



Resource Governance

Lead author: Richard A. Caulfield, University of Alaska Fairbanks, U.S.A.

Contributing authors: Sharman Haley (University of Alaska Anchorage), Alf Håkon Hoel (University of Tromsø), Grete Hovelsrud-Broda (North Atlantic Marine Mammal Commission), Amalie Jessen (Greenland Home Rule Government), Charles Johnson (Alaska Nanuuq Commission), and Konstantin Klokov (St. Petersburg State University)

Human uses of the Arctic – whether subsistence hunting, commercial fishing, reindeer herding, or exploring for oil – reflect diverse histories, cultures, and ecological settings of the North. These uses are often rooted in distinctive traditions and belief systems extending back many generations. But resource uses in the Arctic are dynamic and are increasingly shaped by interactions with the global economy, including distant governments, corporations, and non-governmental organizations. Other powerful global factors, such as climate change, also play a role.

Just as human uses of the Arctic are dynamic and diverse, so too are resource governance systems that shape them. These systems encompass the principles, institutions, and practices a society and its members employ to use shared resources (1). Like resource uses themselves, governance practices in the Arctic are often deeply rooted in cultural traditions. Yet in a time of rapid change, a key question is if existing governance systems can respond quickly and flexibly in a manner that contributes to healthy communities and sustainable economies (2).

This chapter focuses on four trends affecting Arctic resource governance. First is the growing importance of property rights. The second is incorporation of traditional or local ecological knowledge with western science in decision-making. Transfer or devolution of power to local decision makers and co-management is a third trend, while a fourth describes the widening involvement of Arctic peoples in ownership and development of lands and resources. These trends all represent changes to resource management regimes with implications for long-term sustainability and self-determination in the Arctic.

Setting the stage

The vastness of lands and resources controlled by the state distinguishes the Arctic from many of the more industrialized regions of the world. Examples include fishery resources in the Barents and Bering Seas and expansive publicly owned lands in the North American Arctic. In Greenland, private land ownership as such does not exist. All land is owned in common through the state. For some Arctic resources, well-developed and successful management regimes are in place. For others, rights to resources remain contested or uncertain. In Russia, for example, the question of land ownership and rights to resources are continuing sources of debate and controversy.

The fact that so many Arctic resources are publicly owned highlights the importance of resource governance. The way resources are shared and managed in the Arctic is often distinctive, generally rooted in cultural histories and practices and incorporating innovative, cutting-edge approaches to management. Effective governance of Arctic resources requires management regimes that have strength in influencing human behavior to achieve agreed-upon goals, durability over time, and a robust capacity to survive destabilizing forces (3). Such regimes must also fit appropriately with ecological and institutional factors; what works in one setting may be entirely inappropriate in another. Another issue is the interplay between one regime and another, both across resource boundaries and across management jurisdictions. Scale is also of concern in understanding resource regimes. For example, what works at the local level may or may not be effective at a regional or global level.

While publicly owned resources predominate in many regions of the Arctic, privatiza-

tion is expanding significantly in some jurisdictions. For example, recent land claims settlements in North America have placed millions of square kilometers in the hands of for-profit and non-profit entities controlled by indigenous peoples. Such corporations control vast resources, and they interact actively with both public and private resource governance institutions (4).

Arctic resources and sustainable livelihoods

For generations, living resources have provided the basis for sustainable livelihoods for both the Arctic's indigenous peoples and more recent settlers (5). This continues to be the case in many areas today. At the household and community level, fish, wildlife, and plants for subsistence purposes remain important (6). High-latitude agriculture and animal husbandry are also valued sources of income for many Arctic communities and households. For example, reindeer and caribou are a nearly ubiquitous resource, providing an important source of food and some significant income (7-8).



Reindeer round-up in Inari, Finland

Renewable resources in the Arctic are increasingly important in global markets. In particular, commercial fisheries in the Arctic are world-class. Aquaculture and mariculture are well developed in many areas and are expanding as technologies and markets for farmed salmon, halibut, shellfish, and other species increase. Forest products are also important exports, especially in the Nordic countries. Commercialization of renewable resources is sometimes a contentious issue. For example, in some areas commercial use and export of

marine mammals are allowed while in others they are strictly prohibited.

Exploration for and development of non-renewable resources such as oil and gas, gold, lead, zinc, and diamonds have profoundly impacted the histories and livelihoods of Arctic peoples. Early development was often associated with colonization and exploitation, where Arctic residents, who lacked recognized rights to resources, benefited little but paid substantial costs. With growing attention given to indigenous land claims, resource rights, and self-determination, some Arctic peoples are now finding ways to engage productively in non-renewable resource extraction.

As interrelationships between Arctic communities and the global economy grow, tensions over how to balance benefits and costs of renewable and non-renewable resource use and development will continue. In some regions, residents seek to maintain a dynamic mixed economy where both renewable and non-renewable resources play an important role. They seek jobs and income while not undermining opportunities for using local resources that have enduring nutritional, cultural, and economic benefits. This tension reflects the classic definition of sustainable development articulated by the Brundtland Commission two decades ago: development that meets the needs of the present without compromising the ability of future generations to meet their own needs (9). How this tension is addressed and the future trajectory of Arctic economies is difficult to predict. But key to these debates are the emerging forms of resource governance that have the potential to either support or undermine self-determination and self-reliance.

Securing rights to resources

In the Arctic today, effective resource governance increasingly depends upon success in addressing issues of rights to resources. Property rights – including rights to ownership or use – are central to comprehensive claims of indigenous peoples and in innovative approaches to governance such as creation of the Nunavut Territory in Canada, Home Rule in Greenland, and the Sakha Republic in Russia. The Arctic has seen dramatic changes in property rights over the past half-century. Key contributing factors include growing recognition of indigenous peoples' rights (see *Chapter 6. Legal Systems*), the end of the Cold War, implementa-

tion of the UN Convention on the Law of the Sea, and expanded interest in Arctic resource development (10). The following briefly summarizes developments across the Arctic with regard to property rights relating to land and sea. Two case studies further illustrate the links between resource governance and rights.

Addressing property rights issues: A circumpolar perspective

Alaska: Longstanding indigenous claims to land and hunting and fishing rights were addressed in part through the Alaska Native Claims Settlement Act (ANCSA) of 1971, spurred on by the discovery of oil on Alaska's North Slope in 1968 (4). ANCSA came on the heels of the Alaska Statehood Act of 1958 that made Alaska the 49th US state and set aside over one quarter of its land mass for development and use by the new state. These two acts, plus the Alaska National Interest Lands Conservation Act (ANILCA) of 1980, have created an ownership pattern where the US federal government owns nearly 60% of the land, the State of Alaska owns 28%, and Alaska Native corporations own about 12%. Other private lands make up less than 2% of the total. ANILCA created vast new national parks, wildlife refuges, and other conservation units in Alaska. Subsistence hunting and fishing continue in most of these areas. At the same time, they invite development of world-class tourism opportunities.

In Alaska's marine environment, the US Government manages resources in its exclusive economic zone which extends 200 miles offshore. Federal fisheries management – based upon the Magnuson-Stevens Fishery Conservation and Management Act of 1996 – incorporates the broad-based North Pacific Fisheries Management Council, individual fishing quotas, and innovative community development quotas (11-12). Alaska's State Government manages near-shore fisheries – most prominently those for salmon – through its Board of Fisheries, Commercial Fisheries Entry Commission, and Alaska Department of Fish and Game (13).

