

disturbing the peace:
environmental
CHANGE

AND THE SCALES OF JUSTICE ON A NORTHERN RIVER

ABSTRACT

This article examines the environmental and social impacts of damming the Peace River in northern British Columbia as a way of exploring the challenges associated with doing environmental justice. It argues that environmental justice is not simply a matter of rectifying the distribution of environmental harms and benefits. Instead, doing environmental justice requires coming to terms with the different scales at which environmental change is apprehended and comprehended; scales that have sensual, spatial, and temporal dimensions.

IN LAW, “disturbing the peace” is an offense against the public order provided by the state. But the phrase evokes much more than its black letter definition. It resonates with the raucous sounds of urban revelry: shouting, pounding feet, sirens, and slamming doors.

Although the Peace of this essay is a river in northern British Columbia, disturbing it also disrupted an established order, albeit a human ecological one.¹ That disruption was also a matter of the senses. In 1968, the provincial government dammed the Peace to generate hydroelectricity, setting into motion a series of environmental and social changes (see Map 1). While scientists gauged this transformation in terms of cubic meters per second of water flow, percentages

of vegetation change, and parts per million of sediment, the peoples of the Peace experienced it much more directly, seeing, hearing, smelling, feeling, and tasting the changes in the land. Important itself, understanding the sensual dimensions of change is the key to understanding the differing scales at which environmental transformation was apprehended. More broadly, it is the key to understanding the dynamics of environmental politics and the possibilities for environmental justice.

The current global debate over climate change has made the connections between environment and politics apparent to us all now, but scholars have been exploring them for some time. In the last twenty years, researchers, mainly in the United States, have charted the environmental effects of urbanization and industrialization, and in the process argued that the risks associated with these changes were borne unequally.²

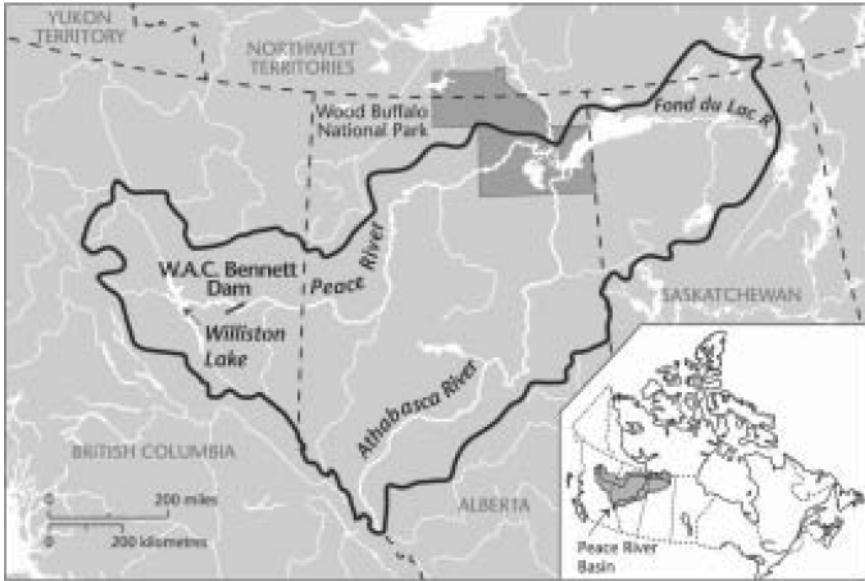
Poor people tend to live in poor environments. Why? Because they lack access to political power, and hence are not in the position to influence decision making—about the location of dumps, for instance, or sewage outflows.³ Terms such as “environmental racism” and “environmental inequality” are used to describe and explain why people on the social, economic, and political margins by virtue of race, class, and gender live in marginal environments.⁴ The social is the spatial.

A new kind of politics arose from the toxic landscapes of American cities. The “environmental justice” movement emerged in the 1980s and was aimed at calling attention to and rectifying the unequal distribution of environmental risks “where we live, work and play” both in the United States and around the world.⁵ In so doing, the movement challenged the traditional focus of North American environmentalism, pushing it beyond what to some was its elitist, white, and middle-class preoccupations with resource conservation and wilderness preservation.⁶

Proponents of environmental justice argue that solutions to environmental problems have to address underlying social, economic, and political inequities (and vice versa).⁷ Eradicating poverty and pollution had to go hand-in-hand. Drawing on the rhetoric and strategies of the U.S. Civil Rights movement, environmental-justice activists have worked for distributive and procedural justice, often framing their claims as human rights—the right to clean air and water; to living in an environment free of toxins.⁸ Rights and rights discourse have become powerful tools in the global pursuit of environmental and social equity.

Many of the principles of environmental justice were enshrined in the Rio Declaration issued by the United Nations Conference on Environment and Development in 1992. Among other things, Rio asserted that environmental protection was an “integral part of the development process” and that “the eradication of poverty ... [was] an indispensable requirement for sustainable development.”⁹ Two years later, in 1994, the Clinton administration took steps to implement the principles of environmental justice. It issued an executive order requiring every U.S. federal agency “to make achieving environmental justice part

Map 1. The Peace River Basin



Map by Eric Leinberger.

of its mission.”¹⁰ In its wake, several American states and some cities have passed similar legislation.¹¹

In Canada, the best-known examples of environmental inequality involve Aboriginal peoples. For instance, the mercury poisoning at Grassy Narrows in Ontario in the 1960s and 1970s and the water problems that currently afflict many Aboriginal reserves across the country have commanded national attention.¹² Despite this, however, environmental justice has not become “institutionalized” in Canadian government policy as it has in the United States.¹³

While researchers in both Canada and the United States have been good at identifying instances of inequality and explaining their causes, there has been less work that uses such episodes to understand what, conceptually, is “involved in rectifying environmental and social inequalities. That is what this story of the Peace River aims to do.

Initially, the literature on environmental justice focussed on identifying examples of the unequal distribution of environmental harms and explaining them. Scholars and activists argued about whether such inequalities were the result of intentional discrimination and whether that discrimination was a manifestation of racism or class divisions. Subsequent work complicated the picture, embracing more sophisticated analyses of race and class that focussed less on describing unequal outcomes and more on the complex process of creating environmental inequality.¹⁴

At the same time, another group of researchers began questioning the extent and nature of the problem. Was environmental injustice really a national or regional problem? Was it really the product of racism or poverty? Or was the siting

of environmental hazards simply the outcome of a series of rational economic choices on the part of those involved?¹⁵

Apart from the particular empirical results, this second body of work raised important general questions about the correct scale at which to measure environmental injustice. Should it be the city, neighborhood, census tract, or zip code? This is a complicated methodological and technical question, and one with political significance. Depending on the scale of analysis, injustice can appear and disappear; its nature can change, and with it the possible and appropriate remedies.

As these scholars searched for the proper scales at which to measure environmental injustice, others, mainly in political geography, asked whether the scales that were the subject of debate really existed. Working from the insights provided by research in the social construction of space, they problematized the concept of scale itself.¹⁶ In their view, scales are not given but constituted by capitalism and serve its ends.¹⁷ Moreover, the socially constructed nature of scale is most visible in the struggle between capital and labor.

Different groups of people have different interests in framing problems; that is, in determining the scale at which a particular issue is perceived and dealt with. How is it, scholars ask, that certain events come to be labelled as being of “global” significance while others are deemed “national” or “regional” or “local”?¹⁸

To be successful, social movements must frame issues in ways that can mobilize sympathies and, more importantly, resources at a variety of scales, from the ground up. For instance, by characterizing the location of hazardous waste sites in neighborhoods that were predominantly African American as “environmental racism,” grassroots activists were able to avail themselves of the powerful rhetoric and strategies of civil rights in seeking redress.¹⁹ This kind of “scale jumping” is what transforms “their problem” into “our problem”—and gets results.²⁰

Rather than examining how inequalities were created or how people mobilized against them, I explore what was entailed in rectifying environmental and social inequalities; in actually doing justice to a river and its peoples. The impact of damming the Peace River is important for what it reveals of the different ways in which people envisaged and experienced environmental transformation. On the Peace, the two were related: doing environmental justice was very much a matter of grappling with the different scales at which environmental change was thought about, lived, and addressed. Solutions framed at one scale could not resolve the problems experienced at another.

This argument builds on the literature dealing with the social construction of scale, but takes it in two different directions. First, it emphasizes the importance of time in defining the scales of inequality. Because geographers have written many of the most stimulating and important analyses of scale, it is perhaps not surprising that scale is defined largely in spatial terms. But what happened on the Peace River reveals that different temporal, as well as spatial, framings animated the struggle for environmental justice. Second, without disputing the power of capitalism to constitute scale, in the context of the Peace

River, other influences were more apparent. Ideology, science and technology, and the experience of living with the river constructed the scales at which the environment, environmental change, and inequality were perceived.

VISIONS

FOR MUCH OF THE TWENTIETH CENTURY, and particularly after the Second World War, high modernism was influential in constituting a particular view of nature.²¹ In Canada, nowhere is this more apparent than in British Columbia. Long before most historians were thinking about the relationship between environment and politics, British Columbia Premier W. A. C. Bennett was establishing a political career based on a particular vision of the environment and environmental transformation. Some time after he was elected in 1952, Bennett went on a tour of northern British Columbia. He asked his driver to pull over at a highway viewpoint where he could look out over the Peace River valley. Seeing him, a passing trapper asked, “Mister, what are you staring at?” Bennett apparently pointed down at the valley and answered with a question of his own: “Look down there. What do you see?”

