ENVIRONMENTAL KNOWLEDGE, ENVIRONMENTAL POLITICS

Case Studies from Canada and Western Europe

Edited by

Jonathan Clapperton
Liza Piper

Transformations in Environment and Society

2016 / 4

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Introduction

As we write, in early December 2015, the UN Climate Change Conference in Paris has just ended. At the heart of the gathering of politicians, industry representatives, and activists was a debate over how best to prevent global self-immolation due to the consumption of fossil fuels. World leaders at the event got the most press, and they signed the resulting agreement. A *Guardian* headline heralded this moment as "the end of the fossil fuel era." But this shift could not have come about without the mass of scientists and activists determined to keep the issue of climate change at the top of the international political agenda, while simultaneously working to discredit alternative environmental knowledge that has suggested in myriad ways that what we see and feel all around us—a changing climate—is somehow a myth or a conspiracy. Convincing governments of the importance of addressing climate change has not been easy, nor is the Paris Agreement the end of the struggle. For at the same time, as we write this introduction, the world, it seems, is enthralled by the United States' Republican presidential nomination race, wherein (to date, and to the best of our knowledge) none of the top contenders have agreed that climate change is real, or that doing anything about it will lead to positive change. Indeed, as the Paris Climate Change Conference proceeded, the media was rife with commentary demonstrating that numerically modest, but nonetheless influential, populations in North America, Europe, and beyond—often directly supported by the fossil fuel industry—are deploying ecological knowledge that challenges the research, models, and empirical observations of the majority of the world's climate scientists and environmental activists, and even much of the public at large.

Determining whose environmental knowledge and whose environmental politics are legitimate or illegitimate, and in what contexts, along with the actual construction of such knowledge and how it has been deployed in the past through to the present, are the key themes that run through this issue. Using different disciplinary methodological and theoretical approaches, each paper considers a number of questions: How is environmental knowledge acquired and mobilized? Who benefits from this mobilization and who is disadvantaged by it? How is such environmental knowledge contested, subverted, or rejected? What power structures are revealed when thinking through these questions? What are the ecological consequences?

The first three papers, by Jonathan Clapperton, Hereward Longley, and co-authors John Sandlos and Arn Keeling, address Indigenous and non-Indigenous constructions of environmental knowledge, and how such knowledge becomes politicized. On 6 December 2015, Indigenous peoples from around the globe paddled down the river Seine in France, while others stood on a bridge holding banners, to draw attention to the importance of ensuring Indigenous rights were included in a finalized UN climate pact (Indigenous rights initially appeared in the text of the Paris Agreement, which would have been legally binding and therefore, theoretically, enforceable, but they were moved to a non-binding preamble following pressure from the United States, the European Union, and Australia, among others). Tom Goldtooth, executive director of the Indigenous Environmental Network, argued that Indigenous peoples are "on the front lines of the impacts of climate change and the innovators of solutions we need to stabilize our climate."[1] Assembly of First Nations National Chief Perry Bellegarde similarly stated, "Our [Indigenous] rights must be respected and protected. States must understand that giving life to Indigenous rights is the most effective way to combat climate change."[2] Both comments speak to broader claims about the value of Indigenous knowledge of, and connections to, the environment, and implicitly suggest that Indigenous ecological knowledge is better than the knowledge that others produce. Clapperton's article engages directly with the scholarship categorizing how Indigenous and "Western" ecological knowledge differ in substance and value. Longley describes how non-Indigenous newcomers to northeastern Alberta, Canada, overlaid Indigenous environmental knowledge with other environmental knowledge principally concerned with deposits of bitumen (oil or tar sands) and other resources, while Sandlos and Keeling examine the history of competing environmental claims made by Indigenous peoples, on the one hand, and industry and government, on the other, over mining pollution—notably from arsenic—in the Canadian North.

The second set of papers—by Nancy Janovicek, Jessica DeWitt, and Marianna Dudley—all reflect on the process of gaining environmental knowledge through labour. It has been accepted without question at the Paris conference that the private sector must

1 Martin Lukacs, "Indigenous Activists Take to Seine River to Protest Axing of Rights from Paris Climate Pact," *The Guardian*, 7 December 2015, accessed 9 December 2015, http://www.theguardian.com/environment/true-north/2015/dec/07/indigenous-activists-take-to-seine-river-to-protest-axing-of-rights-from-paris-climate-pact.

2 Brandi Morin and Jorge Barrera, "'Indigenous Peoples' Cut from Main Text in Draft Global Climate Change Deal," *APTN National News*, 7 December 2015, accessed 9 December 2015, http://aptn.ca/news/2015/12/07/rights-of-indigenous-peoples-cut-from-main-text-of-draft-global-climate-change-agreement/.

play a role in reducing our carbon emissions, and ecological damage more generally, through "clean economy investments." Both Janovicek and DeWitt analyze cases of business owners seeking to exert influence in environmentally responsible ventures; Janovicek reflects on the process and politics of knowledge dissemination from the 1960s and 1970s generation of back-to-the-landers to the present generation of urban eco-hipsters in western Canada, while DeWitt engages with the contested role of private-sector activity in US public parks. Dudley, meanwhile, focuses on getting to "know" riverine ecology—specifically the Severn River, UK—through different means of labour, such as fishing, recreation, and art. In short, these three authors collectively engage in different ways of "knowing" nature through physical labour—quite literally getting one's hands dirty, both for fun and for profit—and the politics embodied in such practice.

Contributions by Henry Trim, Margarida Queirós, and Liza Piper form the third set of papers. These authors present diverse examples from Portugal and Canada, describing the emergence of a local environmentalist consciousness and politics that enabled the search for solutions to environmental problems. In many respects, these papers frame the issues that confront nations as they leave Paris: having agreed that there is a pressing environmental problem that must be addressed, the nations that signed the agreement have embraced a new international consciousness of anthropogenic climate change. Now the politics of achieving the goals set out in the agreement begins. Or, to be more accurate, the international politics involved in implementing the agreement meets the local politics that has already been shaping both alternatives to fossil fuels and grassroots responses to a changing world for many years. The three papers here historicize this process in the context of the environmental problems created by the need for alternative energy sources in Prince Edward Island, the desire to protect and preserve valued ecosystems in Portugal, and strip mining for coal in Alberta. They also highlight the different paths that the search for solutions can take. Trim examines the role of a green development project and the belief in technology as an ecological "fix" in the small Canadian province of Prince Edward Island. Queirós explores the factors shaping the slow rise of environmental politics in Portugal over the past century, where cooperation and competing knowledge acted as brakes against more aggressive environmentalist action. Finally, Piper considers a grassroots provincial environmental consciousness in Alberta in the 1970s that collided with a growing coal mining industry. From this collision came a compromise that saw land reclamation as the salve that would permit the continued expansion of the coal industry, notwithstanding its manifold ecological ills—at least until the rise of new environmental politics in 2015.

The idea for putting this collection together was first envisioned at a three-day interdisciplinary workshop titled "Environmentalism from Below: Appraising the Efficacy of Small-Scale and Subaltern Environmentalist Organizations," held in Edmonton, Alberta, in August 2014. Although narratives of decline are prevalent in environmental history—and, indeed, in modern society generally—one of the themes that emerged from this workshop was that this is not the whole story. We read papers and heard from presenters who provided numerous success stories and were (cautiously) optimistic for our collective environmental futures. Accordingly, the papers chosen for this issue of *Perspectives* were chosen to reflect—and reflect on—this fairly hopeful trend, such as Piper's observation of the end of coal-fired power plants in Alberta in the foreseeable future, the growth of politically active urban food activism as detailed in Janovicek's paper, or, as Keeling and Sandlos describe, the ability of Indigenous communities in the North to effectively mobilize support at multiple geographical scales. Additionally, the articles in this issue form one of two outlets, designed to complement each other, for the discussions held at the workshop; the other is a collection of essays in a forthcoming edited book. We are grateful for the financial and in-kind support of the Rachel Carson Center, the Network in Canadian History and Environment, the Social Sciences and Humanities Research Council of Canada, and the Killam Trusts, the Faculty of Arts, and the departments of History & Classics and Sociology at the University of Alberta.

Jonathan Clapperton

Indigenous Ecological Knowledge and the Politics of Postcolonial Writing

Environmental sustainability and human relationships with the natural world have been dominant topics within the international political and cultural landscape in the last few decades. Everyone, it seems, has an opinion on this subject, and each person bases her or his argument on a range of both academic and non-academic authorities. For scholars, evaluating these contesting discourses is never easy; it is made even more difficult when Indigenous peoples and the politics of (post)colonialism are involved. Academics, as well as the lay public, must negotiate knowledge situated within cultures that can sometimes seem vastly different from their own, and that can sometimes deviate from commonly held beliefs about the natural world. Consequently, a number of important methodological and theoretical questions arise. How does a scholar, as an authority in her or his own right, decide between competing Indigenous and non-Indigenous interpretations of the environment? What are the consequences of making those decisions? What role does culture play in our assumptions about environmental knowledge? To what extent do historians themselves shape the larger narrative? How do these narratives benefit or disadvantage the peoples they are about?

In an attempt to begin a discussion around these questions, I examine the different narrative arcs that measure Indigenous and non-Indigenous claims to know the environment, as trodden by scholars and activists. I also use my own work with an Indigenous community in Canada, the Tla'amin First Nation, to evaluate the effectiveness of these various narrative frameworks. I demonstrate that the Tla'amin's history can adequately fit within a multitude of quite different—even oppositional—narrative structures, each with its own advantages. However, I also suggest that a commonality across these frameworks is that they rely on salvage conceptions of Indigenous knowledge and culture, which constrains Indigenous peoples' identities and political power. That is, there is a prominent tendency to restrict Indigenous knowledge of the environment by emphasizing an authenticity that is devoid of scientific knowledge. I end my discussion by suggesting that this binary is much more porous than commonly portrayed. But rather than merely dismissing the existing frameworks, which all have their merits and which all seek to empower Indigenous peoples, they need only be infused with some theoretical tools used in other areas of culture studies.

The first narrative framework for judging Indigenous and non-Indigenous claims to environmental authority is to argue that Indigenous ecological knowledge is structurally superior to Western scientific knowledge. This position is defended in a number of ways. "Science"[1] is likened to a religion rather than an academic discipline, and in particular to one that has maintained power through domination, intimidation, and gatekeeping, not through any real claim to better know an objective, material reality. Indigenous knowledge, in contrast, is described as holistic and as a means of empowerment through various cultural processes, such as maintaining the integrity of oral traditions and designating individuals as keepers of specialized and sacred information for the well-being of the community, both the living and the ancestors. Indigenous knowledge of the environment is also deemed superior because cutting-edge science has only recently "discovered" environmental facts that Indigenous people have long known—such as the curative properties of certain plants, or the interconnectedness among species—but which were, until recently, suppressed by Western authorities as either superstitions or evidence of primitivism. Finally, Indigenous knowledge is considered superior because, unlike Western science, it does not impose itself onto other ways of "seeing" the world and allows for many other modes of knowledge to exist alongside it. According to this framework, this furthers, rather than constrains, our overall understanding of the world around us.[2]

This position fragments the hegemonic hold scientific knowledge has maintained over other forms of knowledge in the West, reveals scientists as integral actors in colonial projects, and reaffirms the authority of local, Indigenous knowledge. Moreover, this framework could certainly be applied to the Tla'amin's history. They have suffered from—and continue to be subjected to—environmental colonialism, whereby federal, provincial and municipal governments use environmental science to "manage" resources such as fisheries and forests in Tla'amin traditional territory, often without their consent or participation. Environmental scientists working for Canada's Department of Fisheries and Oceans (DFO),

1 While "science," or even "Western science," is certainly not unified, in this framework the binary between science and Indigenous knowledge works to reify each.

2 See for examples Marie Battiste and James (Sa'ke'j) Henderson, *Protecting Indigenous Knowledge and Heritage: A Global Challenge* (Saskatoon, SK: Purich Publishing, 2000); Vine Deloria Jr. and Gregory Cajete, "Western Science and the Loss of Natural Creativity," in *Unlearning the Language of Conquest: Scholars Expose the Anti-Indianism in America*, ed. Wahinkpe Topa (Four Arrows) a.k.a Don Trent Jacobs (Austin: University of Texas Press, 2006), 247–59; George J. Sefa Dei, Budd L. Hall, and Dorothy Goldin Rosenberg, "Introduction," in *Indigenous Knowledges in Global Contexts: Multiple Readings of Our World* (Toronto: University of Toronto Press, 2000); Jerry Mander, *In the Absence of the Sacred: The Failure of Technology & the Survival of the Indian Nations* (San Francisco: Sierra Club Books, 1992); and Rik Scarce, *Fishy Business: Salmon, Biology, and the Social Construction of Nature* (Philadelphia: Temple University Press, 2000).

among other ministries, have also seriously misread environmental warning signs which the Tla'amin have noted, such as the damage industrial fishing causes to fish stocks. At the same time as this framework deconstructs and empowers, however, it has drawbacks. Notably, it leans towards a one-dimensional view of Indigenous identity in which Indigenous peoples are romanticized as all-knowing ecologists. Shepard Krech, among many others, has pointed out the problems with this stereotype, while the Tla'amin acknowledge that they too can misread and mismanage the environment. Furthermore, while this view recognizes the power imbalances between Indigenous people and Westerners, it does not do the same for power imbalances within Indigenous communities.

The second narrative framework, often labeled "knowledge integration," essentially involves intertwining Indigenous and scientific knowledge to create a more complete and accurate understanding of the environment.[3] Indigenous and scientific knowledge are thus used to corroborate and interrogate each other. Further, "knowledge integration" prescribes that while Indigenous and scientific explanations may sound quite different, they often actually refer to the same processes but are conceptualized using different metaphors. For example, Indigenous claims to kinship with the natural world can be thought of as similar to recent data from the Human Genome Project, which has found that humans share an incredible number of identical genes with animals and plants.

"Knowledge integration" is particularly important because it is the discourse that dominates co-management agreements between Indigenous peoples and government environmental agencies or university researchers in North America; it is also the position that environmentalists most often espouse. Proponents of this view argue that the framework increases Indigenous peoples' control over their traditional territories and provides opportunities for economic growth and the cultural reconstruction of knowledge that has been lost or suppressed through colonialism. Again, the Tla'amin First Nation could be situated within this narrative without much effort. For example, Tla'amin elders and individuals at the treaty and band offices have been heavily involved in the co-management

3 Scholars who subscribe to "knowledge integration" from a variety of perspectives include: Peter Knudtson and David Suzuki, *Wisdom of the Elders: Native and Scientific Ways of Knowing about Nature* (Vancouver: Greystone Books, 2006); Nancy J. Turner, *The Earth's Blanket: Traditional Teachings for Sustainable Living* (Seattle: University of Washington Press, 2005); Bronislaw Malinowski, *Magic, Science, and Religion and Other Essays* (Garden City, NY: Doubleday Anchor Books, 1954); Bryan McKinley Jones Brayboy and Angelina E. Castagno, "How Might Native Science Inform 'Informal Science Learning,'" *Cultural Studies of Science Education* 3 (2008): 731–50; Milton M. R. Freeman, "The Nature and Utility of Traditional Ecological Knowledge," in *Consuming Canada: Readings in Environmental History*, ed. Chad Gaffield and Pam Gaffield (Toronto: Copp Clark, 1995), 39–46.

of recreational park areas, where they have succeeded in protecting important cultural and ecological sites that have been overlooked by non-Indigenous park managers. The Tla'amin have also established partnerships with archaeologists, combining the resulting scientific data with their oral traditions to strengthen their position in treaty negotiations, or to legally protect certain places from commercial or residential development.

Yet there is an inequality in the "knowledge integration" paradigm in that the Indigenous discourse of traditional ecological knowledge (TEK) is recognized as inherently political (which it is), but scientific discourse is portrayed as objective (which it is not). Consequently, not all scholars agree that the integration approach is useful for Indigenous people. Anthropologist Paul Nadasdy writes, "Knowledge integration takes for granted existing power relations between Aboriginals and state by assuming that [TEK] is simply a new form of 'data' to be incorporated into existing management bureaucracies and acted upon by scientists and resource managers."[4] Furthermore, environmental scientists generally only accept Indigenous knowledge as valid if it can be corroborated by scientific data. In other words, science—and by extension usually the non-Indigenous government structure—is still the final authority when it comes to interpreting, and making decisions about managing, the environment. Indeed, many Tla'amin individuals have complained about these very inequalities and how they shape an ongoing colonial hierarchy. Critics further contend that even if these structural imbalances were solved, there remains no agreement on how, or even if, Indigenous knowledge can be effectively used and integrated with modern science. It is this last criticism of incommensurability that forms the core of the third framework.