Canada: The Canadian Government has addressed longstanding indigenous claims in the Arctic through constitutional protections, legislation, comprehensive claims settlements, and a new territorial government. In southern Canada, treaties signed under the Indian Act formed the basis for settling indigenous claims. This culminated in 1982 in recognition of abo-

original rights in Canada's new constitution. In the North, Quebec's desire to develop massive hydroelectric resources led to implementation of the James Bay and Northern Quebec Agreement in 1974 (14), whereby Cree and Inuit exchanged aboriginal rights to land and resources for cash, title to hunting areas, and exclusive hunting and fishing rights in some areas. The James Bay agreement created significant new political institutions and paved the way for expanding co-management elsewhere in Canada and beyond.

In 1984, the Inuvialuit of the Mackenzie Delta signed an agreement with the federal government that exchanged aboriginal claims for a cash settlement, title to some 91,000 square kilometers of land, and mineral rights. These developments led to the division of the Northwest Territories and the creation of the new Nunavut Territory in 1999. The Nunavut Agreement, which laid the groundwork for the new territory, was signed in 1993. As discussed in a case study later in this chapter, it also provided a settlement of claims and gave Inuit a role in decision making.

As in Alaska, Canada controls use of its marine environment through its 200-mile exclusive economic zone.

Greenland: Greenlanders achieved Home Rule status within the Danish realm in 1979 (15). The Home Rule Government, a public government representing both indigenous and non-indigenous residents, manages both terrestrial and marine resources within a framework common throughout Denmark. Home Rule in Greenland arose in part at least, because of tensions between Greenlanders and the Danish Government over development policies, particularly in the 1950s and 1960s (16).

Under Home Rule, Greenlanders have gradually taken over responsibility for managing and developing living and non-living resources. Interestingly, there is no private land ownership in Greenland; all land is owned in common by the Greenlandic population through the state. Greenlanders have the right to use living resources subject to Home Rule regulations designed to promote a precautionary approach to resource use and sustainability over time. Fisheries management in Denmark's exclusive economic zone off Greenland's coast uses a system that includes both individual fishing quotas (including transferable quotas for shrimp) and Home Rule regulations. Even while Greenland remains a part of the Danish realm, its role in

resource governance in partnership with Danish counterparts is expanding. This includes negotiations over not only multilateral fisheries agreements but also in other international settings. An agreement exists between the Home Rule and Danish governments about sharing royalties associated with any development of non-living resources. The Home Rule Government recently established a high-level office for self-government that is actively exploring opportunities for expanding Greenland's autonomy in relation to the Danish realm.

Faroe Islands: The Faroe Islands achieved Home Rule within the Danish realm in 1948 and continue to press for greater autonomy or even independence. The Faroese economy is highly dependent upon fisheries and fish processing, although prospects of offshore oil and gas development give hope for a more diversified economy (17). As in Greenland, the government of the Faroe Islands is taking a more active role in resource governance, especially as it relates to fisheries policies, marine mammal management (pilot whaling), and petroleum development.

Iceland: Icelanders have traditionally relied on sheep ranching, small-scale agriculture, and fishing for their livelihoods. Early laws, dating to the 12th century, addressed concerns about overgrazing of common pastures, while marine resources were generally regarded as a "boundless common resource" (18). Iceland's involvement in the commercial fishing industry grew dramatically following independence from Denmark in 1944. Based upon concerns about cod stocks, it embraced a market-oriented approach to fisheries allocations by implementing a system of individual fishing quotas in 1984. This culminated a process of privatizing a common resource.

Scandinavia and Finland: Peoples of northern Scandinavia and Finland include indigenous Saami as well as Norwegians, Swedes, and Finns. This region and the adjacent Russian Northwest have the highest human population densities in the Arctic. The Saami traditional territory – *Sápmi* – lies within the nation-states of Norway, Sweden, Finland, and Russia. Traditionally, Saami livelihoods depended on a mixture of reindeer herding, hunting, fishing, trapping, and gathering. Today, only a minority of Saami are actively engaged in reindeer herding. Others mix agriculture, hunting, and fishing with wage employment. For reindeer herders, national legislation in the Nordic countries pro-

vides some degree of protection and support. Still, conflicts remain between Saami herders and others over rights to resources (see *Chapter 6. Legal Systems*) (19). Concern also persists about herd numbers and carrying capacity of the land.

Elsewhere in the Nordic countries, national governments create the broad framework for use of publicly owned resources by state-owned and private corporations. For example, the Norwegian Government remains the dominant investor in Statoil, the major Norwegian oil producer that was only recently opened to private investors. Norsk Hydro, a developer of hydroelectric energy, is 44% owned by the Norwegian state. In Sweden, the Swedish Forestry Act governs actions of private wood-products and pulp firms.

In the Barents Sea region, the Barents Euro-Arctic Council exemplifies regional cooperation impacting resource management and use. Its regional council is made up of representatives from northern Norway in the west to Russia's Nenets Area and Novaya Zemlya in the east. Its focus includes international collaboration, with special attention to forest management, sources of renewable energy, and development of the Northern Sea Route (20-21).

Russia: Property rights have changed dramatically in Russia since the demise of the Soviet Union. The independent livelihoods of northern peoples in Russia came under Tsarist and later Soviet control from the 18th century onwards (22). Early efforts to recognize and create autonomous territories for minorities in the early Soviet era gave way to traumatic collectivization in the early to mid-20th century. Industrial development in the latter part of the century offered indigenous and local people little control over land or resources. This resulted in widespread impact on the environment and growing inequality.

Since the collapse of the Soviet Union in 1991, property rights systems in Russia have undergone enormous change (23). A central focus has been on large-scale privatization of enterprises previously owned by the state and reallocation of profits and returns from these enterprises. Some new laws seek to guarantee rights of indigenous minorities, including protection for traditional territories (24). The degree to which these laws can and will be applied to the meaningful benefit of northern peoples, however, remains uncertain. Moreover, it remains unclear to what extent indigenous peo-

ples will benefit from industrial development (oil and gas, timber, minerals, fisheries) derived from resources in the Russian North.

Case study: Indigenous rights to traditional lands in Russia

The Russian North is home to nearly 9 million people of whom only about 10% are indigenous to the region. The dominant presence of non-indigenous people in northern Russia reflects centuries of colonial history and a dramatic acceleration of in-migration during the Soviet era (25). Since the demise of the Soviet Union, many non-indigenous people have left the North, as state supported enterprises have declined or collapsed.

As a group, indigenous peoples of the Russian North live in an uncertain transitional economy in which their traditional livelihoods and rights to land and resources are unclear. The dramatic transformation from state ownership of collective enterprises to private control in the post-Soviet era provided a glimmer of hope that indigenous resource rights would be addressed. In the 1990s, one step in this direction was taken when the Russian Government approved some 2,300 *obshchinas*, or familial production units, involved in reindeer herding or fishing (26). In theory, these *obshchinas* could petition for land and acquire it in perpetuity. But this attempt at reform was not fully realized and has had limited effect.

Other initiatives in Russia involve collaboration between indigenous peoples and conservationists in developing “territories of traditional nature use” and “ethno-ecological territories” (27). For example, in 1998 the resource-rich Tkhasanom Reserve was established along the Sea of Okhotsk. It lies within the territory of the Ite’men people who use it for subsistence hunting and fishing. The decree establishing the reserve requires management in cooperation with the Ite’men people who have priority for hunting and fishing quotas. Many similar reserves and protected areas are being developed or discussed across the Russian North and Far East.

