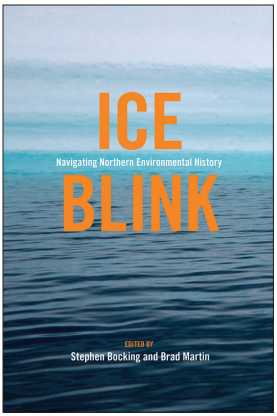

ICE BLINK: NAVIGATING NORTHERN ENVIRONMENTAL HISTORY Edited by Stephen Bocking and Brad Martin

ISBN 978-1-55238-855-6

Acknowledgement: *We acknowledge the wording around open access used by Australian publisher,* **re.press**, *and thank them for giving us permission to adapt their wording to our policy* http://www.re-press.org

Conclusion

14

Encounters in Northern Environmental History

Stephen Bocking

These chapters have ranged across northern space and time, exploring episodes from a century of relations between people and nature, from the Klondike to global environmental change. They have also demonstrated how the natural and cultural features of northern Canada imply many distinctive questions and issues regarding its environmental history. In telling these stories, our authors have drawn on diverse forms of evidence: public documents, archives, physical traces, and the voices of individuals from north and south. But above all, they have shown how this place has been a terrain of encounter: between people (often from elsewhere) and the land, expressed through technology, knowledge, and other dimensions of human thought and activity. Among these encounters, that between Indigenous and newcomer societies has been of special significance, particularly because it has been marked not, as elsewhere in North America, by displacement, but by a long period of cultural mixing. From this encounter have flowed others—between contrasting economic systems and ways of relating to the environment, between different systems of knowledge, and between different political and cultural priorities relating to the northern environment. In this conclusion we will extend our authors' exploration of these encounters by returning to those themes that we considered in the first chapter.

Environmental Change

Change has been a pervasive feature of the northern environment, evident in its histories of climate, fire, and species. As these chapters explain, change has also been central to human history in the north: as the consequence of development or other interventions, or as a factor compelling adaptation. Mining's toxic residues, lands flooded by dams in Quebec and elsewhere, and the local impacts of DEW Line stations all testify to the capacity of industry and technology to transform ecosystems. Development projects have also had wider impacts, as roads or railways (even those that failed, as Jonathan Peyton explains) opened up regions: in the Northwest Territories, Quebec, and elsewhere, mines and dams have been only the starting point for transformation. Fire has often played a role in these transformations, accompanying, as Liza Piper notes, prospecting and other industrial activities. Our chapters have explored other interventions, as well, including efforts to domesticate reindeer (as Andrew Stuhl describes) and to establish gardens to support southern diets. The entire north has experienced the consequences of human impacts on the global environment, including contaminants and climate change, as my and Emilie Cameron's chapters discuss.

Yet these episodes also illustrate how the concept of "impacts," with its implication that humans are an external force, does not adequately describe historical interactions between humans and the northern environment. Environmental change has most often been experienced and understood in terms of people, and particularly Indigenous ways of life and wellbeing. As Piper explains, after 1870, excessive hunting by explorers, whalers, and miners was experienced alongside other pressures on Indigenous northerners' food supplies imposed by natural variability and hunting regulations. Similarly, the effects of infectious diseases were felt not only directly but through disruption of relations with nature, including an accelerated shift to southern foods. Further, as Arn Keeling and John Sandlos note, the toxic aftermath of mineral exploitation has been experienced not in terms of pristine ecosystems, but in relation to existing ties between humans and nature, including hunting. Contaminants and climate change must also be understood in terms of their consequences for humans, again reminding us that the north is not only a natural but a cultural landscape.

These chapters also demonstrated how northern nature has itself shaped the consequences of human activities. The effects of reindeer grazing were partly determined by the ecology of tundra, peculiar atmospheric and ecological conditions rendered the region vulnerable to radioactive fallout and persistent organic pollutants, and arctic ecosystems and wildlife have a special sensitivity to climate change. Thus, ecosystems and humans together define the effects of changes set in motion by human activities. These chapters therefore underline the value of understanding change in terms of new relations—of domestication, exploitation, or contamination—between humans and nature, in which species, ecosystems, and human activities together produce new environments.