The third and final narrative contends that environmental science and Indigenous knowledge are incommensurable. One can neither mesh together knowledge structures that originate within two very different cultural contexts, nor judge them by the other's standards.[5] Any attempt to do so will only result in the continuation of colonialism and

4 Paul Nadasdy, *Hunters and Bureaucrats: Power, Knowledge, and Aboriginal-State Relations in the Southwest Yukon* (Vancouver: University of British Columbia Press, 2003), 25. See also Julie Cruikshank, *Do Glaciers Listen: Local Knowledge, Colonial Encounters, and Social Imagination* (Vancouver: University of British Columbia Press, 2005), 257.

5 See for examples: Nadasdy, *Hunters and Bureaucrats*; Leanne R. Simpson, "The Construction of Traditional Ecological Knowledge: Issues, Implications and Insights," (PhD Diss., University of Manitoba, 1999); Charbel Niño El-Hani and Fábio Pedro Souza de Ferreira Bandeira, "Valuing Indigenous Knowledge: To Call It 'Science' Will Not Help," *Cultural Studies of Science Education* 3 (2008): 751–79. Interestingly, none of these authors discuss the concept of incommensurability as used by Jean-Francois Lyotard in his notion of the *differend*, where a dispute arises when each party employs a form of language (or discourse) incommensurable with the other, and where such a dispute is irresolvable except that one party can use its greater power to enforce its will on the other.

the growth of the settler-colonial state at the expense of Indigenous cultures. Instead, the only apt solution is to give Indigenous peoples total authority over the environment—and thus over its narrative—within their traditional territories. This is not because Indigenous knowledge is inherently superior or more accurate, but because it is the morally and politically superior outcome. This position thus asks us to base environmental authority upon postcolonial principles.

There are certainly Tla'amin individuals who feel that their people should have full control over their traditional territory. These individuals further state that certain non-Tla'amin government mechanisms of control—such as environmental policies—cause them extra work and headaches when they already have their own systems of environmental resource management that work just as well as, if not better than, those of outsider bureaucracies. There are also some who have mentioned that government environmental agencies have forced them to exist in boxes that constrict and delegitimize Tla'amin culture. Furthermore, many have expressed a great concern about opening the community to outside researchers, including me, for fear that the information gathered would be used inappropriately in ways that would harm the community.

Nonetheless, the narrative of incommensurability is entangled in an essentialist, salvage, and romantic view of Indigenous identity, one that ahistorically rejects the process of transculturation whereby Indigenous people have increasingly adopted and learned "science." It also ignores the fact that Indigenous people themselves have chosen to redeploy science for their own anti-colonial purposes. In my research I have not come across anyone espousing the view that combining scientific methods with traditional knowledge is inherently problematic—only that doing so has often been implemented in incorrect or disempowering, colonizing ways. In fact, I found that this attempted integration is a common and accepted occurrence, and the Tla'amin use any available evidence to bolster their authority when it comes to dealing with the government and outsiders, or those within the community.

Overall, the three narratives outlined above, which seek to address the dilemma of how to write about and conceptualize competing interpretations of the environment, all have many strengths; moreover, each could be applied to the Tla'amin First Nation or myriad other Indigenous communities. But I would like to end my discussion by suggesting a means of framing this debate that engages with the tightly intertwined issues of historical interpretation, authority over the environment, and Indigenous cultural identity.

In all the above discussions about Indigenous knowledge and the environment, scholars overtly or covertly trace rigid boundaries between Indigenous and Western ways of knowing. Consequently, those Indigenous people who actually cross these boundaries rarely, if ever, receive much attention if they are "doing" science. Yet, in my discussions with Tla'amin individuals and forays into the archives, there are many instances where Tla'amin members have crossed this Indigenous-scientific boundary and do so on a regular—indeed, daily—basis. This is most apparent at the Tla'amin-run fish hatchery, where staff rely solely on "scientific" means of regulating salmon stocks and influence how the DFO operates other hatcheries. This is also the case for independent Tla'amin contractors who conduct land use studies and environmental monitoring activities throughout their traditional territories. Yet none of the above frameworks provide a space for this boundary crossing and creative knowledge production because it is seen as non-Indigenous; in such narratives, it is Westerners who "do" science, though Indigenous peoples sometimes help with data collection, and it is Indigenous peoples who have traditional knowledge of the environment, though Westerners can learn from this. Indeed, the above narratives have focused so much on recovering disempowered knowledge that they have kept the salvage paradigm alive and well.

Researchers and government agents still focus primarily on Indigenous knowledge of the environment that has been passed down for generations, is considered unscientific, has been misunderstood by cultural outsiders, and is in danger of disappearing or being overwhelmed. Though this type of knowledge is incredibly important to Indigenous people and no doubt should be valued, this narrow focus heavily restricts the knowledge over which Indigenous peoples can be considered a prime authority and a creative force, and it is one reason why science's hegemony can hold sway when the "knowledge integration" framework is used, analytically or practically. Instead, what is needed is the recognition of a fluid, rather than a largely static and all-encompassing, definition of Indigenous environmental knowledge—one that views scientific knowledge created by Indigenous peoples as being just as authentic, authoritative, culturally important, and "Indigenous" as other types of knowledge, while still recognizing claims to "traditional" knowledge as legitimate. This idea is partly inspired by Deborah McGregor, who explains that Indigenous knowledge "must be viewed as a circle and as a process of regeneration and re-creation. It must not be constrained by linear thinking."[6]

6 Deborah McGregor, "Coming Full Circle: Indigenous Knowledge, Environment, and Our Future," *American Indian Quarterly* 28, no. 3/4 (Summer/Fall 2004): 404.

In other words, I contend that the umbrella under which we define Indigenous ecological knowledge needs to be significantly enlarged. Doing so would still allow traditional Indigenous ecological knowledge to be esteemed and critiques of colonial disempowerment to exist. But it would also force a reconsideration of the extent to which Indigenous peoples have been involved in influencing, and are primary agents of, knowledge construction typically seen as non-Indigenous. It could also provide Indigenous peoples with another set of discursive tools with which to attack the structure wherein their traditional ecological knowledge is sought, yet their expertise and understanding are often ignored or discredited when they deploy what is regarded as Western scientific, modern, or technical knowledge. Indeed, my experiences with the Tla'amin have shown that they are just as capable of and comfortable working within a scientific paradigm as any other; any narrative that writes them out of this position of authority is necessarily, and at best, incomplete, and at worst serves to entrench a colonial structure.

Suggested Further Reading

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Hereward Longley

Bitumen Exploration and the Southern Re-Inscription of Northeastern Alberta: 1875–1967

The Alberta bitumen deposits are vast deposits of bituminous sand that sprawl across approximately fifty thousand square kilometres of northeastern Alberta. These deposits have become the home of the oil sands (or tar sands) industry, which extracts bitumen to produce synthetic crude oil, currently generating approximately two and a half million barrels per day. The oldest and most intensive extraction operations are in the Athabasca deposit in the Athabasca River Valley, north of Fort McMurray. The area is the homeland of Woodland Cree, Chipewyan Dené, and Métis Indigenous peoples. Since commercial-scale bitumen extraction began in the 1960s, the environmental impacts of the oil sands industry have damaged the landscape and watershed of the Athabasca River Valley and Peace Athabasca Delta. This has caused adverse environmental, socio-cultural, and economic change in Indigenous communities, and has sparked conflict with the Alberta government and with the industry. The impacts of the industry have become mired in politicized debates which invoke competing claims of environmental knowledge. Indigenous peoples are observing major human health and environmental impacts, which they associate with bitumen extraction, while industry and government have contested the validity of claims about the connection between environmental and health impacts and the oil sands industry. These issues can be partly attributed to hybrid geographies of Indigenous and industrial rights and land use that stem from the colonial production of geographic knowledge by early explorers and surveyors for the Dominion government.

Although the oil sands industry only began commercially producing synthetic oil from the Athabasca bitumen deposits in 1967, the impact of colonial knowledge of these bitumen deposits had re-imagined and reshaped the region long before bitumen became a profitable commodity. Examining the work of the Geological Survey and the Department of Mines between 1875 and 1945 in northeastern Alberta reveals a process of cartographic colonization that produced a resource-based geographic appraisal of the region. This emphasized the Athabasca bitumen deposits and marginalized the Indigenous landscape of the Athabasca region.[1]

1 Gavin Bridge, "Resource Triumphalism: Postindustrial Narratives of Primary Commodity Production," *Environment and Planning* 33 (2001): 2149–73.

The region's Cree and Chipewyan inhabitants have known about the Athabasca bitumen deposits since their settlement in the area. European settlers have been widely aware of the deposits since they were described in 1789 by the Scottish explorer Alexander Mackenzie who conducted an exploration mission seeking a passage across North America on behalf of the fur-trading North West Company.[2] With the Rupert's Land transfer in 1870, the Dominion of Canada purchased the Athabasca region from the Hudson's Bay Company. The Hudson's Bay Company had been given Rupert's Land, which consisted of all the land and rivers of the Hudson Bay watershed, in 1670 by King Charles II of England to create a fur trade monopoly. Following Canadian Confederation in 1867, the Canadian government initially had very little interest in the Athabasca district and repeatedly refused to acknowledge any responsibility for the well-being of Indigenous peoples in the region.

The increasing importance of petroleum and the government's growing knowledge of the Athabasca bitumen deposits fostered a desire for the region's mineral rights, which contributed to the Canadian government's motivation to sign Treaty 8 with the region's Indigenous peoples. In the early 1880s reports from the Geological and Natural History Survey of Canada, such as that of Robert Bell in 1882–83, repeatedly mentioned the abundance of hydrocarbons in the Athabasca River Valley. In historian René Fumoleau's words, the notion that the North was "floating" on oil was born.[3] In 1888 Robert McConnell verified Bell's report. He wrote, "The Devonian rocks throughout the Mackenzie Valley are everywhere more or less petroliferous and over large areas afford promising indications of the presence of oil in workable quantities."[4] The news of such reserves of oil drastically changed southern imaginings of the Northwest, and made the expense and obligation of a treaty with the region's Indigenous peoples look minimal.[5] In 1891 the Privy Council outlined the importance of securing a treaty:

2 Patricia A. McCormack, *Fort Chipewyan and the Shaping of Canadian History, 1788–1920s: "We Like to Be Free in This Country"* (Vancouver: University of British Columbia Press, 2010).

3 Robert Bell, *Report on Part of the Basin of the Athabasca River, North-West Territory*, Geological and Natural History Survey of Canada (Montreal: Dawson Brothers, 1884), cited in René Fumoleau, *As Long as This Land Shall Last: A History of Treaty 8 and Treaty 11, 1870–1939* (Calgary: University of Calgary Press, 2004), 24.

4 Robert G. McConnell, *Report on an Exploration in the Yukon and the Mackenzie Basins, N.W.T.*, Geological and Natural History Survey of Canada, Annual Report, 1888–89 (Montreal: William Foster Brown and Co., 1890), cited in Fumoleau, *As Long as This Land Shall Last: A History of Treaty 8 and Treaty 11, 1870–1939*, 25.

5 Fumoleau, *As Long as This Land Shall Last: A History of Treaty 8 and Treaty 11, 1870–1939*, 27.

> The discovery in the District of Athabaska and in the MacKenzie River Country, that immense quantities of petroleum exist within certain areas of those regions, as well as the belief that other minerals and substances of economic value … are to be found therein, the development of which may add materially to the public wealth, and the further consideration that several Railway projects, in connection with this portion of the Dominion, may be given effect to at no such remote date as might be supposed, appear to render it advisable that a treaty or treaties should be made with the Indians who claim those regions as their hunting grounds, with a view to the extinguishment of the Indian title in such portions of the same, as it may be considered in the interest of the public to open up for settlement.[6]

From the perspective of the federal government, by signing Treaty 8 in 1899, Indigenous signatories gave up their rights to the land in exchange for hunting rights, reserve lands, and various other benefits. Indigenous land was overlaid with a narrative and vision of industrialization, bountiful supplies of petroleum, and massive accumulations of wealth: a vision that excluded the Indigenous communities of the region.

In the early twentieth century, Canada imported over 90 percent of its petroleum. The country's dependence on imports and the increasing importance of the commodity impelled the Dominion government to seek out domestic supplies. During this time, Sidney C. Ells's work as the Athabasca representative of the federal Department of Mines reshaped and colonized the Athabasca region by producing maps, images, and descriptions of the region that defined it exclusively in relation to bitumen, a commodity that could potentially be exploited to replace imported petroleum. Between 1913 and 1945, Ells conducted exploration, surveying, prospecting, documentation, photography, and process experimentation that widely expanded Euro-Canadian knowledge of the Athabasca region, specifically in terms of bitumen and its potential extraction and value.

In 1910, while working as assistant to the director of the Mines Branch, Ells was tasked with conducting an inquiry into the Athabasca bitumen deposits. While completing the project, he became enthralled by the same 1883 reports from Robert Bell that had prompted the pursuit of Treaty 8.[7] In the spring of 1913, Ells loaded up a

6 Government of Canada, Privy Council Report, 1891, cited in Fumoleau, *As Long as This Land Shall Last: A History of Treaty 8 and Treaty 11, 1870–1939*.

7 Sidney C. Ells, *Recollections of the Development of the Athabasca Oil Sands* (Ottawa: Department of Mines and Technical Surveys, 1962), 2.

30-foot scow at Athabasca Landing with four men and three months of supplies, and floated downstream towards Fort McMurray, the town that would become the gateway to the Alberta oil sands region. That summer, Ells conducted reconnaissance survey missions one hundred miles north of Fort McMurray along the Athabasca River, and one hundred miles down each of the Clearwater, Firebag, and Christina Rivers, none of which had previously been surveyed. He made maps, took extensive notes, and photographed bitumen outcrops. On his return to Ontario, his report of the first trip emphasized the abundance of bitumen and advocated an extensive core drilling program, testing of the material for paving, and research into a separation process with which to produce synthetic crude oil.[8]

Between 1922 and 1923, Ells conducted extensive topographical surveying and surface profiling. The survey covered over two thousand square kilometres and focused on the general classification of bituminous sand areas, based mainly on outcrops along various streams and grouped according to possible commercial value, thickness, and character of overburden,[9] the difficulties associated with overburden removal, and the apparent quality and estimated quantity of sand available.[10] Later surveys and prospecting in the region have expanded the map of mineable bituminous sand deposits, but all of Ells's findings have held true. He specifically highlighted the importance of the Mildred-Ruth Lakes area. The Syncrude Mildred Lake project is the largest mine in the region, and one of the largest in the world. It has been active since 1987 and is expected to produce bitumen beyond 2025.

By mapping the region specifically for the location of bitumen deposits, Ells obscured the history of the region's Indigenous people. His maps make no mention of settlements, traplines, and trails relied on by Indigenous peoples for subsistence hunting, gathering, and trapping activities. In his mapping process he renamed features himself, such as naming Patterson and Forrest Lakes after two of his canoemen. Ells's reports also indicated the potential for the oil sands region to provide other economically valuable natural resources, including waterfowl and grouse, fur bearers, and big game, thereby advocating the southern exploitation of Indigenous subsistence resources.[11] Ells conducted

8 Fumoleau, *As Long as This Land Shall Last: A History of Treaty 8 and Treaty 11, 1870–1939*, 14.
9 Overburden is the industry term for the material (rock, soil, trees, etc.) that lies above the mineable bitumen deposits.
10 Ells, *Recollections of the Development of the Athabasca Oil Sands*, 59.
11 Fumoleau, *As Long as This Land Shall Last: A History of Treaty 8 and Treaty 11, 1870–1939*, 55.

