warns. [27] And the noise caused by drilling could drive whales and other marine life away from feeding areas, it added.

For these reasons, the World Wildlife Fund is calling for a moratorium on Arctic development. "The U.S. Minerals Management Service (MMS) estimates that there is a 20 to 52 percent risk of an oil spill in the Chukchi or Beaufort seas," says WWF's Stewart. "The British-based energy company BP did a test in 2000 that concluded you could not clean up a spill if there was 30 percent ice coverage. It is highly irresponsible to proceed without a recovery system."

The European Environmental Agency's Sander says drilling in the High Arctic would be "very risky." The large quantities of ice, 24-hour darkness in winter and extremely low temperatures make conditions for operating a facility treacherous, he says.

EU parliament member Wallis is more circumspect: "In a sense, it is fair for countries to exploit the resources. But you must proceed with caution, getting the best science, not taking risks with the environment and respecting what the local populations want."

According to a recent Arctic Council report, "knowledge about effects on the environment and human health of oil and gas activities is limited." [28] To date there have been no large oil spills in the Arctic Ocean from oil and gas activities (the *Exxon Valdez* ran aground in the Pacific), it noted, and seismic exploration has left "no long-lasting effects on fish stocks or marine ecosystems." [29] Most animals revert to normal behavior when the noise ceases, the report said, except for bowhead whales in the Beaufort Sea,

which had been observed changing swimming direction in response to noise sources up to 20 miles away.

In addition, the report continued, the local communities experienced increased employment during the construction phase, but many workers were brought in from the outside because the locals did not have the necessary training. And when oil and gas activity ceases, old sites need to be safely removed and the surrounding environment cleaned up — something the industry does not always bother to do. [30]

Perhaps for these reasons, the Inuit conference's Lynge says tough questions must be answered before energy exploitation gets the green light. "How many new jobs will be created?" he asks. "How many of them will go to Greenlanders? Who will be getting the high-paid jobs?"

In Alaska, some say the issue is complicated by the polar bears, which the U.S. government recently listed as threatened. "If the Department of Interior decides that exploration will further threaten the polar bears' habitat, it will be difficult to grant development leases," says the State Department's McMurray.

"This finding, given the inflexibility of the 1973 Endangered Species Act, makes it easier to legally challenge oil and gas lease sales in the Beaufort and Chukchi seas," says Professor Jonathan Adler, an environmental law expert at Case Western Reserve University in Cleveland. "I think the matter will be resolved in the courts."

Will the melting ice caps revolutionize international shipping routes?

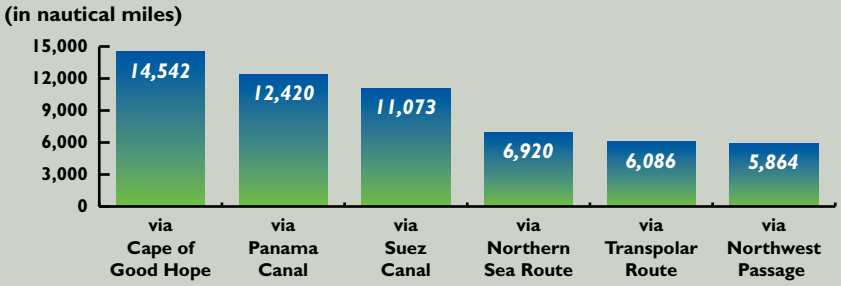
The receding ice caps are likely to affect Arctic shipping, but how quickly things will change and what routes will be affected is unknown.

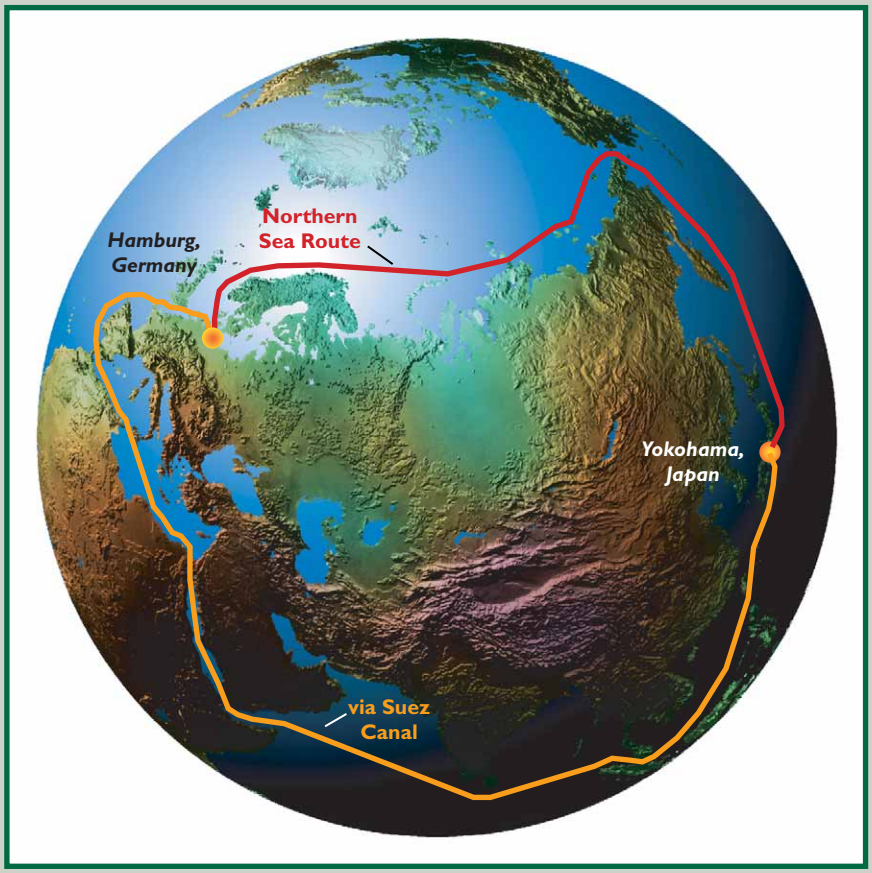
Three basic routes cross the Arctic Ocean: the Northwest Passage in North America, the Northern Sea Route through Russia's northern wa-

Arctic Melting Opens Up Shorter Shipping Routes

The melting of the Arctic ice cap could create more efficient shipping routes from Europe to the Far East. For example, the distance from Hamburg, Germany, to Yokohama, Japan, via traditional shipping routes — around the Cape of Good Hope or through the Panama or Suez canals — could be as long as 14,500 nautical miles. By contrast, the distance is half that amount via the Northern Sea Route (see below), and even less for the Transpolar Route and Northwest Passage.

Nautical Miles from Hamburg, Germany, to Yokohama, Japan





Source: Ray Chartier Jr., "Arctic Sea Ice Recent Trends and Causes; Impact on Arctic Operations," U.S. Naval Ice Center

ters and the Transpolar Route over the North Pole. (*See map, p. 223.*)

"The greatest potential saving is probably over the Northern Sea Route" because it's the most ice-free, according to Mead Treadwell, chairman of the U.S. Arctic Research Commission.

A 2006 study funded by the Alaska-based Institute of the North concluded that shipping containers from the Aleutian Islands in western Alaska to Iceland using the Northern Sea Route would cost $354 to $526 per container compared to the current cost of $1,500 per container from Japan to Europe using the southern route. [31] Other costs also must be factored in, such as having to build and operate new terminals, the study stresses. Until now, the northern route has not been used for shipping goods between continents because its icy waters make it treacherous to navigate.

The Transpolar Route also has potential, says Ragnar Baldursson, an official at Iceland's Department of Natural Resources and Environmental Affairs, because it avoids treacherous coastal areas, such as the Northwest Passage, where ice is often swept towards the straits. "The Transpolar route is easier for political reasons, too, because no one disputes ships' right to sail over the North Pole, which is not the case for the Northwest Passage," he says. In an ongoing dispute, the United States claims the Northwest Passage is an international strait through which all ships can pass, while Canada argues it is Canadian waters and that Canada can impose environmental regulations and demand to be notified of passing ships.