The Indigenous North

Several chapters in this volume considered the evolution of Indigenous peoples' relations with nature, particularly in the context of environmental change, resource development, and the initiatives of governments and other actors. Piper considers the changing sources and meanings of food. Hans Carlson explores, with the Quebec Cree, their landscape after the James Bay hydro project. Paul Nadasdy examines peoples' relations with wildlife and one another in the Yukon territory. Keeling and Sandlos examine the consequences of mining developments for Indigenous health and livelihoods, explaining how remediation and redevelopment is forcing communities to revisit these difficult histories. Matt Farish and Whitney Lackenbauer note the implications of the DEW Line for Indigenous ways of life. Other chapters consider these relations in terms of reindeer herding, prospecting, or contaminants.

Throughout this history, people from elsewhere have perceived the relations between Indigenous people and nature in various ways. In the 1920s, prospectors and others believed that through contact with outsiders Indigenous people had lost much of their knowledge of the land. As Tina Adcock explains, this was for some a matter of regret because of nostalgia or because of concerns regarding traditional diets. Others considered this merely the inevitable consequence of assimilation and modernization, made necessary by the uncertain fur economy, shifting caribou migration routes, incidents of scarcity and starvation, and the conclusion that the

northern environment remained beyond control, implying the need for an agriculture-based diet. This perspective had a variety of consequences. For a time, reindeer herding was seen as a path toward a more secure northern food economy—and an occupation for which, as Stuhl explains, Inuit were thought to be particularly suited. But as Piper notes, food also became central to more ambitious interventions, including relocation, economic development, and wildlife management, all consistent with the shift from traditional foods to food from the south that was being encouraged by Family Allowances, nutrition surveys, relief rations, and education. In addition, new settlements were often situated in places that responded to southern priorities (like access to natural resources or transport routes), but that were distant from local food supplies.

Interventions had other implications for Indigenous environmental relations. Indigenous people were often kept at a distance from state and industry initiatives, including resource development, aviation, and military projects. But other interventions focused directly on Indigenous communities. As Tina Loo describes, sustainable development meant encouraging more cohesive Inuit communities, in part through communication projects and applied anthropology, and efforts to enable Inuit to continue living on the land even while joining the wage economy. And as Nadasdy explains, the division of Indigenous people in the Yukon into bands and the imposition of property and territorial regimes has devalued non-territorial forms of organization, encouraging bureaucratization of their relations with animals and each other. The results of these interventions could often be ambiguous. Yukon co-management arrangements are the product of resistance to colonization, but are also rooted in colonial administration and state-based practices of territorial governance. And while the James Bay and Northern Quebec Agreement maintains a Cree presence on and understanding of the land, it also established a new language of environment, embodying Western ideas regarding the division between nature and culture. This accommodation reflects, as Carlson notes, how development co-exists with traditional ideas of the bush, sometimes producing compromises, like the 2002 "Paix des Braves" agreement, which reflect the challenges involved in navigating this complex landscape.

However, while describing these interventions, our authors have, as have other historians, portrayed Indigenous people as active agents in

northern environmental history, acting on the basis of their knowledge and values, even amidst the colonizing agenda of political, military and economic actors. Resisting wildlife regulations, insisting on changes to government relief and rations, influencing research activities, negotiating land claims, and asserting their views regarding contaminants and climate—through these and other means, they have sought to redefine their relations with government, science, and nature.