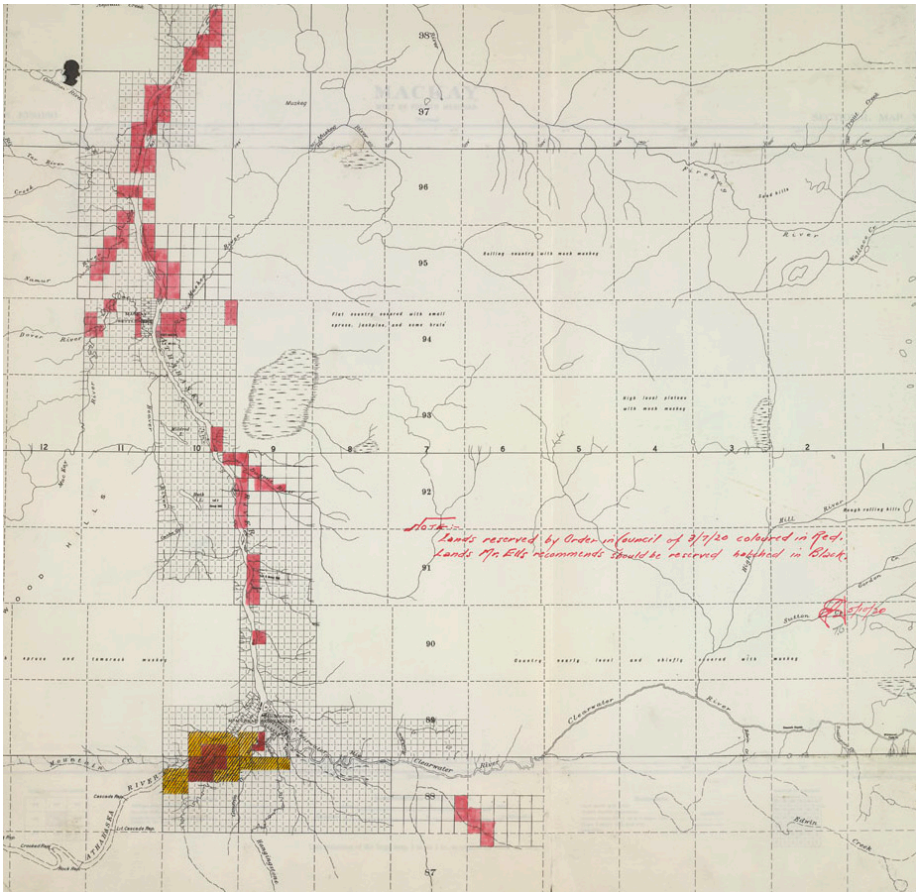

Figure 1:
Northern Affairs Program, "Lands reserved by Order in Council of 2/7/20 coloured in Red. Lands Mr. Ells recommends reserved hatched in Black." (5 October 1920), Regulation file for tar sand - Star, Spence, Cooper and Fraser - Dom. [Dominion] Land agent, Edmonton - Mines Department - McMurray tar sands - Thomas Drapeu, J. J. Rinner – General, Source: Library and Archives Canada/Department of Indian Affairs and Northern Development fonds/ e010783388

further surveying and exploration, and some limited drilling in 1931, which constituted some of the only significant geological surveying before his 1942–47 survey of 6,500 square kilometres south of Lake Athabasca.

Ells recommended to the Dominion government that some of the richest bitumen deposits in the region be set aside as bitumen leases. These deposits were reserved for resource development by order-in-council in October 1920 (figure 1). The government of Canada thus removed these lands as possible selections for Indigenous reserves that were promised under Treaty 8 and were at that time still unsettled, despite calls from Indigenous communities for the settlement of Canada's treaty obligations beginning in the mid-1920s.

Under the 1930 Natural Resources Transfer Agreement, resource ownership was transferred from the federal government to the Prairie provinces (the other Canadian provinces already owned their own resources), a change that further complicated the settlement of treaty obligations. Treaty land entitlement settlements in the Athabasca region of Treaty 8 did not begin until the 1980s, and many are still before the courts.

The efforts of Sidney Ells are far more significant for their contribution to colonizing the region by re-imagining place in the southern mind than they were for any tangible accomplishment. Many attempts to exploit bitumen resources were short-lived. The International Bitumen Company, which had produced pavement, succumbed to the Depression and closed its doors in 1930. Towards the end of the Second World War, extensive efforts to produce synthetic crude oil at the Abasand plant came to a halt when the facility burnt to the ground in 1945. After Ells retired in 1945, the discovery of billions of barrels of conventional oil at Leduc and Redwater near Edmonton in 1947 sidelined major oil sands development efforts until the late 1960s. But recalling over 30 years of work in northeastern Alberta in 1962, Ells reaffirmed his vision for the oil sands region:

> In 1913 a great and potentially valuable natural resource in the northern part of the province of Alberta lay dormant and unknown while even the surface of the country was unsurveyed. Yet as a result of investigations in the field and in the laboratory, the outcome may ultimately be reflected in important commercial development. Where now the almost unbroken wilderness holds sway, industrial plants may arise and tall stacks dominate the landscape. Few will then pause to consider what these developments represent, but success will be the reward of those who had a part in the undertaking.[12]

As the scale of the deposits was realized, the oil sands region was conceptualized in Alberta and southern Canada as an industrial heartland of oil production, wealth, and sustenance, rather than a faceless resource extraction zone. Using Treaty 8 as its legal basis, along with the knowledge gleaned from cartographic, visual, and narrative reports from people like Ells, southern Canada colonized the oil sands region, gaining political control and exploiting it for economic gain.

12 Ells, *Recollections of the Development of the Athabasca Oil Sands*, 100.

Although the work of Ells contributed to a new cognitive geography of resource extraction in the Athabasca River Valley, the process of resource colonialism has remained incomplete and Indigenous geographies have prevailed. Competing and conflicting geographies of traditional and industrial land use rights overlay and intertwine with each other, and have made the Athabasca region a contested space in which political struggles over environmental impacts have become struggles between local Indigenous knowledge of the Athabasca environment, and industry and state conceptions of the region as a resource extraction zone.

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John Sandlos and Arn Keeling

Pollution, Local Activism, and the Politics of Development in the Canadian North

Once considered pristine and untouched wilderness lands, northern Canada is now more commonly regarded as an area threatened by environmental changes ranging from climate change to acid rain to nuclear fallout. The discovery of toxic contaminants in the northern environment and in the bodies of Indigenous northerners in the 1980s illustrated what is known as the "Arctic Paradox": the region is remote from most modern industry, yet distant sources of persistent organic pollutants (POPs) and other chemical and radiological hazards represent a persistent health and environmental threat.[1] Such widespread pollution in the Arctic environment (and by extension in Inuit food sources) through the long-range transport of POPs captured the attention of policy makers and the media, and galvanized Inuit activists to lobby for the 2001 Stockholm Convention that banned the 19 worst of these pollutants.[2] Indigenous advocates displayed a remarkable ability not only to mobilize concern and influence at the local community level, but also to work at the national and international level through organizations such as the Inuit Circumpolar Council (ICC).[3]

Less well-known, however, is the longer history of community activism against local sources of pollution and industrial development undertaken by Indigenous and community activists in northern Canada, dating back to at least the 1960s. Pollution was the key environmental issue for the wave of environmental consciousness that swept North America in the 1960s and 1970s.[4] Whether pesticides, smokestack emissions, smog, or water pollution, toxic contaminants and their effects on local populations inspired environmental activism and eventually spawned a broad social movement for environmental justice.[5] While often associated with urban and industrial environ-

1 Marla Cone, *Silent Snow: The Slow Poisoning of the Arctic* (New York: Grove Press, 2005).
2 Terry Fenge and David Leonard Downie, eds., *Northern Lights Against POPs: Combatting Toxic Threats in the Arctic* (McGill-Queen's University Press, 2003).
3 Sheila Watt-Cloutier, *The Right to Be Cold: One Woman's Story of Protecting Her Culture, the Arctic, and the Whole Planet* (Toronto: Allen Lane, 2015).
4 Adam Rome, "'Give Earth a Chance': The Environmental Movement and the Sixties," *Journal of American History* 90, no. 2 (2003): 525–54; and Laurel Sefton-McDowell, "The Environmental Movement and Public Policy," in *An Environmental History of Canada* (Vancouver: University of British Columbia Press, 2012), 243–67.
5 Luke Cole, *From the Ground Up: Environmental Racism and the Rise of the Environmental Justice Movement* (New York: New York University Press, 2000); and Michael Egan, "Subaltern Environmentalism in the United States: A Historiographic Review," *Environment and History* 8 (2002): 21–41.

mental issues, pollution fears also contributed to controversies over industrial developments in the north, such as the Mackenzie Valley Pipeline Inquiry and the Cyprus Anvil Mine.[6]

The issue of arsenic pollution at Giant Mine near Yellowknife, Northwest Territories (NWT), constitutes one of the earliest and most dramatic cases of communities mobilizing knowledge in response to environmental contamination in northern Canada. Opened in 1948, Giant Mine began a year later to emit large amounts of highly toxic arsenic trioxide dust into the atmosphere and water surrounding Yellowknife (figure 1). The small Dene (Indigenous) communities adjacent to the mine were particularly vulnerable to this pollution, as they relied on snowmelt—wherein arsenic readily accumulated over the long northern winter—for drinking water. In the spring of 1951 a small child died of acute gastroenteritis due to arsenic poisoning and the Indian Agent reported illness as widespread, with several people being hospitalized with unspecified medical conditions. Yellowknives Dene elders claim that several other children and elders died due to arsenic poisoning. Some action was taken at this time: pollution control equipment installed at the mine reduced the arsenic load in the atmosphere, the federal government conducted health studies, and municipal authorities began to truck water to the Dene community on Latham Island—for a fee—much to the exasperation of local residents, who resented the loss of local water sources and could ill afford the cost.[7]

In spite of these actions, arsenic continued to be released into the atmosphere from the mine's stack, and intermittent study of the arsenic issue proceeded in the 1950s and 1960s. Non-Indigenous Yellowknife residents and Indigenous people alike were keenly interested in the results of the most intensive research study to date, conducted by

6 Thomas Berger, *Northern Frontier, Northern Homeland: The Report of the Mackenzie Valley Pipeline Inquiry,* vol. 1 (Ottawa: Supply and Services Canada, 1977); Robert Page, *Northern Development: The Canadian Dilemma.* (Toronto: McClelland and Stewart, 1986); Paul Sabin, "Voices From the Hydrocarbon Frontier: Canada's Mackenzie Valley Pipeline Inquiry (1974–1977)," *Environmental History Review* 19, no. 1 (1995): 17–48; and Janet E. McPherson, "The Cyprus Anvil Mine," *in Northern Resource and Land Use Study*, vol. 1 of *Northern Transitions*, ed. Everett B. Peterson and Janet B. Wright (Ottawa: Canadian Arctic Resources Committee, 1978), 111–50.

7 See Minutes of Meeting Held to Discuss the Death of Indian Boy, Latham Island, 1 June 1951. RG 29, vol. 2977, file 851-5-2, pt. 1, LAC. Elders' memories of the deaths in the community are recorded in Yellowknives Dene First Nation, *Weledeh Yellowknives Dene: A History*, accessed 25 October 2015, http://www.akaitcho.info/linked/weledeh%20yellowknife%20dene%20history.pdf. For an overview, see John Sandlos and Arn Keeling, "Giant Mine: Historical Summary, Report Submitted to the Mackenzie Valley Environmental Impact Review Board," 12 August 2012, accessed 11 February 2013, http://www.reviewboard.ca/upload/project_document/EA0809-001_Giant_Mine__History_Summary.PDF.

A. J. DeVilliers of the Department of Health and Welfare from 1966 to 1969. Increasingly angry requests for copies of the reports from municipal officials and Dene leaders waited without response for several years. In 1975, the Canadian Broadcasting Company (CBC) radio news show *As it Happens* produced an in-depth documentary on the issue, providing a national forum for local fears about arsenic and ultimately accusing the government (using distinctly Watergate-era language) of covering up links between arsenic and high cancer rates in Yellowknife. The federal Department of Health and Welfare responded to the accusations with a new health study, which concluded that the ill effects of arsenic were confined to the workplace at Giant Mine. As far as the government and the local press were concerned, the new studies proved that the arsenic concerns raised by the CBC were a "scare"—nothing more.[8]

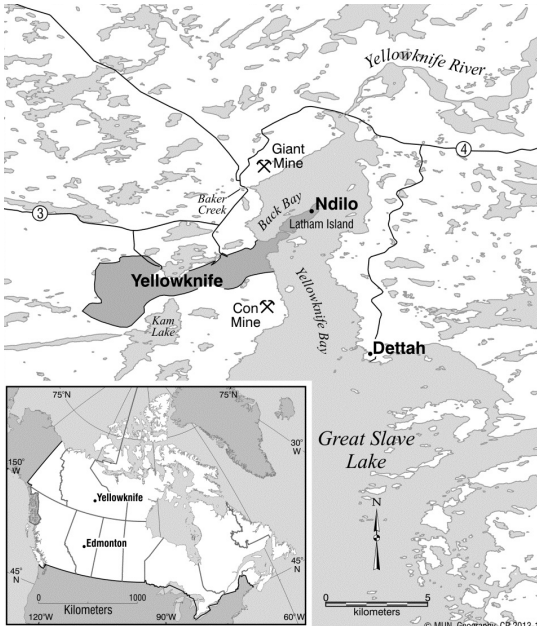

Figure 1:
Location of Giant Mine, the city of Yellowknife, and the adjacent Dene communities of Ndilo and Dettah. Map by Charlie Conway.

The Yellowknives Dene responded to this dismissal of their concerns with public activism and research of their own. Their voices were prominent in the inaugural NWT Water Board hearings in 1974 and 1975, where Giant Mine's water licence application was under review. Yellowknives Chief Joe Charlo summed up the community's concerns when he decried the previous deaths in the community, the "spoiling" of fish in Yellowknife Bay, and the fact the households who could not afford water delivery were simply bypassed although the mine was responsible for polluting the water.[9] After the release of the federal government's 1975 health survey, local activists working with the

8 Occupational Health Division, Environmental Health Directorate, Department of Health and Welfare, *An Investigation of the Health Status of Inhabitants of Yellowknife, Northwest Territories*, by A. J. de Villiers and P. M. Baker (Ottawa, 1970). A transcript of the CBC show was printed in the *Yellowknifer* newspaper, 11 January 1975. See also, "CBC Causes Arsenic Scare," *News of the North*, 31 December 1975.

9 Chief Charlo's comments are contained in the transcript of the 1974 NWT Water Board Hearings on Giant Mine, NWT Water Board paper registry, Mackenzie Valley Land and Water Board Office, Yellowknife, NWT.

National Indian Brotherhood (NIB, an activist group that arose out of the broader Indigenous rights movement in Canada during this period) recorded high arsenic levels in hair samples from 18 Dene children. After government officials rejected the results due to the small sample size, the NIB organized a remarkable community-based study involving an unprecedented partnership with the United Steelworkers Local at Giant Mine and academics from the University of Toronto. Critical of the government study for relying on volunteers—a non-random sample—and for focusing on the non-Indigenous population, the NIB concentrated on the Dene communities of Dettah and Latham Island (present day Ndilo) because of the water issue and because these villages were directly downwind of the Giant Mine smokestack. Hair sample results showed high levels of arsenic exposure among the Indigenous population.[10] The federal government rejected these results after the non-profit Canadian Public Health Association conducted an independent (but still controversial) study that once again concluded that the arsenic exposure problem was confined to processing facilities at Giant Mine.[11]

In spite of these conclusions, the convergence of community knowledge, scientific research, public health advocacy, and Indigenous activism in Yellowknife represented a significant moment in the history of local resistance to industrial pollution in northern Canada. In 1978, the NIB summarized the arsenic saga in a damning report, "Arsenic and Red Tape," documenting what it regarded as the history of bureaucratic delays and inconclusive studies that resulted in what respected toxicologist Dr. Kingsley Kay called "a human experiment" of carcinogen exposure at Yellowknife.[12] Coming as it did during the same period as Dene land claims activism and widespread opposition to the Mackenzie Valley pipeline proposal (a projected mega-development that many felt threatened the Dene hunting and trapping economy) the arsenic controversy exemplified the deep mistrust of government agencies and industry among northern Indigenous people. As one Dene woman wrote in a brief to the Canadian Public Health Association, "The continuing pollution and destruction by corporate interests of our air, water and soil and the government's failure to stop this contamination, is a prime example of why we insist we can no longer allow our land and our lives to be con-

10 Lloyd Tataryn, *Dying for a Living* (Ottawa: Deneau and Greenberg, 1979).
11 Canadian Public Health Association, *Task Force on Arsenic: Final Report, Yellowknife Northwest Territories* (Ottawa: CPHA, 1977).
12 Lloyd Tataryn, "Arsenic and Red Tape," National Indian Brotherhood Report, 1978, 5. Kay's comments were made to the CBC and also reported in "How the Uproar Got Started," *News of the North*, 15 January 1975.

Figure 2:
Giant Mine Shaft no. 2 headframe partially deconstructed, July 2012. The mine site is currently undergoing extensive subsurface and surface remediation. Photo by Kevin O'Reilly.

trolled by others."[13] Episodes in the 1970s such as the arsenic contamination at Giant Mine and mercury poisoning at the Anishinaabe community of Grassy Narrows in the province of Ontario epitomized what many regarded as a pattern of environmental racism against Indigenous communities across Canada.