More recently the Russian State has begun to address indigenous rights through legislation. A major voice for addressing these rights is the Russian Association of the Indigenous Peoples of the North (RAIPON) (28). RAIPON has advocated successfully for three important but as yet untested pieces of federal legislation. One is “On the guarantees of the rights of the

numerically small indigenous peoples of the North,” which was adopted in June 2000. The second is “On traditional natural resource use of indigenous numerically small peoples of the North,” adopted in June 2001. The third is “On basic principles of organizing communities of indigenous peoples of the North, Siberia, and the Far East,” which was adopted in 2002 (23). These laws, based broadly on principles drawn from international law, seek protection for indigenous rights to lands and resources in the Russian North.

Despite these legislative achievements, some argue that the impact at the local and regional levels is negligible. Mechanisms in Russia for implementing these rights are lacking and powerful political forces resist their implementation. Indeed, RAIPON president S.N. Kharyuchi recently expressed fears that these laws may be repealed just at a time when their adoption offers hope for resolving the legal basis for the establishment of conditions for sustainable development of indigenous peoples in the Russian North, Siberia, and the Far East (29).

The outcome of this debate will determine to what extent Russian indigenous peoples will have meaningful opportunities for self-determination as envisioned in the UN Charter and in international law. These efforts to secure indigenous rights to land and resources mirror similar struggles in recent decades in Alaska, Canada, Greenland, and the Nordic countries. While the approaches used vary dramatically, they all reflect a movement toward addressing legitimate rights to resources based upon traditional use and occupancy by Arctic indigenous peoples.

Case study: Privatization of Arctic fisheries

Management of Arctic fisheries focuses increasingly on privatizing harvest rights to publicly owned resources using individual fishing quotas and other mechanisms (30). This process is an outgrowth of developments in international law, particularly the 1982 Law of the Sea Convention which establishes rules and principles for the use and management of the natural resources in the ocean (31). The most important element is the creation of exclusive economic zones extending 200 miles offshore, in which coastal states control use of resources. Coastal states are to manage resources to achieve a “maximum sustainable yield,” effectively requiring that natural resources be used sustainably. All Arctic countries except the United States are party to



PHOTO: NIELS ERICSSON

Húsavík harbor, Northern Iceland

the Law of the Sea Convention and are therefore bound by its provisions. The United States has adopted most of its provisions in practice, and continues to consider ratification.

At first, the Law of the Sea Convention provided hope that overharvesting and depletion of fisheries resources would end. However, subsequent increases in fishing both inside and outside of the exclusive economic zones demonstrated that this hope was premature. The growth in number of fishing vessels and fishing effort created a rapidly growing fishing capacity. Many fish stocks were increasingly overfished, resulting in declining yields and increased pressure on the remaining resources (32-33).

The 1995 United Nations Fish Stock Agreement, negotiated under the auspices of the UN General Assembly, seeks to correct these deficiencies. The new agreement provides a legal basis for controlling fisheries on the high seas through more restrictive management principles. It strengthens regional cooperation in resource management, provides better enforcement of management measures, and requires mandatory dispute settlement procedures. Importantly, it emphasizes a precaution-

ary approach in fisheries management in light of continuing scientific uncertainty about what is sustainable yield. The thinking behind such an approach is that, in managing resources, governments should err on the side of caution, in the face of uncertainty, when striving to fulfill conservation and management goals.

The precautionary approach and enhanced regional cooperation has proved crucial in recent fisheries development in the Arctic (34). For example, a number of regional fisheries agreements affecting Arctic waters have been modified to implement the agreement. This includes the Northwest Atlantic Fisheries Organization (NAFO), which covers the Northwest Atlantic and the Northeast Atlantic Fisheries Commission (NEAFC), which covers the international waters in the Northeast Atlantic, where enforcement of fisheries regulations and coordination of management for shared stocks has improved. In the Bering Sea, a moratorium on the harvest of living marine resources outside of the exclusive economic zone came into effect in 1992 (35).

In addition to the international fisheries management framework, Arctic countries are also

involved with substantive and sometimes controversial changes to fisheries regulatory regimes. In Iceland, a desire to conserve fish stocks and to promote efficiency and safety led the government to implement a system of individual transferable quotas in the 1980s (30). In 1990, a new law expanded this system to nearly all Icelandic fisheries. Under this quota system, quota shares can be bought and sold, creating a perception among many that what was once a public resource has now become privatized. Research shows that individual quotas offer benefits in the form of a more rigorous and closely monitored management system incorporating the best available scientific advice. When well managed, such a system rewards efficiencies, provides a more stable business environment, and encourages quota-holders to focus on long-term viability of fish stocks. Critics note, however, that the system has also concentrated quotas in the hands of fewer vessel owners and fostered development of powerful, vertically integrated fisheries companies (36). For some, this raises concerns about social equity in allocating a publicly owned resource.

In the Bering Sea, the United States has implemented several different management approaches (11). For halibut and sablefish, an individual fishing quota program was established in 1996. Other mechanisms focused on limiting entry to salmon and other fisheries. As in Iceland, the goal was to sustain fish stocks, improve efficiency and safety, and increase the value of fisheries products. But the individual fishing quota program also raised questions about growing economic dependence on only a few owners and processors.

One special innovation in management of Alaska's Bering Sea fisheries is adoption of the unique community development quota program (12). Enacted by the North Pacific Fisheries Management Council in 1992, this program allocates a small portion of the total allowable catch for pollock, halibut, sablefish, Atka mackerel, Pacific cod, and crab directly to coalitions of identified indigenous communities in western Alaska. The community development quotas are designed to expand community involvement in Bering Sea fisheries, create jobs, and attract new capital. Other goals are to develop infrastructure and to improve social and economic conditions. Some 56 communities, organized into six regional fisheries companies, are now engaged in Bering Sea commercial fishing. Since 1992, the community development quota program

has been responsible for creating some 9,000 jobs and income amounting to some US\$60 million (35).

Emerging policy debates about oceans governance will undoubtedly influence Arctic fisheries in coming years. They reflect broad concern about Arctic marine resources, ranging from overfishing to pollution to examples of ineffective management (11). The recently released Pew Oceans Commission report in the United States calls for a new ethic of stewardship and responsibility toward the marine environment, centered on ecosystem-based management (32). It also calls for new institutional structures for fisheries management, establishment of marine reserves, and protection of critical habitat, as well as further research and education. The US Commission on Oceans Policy calls for many of the same actions (33). These reports and others point toward specific innovations in oceans management, including ocean zoning and marine reserves. Growing interest in the Northern Sea Route, especially in light of global climate change, also brings new attention to special Arctic shipping regulations and emergency response systems (37).

Trend summary

Resource governance in the Arctic shows a strong trend toward recognizing and formalizing property rights, including the rights of indigenous peoples. Resources once part of the commons and owned by no one are increasingly subject to legislation designed to specify ownership and use.

Traditional and local ecological knowledge

For generations, Arctic indigenous peoples have mediated relationships with each other and their environment using ecological knowledge and associated customary laws and practices. Settlers arriving more recently to the Arctic have also developed detailed local knowledge and practices now central to effective resource governance. A key trend in Arctic resource governance is to combine these knowledge systems with western science.

Traditional ecological knowledge as part of everyday life

Traditional ecological knowledge is defined as a body of knowledge, practice, and beliefs about the dynamic relationship of living beings with



Seal hunters from
Ittoqqortoormiit
(Scoresbysund), East
Greenland

PHOTO: JONAS G. ALMSSON

one another and with their environment, which has evolved by adaptive processes and been handed down from generation to generation (38). In some regions of the Arctic, the phrase *local* ecological knowledge is more commonly used. Traditional or local knowledge systems can include several interrelated levels of analysis. Central are local knowledge of resources and knowledge of resource management systems, including practices, tools, and techniques for resource use and management (38). It also commonly includes knowledge of social institutions, such as “rules-in-use” and codes of social relationships, as well as a worldview that both informs and is informed by notions of religion, ethics, and broader belief systems.