The State

Our authors considered several aspects of the relations between the state and the northern environment, through its own activities, as well as its influence on how others—scientists, Indigenous peoples, industries—have understood, used, or transformed the environment. The state's role in encouraging resource development has been central to these relations, linking the northern environment to global markets. In this volume, this has been evident in resource surveys and support for aviation and the expansion of mining and hydroelectric development. Economic activities by the state have had, as we have seen, far-reaching impacts on the environment and on Indigenous ways of life. The state has also promoted or imposed a variety of other ways of relating to the environment. During the interwar era, the state attempted domestication of wildlife through the Canadian Reindeer Project; as Stuhl describes, this "experiment" in expanding the role of the state in the northern environment aimed to replace Inuit reliance on the fur trade and caribou with what was hoped to be a more stable and predictable pastoral economy. But as northern priorities shifted in the postwar era, so did state activities—to encompass, for example, the "geographical engineering" of the DEW Line—one of many ways in which the state, as Farish and Lackenbauer explain, fused science and security. These interventions also included relocation of settlements and expanded social programs (including sustainable development initiatives, which, as Loo explains, demonstrated the limits of state action), and land and wildlife management regimes based on property rights and territorial jurisdiction. Another role of the state became evident in the Northern Contaminants Program: contaminants were redefined in terms of federal jurisdiction, reframing an environmental and health issue to be consistent

with administrative boundaries. These and other initiatives exhibited the extension of the state's authority and capacity to impose order, making the north administratively legible and amenable to regulation.

Several chapters also illustrated the significance of food in state roles and policies in northern environmental history. Changing views of subsistence have been part of this picture, with an early preference that Indigenous people continue to rely on hunting and fishing being eventually displaced by the assumption that an agriculture-based diet was superior. The result was "food colonialism"—evident in the reindeer project, relocation to places lacking adequate local food supplies, and a variety of other educational, nutritional, and social interventions. Food thus became the basis for northern administration—a means of managing the relations between people and nature, bringing the region into the Canadian mainstream, and making Aboriginal peoples full citizens of Canada. Food itself was redefined, becoming a matter of nutrition, not culture. Ultimately, however, food also became a basis for resistance to the state, as became evident in reactions to wildlife management, nutritional policies, and contaminants research.

Technology

Our authors have explored several aspects of the history of technology in the north, including its roles in creating new environments and new relations between nature and northern society. One aspect has been the sometimes unpredictable or unintended consequences of technology, as experienced, for example, at DEW Line stations, or with the pollution control equipment installed in mines—which only displaced many of the problems associated with toxic contaminants. Another aspect has been the influence of technology on how northern environments are understood. As Farish and Lackenbauer note, military technology implied a view of the northern environment as a technical space remote from politics, merely a set of problems to be solved or held at a distance. This influence has also been evident in the case of scientific technologies: analytical equipment detecting the presence of contaminants enabled perception of previously unknown aspects of the northern environment, while also

sharpening distinctions between scientific and Indigenous perceptions of the environment.

These chapters also illustrate the reciprocal relationship between technology and the environment. This has included the impacts in the north of technology situated elsewhere, such as industrial and agricultural technology that has affected the global climate and the movement of contaminants. In such ways, technology has linked the north and the rest of the world. And as Cronin explained, airplanes, although built elsewhere, were then recreated in northern environments, with modifications made on the basis of experience with their performance. The experience of flying became incorporated into aviation technology and practices, as pilots dealt with novel problems: where to land on Great Slave Lake, how to deal with seasonal rhythms of ice and open water, how to maintain machinery in extreme cold. Experience with aspects of the northern environment that could once be ignored, such as particular patterns of ice cover and weather, thus became crucial to northern travel, and northern landscapes, waterscapes, and airscapes left their traces in or on the airplanes themselves. A similar relation between the environment and technology became evident when equipment for the DEW Line was brought into the north, and then had to be modified for work under local conditions. This conclusion suggests the need for a broader focus in the history of northern technology, which considers not just its impact on the environment, but the role of the environment in shaping technology.