Local concern over arsenic in Yellowknife dissipated somewhat in the 1980s as technological improvements led to further reductions in air pollution. Nonetheless, local non-Indigenous activists Kevin O'Reilly and Chris O'Brien pushed for zero emissions in the 1980s and 1990s as evidence mounted that arsenic trioxide is a non-threshold carcinogen: there is no safe exposure level. Among the Yellowknives Dene, advocacy surrounding the historical and contemporary arsenic loading continued unabated, as evidenced by comments at intermittent public hearings on the issue. Even after Giant Mine finally closed in 2004, the Dene continued to press government officials on the possible long-term health impacts of arsenic exposure, including the incidence of cancer. The abandoned mine site, where 237,000 tonnes of arsenic trioxide are stored in underground chambers, remains extensively contaminated with arsenic and is now a public environmental liability. As recently as the 2012 public hearings on the remediation plan for Giant Mine, Yellowknives elders and community leaders continued

13 Cited in Tataryn, "Arsenic and Red Tape," 64.

to press the government to focus on permanent removal of the arsenic from the site (rather than containment strategies for the surface and underground) and for a study of long-term health impacts.[14]

Since the original Giant Mine arsenic controversy, a series of other local pollution issues have spurred similar grassroots concern and mobilization. Northern advocates have highlighted the long-term legacies of military activity in the north, for instance, including abandoned infrastructure and toxic sites ranging from the CANOL pipeline (originally built to ship oil from Norman Wells, NWT, to Alaska) to the Cold War-era Distant Early Warning (DEW) Line radar stations originally built to warn of Soviet nuclear attack, but which left behind soils contaminated with PCBs and hydrocarbons.[15] Perhaps the most high-profile recent case is the campaign of the Sahtu Dene for redress due to the high incidence of cancer in the community of Déline, where many people worked as uranium ore carriers at the Port Radium mine on Great Bear Lake during the Second World War and the Cold War. Although the government ultimately dismissed as inconclusive the evidence for a cancer cluster in Déline in 2005 after a collaborative research process called the Canada-Déline Uranium Table (CDUT), the national attention afforded the issue (in the form of two films, newspaper and magazine articles, and lobbying from the community) brought the mine's environmental and public health legacies to a wider audience. Funding through the CDUT process also produced a rich oral history collection that documented the Sahtu Dene's convictions that radium and uranium mining had poisoned individuals and the land and water surrounding the mine.[16]

14 Editorial, "Report Fails to Clear the Air," *Yellowknifer*, 9 July 1993; Fred Sangris, Evidence, Parliamentary Hearings on Canadian Environmental Protection Act, 11 May 1995, accessed 13 March 2012, http://www.parl.gc.ca/content/hoc/archives/committee/351/sust/evidence/122_95-05-11/sust122_blk-e.html#0.1.SUST122.000001.AA1040.A; Giant Mine Remediation Environmental Assessment Hearing EA-0809-001, Yellowknife, 12 September 2012, http://www.reviewboard.ca/upload/project_document/EA0809-001_Giant_Mine_hearing_transcript_-_September_12__2012.PDF.

15 K. J. Reimer and Douglas Arthur Bright, *The Environmental Impact of the DEW Line on the Canadian Arctic* (Ottawa: Department of National Defence, 1993); Sandro Contenta, "DEW Line: Canada is Cleaning Up Pollution Caused by Cold War Radar Stations in the Arctic," *Toronto Star*, 4 August 2012, https://www.thestar.com/news/insight/2012/08/04/dew_line_canada_is_cleaning_up_pollution_caused_by_cold_war_radar_stations_in_the_arctic.html

16 *Village of Widows*, directed by Peter Blow (Toronto: Lindum Films Inc., 1999), 52 min.; Canada-Déline Uranium Table, *Canada-Déline Uranium Table Final Report* (Ottawa: Department of Indian Affairs and Northern Development, 2005); Déline Uranium Team, *If Only We Had Known: The History of Port Radium as Told by the Sahtúot'ine* (Déline, NWT: Déline Uranium Team, 2005); David Henningson, *Somba Ke: The Money Place*, directed by David Henningson (Urgent Service Films, 2006), 45 min., http://www.sombake-themoneyplace.com/; Andrew Nikiforuk, "Echoes of the Atomic Age: Cancer Kills Fourteen Aboriginal Uranium Workers," *Calgary Herald*, 14 March 1998, A4; Peter Van Wyck, *The Highway of the Atom* (Montreal: McGill-Queen's University Press, 2010).

The case of Giant Mine offers several key lessons about environmental justice and the politics of waste in resource extraction zones. While it is common to frame Indigenous communities as "victims" of environmental injustices, it is important to acknowledge the various ways local people historically mobilized to resist pollution and industrial development—from the decades-long struggles of the Yonggom of Papua New Guinea against the Ok Tedi Mine to Navajo activism around the legacies of uranium mining in the US Southwest.[17] Stories of northern communities responding to pollution have remained somewhat below the radar of historians and other scholars in Canada (who have tended to focus on controversies at the front end of the northern development process), despite the rich array of available sources. Yet as these cases demonstrate, for northern Indigenous communities pollution and environmental justice issues have historically been (and continue to be) bound up with critical issues surrounding land claims, sovereignty, and colonial dispossession.[18] As scholars uncover more of these stories from northern Canada, it becomes clear that environmental justice struggles over pollution are not confined to the large urban areas or extensive industrial sacrifice zones that have been so well documented in the US literature, but permeate the histories of small communities in remote regions where intensive resource extraction occurs.[19] Finally, the prominent place of Indigenous communities in northern pollution debates provides a clear example where "traditional" ecological knowledge is not confined to "long ago" stories or matters of flora and fauna, as is often the case, but provides insight into more recent historical experiences of industrial development and toxic contamination.

As with the issue of POPs, Indigenous activism around mine pollution showed an ability to move beyond the local context, mobilizing regional and national allies and resources to pressure governments and industries into action.[20] The historical interface between northern Canadian communities and development is complicated, with

17 Stuart Kirsch, *Reverse Anthropology: Indigenous Analysis of Social and Environmental Relations in New Guinea* (Stanford, CA: Stanford University Press, 2006); Traci Brynne Voyles, *Wastelanding: Legacies of Uranium Mining in Navajo Country* (Minneapolis: University of Minnesota Press, 2015).

18 Arn Keeling and John Sandlos, "Environmental Justice Goes Underground? Historical Notes From Canada's Northern Mining Frontier," *Environmental Justice* 2, no. 3 (2009): 117–25.

19 See for example Steve Lerner, *Sacrifice Zones: The Front Lines of Toxic Chemical Exposure in the United States* (Cambridge: MIT Press, 2010). Although Yellowknife today can be classified as a small city (with a population of close to 20,000) that is well-connected to southern centres, in the 1940s and 1950s the population was small (1,000 people in 1940) and transportation links much more tenuous.

20 Similar to the examples discussed in Stuart Kirsch, *Mining Capitalism: The Relationship between Corporations and Their Critics* (Berkeley: University of California Press, 2014).

many instances where Indigenous and settler communities have welcomed intensive resource development with open arms. But cases such as Giant Mine and Port Radium are among the most significant examples in Canada of communities mobilizing their own knowledge to resist and mitigate the health and environmental impacts of large-scale development.

Suggested Further Reading

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Nancy Janovicek

Seeds of Knowledge: From Back-to-the-Land to Urban Gardening

For the past few years, my partner and I have worked with a group of young entrepreneurs, the Leaf Ninjas, to transform a beat-up fence and a weedy patch of grass in our backyard into an "urban food forest." The first steps involved working with our neighbours to tear down the fence, dig a swale to store water from our neighbours' eaves trough, and plant a row of berry bushes on the property line. We followed plans that Luke Kimmel, one of the Ninjas, developed for us. Even with a lot of help from young activists from Calgary's anarcho-punk scene, it took us three summers to complete the project. So we hired the Ninjas to finish the job on our side of the "food wall." Now our backyard grows raspberries, apples, pears, plums, cherries, goji berries, Saskatoon berries, currants, gooseberries, sea buckthorn, blueberries, strawberries, rhubarb, asparagus, lovage, mint, chives, tarragon, dill, rosemary, and thyme. Bees from our neighbour's hive pollinate the garden. We are nowhere close to being self-sustaining. I hope to harvest enough fruit to bake a bumbleberry pie next summer. But we're proud of our small contribution to initiatives to build sustainable, local food economies.

I tell this story because the Leaf Ninjas have connections to the West Kootenays, a region in British Columbia, Canada, which is also the place where I study the back-to-the-land movement of the 1960s and 1970s. Kimmel trained with Grégoire Lamoureux at the Kootenay Permaculture Institute in the Slocan Valley, then returned to Calgary, Alberta, and founded the Leaf Ninjas in 2010 with three friends. The Ninjas are a Calgary-based permaculture company committed to creating food gardens in unused public spaces and private yards that are both beautiful and ecologically sustainable. One of the videos on their website explains that their goals are to "change the face of food today" and to "[knit] together the broken fabric of the ecosystem, which is so fragmented. Especially in cities."[1]

There are parallels between the lives of the Ninjas, well-known activists in Calgary's contemporary local food movement, and those of the "freaks" who moved to the Kootenays in the 1960s and 1970s, now known as a hippie haven because of their migration to the region. The Ninjas are city kids. In their early twenties they travelled to rural

1 "Leaf Ninjas – Local Food Pioneers," accessed 29 June 2015, https://vimeo.com/channels/leafninjas/78936090. Available via Leaf Ninjas website, http://www.leafninjas.ca.

places to learn the skills that they needed to build alternatives to wasteful industrial food systems. Yet they did not stay in the country, but instead decided to bring these skills to the city to share the knowledge that they had acquired from previous generations who had also learned by doing it themselves. The Ninjas and their fellow activists in the food movement are part of a history of the intergenerational dissemination of traditional agricultural skills that have been preserved to counter the rise of agribusiness and build alternatives to the industrial diet.[2] Their political messages have changed to address the shifting challenges created by environmental degradation. Yet these generations of activists share the belief that "food is a tool for social change."[3] Food activism focused on the preservation and transmission of agricultural skills does not only connect activists across generations, but also across space: the Leaf Ninjas and back-to-the landers are part of a transnational food movement that spans the Global North and the Global South.

Too often, histories of the back-to-the-land movement study the 1960s generation as an anomaly rather than identifying similarities to previous historical moments when significant numbers of people moved from cities to rural places.[4] Popular accounts of back-to-the-land movements focus on the new ideas and lifestyles that hippies brought to staid rural communities.[5] I find the relationships that young people, who were keen to live sustainable, self-sufficient, and simple lives on the land, built with the elders in their communities far more compelling. Learning to become self-sufficient was one of the deepest connections between the newcomers and old-timers. This was especially true for growing crops and putting up the harvest.

Coming to the Kootenays

Located in southeastern British Columbia, the West Kootenays is a popular tourist destination because of the bucolic old-growth forests protected in its provincial parks and

2 Anthony Winson, *The Industrial Diet: The Degradation of Food and the Struggle for Healthy Eating* (Vancouver: University of British Columbia Press, 2013).

3 BC Regional Group of The Peoples Food Commission, "Finding out About Food," *Catalist*, February 1979, University of British Columbia Archives and Special Collections.

4 For a study of the connections between back-to-the-land movements in the United States, see Dona Brown, *Back to the Land: The Enduring Dream of Self-Sufficiency in Modern America* (Madison: University of Wisconsin Press, 2001).

5 Recent academic literature complicates this story. See Sharon Weaver, "First Encounters: 1970s Back-to-the-Land, Cape Breton, NS and Denman, Hornby and Lasqueti Islands, BC," *Oral History Forum d'Histoire Orale* 30 (2010): 1–30; Jinny A. Turman-Deal, "'We Were an Oddity': A Look at the Back-to-the-Land Movement in Appalachia," *West Virginia History* 4, no. 1 (Spring 2010): 1–32.

because it has some of the best skiing conditions in Canada. Today, largely due to tourism, the region is affluent. But in the 1960s and 1970s, when the back-to-the-landers moved to the region, its then resource-based economy was in decline. Urban refugees moved to a place that had a long tradition of farming. Agriculture was an important part of the Kootenay economy until the Keenleyside Dam, opened in 1968, flooded 25,000 acres of arable land, which had been home to many successful market farms, to make way for the hydroelectric development.[6] The completion of the highway—in parallel with the rise of mechanized agribusinesses—made it easier to produce food more cheaply elsewhere and transport it to supermarkets in the interior of British Columbia. This in turn made smallholder market farms even less lucrative. When young urban people were looking for land, many farmers were selling their properties because their children were leaving the farm and did not wish to follow their parents into farming. Cheap land prices attracted new homesteaders to the area.

These new homesteaders joined the remaining agrarian communities, many of whom shared their commitment to peace, self-sufficiency, and anti-consumerism. Doukhobors, a pacifist religious community, had lived in the Slocan Valley since the early twentieth century. The Doukhobors held land collectively until government intervention in the 1950s forced them to conform to private land-holding practices.[7] While the British Columbia government was repressing Doukhobor families, a group of Quakers moved from California to Argenta, a small community east of Kootenay Lake, because they had refused to sign oaths of loyalty associated with McCarthy era fearmongering. They established the Delta Co-op in order to develop a collectively held, small-scale farming business that reflected their observance of religious practices and their political values. Some of the draft resisters opposed to American intervention in the Vietnam War also made their way to the region through the networks that helped young men and their families escape from the draft. Those who stayed in Argenta became part of the co-op while those who moved to the Slocan Valley lived separately from the Doukhobors.

6 Tina Loo, "People in the Way: Modernity, Environment, and Society on the Arrow Lakes," *BC Studies* 142/143 (Summer 2004): 167; Joy Parr, *Sensing Changes: Technologies, Environments, and the Everyday, 1953–2003* (Vancouver: University of British Columbia Press, 2010).

7 John McLaren, "The State, Child-Snatching, and the Law: The Seizure, Indoctrination of Sons of Freedom Children in British Columbia, 1950–1960," in *Regulating Lives: Historical Essays on the State, Society, the Individual, and the Law*, ed. John McLaren, Robert Menzies, and Dorothy Chunn (Vancouver: University of British Columbia Press, 2002), 259–93.

Commitment to pacifism, as well as simple living and self-sufficiency, fostered supportive relationships between old and young. In the Slocan Valley, Doukhobor elders were an important source of knowledge for the urban youth who had little experience of living rurally. Bob Ploss, a draft resister who left Berkeley in 1966, had few gardening skills when he arrived. "I knew that the green side went up and the roots went down," he joked.[8] He recalled that neighbours were eager to help out the new young families:

> We had a lot of support from the local Russians, especially the Sons of Freedom branch of the Doukhobors. Peter and Ellen Demoskoff and Mary Speirka were especially kind to us. And they showed us how to garden and lent us tools and plants to get started with, and helped us out.[9]

Many of the people I met shared similar stories. Some back-to-the-landers had already learned basic gardening skills from *Harrowsmith* and the *Rochdale Encyclopedia of Organic Gardening* and had maintained significant gardens in the city.[10] Friendly relationships with people who had been farming in the region for generations helped them learn to adapt to local conditions.[11]

As back-to-the-landers established themselves in the community, they took an active role in preserving traditional agricultural techniques. *The Smallholder*, published by the Quaker Press in Argenta since 1974, was a forum for new and old smallholders to share information about organic farming techniques and environmental politics. Often well-educated, back-to-the-landers also used their own knowledge and skills to develop traditional farming techniques. Sigrid Shepard, author of *The Thursday Night Feast* (a popular cookbook that inspired people to learn to cook East Asian foods in the 1970s), had moved to the Kootenays because living in the city was making her sick. Her doctor advised her to move to a place with clean air and water where she could grow her own organic food. She was also married to an entomologist, whose research on butterflies had sparked her interest in genetic diversity. She began to cultivate seeds suited to the local climate. She explained why this was important in the West Kootenays: "We live in a narrow mountain valley. We

8 Interview with Bob Ploss, Vancouver, BC, 7 July 2011. All interviews by author.
9 Ibid.
10 Interviews with Brenda and Gail Elder, 25 July 2012, and Sally Lamare, 31 August 2011, New Denver, BC.
11 It is important to note that there were many conflicts over politics and alternative lifestyles between back-to-the-landers and conservative communities in the Slocan Valley. I discuss these conflicts in my article "'Good Ecology is Good Economics': The Slocan Valley Community Forest Management Project, 1973–1979," in *Canadian Countercultures and the Environment*, ed. Colin Coates (Calgary: University of Calgary Press, 2015), 55–78.

lose the sun at five or six in the afternoon. It drops down to below ten degrees every night. We knew that we had to grow our own seeds in order to produce food that we could grow here."[12] She worked with a collective of women to found a seed-saving group in 1978 to preserve the seeds that grew in the climate. They relied on local knowledge to understand which crops were best suited to the region:

> I saved seeds from the Russian community, from the German community, from the Dutch community, from the Italian community. And also Chinese people, too. And Japanese. All of the different ethnic groups that have been in the Kootenays before I came … had saved seeds. I took their seeds and I saved it here.[13]

Growing food organically was both personal and political. Bonnie Baker, a founder of the Kootenay Organic Growers, grew organic crops because "it never occurred to me to do anything else. I don't want to handle toxic chemicals. Why would I do that? … I can't tell you where it came from, I just knew it."[14]

In the back-to-the-land movement, growing one's own food was an essential step towards self-sufficiency and removing oneself from wasteful and chemical-dependent food systems. Judi Morton and Alex Berland believed that organic farming was political and grew their own food so that they would not be tied to the corporate grocery store.[15] However, the short growing season made it impossible for back-to-the-landers to grow all of their food. Building on the socialist co-operative tradition, Morton and Berland helped establish a food-buying club to source food that they could not grow themselves. Organizing food-buying clubs helped back-to-the-landers supplement the fresh produce that they could grow in the valley with beans, flour, and other staples. More importantly, worker-run co-ops gave back-to-the-landers control over the food they ate and enabled them to buy food that was produced by independent farmers who used environmentally sustainable agricultural techniques. This offered another way to support farmers who were preserving older knowledge and techniques, and contributed to building a viable alternative to profit-driven global food systems that paid no heed to the impact of agribusiness on local environments.