Diplomatic squabbles aside, Canadian shipping executive Thomas Paterson says greater commercial use of the Northwest Passage is not viable. "It would need to be completely ice-free to be economical, but this will not happen," says Paterson, vice president of Montreal-based Fednav Ltd. "Ships coming up Greenland's coast [to reach the passage] will encounter icebergs broken off from Greenland's glaciers and will have to slow down to avoid them, so the journey could end up taking more time despite the shorter distance."

In addition, icebreaking ships are more expensive to build — $100 million compared to $40 million for a standard ship, he points out. Businesses shipping goods across continents will not take on these extra risks and costs, he says, although oil companies shipping Arctic oil in and around the Northwest Passage may be willing to pay.

The greatest potential for improved Arctic shipping lies with regional, not trans-continental, shipping, says Lawson W. Brigham, director of the Arctic Research Commission's Alaska Office and a former U.S. Coast Guardsman who commanded icebreakers in the Arctic and Antarctic. There is already a thriving seasonal trade in shipping minerals, he notes, including zinc from Alaska's Red Dog mine and nickel and copper from Siberia.

"This trade has nothing to do with climate change," says Brigham, who earned a Ph.D. in polar oceanography from England's Cambridge University. With seven nuclear-powered icebreakers to escort ships, Russia has used the Northern Sea Route for 60 years to transport fuel, food, minerals and machinery during the summer months, according to a Russian official.

The University of Calgary's Huebert predicts that most of the new shipping will support the oil and gas industry rather than regular cargo, a view shared by Brigham. "The distances may be shorter, but there will still be ice," Brigham says. "The Northwest Passage was open for less than a month in 2007, and even then there may have been small ice floes that the satellite images did not pick up. If you go too fast, you risk damaging things."

In 1994 Brigham captained the U.S icebreaker *Polar Sea*, which, in a joint expedition with its Canadian counterpart the *Louis S. St. Laurent*, became the first surface ships to cross the central Arctic Ocean. They approached the polar sea via the Bering Strait and came out at Svalbard. "It was a slow crossing, about 40 days," he says. "Certain commodities — toys, fresh fruit, clothing, cars — are very time-sensitive and you may not be able to afford to arrive a few days late." Brigham says "there are strong differences of opinion about the use of trans-Arctic navigation on a routine basis" and that solid economic analyses of its viability have yet to be performed.

Ice itself isn't the only obstacle to trans-Arctic shipping, notes Winn Dayton, a director of transportation policy at the U.S. State Department's Bureau of Economic and Business Affairs. Special ice-resistant hulls are expensive, and Arctic ports lack road and rail connections, Dayton says. Extracting materials in such remote areas is costly and dangerous, since it is far from Coast Guard crews who could launch search-and-rescue operations, he adds. [32]

"Conditions are extremely tough up there, with the storms and rough seas," says Petter Meier, fisheries counselor at the Norwegian Embassy in Washington. "In ice-covered waters, the ice can actually screw a ship right down into the sea."

Arctic tourism — which is experiencing something of a boom, with hundreds of cruises crisscrossing Arctic waters last summer — is a potential growth sector. Yet lack of infrastructure in the remote regions of Canada and Greenland limits the potential, according to Capt. Ted Thompson, senior vice president of the Cruise Lines International Association.

"Tourists will have nothing to do if you dump them at the ports there," he says. "Even if the Northwest Passage is open for a week and a half this year, it will not be long enough to make it through all the way. We

Continued on p. 227

Chronology

35,000-10,000 B.C.

First settlers arrive in the Arctic.

11,000 B.C.
Ice cap thaws, and land bridge linking Asia and North America floods.

900-1910s

Explorers and colonial powers arrive in the Arctic.

986 A.D.
Erik the Red establishes a small Norse colony in Greenland.

1609
Dutch jurist Hugo Grotius publishes *Mare Liberum*, establishing free-seas principle.

1845
An expedition led by Britain's Sir John Franklin in search of Canada's Northwest Passage disappears, never to be heard from again.

1867
Russia sells Alaska to the United States for $7.2 million.

1909
U.S. explorer Robert Peary claims to be first to reach North Pole.

1920s-1960s

Governments begin exploiting the Arctic's natural resources and questioning Grotius' free-seas principle.

1920
Oil exploration begins in Canada's Northwest Territories.

1922
Oil exploration begins on Alaska's North Slope.

1945
President Harry S Truman claims all resources on the U.S. continental shelf.

1958
U.S. government issues first lease for oil exploration on the North Slope.

1967
Malta's ambassador to the U.N. gives a groundbreaking speech calling for an international treaty on the sea.

1968
First surface expedition, led by American Ralph Plaisted, reaches the North Pole, using snowmobiles.

1970s-1990s

Global governments regulate the seas. Economic development of the Arctic continues to grow.

1973
U.N. conference convenes to write a global oceans treaty.

1977
Trans-Alaska pipeline begins pumping oil 800 miles from northern Alaska to the ice-free southern seaport of Valdez. . . . Inuit establish the Inuit Circumpolar Council to represent their interests. . . . Soviet nuclear-powered icebreaker *Arktika* is first ship to reach the Pole.

1981
First exploratory well is drilled on Alaska's outer continental shelf.

1982
U.N. adopts the Convention on the Law of the Sea (UNCLOS) and opens it for ratification. Eventually 156 nations, but not the United States, will ratify it.

1984
Snohvit gas field is discovered in Norway's Barents Sea.

1987
Soviet leader Mikhail Gorbachev proposes transforming the Arctic into a "zone of peace."

1994
UNCLOS enters into force.

2000s

Melting ice caused by global warming triggers a new rush for Arctic land and natural resources.

2001
Russia becomes the first Arctic nation to claim sovereignty over the North Pole, using a process set up under UNCLOS.

2007
The Northwest Passage is ice-free for the first time on record. . . . Russia plants its flag on the North Pole seabed, galvanizing other Arctic nations into asserting their own sovereignty. . . . U.S. Senate Foreign Relations Committee approves UNCLOS, bringing it a step closer to ratification.

2008
U.S. authorizes oil and gas exploration in the Chukchi Sea. . . . U.S. lists the polar bear as a threatened species due to loss of its sea-ice habitat. . . . Russia, Canada, Denmark, the United States and Norway agree to use UNCLOS to resolve Arctic territorial claims. . . . U.S. and Canada begin collaborating on Arctic seabed mapping to pursue continental shelf claims.

Territorial Disputes Roil the Arctic

Many nations eying gas and oil reserves.

On a tiny, uninhabited island in the remotest reaches of the Arctic, Danish naval officers stake their nation's claim to the island once a year by planting bottles of Old Danish bitters in the snow. Troops from Canada also claim the barren patch of land, but with Canadian Club whiskey, drinking the bitters to remove all traces of a Nordic colony. The Danes return the favor when they come back, downing the Canadian whiskey and replacing it with more Danish spirits.

This good-humored sparring continued for years until recently, when the dispute between Canada and Denmark over Hans Island — about 300 acres wedged between Canada's Ellesmere Island and Greenland — suddenly was no longer a joke.

At an Arctic foreign ministers meeting in Ilulissat, Greenland, in May, Greenlandic Prime Minister Hans Enoksen declared, "We traditionally have already named the island The Kidney-Shaped Island. . . . should anyone have any claims prior, they would have named it already before we did." Canada's natural resources minister, Gary Lunn, retorted tersely, "I'm not going to comment on that," adding, "we're here to affirm Canada's sovereignty by our strong presence in the North." [1]

While the row may seem as silly as a "Monty Python" sketch, no one is giving a square inch — keenly aware of the precedent it might set for other territorial claims and, ultimately, control of the Arctic's vast resources.

Southwest of Hans Island, the United States and Canada have been entangled in a similar standoff since 1969 over the status of the Northwest Passage, the stretch of water in northern Canada that connects the Atlantic and Pacific oceans. The United States insists the fabled passage is an international strait open to all vessels. [2] Canada insists it is part of Canada's territorial waters.

"If Canada is right," says Professor Rob Huebert, an Arctic sovereignty expert at the University of Calgary, "Canadian authorities will decide who can or cannot pass and what safety and environmental rules they must follow."