Experience

The history of technology also illustrates some ways in which experience has been linked to trends in northern environmental history. As airplanes extended the reach of prospectors and other newcomers, they changed the experience of northern travel, eliminating most of the effort and time required. As Adcock describes, time itself seemed to speed up—at the expense, however, of experience with the intimate details of the land. As a result, northern travellers like Douglas and Blanchet were ambivalent about aviation and wary of how experience defined by distance and dependent on fossil fuels was privileged over that based on proximity and exertion. Technology thus reshaped how people experienced the north,

reordering how evidence from their senses was interpreted, and how they perceived time and space. This would have practical consequences for how the north would be valued and transformed.

There are many other links, as well, between experience and northern environmental history. Some have been evident in interventions in Indigenous ways of life. As Piper explains, residential schools removed children from families and thus also from opportunities to learn about hunting and other subsistence practices, while instilling a taste for gardening and southern foods. And as Nadasdy describes, the consequences of co-management in the Yukon have become evident through the disconnect between how the land has traditionally been experienced—through hunting, kinship and reciprocity—and how it is now experienced within a system of resource management based on institutions, laws, and social relations consistent with state-based administration. In Quebec, the history of relations between the Cree and resource development is embodied in stories that make sense of experiences associated with places. As Carlson notes, they have continued hunting and trapping through the Income Security Program, thereby maintaining their experience with and understanding of the land.

Experiences and perceptions have also been essential to encounters between the north and people from elsewhere. Their arrival implied new ways of experiencing the north, such as the struggles of would-be Klondike prospectors, Blanchet's playful "Indian" engagement and Douglas' more controlled forays, and the careful observations by pilots and mechanics of the effects of flying and landing on their aircraft. These encounters also exhibited the influence of experience on perception, illustrating how memory has shaped how the north, time, and change are understood. As Adcock explains, old campsites, piles of firewood, and other traces coloured Douglas' and Blanchet's perceptions, imparting a sense of nostalgia, a desire for a more primitive, intense experience with nature, and dismay over the impacts of modern mining and surveys. How Western Electric employees on the DEW Line perceived the north was similarly shaped by their experience both there and in the south. More recently, Indigenous communities' responses to the revival of "zombie" mines have been influenced by memories of past experiences with the industry; and scientists' surprise when encountering the residues of global industrial activity was rooted in the cultural memory of a once-pristine north. And as Cameron

notes, past experience can also help in understanding perceptions of climate change today.

Knowledge

These chapters have much to tell us regarding knowledge and the northern environment. Knowledge has been linked to changes in this environment, to how people live on or transform it, and to the pursuit of diverse political or economic goals. New ways of relating to or manipulating northern nature and people have implied new definitions of relevant knowledge. In the Stikine, plans for trails and railways required information about the landscape; as Peyton notes, even these failed schemes encouraged awareness of the region's economic potential. As Stuhl explains, the reindeer industry required a new form of botanical expertise and a new relationship between science and the state, based not simply on describing the range but on experimenting with it to increase productivity. Geological information about the Great Slave and Great Bear lakes region that companies collected in the 1920s (using government maps, surveys, and aerial photos) supported mining development. Nutritional science guided interventions in Indigenous communities, justifying a view of their diets as inherently insecure. Cold War technology, including the DEW Line, demanded knowledge of northern geography and local construction sites. Anthropology became an applied science, guiding economic development in northern communities. Contaminants rendered newly relevant knowledge about the physical environment, ecosystems, and human health.

The social relations of northern knowledge have been especially evident in how various ways of knowing have been defined as authoritative. While the 1919–20 Royal Commission on Possibilities of Reindeer and Musk-ox Industries in the Arctic and Sub-arctic Regions defined northern experience as the basis for expert advice, by the 1930s knowledge of botany and project management experience obtained in Alaska and the western United States was considered more reliable. Aviation privileged observations obtained at a distance over those based on more immediate experience. Status within institutions could determine the authority of knowledge, as pilots and engineers struggled to have their ground-level, experience-based knowledge recognized within their company. New

kinds of experts emerged during the Cold War, including technicians able to manage complex systems. Contaminants and climate change have encouraged reconsideration of the relative authority of scientific and Indigenous knowledge, and awareness of the social implications of science has led to the concept of "responsible research," redefining relations between researchers and northern communities.