12 Interview with Sigrid Shepard, Nelson, BC, 24 October 2010.
13 Ibid. When I interviewed Shepard, the collective was still active.
14 Interview with Bonnie Baker, Nelson, BC, 26 October 2010.
15 Interview with Judi Morton and Alex Berland, Passmore, BC, 25 July 2012.

Conclusion

Many of the counterculturalists who went back to the land in the 1960s and 1970s believed that fostering local agricultural economies could produce a viable alternative to exploitive and wasteful global food systems. The young families who moved to the West Kootenays brought new ideas to the region, but they were also receptive to learning farming skills from the elders who had been raised in the area. Those who stayed are now the elders. They are passing on their knowledge to a new generation of activists who share their concerns about the negative impacts of agribusiness on the environment and the exploitation of agricultural workers who produce most of the food that is sold in grocery stores. Others have chosen not to stay but are passing on their knowledge in other ways. When I was doing research for this project, I attended a talk by Bonnie Baker who has sold her farm and moved into Nelson, an urban hub in the West Kootenays. She was encouraging people to replace the grass in their yards with an urban farm, a trend that has caught on in the city.

Urban farming and community gardens are becoming increasingly popular in larger urban centres, too. The Leaf Ninjas are successful in part because of the current enthusiasm for eating from our backyards. Education and the preservation of local foods are central components of their business. They offer "ed-u-tain-ment" lessons in classrooms and community halls to teach Calgarians the basics of soil biology, urban farming, and vermiculture. They also run the Future Fruit Foundation, a project that they hope will preserve the genetic stock of heritage fruit trees in the city that are disappearing because of new development. In exchange for a free consultation on the health of a heritage fruit tree in one's yard, owners agree to allow the Ninjas to collect cuttings from the tree in order to produce new plants to "keep the legacies of these trees alive."[16]

Access to healthy, wholesome food is fundamental to food security. Producing and distributing food using techniques and systems that are economically and environmentally sustainable are tools of a growing social movement that is at once global and profoundly local. Preserving local seeds, knowledge, and agricultural techniques is most often associated with addressing malnourishment and poverty in rural communi-

16 "Call to Calgary Fruit Tree Owners," Leaf Ninjas, accessed 28 December 2015, http://www.leafninjas.ca/future-fruit-trees. See the Leaf Ninjas blog for examples of other education events, http://www.leafninjas.ca/blog/.

ties in the Global South, areas that have been most devastated by capitalist expansion. Revitalizing local food economies in these areas is crucial to ending the systemic economic inequities caused by globalization. Yet tackling global inequality and building alternatives to a globalized food system requires change in the Global North as well. Back-to-the-landers and the young food activists whom they have inspired realize that fostering local food economies in affluent countries is a necessary part of this political movement.

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Jessica M. DeWitt

Between Stewardship and Exploitation: Private Tourism, State Parks, and Environmentalism

As we sit together at a restaurant in the summer of 2007, the person I am interviewing, an owner of a business adjacent to Cook Forest State Park, Pennsylvania, hesitates to discuss with me one of the ways in which he and his employees manage the river because he is unsure if the activity is allowed.[1] The potentially taboo activity he is referring to is the movement of rocks in the Clarion River to make passageways for thousands of recreational—often novice—canoeists, kayakers, and "tubists" that visit the Cook Forest area every year. He also cuts out potential snags in the river and erects signage directing canoeists to deeper water. For him, the management of the river for customers goes hand in hand with taking care of the river—picking up garbage left behind by recreational users, giving out free trash bags to users, and participating in local environmental groups. The apprehension expressed by the business owner is valid, though, because many environmental groups view water recreation specifically, and tourism in general, to be detrimental to the area. For instance, the Audubon Society, a non-profit conservation organization with a particular focus on birds, states that in Cook Forest "runaway development on the periphery of the park is a concern … [and] booming commercial canoeing recreation poses a threat to the riparian habitat."[2] An inherent distrust of private tourism on the part of environmentalists, as well as by the broader public, often means that the legitimacy of private-sector environmental knowledge and perspectives in park historiography and contemporary environmental debates is downplayed or disregarded.

The tension between possessing an intimate knowledge of and affection for the Clarion River and the need to use it for profit illustrates the complicated relationship between environmental stewardship and exploitation inherent in the activities of tourism business owners located on the peripheries of national, state, and provincial parks in North America. Such tension between recreation and preservation in parks is nothing new. A great number of scholars have tackled the topic of this clash, with many

1 Identifiers may have been changed throughout to preserve the anonymity of the interviewees. All interviews conducted with author in 2007. Names withheld for privacy. Copies of interviews can be found at the Jefferson County History Center, Brookville, Pennsylvania.

2 Audubon Society, "Important Bird Areas: Cook Forest State Park," accessed 24 March 2016, http://netapp.audubon.org/iba/Site/1166.

concluding, ironically, that the increased popularity of parks is their greatest threat. As early as 1967, Roderick Nash concluded the first edition of *Wilderness and the American Mind* by observing how environmentalists and preservationists "reasoned that preserving wild places depended on getting Americans into them without saws or bulldozers, only to find in their success the source of their gravest present challenge."[3] Yet tourism in parks can be categorized as a necessary evil. In most instances, high rates of visitation are crucial for ensuring continued government funding, protection, and acquisition of park land.

Private sector tourism on the outskirts of parks is not as readily embraced. The exploitation of park nature for personal gain is not easily whitewashed with feel-good tales of environmental heroism or shrugged off as unavoidable. Public opinion tends also to view private sector tourism through a more critical eye. When asked whether they agreed or disagreed with the statement, "Stores and commercial development should be encouraged in the area immediately adjacent to a state park/trail," 85 percent of Wisconsin residents polled disagreed or were neutral.[4] Government-sanctioned opportunism in protected lands is tolerated, even encouraged; private sector opportunism is eyed with suspicion. Without access to the financial and professional resources that enable governments to justify their right to stewardship and exploitation of the environment, or the connections to popular avenues of environmental discourse enjoyed by many environmentalist groups, private business owners are at a disadvantage in regard to their ability to legitimate their role in environmental stewardship.

Contempt for private sector tourism is tied to a general mistrust of those individuals and industries that make their living working on the land and profiting from natural resources. As Richard White argues in "'Are You an Environmentalist or Do You Work for a Living?,'" environmentalists and society in general often "equate productive work in nature with destruction. They ignore ways that work itself is a means of knowing nature while celebrating the virtues of play and recreation in nature."[5] The historical record similarly tends to overlook the importance of these business owners and the

3 Roderick Nash, *Wilderness and the American Mind* (New Haven: Yale University Press, 1967), 236.
4 Dave Marcoullier, Eric Olson, and Jeff Prey, *State Parks and Their Gateway Communities: Development and Recreation Planning Issues in Wisconsin* (Madison, Wisconsin: Board of Regents of the University of Wisconsin System, 2002), 27.
5 Richard White, "'Are You an Environmentalist or Do You Work for a Living?': Work and Nature," in *Uncommon Ground: Toward Reinventing Nature*, ed. William Cronon (New York: W. W. Norton & Company, 1995), 171.

gateway communities they live in, their role in park guardianship, and the significance of parks and park peripheries as places of work. Business owners' concerns about and opinions on contemporary issues also tend to be brushed aside.

Gateway communities—those communities that are located on the outskirts of parks and natural areas through which visitors have to travel to get to the park—can be beneficial to the parks that they neighbour. R. Neil Moisey argues that natural areas and parks benefit from gateway communities in two major ways. Firstly, "by providing the needed services for visitors, gateway communities can concentrate the development in the best locations." Secondly, "gateway communities can provide economic and political support for the protection of the park and protected area resources."[6] Writing in response to over a decade of decreased funding, Phyllis Myers argues that state parks had to create closer relationships with the private sector in order for both to survive.[7]

Former Cook Forest operations manager Steve Farrell acknowledged the importance of businesses in the area in 2000, stating, "Businesses and the park are great partners." Cook Forest's gateway community is as old as the park itself. The park was established in 1928, and the first cabin rental businesses were opened in 1928 and 1929. By the 1950s, Cook Forest was one of the most popular vacation destinations for working- and middle-class people from western Pennsylvania, mainly Pittsburgh and Erie, and northeastern Ohio, mainly Cleveland. The 1956 pamphlet from the Cook Forest Vacation Bureau—the area's business association—lists over 20 places to stay in the area. This growth in tourism continued through the early 1990s as individuals and families moved to the area specifically to capitalize on the park's popularity. Others fell in love with the area first as tourists, moved to the region, and turned to the tourism industry because it was the only viable option to make a living.

Interviews with Cook Forest area business owners illuminate the way in which they connect to nature and the park on both a personal and a business level. A cabin rental business owner in Cook Forest discusses how he distributes informational packets and newsletters about taking care of the area's land and wildlife. "Don't kill my snakes

6 R. Neil Moisey, "The Economics of Tourism in National Parks and Protected Areas," in *Tourism in National Parks and Protected Areas: Planning and Management*, ed. Paul F. J. Eagles and Stephen F. McCool (New York: CABI Publishing, 2002), 238–39.

7 Phyllis Myers, "Strategies for Tourism and Economic Development," in *State Parks in a New Era* (Washington, DC: Conservation Foundation, 1989).

… don't kill my bats … don't cut any of my trees … no harm," states the owner, who purposely leaves areas of his property natural for wildlife. Another business owner describes feeling satisfaction when simply walking their property. Many of the business owners describe a symbiotic relationship with the park; cuts to funding and poor management directly affect the prosperity of their businesses.

One cabin owner connects the downward turn of the area's economy and aesthetics in the late 1990s and early 2000s, which led to the demise of his business, with the decline of conditions in the park. The park was a "mess" and the entire area began to look "seedy and sad," he states. Several other business owners connect this decay to a political and environmental battle that took place in the mid-1990s over a state-sponsored bid to build a US$3 million, 50-room lodge and convention centre in the forest at the same location as the Sawmill Center for the Arts—a private arts-and-crafts organization and business established in 1976. The issue pitted Anthony E. Cook,[8] influential heir of the Cook family from whom the land for the park was purchased in 1928, environmentalists, and a minority of business owners, known as the Save the Forest Committee, against the Sawmill Center, the majority of area businesses, and the state of Pennsylvania.

The proposed complex was a unique opportunity, remembers one business owner and lodge advocate. According to others, the opposition was a powerful and vocal minority. A. E. Cook's stance against the lodge illuminates some of the broader tensions between private business and the park:

> Cook Forest is a park for all of the public to share. Cook Forest was not created so that a certain few could take a piece of Cook Forest for their own private use … not one dime of this money benefits the park … there is a tremendous amount of scientific information available concerning the adverse affect [sic] a development such as the lodge would have on the fragile ecosystem of Cook Forest … the conception for

8 Cook is described by Mary Byrd Davis in her book, *Eastern Old-Growth Forests*, as Cook Forest State Park's "leading citizen activist." In addition to environmental activism, he is a photographer and owns/has owned oil and natural gas production companies in Southern California, Pennsylvania, and elsewhere. Cook has stated that "being in the oil and gas business is something that might strike people as a conflict with my environmental feelings. The oil industry has always been maligned or accused as a ruiner of natural resources … But I can show that it doesn't have to be that way." Mary Byrd Davis, *Eastern Old-Growth Forests: Prospects For Rediscovery and Recovery* (Washington, DC: Island Press, 1996): 369; John Bartlett, "Cook Forest State Park Is One Man's Family Legacy," Time News, 1994. More precise dates for sources 8–11 are unavailable. For more information, please contact the author.

> which Cook Forest was preserved for all of us should not have to involve discussions today around the issue of sharing Cook Forest as a publicly held recreational forest preserve and the aspirations of the private business enterprise … for their own special interests and financial gain.[9]

A significant proportion of locals believed that the lodge would be good for business by drawing in large groups and conferences, and that it was even essential for maintaining the relevance of Cook Forest as a vacation destination. The business owners who opposed the lodge claimed the exact opposite—that the proposed lodge would drain business from already established businesses—and joined ranks with Cook mainly out of economic, not environmental, concerns.[10] Both sides attempted to gain control of the discourse surrounding the lodge project in order to sway public opinion. However, the perspectives and knowledge of A. E. Cook and other environmentalists—or as some referred to them, "Tony Cook and his friends"[11]—were given more weight than the viewpoints and knowledge of pro-lodge local business owners whose livelihoods were directly connected to the economic and ecological health of the park. Ultimately, the opposition was successful. The state capitulated to the pressure of A. E. Cook and his allies. The lodge bid and its corresponding funding were moved to other Pennsylvania state parks (as was, presumably, the environmental degradation); this led to Cook Forest missing out on other future funding opportunities and elicited hard feelings between those business owners that had supported the project and those that had joined Cook to lobby against it.

This episode also highlights two characteristics of the historical and contemporary relationship of parks and protected areas to the private businesses that lie adjacent to them. Firstly, the opinions and knowledge of environmentalists and elite activists are typically granted more value than those of local business owners whose existence is tied to the park. This trend occurs because of a power imbalance between some environmentalists and the owners of small tourist businesses, and an alleged incongruence between tourism and environmentalism, which together work in favour of individuals with the resources and standing to position themselves within mainstream

9 Anthony E. Cook, "Let Voters Decide Lodge Issue," *Clarion News*, 1994.

10 For instance, one business owner, Ellen O'Day, then innkeeper at Clarion River Lodge, stated "I am absolutely livid … They (want to use) tax money to build a place in direct competition with private concerns." Lisa C. Caylor, Untitled, *Clarion News*, September 1994.

11 Jeremiah Nebbish, "Martha Should Run for Governor," *Clarion News*, September 1994.

environmentalist discourse. Secondly, funding cuts to parks lead to (at least perceived) direct effects on the economy of the surrounding area. This relationship between private enterprise and parks and protected lands needs to be given more comprehensive attention in historical analyses. In order for this to occur, scholars need to look outside the strict boundaries of parks, to their peripheries and the communities whose subsistence is tied to the park's existence, analyzing parks and their surrounding areas as places not only of recreation and preservation, but also of work.

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Marianna Dudley

Reflections on Water: Knowing a River

Where should I begin to describe a place characterized by flux and flows? The Severn Estuary, where Britain's longest river meets the sea, is a big place, so maybe impressive facts are appropriate. "It has the second highest tidal range in the world" (after the Bay of Fundy, Nova Scotia, Canada), I could say, but that doesn't convey the salty tang of the mud at low tide carried on the air to the shore or acknowledge the birds, mudworms, and diatoms that depend on the tidal movement for life. "Eels migrate from the Sargasso Sea to the Severn in their millions," I could say, without exaggerating, or expanding on the patterns of consumption that see the elvers caught and shipped to lucrative overseas food markets. "The Severn is a historic trading river," I can state, and recognize that this is not a noble claim, remembering the slave ships that passed through its waters and the money they accrued that helped to build the city of Bristol.

Place, as a concept, is central to the pursuit of environmental studies. It gives shape to our research projects (and corrals our ambitions). It is where habitats grow, power is exerted, boundaries are drawn, behaviours are exhibited, and experience lies. But what is "place"? It has a close relationship, and is sometimes used interchangeably, with "space," but space is abstract and potentially limitless. Place has confines. The Oxford English Dictionary's definitions of place start small, and very human (an open space in a town, a public square, a marketplace), eventually expanding in its fifth definition to define place as a particular part or region of space, a physical locality, a locale—a definition which sits more comfortably with those of us interested in environments which can, but do not always, include humans, and are certainly not always defined by their marketplaces and town squares.

Place is something real that can be experienced in person and pinned on a map, that we use to ground our more theoretical discussions. But it is also a way of thinking about and being in the world. We become attached to places; we develop a sense of place; we can think about "place" without reference to a specific site: it has a conceptual life that has intrigued key thinkers in our field of environmental humanities (and beyond).