Until now, the dispute has been largely academic, because the passage historically has been frozen and unnavigable for most of the year. But global warming made the passage ice-free last summer for the first time in observational record and has catapulted the dispute into the political realm.

"There is no room to move. We have agreed to disagree," says Claudia McMurray, the State Department's assistant secretary for oceans, environment and science. "It is not a major issue right now, but it will be if the ice melts forever and the passage becomes a shipping lane." Neither side has brought a case to the International Court of Justice (ICJ) yet, but this could well happen given the increasing inflexibility Arctic nations are showing in territorial disputes.

A 1949 ICJ ruling on the use of the Corfu Channel in the Mediterranean Sea found that the channel was an international strait only if the passage was used for international navigation. So far the Canadians have argued that is not the case for the Northwest Passage, because so few ships use it. But that may soon change.

Canada and the United States also are at odds over how to draw their border in the Beaufort Sea. The Canadians say it should be a continuation of the land border between Alaska and Canada, while the United States says it should be a line equidistant from both countries' coastlines. At stake are rights to the rich, underwater oil and gas deposits.

Some 10,000 miles to the east, Russia and Norway are contesting the sovereignty of a 60,000-square-mile area in the Barents Sea, with no resolution in sight. Oslo and Moscow have agreed to allow their military, commercial and fishing vessels to use the waters, but the oil or gas reserves remain untouched.

Meanwhile, Iceland contests Norway's sovereignty — gained under a 1920 treaty — over the Svalbard archipelago. "It is not obvious that Norway owns Svalbard, yet it has taken unilateral control of fishing rights there," complains an Icelandic diplomat, who asked that his name not be used. In another Arctic dispute, Norway, Denmark and Iceland have overlapping claims on a section under the Norwegian Sea called the Banana Hole. [3]

But the granddaddy of Arctic territorial disputes is now before the U.N. Continental Shelf Commission. Russia, Canada and Denmark each have their eyes set on the enormous, underwater Lomonosov Ridge, which straddles the North Pole. The ridge is as big as California, Indiana and Texas combined and is thought to contain rich mineral and possibly oil and gas deposits, although the U.S. Geological Survey recently concluded that most Arctic oil and gas are located elsewhere. [4]

For now, diplomacy remains the favored channel for resolving the disputes, but as the Arctic's geopolitical significance grows, that could change. As Denmark's ambassador to the United States, Friis Arne Petersen, notes, "In the 1930s and 1940s when Denmark and Norway contested a part of Greenland in the northeast, we went to the ICJ to get our sovereignty confirmed. If we cannot agree on Hans Island, we could go to the ICJ again."

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[1] Randy Boswell, "Hans Island ours first: Greenland; Premier rejects Canada's claim to disputed Arctic territory," Canwest News Service, May 29, 2008, www.canada.com/ottawacitizen/news/story.html?id=582509c7-fe1a-46f9-887d335a1b100e72.

[2] "Documents on the law of the sea — historical perspective," United Nations Web site, www.un.org/Depts/los/convention_agreements/convention_historical_perspective.htm#Historical%20Perspective.

[3] "Continental Shelf Submission of Norway in respect of areas in the Arctic Ocean, the Barents Sea and the Norwegian Sea," Government of Norway, 2006, www.un.org/Depts/los/clcs_new/submissions_files/submission_nor.htm.

[4] "Circum-Arctic Resource Appraisal," U.S. Geological Survey, July 2008, http://energy.usgs.gov/arctic.

Continued from p. 224

will see expeditionary cruises but not big-scale tourist cruises." [33]

Bill Sheffield, director of the Port of Anchorage and a former Alaska governor, notes that only "120 ships crossed the Northwest Passage last year, whereas 5,000 passed through the Panama Canal. I do not think the Northwest Passage will be commercially viable in my age. But if it does happen, Anchorage will be very important because it is a deep-water port." [34] ■

BACKGROUND

Exploration and Migration

The first human settlers arrived in the Arctic — from the Greek word *arktos*, meaning "bear" — some 30,000 years ago. [35] At the time a land bridge across the Bering Strait linked the North American and Eurasian continents, but around 11,000 B.C. the climate warmed and melting ice flooded the land bridge. [36] The warmer temperatures enabled forests to grow and led to better hunting and fishing possibilities.

By the Middle Ages (900-1400 A.D.) Europeans looking for fur and foodstuffs made trading and raiding forays into the northern parts of what is now Norway, Sweden, Finland and Russia. During the modern era, Russia emerged as the dominant Arctic power, expanding its borders, subjugating indigenous peoples, exploiting the region's fishing, forestry, mineral and energy resources and establishing a strong military presence. They colonized Alaska after Tsar Peter the Great ordered the exploration of Russia's Pacific coast; a Russian expedition landed in Alaska in 1741. [37] The United States purchased Alaska from a financially strapped Russia in 1867 for $7.2 million, although Alaska did not become a U.S. state until 1959. [38]

Greenland was settled more than 4,000 years ago by North American Inuit. In 986 A.D. the Vikings settled the huge island during a warm spike, led by Erik the Red, but they left when it got colder in the early 15th century. In 1721, a Danish-Norwegian priest, Hans Egede, settled in Godthab (today's capital, Nuuk), marking the beginning of Danish sovereignty over the island. [39] Norway occupied and tried to claim part of Greenland in 1931, but the International Court of Justice ruled in 1933 that the whole island belonged to Denmark.

During World War II, Nazi Germany's occupation of Denmark blocked Danish contact with Greenland. The United States, recognizing its geopolitical importance, started to trade more with Greenland and in 1946 even offered $100 million for the island, which the Danes rejected. [40] In 1951 the United States opened an Air Force base at Thule in northwest Greenland. [41] Meanwhile, Greenlanders began to seek more autonomy, winning home rule in 1979.

Between the 16th and 20th centuries, explorers mapped out the Arctic sea routes. Dutchman Willem Barents discovered the island of Novaya Zemlya off the north Russian coast in 1594 and the Svalbard archipelago north of Norway in 1596. An Austro-Hungarian expedition led by Karl Weyprecht discovered the Franz Josef Land archipelago north of Novaya Zemlya in 1873. In 1845 Britain's Sir John Franklin led the most famous and tragic expedition, searching vainly for a navigable path through Canada's Northwest Passage. Franklin and his men were never seen again, but expeditions launched to find him greatly expanded knowledge of the area's geography. Remains of the expedition, including bones of crew members, were later discovered, indicating they perished from a combination of bad weather, disease and starvation. [42] In 1906 Norwegian explorer Roald Amundsen became the first to successfully traverse the passage.

The race to reach the North Pole began in the late 1800s, with American explorer Robert E. Peary declaring he had won in 1909 — although his claim is widely disputed today. The first surface expedition definitely to reach the Pole was led by American Ralph Plaisted in 1968, using snowmobiles. The Soviet nuclear-powered icebreaker *Arktika* in 1977 became the first surface vessel to reach the Pole. [43]

Global Treaties

Historically, the seas were regulated by the "cannon-shot-rule," which held that countries controlled the seas up to three miles from their coast — or the range of a 17th-century cannon. In 1609, Dutch philosopher and jurist Hugo Grotius' influential treatise, *Mare Liberum*, established the right to freely navigate the seas for trade purposes. [44]

In the mid-20th century, however, countries began pushing to expand their maritime territory to exploit offshore natural resources. In 1945 President Harry S Truman extended U.S. jurisdiction over all oil, gas and minerals on the "continental shelf" — a term not clearly defined at the time. [45] In 1970, in an effort to prevent its waters from becoming polluted, Canada asserted its right to regulate navigation for 100 nautical miles from its shores. [46] Iceland then extended its maritime boundary to 200 miles, provoking three bloodless "cod wars" with Britain, which dispatched warships to protect its trawlers against the Icelandic coast guard. [47]

Such tensions underscored the need for a global treaty to regulate the seas. In 1967, a passionate address

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A family of indigenous Sami — formerly called Laplanders — prepares a meal during the reindeer migration in northern Norway.