Throughout this history, new ways of arranging knowledge have accompanied novel relations with the environment. As these new relations emerged, science, because of how it was organized, was often able to provide at best only an incomplete understanding. This occurred with contaminants, knowledge of which was divided across several disciplines and institutions. The consequences included new combinations of knowledge cemented by new research institutions and by new objects of research and practice, such as the Arctic Dilemma, which combined, in a way distinctive to the north, the social and physical dimensions of contaminants. The history of northern knowledge exhibits other such objects: the variables describing tundra that ecologists used to indicate its ability to support reindeer; the complex technical systems (such as airplanes and radar) that enabled mobility and surveillance; the territorial units used to define areas of wildlife management. Each of these objects served to make the northern environment amenable to study and administration.

Several chapters have also examined where knowledge is formed, identifying the multiple "locals" of northern knowledge. One aspect of this is the distinction between knowledge tied to a specific location and knowledge of wider relevance and authority. In the 1920s, expertise in reindeer was not thought to be available locally; accordingly Saami, with experience in herding, were brought over from Scandinavia, and the Porsilds, with their botanical knowledge, were brought over from Denmark (and they then travelled elsewhere to learn more about herding). More recently, as Cameron noted, climate research has tended to consider local activities and adaptations as the sites of Indigenous knowledge, in contrast to activities like shipping, which take place on larger scales. This association of Indigenous knowledge with local places has been resisted in international contaminants negotiations.

Across a variety of areas of activity, distinctive northern knowledge has been formed by combining knowledge of the north with knowledge from elsewhere. Cold War installations merged laboratory knowledge

from elsewhere with local field knowledge, illustrating how high modernist projects adhering to "universal" ideals of rationality and efficiency nevertheless also required local knowledge. Similarly, contaminants scientists found, sometimes to their surprise, that standard assumptions about substances, bodies, health, and risk were not valid in the north, and therefore distinctive research approaches were necessary. The emerging community-based character of northern contaminants research reinforced this distinctive character, dispensing with the notion of the north as a placeless laboratory.

Mobility

As our authors have demonstrated, northern environmental history is a history of movement—of people, animals, machines, materials, ideas. They have described efforts to enable mobility by flying, importing reindeer, or exporting resources; to understand it, by walking through Eeyou Istchee or through studies of animal migrations or the flows of contaminants; and sometimes to prevent it, through strategic surveillance. Efforts to build an all-Canadian route to the Klondike illustrated how mobility was considered an essential response to the discovery of gold, as it also was during the Great Bear Lake radium boom of the early 1930s, and in subsequent resource developments. Mobility has often embodied an ambition to transcend environmental constraints, including distance, climate, and landscape. Yet these still exerted their influence: pilots followed waterways, while paying careful attention to freezing, breakup, and weather.

Mobility transformed travellers' lives: what they saw, heard, and felt; their perceptions of time and space; and distinctions of gender, class, and race. Materials have also been mobilized, including minerals, petroleum, electricity, and other commodities exported to meet market demands. Different kinds of mobilities have combined: capital with people, technology, and commodities; knowledge with the mobile phenomena it described. Technology and mobility have intersected: an aviation network, initially along waterways, emerged out of the interaction between geography, environment, technology, and the market; and airplanes, as well as roads and railways, spurred export of resources. Resource booms and busts have demonstrated how signals from distant markets could produce or disrupt

mobility. The movement of materials into the region, such as surveillance equipment, and food and other consumer goods, have demonstrated how policy could drive mobility. Some materials have moved themselves, including contaminants. Together, these mobilities have eroded the notion of the north as the last inaccessible place (although the continuing challenge of expensive imported food illustrates the limits of mobility).