Heidegger's (and Ingold's) discussions of "dwelling" and Tuan's exploration of *topophilia*, "the love of landscape," have helped me think more deeply about the complex connections between our inner and outer worlds, and being and thinking in the world.[1] But the fluid nature of rivers (as opposed to the fixedness of landscapes) encouraged me to look afresh at philosophies of place, and particularly those that consider the relational, and changing, nature of people and/in place.

Henri Lefebvre proposed distinctions between types of space that speak to the differences in knowing a river that I have observed over two years of researching the Severn.[2] He distinguishes between "perceived space" (that of everyday social life), "conceived space" (that is theorized by planners, cartographers, and the law, for example), and "lived space" (as it exists imaginatively, and is sustained through artistic practices). Lefebvre's "triple dialectic" allows scholars to understand places as multidimensional sites of processes of social construction, symbolic representation, and spatial practices. This multidimensionality can usefully complicate place, enabling us to identify and recognize differences in place-knowledge. Such differences have the capacity to cause tensions or even conflict among communities or opposing interest groups.

A river as "conceived space" is a regulated place where water companies, regional authorities, and environmental agencies co-manage the territorialized environment. This river can be owned, mapped, bought, and sold. The privatization of place, as Marx, Harvey, Armiero, and others have shown, enables it to be subsumed within capitalist structures in which natural resources are commodified, extracted, and exploited.[3] It also allows rivers to be regulated, maintained, and managed.

1 Martin Heidegger, "Building, Dwelling, Thinking," in *Poetry, Language, Thought*, trans. Albert Hofstadter (New York: Harper and Row, 1971; reissued 2001); Tim Ingold, *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill* (London: Routledge, 2000); Yi-Fu Tuan, *Topophilia: A Study of Environmental Perception, Attitudes, and Values* (Englewood Cliffs, NJ: Prentice Hall, 1974).

2 Henri Lefebvre, *The Production of Space*, trans. Donald Nicholson-Smith (Oxford: Basil Blackwell, 1991, originally published in French, Paris: Éditions Anthropos, 1974); Phil Hubbard, Rob Kitchin, and Gill Valentine, eds., *Key Thinkers on Space and Place* (London: Sage, 2004).

3 Karl Marx, "Debates on the Law on the Theft of Wood," *Rheinische Zeitung*, 25 October–3 November 1842, available via the Marxists Internet Archive, http://marxists.anu.edu.au; David Harvey, *Justice, Nature and the Geography of Difference* (Oxford: Blackwell, 1996); Marco Armiero, "Seeing Like a Protestor: Nature, Power, and Environmental Struggles," *Left History* 13, no. 1 (Spring/Summer 2008): 59–76; Stefania Barca, *Enclosing Water: Nature and Political Economy in a Mediterranean Valley, 1716–1916* (Cambridge: White Horse Press, 2010).

Getting to know the river has involved learning about its regulation, its cartographic representation, its legal geography, and its history of use and ownership. Documents, rules, and practices constitute the river.

Such a formulation of place may dominate the ways in which we are able to engage with it—determining access, regulating use, establishing codes of conduct—but it does not reflect the variety of knowledge of rivers, those forms of knowledge that reject, challenge, or subvert the "conceived" knowledge of place, or those that value more the "perceived" or "lived" qualities of place. Through my research, I have encountered groups who do not fit within—or have actively been excluded from—"official" definitions of place. These include villagers and farming communities evicted from their homes by the British military as it expanded its training estate during the Second World War.[4]

On rivers, too, there are groups which have been and are excluded. Studying the ongoing conflict between recreational groups—anglers and canoeists—over rights of use of rivers has deepened my understandings of place, knowledge, and power. Though the flow of water invites the contemplation of connectedness and movement, rivers in Britain (as elsewhere) are riven with invisible lines denoting what may and may not be done, and where. Anglers have worked within this system of ownership, while (some) canoeists and swimmers are challenging it.

This is not a life- or health-defining struggle. Yet neither is it without meaning. Recreational engagement with place creates highly nuanced environmental knowledge, and recreational users have been among those who have worked hardest to protect rivers from environmentally damaging pollution, dams, and hydropower installations. Anglers in the UK are proud of their history of river stewardship, while on the Severn, a broad coalition of environmental, community, and recreational interests have opposed plans to barrage the estuary for tidal energy. I agree with Richard White when he claims that environmentalists "are most aware of nature when we backpack, climb, and ski. Then we are acutely aware of our bodies … we know and care about weather. We are acutely conscious of our surroundings." I challenge his assertion that such embodied, experiential knowledge of place is inferior to other ways of knowing and being in place—through work, for example. White suggests that "work entails an embodiment, an interaction

4 Marianna Dudley, *An Environmental History of the UK Defence Estate, 1945–Present* (London: Continuum, 2012).

with the world, that is far more intense than play. We work to live. We cannot stop. But play … does not so fully submerge us in the world. … A game unfinished ultimately means nothing."[5]

Working on the river has changed considerably in the twentieth, and into the twenty-first, century. Rather than barges plying goods on the tides between Bristol and Gloucester, or large ships piloting in to Bristol city centre harbour after long voyages, the majority of trade entering the estuary is unloaded at Avonmouth and Royal Portbury docks; fruit and vegetables are unpacked in windowless warehouses, and cars unloaded and parked in neat rows. The acquisition of knowledge of place through labour continues—but the river flows past, tangential to the work itself. More connected with the river these days are the Environment Agency, which monitors water quality and manages water use, and nature conservation bodies such as the Royal Society for the Protection of Birds (RSPB). The Severn Estuary (and the rivers that feed into it) is an internationally recognized habitat of significance for wading birds and wildfowl, wintering migratory birds, and large numbers of fish, some of them migratory, too. While ships refuel at the docks, the RSPB reminds us that the estuary is a "vital service station where birds can rest and refuel" on their long journeys from Siberia to North Africa.[6]

Up and down the river, fishermen use the tides and weather conditions to catch fish by rod. On the Severn there is also a long history of catching fish with nets and baskets. As an industry it has all but disappeared, but some people still hold rights to fish in this way, with woven *putts* and *putchers*: objects shaped by human knowledge of river, tide, and fish. The incoming tide flows through the basket, taking fish (mainly salmon) into the tapered end of the funnel, from which they cannot escape. Surfers—yes, the Severn has a hardy band of river-surfers—pore over tide timetables and congregate on certain days when the tides run high and bring a surge that forms a peeling river wave, the Severn Bore, that they ride upriver for miles (the world record for longest continuous wave ridden is held by Gloucester man Steve King who surfed the Severn Bore for 7.6 miles, or 12.2 kilometres, upriver in 2006).[7] These groups know the river, its flows and peccadillos, its animal presences and the ways in which other forces—a southwesterly wind, say—affect the water

5 Richard White, "'Are You an Environmentalist or Do You Work for A Living?: Work and Nature," in *Uncommon Ground: Toward Reinventing Nature*, ed. William Cronon (New York: W. W. Norton & Co, 1995), 174.

6 RSPB website, "Campaigning for Nature Casework: The Severn Estuary," accessed 13 July 2015, http://www.rspb.org.uk/whatwedo/campaigningfornature/casework/details.aspx?id=tcm:9-228221.

7 King has surfed further, on the Severn and on the Amazonian river wave (the *pororoca*), but this is his Guinness World Record-recognized distance.

Figure 1:
A salmon fisherman and his dog, by an "engine" of putts on the River Severn (date & photographer unknown, circa 1900; source: The Mary Bruton Collection, Thornbury and District Museum).

and the wider river environment. They have also forged strong relationships with each other, with identities crafted through the repeated practice of a skill and through being in place. Contra White, I argue that these activities are no less "submerged" in the world for the fact of being play, not work. A game can mean many things.

Getting to know the river has involved talking to these, and other, groups and individuals, observing and interacting with their activities, acknowledging their perspectives. Recreational knowledge, embodied practices, and water-based skills constitute the river too.

I have been acquiring knowledge of the Severn by seeking out the records and testimonies of people who have had relationships with the river, calling on a broad range of sources, including oral histories, newspaper archives, film and photography, and the documentary recordings of the river as "conceived place": plans, maps, and legal records. I have felt the historian's responsibility of giving voice to historical actors underrepresented in the historiography, and of noting engagements with place that have been largely forgotten or overlooked by others. My knowledge of other people's knowledge of the river has grown.

But the connecting sinew between knowledge and place is experience (as suggested by Tuan).[8] Through walks, river-bank litter analysis, and outdoor workshops my own experiences of the river have influenced my personal sense of place, and connected me to others for whom the river is a "lived" place, such as ceramic artist Tana West.

In 2009, West walked the length of the Severn from its source in the Welsh mountains to its estuary (a distance of 220 miles, or 354 kilometres). Along the way, she extracted mud from the river bed. She carried the sediments with her, and back in the studio incorporated them into ceramic objects that reference historical manufacturing processes that have existed by and near the river. The tiles she made for *In the Vernacular* are coloured only by the presence of metallic dusts held in the soil: remnants of past industry, invisible to the naked eye, but released through the creative process and the firing of the clay. I find her work profound: it captures place, beautifully.

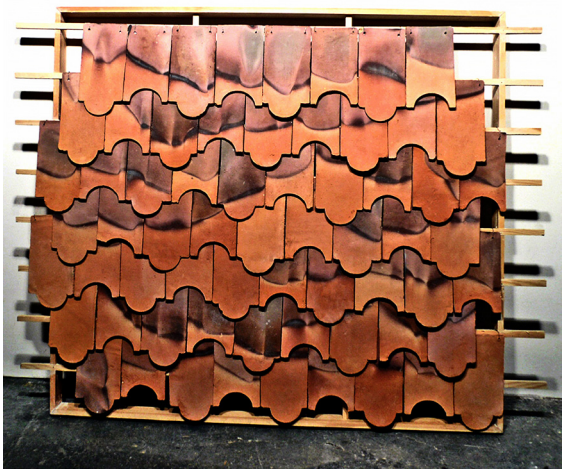

Figure 2: ©Tana West, *In The Vernacular* (2009), installation of tiles made with River Severn mud. The coloration occurs from minerals and metals found in the sediment, and cannot be predicted before the firing takes place.

West's artistic practice feeds a knowledge of place that is released through a creative process. It resides in a conversation between imagination and experience, and expresses the river representationally. The environmental historian's task is also to get to know the river better and to represent it well. The written word will always be our chief currency and conduit of knowledge, but it is not our only way of expressing and representing place. There is much to be learnt from responses to and iterations of place which reside beyond the spheres in which we feel comfortable and skillful.

8 Yi-Fu Tuan, *Space and Place: The Perspective of Experience* (London: Edward Arnold, 1977).

Figure 3:
©Tana West, *Subject to Change: River Severn* (2009), documentation. The research process is as important to West as the end product, and she documents it carefully. This shows a section of her Severn walk route, found objects (natural and man-made), and an image of her extracting mud from the riverbed.

With funding from the Arts and Humanities Research Council, I held a one-day workshop with West at Severn Beach that brought a diverse group of people together to establish a temporary ceramics manufacturing base.[9] Amateur potters, members of a local community group, and academics were taught how to form and shape the clay, which had been extracted from the estuary mud flats the day before. We pressed it into moulds, collectively dredged it with shaped frames to create a water "pipe," and freestyled on our own using the materials around us. Sheltered in the lee of the seawall, we worked the clay as the tide receded in front of us, exposing more of the raw material. From the base, we could see the Severn Bridge that connects England and Wales, and the processing plants of Avonmouth. We talked about the river while we worked and our conversation drew in passers-by. The experience placed the river in the context of the lives of people who live by it. The energetic wind whipped around us the whole time, yet by the end we had crafted a range of objects from the mud of the river, and appreciated them, "stilled at the edge of the Severn's turbulence / and the tangled waters of two river currents."[10]

9 Mireia Bes and Ana Miguel, "Into the Mud," The Power and the Water project website, 15 July 2015, http://powerwaterproject.net/?p=618.
10 Gillian Clarke, "White," *A Recipe for Water* (Manchester: Carcanet, 2009).

Getting to know the river has been about looking beyond what we already know about it and seeking knowledge in places that are less familiar. Knowing the river is also about using that knowledge creatively to express the river in imaginative ways, to sustain its future as a "lived" place.

Place grounds us. But place itself is not grounded. Notions of place shift with time, cultural and environmental change, and political climates. Notions of place both bind us (as groups) and separate us (through our individual experiences). Being alert to many different ways of knowing place has deepened my appreciation of the river's role in shaping local history, identity, and environment. It has also challenged narratives of the decline and death of industry and commerce, as I observe other uses—environmental, recreational, artistic—that have grown or that still thrive. It has become important to me to include these practices, through which knowledge and place are sustained and developed, in the narratives I produce. Getting to know a watery place has unsettled the solid habits of research and opened up new possibilities for acquiring, interpreting, and expressing knowledge.

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Henry Trim

"We Are as Gods": The Green Technical Fix

The environmental movement exploded into North American politics in the 1970s. Emerging environmentalist groups broke with the tradition of conservation, abandoned the Sierra Club and other, larger professional organizations, and, drawing on new sources of knowledge, experimented with novel strategies. Denis Hayes organized the Earth Day Network to kick off the inaugural Earth Day in the 1970s. The media-savvy leaders of Greenpeace dramatized global environmental issues with daring marine protests. "Countercultural environmentalists," as Andrew Kirk calls them, also pioneered a new approach.

Gathered around the *Whole Earth Catalog*, an iconic magazine which merged back-to-the-land and Californian techie culture, these environmentalists embraced technological optimism. They attempted to discover or invent the technology and the knowledge required for a sustainable society. This strand of environmentalism attempted to eschew political conflict and rely instead on innovation and on cooperation with small-scale businesses and local government. Some leaned towards E. F. Schumacher's "Buddhist economics" and attempted to develop small-scale technology capable of providing prosperity while protecting the biosphere's complexity. Others, particularly those at the *Whole Earth Catalog*, championed the promise of new technology, better science, and human potential with a motto that foreshadowed the rise of the Anthropocene: "We are as gods and we may as well get good at it."[1]

While this optimistic and heavily technological strand of environmentalism was a novel approach in the 1970s, it has since become ubiquitous. A multitude of institutes, companies, and government departments are dedicated to sustainability and green development. The world famous advocate of efficiency Amory Lovins, whose Rocky Mountain Institute champions green technology and advises corporate clients on sustainability, is just one example of the many promoters of innovation and "natural capitalism" who have enjoyed great success helping companies cut energy and resource use and designing green "disruptive" technologies. Despite this success, questions circle this intersection of environmental knowledge and political compromise. Can

1 *Whole Earth Catalog* (1969), 1.

knowledge depoliticize environmental issues? Are green projects about economic development or environmental health? Perhaps most important of all, does approaching environmental issues as technical problems amenable to innovation and better engineering help solve the conundrum of sustainability? To explore these questions this essay returns to one of the first green development projects: the Prince Edward Island Ark project.

It was launched in the unlikely location of Prince Edward Island (PEI), Canada's smallest and, at the time, its poorest province. The pioneering project owed its birth to a unique confluence of circumstances in the 1970s. In 1968 the newly formed government of Pierre Elliott Trudeau named economic development a top federal priority. It generously funded a series of regional development programs for the Atlantic provinces, including PEI. Designed to create "growth poles" by industrializing existing urban centres and subsidizing selected local resource industries, these programs provided the provinces with cash. This cash, however, required the selected regions and industries to undergo federally supervised "modernization," with no regard for environmental impacts. Unsurprisingly, the highhandedness of these conditions annoyed Atlantic Canadians. Alex Campbell, the premier of PEI, was unhappy with the direction of these programs and, prodded by local protests, decided to experiment with a different approach, one more environmentally aware and better adapted to the local conditions of his small province.

Campbell and his chief advisor, Andy Wells, began searching for a means of realizing this goal. They quickly discovered that their interests paralleled those of countercultural environmentalists. Both sought an environmentally appropriate way to organize small-scale, decentralized economic and social systems and technologies that supported their alternative vision. Campbell and Wells's earnest desire to try something new, as well as their access to substantial federal and provincial funds, generated considerable interest within the emerging community of scholars, analysts, and activists dedicated to alternative technologies and small-scale development.

To start his new venture, the premier invited countercultural environmental groups to help formulate Canada's first alternative development program. In early 1976, scientists and developers invited to PEI included: the "hip" scientists of the New Alchemy Institute, a group of biologists that specialized in sustainable architecture and aqua-

culture; Amory Lovins, then the leading energy analyst for the international environmental group Friends of the Earth; and George McRobie from E. F. Schumacher's Intermediate Technology Development Group, which pioneered programs of village-scale development in the Global South. Leveraging their presence on PEI, Campbell and Wells held a lengthy conference at which these environmental experts met with Canadian energy analysts and scientists to extoll the benefits of energy conservation, renewables, and green architecture to local politicians and members of the federal government. "Energy Days," as the event was called, put Campbell's ideas on the map and resulted in Can$3 million of funding for a local institute to oversee green development on PEI.