to the General Assembly by Malta's ambassador to the United Nations, Arvid Pardo, helped launch a 15-year negotiation process that led to the signing of UNCLOS in 1982. [48] Another groundbreaking moment came five years later, when Soviet leader Mikhail Gorbachev declared the Arctic should be transformed into "a zone of peace." At the time, the Soviet and U.S. navies were conducting Cold War maneuvers in the region as a display of their military preparedness. [49]

UNCLOS gave coastal countries the right to exploit all marine resources in their "exclusive economic zone," or the area up to nautical 200 miles from shore. The provision especially benefited coastal states without a big continental shelf, guaranteeing them a minimum of 200 miles of control. States could extend that limit even farther if their continental shelf extended beyond 200 miles. [50]

In 2001 Russia became the first Arctic coastal state to request such an extension, claiming four separate areas of the Arctic Ocean. The U.N. Continental Shelf Commission has asked for more data. [51] In 2006 Norway, whose sovereignty over the Svalbard archipelago in the Barents Sea has proved extremely useful in the claims process, submitted a claim for parts of the Norwegian Sea, Barents Sea and Arctic Ocean. [52]

Under a 1995 UNCLOS agreement, global commercial fishing is also being regulated, with countries obliged to set total allowable catches for certain species. [53]

In 1982 President Ronald Reagan objected to UNCLOS provisions on deep seabed mining in international waters, arguing they went against U.S. economic and security interests. The provisions empowered a new international body to license such activities, including the right to collect and distribute royalties. [54] While President Bill Clinton secured an agreement in 1994 aimed at allaying such concerns, the Senate continued to balk at ratification, fearing it undermined U.S. sovereignty.

Last October, the Senate Committee on Foreign Relations approved UNCLOS, but it still must pass the full Senate by a two-thirds majority. Sen. Richard G. Lugar, R-Ind., who supports passage, noted that "unlike some treaties, such as the Kyoto Agreement and the Comprehensive Test Ban Treaty — where U.S. non-participation renders the treaties virtually ineffective — the Law of the Sea will continue to form the basis of maritime law regardless of whether the U.S. is a party." [55] Lugar was referring to the fact that the United States applies the Law of the Sea in practice, even though it hasn't ratified the treaty.

Another UNCLOS backer in the Senate, Foreign Relations Committee Chairman Joseph R. Biden, D-Del., argues the treaty gives the United States the opportunity to extend its control up to 600 miles off the Alaska coast. "The oil and gas industry is unanimous in support of the convention," said Biden. [56]

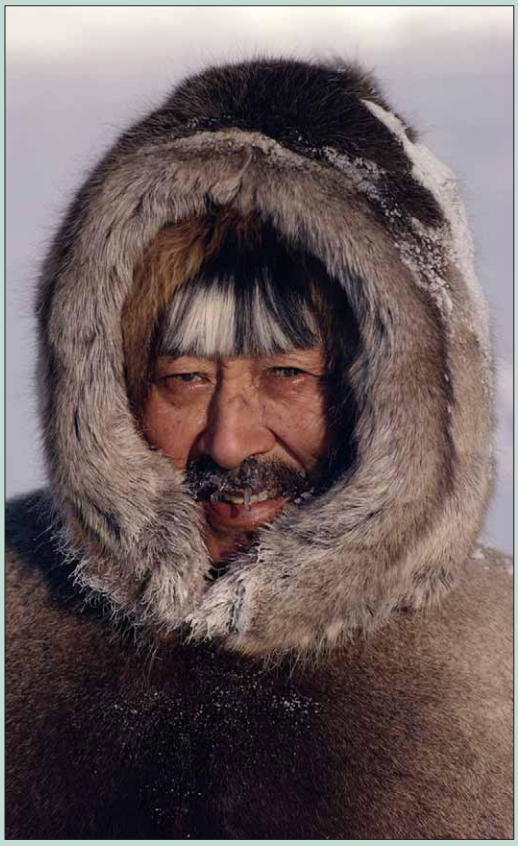
Environmental Threats

The reduction in sea ice has devastated marine mammals, causing mass walrus deaths along the Chukotka coast in northeastern Russia, notes Oceana's Krenz. Fish populations have been affected too. Shrimp and crab, which prefer the cold, have become rarer while stocks of cod, salmon, mackerel and pollock have increased. [57] For unknown reasons, fish stocks are moving from the coastal areas to the open sea, causing problems for the seabirds that feed on them, which don't venture that far from shore; sea parrots, for instance, are declining significantly. [58]

Meanwhile, Greenland's stunning Ilulissat glacier, a UNESCO World Heritage Site, moves toward the sea at seven feet per hour as it melts — three times its pace in 2002. [59] When the

Arctic Life Is Changing

Traditional Arctic culture and ways of life are disappearing as temperatures rise and oil and gas exploration intensifies. Inuit hunters in Northwest Greenland today rarely build igloos like this one built during a long 1986 hunting trip because the warmer atmospheric temperatures make construction difficult (top). Reindeer herders like this Tundra Nenets man in Western Siberia say oil and gas pipelines make it difficult to move the herds. An Inuit man in Igloolik, Nunavut, Canada (right), wears a traditional caribou-skin outfit.



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glacial ice reaches the sea and breaks off into the ocean it raises sea levels, threatening coastal populations. (Melting sea ice, on the other hand, does not raise sea levels because the ice is already floating on the sea.)

The Arctic's permafrost — or frozen soil — is melting as well, buckling highways, bursting pipelines and weakening the foundations of buildings. In Vorkuta, Russia, for example, resident Lyubov I. Denisova complained that "everything is falling apart. The ceiling has warped, the walls cracked, the window frames splintered." [60] Melting permafrost also releases methane into the atmosphere, further accelerating global warming.

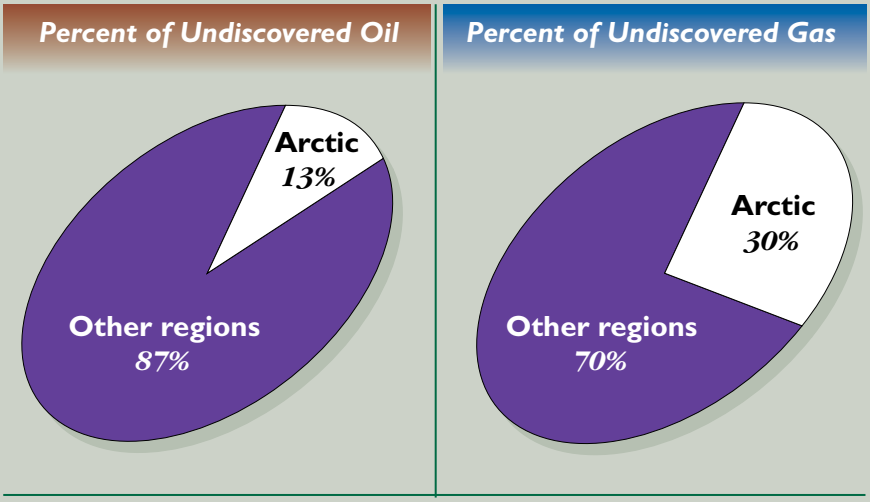
The Arctic environment also has been polluted by industrial emissions transported by air and sea, often from installations thousands of miles away, such as coal-fired power plants. "The Arctic is a sink for a lot of contaminants like mercury, pesticides and PCBs," says Sander at the European Environment Agency. "Arctic species have no capacity to resist these chemicals. They get stored in fat deposits and enter the food chain." A new study from the University of Northern British Columbia found that mercury levels in the Arctic remain stubbornly high, with coal-fired power plants the main culprit. [61]

Opportunity Knocks

Commercial oil activity in the Arctic began in 1920 in Canada's

Canada and Russia Dominate Arctic Production

The Arctic contains 22 percent of the world's undiscovered oil and gas deposits (top). Russia produces more oil and gas per day than any other Arctic country and has more gas reserves than all the other Arctic nations combined. Canada holds the most known oil reserves. Finland, Sweden, Iceland and Greenland produce almost no oil or gas and have no known reserves, although a recent study estimated that Greenland, which is owned by Denmark, is likely to have large, undiscovered deposits.