For many indigenous peoples, customary practices and a profound sense of the sacred continue to inform everyday life. Anthropologist Ann Fienup-Riordan writes about Yup’ik in Alaska: “the most striking feature of traditional Yup’ik law and order . . . was its constant, competent, discourse. First and foremost, leaders were attentive listeners and knowledgeable speakers. The laws that ordered their lives were known collectively as *qaneryaraat* – that which is spoken – and instruction in these laws constituted both the form and content of a vast amount of social interaction, especially between older and younger community members. Moreover, social control and decision-making

both turned on speech – voicing opinion, administering warnings, listening to advice” (39). Fienup-Riordan notes that these practices continue today through “complex historical processes of appropriation, compromise, and revival that inform the activity of a people no longer living in isolation but ‘reckoning themselves among the nations’” (39).

The challenge of integrating knowledge systems

Traditional or local knowledge-belief-practice can be an essential element in building more effective resource governance regimes, especially when it can also draw on the best of western science (38). But challenges to achieving this can be huge. Some argue that using traditional knowledge outside the local context degrades it to “just another form of data” – it is artificially dissected from the cultural whole in which it is embedded (40). In Iceland, Pálsson reveals how local fishermen’s knowledge is commonly silenced when confronted with assertions of scientific precision in biologists’ data (41). Some critics argue that in light of these challenges, the only remedy is to return control to local people (40).

The challenges of drawing meaningfully from traditional and local knowledge have not kept Arctic resource users, their advocates, and even many biologists and managers from promoting

its use. Examples include pioneering studies from Canada, such as the *Inuit Land Use and Occupancy Project* (42) and the more recent *Voices of the Bay* (43), both of which illustrate the richness of environmental knowledge of Arctic environments and landscapes. Cultural studies such as Richard K. Nelson's *Make Prayers to the Raven* reveal detailed knowledge of the Koyukon Athabaskan people in Alaska, while others focus on Cree fishers in Canada, and Yamal-Nenets people in the Russian North (38). More recently, traditional knowledge has been instrumental in planning applied projects in the Arctic, ranging from assessment of the cumulative impacts of hydroelectric development in Quebec to planning for gas pipeline development in the Mackenzie Delta of Canada. The North Atlantic Marine Mammal Commission (NAMMCO) recently organized a conference on integrating local and scientific knowledge in management decision making for marine mammals (44).

Researchers caution that use of traditional ecological knowledge can be problematic if not done carefully. Examples exist where unthinking use has contributed to misunderstandings (38). Uncritical use can also create pitfalls such as characterizing indigenous peoples as “natural conservationists” or “original ecologists” whose knowledge and actions are beyond scrutiny (39). In spite of these cautions, a growing number of scientists believe that traditional knowledge can complement western scientific knowledge. It can also serve as a reminder that there are multiple ways of knowing about the world and that effective resource management requires understanding this diversity. Moreover, awareness of traditional knowledge leads the way towards the development of participatory, community-based resource management systems that allow diverse knowledge-practice-belief systems to become visible. Doing so overcomes the limitations of conventional science, which risks becoming blind to its (western) cultural foundation.

Customary law and practice still regulate resource use

Despite disruption and change in the post-contact era, Arctic peoples continue to use customary laws and practices in resource management. In Canada, the James Bay Cree use a system of hunting territories allotted to specific individuals. This practice serves to limit risks of overexploitation of beaver (45). In fishing for whitefish,

the Cree also have cultural practices that recognize certain use rights and validate particular means in fishing (46). Another documented example is how Inuit hunters on Victoria Island exhibit self-limiting practices in hunting for ducks (47). In the Russian Far East, Chukchi hunters continue to appease the spirit of a hunted gray whale by offering it fresh water as it is brought onshore (48).

In Alaska, Yup'ik use of the environment continues to be informed by the view that animals are nonhuman persons and that a “collaborative reciprocity” must be observed between hunters and animals (39). Maintaining such reciprocity may include prohibitions on women's involvement in hunting and prescriptions about their behavior while their husbands are engaged in hunting; such practices are based upon deeply rooted cultural beliefs. This cultural notion of reciprocity may, in fact, *require* that animals and fish be taken to ensure their continued availability in the years ahead – the more taken, the more likely they will return again. Similarly, some Alaska Athabaskan hunters believe that the first caribou to appear in a migrating herd (the ‘leaders’) should not be taken so that others will follow. They also insist that the site of a caribou kill should be cleaned thoroughly so that respect is shown to the caribou spirit (49).

Trend summary

Field research among Arctic peoples suggests that it is important not to overlook or dismiss customary law and practice in resource management simply because they are based on strikingly different worldviews. The “rediscovery” of traditional knowledge in recent years is certainly not a panacea for conflicts, but it does suggest a growing awareness that there is more than one way to understand the dynamics of human-environment relationships.

Devolution and co-management

Throughout the Arctic there is growing interest in political devolution and co-management as strategies for devising more appropriate and effective resource management (50). Devolution refers to the transfer of power to more local and regional jurisdictions and governments. Co-management typically involves a sharing of power between the state and resource-user communities (51).

Devolution can take at least two forms. One is a transfer of authority and budgets to northern jurisdictions for macro-scale management of renewable and non-renewable resources. A second is the creation of more discrete co-management regimes designed to widen participation and build legitimacy in resources decision making. Devolution often occurs within national boundaries, as with creation of the Nunavut Territory within Canada. However, it can also occur at the international level, as illustrated by a case study of the North Atlantic Marine Mammal Commission (NAMMCO).

Case study: Devolution and the Nunavut Territory

A recent example of political devolution is the creation of the Nunavut Territory in Arctic Canada (52). Nunavut (“our land” in the Inuktitut language) came into existence on April 1, 1999 as a result of a decades-long struggle by the territory’s 27,000 residents, 85% of whom are Inuit (see also *Chapter 5. Political Systems*). Nunavut’s population is spread across 25 incorporated communities, situated in a vast Arctic landscape encompassing more than 2.1 million square kilometers (23% of Canada’s land mass). The capital of Nunavut is Iqaluit, a community on southern Baffin Island.

The creation of Nunavut as a territory came on the heels of the 1993 Nunavut Agreement between Inuit of the region and the Canadian Government. In that agreement, the Inuit of Nunavut exchanged aboriginal rights to lands and resources for title to about 350,000 square kilometers of land, of which about 10% include subsurface rights. They also received priority rights to harvest wildlife, and equal membership with the government in the new co-management institutions. As part of the exchange, Inuit received payments of nearly US\$900 million (CAN\$1148 million) as well as enduring resource royalties (50).

With regard to resources governance, the Nunavut Agreement created a Nunavut Wildlife Management Board, Nunavut Water Board, Nunavut Impact Review Board, Nunavut Planning Commission, Nunavut Social Development Council, and a Surface Rights Tribunal (52). While part of a public government rather than an indigenous or aboriginal self-government, these new institutions ensure equal involvement of Inuit in decision making and provide mechanisms for full consideration of regional and local concerns. They are designed to “bring together the traditional Inuit system of knowledge and management [*Inuit Qaujimagatuqangit*] with that of Canada’s . . . blending . . . two systems of management in such a way that the advantages of both are optimized and the domination of one on the other is avoided” (53). Strictly speaking, these new co-management institutions are advisory bodies making recommendations to ministers in Iqaluit and Ottawa. In practice, however, they are expected to become powerful new institutions, providing a clear voice to the Inuit.