On top of this success, the scientists of the New Alchemy Institute convinced both the federal and provincial governments that PEI would be the perfect place for an "Ark": a "family-sized food, energy and housing complex." This "synergistic" structure incorporated solar heating, an experimental wind turbine, and a solar greenhouse. More importantly, it promised to provide PEI with the means to live in a decentralized and environmentally sustainable way, and to help develop local wind and solar industries. The Ark made waves in Canada. Prime Minister Trudeau flew to the island to deliver an optimistic speech on the promise of appropriate technology for its official opening in September 1976. The excited crowd included such countercultural environmentalists as Stewart Brand, the founder and editor of the *Whole Earth Catalog*. Local islanders, however, were less impressed. They remained unsure how this large, futuristic, and expensive structure could help them deal with PEI's high energy prices and falling farm incomes.

With the construction of the Ark, green development went national. Inspired by the possibilities for economic growth, the Minister of Energy unabashedly stated that Canada needed to become a leader in the field before the United States and other countries came to dominate what promised to be a profitable new industrial sector. To do this, the government promised Canadian solar companies hundreds of millions of dollars in funding over five years. Echoing the claims made by advocates of solar power at Energy Days, the government claimed that its funding would create a solar industry worth hundreds of millions of dollars and capable of providing tens of thousands of "man-years" of employment by 1990.

Unfortunately for countercultural environmentalists, this optimism created a liability. The first problems emerged on PEI where it quickly became obvious that the New Alchemists' Ark could not live up to its promise of decentralized self-sufficiency. Its experimental wind turbine was its most egregious failure; rushed through development and under-engineered, the turbines' hydraulics seized up in 1977, soon after it was completed. For many local islanders who had never been convinced of the project's value, the collapse of the wind turbine—and with it the most visible promise of a local wind industry—proved the project's harebrained nature. Some even began to suggest that the entire approach to development only served to funnel federal and provincial dollars to Campbell and Wells's hippie friends. This combination of bad press and a close association with the now former Premier Campbell led a newly elected conservative provincial government to quickly distance itself from the Ark in 1979. Promising innovation and economic growth had generated interest and brought in funds. But it also meant that the Ark and other projects had to provide more than environmental benefits: they had to provide new industries in one of Canada's most economically depressed regions.

Federal solar programs ran into similar problems in the early 1980s. Immediately after launching their funding programs, federal managers noticed problems with the technology when inexperienced or badly managed companies flooded into the new solar market. Even worse, those Canadian companies that could produce quality solar collectors and provide good installations proved unable to innovate and rapidly improve performance, a requirement for driving down prices as quickly as environmentalists and energy analysts had promised. This caused serious problems. The funding program had been premised on projections of very rapid technological development, which did not account for possible technological failures or the necessary shake-out of the newly created industry. When the Canadian government began cutting spending to combat inflation in 1983 and oil prices fell, support for solar energy unceremoniously ended and the program dissolved.

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Countercultural environmentalists' recasting of environmental health as an issue of technological development and as a possible engine of economic growth generated substantial support. In the 1970s it attracted substantial sums of money for new experimental technologies. It prompted prime ministerial visits and national media cov-

erage. It even helped launch the renewable energy sector. Despite this, the technical fix was far from an unalloyed success.

Political support came with expectations of successful technological innovation and rapid economic growth. Moreover, refocusing environmental action around technology did nothing to remove politics from the equation. While advocating investment in solar energy may seem less political than protesting against nuclear testing, it relied fundamentally on a friendly government. When green development projects, such as the Ark, ran into technical problems, failed to deliver promised benefits, or simply inconvenienced a segment of the population, they created significant political costs for their advocates. Despite their efforts to escape the entangling reach of politics through technology, countercultural environmentalists simply ended up becoming enmeshed in a different set of political conflicts.

Thus, treating environmentalism as a technical problem did not remove conflicts. Rather, it shifted the debate from questions of ethics and environmental science into the terrain of economics and technical innovation. This has undoubtedly expanded the reach of environmental issues. Above all, it has made them an object of interest for politicians and business people seeking to provide new jobs and chase new markets. But in doing so, it also enmeshed environmental health in existing political and corporate structures, where it becomes one of many elements of corporate strategy or federal cost-benefit analysis. Unfortunately, this means that in order to succeed, green technologies and industries must deliver economic or political returns as well as environmental benefits. This is a far cry from Stewart Brand and the New Alchemists' desire to transcend politics and from their hoped-for environmental transformation. That said, it also represents a profound improvement because environmental concerns have been inserted into technological and economic calculations. Power politics, it seems, are inescapable. But, thanks in part to countercultural environmentalists' efforts to escape them through technology, the environment has also become an inescapable political reality in "light green" societies the world over.

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Margarida Queirós

Environmental Knowledge and Politics in Portugal: From Resistance to Incorporation

In this paper I examine the rise and development of the Portuguese environmental movement. Portugal, once an "insular" country, has become entwined in the processes of globalization. While many such global processes (e.g., neoliberalism) have been characterized as adverse for the environmental movement, the Portuguese environmentalist community has been able to use these as opportunities to enhance their actions and influence, bringing the environment into the public and private policy arenas. Having an impact on environmental politics in this way does not require action within the political system itself. Rather, Portugal's environmental movement has come about through a mixture of push and pull factors, including its integration into the broader European community, where such politics are important and carry weight with democratically elected bodies.

Scientific environmental knowledge in Portugal throughout much of the twentieth century consisted of isolated academic voices that had little impact on policy or society. Portugal's integration into the European Union (EU) in 1986, however, changed the direction of national environmental policies and stimulated the rise of environmental groups over the next decade. Together, these developments sought to simultaneously change the political system and alter the dominant environmental discourse in the country. In the years that followed, this process deepened. Today, members of Portuguese society and environmentalists discuss environmental policies by drawing on scientific knowledge, though the policies themselves are controlled by the state in congruence with other European state policies. This shift demonstrates that individual actions, though collectively meaningful, are not as important as pressuring the government to make environmentally friendly decisions and democratizing the political system as a whole to further the incorporation of environmental knowledge into decision making.

The environment was a marginal concern in Portugal prior to the 1970s. Environmental problems that the country faced were minimized in the popular discourse, localized, and hidden, revealing a divergent path compared to other environmentally conscious European countries. Soromenho-Marques identifies four main character-

istics to explain the weaknesses of Portuguese environmental protection ideology: a bureaucratic centralized state, lack of a competitive culture, scarce literacy associated with a weak civil society, and rurality (which, in my opinion, is also connected to poverty).[1] Additionally, Portugal could not easily establish non-governmental organizations (NGOs) as the Estado Novo (New State) regime, the military dictatorship in power from 1928 to 1974, strictly controlled any organized groups.

Nonetheless, in 1948 the first NGO focusing on environmental protection, Liga para a Proteção da Natureza (League for Nature Protection, LPN), was born in Portugal. One of its founders was Professor Carlos Baeta Neves from the Agronomic Institute (1989 recipient of the Johann Wolfgang von Goethe prize, awarded to those who most distinguished themselves in the protection of nature and landscape in Europe).[2] LPN's founding was a reaction to the destruction of the Mata do Solitário forest for wood for use in a limekiln in Arrábida Mountain (Arrábida itself became a Natural Park in 1976). But the creation of LPN in the political context of the time was audacious since any association, especially of academics, was regarded by the state as extremely suspicious and potentially subversive. Consequently, until the 1970s, LPN's members limited their activity to publications in scientific journals, field trips, or classes at the university, and therefore had little public presence.[3] As part of the global conservation movement, LPN was an example of "militant environmentalism" since, as Jamison argued, its ideology and actions were close to a moral and even spiritual concern with species protection—and at that time, it signified a disruption of the system.[4] LPN was at that time closely linked with the university, its headquarters were located in Lisbon, and it expressed itself mainly through the publication of scientific articles. LPN was responsible for the creation of the main protected areas in Portugal (notably Peneda-Gerês National Park in 1971, Arrábida Natural Park in 1976, and some nature reserves) and also for their conservation and management through its active participation in their Technical Commissions and Advisory Boards. Today, along with other international organizations, LPN is a member of the World Conservation Union and of the European Environmental Bureau.

1 Viriato Soromenho-Marques, "*Raízes do ambientalismo em Portugal." Metamorfoses. Entre o colapso e o desenvolvimento sustentável* (Mem Martins: Publicações Europa América, 2005).
2 Margarida Queirós, "Natural Parks in Portugal: A Way to Become More Ecologically Responsible?" *Environment and History* 18, no. 4 (2012): 585–611.
3 Paulo Pereira, *A mundivisão ambiental, partidos políticos e leis em Portugal.* ISCSP (Lisboa: Universidade de Lisboa, 2014). http://www.repository.utl.pt/handle/10400.5/7145.
4 Andrew Jamison, "The Making of Green Knowledge: The Contribution from Activism," *Futures* 35 (2003): 703–16.

The year 1984 saw the rise of another important national NGO, Quercus. It was named after the Latin term for the oaks that characterized the most advanced forest ecosystems covering Portugal; these were, and still are, degraded relics. Quercus was composed of environmentalists concerned with the protection of the country's primitive vegetation and the conservation of wildlife. Thereafter, the environmental movement in Portugal would rise in the form of what Jamison labelled "professional environmentalism," focusing its activity on results, as well as on changing policies and political decisions, rather than changing beliefs.[5] Quercus's environmentalists were academics and professionals who kept up pressure in the public sphere, becoming agenda-setters and taking on the responsibility of representing the broader social and political interest in the environment.[6] Operating at a national level, through its regional delegations, Quercus produced knowledge that was subject to scientific scrutiny, and their green experts collected scientific information to back up their environmental claims. Quercus thus became an NGO very well connected to national policy bodies and public environmental authorities. Two years later, another NGO, Geota (Environmental and Land Use Planning Study Group / Grupo de Estudos de Ordenamento do Território e Ambiente), was legally constituted as a think tank dedicated to environmental education. This expansion of the environmental movement in Portugal was possible because of the fall of the authoritarian regime in the 1970s, the development of the education and training sector, and the national expectations of joining the European Community.

Perhaps most importantly, in 1986 Portugal joined what was at the time called the European Economic Community. This was a crucial milestone in strengthening the country's environmental policies, as it offered financial support for the building of basic infrastructure (e.g., solid waste, water, and sanitation), pollution control, and introducing new measures, such as legislation, to intensify ecological protection (e.g., natural reserves, national parks, etc.). The late 1980s and the 1990s thus saw a huge effort by Portugal's public administration to comply with European Directives and Regulations. This helped to realize the escalation of command and control environmental policies—the direct regulation of economic activities by law, which states what is permitted or illegal regarding the environment. Political parties in parliament soon recognized the importance of being green and could not help joining in with this new trend.

5 Ibid., 704.
6 Ibid., 707.

Within this political and economic climate—one conducive to the tenets of environmentalism—Portugal's environmental organizations began to mirror those elsewhere, notably Greenpeace, which became more professional. Such professionalization proved operationally effective. From the 1990s onwards, Portuguese NGOs—notably LPN, Quercus, and Geota—managed to markedly influence the country's national environmental agenda owing largely to the level of training and preparedness of its members, most of whom were recruited at universities and trained by the urban elite, on whose support they also relied. Legal expertise, a network for knowledge dissemination through the media, and autonomy from economic interests are some of the factors that help to explain this trend.[7] The politicized character of Portuguese environmental movements has thus transformed into a technocratic pragmatism. NGOs have shifted from "contestation" to "official acceptability" thanks to the increasing power of the middle class within Portuguese society, and now make stronger claims based on scientific facts rather than simply calls for support based upon morality.[8] Their prominence derives from their ability to collect scientific knowledge and information on the environmental impact of economic activities, and to bring this knowledge to bear on state negotiations.[9] So, as Epstein states, science, knowledge, and power are linked to green activism; science became a key resource for environmental activism. Of course, the media helped to spread the message by articulating the environment as a problem for public and political concern.[10]

Despite their impact on politics and policy, however, environmentalists have not had much impact via being elected specifically as "greens" or as part of a formalized Green party. As neoliberal ideology spread in Portugal and abroad beginning in the 1980s, the possible economic responses to the environmental challenge seemed to be "green" (with reduced impacts on the environment) or "brown" (with strong negative environmental impacts). Portugal's economy was mostly brown. Thus, on the one hand, greening the economy should have been the best way to respond to the environmental protection measures required by political programs; on the other hand, green parties as a weapon to protect nature were not a viable option in Portugal. They never managed to

7 Soromenho-Marques, *Raízes do ambientalismo em Portugal*, 144.
8 Fundação Calouste Gulbenkian, *Diagnóstico das ONG em Portugal*. Universidade Católica Portuguesa (Lisboa: Fundação Calouste Gulbenkian, 2015). http://www.gulbenkian.pt/mediaRep/gulbenkian/files/institucional/actividades/programas_projectos/EEAgrants_CidAtiva/Docs/Diagn__stico_das_ONG_em_Portugal.pdf.
9 Charlotte Epstein, "Knowledge and Power in Global Environmental Activism," *Journal of Peace Studies* 10, no. 1 (2005): 47–67.
10 Anders Hansen, "The Media and the Social Construction of the Environment," *Media, Culture and Society* 13 (1991): 443–58.

assert themselves in the Portuguese political system, always gaining electorally insignificant results; only in alliances with established political parties (such as the Portuguese Communist Party) could they survive. Such alliances did not please the environmentalist movement.[11] Environmental NGOs operating at a national level, like LPN, Quercus, and Geota, thus chose to professionalize, rather than formalize as political parties, in order to influence policy making. This explains the emergence in Portugal of a mainstream professional environmentalism, guided by NGOs and supporting the policy guidelines of the state.

Despite remaining out of the running for political office, environmentalist organizations became less radical in both thought and action. Environmental NGOs (ENGOs), it seems, could not help becoming part of the establishment, and they used knowledge produced in academia (scientific and technical) to support their claims and help guide alternative solutions. ENGOs and government institutions became allied, and private and public companies had to improve their environmental performance. This discourse combining environmentalism with economics was ultimately labelled ecological modernization or green business.

In the 2000s, the incorporation of the environmental agenda into the Portuguese political framework and economic development goals was well established. As has happened all over the world, environmental discourse has not only become institutionalized, but also corporatized. Coca-Cola, Starbucks, and Walmart have partnerships with Conservation International, while the Environmental Defense Fund cooperates with McDonald's and so on. In Portugal the major national electricity company (Eletricidade de Portugal, EDP) and the largest agro-livestock and forestry company (Companhia das Lezírias) cooperate with ENGOs. The new century has witnessed many green economic alternatives that are advocated on the grounds of their positive environmental contributions. Among these are the recycling of urban and industrial materials and waste, ecotourism, organic agriculture, and renewable energies. Behind the academic scrutiny, ENGOs and their green experts became prominent actors in environmental policy as they increased their audiences and started to participate in studies, reports, and negotiations on environmental agreements.

11 Pereira, *A mundivisão ambiental*.

Thus, the agenda for sustainable change was set. But the Eurozone crisis introduced imbalances into this framework. During the course of 2010–12, it became evident that Portugal was incapable of repaying its debt without the assistance of bailout support from the Troika.[12] The crisis had significant adverse economic effects, with damaging labour market outcomes and subdued economic growth.[13]

In a context of economic and political uncertainty where harsh austerity measures were being applied, resulting in a cycle of financial hardship, unemployment, and street protests calling for jobs and a better life, environmental policies could easily fade into the background. And despite the long-standing opposition between economic and environmental values, forced economic contraction imposed by the Troika is not necessarily environmentally friendly. On the economic policy agenda, the binary that sets austerity against economic growth preoccupies state politicians today. Apparently, there is now a dilemma: is a time of crisis appropriate for environmental tax reform? The introduction of green taxes may have a negative impact on GDP and employment, simply because they reduce household purchasing power and increase business costs. Businesses either have to pay higher prices for the most polluting energy sources or divert resources for investment in cleaner technology.[14] But, after all, the current global financial crisis is a result of the lack of regulation by successive governments, which has placed too much pressure on future resources for the benefit of the present.

Although the European countries most affected by the economic crisis have diverse environmental policies, Portugal is actually an example of a country dealing with the economic crisis via addressing energy use and climate change. Portugal has reduced its dependence on non-renewable resources and profited from investments made by previous governments in key areas such as the expansion of renewable energy (e.g., wind power, hydropower). In fact, the country has recently modernized its electricity grid to accommodate the conversion to alternative and renewable forms of energy, which already affects about 25% of production. According to Green Savers, Portugal was ranked sixth out of 58 coun-

12 A group of international lenders comprising the European Commission, the European Central Bank, and the International Monetary Fund, which imposed austerity measures on indebted European states when providing bailouts.