“I see a small, winding, muddy river.”

“Well, my friend,” said the premier, “I see dams. And I see power. And I see development. I see roads, highways, bridges, and growing communities. I see cities—prosperous cities with schools, hospitals, and universities. I see beautiful homes with housewives baking bread.”²²

Bennett, like Canadian Prime Minister John Diefenbaker, had his own “northern vision.”²³ In it, British Columbia would become a prosperous modern industrial society by exploiting its natural resources. Hydroelectricity would transform the province, shifting power away from the southern coast to the central interior. In the overblown rhetoric of the time, each of the communities in the Prince George area was a “potential Pittsburgh,” part of a “new Canadian Ruhr.”²⁴ Like other Canadian premiers who would follow him, Bennett also believed that his province’s energy resources would give it political leverage in its dealings with Ottawa, shifting the balance of power in Confederation. In short, for Bennett the Peace was a river of destiny.

To realize that destiny, Bennett’s government formed a partnership with private enterprise, with a man whose ambitions were equal to the scale of the premier’s vision. That man was Axel Wenner-Gren, the Swedish vacuum cleaner salesman who had gone on to head Electrolux and consort with persons rich, famous, and, occasionally, fascistic. While his alleged Nazi associations were enough to get him blacklisted by the governments of Great Britain, the United States, and Canada, they did not prevent others from dealing with him.²⁵ In 1956 the Bennett government granted Wenner-Gren resource rights to one-tenth of the province. Approximately 130,000 square kilometers in size, “Swedish Columbia” as it was dubbed by its detractors, was an area equivalent to the British Isles. In return for this fiefdom, Wenner-Gren agreed to complete surveys of the area and come up with a comprehensive plan for developing its hydroelectric, forestry, and mineral resources by 1959.²⁶

The possibilities of a nature transformed by expertise were seductive enough to transcend political ideologies. When the Wenner-Gren group faltered, Bennett's Social Credit government—believers in a small state—nationalized electricity generation, creating the British Columbia Hydro and Power Authority (BC Hydro) in 1961 to complete the Peace project. The enthusiasm for big dams and for megaprojects in general was not limited to Canadian politicians and bureaucrats, but was broadly shared globally and locally. Around the world, regimes across the political spectrum engaged in dam-building, often with the support and enthusiasm of ordinary people. In 1965 alone, fifty thousand people flocked to Portage Mountain, where the Bennett Dam, as it was dubbed, was being built. In all, Hydro welcomed over 500,000 visitors during the course of construction, from 1961–1968.²⁷ This was a time when environments undergoing transformation were celebrated; a particular moment in the environmental history of North America conveyed by an aesthetic that American historian David Nye has labelled the “technological sublime.”²⁸ These landscapes also were distinguished by a particular scale.

When Axel Wenner-Gren and W. A. C. Bennett looked at British Columbia's “environment” they saw it schematically: Their bird's eye view flattened and simplified it. Rivers were reduced to elevations and megawatt-hours, highlighting the connections among them and the relationship between their development and that of other resources.²⁹ A river like the Peace was part of a system. Not an ecosystem, but a nervous system—one belonging to an industrial giant just waiting to be jolted into action with help of experts. It was left to the engineers to execute the grand plan for development; they were the midwives of a high modernist vision that rendered British Columbia's environment a space of flows—flows of energy, capital, and power—that respected few boundaries but at the same time enhanced the province's clout.

EFFECTS

PERHAPS THE MOST SURPRISING thing about the Peace project and the W.A.C. Bennett Dam was the extent to which the vision was realized. While Wenner-Gren's plans for “heated polar cities” and a monorail connecting British Columbia to the Yukon fell by the wayside, power from the Peace did shift the economic geography of the province from the coast to the central interior. In 1964 the prospect of available power led BC Forest Products to announce it would spend \$60 million building a “forestry complex” in the region. The result was the “instant town” of Mackenzie, where a number of pulp mills and sawmills, as well as various logging operations, were centered, providing employment for thousands, both directly and indirectly.³⁰

Peace power also changed the political landscape of Canada. As Bennett predicted, building the Peace gave him a good deal of leverage over Ottawa in the Columbia River Treaty negotiations. British Columbia managed to force the federal government to allow the province to export electricity to the United States, something it had forbidden until that point. While British Columbians continue to enjoy the economic benefits of such exports to this day, the impact of this

change went well beyond the province's borders, shaping Canada's energy policy and federal-provincial relations.³¹

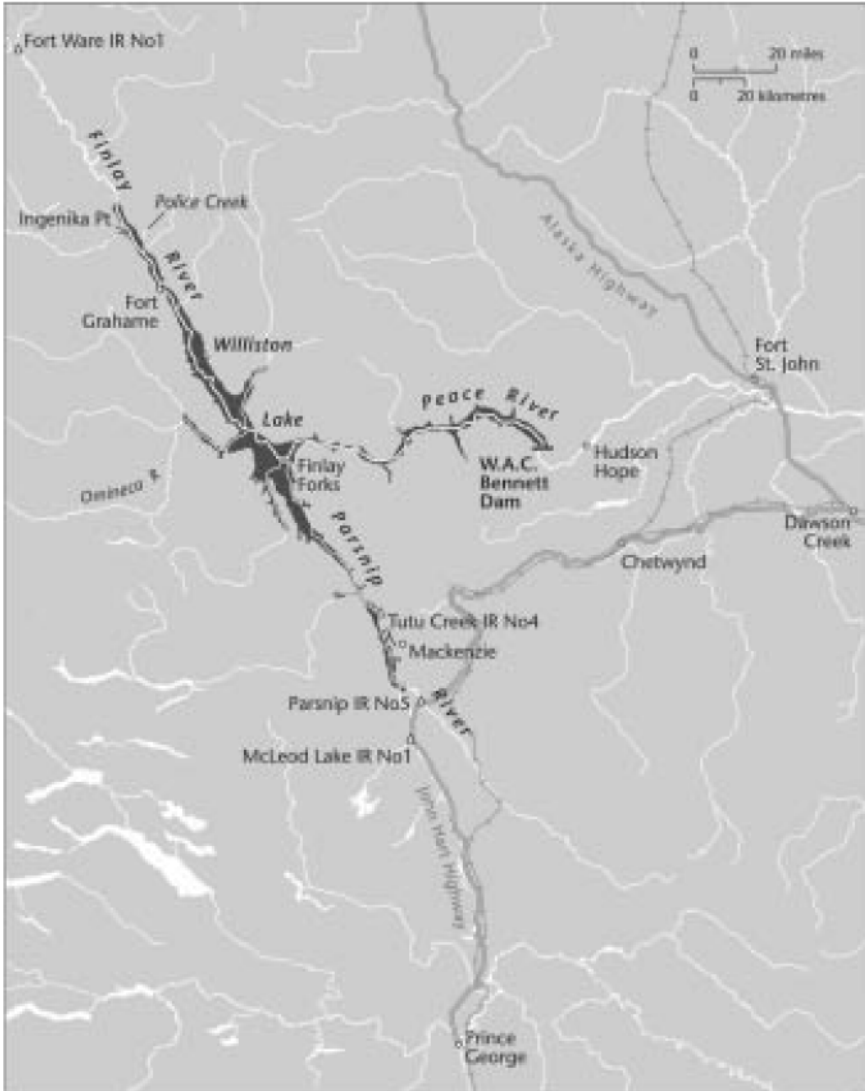
Of course, damming the Peace was not without environmental and social costs. In the immediate vicinity of the dam and reservoir, the problems were caused by too much water. The Bennett Dam turned parts of three rivers—the Finlay, Parsnip, and the Peace—into a huge lake: the Williston Reservoir runs 250 kilometers north-south and another 150 kilometers east-west (see Map 2). Its creation destroyed habitat, changed the immediate climate of the area, and compromised biodiversity. In addition to flooding 350,000 acres of forested land and drowning countless animals, the reservoir blocked the east-west migration of the now endangered mountain caribou across the Rocky Mountain Trench.³²

The same waters that prevented the mountain caribou from migrating also forced some of the human residents of the Trench to move. Some forty or fifty members of the Tsay Keh Dene First Nation, Sekani peoples then known as the Ingenika, were relocated to new reserves when it became clear their settlements and traplines near Fort Grahame and Finlay Forks would be inundated by the reservoir's waters.³³ The Ingenika were not the only human residents of the Trench who lost their lands, however. In all, approximately one hundred non-Aboriginal people and some fourteen thousand acres of land as well as mineral and timber rights were also at risk. The \$1.7 million the BC Hydro paid to acquire all the properties and associated rights facilitated the construction of the dam, but did little to settle the issue.³⁴

Those who were able to stay where they lived experienced a change in the weather. While it is widely accepted that large bodies of standing water like reservoirs have general climatic effects, the exact nature and extent of those effects for Williston Lake are largely unknown. But for those who lived in the area, they were clear. The most common complaint was how much windier it seemed.³⁵ That was bad enough, but for Jed Woolley the change in climate also compromised his ability to make a living. He demanded that BC Hydro compensate the area's farmers for the increased cold and humidity which prevented their grain, legumes, and seeds from drying properly.³⁶ Ed Summers, who ran cattle on the Tompkins farm, experienced the humidity in the form of a heavy fog that rolled over his land in the fall.³⁷ While some dam supporters dismissed Woolley's and Summers's claims, there is scientific evidence to back their anecdotal observations, which suggested that temperatures fell and humidity increased in the area surrounding the reservoir.³⁸