Creation of the Nunavut Territory is an expression of political devolution on a macro scale, with creation of new regimes for decision making and new institutions for giving voice to Arctic residents. Similar processes of political devolution can be found elsewhere in the Canadian Arctic, in the Nordic countries, and in Russia.

Regional management: The North Atlantic Marine Mammal Commission

The North Atlantic Marine Mammal Commission (NAMMCO) is an international body for regional cooperation on conservation, management, and study of marine mammals in the North Atlantic (54). The Commission was founded in 1992 by the Faroe Islands, Greenland, Iceland, and Norway. It is an example of regional co-operation and co-manage-



Lining up and measuring pilot whale in Klaksvik, Faroe Islands

PHOTO: OLAVUR SUURDABERG



PHOTO: OLAVUR SUURDABERG

ment of whale, seal, and walrus that migrate between national and international waters. Using a multi-species, ecosystem-based management approach (55), NAMMCO's work is grounded in science yet seeks to increase understanding of the cultural and socio-economic values associated with sustainable use of marine mammals.

NAMMCO's activities include coordinating scientific research and providing practical management advice to governments. It is also in a position to examine issues like marine mammal-fisheries interactions – a topic of shared interest to member governments. NAMMCO engages governments in managing resources and is an institution with a strong connection to coastal communities and indigenous peoples. As such it strives to find ways of bringing together scientific and traditional knowledge systems; it recently organized a conference on user knowledge and scientific knowledge in management decision making, which was held in Iceland in 2003 (44).

NAMMCO's regional focus highlights the importance of appropriate scale in addressing resource issues. The Commission's regional approach contrasts with global entities such as the International Whaling Commission (56). There, science-based approaches to managing harvests of large whales are frequently confronted with objections to all whaling based upon appeals to "universal" values or ethics. In response, member governments prefer regional approaches that keep authority for management closer to home and more in tune with local cultures and traditions.

Defining co-management

In co-management, stakeholders share power in managing specific resources. In a North American context, co-management commonly refers to a "shared decision-making process, formal or informal, between a government authority and a user group for managing a species of fish and wildlife, or other resource" (57). More specifically, a co-management regime is an institutional arrangement in which stakeholders establish 1) a system of rights and obligations for those concerned with the resource, 2) rules indicating actions that stakeholders are expected to take under various circumstances, and 3) procedures for making collective decisions affecting diverse interests.

In the Arctic, co-management often provides avenues for sharing knowledge between users

and scientists and balancing power between users and government officials. It also allows for expanding cooperation in research, education, and management and recognizes cultural and linguistic differences as they impact effective understanding. Finally, it focuses on integrated systems approaches for sustainable resource management.



PHOTO: ANATOLI KOCHNEV

Chukotka – Wrangell Island polar bears

Case study: Shared management of polar bear in Alaska and Chukotka

An example of co-management is the initiative of indigenous peoples in Alaska and Chukotka in managing a shared polar bear population in the Bering and Chukchi seas. Indigenous groups on both sides of the Bering Strait have long used these bears for food, clothing, and in artwork. In the late 20th century, the Soviet Union banned all polar bear hunting and the United States considered a similar ban. However, an exemption in the US Marine Mammal Protection Act of 1972 allowed Native hunters to take polar bear, and the 1973 International Polar Bear Treaty opened doors to new forms of co-management involving indigenous peoples (58).

The Inuvialuit and Iñupiat of Alaska and western Canada initiated this arrangement in 1984 by signing a polar bear management agreement in which hunters themselves – outside of government structures – agreed to protect females and cubs. This and similar agreements encouraged hunters in Alaska and Chukotka to form the Alaska Nanuq Commission and the Chukotka Association of Traditional Marine Mammal Hunters, respectively. These organizations undertook a com-

mon study of polar bear habitat in Chukotka, which involved traditional knowledge about feeding areas, migration routes, and denning areas, and the information is being used to develop a polar bear management plan and appropriate regulations and enforcement procedures in Chukotka.

This collaboration led to the signing of the United States/Russia Polar Bear Treaty in October 2000 (59). The treaty contains several unique features. First, it creates a joint commission that establishes policy and sets annual harvest limits. The commission includes representatives of the Alaska Nanuuq Commission and the Chukotka Association of Traditional Marine Mammal Hunters and is required to make decisions on a unanimous basis. This essentially gives indigenous peoples in Chukotka and Alaska the ability to veto any decision that would be counter to their interests under the treaty. A second unique aspect of the treaty is that its implementation is by agreement between two indigenous organizations. National governments will leave to indigenous organizations the responsibility for distributing allowable quotas and determining appropriate regulations.

Striving for sustainability: rights-based development

Arctic residents are focusing increasingly on new forms of resource governance tied to sustainable community development and widening involvement in the global economy (60-62). Particularly in North America, opposition to industrial development may be giving way to cautious acceptance or even the embracing of new economic partnerships (63-64).

Economic development can offer a means to expand political and economic self-determination and to create jobs and wealth for younger generations (65). But many questions remain about how to strike a balance between the benefits of such development and the trade-offs

necessitated by its impacts (66). Key to resolving this conundrum is the development of resource governance regimes that reflect indigenous and local values and interests while taking advantage of economic opportunities available in the global marketplace. The following case study from Alaska's North Slope illustrates some of the opportunities and challenges.

Case study: Oil development on Alaska's North Slope

The Alaska Native Claims Settlement Act (ANCSA) was realized largely because of pressure to develop oil resources discovered on Alaska's North Slope – homeland of the Iñupiat. The North Slope alone produces about 17% of all oil consumed in the United States. ANCSA created 13 Native regional corporations and several hundred smaller village corporations, designed to be vehicles for indigenous economic development. On Alaska's North Slope, the Arctic Slope Regional Corporation became a major owner of surface and subsurface land rights and also a major player in providing oil-field services in partnership with other companies (67).

Shortly after ANCSA's passage, Iñupiat residents of the North Slope created the North Slope Borough, a regional public government (68). Alaska's state constitution encourages development of boroughs, and Iñupiat political leader Eben Hopson realized that a borough would provide opportunities for expanding local control of development and dramatically improving services. Importantly, the borough has the ability to tax oil-field infrastructure and has been a major player in providing jobs and services to its residents.

Creation of the North Slope Borough, the Arctic Slope Regional Corporation, and smaller village corporations provided an essential framework for resource governance in northern Alaska that is fostering greater resource development. Initial oil development in the Prudhoe Bay and Kuparuk areas now extends westward toward the village of Nuiqsut, a predominantly Iñupiat community of about 420 people. Nuiqsut's experience with nearby oil development illustrates the promises and the challenges of balancing industrial development and indigenous values through effective governance regimes (69)

Located in a traditional Iñupiat subsistence area, Nuiqsut was reestablished as a village fol-



PHOTO: MIALE NOKIK

Oil field infrastructure, Prudhoe Bay, Alaska

lowing ANCSA's enactment in 1971 (70). Under ANCSA, Nuiqsut's Iñupiat residents became shareholders in the Arctic Slope Regional Corporation and in a village for-profit corporation, the Kuukpik Corporation. Kuukpik received surface ownership of almost 600 square kilometers of land, plus US\$3 million. The subsurface mineral rights to Kuukpik's lands are owned by the State of Alaska and the Arctic Slope Regional Corporation, but a settlement with the regional corporation gives Kuukpik a royalty interest in subsurface resources. Moreover, in 1974 Kuukpik negotiated cooperative agreements for petroleum exploration and development on its lands.

In that year, the oil company Arco (now part of Conoco-Phillips) discovered oil on Kuukpik lands only eight miles from the village. The city and tribal governments of Nuiqsut signed a cooperative agreement with Kuukpik to ensure that they would speak with one voice about nearby development. Kuukpik negotiated a deal with Arco for benefits including rents and royalties, jobs and training, subsistence and environmental oversight, and a local supply of natural gas for power generation.