Arctic Energy Production and Known Reserves

Country	Daily oil production, 2007 (thousand barrels)	Proved oil reserves, 2007 (billion barrels)	Annual natural gas production, 2006 (billion cubic feet)	Proved natural gas reserves, 2006 (billion cubic feet)
Canada	3,355.79	179.21	6,548	56,577
Russia	9,875.77	60.00	23,167	1,680,000
Norway	2,565.27	7.85	3,196	84,260
U.S.	8,487.40	21.76	18,531	204,385
Greenland	0	0	0	0
Iceland	0	0	0	0
Finland	8.95	0	0	0
Sweden	2.35	0	0	0

Source: Energy Information Administration, U.S. Department of Energy; U.S. Geological Survey 2008

Northwest Territories, with ventures in Russia and Alaska following soon after. [62] The U.S. government issued its first oil exploration lease on Alaska's North Slope in 1958, bringing in big producers like ConocoPhillips. [63] Given the difficulty of Arctic Ocean shipping, a land-based pipeline was constructed in the 1970s to transport oil from northern Alaska to the ice-free port of Valdez in the south.

Oil companies began drilling off the Alaskan, Canadian, Norwegian and Russian coasts in the 1980s. Interest in Greenland has intensified in recent years, especially after a 2007 U.S. Geological Survey assessment of reserves ranked an area of northeastern Greenland as 19th among the world's 500 biggest oil and gas regions. [64]

Offshore oil and gas drilling in the Arctic was initially concentrated along shorelines due to the harsh climate, but companies are gradually venturing northward. In August 2007 the Snohvit natural gas field went online in the Barents Sea, 90 miles from the Norwegian coast. [65] Snohvit operates some 300 meters below sea level, sending extracted gas via pipeline to a processing plant on Melkoya Island, which liquefies it for export to Europe and the United States. [66] Petroleum has made Norway one of the globe's richest nations, with total revenues from Snohvit alone expected to top $39 billion, or $8,200 per citizen, over its estimated 25-year lifecycle. [67]

Russia, with help from two foreign energy firms, Norway's huge Statoil-Hydro and France's Total, has begun developing the Shtokman gas field in the Barents Sea, 373 miles offshore, although it is not expected to produce for several years.

Russian Foreign Minister Sergey Lavrov has noted how "global warming not only creates additional problems for us but opens up new possibilities as well." [68] As for environmental concerns about resource extraction, Lavrov said he had helped set up a public-private partnership, Emercom, to monitor and respond quickly to risks arising from "oil and gas production, nuclear energy, the transportation and processing of hydrocarbons and other raw materials." [69]

Meanwhile, the development of the double acting ship has made it easier for ships to navigate the Arctic's icy

Offshore Drilling Poses Special Challenges

Access and cleanup are more difficult in the Arctic.

Exploring for oil and gas under the sea usually begins with geological mapping and a search for two key factors: sedimentary rock at least 1.8 miles thick and evidence of an ancient "tectonic event." The thick rock is a precondition for oil and gas to be present, geologists say. And a shift in one or more of the Earth's tectonic plates typically would have sealed the oil into a confined space. [1]

In the early days, oil explorers simply drilled holes to find oil. Today images of the seabed are created by seismic surveys, in which explosions are triggered that send shockwaves into the Earth, which then are reflected back in radio waves that provide a picture of the ocean floor. Next, well data is gathered by boring into the ground to obtain core samples.

Before a well can be drilled, an area must be at least temporarily ice-free. If oil is discovered, facilities and pipelines must be constructed. Rigs may be installed either above the sea surface or on the seabed. Surface rigs can be either fixed or floating units, with the latter providing necessary flexibility to cope with icy Arctic conditions. The Snohvit gas rig in Norway's Barents Sea, which is ice-free, stands entirely on the seabed, with no surface installations. Snohvit is "over-trawlable" and does not interfere with trawl nets and other fishing equipment. Pipes along the sea floor transport the gas from the wells to the shore 90 miles away for processing.

Drillers avoid areas where the sea is permanently ice-covered, because access to oil and gas is more complicated and spillages more difficult to clean up. Extreme cold and the need to work during the winter months, in 24-hour darkness, also deter Arctic petroleum exploration.

Once extracted, oil is transported by pipeline or tanker to a refinery or storage depot; gas is converted into liquefied natural gas (LNG) and shipped. Once a well is exhausted, the rig must be removed in an environmentally safe manner. Depending on the country, exploration may need to be accompanied by environmental-impact assessments and public consultations with neighboring communities.

Spillages can be caused by oil-well explosions, collisions of oil-laden ships or leaking pipelines. Clean-ups pose particular challenges because ice makes it hard to reach the spills and more difficult to detect spills that are trapped under the ice. On the other hand, if contained by the ice, the oil can be easier to clean up because it is less emulsified than when mixed with the water.

Sometimes a spill is cleaned up by setting it on fire. But the resulting thick, black smoke plume releases toxic chemicals into the atmosphere and may not be feasible if there is a community nearby. An experimental, controlled spill and so-called *in situ* burning are planned for the Barents Sea in May 2009, organized by Norway in collaboration with Statoil, Chevron and ConocoPhillips.

[1] Arctic Monitoring and Assessment Programme, "Arctic Oil and Gas 2007," Oslo, Norway, 2007, www.amap.no/oga; Don Gautier, geologist at United States Geological Survey; Amy Merten, co-director, Coastal Response Research Center, National Oceanic and Atmospheric Administration.

waters. Pat Broe, a Denver businessman, has spent $50 million modernizing a derelict Hudson Bay port that he bought for $7 from Canada in 1997 and hopes will figure prominently in a coming boom in Arctic shipping. Broe has estimated that the port in Churchill, Manitoba, could make $100 million a year serving as a terminal for ships from Murmansk, a major Russian port. [70] Churchill could also service the increasingly popular Arctic tourist cruises, some carrying more than 1,000 passengers.

The development of huge factory fishing ships that can stay at sea for months has led to severe depletions of fish stocks. [71] Governments responded by setting catch quotas and limiting fishing rights of foreign vessels within their 200-mile boundaries. Norway and Russia now have agreements allowing some non-Arctic nations like Poland, Spain, France, Germany and the U.K. to fish in the Barents Sea. [72] Norway, which exports $6 billion worth of fish a year, also has been clamping down on Russian vessels that poach in Norwegian waters. [73] Meanwhile, the shrinking sea ice is encouraging vessels to move further north.

"It is happening in the Barents Sea — not yet in Canadian and U.S. waters, but the potential is there," says Oceana's Krenz.

Arctic coastal states traditionally have maintained a strong military presence in the region. In the past year, however, Canada has beefed up its military profile. The government announced in October 2007 that "as part of asserting sovereignty in the Arctic . . . new Arctic patrol ships [costing $3.1 billion] and expanded aerial surveillance will guard Canada's Far North and the Northwest Passage." [74]

Canadian forces also have stepped up patrols in the world's most northerly settlement — the community of Alert on Ellesmere Island — to "look for evidence of incursions into the area by Inuit from Greenland to hunt polar bears." [75] It also launched a space satellite, *Polar Epsilon*, to provide land and sea surveillance for Canadian forces beginning this summer. [76] ■

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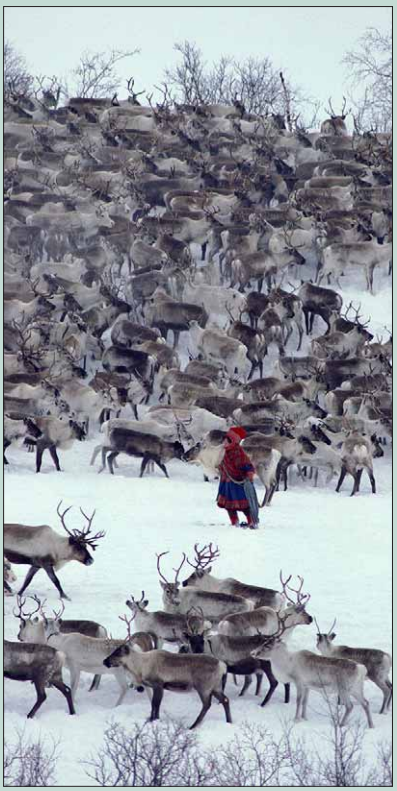

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Arctic Wildlife Abounds

A variety of mammals are able to survive the Arctic's harsh climate, including walruses in Spitsbergen, Norway (top), reindeer in northern Norway being herded by a Sami woman (right) and bull musk-oxen in Canada's Northwest Territories (bottom).