If change was in the air, it was also in the waters of Williston Lake. The lacustrine environment of the reservoir supported different kinds and numbers of fish than did the riverine habitat it replaced.³⁹ Arctic grayling, mountain whitefish, and rainbow trout populations declined, while other species thrived, among them lake whitefish (which came to comprise half the fish population in the reservoir), dolly varden, kokanee, lake trout, ling, and peamouth chub.⁴⁰ Writing in 1989, BC Hydro Vice-President C. W. J. Boatman lauded the changes, noting that "[i]n total numbers ... there are likely more fish in the basin today than prior to reservoir formation ... due to a major increase in aquatic habitat."⁴¹

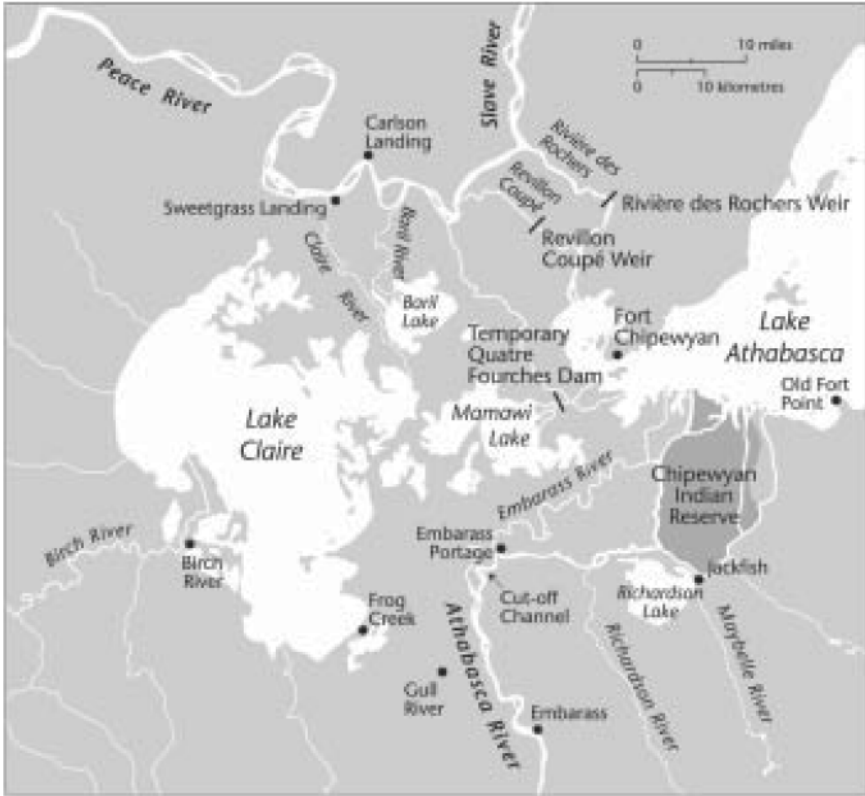
Map 2. Extent of Flooding Caused by the Bennett Dam



Adapted by Eric Leinberger from Peace River Power Development Company, Limited and BC and BB Power Consultants, Limited, *Peace River Hydro-Electric Project*, vol. 1 (Vancouver: BC and BB Power Consultants, Limited, 1959); and Brian G. Blackman, *Fisheries Resources of the Williston Reservoir Twenty Years after the Impoundment* (Prince George: BC Hydro and Peace-Williston Fish and Wildlife Compensation Program, 2001).

Despite their increased numbers, the fish population was not entirely healthy. By the time Boatman wrote, bull trout in the reservoir possessed levels of mercury that exceeded Health Canada guidelines, and by 2000 levels were high enough for British Columbia to issue a Fish Consumption Advisory for bull trout and dolly varden.⁴² Released as a result of the decomposition of the trees and vegetable matter on the reservoir floor, mercury enters the food chain when it is absorbed

Map 3. The Peace-Athabasca Delta



Adapted by Eric Leinberger from Stuart Adams and Associates, *Fort Chipewyan Way of Life Study: An Assessment of Impacts of the WAC Bennett Dam on the People of Fort Chipewyan and the Peace-Athabasca Delta and Suggestions for Action* (Vancouver: Stuart Adams and Associates, 1998).

by small organisms like plankton and algae and becomes concentrated in the tissues of larger ones. Because bull trout are at the top of the lake's food chain, the bioaccumulation of mercury in their tissue is highest.⁴³

The Peace River flows from west to east, and then north, emptying into the Arctic Ocean. Downstream, in Alberta and the Northwest Territories, the environmental and social problems caused by the dam were due to a lack of water. When the river was dammed and the reservoir began to fill (1968-1971), the impact on the area known as the Peace-Athabasca Delta became the focus of immediate attention, largely because of its ecological significance (see Map 3). Designated by the Ramsar Convention as a wetland of international importance, and part of Wood Buffalo National Park, the Peace-Athabasca Delta is one of the most biodiverse northern environments in Canada, home to more than 530 species of vegetation and vertebrates.⁴⁴ It is also a crucial staging ground for migratory birds from all four of North America's flyways. Approximately 400,000 birds use the delta on their way to the Mackenzie River lowlands and Arctic in the spring, while more than 1 million stop there in fall during their migration south. In

addition, the delta's undisturbed grass and sedge meadows are among the largest in the world and provide range for one of the largest free-roaming herds of bison.⁴⁵

After the Bennett Dam was completed, water flows on the Peace decreased 15 to 70 percent, depending where on the river measurements were taken.⁴⁶ Reduced flow meant that the river's channels were not scoured to the same extent: Water quality was compromised as sediments and toxins were left to accumulate rather than being flushed out. As well, water levels in the delta's lakes and its "perched basins" (elevated bodies of water replenished by periodic flooding) fell, and over time some disappeared all together.⁴⁷ The rejuvenating floods that had come every two or three years stopped. Since the mid-1970s there has only been one.⁴⁸ The delta was drying out. By the time the Williston reservoir was full in 1971, the water cover had been reduced by 38 percent, and by 1989, wetlands and wet marshes had declined by 47 percent.⁴⁹ As lake and basin levels fell, willows and sedge colonized the areas of the delta left exposed by the receding water.

These changes in water level and vegetation had further effects on fish and wildlife. There were fewer channels for Walleye to reach their spawning grounds and for juvenile fish to reach important nursery areas. If they got there, there was often less food available for them, further compromising their survival.⁵⁰ In terms of wildlife, the delta's muskrat, migratory bird, and moose populations were threatened by the loss of wetland habitat. By 1996, for instance, muskrat had declined 89 to 95 percent from their pre-dam levels, a loss that had a severe impact on the Aboriginal peoples who relied on them.⁵¹

In addition to those stemming from too much and too little water, other problems arose from disruptions to the river's flow and flooding regime. In essence, dams reverse the usual flow pattern: free-running rivers are characterized by high flows in summer and low ones in winter, while rivers that are dammed have low flows in summer and high flows in winter when reservoir water is released to generate electricity.

The release of water in the winter had serious environmental implications at both the dam site and downstream. On average, the winter draw-down on Williston Lake is seventeen meters, but it can be as much as thirty-two meters. The retreating water had detrimental effects on the beaver population, leaving dams high and dry and the confused animals at the mercy of the winter elements.⁵² It also exposed a large muddy foreshore, full of dead snags and debris. When exposed to the high winds that blasted through the area, it dried out and became the source of dust storms that could last hours and even days, and were severe enough to impair navigation.⁵³

Downstream, the seasonal draw-down meant winter water flows on the Peace were two-and-a-half times their pre-Bennett Dam level. The higher flows and higher temperature limited ice formation and thus decreased the extent of ice jams and spring flooding that was the key to rewatering the delta, especially its perched basins.

In making sense of the environmental changes that occurred in the wake of the Bennett Dam, scientists saw the river as a system, as Axel Wenner-Gren and the Premier did—but an ecosystem, not a hydraulic one, made of related parts.

Hydrology, ecology, and technology shaped the scales at which scientists assessed the river. The aerial photography and LANDSAT images that allowed them to assess changes in vegetation cover in the Peace-Athabasca Delta meant that they literally had a bird's-eye view. However, unlike that of Wenner-Gren and Bennett, the scope of the scientists' vision was augmented by its high resolution: In addition to being able to see the delta as a whole and track changes in its appearance, for instance, they were also able to discern shifts in sediment or toxins at the level of parts per million and changes in the river flows in cubic meters per second; that is, at micro-scales that were beyond humans' ability to discern unassisted by technology.

EXPERIENCES

ENUMERATING THE EFFECTS of damming the Peace—the changes in habitat, climate, and biodiversity—conveys the nature and extent of environmental transformation, but it does not capture how people experienced it, how they apprehended these changes and what they meant. It was the meaning of change and the human scale at which it was experienced that was fundamental to understanding the possibilities and challenges of doing environmental justice.

