

**INFRASTRUCTURES OF VULNERABILITY,  
OR,  
HOW THE FRASER VALLEY FLOODED TWICE**

by

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B.A., Haverford College, 2016

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF  
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES  
(Geography)

THE UNIVERSITY OF BRITISH COLUMBIA  
(Vancouver)

November 2022

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Infrastructures of vulnerability, or, how the Fraser Valley flooded twice

submitted by Nick Gandolfo-Lucia in partial fulfilment of the requirements for

the degree of Master of Arts

in Geography

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## **Abstract**

In November and December of 2021, major floods occurred in the Fraser Valley of British Columbia due to exceptional rainfall from an atmospheric river. As Justin Trudeau stoically informed the House of Commons, the unusual weather pattern that precipitated this event was likely an effect of anthropogenic climate change. However, the flooding of the Fraser Valley was not only due to new, more extreme weather patterns: for the last 150 years, flooding has been a persistent danger in this area. Drawing on a range of archival sources, I argue that the expansion and movement of the Fraser River was transformed into a hazard through the processes of colonial and capitalist development in the valley that followed the goldrush of 1858. These processes differentially rendered the inhabitants of the valley vulnerable to flooding.

The introduction outlines this argument in the context of the floods of 2021. In Chapter 1, I provide a sympathetic critique of prevailing conceptions of vulnerability in geographic thought, arguing that vulnerability to flood hazards is not an inherent quality of individuals. Rather, individuals are produced as vulnerable through the socioecological relations in which they exist. Chapter 2 returns to the Fraser Valley. I show how the seasonal rhythms of the river, which had long been used by First Peoples for subsistence and cultural purposes, were rendered disastrous through the colonization of the valley and the imposition of European-style agriculture in the late 19<sup>th</sup> century. The vulnerability of settler-farmers to flooding led to the provincial state taking over the task of diking the valley in 1898. Significantly, however, the construction of this intervention introduced new vulnerabilities: the need to fund and maintain the dikes, dams, floodgates, and pumps on which agriculture in the valley depends. In Chapter 3, I show how

these vulnerabilities were dramatically realized in the flood of 1948. After the flood, dikes and other infrastructures were rebuilt, ensuring that this vulnerability endured. Lastly, in the conclusion, I briefly highlight recent proposals from community groups around the Fraser Valley, particularly First Nations, to find alternative ways of managing flooding that do not rely on traditional dikes.

## **Lay Summary**

As the long march of climate change accelerates, extreme weather events like floods are becoming more common. There is therefore a temptation to attribute such events exclusively to the extremes precipitated by climate change. In this thesis, I suggest that it is equally important to attend to the local history and geography in which these disasters occur. Focusing on flooding in the Fraser Valley of British Columbia, I show that this ‘natural hazard’ was produced through the processes of colonialism and capitalism that transformed the valley in the late 19<sup>th</sup> century. Flooding, which is to say the natural expansion and movement of the rivers in the valley, is therefore not inherently dangerous, but rather became dangerous due to the form of settler-colonial society that developed in the valley after the 1858 gold rush. We are still living in this society today.

## **Preface**

This thesis is the original, unpublished, and independent (insofar as any scholarly effort is independent) work of Nick Gandolfo-Lucia.

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## List of Abbreviations

BC	British Columbia
BCARS	British Columbia Archives and Records Services
CA	Chilliwack Archives
CCLW	Chief Commissioner of Lands and Works
CPR	Canadian Pacific Railway
FV	Fraser Valley
FVDB	Fraser Valley Dyking Board
FRB	Fraser River Board
HBC	Hudson's Bay Company
LMRPB	Lower Mainland Regional Planning Board
TH	Tim Hood Radio Broadcast Collection
UBCIC	Union of BC Indian Chiefs

## Acknowledgements

The modest successes of this thesis were only possible due to the thoughtfulness, brilliance, and generosity of the people who supported it from start to finish.