CURRENT SITUATION

Ilulissat Fallout

The joint declaration adopted at the May 27-29 Ilulissat ministerial meeting asserts the primacy of UNCLOS for resolving territorial claims. [77] Danish Foreign Minister Per Stig Moller proclaimed "hopefully we have eradicated all the myths about a 'race for the North Pole.' The legal framework is in place, and the five states have now declared that they will abide by it." [78]

But Huebert at the University of Calgary insists "not everyone is getting along like they pretend. In reality, there is a race to the North Pole."

To begin with, the meeting ruffled feathers by its exclusivity. "This is a very strange way of discussing what is a pan-Arctic issue or indeed an international issue," protested EU Parliament Vice President Wallis. "Why have not Finland, Sweden and Iceland been invited, countries which are also full Arctic Council member states?" [79]

Indeed, an Icelandic diplomat says his government was "not amused" at being left out. "We agree that territorial claims can be resolved by bilateral agreements, but in Ilulissat they also talked about shipping, Inuit rights and security. We should have been invited."

The State Department's McMurray, who attended the meeting, says the most concrete thing to emerge was a green light for Norway to draft a proposal to improve search and rescue services. "This will cover airplane and shipping accidents," she says. "Greenland presently has no capability to cope with the numbers of tourists going there, most of whom are Americans."

New Energy Leases

More than 400 oil and gas fields have been discovered north of the Arctic Circle, and that figure is set to rise. [80] In February 2008 the U.S. government's Minerals Management Service approved the extraction of oil and gas from a portion of the Chukchi Sea off Alaska's northern coast. It plans to open four other sections of the Chukchi and Beaufort seas between now and 2012. [81] The World Wildlife Fund says the leases should not have been awarded, because the impact of exploration on polar bears and indigenous communities has not been determined. [82]

Sen. John Kerry, D-Mass., agrees and has introduced a bill to ban exploration until the assessment is made. [83] But President Bush is calling for more offshore oil drilling to help bring down high oil prices. "Congress should permit exploration in currently restricted areas of northern Alaska, which could produce roughly the equivalent of two decades of imported oil from Saudi Arabia," Bush recently said. [84]

Although Bush was talking about drilling inland, the USGS's recent conclusion that Arctic Alaska is the region's most oil-rich area will undoubtedly increase pressure to drill — especially offshore, where most of the Arctic's undiscovered oil and gas is thought to be found. The Arctic's 90 billion barrels of undiscovered oil compares to U.S. reserves of 22 billion barrels and annual production of 1.6 billion barrels. [85]

This June Canada awarded a $1.2 billion lease to Britain's BP to develop oil and gas in the Beaufort Sea. [86] The World Wildlife Fund's Stewart criticizes the move and notes that the Canadian government has no consistent energy-exploration policy because the responsible departments disagree over whether drilling should go ahead. One indication of that internal disarray: Despite numerous efforts, the Canadian Embassy in Washington was unable to provide a single Canadian official willing to discuss the topic for this article, because, according to an embassy official, no single agency is in charge of Arctic policy.

Meanwhile, Russia is stepping up its activity. In the Shtokman gas operation in the Barents Sea, it is using the expertise of foreign companies — StatoilHydro of Norway and Total of France — to produce the gas, but they must sell it all to Russia's state-owned energy giant Gazprom. [87] A new oil terminal at Varandey, 14 miles offshore in the Barents Sea, became operational in June 2008. It will load oil onto ships for transport to Europe and America.

"The infrastructure we have been able to establish helps develop new fields in Timan-Pechora oil and gas province," noted Vagit Alekperov, president of Russia's Lukoil, which spearheaded the project. [88]

In other developments, Greenland awarded numerous exploration licenses this year to U.S., Canadian, British, Danish and Swedish companies, and in July StatoilHydro began mapping the seabed of northeast Greenland. [89] Iceland plans to grant licenses within the next year to develop undersea resources on the Jan Mayen Ridge, off its northeastern coast.

Revamping Policies

The EU is paying more attention to the Arctic than ever before, with the Parliament planning to pass a resolution in September providing direction to the European Commission on its Arctic policy paper, due out in the autumn. EU Parliament Vice President Wallis feels the EU, with no Arctic territory, could play the role of an honest broker in future talks.

The Bush administration also is due to unveil its new Arctic policy soon, but none too soon for Alaska's Sen. Murkowski. "We have not accepted the responsibility of being an Arctic nation yet. I want a policy that does not simply say, 'We value the Arctic' or 'The Arctic is a lovely place,' but provides specifics, such as how many icebreakers we will acquire." The United States currently has only three: One is laid up in Seattle for repairs, another was designed mainly for scientific expeditions and a third, a more heavy-duty design, is in use. [90] Consequently, the United States contracts with foreign icebreakers to meet its needs. Meanwhile, Russia has 18, Finland and Sweden each have seven and Canada has six. Apart from helping other ships navigate icy seas, icebreakers can be used to support search and rescue and oil-spill cleanup operations as well as to gather seabed data to evaluate extended continental shelf claims.

The Arctic Council is scheduled to publish an assessment of the long-term potential for Arctic shipping. Inuit leader Lynge believes a moratorium on increased commercial shipping should be imposed until a stricter regime can ensure that only "Arctic-proof" ships enter Arctic waters.

Meanwhile, Arctic governments continue mapping the Arctic seabed in pursuit of continental shelf claims. But there probably won't be global scientific consensus on where those geological borders lie because finding the shelf can be tricky.

"Think of a continent as a big rock sitting in a bathtub, and imagine that a chunk of it rises out of the water," wrote *Wired* reporter Geoffrey Gagnon. "The question for scientists is, where does the rock end and the acrylic tub begin? It sounds simple enough, but imagine now that your tub is also made of rock and that smaller rocks are piled up all over the place." [91]

In Nunavut, Canada, researchers 375 miles north of Grise Fjord are trying to determine whether their shelf extends as far as the Eurasian side of the North Pole, where Russian geologists are also gathering data. [92]

"The need to assert our sovereignty and take action to protect our territorial integrity in the Arctic has never been more important," Canadian Natural Resources Minister Gary Lunn has said. [93]

Equally assertive, Danish Ambassador Petersen says, "We already have a lot of geological data. We believe Russia's claim to the Lomonosov Ridge to be unfounded." The Danes have until 2014 to make their claim, Canada until 2013 and Norway and Russia until 2009.

The United States is at another disadvantage because it does not own any islands near the North Pole. Calculating the continental shelf limit can begin at any of a country's islands.

It will be several years before the U.N. commission assessing the claims passes judgment. And that probably will not be the final word on the matter. In its submission to the commission, Norway said the final boundaries will have to be determined through bilateral agreements with its Arctic neighbors. [95]

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A fur-clad Inuit hunter in northwest Greenland scans the sea ice for polar bears. His world is rapidly changing as global warming melts the ice and introduces increased tourism, energy development and transcontinental shipping.

The United States has just begun gathering data for a claim. The Coast Guard's largest icebreaker, *Healy*, is conducting a joint collaboration in the Arctic Ocean this summer with Canada's *Louis S. St. Laurent*. [94] "We are far behind other countries," Assistant Secretary McMurray admits. But the United States cannot submit a claim unless and until the Senate ratifies UNCLOS. Most senators support ratification, but the Democratic leadership has not put it to a vote yet, fearing it will not pass by the necessary two-thirds majority.

McMurray agrees: "It is not going to be the U.N. that sorts out overlapping claims. The countries will have to agree among themselves." Petersen says "if we fail to agree bilaterally we can still go to the International Court of Justice."