For the thousands of people employed in the pulp and paper industry, environmental change meant jobs—economic opportunity. For millions of industrial and residential consumers, it meant cheap electricity. And by virtue of the favorable terms of the Columbia River Treaty made possible by the Peace development, it meant revenue for the provincial treasury from the sale of downstream benefits to the United States (\$254.4 million in cash). But for a minority of people, many of whom were Aboriginal, environmental change meant dependence, isolation, alienation, and illness. When the peoples of the Peace lost their farms and trap lines, they lost more than the land that fed them; they lost their autonomy. The holdings around Hudson's Hope and in the vicinity of the Williston reservoir were sufficiently productive to provide sustenance for many families, both Aboriginal and white.

Elizabeth Beattie and her husband had come to Hudson's Hope before the First World War, establishing a thousand-acre farm in the Peace Valley, a place where they could “grow anything. ... It was more or less a vegetable valley.” The \$28,000 she got from BC Hydro for the family property was enough to buy her a house in town, but little more. The Beattie boys could not reestablish themselves on the land and went to work for wages, Jim for the Department of Highways, and his brother for an outfitter.⁵⁴

Full-time waged work supported the Beatties and other displaced white settlers, but it was either unavailable to Aboriginal peoples, or not wanted by them. For the Athabasca Chipewyan, a living delta with its large population of muskrat was, according to elder Victorine Mercredi, “like having money in the bank.”⁵⁵ But soon after the Bennett Dam was completed, the bank failed; welfare payments to both the Ingenika and the residents of the Peace-Athabasca Delta increased.

In Fort Chipewyan (the main community in the delta), average yearly per capita incomes declined by a third between 1965 and 1970. In the same period, the amount of federal social assistance rose 80 percent, while that provided by the province increased 300 percent.⁵⁶ It was a trend that dismayed Ingenika like Albert Poole, who worried about the enervating effects of welfare. “[N]owadays most everybody gets social assistance,” he remarked in 1989. The young people at Ingenika Point have “nothing at all to do. ... We visit. Watch TV. Lots of TV. Lots of videos.”⁵⁷

If environmental change meant dependence, it also meant isolation: between generations and communities. Not only could welfare have debilitating effects, but it also cut young people off from their traditions. With social assistance, fewer young people were interested in spending time in the bush with their relations.⁵⁸

The isolation from the past was compounded by the physical isolation of Aboriginal communities that came as a result of damming the Peace. Prior to 1968, the Ingenika had lived in Finlay Forks or in one of three reserve settlements, Fort Ware, Fort Grahame, and McLeod Lake, all former Hudson’s Bay Company posts where many Ingenika families had traded furs for generations. The dam flooded Fort Grahame and Finlay Forks and turned the river into a large, dangerous, and unnavigable lake. For most boats, the waters of the reservoir were too rough and unpredictable to be travelled safely. Those who tried encountered unexpected winds, large waves, and hundreds of thousands of acres of debris—trees that had been cut but not removed before the reservoir was filled.⁵⁹ For all intents and purposes, the waters of Williston Lake separated the Ingenika at Fort Ware from relatives and friends at McLeod Lake and at the new reserves at Tutu Creek and on the Parsnip River (see Map 2). In 1977, Hydro’s own consultant argued that the isolation imposed by the reservoir had “radically altered” Ingenika society and culture and was at least partially responsible for the “high incidence of social disorganization” that characterized some of their communities.⁶⁰

Around Fort Chipewyan, the drying of the delta meant economic isolation. For almost two centuries, a staples economy had connected the northern community to the world. Established in 1788, Fort Chipewyan was one of the major centers of the fur trade and an important base for European exploration of the Canadian North and West. Although the trade began to decline in the late nineteenth century, trapping remained a central part of the region’s economy in the postwar period, employing more than 60 percent of the male labor force.⁶¹ While the Bennett Dam did not cause the decline of trapping, its ecological effects dealt a serious blow to the economic viability of the industry, causing it to fall off somewhat more steeply there than in other comparable parts of Canada.⁶² The fate of Fort Chipewyan was the fate of other northern resource towns; in the postwar period, it became a society in search of a commercial economy.⁶³

Isolation was just one aspect of a broader sense of alienation provoked by environmental change. Those changes were perceived through the body as much as the mind. The environmental history of the Peace was a history of the senses: the sounds of the bush, the color of ice, the shape of the river.⁶⁴ For Hudson’s Hope resident Earl Pollon, dynamite and earth movers signalled the ear-splitting

arrival of modernity.⁶⁵ While Pollon complained about the noise, downstream Josephine Mercredi worried about the quiet. Changes to the river's flow and ice formation meant that there were no longer the same spectacular ice jams in the spring that were so important to flooding and replenishing the delta. The land signalled its thirst with silence: "Today you go on Reserve [201], you look, you listen for the sounds of birds, waterfowl, ducks, geese. You don't hear anything anymore."⁶⁶

The dissonance of environmental change was not just aural, but visual. Because the water released from the Williston reservoir in the winter was warmer than the water in the Peace, ice formed later in the river, and instead of freezing into the usual flat pans, the cover was thicker and rougher, especially on the middle portions of the Peace.⁶⁷ It looked different. "Back in the 50s when the river broke up in the spring, the river ice that came down ... was solid blue ice that broke up in big chunks," recalled Margaret Marcel in 1996. "But after the Bennett dam was built ... you don't see the big thick blue ice. ... Today all you see is small little chunks of ice."⁶⁸

Changes to the river's water and ice regime changed its morphology. Lowered flows meant more sediment remained in the river. Sand and silt built up, narrowing the river at many points and creating sandbars, small islands, and wider shorelines, which were slowly colonized by vegetation.⁶⁹ As new physical features appeared in the river and along its banks, old familiar ones disappeared. Islands became hills.⁷⁰ Lakes vanished under willow and sedge. "Today, I don't know where that lake is," said puzzled trapper Daniel Marcel of Big Egg, one of the delta's large perched basins. Nevertheless, every day during trapping season he went out looking, knowing it was "for almost nothing."⁷¹

Daniel Marcel had faith that his efforts might someday be rewarded; that the lake and the muskrat would come back. But such rituals of environmental belief were almost impossible in desecrated landscapes. Upstream, the dam had killed the river, despoiling places of spiritual as well as material significance. A bush pilot recalled one particularly distressing moment for the Ingenika. "A piece of land had broken off and slid into the lake," explained A.C. Geddes. "It was where their graveyard was, and there were coffins, some whole and some all broken up, bones and bodies strewn all down the bank." It was a scene from a northern hell: dead bodies in a dead river already choked with the corpses of trees. The Ingenika knew this was no natural disaster. When Geddes landed to see if he could help, they rushed up to him. "Are you the government? Indian Affairs?" "No." "Our ancestors are angry."⁷²

Although changes to the riverine environment were most apparent, the dam also made the familiar urban environments of the Peace valley foreign. In towns like Hudson's Hope that foreignness was literally embodied in the thousands of construction workers who descended on the community during the 1960s. Many were Portuguese and Italian, recent arrivals to Canada who in some cases had been recruited specifically to build the Bennett Dam.⁷³ While these workers spent some of their earnings locally—mainly, it seems, in the bar of the Peace Glen Hotel—some residents were not entirely happy with the invasion of these southern

European men, particularly when it appeared they were taking jobs away from locals.⁷⁴

The embodied nature of environmental change went beyond the presence of immigrant workers in Peace River valley towns. It was also manifested in the bodies and minds of local people. In addition to dependence, isolation, and alienation, the peoples of the Peace experienced environmental change as illness. The current high level of cancer among Fort Chipewyan residents might be attributable to the accumulation of toxins in the delta's waters, something facilitated by the reduced flows resulting from the Bennett Dam.⁷⁵ But cancer is only the most recent example of the affliction of environmental change.

Upstream, dust storms seemed to be the cause of many of the ailments that troubled those living around Williston reservoir. Dust made it hard to breathe—especially if you were very old or very young—and irritated the skin and eyes.⁷⁶ “The sand gets in your eyes, ears, everything,” complained Jean Isaac. “And ... our people have a lot of skin sicknesses that comes out in little welts and different ways.” But while the dust might have been the immediate cause of the illnesses that troubled the Ingenika, Isaac believed the malaise afflicting them was as much a matter of the mind as the body. “[I]t could be ... a psychological problem too, I don't know. You know, when a person thinks too much, they could break out in a rash, they could have stomach cramps, they could have anything. So you know, we don't know which is the real sickness, or which is in our minds.” The only thing she was certain of, however, was that “it didn't used to be.”⁷⁷

After the dam was constructed and the Ingenika were dispossessed of their trap lines, alcoholism emerged as a major social problem on the new reserves—so much so that many Ingenika abandoned the reserves for the bush in 1971.⁷⁸ To BC Hydro and the Department of Indian Affairs, this was inexplicable behavior. The reserves at Tutu Creek and Parsnip River had, after all, been chosen by the Ingenika, and met their requirements for access to jobs and services.⁷⁹ For the Ingenika, the move was the only sensible thing they could do; it was an act of community self-preservation. Jean Isaac left because she “didn't want to stay near the bars [at Mackenzie].”⁸⁰ Chief Seymour Isaac agreed. Moving to the Parsnip reserve “was a big mistake,” he told the Department of Indian Affairs in 1975. “[I]t's too close to town and [there are] too many people coming in and out with booze.”⁸¹

The psychological effects of losing land were not limited to the Aboriginal population. Some whites who lost their livelihoods to the waters of the reservoir could not easily imagine a future for themselves. Despair turned, in some cases, to suicide. “[I]t was such a change to him that his riverboats were no good anymore on Williston Lake,” recalled Jim Beattie of one unfortunate man. “[H]e was all finished.”⁸²

The ways in which the peoples of the Peace experienced environmental change point to the meanings attached to the land and the material and emotional work these places lost had performed. Land and water were dignity and security. They were connection—across space, time, and people—and they were wellness. Those meanings were embedded in places as expansive as a delta—and as intimate as a

garden plot, a trap line, or the very bodies of the individuals who worked and played in them.