The economic benefits of nearby oil field development have been huge for Nuiqsut. Kuukpik's revenues are on the order of US\$5 million per year (and increasing), personal income is up 50% over the decade, and imported goods and amenities are widely available. The North Slope Borough earned significant property tax revenues; in 2002 these totaled US\$16 million, helping finance Nuiqsut's new water and sewer system. The Arctic Slope Regional Corporation earned US\$10.8 million in resource revenues and paid dividends that averaged US\$1000 per shareholder. The downside is increasing dependence on the cash economy and the fact that most jobs are in the construction field and are not likely to be sustainable. To offset this, Kuukpik has established a permanent fund that promises a sustainable income stream into the future. Other initiatives focus on getting more residents qualified for, and employed in, oil field jobs.

Cumulative impacts from expanding development, including new roads and infrastructure, increasingly cause local residents to voice concern about social and cultural stress. George Ahmaogak, Sr., mayor of the North Slope Borough, states that "when development was contained in the Prudhoe Bay area, we didn't feel the disturbance. Now that some of us can

see it from our homes, we are reaching a threshold of awareness with potentially serious effects. . . . While the [federal agencies] spend millions for research on the land and wildlife populations, they dismiss human impacts with vague references, effectively ignoring the questions of social and cultural stresses on our people" (71).

These comments suggest that traditional cultural values and subsistence resources – while largely healthy – are under stress. Success in developing the initial field is contributing to further development such that Nuiqsut is nearly surrounded by industrial activity. Oil development has reportedly impacted subsistence by displacing hunting and fishing activities, diverting wildlife migrations, and removing a sense of solitude and cultural privacy on the land. Moreover, the social fabric of Nuiqsut is strained by an increase in alcohol and drug abuse, associated police problems, and an influx of outsiders. There are also anxieties about further impacts of development on subsistence.

In addressing these concerns, Nuiqsut has the advantage of identified property rights, a strong home-rule borough government dedicated to preserving Iñupiat values, and influential community leadership. Agreements between Nuiqsut and industry have created a foundation for on-going negotiations to address environmental concerns, resolve day-to-day conflicts with hunters, and overcome barriers to local hire. The North Slope Borough has used its planning and zoning powers to regulate land use and infrastructure design. It remains to be seen, however, if these powers are sufficient to protect and balance long-term interests in connection with further exploration and development on land or offshore in the Beaufort Sea. Not all of Nuiqsut's traditional subsistence use area is controlled by the corporation, and local people have limited ability to influence subsistence protections on adjacent lands and waters. The industry and the federal and state governments are anxious to move ahead with development, raising questions about how much local communities can influence the extent or pace of development.

These opportunities and challenges on Alaska's North Slope illustrate opportunities and trade-offs Arctic peoples face in large-scale industrial development (72). Economic benefits of oil development include jobs, tax revenues, access to new resources, and expanded infrastructure. New resource governance regimes

can, as in Nuiqsut's case, provide local people with rights for regulating some aspects of development and bring significant royalties. As the scale of industrial development increases, however, costs to landscape, wildlife, subsistence, and cultural values can also increase while benefits from jobs and immediate income remain modest or even decline.

Uncertain picture for Arctic peoples and industrial development

The growing involvement of Arctic peoples in resource development is not unique to Alaska's North Slope. Elsewhere in North America and in Greenland, local decision makers are increasingly involved as active partners, while this is not necessarily the case in Scandinavia and Russia. This trend highlights the question about whether existing resource governance systems in the Arctic are able to respond quickly and flexibly to emerging opportunities in a way that contributes to healthy communities and sustainable economies.

Alaska's most profitable regional and village corporations generated revenues of some US\$2400 million in 2002 with assets of US\$2700 million. In that year, these for-profit corporations paid US\$45.6 million to Alaska Native shareholders and employed over 12,000 people in the state (72). In northwest Alaska, Iñupiat shareholders in the NANA Regional Corporation are partnering with multinational Teck-Cominco in operating Red Dog, the world's largest lead-zinc mine. Cook Inlet Region, Incorporated, whose shareholders live predominantly near Anchorage, earned over US\$850 million in 2001.

Similar developments are taking place in Canada in the aftermath of comprehensive claims settlements. In Canada's Northwest Territories, Inuvialuit and Dene seek to become active partners in the ownership of a major gasline extending the length of the Mackenzie River, from its mouth to distant southern markets (73). Their Aboriginal Pipeline Group is in the midst of negotiating a financial package as well as impact and benefit agreements to address immediate and long-term cumulative impacts.

Development of the Canadian diamond industry in the Northwest Territories and Nunavut is also creating jobs, generating resource wealth, and expanding self-determination. Greenland's Home Rule Government is

developing partnerships with multinational corporations for exploration and potential development of non-renewable resources such as offshore oil, gold, and zinc. It must share royalty income and some management authority, however, with Denmark.

Elsewhere in the Arctic, rights of indigenous peoples to resource wealth remain uncertain, both with regard to traditional uses and commercial exploitation. For example, some Saami in Norway fear that new impending legislation provides little or no recognition of their resource rights (19) (see *Chapter 6. Legal Systems* for details). Similarly in Russia, indigenous peoples express concern that they benefit little from privatization of collective enterprises and the resources they control. Yet it is northern peoples who more often than not bear the costs of resource development through environmental, social, and cultural impacts.

Climate change creates new challenges

The issue of climate change in the Arctic is only beginning to be understood and analyzed in terms of its potential effects and impacts on resource governance. The Arctic Council's *Arctic Climate Impact Assessment* (ACIA) has evaluated data about climate change, climate variability, and increased UV exposure in the Arctic (74). In developing awareness of potential impacts, ACIA will also inform discussions about how to address them.

For resource governance, debates about Arctic climate change will almost certainly focus on whether current institutions are sufficiently flexible, resilient, and robust. They will have to cope with rapid changes in biological systems, including alteration of marine and terrestrial ecosystems, loss of polar bear habitat, and emergence of new species. Permafrost melt, reduced sea ice, and increased Arctic Ocean shipping will also have impacts on industrial development (75-76). These impacts and the potential demise of traditional subsistence systems may well affect community viability. The impacts from climate change could be profound and pose significant challenges to established and fledgling governance institutions in the Arctic.

Trend summary

Arctic peoples are increasingly involved in industrial development, especially in North America. This fact may advance political and economic self-determination, but it may also raise new

challenges to effective resource governance. Rights to land and resources, political devolution, and new regimes for co-management are crucial in providing a voice in this development and a share of the wealth. Climate change presents new and uncertain challenges in the Arctic; research now under way will help determine effective responses to these challenges, including in the area of resource governance.

Key conclusions

This chapter illustrates how continuing efforts to define and clarify rights to resources in the Arctic have profound political, economic, social, and cultural implications. How these rights are finally addressed, and who has control over resources, will be the key issue for sustainable development of Arctic communities.

Efforts to incorporate traditional and local ecological knowledge in resource management are also almost certain to continue. How meaningful these efforts will be in addressing the needs and concerns of Arctic peoples remains to be seen, but the very existence of this debate signals growing awareness that effective governance requires broader thinking. Moreover, devolution of authority for local or regional resource governance offers promise for greater legitimacy in management for sustainability.

A third conclusion is that expanding involvement of Arctic peoples in economic development may become increasingly important to the future of effective resource governance in the Arctic. In the 20th century, economic development forces commonly came from outside of the Arctic region and were often imposed upon local residents. As more Arctic residents get involved in economic development, the character of resource governance institutions and political debates will almost certainly change. The link between economic power and self-determination has not gone unnoticed by Arctic residents.