Lynge believes indigenous communities are the key to avoiding an ugly dispute. "They must look for partnership with us — otherwise they will simply fight among themselves for decades. The Inuit can be the glue that stops this from disintegrating into a territorial fight." Indigenous community representatives are quick to point out that they have shared the Arctic's resources for thousands of years without resorting to conflict with one another.

The polar bears' threatened-species designation could throw a monkey wrench into the oil developers' plans, because U.S. law bars government agencies from taking any action that could further endanger a listed species. Conservation groups can argue before the courts that drilling poses a threat — both directly from spillages and indirectly through more fossil fuels being consumed, triggering more global warming and more loss of sea ice. [96]

In June conservationists scored another success when President Bush signed a congressional resolution aimed at preventing a mad dash to exploit Arctic fish stocks. The resolution's sponsor, Republican Sen. Ted Stevens of Alaska said, "with less summer ice in the Arctic, our northern waters will be open for exploitation from pirate fishing fleets. But the passage of the resolution will help protect our marine resources." [97]

The measure calls on the United States to consult with other Arctic nations for an agreement on managing fish stocks. [98] Oceana has called the move "the first significant step the U.S. government has taken to protect the Arctic Ocean," adding, "hopefully this starts a trend towards conservation and away from the 'too much, too fast and too soon' pace we've seen so far." [99] ■

OUTLOOK

Strategic Importance

Most scientists believe the Arctic will continue to warm faster than the rest of the planet. "It seems nearly impossible for summer Arctic sea ice to

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Should the U.S. Senate ratify the U.N. Convention on the Law of the Sea?

SEN. LISA MURKOWSKI, R-ALASKA
MEMBER, SENATE FOREIGN RELATIONS AND ENERGY AND NATURAL RESOURCES COMMITTEES

WRITTEN FOR *CQ GLOBAL RESEARCHER*, AUGUST 2008

YES

Recent actions by Russia, Canada and other northern-tier nations to strengthen or establish claims in the Arctic Ocean underscore why it's so critical for the U.S. Senate to ratify the U.N. Convention on the Law of the Sea (UNCLOS). Otherwise, we may be watching from the sidelines as other nations divvy up the significant energy resources contained in the Arctic seabed.

It is believed that the Arctic may hold 22 percent of the world's undiscovered oil and gas — a number that could rise considerably as additional survey work is completed in the region. An expedition by the Coast Guard cutter *Healy* last winter showed that the United States could lay claim to an area the size of California as part of our extended continental shelf.

The problem? The United States has no legal claim to most of this area — and the oil or gas it contains — unless we become a party to the UNCLOS. If we don't claim it, others certainly will.

Russia already has claimed almost half of the Arctic, including parts of what we believe to be Alaska's extended continental shelf, while Canada is looking to establish military bases in the north.

For those who think Russia's claims, or those of other nations, will not be recognized, think again. On April 21 of this year, Australia's claim to 2.5 million square kilometers of extended continental shelf — an area three times the size of Texas — was recognized. It is only a matter of time before other claims are accepted as well.

It would be naïve to believe we could reach multiple bilateral agreements with nations once their claims in the Arctic, and to its oil and natural gas, are internationally recognized. What is their incentive? What would the United States need to give up in return?

When we talk about sovereignty, those who say the United States already enjoys the benefits of the Law of the Sea Treaty ignore that we do so only by the grace of other nations. They ignore that our military commanders believe UNCLOS is vital to ensuring the passage of U.S. naval vessels through international waters. They ignore that if we cede the Arctic to Russia and other Arctic nations, we could very well be importing oil that should belong to us in the first place.

In a time of rising energy costs and demands, that does not seem like a sound policy for the United States to follow.

LAWRENCE A. KOGAN
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WRITTEN FOR *CQ GLOBAL RESEARCHER*, AUGUST 2008

NO

Since 2007, a growing body of evidence has revealed that UNCLOS, if ratified by the United States, would ensure much more than what the U.S. Navy recognizes as America's absolute right to freedom of navigation.

Granted, UNCLOS codifies this customary international-law principle. But UNCLOS parties, especially European governments, also increasingly embrace recent U.N. concepts of environment-centric sustainable development, which ultimately are based on environmental and health regulation that reflect hypothetically possible rather than empirically probable harms. These nostrums already have been used to reshape international environmental law, which will now be implemented and enforced through the treaty's dynamic environmental provisions, putting new conditions on the exercise of that right to freedom of navigation.

Indeed, there are 45-plus environmental articles, annexes, appendices, protocols and regulations within UNCLOS that can expand and evolve over time to reflect the most current international environmental law. Ironically, these same provisions have captured the imagination of creative, transatlantic policy makers, who, aided by sensationalist media, have triggered public anxieties about the potential environmental and health hazards posed by observable (but likely cyclical) global warming and melting ice.

UNCLOS ratification raises several important questions. For instance, what connection, if any, exists between UNCLOS, global warming, carbon dioxide emissions and other types of air and water "pollution" generated both within U.S. jurisdiction and beyond? What legislative, regulatory and judicial obligations would UNCLOS place on the U.S. government to prevent such pollution from materializing in the first place? What economic, technological and legal burdens would U.S. businesses and individual Americans consequently face as U.S. laws are made more stringent and costly due to UNCLOS ratification? Why is UNCLOS ratification necessary to drill for oil and gas in Alaska's inland and offshore sites, since most of the untapped reserves are reportedly within 200 miles of the coast — where the United States can drill without U.N. permission? And finally, why do administration officials, congressional representatives and environmental activists oppose holding open, public and transparent Senate and House hearings to investigate the potential impact of UNCLOS' "green" provisions on the U.S. economy, national security and sovereignty?

If UNCLOS isn't the green Trojan Horse that opponents say it is, why not prove it?

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return to the climatological extent that existed prior to 1980," according to NOAA's Overland, who predicts that within 12 years the Arctic may be entirely ice-free in summer. [100]

Meanwhile, offshore oil and gas development will expand, especially within Arctic nations' exclusive economic zones, where reserves are easier to access and where most oil and gas is thought to be located. There will be more onshore development as well. A 750-mile natural gas pipeline connecting gas fields in Canada's Northwest Territories with markets to the south is being planned, although its development has slowed recently due to land-ownership disputes with indigenous communities. [101] A rival pipeline starting in Prudhoe Bay in neighboring Alaska is also being touted. [102]

Russia is expanding operations in western Siberia — where most of the Arctic's gas is thought to lie — and in the Timan-Pechora Basin. But concerns about global warming could stall drilling operations, especially in Canada and the United States, where environmental groups are likely to mount strong legal challenges.

Rich oil profits should flow into the region, although foreign energy firms could do well, too, since four of the five Arctic coastal states have no restrictions on foreign ownership of oil companies. [103] Cash-strapped governments may demand a bigger slice of the pie. Currently, their revenue share ranges from 46-65 percent in Greenland to 90-100 percent in Russia. [104] The people of Greenland will vote in November on a revenue-sharing agreement signed in June with Denmark. Exploration could creep higher into the Arctic if the sea ice continues to recede and the seas become more accessible — but only if companies are convinced there is enough oil and gas to make it worth their while.

Shipping may be the more viable option for transporting fuels, given how costly and complicated it is to construct pipelines and how vulnerable they are to being ruptured by melting permafrost. [105] Thus, Arctic shipping routes will become busier, and the necessary support infrastructure must be developed. An immediate boom in transcontinental shipping of other non-fuel cargo looks less likely, because ice-related delays or the cost of extra fuel needed to cut through ice-covered seas will cancel out the cost-savings from the shorter travel distances. Oceana's Krenz says an increase in shipping also could further hasten the melting of the ice cap, because ships' carbon emissions darken the ice, increasing its absorption of heat.