First, I must thank my supervisor Trevor Barnes for both his intellectual and financial support throughout the project. Trevor spent many hours talking through the details of my argument and made many valiant attempts to steer me away from folly. His rigorous feedback and unfailing moral support, particularly in the final weeks of the project, were invaluable. I am grateful to Matthew Evenden for acting as my second reader. His helpful feedback, advice, and encyclopedic knowledge of British Columbia greatly improved this thesis. Thanks are also due to Gerry Pratt, who supervised me and provided funding in the early part of my studies. I also thank Jamie Peck for overseeing a directed reading in which the earliest formulations of this project took shape. Lastly, I am grateful for the Larry Bell Urban Research Award, which funded part of my research.

I owe a great intellectual debt to my fellow graduate students (one I doubt they will allow me to pay back in full—not least because they will reject the idea that any ‘debt’ exists). This thesis very simply would not have been written without Audrey Irvine-Broque, Yardain Amron, and Adriana DiSilvestro. During the morbid prime of the COVID-19 pandemic, I found community, solidarity, and intellectual refuge with the three of you. Nothing has stimulated my thinking in the last two years as much as the conversations I shared with you, and I will be a rich man if there are more in my future. I also thank Prashant Rayaprolu, Gabby Wolf, Peter de Montmollin, Eric Hagen (honorary graduate student), Brandon Hillier, Chris Meulbroek, Rachel Phillips, Bella Pojuner, Max Cohen, and Gabriele Woolever, all of whom have touched this project in various ways.

I would also like to thank the many archivists around British Columbia who helped me to navigate the labyrinth of primary sources. Likewise, I thank the community historians of the Fraser Valley, particularly K. Jane Watt and Chad Reimer, who are not always adequately recognized in academic circles. This project would not have been possible without their work.

Special thanks are owed to my parents, who have supported me enthusiastically through every endeavor I have pursued for nearly three decades. Although they were in the distant land of New Jersey, their encouragement was close to me throughout the writing of this thesis.

Finally, Sabrina Materie, without whom this and many other projects would have been put aside long ago.

I dedicate this thesis to Cole Harris, who passed away shortly before it was completed.

## Introduction: Sumas Lake, 2021

Every historical perception can be visualized by substituting the image of a pair of scales, one pan of which is weighted with what was, the other with a recognition of what now is. While the facts collected on the first pan can never be too trivial or too numerous, only a few heavy, massive weights need to lie on the other.  
Walter Benjamin, *The Arcades Project*<sup>1</sup>

For a few weeks in November and December of 2021, Sumas Lake appeared again. An atmospheric river had set in over British Columbia and proceeded to break rainfall records across the province, leading to massive flooding.<sup>2</sup> In the deluge the Nooksack River overflowed its banks and crossed the US-Canada border into British Columbia. It inundated Sumas prairie, killing several people and over 600,000 livestock—not to mention uncounted plants and animals absent from governmental statistics—as well as causing billions of dollars in damages.<sup>3</sup>

What do I mean when I say that Sumas Lake appeared *again*? For most of the last century, Sumas Lake has not existed. It was drained in the 1920s under the direction of British Columbia Premier John Oliver’s Liberal government. The province undertook the massive project of draining a 132 square mile lake for two reasons: to protect existing farmland from flooding and to produce new farmland by “reclaiming” the lakebed—two aspects of an effort to create a “modern countryside,” in historian James Murton’s words.<sup>4</sup> Although the lake was ‘successfully’ drained and converted to farmland, when the dikes and pumps installed to hold the

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<sup>1</sup> Walter Benjamin, “N [Re the Theory of Knowledge, Theory of Progress,” in *Benjamin: Philosophy, Aesthetics, History*, ed. Gary Smith. (Chicago: University of Chicago Press, 1983), 57.

<sup>2</sup> Vincent Plana, “Sunday’s atmospheric river broke 20 rainfall records across BC,” *Daily Hive*, November 15, 2021.