Finally, research shows that sustainable development of Arctic communities is advanced when institutions and processes for decision making take into account the social and cultural values of Arctic peoples. The most appropriate institutions appear to be those that are flexible, responsive to change, and scaled appropriately to maximize effectiveness and legitimacy. Building on these values and principles is no guarantee of effective governance and resource

conservation, but experience shows that effective governance has often been thwarted when these factors were ignored.

Gaps in knowledge

The policy conclusions point to several gaps in our knowledge about Arctic resource governance. First, we need a better understanding of the dynamics of effective regimes for resource governance – the socio-political contexts from which they emerge and the factors that support or undermine their implementation and long-term effectiveness (1).

We also need systematic studies and analysis of the full range of property-rights systems as they are applied in the Arctic. We need to look critically both at the privatization approaches increasingly common in North America and of alternative systems. Such studies should look not only at legal or political structures but also at the social and political context in which they are embedded. The still-evolving nature of property-rights systems in the Arctic and the openness to new approaches in different jurisdictions offers intriguing case studies that may have significance far beyond the Arctic.

The policy conclusions also point to gaps in our knowledge about how best to understand, assess, and address cumulative impacts related to resource development, as exemplified by North Slope development in Alaska. This includes improving data about the ecological and socio-cultural impacts of development and planning processes (66). Studies of cumulative effects are especially relevant in light of the potential impacts from climate change. Much more basic and applied research will be needed to understand and respond to climate change in the years ahead, while the science of integrated assessments offers a means for understanding dynamic and complex factors contributing to effective resource governance (77).

Chapter summary

Effective resource management regimes are important for long-term sustainability and self-determination in the Arctic. In describing the interrelationships between Arctic peoples, their environments, and resource governance, this chapter focuses on how human uses of Arctic environments have changed dramatically over time. It highlights opportunities for improving systems of resource governance through 1)

addressing property rights to resources, 2) incorporating traditional and local ecological knowledge along with western science in decision making, 3) co-management and devolution to local and regional levels, and 4) expanding our understanding of resource governance dynamics – particularly as it relates to resource development and climate change.

References

- O. R. Young, *Creating Regimes: Arctic Accords and International Governance* (Cornell Univ. Press, Ithaca, 1998).
- O. R. Young, *The Institutional Dimensions of Environmental Change: Fit, Interplay, and Scale* (The MIT Press, Cambridge, 2002).
- F. Berkes, C. Folke, Eds., *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience* (Cambridge Univ. Press, Cambridge, 1998).
- S. Haycox, *Frigid Embrace: Politics, Economics, and Environment in Alaska* (Oregon State Univ., Corvallis, 2002).
- R. Caulfield, "The political economy of renewable resource management in the Arctic," in *The Arctic: Environment, People, Policy*, M. Nuttall, T. V. Callaghan, Eds. (Harwood Academic, Amsterdam, 2000), chap. 17.
- I. Krupnik, *Arctic Adaptations: Native Whalers and Reindeer Herders of Northern Eurasia* (Univ. Press of New England, Hanover, NH, 1993).
- J.-L. Jernsletten, K. B. Klovov, *Sustainable Reindeer Husbandry* (Univ. of Tromsø, Tromsø, 2002)
- G. Kofinas, G. Osherenko, D. Klein, B. Forbes, "Research planning in the face of change: The human role in reindeer/caribou systems," *Polar Research* **19**, 1(2000).
- World Commission on Environment and Development, *Our Common Future* (Oxford Univ. Press, Oxford UK, 1987).
- M. Nuttall, T. V. Callaghan, Eds., *The Arctic: Environment, People, Policy* (Harwood Academic, Amsterdam, 2000).
- National Research Council, *The Bering Sea Ecosystem* (National Academy Press, Washington, DC, 1996).
- National Research Council, *The Community Development Quota Program in Alaska and Lessons for the Western Pacific* (National Academy Press, Washington, DC, 1999).
- Alaska Department of Fish and Game, Division of Commercial Fisheries. See <http://www.cf.adfg.state.ak.us/> July 2004.
- R. Niezen, *Defending the Land: Sovereignty and Forest Life in James Bay Cree Society* (Allyn and Bacon, Boston, 1998).
- R. Caulfield, *Greenlanders, Whales, and Whaling: Sustainability and Self-determination in the Arctic* (Univ. Press of New England, Hanover, NH, 1997).
- J. Fleischer, *A Short History of Greenland* (Aschehoug, Copenhagen, 2003).
- D. Gaffin, *In Place: Spatial and Social Order in a Faroe Islands Community* Waveland Press, Long Grove, IL, 1995).
- G. Pálsson, A. Helgason, "The politics of production: enclosure, equity, and efficiency," in *Images of Contemporary Iceland: Everyday Lives and Global Contexts*, G. Pálsson, E. P. Durrenberger, Eds. (Univ. of Iowa Press, Iowa City, 1996), pp. 60-84.
- T. G. Svensson (ed.), *On Customary Law and the Saami Rights Process in Norway: Proceedings from a Conference at the University of Tromsø 1999* (University of Tromsø, Norway, 1999).
- O. S. Stokke, O. Tunander, *The Barents Region: Cooperation in Arctic Europe* (The Fridtjof Nansen Institute and SAGE Publications, Oslo, 1994)
- Barents Euro-Arctic Council 2003, <http://www.beac.st/> (July 2004).
- J. Forsyth, *A History of the Peoples of Siberia: Russia's North Asian Colony, 1581-1990* (Cambridge University Press, Cambridge, 1994).
- T. Kähler, K. Wessendorf, Eds., *Towards a New Millennium: Ten Years of the Indigenous Movement in Russia* (IWGIA, Copenhagen, 2002).
- N. Vakhtin, "Native Peoples of the Russian Far North," *Polar Peoples: Self-determination and Development*, Minority Rights Group, Ed. (Minority Rights Publications, London, 1994), pp. 29-80.
- Slezkine, *Arctic Mirrors: Russia and the Small Peoples of the North* (Cornell Univ. Press, Ithaca, 1994).
- G. Fondahl, "Autonomous Regions and Indigenous Rights in Transition in Northern Russia," in *Dependency, Autonomy, Sustainability in the Arctic*, H. Petersen, B. Poppel, Eds. (Ashgate, Aldershot, UK, 1999), pp. 55-63.
- V. Tyrlyshkin, A. Blagovidov, A. Belokurov, *Russia: Management Effectiveness Assessment of Protected Areas using WWF's RAPPAM Methodology* (WWF, Gland, 2003).
- Russian Association of the Indigenous Peoples of the North (RAIPON), See <http://www.raipon.org/>. July 2004.
- S. Kharyuchi, <http://www.raipon.net/english/events/4conference/report.html> (July 2004).
- National Research Council, *Sharing the Fish: Toward a National Policy on Individual Fishing Quotas* (National Academy Press, Washington, DC, 1999).
- C. Pinto, "The United Nations Convention on the Law of the Sea: sustainable development and institutional implications," in *Ocean Governance: Sustainable Development of the Seas*, P. B. Payoyo, Ed. (United Nations Univ. Press, Tokyo, 1994), pp. 3-27.