Exporting freshwater — either from icebergs or, more likely, from existing lakes, of which Canada has many — is another potential profit source, says the Arctic Research Commission's Brigham. "No one is doing it yet, but with freshwater increasingly scarce and expensive, it may become commercially interesting to ship it to countries with shortages." [106]

"The amount of ice that comes into the ocean [from melting glaciers] could provide the water supply for any of the largest cities in the world for an entire year," according to Robert Corell, director of the Global Change Program at the H. John Heinz III Center for Science, Economics and the Environment, in Washington, D.C. [107]

The European Environment Agency's Sander predicts Arctic waters will become a center for genetic resources, a growing industry involving the harnessing of plant or animal substances for use in medicines. And, as job opportunities grow in the oil and gas, agriculture, fishing, shipping and tourism industries, so, too, could immigration, which may heighten tensions between indigenous communities and newcomers.

The burgeoning economic activity may motivate countries to step up their military presence, as Canada and Russia are doing. Russian Gen. Vladimir Shamanov has announced plans to deploy more naval vessels, adding, "We are also planning to increase the operational radius of the Northern Fleet's submarines."

A prominent military hawk, Shamanov insists Russia has the capability to defend its claim to half of the Arctic Ocean. [108]

On the governance side, the European Union will seek ways to assert itself, despite owning no Arctic territory. A recent EU policy paper noted "an increasing need to address the growing debate over territorial claims" and new trade routes, which challenge Europe's trade and resource interests in the region and "may put pressure on its relations with key partners." [109]

The Arctic Council may also have a chance to play a more prominent role. "The council could focus on policy development in specific areas like combating mercury pollution," says Sander. Icelandic official Baldursson says the council "could be used as a venue for information exchange and preliminary negotiations." Danish Ambassador Petersen says the council should address not just environmental but also economic activities.

In the inevitable pursuit of the Arctic's resources, Gun-Britt Retter, a member of the Sami indigenous people's parliament in Norway, fears governments will pay scant regard to the environmental impact of it all. "We have lived off the land for 10,000 years without extracting all the resources. We think long-term, not about filling our budgets. Governments only think four years ahead until the next election." ■

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About the Author

Brian Beary — a freelance journalist based in Washington, D.C. — specializes in EU-U.S. affairs and is the U.S. correspondent for *Europolitics*, the EU-affairs daily newspaper. Originally from Dublin, Ireland, he worked in the European Parliament for Irish MEP Pat "The Cope" Gallagher in 2000 and at the EU Commission's Eurobarometer unit on public opinion analysis. A fluent French speaker, he appears regularly as a guest international-relations expert on television and radio programs. Apart from his work for Congressional Quarterly, Beary also writes for the *European Parliament Magazine* and the *Irish Examiner* daily newspaper. His last report for *CQ Global Researcher* was "Separatist Movements."

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FOR MORE INFORMATION

Arctic Council, Polarmiljøsenteret, NO-9296 Tromsø, Norway; +47-77-75-01-40; www.arctic-council.org. High-level forum for cooperation between Arctic states and their indigenous communities.

Embassy of Denmark to the United States, 3200 Whitehaven St., N.W., Washington, DC 20008; (202) 234-4300; www.ambwashington.um.dk. Denmark owns the self-governing Arctic territory of Greenland, making the Danes a major player in the race for Arctic resources.

Embassy of Russia to the United States, 2650 Wisconsin Ave., N.W., Washington, DC 20007; (202) 598-5700; www.russianembassy.org. The largest Arctic nation, which has claimed sovereignty over the North Pole.

International Maritime Organization, 4, Albert Embankment, London, SE1 7SR, United Kingdom; +44 (0)20-7735-7611; www.imo.org. U.N. agency responsible for improving maritime safety and preventing pollution from ships.

Inuit Circumpolar Council, Dronning Ingridsvej 1, P.O. Box 204, 3900 Nuuk, Greenland; +11 299-3-23632; www.inuit.org. Greenlandic branch of the organization that represents 150,000 Inuits in Russia, Canada, Alaska and Greenland.

National Snow and Ice Data Center, 449 UCB University of Colorado, Boulder, CO 80309-0449; (303) 492-6199; www.nsidc.org. Studies snow, ice, glacier, frozen ground and climate interactions around the world; provides regular updates on extent of Arctic sea ice.

Norwegian Petroleum Directorate, P.O. Box 600, 4003 Stavanger, Norway; +47 51-87-60-00; www.npd.no. Norwegian government agency responsible for managing the country's abundant petroleum resources.

Oceana, 1350 Connecticut Ave., 5th floor, N.W., Washington, DC 20036; (202) 833-3900; www.oceana.org. Environmental advocacy group with offices in the United States, Chile, Spain and Belgium; dedicated to protecting and restoring the world's oceans.

U.S. Arctic Research Commission, Alaska Office, 420 L St., Suite 315, Anchorage, AK 99501; (907) 271-4577; www.arctic.gov. Government agency set up in 1984 to promote research and provide policy guidance on Arctic matters.

WWF Canada, 245 Eglinton Ave. East, Suite 410, Toronto, ON M4P 3J1, Canada; (416) 489-8800; www.wwf.ca. A leading Canadian conservation organization and a member of the World Wildlife Fund's global network.

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While increased cooperation is needed for search and rescue, there is already an extensive framework governing the Arctic region, according to ministers who met in Greenland.

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Voices From Abroad:

VLADIMIR CHAMANOV
General, Russia
Wars are won beforehand

"After the reaction of a certain number of heads of state to Russia's territorial claims to the continental plateau of the Arctic, the training division has immediately set out (training) plans for troops that could be engaged in Arctic combat missions."

Krasnaya Zvezda (Russia), June 2008

FRANK-WALTER STEINMEIER
Foreign Minister Germany

Arctic is not law-free

"Everybody should respect international law. The North Pole is not a law-free zone; there are international accords which must be respected by all nations who have interests here. If everybody sticks to the rules, there will be no conflict."

Agence France-Presse, August 2007

GARY LUNN
Minister of Natural Resources, Canada

The Arctic will bring prosperity to Canada

"The need to assert our sovereignty and take action to protect our territorial integrity in the Arctic has never been more important. . . . Our commitment to this initiative, as well as other investments in the North, is ultimately about turning potential into prosperity for this remarkable region and for our country as a whole."

Marketwire (Canada), April 2008

MINIK ROSING
Geologist, Greenland

Oil will curse Greenland

"As soon as we find oil, that will end independence. Everyone thinks that oil will buy us independence, but how would we absorb all of this wealth? As everyone gets more desperate for that commodity, you don't want to be a very small, very independent country, very far from anywhere else. Independence based on oil is probably not a good idea."

The Independent (England), September 2007

PER STIG MOELLER
Foreign Minister Denmark

All parties must act responsibly

"I am sure we will be able to identify ways ahead for future development in and around the Arctic Ocean which will be peaceful, secure and to the benefit of all our countries. We need to send a common political signal to both our own populations and the rest of the world that the five coastal states will address the opportunities and changes in a responsible manner."

Turkish Daily News, May 2008

AQQALUK LYNGE
Vice President, Inuit Circumpolar Conference

Enough is enough

"We no longer want to accept the isolation and harsh treatment that has been inflicted upon us in the past. We paid the price of the sovereignty of these governments who steal our land, our resources. Enough is enough; we don't want to be displaced by force, as was the case in Thule, and we demand to be treated humanely."

Agence France-Presse, June 2008

SERGEI LAVROV
Foreign Minister, Russia

Expedition is proof

"The goal of the expedition is not to reserve Russia's rights but to prove that our shelf reaches the North Pole. The Arctic region is rich in natural resources, but we must find a reliable method of their development. This expedition is very important for the solution of this complicated task."

The Christian Science Monitor, August 2007

ALEQA HAMMOND
Minister for Finance and Foreign Affairs, Greenland

The North Pole belongs to Greenland

"The Russians came and planted their flag up there on the North Pole, but everyone knows it's Greenlandic. The last land before you reach the Pole is Greenlandic land."

Business Line (India), October 2007

MIKE TOWNSLEY
Spokesman, Greenpeace International

Nothing more than a carve-up

"It's clear what's going on. They are going to use the Law of the Sea to carve up the raw materials, but they are ignoring the law of common sense — these are the same fossil fuels driving climate change in the first place. The closed-door nature of this is doubly troubling. It's clear they know what they're trying to do is unacceptable."

The Guardian (England), May 2008

The Calgary Sun/Tab