CHALLENGES

DOING RIGHT BY THIS RIVER and its peoples would require solutions that addressed the depth, extent, and embeddedness of their sense of wrong. It was a challenging task, and the difficulties that accompanied it reveal that “the politics of environmental justice pivot around defining the scales of inequity.”⁸³ On the Peace River, the struggle for environmental justice was rooted in the different scales at which people experienced changes in the land and at which others tried to deal with them. Because the scale of human experience was incommensurate with the scale of management, achieving environmentally just solutions remained elusive.

Shortly after the Bennett Dam was completed, a group of scientists working at the University of Alberta and for various federal agencies challenged the government to act. They focussed their concern on the delta, which they considered a “Canadian resource” meriting national attention.⁸⁴ Their pressure led to the creation of a number of intergovernmental task forces beginning in 1971. The Peace-Athabasca Delta Project Group reported its findings and recommendations in 1973 and was followed by an implementation committee (1987) and a series of technical studies (1996). Their aim was to understand the river’s hydrology, assess the dam’s impact, and offer solutions to deal with the low water levels. Ultimately, their task was nothing less than “restoring the role of water to the delta.”⁸⁵

In the 1970s, that meant building control structures on the smaller rivers and channels that flowed out of the delta to prevent water from leaving—or at least to slow it down (see Map 3 for locations of control structures). In other words, it meant building more dams. Retaining water would keep the delta from drying out and prevent habitat degradation. These engineering solutions were, at best, only partly successful in hydrological and biological terms.⁸⁶ In terms of restoring the social and economic role of water to the delta, however, these engineering solutions fell far short.

The failure of the task force to formulate solutions that addressed the social as well as the environmental impacts of the Bennett Dam was due to the different scales at which the problem in the delta was perceived. The solutions implemented by the Project Group were framed at a systemic level. They conceptualized the Peace as a hydrological system in which water moved—up and down in the reservoir, and from west to east and north, through a large geographic area.

In contrast, a different spatial framing characterized how the peoples of the Peace saw the river and assessed its transformation. Rather than a hydrological system, they understood it as an intimate geography of belonging. Riverbanks, garden plots, lakes, and trap lines were prominent features in personal maps of attachment that located them in relation to each other and connected them to their past, present, and future. Yet these features were invisible at the scale and

resolution that characterized the way politicians and scientists envisioned the environment and environmental change.

While the spatial dimensions of scale have been explored in discussions of environmental justice, its temporal dimensions have not. Yet time also distinguished how the peoples of the Peace and the members of the Project Group saw the problem to be solved. Nowhere was this clearer than in an exchange between the band councils for Athabasca Chipewyan and Mikisew Cree and the Project Group. Invited to comment on plans to build control structures in the delta to retain water, the bands had this to say: "The Government people say that the proposed dam will make things the way they always were on the Delta. This would be good," they wrote. "But many people who remember the low water years wish the dam could make the Delta even better." The bands went on to ask for an all-weather road, improvements to the airport, better schools, help with starting a quarry, and jobs in tar sands development.⁸⁷

The Project Group and government were flummoxed: What did airports have to do with the delta's problems? Everything, as it turned out. But the connection between airports and water was only visible if one stood where the Athabasca Chipewyan and Mikisew Cree did and shared their temporal horizons. The Project Group did not.

Scientists and Aboriginal peoples worked from different time lines; different notions about when history started. The Project Group wanted to return water levels in the delta to their "natural" ones; that is, what they had been before the Bennett Dam was constructed in 1968. But from the perspective of the Aboriginal peoples in the delta, 1968 was an almost arbitrary date; certainly, the state of human affairs in the delta before 1968 left much to be desired. The Bennett Dam might have contributed to their problems—and for that matter those upstream in British Columbia—but from bands' standpoint, the damage caused by the dam merged almost seamlessly into the larger impacts of centuries of colonization and structural changes in the economy that rendered many northern communities poor.⁸⁸

Different configurations of space and time thus lay at the heart of the struggle for environmental justice in the delta. The framing Aboriginal peoples gave the water problem combined a limited spatial scale (a lake or the reserve) with an expansive temporal one (the history of colonialism). The way the Project Group framed the problem was just the opposite: its scientists used an expansive spatial scale (the watershed) with a limited temporal one (after 1968). These different configurations made the solutions offered by each group incomprehensible to the other, and because of this the proposed solutions themselves became sources of conflict.

As important as they are, the temporal horizons imposed by human history were not the only ones at play in the delta. More recent scientific work highlights the importance of other chronologies in shaping how we understand environmental change. In so doing it raises questions about what environmental justice might look like if nature's timeframe is taken seriously; if one begins "thinking like a river," or in this case, like a delta.

Since the 1970s and 1980s, the work on the delta's hydrology and ecology has highlighted the fact that wetlands are complex dynamic ecosystems comprising loosely associated component parts, each of which changes at different rates and in different ways. As one group of researchers noted, "profound changes in hydro-ecological conditions are ... a natural feature of this ecosystem."⁸⁹ Indeed, observed another, "the only 'constant' in the Peace-Athabasca Delta is change."⁹⁰

This context of variability makes it difficult to assess the meaning of change and its causes. If "change, per se, in a delta is not indicative of ecosystem stress or disease," then how do you sort out good changes from bad ones?⁹¹ More particularly, how can the changes in the delta caused by the Bennett Dam be distinguished from those that occur naturally? As time passes, the task becomes more complex: As other human activities affect the delta it becomes harder to separate the changes caused by the dam from those stemming from the operation of pulp and paper mills, oil sands development, and climate change.

For the people of the delta who have to live with the negative consequences of environmental change, the uncertainty about which anthropogenic factor is responsible for what changes undermines their chances at arriving at an environmentally just settlement. Achieving environmental justice—particularly in the courts, but also in the political arena—requires a discrete problem caused by a discrete entity.

Not only are wetlands dynamic, but their cycles of variability are lengthy, further complicating our understanding of change and making the pursuit of environmental justice even more challenging. When the Peace-Athabasca Delta Project Group recommended that control structures be built on the delta, they based their recommendations on a short-term assessment of changes in water flows and levels, in flooding, and in vegetation cover. Recently, however, some scientists have constructed histories from the study of lake sediment cores and argue that a much more expansive timeline is required to assess change in wetlands; perhaps one of three hundred or more years.⁹²

From that scale, there was nothing unusual about the conditions observed in the delta after the construction of the Bennett Dam.⁹³ Human perceptions of what was "normal"—and hence what was not—appear to have been formed in the late nineteenth and early twentieth century; a period of unusually frequent and high floods.⁹⁴ Examined over the long term, what appeared to be a "dying delta" was, to one scientist, really a "paragon of ecosystem health."⁹⁵ The *longue durée* of wetland dynamics suggests a different approach to management. If, within the context of long-term variability, everything is fine with the delta, doing *environmental* justice might mean doing very little in the short—human—term. Yet the short-term is what matters to human societies in the delta. Where does this leave them?

And us? If nothing else, it should leave us with an appreciation of how different temporal and spatial scales shaped how environmental change on the Peace was perceived, and how those scales themselves were constituted by ideology, experience, and science. The high modernism of Axel Wenner-Gren and W.A.C. Bennett produced a simplified futurescape which highlighted the economic

potential of the environment, reducing rivers to flows of power and celebrated large-scale, state-sponsored environmental change. In contrast, the experience of living, working, and playing on the Peace produced a more intimate and textured historical geography, one that rooted people to place and located them in time. Many of those roots were damaged—drowned or desiccated—by the dam, with destabilizing effects. Distinct from both, scientists' assessments of the impact of damming the Peace were shaped by developments in hydrology and ecology, and changed from ones which emphasized the dam's negative effects to others which presented them as negligible.

The importance of scale in constituting environmental change suggests that we need to broaden our thinking about environmental justice, moving beyond questions of the distribution of risk and procedural fairness. In framing solutions, we must grapple with multiple scales: not just the large scale space of flows and the small scale space of places, but with deep time and human time—with when history starts and where history happens.

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NOTES

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1. In fact, damming the Peace was illegal, a contravention of the Navigable Waters Protection Act. The government of British Columbia appears to have known this before the dam was constructed; certainly the Canadian federal government considered the structure illegal—but chose not to act. That part of the story is, however, beyond the scope of this essay. For an introduction, see James Howell, "The Portage Mountain Hydro-Electric Project [the W.A.C. Bennett Dam]," in *Northern Transitions, Volume 1: Northern Resource and Land Use Policy Study*, ed. Everett B. Peterson and Janet B. Wright (Ottawa: Canadian Arctic Resources Committee, 1978), 34-37.
2. Early key studies include Robert D. Bullard, "Solid Waste Sites and the Black Houston Community," *Sociological Inquiry* 53 (1983): 273-88; United States General Accounting Office, *Siting of Hazardous Waste Landfills and Their Correlation with Racial and Economic Status of Surrounding Communities* (Washington, DC: United States General Accounting Office, 1983); and United Church of Christ, *Toxic Waste Sites and Race in the United States: a National Report on the Racial and Socio-economic Characteristics with Hazardous Waste Sites* (New York: United Church of Christ Commission for Racial Justice, 1987).