Ideas have also been mobilized, taken from elsewhere to influence attitudes and policies in northern Canada. These have included antimodernist attitudes that framed personal encounters with and perceptions of change; ideas about economic progress through commodity exports; principles of scientific management that reordered relations between hunters and wildlife in terms of capitalism, agriculture, and territory; ideologies of apolitical rationality and high modernism, which guided development of the DEW Line and other projects; models of sustainable and regional development, including cooperatives; and expert ideas about food and nutrition. But these chapters also portray a north that is part of the world's conversation, not merely receiving but forming ideas, which in turn have become influential elsewhere. Knowledge has flowed out of the north, including accounts of the exploitation, management, or conservation of its landscapes, and the region's place in global ecosystems. Indigenous perspectives have been mobilized: by the Cree advocating in New York and elsewhere regarding the Great Whale Project, and by communities seeking a voice in global contaminant negotiations. Mobility has been particularly evident in the stitching-together of sites of production and application of knowledge. In the Canadian Reindeer Project, ecological information and advice was transferred between Alaska (and before that, the rangelands of the American west), the Yukon and Northwest Territories, Norway, and Ottawa. Networks of knowledge also formed during the design and construction of the DEW Line, combining plans, equipment, and technical expertise from the south with local information from the north. The movement of knowledge within an airline illustrated how power and bureaucracy could shape the flow of observations and technical advice even within one organization. Contaminants science formed yet another network: knowledge moved among scientists, between scientists and communities, and between north and south.

Northern Places

Throughout these chapters, the north has been identified as not only a physical but an imagined space, with diverse ideas about where it is, who and what belongs there, and what its future could be. As Peyton explained, a failed railway to the Klondike catalyzed perceptions of the Stikine as a place of opportunity. Carlson and Nadasdy explored in Quebec and the Yukon the north imagined as a homeland defined by Indigenous identity, kinship, and ways of life—a view transformed in recent decades, but still essential to northern history and life. Other ways of imagining the north have encompassed ambitions to tame this space. One way was by combining, as Stuhl and Piper described, science, the state, and species (reindeer and garden crops) in attempts to form a domesticated agricultural region. Another was by converting its geology into commodities, and the north into a region accessible to global markets. This redefinition of the north in terms of natural resources neglected other features of the northern landscape, including its social dimensions. The north also became a proving ground for the military, as Farish and Lackenbauer explain; and this once-pristine place became an environment newly vulnerable to contaminants, as my chapter shows. This imagined north has been a dynamic place, with shifting perceptions, interests, and attitudes.

Experience has been essential to these imagined norths. Aviators and airborne prospectors perceived an apparently empty but newly accessible and resource-rich landscape; the Cree walked, worked, and camped on the land. Economic interests have also been influential, such as those of private operators and state agencies imagining northern resource wealth. Other attitudes, too, have made their influence felt: the strategic concerns that led Cold War military strategists to imagine the north as a defensive bulwark; and ideas about food quality that led officials and nutritionists to imagine a new agricultural frontier. Throughout, physical realities have both inspired and constrained these ideas. Agricultural aspirations collided with the cold. The presence of gold and other minerals justified formation of a toxic "landscape of exposure." Northern geography and climate shaped aviators' ideas about the north as a technological frontier. Ecological and cultural circumstances encouraged a view of the north as distinctively vulnerable to contaminants.

One feature that these imagined norths share is that they have been framed in relation to other places. The transformation of the northern landscape into commodities has been the most obvious relation, but there have been others, as well. Antimodernist ideals led some to view the north in terms of what southern Canada was not: a relic of the past, and a place to retreat from the modern world. Aviators described the northern environment as exceptional, implying a need to adapt technology accordingly. Military strategists located the north as a strategic space between Cold War superpowers—geographically distinct yet potentially universal. Government officials interpreted economic challenges in the postwar north in terms of underdevelopment—a concept more often applied to what was referred to during that period as the Third World. More recently, the challenge has been to imagine a north on its own terms, responding to aspirations and opportunities framed within the region itself.