<sup>3</sup> Kendra Magione, “Livestock death toll from B.C. flooding: 628,000 poultry, 12,000 hogs, 420 cows,” *CTV News Vancouver* December 2, 2021; Justine Hunter, “Cost of rebuilding B.C. after flooding nears \$9-billion,” *Globe and Mail*, February 19, 2022.

<sup>4</sup> James Murton, *Creating a Modern Countryside: Liberalism and Land Resettlement in British Columbia* (Vancouver: University of British Columbia Press, 2007), 109-110. The word “reclaim” in this case means to drain land of water or to prevent land from flooding.

water at bay failed, Sumas Lake appeared again. As Jody R. Woods writes, the “dynamic spirit of the lake [...] still strives to grow: left alone, the water would rise again and fill up the vast area known as Sumas Prairie.”<sup>5</sup> And this is precisely what occurred during the 2021 floods. After the Nooksack and Sumas Rivers covered the prairie, the pumps that divert the much larger Fraser River failed. The Fraser then flowed into a resurrected Sumas Lake, submerging the entire region surrounding the lake. The results were “catastrophic.”<sup>6</sup>

Of course, the highly unusual atmospheric river that (literally) precipitated the flood immediately conjures up, as all such events do in our current conjuncture, the image of climate change. A stoic Prime Minister Justin Trudeau addressed the House of Commons during the event to declare that climate change had arrived “sooner than expected.”<sup>7</sup> Likewise, a coalition of climate scientists across Canada argues that the atmospheric river was made “60% more likely by the effects of human-induced climate change.”<sup>8</sup> Even the *New York Times* focused on “record rainfalls” and the connection between the atmospheric river, the extreme wildfire season of the previous year, and the progress of climate change.<sup>9</sup>

The story of this flood, however, is not only one of climate change and extreme weather. It is also, and perhaps more primarily, the story of a century-and-a-half long effort by settlers to

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<sup>5</sup> Jodie R. Woods, “Sumas Lake Transformations,” in *A Stó:lō-Coast Salish Historical Atlas*, ed. Keith Thor Carlson. (Vancouver: Douglas & McIntyre, 2001), 104.

<sup>6</sup> David Carrigg, “Catastrophic Flood Warning Issued for Sumas Prairie as Pump System Set to Fail,” *Vancouver Sun*, November 16, 2021.

<sup>7</sup> Eric Stober and Sean Boynton, “Trudeau says B.C. flooding shows climate change impacts have arrived ‘sooner than expected,’” *Global News*, November 24, 2021.

<sup>8</sup> Nathan P. Gillet et. al., “Human Influence on the 2021 British Columbia Floods,” *Weather and Climate Extremes* 36 (2022): 1-13.

<sup>9</sup> Ian Austin and Vjosa Isai, “Vancouver is Marooned by Flooding and Besieged Again by Climate Change,” *New York Times*, November 21, 2022.

insulate the lands of the Lower Mainland from flooding (see Appendix, Map 1).<sup>10</sup> The economic development of this region, which stretches from the Vancouver metropolitan area to the east end of the lower Fraser Valley, has since its colonization began been predicated on increasingly elaborate dikes, dams, ditches, and pump systems that regulate the boundary of the Fraser River and its tributaries. I do not offer this fact as useful context, but rather because it is at the root of the 2021 flood disaster and, not coincidentally, the subject of this thesis.

By design these efforts to engineer the environment were predicated on the violent displacement of Stó:lō First Peoples, for whom these lands and waters are ancestral and unceded sources of life and means of subsistence. Since time immemorial, the multitude of communities that collectively comprise the Stó:lō Nation have lived along the Stó:lō River, known to settlers as the Fraser River.<sup>11</sup> Diking and other land reclamation projects disrupted these ecologies, dispossessing the First Peoples of the valley of their traditional means of subsistence.<sup>12</sup> The draining of Sumas Lake was one of the most destructive moments of environmental engineering in this history as it wiped out the sturgeon population. In the words of Sumas First Nations Chief

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<sup>10</sup> There is also the problem of transnational river management, the fact that the river systems of Washington state in the US and British Columbia in Canada have little respect for national borders. As Matthew Evenden details, the transnational management of rivers and river basins is an important concern in river historiography—but it is not one that I discuss at length here. See Evenden, “Beyond the Organic Machine? New Approaches in River Historiography,” *Environmental History* 23, no. 4 (2018): 698-720.