3. Julian Agyeman, Robert Bullard, and Bob Evans give what they call the “traditional” definition of environmental injustice: It is a situation in which “people of color are forced, through their lack of access to decision-making and policy-making processes, to live with a disproportionate share of environmental ‘bads’ –and thus to suffer the related public health problems and quality of life burdens.” They go on to note that “[e]nvironmental justice activists claim that the ‘path-of-least-resistance’ nature of locational choices within our economy functions to the detriment of people of colour, and, moreover, this disproportionate burden is an intentional result.” Julian Agyeman, Robert D. Bullard, and Bob Evans, “Exploring the Nexus: Bringing Together Sustainability, Environmental Justice and Equity,” *Space and Polity* 6 (2002): 81-82.
4. There is a debate in the literature about whether environmental injustice is primarily an outcome of racism or poverty. For Robert D. Bullard it is “a race thing, not a poverty thing.” Andrew Hurley disagrees, exploring how industrial capitalism exploited the divisions of race and class to its benefit, in the process producing different kinds of environmental inequalities. See Robert D. Bullard, “Environmental Justice for All,” in his *Unequal Protection: Environmental Justice and Communities of Color* (San Francisco: Sierra Club Books, 1994), 5-6; and Andrew Hurley, *Environmental Inequalities: Class, Race, and Industrial Pollution in Gary, Indiana, 1945-1980* (Chapel Hill: University of North Carolina Press, 1995). Laura Pulido tries to get beyond the race versus class debate, arguing for a more complex view of racism. See her essay, “A Critical Review of the Methodology of Environmental Racism Research,” *Antipode* 28 (1996): 142-59.
5. Patrick Novotny, *Where We Live, Work and Play: The Environmental Justice Movement and the Struggle for a New Environmentalism* (Westport, CT: Praeger, 2000). For a review of environmental inequality outside the United States, see Francis O. Adeola, “Cross-National Environmental Injustice and Human Rights Issues: A Review of Evidence in the Developing World,” *American Behavioral Scientist* 43 (2000): 686-706.
6. For a discussion of how traditional environmentalism marginalized and oppressed certain groups of people, see, for instance, Karl Jacoby, *Crimes against Nature: Squatters, Poachers, Thieves, and the Hidden History of American Conservation* (Berkeley and Los Angeles: University of California Press, 2001); and Mark David Spence, *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks* (New York: Oxford University Press, 1999).
7. The “Principles of Environmental Justice” were defined at the First National People of Color Environmental Leadership Summit in 1991. See <http://www.ejnet.org/ej/principles.html>.
8. On the connections between the U.S. Civil Rights Movement and the environmental justice movement, see Eileen Maura McGurty, “From NIMBY to Civil Rights: The Origins of the Environmental Justice Movement,” *Environmental History* 2 (1997): 301-23; Stephen Sandweiss, “The Social Construction of Environmental Justice,” in *Environmental Injustices, Political Struggles: Race, Class, and the Environment*, ed. David E. Camacho (Durham, NC: Duke University Press, 1998), 31-57; and Robert D. Bullard and G. S. Johnson, “Environmental Justice: Grassroots Activism and its Impact on Public Policy,” *Journal of Social Issues* 56 (2000): 555-78. Other scholars make the case that what we now call “environmental justice” activism predated the Civil Rights Movement and was a part of race, gender, and class inequities in North America and elsewhere. See Dorceta E. Taylor, “American Environmentalism: the Role of Race, Class, and Gender in Shaping Activism, 1820-1995,” *Race, Gender, and Class* 5 (1997): 16-62. Laura Pulido frames her study of the southwest as an examination of subaltern struggles for environmental justice. See her *Environmentalism and Economic Justice: Two Chicano Struggles in the Southwest* (Tucson, AZ: University of Arizona Press, 1996).

9. <http://www.unep.org/Documents.multilingual/Default.asp?DocumentID=78&ArticleID=1163>.
10. http://www.epa.gov/compliance/resources/policies/ej/exec_order_12898.pdf.
11. Evan J. Ringquist, "Environmental Justice: Normative Concerns and Empirical Evidence," in *Environmental Policy in the 1990s: Reform or Reaction?*, 3rd ed., ed. Norman J. Vig and Michael E. Kraft (Washington, DC: CQ Press, 1997), 247-48.
12. Anastasia M. Shkilnyk, *A Poison Stronger than Love: the Destruction of an Ojibwa Community* (New Haven: Yale University Press, 1983). In addition, the toxic effects of the tar ponds on the residents of Sydney, Nova Scotia, also have attracted attention. See Maude Barlow and Elizabeth May, *Frederick Street: Life and Death on Canada's Love Canal* (Toronto: Harper Collins, 2000).
13. The term is Ryan Holifield's and it describes the situation in the United States: "Defining Environmental Justice and Environmental Racism," *Urban Geography* 22 (2001): 79.
14. See, for example, Hurley, *Environmental Inequalities*; Pulido, *Environmentalism and Economic Justice*; and Laura Pulido, "Rethinking Environmental Racism: White Privilege and Urban Development in Southern California," *Annals of the Association of American Geographers* 90 (2000): 12-40; and David N. Pellow, "Environmental Inequality Formation: Toward a Theory of Environmental Justice," *American Behavioral Scientist* 43 (2000): 581-601.
15. On various explanations for environmental inequity in the global context, see Adeola, "Cross-National Environmental Injustice and Human Rights Issues," 69off. For the United States, see Robert W. Williams, "Environmental Injustice in America and its Politics of Scale," *Political Geography* 18 (1999): 49-73. For a critique of the central argument of environmental justice—namely that environmental harms are distributed unequally and that those on the social margins bear the burden of them—see William Bowen, "An Analytical Review of Environmental Justice Research: What Do We Really Know?" *Environmental Management* 29 (2002): 3-15.
16. George Towers, "Applying the Political Geography of Scale: Grassroots Strategies and Environmental Justice," *Professional Geographer* 52 (2000): 25. He notes that the work of Edward Soja and Henri Lefebvre was particularly important in shaping inquiry into the social construction of space.
17. For an overview, see Williams, "Environmental Injustice in America and its Politics of Scale." On scale and capitalism, see Neil Smith, *Uneven Development: Nature, Capital, and the Production of Space*, 2nd ed. (Oxford: Basil Blackwell, 1990).
18. Andrew Herod and Melissa W. Wright, "Placing Scale: An Introduction," in *Geographies of Power: Placing Scale*, ed. Andrew Herod and Melissa W. Wright (Oxford: Blackwell Publishing, 2002), 2ff.
19. For an overview and a specific example, see Hilda E. Kurtz, "The Politics of Environmental Justice as the Politics of Scale: St James Parish, Louisiana, and the Shintech Siting Controversy," in *Geographies of Power: Placing Scale*, ed. Herod and Wright, 249-73.
20. "Scale-jumping" is discussed in Herod and Wright, "Placing Scale: An Introduction," 4, 10-11; and Towers, "Applying the Political Geography of Scale," 27.
21. On high modernity, see James C. Scott, *Seeing like a State: How Certain Schemes to Improve the Human Condition have Failed* (New Haven: Yale University Press, 1998).
22. Cited in David J. Mitchell, *W.A.C. Bennett and the Rise of British Columbia* (Vancouver: Douglas and McIntyre, 1983), 255.
23. John Diefenbaker was Prime Minister between 1957 and 1963. In the election campaigns of 1957 and 1958 he articulated his "northern vision," a plan for national economic development based on exploiting the resources of Canada's north.