Doing Northern Environmental History

Finally, we can see throughout this volume how these encounters have encouraged distinctive ways of doing environmental history. This includes acknowledging the nature of northern environmental change, which, though part of a larger history of global change, has distinctive physical and social features. These features imply a need to understand northern historical relationships in terms of the experience and perspectives of northerners themselves, especially Indigenous people, drawing on distinctive approaches to place and history, nature and culture. One way is that of exploring, as Carlson describes, the ecology of stories that embodies the ties between personal history and the history of a place. This also implies distinctive challenges. Forming relationships with Indigenous communities can take a great deal of time, which can be difficult for scholars with limited time and budgets. Environmental historians must also be aware of Indigenous rights, identities, knowledge, and community realities, and consider critically their role in representing the stories of others.

However, these chapters also illustrate numerous points of contact between environmental history in the north and elsewhere. A comparative approach can challenge assumptions of northern exceptionalism by

identifying features shared by the north and other regions, such as the specific structural relationships between remote regions and centres of power.[1] Useful comparisons can also be made with other regions where resource exploitation imposed from the outside has reshaped lives. Struggles in the north between dominant institutions and Indigenous people over knowledge and authority can be compared with similar struggles elsewhere in the circumpolar region, or with other places with colonial histories, or wherever Indigenous people have faced pressures to adapt to or participate in development. A history of contentious relations between colonial officials and Indigenous people over land and wildlife has been seen in many other countries, even as these have assumed a distinctive character in the north. The gendered dimensions of food and contaminants, and the relation between human health and the health of the northern environment, suggest other opportunities for comparison with histories elsewhere.[2]

This volume has also demonstrated the value of an interdisciplinary perspective on environmental history, drawing on the work of historians, geographers, anthropologists, and scientists, as well as on perspectives formed by scholars elsewhere. Knowledge of how technology embodies power places the DEW Line into perspective. Political ecology provides insights into the global context of local environmental changes, such as those caused by the James Bay dams and other developments. Our understanding of the history of northern science has been informed by work elsewhere on the history of the field sciences, including the relations between expert and vernacular knowledge and the practice of natural history surveys.[3] The "envirotechnical" perspective, combining environmental history and the history of technology, illuminates the evolving relations between airplanes and the northern environment. Concepts of territoriality—how people and their actions are administered through the control of space—have guided our exploration of co-management regimes. Regimes of perceptibility and evolving views of the linkages between the health of environments and of bodies have been applied to the history of northern contaminants. Northern environmental history also draws on our understanding of the social and political dimensions of food, and its role in the relationships between bodies and environments.

This book began with the ice blink, symbolizing the encounters between people and nature that have shaped northern history, and the

challenge of navigating this region and its history as it undergoes rapid change. Today, northern change is often taken to mean climate change. This is understandable, given the capacity of warming to transform sea and land—a reality already apparent in record losses of sea ice, with consequences for people and polar bears alike. But as our authors have shown, change in the north has taken many forms, driven not just by environmental transformation, but through the agency of Indigenous peoples and newcomers using varied technologies and guided by their experience and knowledge. Through this richer understanding of the nature of change, northern environmental history can provide an essential perspective on contemporary northern issues, and on the future of the region.

Notes

1 Kenneth Coates, "The Discovery of the North: Towards a Conceptual Framework for the Study of Northern/Remote Regions," *Northern Review* 12–13 (1993–94): 15–43.

2 Gregg Mitman, *Breathing Space: How Allergies Shape Our Lives and Landscapes* (New Haven: Yale University Press, 2007); Linda Nash, *Inescapable Ecologies: A History of Environment, Disease, and Knowledge*(Berkeley: University of California Press, 2007).

3 See, for example, Robert E. Kohler, *All Creatures: Naturalists, Collectors, and Biodiversity, 1850–1950* (Princeton: Princeton University Press, 2006).