SCIENCE AND GOVERNMENT

Governance and Environmental Change in the Arctic Ocean

Strategies are being sought that will promote international cooperation and reduce the risks of discord in the Arctic Ocean.

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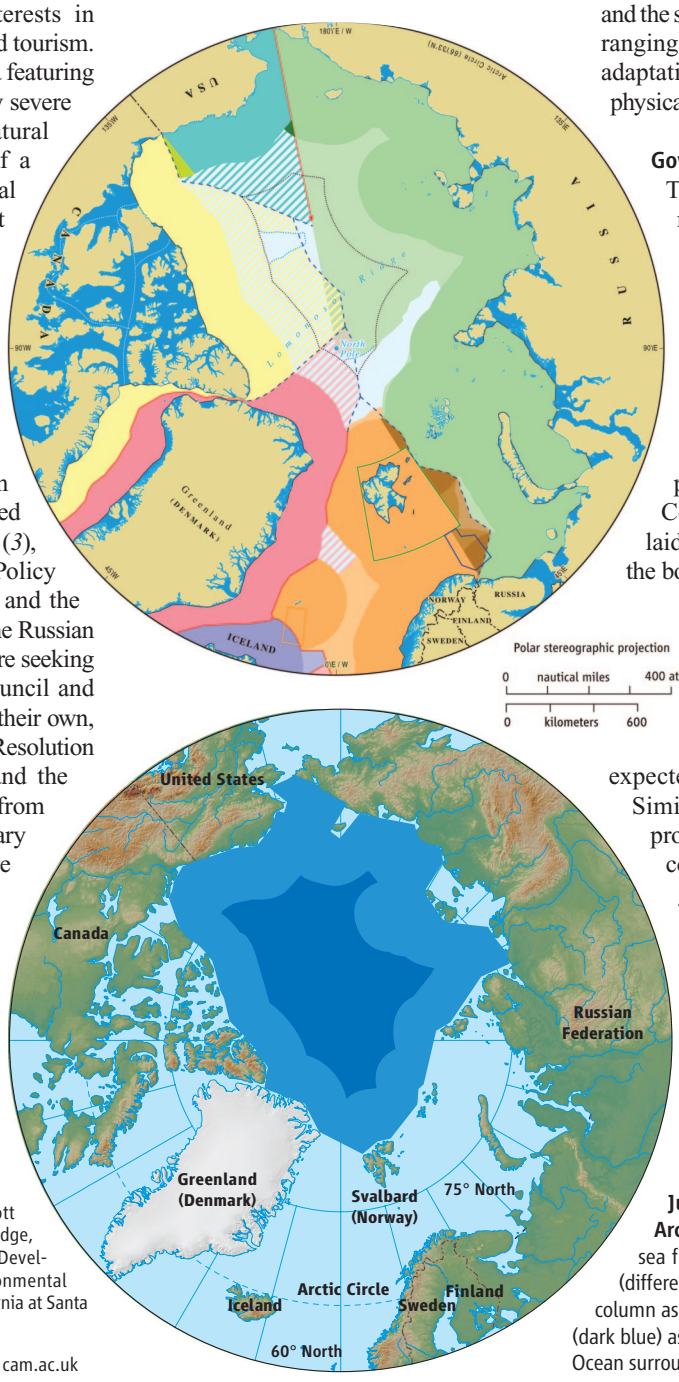
The Arctic Ocean is crossing an environmental threshold expected to transform it from a perpetually ice-covered region to a seasonally ice-free sea within the next few decades (*1*, *2*). This environmental change has awakened global interests in Arctic energy, fishing, shipping, and tourism. The Arctic could slide into a new era featuring jurisdictional conflicts, increasingly severe clashes over the extraction of natural resources, and the emergence of a new "great game" among the global powers. However, the environment provides a physical and a conceptual framework to link government interests in the Arctic Ocean, as well as a template for addressing transboundary security risks cooperatively.

The Arctic coastal states are collectively and individually reinforcing their sovereign rights and jurisdiction from their coastlines seaward, as stated in the May 2008 Ilulissat Declaration (*3*), the January 2009 Arctic Region Policy directive of the United States (*4*), and the March 2009 Arctic State Policy of the Russian Federation (*5*). Non-Arctic nations are seeking an enhanced role in the Arctic Council and asserting Arctic policy strategies of their own, as exemplified by the October 2008 Resolution of the European Parliament (*6*) and the November 2008 Communication from the European Commission (*7*). Military interests in the Arctic Ocean are mounting as reflected by the Canadian decision to purchase ice-breaking patrol vessels, the rebuilding of Russia's northern fleet, and the emerging interest in the Arctic on the part of the North Atlantic Treaty Organization.

At the same time, these developments present the international community with a historic opportunity to integrate science and diplomacy. As with the governance of other international spaces, such as Antarctica, science has a dual role: to interpret the dynamics of the Earth system (e.g., phenomena of stratospheric ozone depletion and climate change) and to carry out the monitoring, reporting, and verification needed to maintain trust in international cooperation. Success of science diplomacy in the Arctic will depend on knowledge-sharing and the steady generation of scientific findings ranging from climate feedbacks to human adaptations under conditions of rapid biophysical and socioeconomic change.

Governance Challenges

The Arctic Ocean is already subject to a number of governance systems (*8*). The 1982 United Nations Convention on the Law of the Sea (LOSC) applies to the entire Arctic Basin and is in force for all Arctic rim states except the United States, which accepts the relevant provisions of LOSC as customary international law. This governance system is playing a major role in the Arctic today. Coastal states are following the rules laid out in LOSC Article 76 to establish the boundaries of their jurisdiction over the seabed beyond the limits of the Exclusive Economic Zone (EEZ) (*9*). Russia and Norway have made submissions to the Commission on the Limits of the Continental Shelf; others are expected to follow suit (see figure, top). Similarly, the coastal states are using the provisions of LOSC Article 234 on ice-covered areas as a basis for regulatory guidelines applicable to Arctic shipping. Canada is extending the reach of its Arctic Waters Pollution Prevention Act. A number of related legal regimes, such as the 1973–78 Convention for the Prevention of Pollution from Ships and the 1995 United Nations Fish Stocks Agreement, are fully applicable to the Arctic.