32. Pew Oceans Commission, "America's living oceans: charting a course for sea change; a report to the nation – recommendations for a new ocean policy" (2003).
33. United States Commission on Ocean Policy, "Preliminary report of the US Commission on Ocean Policy – Governors' draft," (Washington DC, 2004); <http://oceancommission.gov/documents/prelimreport/welcome.html>
34. O. S. Stokke, *Governing High Seas Fisheries. The Interplay of Global and Regional Regimes* (Oxford Univ. Press, Oxford, 2001).
35. Bering Sea Fishermen's Association, <http://www.cdqdb.org/reading/research.htm> (July 2004).
36. G. Pálsson, A. Helgason, "Property rights and practical knowledge: the Icelandic quota system," in *Fisheries Management in Crisis*, K. Crean, D. Symes, Eds., (Blackwell, Oxford UK, 1996)
37. W. Østreg, Ed., *The Natural and Societal Challenges of the Northern Sea Route* (Kluwer, Amsterdam, 1999).
38. F. Berkes, *Sacred Ecology: Traditional Ecological Knowledge and Resource Management* (Taylor & Francis, Philadelphia, 1999).
39. A. Fienup-Riordan, *Eskimo Essays: Yup'ik Lives and How We See Them* (Rutgers Univ. Press, New Brunswick, 1990).
40. P. Nadasdy, *Hunters and Bureaucrats: Power, Knowledge, and the Restructuring of Aboriginal-State Relations in the Southwest Yukon, Canada* (Univ. of British Columbia Press, Vancouver, 2003).
41. G. Pálsson, *Coastal Economies, Cultural Accounts: Human Ecology and Icelandic Discourse* (Manchester Univ. Press, Manchester, 1991).
42. M. M. R. Freeman, *Inuit Land Use and Occupancy Project*, (3 vols.) Government of Canada, Minister of Supply and Services, Ottawa, 1976).
43. M. McDonald, L. Arragutainaq, Z. Novalinga, compilers, *Voices from the Bay: Traditional Ecological Knowledge of Inuit and Cree in the Hudson Bay Bioregion* (Canadian Arctic Resources Committee and Municipality of Sanikiluaq, Ottawa, 1997).
44. NAMMCO, "The NAMMCO conference on user knowledge and scientific knowledge for management decisionmaking." January 4-7, 2003, NAMMCO report 12/10 (Reykjavik, Iceland, 2003).
45. F. Berkes, "Common property resource management and Cree Indian fisheries in subarctic Canada," in *The Question of the Commons* (B. J. McCay, J. M. Acheson, eds. (Univ. of Arizona Press, Tucson, 1987), pp. 66-91.
46. H. Feit, "Gifts of the land: Hunting territories, guaranteed incomes and the construction of social relations in James Bay Cree society." *Senri Ethnological Studies* 30:223 (1991).
47. P. Collings, "The cultural context of wildlife management in the Canadian north," in *Contested Arctic: Indigenous Peoples, Industrial States, and the Circumpolar Environment*, E. A. Smith, J. McCarter, Eds. (Univ. of Washington Press, Seattle, 1997), pp. 13-40.
48. G. Pullar, Anchorage, AK, Personal communication (2004).
49. R. Caulfield, "Subsistence land use in Upper Yukon-Porcupine communities, Alaska," (Alaska Department of Fish and Game, Division of Subsistence, Fairbanks, Technical Paper 16, 1983).
50. International Work Group on Indigenous Affairs, *Nunavut: Inuit Regain Control of Their Lands and Their Lives* (IWGIA, Copenhagen, 2000).
51. C. Hensel, P. Morrow, "Co-management and co-optation: Alaska participation in regulatory processes," *Cultural Survival Quarterly* Fall 1998, 69 (1998).
52. Government of Nunavut, <http://www.gov.nu.ca/> (July 2004).
53. Quote from page 60 in (50).
54. North Atlantic Marine Mammal Commission, see <http://www.nammco.no/Agreement.htm>. July 2004.
55. Ecosystem management involves an approach to natural resource management to assure productive, healthy ecosystems by blending social, economic, physical, and biological needs and values.
56. D. D. Caron, "The International Whaling Commission and the North Atlantic Marine Mammals Commission: The institutional risks of coercion in consensual structures," *American Journal of International Law* 89, 154 (1995).
57. Native American Fish and Wildlife Society. "Co-management information and examples of co-management agreements in Alaska." Report prepared for the Southeast Regional Sea Otter Management Planning Workshop, September 27-29, 1993, Sitka, Alaska (1993).
58. C. Johnson, 2002. "Subsistence and the co-management of marine resources," Statement to the US Commission on Ocean Policy, Anchorage, Alaska. August 21-22, 2002; http://oceancommission.gov/meetings/aug21_22_02/johnson_testimony.pdf.
59. "Agreement between the Government of the United States of America and the Government of the Russian Federation on the conservation and management of the Alaska-Chukotka polar bear population" (2000), <http://www.bearbiology.com/polarbeartreaty.html> (July 2004).
60. Association of ANCSA regional corporation presidents/CEOs, *Native Corporations: 2003 Annual Economic Impact Report* (Anchorage, AK 2004).
61. International Union for the Conservation of Nature (IUCN), Inter-Commission Task Force on Indigenous Peoples, *Indigenous Peoples and Sustainability: Cases and Actions* (International Books, Utrecht, 1997).
62. Nordic Council of Ministers, "Indigenous peoples production and trade," *TemaNord* 1996, 553 (Nordic Council of Ministers, Copenhagen, 1996).

63. S. Colt, 2001. *Alaska Natives and the 'New Harpoon': Economic Performance of the ANCSA Regional Corporations* (Univ. of Alaska Anchorage, Institute of Social and Economic Research (ISER), Anchorage, 2001)
64. Commonwealth North, <http://www.commonwealthnorth.org/transcripts/anca.html> (July 2004).
65. For examples from Alaska, Greenland, and Canada, see <http://www.anwr.org/features/ahmaogak-speech.htm>, http://www.bmp.gl/E/EC2_periodicals/EC2_30aa_mining-journal-suppl-index.htm, <http://www.aboriginalpipeline.ca/>
66. National Research Council, *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope* (National Academy Press, Washington DC, 2003).
67. Arctic Slope Regional Corporation, <http://asrc.com/intro.html> (July 2004).
68. North Slope Borough, <http://www.north-slope.org/> (July 2004).
69. S. Haley, "Institutional assets for negotiating the terms of development: Indigenous collective action and oil in Ecuador and Alaska," *Economic Development and Cultural Change* (forthcoming, 2004).
70. W. E. Brown, *Nuiqsut Paisangich. Nuiqsut Heritage: A Cultural Plan* (North Slope Borough, 1979).
71. G. Ahmaogak, in *Anchorage Daily News*, September 30, 2003, p. B3.
72. K. Storey, L. C. Hamilton, "Planning for the impacts of megaprojects: Two North American examples," in *Social and Environmental Impacts in the North*, R. O. Rasmussen, N. E. Koroleva, Eds. (Kluwer Academic Publishers, Dordrecht, 2003), pp. 281-302.
73. Aboriginal Pipeline Group, <http://www.aboriginalpipeline.ca/> (July 2004).
74. Arctic Climate Impact Assessment (ACIA). "Summary Report on the 10th Assessment Steering Committee (ASC) Meeting, 15-16 October 2003, London, England"; www.acia.uaf.edu/PDFs/ASC-10.pdf
75. G. Osherenko, "Social and cultural impact on indigenous peoples of expanded use of the Northern Sea Route," in *Northern Sea Route: Future and Perspective* (Ship and Ocean Foundation, Tokyo, 1996).
76. M. Tennberg, *Arctic Environmental Cooperation: A Study in Governmentality* (Ashgate, Aldershot, UK, 2000).
77. E. Parson, "Integrated assessment and environmental policy making," *Energy Policy* **23** (4/5), 463 (1995).