24. Jack Scott, "Jack Scott Visits Wenner-Grenland," *Vancouver Sun*, 1957, 1, VPL Clippings File: "Dams-BC-Peace River to 1957"; and "A Great Project for the North," *Province*, October 10, 1957, 6.
25. Memorandum for the Deputy Custodian Re: Mr. Castleden's question with respect to the placing of Mr. Axel Wenner-Gren's name on the list of specified persons, April 3, 1957. Canada, Custodian of Enemy Property, "Wenner-Gren, Axel." Library and Archives Canada [LAC], RG 117, Series A-3, volume 2060, file 6251.
26. "Here is the text on Wenner-Gren," *Vancouver Sun*, 1957. VPL Clippings file Dams-BC-Peace River to 1957. Stuart Keate, "Axel in Wonderland," *Saturday Night*, 13 April 1957, 50, in Canada, Canadian National Railways. "British Columbia-Wenner-Gren Development." LAC, RG 30, Series V-A-9-j, volume 14440.
27. "Peace Project Gears Up for Spring Thaw," *Vancouver Times*, March 15, 1965, in VPL Clippings File, "Dams-BC-Peace River-1964-1967; and Gordon M. Shrum, "Foreword," to Bruce Ramsay and Dan Murray, *Big Dam Country: a Pictorial Record of the Development of Peace River Country* (Fort St John: Dan Murray, Ltd., 1969), np.
28. David E. Nye, *American Technological Sublime* (Cambridge: MIT Press, 1994).
29. The Peace was dammed to promote the exploitation of forestry and mining resources. But it was also dammed because it was not a salmon river; its waters were impounded so that those of the Fraser, which supported another valuable resource (salmon), would not be. As Matthew D. Evenden argues, the government of British Columbia made choices between fish and power. See his *Fish versus Power: An Environmental History of the Fraser River* (Cambridge, UK, and New York: Cambridge University Press, 2004).
30. Greg Halseth and Lana Sullivan, *Building Community in an Instant Town: Geography of Mackenzie and Tumbler Ridge, British Columbia* (Prince George, BC: University of Northern British Columbia Press, 2002), 30-34 and Patricia Marchak, *Green Gold: The Forest Industry in British Columbia* (Vancouver: UBC Press, 1983), 306-11.
31. The connections between the Columbia River Treaty negotiations and the shift in policy regarding electricity exports was complex and are spelled out in Earle Gray, *Forty Years in the Public Interest: A History of the National Energy Board* (Vancouver: Douglas and McIntyre, in cooperation with the National Energy Board and Canadian Government Publications, 2000), 108-11.
32. The figure for acres flooded is from Douglas Baker, Jane Young, and J.M. Arocena, "An Integrated Approach to Reservoir Management: The Williston Reservoir Case Study," *Environmental Management* 25 (2000): 567. There is no count of how many animals were drowned. However, there are anecdotal accounts, like that of bush pilot Pen Powell. "The things I saw I wish I could forget," he recalled. "I and a friend were flying one day around the highth [sic] of the disaster ... and saw a large herd of moose that were trapped on a piece of high ground by floating debris and pulled over trees. We counted well over one hundred moose in about a ten acre area, the next day we came back over the same area and it was completely covered with water and lots of dead moose floating among the debris." See Powell to Matheson, May 30, 1989, 3. Shirlee Smith Matheson Fonds, University of Calgary Archives [UCA] Acc. 685/00.16, box 43, file 4. The reservoir's impact on mountain caribou is from Scott Simpson, "A Dam Never Forgotten: Trouble on the Peace," *Vancouver Sun*, July 8, 2004, F3.
33. While forty to fifty families were moved to new reserves, all of the approximately two hundred members of the band were affected by the flooding. See Mary Christina Koyl, "Cultural Chasm: a 1960s Hydro Development and the Tsay Keh Dene Community of Northern British Columbia," (MA Thesis, University of Victoria, 1993), 69.
34. Boatman to Matheson, May 15, 1989, 4. Shirlee Smith Matheson Fonds, UCA Acc. 685/00.16, box 43, file 4. Boatman noted there were five expropriations related to the project, "most of them necessary to overcome problems transferring title."

35. See, for example, interview with Jean Issac, Ingenika Point, 16 April 1989, 5. Shirlee Smith Matheson Fonds, UCA Acc. 685/00.16, box 44, file 3. Scientific research corroborates this observation. See D. G. Schaefer, *Climatological Impacts of Peace River Regulation and a Review of the Possible Effects of Climatic Change on Agriculture in the Area* (Victoria: BC Hydro and Power Authority, 1976), 51.
36. John Sawatsky, "Explainers Meet Opposition," *Vancouver Sun*, February 14, 1974. VPL Clippings File—"Dams-BC-Peace River-1970-74."
37. Nat Cole, "'You Hate to See the Beauty of Peace River Disturbed,'" *Vancouver Sun*, October 10, 1970, 12. VPL Clippings File—"Dams-BC-Peace River-1970-74."
38. A study done for BC Hydro noted that the effects of the reservoir were limited to the area immediately surrounding it. While temperatures fell by a few degrees, no discernable difference in humidity was detected. However, studies did indicate an increase in fog in the fall months. See Schaefer, *Climatological Impacts of Peace River Regulation*, 50-54.
39. The general pattern was as follows: tremendous increases in fish populations in first few years after the flood, followed by decline, and then stabilization. The shift in species composition is due to fluctuating water levels which destroy shorelines that had supported aquatic plants and insect populations important to riverine species. The average annual draw-down in the Williston reservoir between 1972 and 1987 was 16.8 meters, more than enough to create "a basically abiotic littoral zone." Brian G. Blackman, *Fisheries Resources of the Williston Reservoir Twenty Years after Impoundment* (Prince George, BC: BC Hydro Peace/Williston Fish and Wildlife Compensation Program, 1992), vi, 1.
40. *Ibid.*, 19ff.
41. Boatman to Matheson, May 15, 1989, 3. Shirlee Smith Matheson Fonds, UCA Acc. 685/00.16, box 43, file 4.
42. Brian G. Blackman, *Peace-Williston Compensation Program Summary of Activities, 1988-1997* (Prince George, BC: Peace-Williston Compensation Program, 2001), 5; Mary Ellen Wood and Luke Trip, *Examining Fish Consumption Advisories Related to Mercury Contamination in Canada* (Hull, Quebec: Environment Canada, nd), 7 at <http://www.ec.gc.ca/MERCURY/EN/efca.cfm>.
43. British Columbia. Ministry of Environment, *State of Environment Reporting* at <http://www.env.gov.bc.ca/soerpt/993contaminants/trout.html>.
44. "Submission to the ICC Inquiry-Specific Claim-Athabasca Chipewyan First Nation by D. W. Schindler (summary expert opinion), November 1996." Canada. Indian Claims Commission, *Athabasca Chipewyan First Nation Inquiry-W.A.C. Bennett Dam and Damage to IR 201, ICC Exhibit 17, 2*.
45. <http://www.mb.ec.gc.ca/nature/whp/ramsar/dfo2so6.en.html>. Also see Peace-Athabasca Delta Project Group, *The Peace-Athabasca Delta: A Canadian Resource*, (Edmonton: Peace-Athabasca Delta Project Group, 1972), 24-36.
46. Northern River Basins Study Board, *Northern River Basins Study Report to the Ministers* (Edmonton, Alberta: Northern River Basins Study, 1996), 62-63.
47. While the reservoir filled, mean peak summer water levels in Lake Athabasca fell from a pre-dam level of 209.95 meters to 209.10 meters. After 1972, the mean peak summer water level in the lake was somewhat higher, but still well below the pre-dam level, at 209.55 meters. See D. R. Jaques, *Vegetation Habitat Types of the Peace-Athabasca Delta, 1976-1989* (North Vancouver: Ecosat Geobotanical Surveys, Inc., 1990), 7 and 14.
48. David Schindler, "The Effects of Climate Warming and Cumulative Human Activity on Canada's Freshwater in the 21st Century," in *Water and the Future of Life on Earth*, ed. Patricia Gallagher and Laurie Wood (Burnaby, BC: Simon Fraser University Continuing Studies in Science, 2002), 2-6. <http://www.sfu.ca/cstudies/science/water/pdf/Water.pdf>.

49. Ibid., Major Findings, Section 3.5 Flow Regulation-Effects on the Peace-Athabasca Delta; and Submission to the ICC Inquiry-Specific Claim-Athabasca Chipewyan First Nation by D. W. Schindler (summary expert opinion), November 1996, 2. Canada. Indian Claims Commission, *Athabasca Chipewyan First Nation-W.A.C. Bennett Dam and Damage to I.R. 201*, Exhibit 17. By early in the twenty-first century, Schindler estimated that 78 to 85 percent of wetlands and wet marshes would be lost. On the loss of food for fish and wildlife, see Jeffrey E. Green, *A Preliminary Assessment of the Effects of the W.A.C. Bennett Dam on the Athabasca River Delta and the Athabasca Chipewyan Band, An Information Document by the Athabasca Chipewyan Band to the Department of Justice and the Office of Native Claims* (Vancouver: The Delta Management Group, Ltd., 1992), 23. Canada. Indian Claims Commission, *Athabasca Chipewyan First Nation-W.A.C. Bennett Dam and Damage to I.R. 201*, ICC Exhibit 1A, tab 1.
50. Green, *A Preliminary Assessment of the Effects of the W.A.C. Bennett Dam*, 23. Canada. Indian Claims Commission, *Athabasca Chipewyan First Nation-W.A.C. Bennett Dam and Damage to I.R. 201*, ICC Exhibit 1A, tab 1.
51. Submission to the ICC Inquiry-Specific Claim-Athabasca Chipewyan First Nation by D. W. Schindler, 3.
52. Interview with A.C. Geddes, Calgary, 14 May 1989, 14-15. Shirlee Smith Matheson Fonds, UCA Acc. 685/00.16, box 44, file 3.
53. Baker, Young, and Rocena, "An Integrated Approach to Reservoir Management," 571.
54. Earl K. Pollon and Shirlee Smith Matheson, *This Was Our Valley* (Calgary, AB: Detselig, 1989), 212-13.
55. Canada. Indian Claims Commission. *Athabasca Chipewyan First Nation Inquiry: W.A.C. Bennett Dam and Damage to Indian Reserve 201* (Ottawa: Indian Claims Commission, March 1998), 24.
56. Note that the average yearly per capita income in Alberta in 1970 was \$2,400. Montcrieff, Montgomery & Associates, Ltd., *Draft Report to the Socio-Economic Sub Committee of the Peace-Athabasca Project* (Edmonton, Alberta: Montcrieff, Montgomery & Associates, Ltd., 13 December 1971), 53-54. Alberta. Department of Environment, Peace-Athabasca Delta Study Task Force. Provincial Archives of Alberta [PAA], GR 1988.0422, box 1, file "Socio-Economic Sub-Committee."
57. Interview with Albert Poole, April 16, 1989, 3. Shirlee Smith Matheson Fonds, UCA Acc. 685/00.16, box 44, file 3.
58. Interview with Albert Poole, April 16, 1989, 3. Shirlee Smith Matheson Fonds, UCA Acc. 685/00.16, box 44, file 3. Also see Green, *A Preliminary Assessment of the Effects of the W.A.C. Bennett Dam*, 30.
59. On the failure to clear the Williston Reservoir of timber, see Marchak, *Green Gold*, 308-09. The sight of the Ingenika trying to travel the lake haunted A. C. Geddes of Hudson's Hope, who worked for a time clearing debris. "They would try to go across the lake in their old riverboat[s], ... the debris ... knocking the props off...[.] They're stranded out there on the water and trying to build a little fire on those mats [of timber]" while they waited for the logs to shift and give them a way out. Interview with A. C. Geddes, May 14, 1989, 7. Shirlee Smith Matheson Fonds, UCA Acc. 685/00.16, box 44, file 3.
60. Veit-Draft Report, 22 March 1977, 2, 5. Canada. Department of Indian Affairs, LAC RG 10, file 985/19-4-609.
61. Montcrieff, Montgomery & Associates, Ltd., *Draft Report*, 26. Alberta. Department of Environment, Peace-Athabasca Delta Study Task Force. PAA, GR 1988.0422, box 1, file "Socio-Economic Sub-Committee."
62. Stuart Adams and Associates, *Fort Chipewyan Way of Life Study: an Assessment of Impacts of the W.A.C. Bennett Dam on the People of Fort Chipewyan and the Peace-Athabasca Delta and Suggestions for Action* (Vancouver: Stuart Adams and Associates, 1998), 161.