<sup>11</sup> It is important to recognize that Stó:lō is both a cultural group and, more recently, an administrative entity that emerged in response to Pierre Trudeau’s Liberal government’s efforts to end all benefits to Status Indians. Here I refer primarily to the cultural group of First Peoples living along the Stó:lō River. Not all groups and communities that have historically belonged to this cultural group participate in the Stó:lō Nation Society, which is the administrative entity advocating for the rights of Stó:lō peoples. Therefore, although I sometimes use Stó:lō to refer a collective of nations and communities, it is important to understand the complexities of this term. For more, see Keith Thor Carlson, “Introduction,” in *A Stó:lō-Coast Salish Historical Atlas*, ed. Keith Thor Carlson. (Vancouver: Douglas & McIntyre, 2001), 2.

<sup>12</sup> Kyle Whyte emphasizes the ecological destruction is a tool of settler colonialism. Kyle P. Whyte, “Settler Colonialism, Ecology, and Environmental Justice,” *Environment and Society: Advances in Research* 9 no.1 (2018), 125.



Dalton Silver, the draining of the lake and destruction of other ecosystems to construct dikes was “devastating for our people [...] it was more or less like taking away our supermarket.”<sup>13</sup>

For this reason, the 2021 floods cannot be understood only as an ‘extreme’ climate event but must be placed in the long history of schemes to engineer an environment that promotes colonial and capitalist development. As Sumas Lake dramatically flooded farms, businesses, roads, and homes, the extremities of climate change articulated with the specific, local historical-geographic processes by which flooding became a problem in the Lower Mainland.

An epoch rife with catastrophic global climate change and ecological destruction paradoxically demands that we attend to these local histories. Climate change, as the recent Intergovernmental Panel on Climate Change report makes clear, continually increases the frequency and severity of ‘extreme’ weather events like the atmospheric river of 2021.<sup>14</sup> These extremes of weather only become disastrous because they intersect with local relations between peoples and the natures with which they live. Disasters always “take *place*,” as it were. The socioecological relations that constitute the place are as important as the global processes that engender the extreme weather, because it is these relations that extreme weather affects or disrupts. (One could go further and say that it is only in relation to the norms of existing relations that weather can be ‘extreme.’) It is my intention in this thesis to draw out the historical-geographic relations that produce the Lower Mainland of British Columbia, particularly the Fraser Valley, as vulnerable to floods like those that occurred in 2021.

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<sup>13</sup> Elizabeth McSheffrey, “Sumas First Nation chief reflects on ‘disaster’ B.C. flooding where lake used to be,” *Global News* November 18, 2021.

<sup>14</sup> IPCC, *Climate Change 2022: Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. [H.-O. Pörtner, et. al.] (Cambridge: Cambridge University Press, 2022.) In Press.

I am therefore trying to construct what Walter Benjamin calls a “dialectical image” of history. An esoteric, even ecstatic theorist of method, Benjamin writes that in the dialectical image the “Then must be held fast as it flashes its lightning image in the Now of recognizability.”<sup>15</sup> I take Benjamin to mean that, at least in his approach to history, the past must be considered in its particular relation to the present, the concrete way in which it is recognizable (if only for a second) from the conditions of the present. The reappearance of Sumas Lake and the crisis of climate change provide the vantage point of recognizability: the view from which the history of how flooding became disastrous is not only visible but essential. Benjamin says elsewhere in the passage that serves as the epigraph of this introduction, that this image can be thought of as a pair of scales, one weighing the past and the other the present. While the past must be measured as an immense accumulation of fragments, the present requires only a few “heavy, massive weights.” I offer the return of Sumas Lake and the global climate crisis on the side of the present; I offer the remainder of this essay on the side of the past.