13 "Crisa da dívida ameaça futuro do euro e provoca queda de governos," *Diário de Notícias*, 1 January 2012, http://www.dn.pt/gente/perfis/interior/crise-da-divida-ameaca-futuro-do-euro-e-provoca-queda-de-governos-2181419.html.

14 Ricardo Garcia, "Reforma dos impostos ambientais poderá ter reflexos já em 2015," *Público*, 29 January 2015, https://www.publico.pt/economia/noticia/reforma-dos-impostos-ambientais-podera-ter-reflexos-ja-em-2015-1621607.

tries in an assessment of the performance of climate change policies, placing Portugal higher than Germany, Sweden, or Canada.[15] Supporting public policies, Portuguese NGOs have developed awareness raising, projects, and partnerships for reducing the country's carbon footprint and promoting greater sustainability in energy consumption.

Despite being a relatively recent phenomenon in the history of Portuguese environmental awareness, NGOs have demonstrated an increasing capacity to redefine issues, focus, strategies, coalitions, and networks to influence the greening of public policies. Meanwhile, civil society is more aware and empowered when it comes to national environmental issues. This is a gain for democracy and for society in general. Nevertheless, the environmental dilemma facing the country in the years to come will not fade away; as a society we will constantly have to negotiate what behaviour is and is not acceptable with the support of the environmental movement. It would be a great improvement if environmental knowledge continues to inform the environmental policy agenda, with open structures of governance to determine what sort of environment we really want, even in times of economic austerity. However, due to the increase of the environment-globalization interactions, to which Portugal is increasingly exposed, it is clear that there are limits to the state's and NGOs' ability to control key environmental issues affecting the country. We need to be aware of the domestic capacity constraints. These are some of the most relevant matters related to environmental policies that Portuguese society needs to start thinking about.

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15 Green Savers, "Alterações Climáticas: Portugal surpreende e é o 3° país com melhor desempenho entre os 58 mais industrializados," http://greensavers.sapo.pt/2013/11/18/alteracoes-climaticas-portugal-surpreende-e-o-3o-pais-com-melhor-desempenho-entre-os-58-mais-industrializados/.

Liza Piper

Coal in the Age of the Oil Sands

It is common knowledge that emissions from coal are essential to the warming stew of greenhouse gases transforming the climate of our Earth. This point was forcefully made by Andrew Weaver, noted climate modeller and the Green Party's first ever Member of the Legislative Assembly of British Columbia, Canada. Weaver published a 2012 paper with Neil Swart in *Nature Climate Change* in which they state, "Our overarching conclusion is that as a society, we will live or die by our future consumption of coal."[1] This conclusion, highlighting the significance of coal rather than, say, oil or bitumen, was received with some smug satisfaction in the province of Alberta. Alberta takes it on the nose pretty regularly because of the centrality of the oil sands to its economic health and its promotion of the same across North America and the globe. But if the oil (or tar) sands are the poster child—good or bad depending on your perspective—for Alberta's fossil fuelled economy, they are also just that: one highly visible representative of a range of sources of greenhouse gas emissions (including conventional oil, natural gas, coal, and cement) produced in the province and marketed around the world. Coal, specifically, has a big place in Alberta's political, economic, and environmental history, second only to the place of oil itself. Hereward Longley's piece in this collection examines some of the history of the oil sands in Alberta and collectively our contributions offer two different perspectives on the energy and environmental history of that province—a global player in the market for fossil fuels.

Prior to the Second World War, coal was essential to Alberta's economy, shaping its industrial history, labour relations, and landscape. Workers connected to the coal industry, whether as miners or railway workers in the days when the railroads ran on coal, were the most important members of Alberta's industrial workforce, and among its most radical representatives. When, in 1947, Alberta was transformed by the Leduc well into an internationally significant oil producer, coal took a backseat. The main underground coal mines, operating in the Crowsnest Pass area (south of Banff in the Rockies) and across a swath of land heading west from Edmonton to the boundary of Jasper National Park (referred to as the Coal Branch), either closed or significantly

1 Andrew Weaver, "Our New Study: Global Warming from Coal Worse than Oil Sands," *The Huffington Post*, 21 February 2012, http://www.huffingtonpost.ca/andrew-weaver/eu-law-oil-canada_b_1288264.html.

curtailed operations. Up until this point, total coal production had grown steadily, except during the years of the Great Depression, since the first mines opened in the 1870s. The turnaround was short and swift: between 1949 and 1961 total coal production dropped from 8.6 million short tons (7.8 million metric tonnes) to a nadir of 2.0 million short tons (1.8 million metric tonnes). If we were to stop there (as many do; very little has been written on the history of Alberta's coal industry after the 1940s), the decline of coal in the face of superior fossil fuels—oil and gas—would seem clear. But in the 1960s, Alberta's coal production began to rise once again, at first slowly and then swiftly after 1971—the year when production exceeded the previous peak reached in 1946.

The provincial and federal governments had both been deeply concerned about the decline in the coal industry: they investigated the problem, increased assistance to the industry, and changed regulations to ease the pain of shrunken markets. In Alberta, for instance, a 1954 Order-in-Council signed by Premier Ernest Manning decreed that rent payments on coal lands held by companies that had suspended operations would be reduced by 75 percent for the next 10 years. This enabled companies to hold onto their lands and wait out what was anticipated to be a short-term decline. Nationally, domestic transportation of coal was subsidized to help promote domestic over international production. A national 1960 Royal Commission on Coal (coincident with the Royal Commission on Energy, but the separate attention given to coal signalled its importance) sought to encourage and open up new markets for Canadian coal.

These efforts paid off. The most important new market for Alberta coal in the postwar period was the expanding Japanese iron and steel industry, which added considerable demand to the pre-existing domestic heating market. As well, by 1970, instability in oil prices led many of the larger oil and gas companies to look to coal as an opportunity to diversify their operations. Coal for export came mostly from the mountains and foothills, while heating coal came from the prairies and parkland regions. Lowered transport costs to West Coast (British Columbia) ocean freight terminals and lowered labour costs resulting from greater mechanization within the industry—most significantly a turn to surface and strip mining—further encouraged the expansion of production. Indeed, much of the change that took place in the doldrums of the 1950s and early 1960s involved massive consolidation and mechanization within the industry, change that was only possible because of the rise of gasoline- and diesel-powered machinery. Where in 1943 there

had been 168 underground mines and 36 stripping pits, in 1971 operators produced more coal but now there were only 27 mines in total, of which 5 were underground and the other 22 were surface strip mines. The concentration of operations into fewer and fewer mines, with most of the activity taking place at the Earth's surface, while steadily increasing overall production, continued into the twenty-first century: by 2008, 13 mines (all of which had surface stripping operations and one also had an underground mine), produced 41.7 million short tons (37.8 million metric tonnes) of coal, almost five times the production at mid-century. Thus the transformation of Alberta's coal mining industry in the postwar period also transformed Alberta's landscape.

At the same time that the industry was reaching new production heights in the early 1970s, a new environmental consciousness had taken hold in Alberta. This new consciousness was part of the emerging environmentalist sensibility of this era. It is important to note that in developing this environmental consciousness, Alberta was part of this larger Western trend, not a holdout from it—yet the fact that this is still a somewhat novel point to make further highlights the extent to which Alberta has become so closely identified with natural resource exploitation and the oil industry, rather than other interests. In addition to longstanding fish and game clubs and mountain recreation clubs, there was a new grassroots dimension to this environmentalism, for example in the creation of STOP: Save Tomorrow Oppose Pollution in Edmonton in 1970, to generate public awareness about the dangers of environmental pollution. The following year, the Calgary Eco-Centre Society was formed to disseminate ecologically-informed materials. Also in 1970, the Social Credit government of Harry Strom passed the *Environment Conservation Act*, which established the Environment Conservation Authority (ECA; from 1977 it became the Environment Council of Alberta)—an entity with wide-ranging responsibility to review policies and programs with an eye to conservation and environmental protection.

Soon after its formation, the ECA was tasked with completing a comprehensive review of the environmental impacts of resource development in Alberta.[2] Although ultimately expected to review legislation and practices affected by coal, oil, gas, and forestry development and to give particular attention to watershed integrity, it was "the environmental effects of strip mining and its attendant land reclamation problems" that were given

2 Strom's Social Credit government was defeated in a provincial election in August 1971 by the Progressive Conservative (PC) party under the leadership of Peter Lougheed. The ECA and its original mandate were Social Credit creations, but all of its subsequent activities fell under the auspices of the PC government.

priority, with public hearings beginning in December 1971.[3] Moreover, the Authority emphasized that it was pushed to pursue these hearings, "by briefs and petitions from many citizens and many parts of the Province."[4] The massive expansion of strip mining for coal, and its impacts, had not gone unnoticed by the citizens of Alberta.

In many respects, the ECA was a late-twentieth-century, provincial variant of the Canadian Commission of Conservation, established by Wilfrid Laurier in 1909: a Progressive-era response to issues of resource exploitation and conservation, in a country where the export of staple goods (whether fish, furs, timber, minerals, or wheat), prevailed. A key difference, however, was the number of civil society organizations that participated in the ECA's public hearings and the environmentalist perspective they brought to the discussion. In addition to 12 fish and game clubs, 6 farm and labour organizations, and a handful of other entities (including the Archaeological Society of Alberta), there were 16 organizations representing wilderness, parks, natural history, pollution control, and mountain recreation interests at the public hearings.

The new measures taken by the provincial government to protect Alberta's environment created challenges for the thriving coal industry. In their submission to the public hearings, the Coal Association of Canada (CAC)—an industry lobbying organization dating back to 1907 and still active today—opened with the following claim: "We submit that the first phase of the fight against pollution has been won. The ecologists have rendered a valuable service to society by alerting it to the dangers which were ahead if corrective action were not taken. However, in doing so, they have frequently exaggerated the negative and eliminated reference to many highly successful reclamation projects and costly pollution control mechanisms now in existence. As is often the case, such action has resulted in the pendulum swinging perhaps too far and we submit that it is the opportune time to bring it back closer to its proper place. We must now balance the understandable emotional desire for a completely undisturbed environment against the practical needs of an energy-hungry society which demands a low unemployment rate and a high standard of living."[5] Much can be made of this statement: from the praise of ecologists, promptly revoked, to the assertion that the

3 Environment Conservation Authority, *The Impact on the Environment of Surface Mining in Alberta: Report and Recommendations* (December 1971, January 1972), 12.
4 Ibid.
5 Coal Association of Canada, "Submission to Public Hearings Conducted by the Environment Conservation Authority," 21 December 1971, File M-8393-1361, Coal Association of Canada Fonds, Glenbow Archives.

fight against pollution had been won, and the dichotomy the CAC advanced contrasting the "emotional desire" for environmental protection versus the "practical needs" for economic health—a variant on the *idée fixe* of late capitalism: jobs vs. nature (or in more honest moments, profit vs. nature).

The hearings highlighted for the ECA the need for improved environmental management of resources and for coordinated development with other economic activities and land uses (farming and recreation in particular). They also brought to the fore the key distinction between mining in the "uplands"—which could have significant negative cumulative effects on water resources downstream—and in the "plains."[6] The ECA emphasized that when it came to strip mining, "activities which result in permanent loss of productivity of the land are intrinsically undesirable. Reduction or elimination of undesirable environmental impact and restoration of acceptable land use after mining has ceased, should be recognized as a public benefit now and for the future." Nevertheless, industry lobbying helped ensure that the ECA's extensive recommendations on the issue of strip mining were far from radical. The focus was on land reclamation, more so than on the curtailment or restriction of mining activities. And land reclamation was a slippery concept. For even if it was recognized in advance of a mining development that the reclaimed land would be "less valuable," development could still proceed if other economic criteria favoured the mine.

Large-scale strip mining for coal in Alberta had nevertheless provoked environmentalist opposition and the main response was new regulatory action on the part of the provincial government. In the late 1970s and 1980s, the CAC would focus on the regulatory burden imposed by the state, emphasizing the "excessive" number of approvals required to bring any Alberta coal mine into production.[7] But mine development continued and the regulatory framework employed in strip mining for coal would be applied as well to the oil sands developments in the northern parts of the province.

The CAC chose to emphasize in their brief to the public hearings that "as late as even two or three years ago there was no public, government or industry recognition about such matters, nor about ecology in general."[8] In implying that ecology was a pass-

6 ECA, *Impact*, 3.
7 Coal Association of Canada, "A Proposal for Regulatory Reform with Respect to the Alberta Coal Industry," Appendix III, 15 June 1984. File M-8393-1369, Coal Association of Canada Fonds, Glenbow Archives.
8 CAC, "Submission to Public Hearings," 4.

ing fancy, the CAC were not entirely off-base. By the early 1980s, both STOP and the Calgary Eco-Centre Society had dissolved (although both had continuing influence or later iterations). Moreover, even if the coincidence in time of the creation of the ECA and the election of a new Progressive Conservative (PC) government signalled that social values had changed in Alberta, as they had in countless other jurisdictions across the West, that new PC government eventually grew old, staying in power for an unprecedented 44 years. Coal production grew steadily and significantly in that period.

The creation of the ECA appears on the surface to have been a progressive political response to changed knowledge about the environment and its significance. In the late 1960s and early 1970s, Albertans from many different backgrounds were aware of and concerned about the ecological consequences of strip mining for coal. They were concerned about the health of watersheds, about toxic pollution and its effects. Notwithstanding the progressive appearance of the ECA and its public hearings in particular, the outcomes of this process—and especially the focus on land reclamation as the primary regulatory tool—highlighted the enduring importance of economic development over ecological integrity or protection from pollution: the land could be broken, so long as it could also be put back, although whether it could ultimately be "reclaimed" is a question that remains to be answered. Little had changed from the earlier Commission of Conservation, an entity that strove to ensure the conservation of resources so that they could be exploited in the long term rather than wasted in the short term. Under this kind of regulatory model, harmful consequences from coal production and consumption persisted, culminating in 670 million litres of coal slurry spilling from the Obed strip mine near Hinton on 31 October 2013, flowing into the Athabasca River and then northward from there. This, the largest spill ever from a coal mine in Canada, dramatically signalled that the environmental effects of coal were by no means limited to the narrow concerns about land reclamation that had served as the focus of the ECA's hearings in the early 1970s.

Ultimately, though, it is a changed constellation of environmental knowledge and politics that looks likely to kill the coal industry in Alberta. The election of a New Democratic Party (NDP) government on 5 May 2015 ended the 44-year stranglehold of the Progressive Conservative Party in the province. The NDP has committed to phasing out coal-fired electricity as the centrepiece of its climate change mitigation strategy. This commitment comes at a time when the bottom has dropped out of the interna-

tional coal market. The Grande Cache coal mines, the last with an underground mine, announced the closure first of its open pit operations in January 2015, and then of its underground operations as of 24 December 2015. If knowledge of the impact of coal in climate change has changed the political landscape, and if the provincial government does not come to the aid of the industry as it did in the mid-twentieth century, these closures will be the beginning of the end.

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Arn Keeling is Associate Professor of Geography at Memorial University of Newfoundland. His research explores the historical and contemporary encounters of northern Indigenous communities with large-scale resource developments. He is the co-editor, with John Sandlos, of the 2015 book *Mining and Communities in Northern Canada: History, Politics, and Memory* (University of Calgary Press).

Hereward Longley is a PhD candidate in Environmental History at the University of Alberta. His research assesses the dynamics that have shaped the environmental history of the Athabasca oil sands industry, focusing on the consequences of development for nature and Indigenous peoples in the Athabasca region and how these impacts and conflicts have influenced subsequent development. Hereward's paper "Indigenous Battles for Environmental Protection and Economic Benefits during the Commercialization of the Alberta Oil Sands, 1967–1986" appeared in *Mining and Communities in Northern Canada: History, Politics, and Memory* (2015), edited by John Sandlos and Arn Keeling. Hereward holds a Social Sciences and Humanities Research Council (SSHRC) Doctoral Fellowship.

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During the Paris Climate Change Conference in 2015, public demonstrations were banned by French authorities in response to recent terrorist attacks. After a large climate march was cancelled, activists arranged shoes in the Place de la République to stand in for the absent protesters.

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The ways in which we come to know the environment are always inherently political—as are the ways in which environmental knowledge is put to use in the world. Focusing on "scientific knowledge" and "Indigenous knowledge," on knowledge obtained through work as well as through leisure, the contributions in this volume explore how environmental knowledge is acquired, constructed, and deployed to make political claims on or for the environment. This volume also shows how environmental knowledge is embedded in grassroots, national, and international political efforts to find solutions to environmental problems. These essays showcase examples from Canada and Western Europe, offering insights into how different forms of environmental knowledge and environmental politics come to be seen as legitimate or illegitimate.

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