63. This theme is pursued in a different context in Cole Harris, "Industry and the Good Life around Idaho Peak," *Canadian Historical Review* 66 (1985): 315-43.
64. On this approach, see Joy Parr, "Notes for a More Sensuous History of Twentieth-Century Canada: the Timely, the Tacit, and the Material Body," *Canadian Historical Review* 82 (2001): 720-45; Linda Nash, "The Changing Experience of Nature: Encounters with a Northwest River," *Journal of American History* 86 (2000): 1600-1629; and Christopher Sellers, "Thoreau's Body: Towards an Embodied Environmental History," *Environmental History* 4 (October 1999): 486-515.
65. Pollon expressed himself in verse: "God! How I hate it! Yes, hate it! / I wish this dam project in hell! / With all this rumble and racket / I'd sooner hear harness and bell." Pollon and Matheson, *This Was Our Valley*, 183.
66. Canada. Indian Claims Commission. *Athabasca Chipewyan First Nation Inquiry*, 75.
67. Northern River Basins Study, *Final Report*, Major Findings, Section 3.5 Flow Regulation-Ice Formation..
68. Testimony of Margaret Marcel, ICC Transcript, October 10, 1996, 60-61. Canada. Indian Claims Commission. *Athabasca Chipewyan First Nation Inquiry*, ICC Exhibit 15.
69. Northern River Basins Study. *Final Report* (Ottawa: Northern River Basins Study, 1996), Section 3.5. <http://www3.gov.ab.ca/env/water/nrbs/index.html>.
70. Testimony of Josephine Mercredi, ICC Transcript, October 10, 1996, 53. Canada. Indian Claims Commission. *Athabasca Chipewyan First Nation Inquiry*, ICC Exhibit 15.
71. *Ibid.*, 74.
72. Interview with A. C. Geddes, May 14, 1989, 8. Shirlee Smith Matheson Fonds, UCA Acc. 685/00.16, box 44, file 3.
73. *Ibid.*; and Pollon and Matheson, *This Was Our Valley*, chap. 17.
74. Pollon and Matheson, *This Was Our Valley*, chaps. 14, 16, and 17.
75. Patrick Brethour, "Why is Cancer Sweeping Tiny Fort Chipewyan?" *Globe and Mail*, May 23, 2006.
76. Baker, Young, and Arocena, "An Integrated Approach to Reservoir Management," 573.
77. Interview with Jean Issac, Ingenika Point, April 16, 1989, 5. Shirlee Smith Matheson Fonds, UCA Acc. 685/00.16, box 44, file 3.
78. *Veit-Draft Report, March 22, 1977*, 4. Canada, Department of Indian Affairs, Relocation of Indians-Ingenika Band, LAC RG 10, Acc. V-1994-95/559, Box 1, File 985/19-4-609.
79. Report on Ingenika Band of Indians in Occupation of Crown Lands at Ingenika River, February 19, 1974, 2, *ibid.*
80. Interview with Jean Issac, Ingenika Point, April 16, 1989, 5. Shirlee Smith Matheson Fonds, UCA Acc. 685/00.16, box 44, file 3.
81. Isaac to Rhymer, September 18, 1975, 1. LAC RG 10, File 985/19-4-609.
82. Interview with Jim Beattie (with input from Al Hamilton), nd, 26. Shirlee Smith Matheson Fonds, UCA Acc. 685/00.16, box 44, file 2.
83. Williams, "Environmental Injustice in America and its Politics of Scale," 49.
84. Peace-Athabasca Delta Project Group, *The Peace-Athabasca Delta*. The title page has the inscription: "This is remote country. This is beautiful country. This is rich country. This is what Canada is all about."
85. Peace-Athabasca Delta Technical Studies, *Peace-Athabasca Delta Technical Studies-Final Report 1996* (Fort Chipewyan: Peace-Athabasca Delta Technical Studies, 1996), 1-2. The other reports are: Peace-Athabasca Project Group, *The Peace-Athabasca Delta Project Technical Report: A Report on Low Water Levels and their Effects on the Peace-Athabasca Delta* (Edmonton: Peace-Athabasca Delta Project Group, 1973) and Peace-Athabasca Delta Implementation Committee, *Peace-Athabasca Delta Water Management Works Evaluation: Final Report* (Governments of Canada, Alberta, and Saskatchewan: Peace-Athabasca Delta Implementation Committee, April, 1987). At the

- same time the Technical Studies were underway, there was also a larger intergovernmental research initiative which investigated the Peace River. See Northern River Basins Study, *Final Report*.
86. Peace-Athabasca Delta Implementation Committee, *Peace-Athabasca Delta Water Management Works Evaluation Final Report*, v.
 87. Submission to the Environment Conservation Authority by the Athabasca Cree and Chipewyan Bands, Fort Chipewyan, Alberta, 3. Alberta. Department of Environment, Peace-Athabasca Delta Study Task Force Files. PAA, GR 1988.0422, box 2, file: Peace Athabasca Hearings 1973.
 88. Their perspective is shared by indigenous peoples in the United States and around the world. In *Defending Mother Earth*, Jack Weaver argues that “Natives view the environmental depredations being visited upon them as merely one more manifestation of colonialism that has attacked their lives for over five hundred years. Ecojustice, therefore, cannot be discussed apart from that racism and colonialism.” Cited in Paul C. Rosier, “Fond Memories and Bitter Struggles: Concerted Resistance to Environmental Injustices in Postwar Native America,” in *Echoes from the Poisoned Well: Global Memories of Environmental Injustice*, ed. Sylvia Hood Washington, Paul C. Rosier, and Heather Goodall (Lanham, MD: Lexington Books, 2006), 36. Writing about the situation of indigenous peoples around the world, Heather Goodall argues that “[h]istory is central to questions of how those indigenous people have understood environmental injustice because ... [p]ower in colonies has been exercised through control over space and environment.” See her “Indigenous Peoples, Colonialism, and Memories of Environmental Injustice,” in *ibid.*, 74.
 89. Brent B. Wolfe et al., “Impacts of Climate and River Flooding on the Hydro-ecology of a Floodplain Basin, Peace-Athabasca Delta, Canada since A.D. 1700,” *Quaternary Research* 64 (2005): 148.
 90. Kevin Timoney, “Landscape Cover Change in the Peace-Athabasca Delta, 1927-2001,” *Wetlands* 26 (2006): 777.
 91. Kevin Timoney, “A Dying Delta? A Case Study of a Wetland Paradigm,” *Wetlands* 22 (2002): 296.
 92. Timoney, “Landscape Cover Change,” 776. Also see Wolfe et. al., “Impacts of Climate and River Flooding on the Hydro-ecology of a Floodplain Basin; and Brent B. Wolfe et al., “Reconstruction of Multi-century Flood Histories from Ox-bow Lake Sediments, Peace-Athabasca Delta, Canada,” *Hydrological Processes* 20 (2006): 4131-53.
 93. According to Wolfe et. al., “[t]he “hydro-ecological conditions after regulation of the Peace River began in 1968 are well within the broad range of natural variability observed over the past 300 years.” See “Impacts of Climate and River Flooding,” 160.
 94. Brent B. Wolfe, Roland I. Hall and Thomas W. D. Edwards, “Assessing the Status of the Peace-Athabasca Delta Ecosystem: Challenging the Paradigm from a Paleoenvironmental Perspective,” *Meridian* Fall/Winter 2006, 9.
 95. Timoney, “A Dying Delta?” 282.