Jurisdictional representations of the Arctic Ocean with boundaries based on (**top**) sea floor as a source of conflict among nations (different colors) (*17*) and (**bottom**) overlying water column as a source of cooperation, with the high seas (dark blue) as an international space in the central Arctic Ocean surrounded by EEZs (light blue) (*18*).

CREDITS: (TOP) INTERNATIONAL BOUNDARIES RESEARCH UNIT, UNIVERSITY OF DURHAM; (BOTTOM) ADAPTED FROM CANADIAN POLAR COMMISSION

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At the other end of the spectrum lies the intergovernmental forum of the Arctic Council (*10*, *11*). Although the council has no regulatory authority, it has achieved considerable success in generating policy-relevant knowledge about the Arctic and bringing Arctic issues to the attention of global forums, such as the negotiating committee that produced the 2001 Stockholm Convention on Persistent Organic Pollutants. The council's primary products have been scientific assessments, including the 1997 State of the Arctic Environment Report, 2004 Arctic Climate Impact Assessment, 2004 Arctic Human Development Report, and 2008 Arctic Oil and Gas Assessment. An Arctic Marine Shipping Assessment is scheduled for release during 2009, and science is likely to continue to play a key role in the conduct of similar assessments.

Intermediate regulatory arrangements are emerging. The International Maritime Organization adopted a set of voluntary "Guidelines for Ships Operating in Ice-Covered Arctic Waters" in 2002 (*12*). The scope of some regional fisheries management organizations (RFMOs) created pursuant to LOSC Article 118 (e.g., the Northeast Atlantic Fisheries Commission) is broad enough to cover parts of the Arctic Basin (*13*). The 1992 Convention for the Protection of the Marine Environment of the North-East Atlantic, which focuses on pollution, is applicable to a significant segment of the Arctic Ocean.

Further developments of this sort are needed, including a mandatory polar code covering all forms of shipping, an Arctic-wide agreement designed to control marine pollution, a system of RFMOs specifically applicable to large marine ecosystems located wholly or partially in the Arctic, and a regulatory regime for tourism along the lines of the International Association of Antarctic Tour Operators. Such arrangements should be in place before severe ecological damage occurs and conflicts of interest become intractable.

Yet these sectoral regimes cannot avoid the dangers of institutional fragmentation. They also cannot provide integrated governance for the Arctic Ocean treated as a large, complex, and highly dynamic socio-ecological system (*14*). Some relevant precedents for integration exist. The 1980 Convention on the Conservation of Antarctic Marine Living Resources, for example, is based squarely on the goal of ecosystem-based management (EBM). But there is a clear need for enhanced scientific understanding of both biophysical and socio-economic systems in the Arctic as a basis for applying EBM. An important step is to strengthen the International Arctic Science Committee to further facilitate cooperation in all aspects of Arctic research (*15*). We also need to carry forward the shared momentum of the 2007–09 International Polar Year to stimulate ongoing interdisciplinary research and analysis relevant to the practice of EBM in the Arctic.

One useful approach in developing effective governance for a rapidly changing Arctic may be to treat the central Arctic as an international space and to draw a clear distinction between the overlying water column and the sea floor. Ecologically and legally distinct from the sea floor, the overlying water column and sea surface of the central Arctic can remain an undisputed international area (see figure, page 339, bottom) in which the interests of Arctic and non-Arctic states alike play a role in the development of effective governance. This region involves the high seas, a sea zone universally accepted as beyond national jurisdictions. Focus on the high seas opens the door to treating the central Arctic as an international space subject to cooperative decision-making regarding a variety of issues (e.g., fishing and shipping) through regulatory arrangements articulated under the auspices of LOSC and customary international law.

Environmental Security

As the European Commission Communication points out, environmental changes are altering geostrategic dynamics of the Arctic, and these changes could have consequences for international stability (*7*). The resultant risk of political, economic, or cultural instability has become a matter of global security. However, an inclusive dialogue about security risks and responses relating to the Arctic Ocean has yet to emerge. The injunction in the 1996 Ottawa Declaration that the Arctic Council should not deal with matters related to military security (*11*) is a serious constraint on efforts to address security and to come to grips with transboundary challenges. This has not precluded ad hoc measures directed toward specific concerns, like mitigating the impacts of radioactive waste associated with decommissioned nuclear submarines (*16*). But it has truncated efforts to design a coherent and inclusive approach to Arctic Ocean governance that prevents international discord.

The success of the Antarctic Treaty, founded on scientific cooperation and denuclearization, offers inspiration, although differences between the polar regions rule out a similar treaty in the Arctic. Moreover, in the Arctic, the combination of national and common interests will expand the policy choices for governments to enhance their own security.

Harmonization of international law with national approaches is a difficult task, especially without detracting from the authority of the Arctic rim states over their coastal and continental shelf regions. Nonetheless, national implementation strategies lack the consistency needed to resolve transboundary issues in a dynamic natural system. Holistic integration of EBM and other maritime management strategies pertaining to the Arctic Ocean requires coordination that acknowledges the special role and responsibilities of the Arctic States and indigenous peoples organizations. Before sectoral activities accelerate with the diminished sea ice, the window of opportunity is open for all legitimate stakeholders to forever establish their common interests in the central Arctic Ocean as an international space dedicated to peaceful uses.

References and Notes

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