Over the course of three chapters, I outline the historical geography of flooding in the Lower Mainland and the social processes through which flooding became a persistent problem from the mid-19<sup>th</sup> to the mid-20<sup>th</sup> century. I should say first what I do not mean by this. I am not undertaking a history of the extreme flood disasters in this area. To approach the problem this way would be to presuppose exactly what must be explained: that flooding is a disaster. Instead, I am interested in how flooding, a 10,000-year-old constitutive rhythm of the Fraser River and its tributaries, became disastrous through the processes of colonialism and capitalist development.<sup>16</sup> To put it slightly differently, the categorization of certain floods as ‘extreme’ or ‘disasters’

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<sup>15</sup> Walter Benjamin, N, 64.

<sup>16</sup> As I will argue in Chapter 2, the First Peoples of the valley had agricultural and migratory practices that largely relied upon, rather than existed in tension with, the yearly freshet of the rivers.

already presupposes a whole series of relations between humans and the river that must themselves be explained. I reconstruct the historical-geographic processes through which these relations were produced and then reproduced from one epoch to the next. In short, I argue that the dike-dependent economy of the Fraser Valley is constitutively, not contingently, vulnerable to flooding.

I pursue this argument over the course of three chapters. In Chapter 1, I revisit the primary concepts that geographers have used to understand flooding and other disasters: hazards and vulnerability. Following the development of these concepts over the course of 20<sup>th</sup> century geography beginning with the work of Gilbert F. White and ending with recent radical departures from this paradigm, I undertake a sympathetic critique of these concepts. I argue that no form of nature is inherently hazardous and no person is inherently vulnerable: to the contrary, people are *produced* as vulnerable and the environment is *produced* as hazardous by the social and ecological relations in which they exist. To give a concrete example, the introduction of cattle farming on privately held lots along the Fraser River produced its normal expansion as potentially hazardous, and equally produced these farmers as vulnerable. Likewise, the confining of First Peoples to reserves along the river produced these groups as vulnerable to the erosion caused by the Fraser River in ways that were unthinkable prior to colonization. Lastly, I argue that the infrastructures deployed to facilitate these modes of life—for instance, the dikes that permitted farmers to live in the Fraser Valley despite its floods—constitute and reinforce the vulnerabilities inherent in them.

Having developed a theoretical apparatus to explain the production of hazards and vulnerability, in Chapter 2 I demonstrate how a society predicated on dikes and other flood control infrastructure emerged during the colonization of the Fraser Valley after the goldrush of

1858. Although the yearly freshet of the Fraser River was initially attractive to settlers because it renewed the fertility of the soil, it quickly became an existential threat to the colonial project. By the floods of 1894 and 1896, settler-farmers were so impoverished from repeated washouts that many were quitting the valley. I argue that a coalition was formed between capitalists in the forestry, mining, and fishing industries and the farmers of the valley to agitate for the construction of dikes to protect the farmers. Drawing on the work of Antonio Gramsci, Stuart Hall, and Ruth Wilson Gilmore, I suggest that under the leadership of mining and forestry capitalists the state was pressured to undertake this work to stimulate a society of independent farmers and (hopefully) to encourage a domestic supply of agricultural goods. However, the construction of these infrastructures did not end the threat of flooding but instead produced a new vulnerability: the dikes themselves had to be constantly maintained to avoid catastrophe. In the long term, this proved impossible.

Finally, in Chapter 3, I argue that in the period after the Second World War flood control was detached from its original project of facilitating a settler society of independent farmers, and instead connected to the economic development of the Lower Mainland as a whole. This development was triggered by the catastrophic flood of 1948, by a wide margin the worst Fraser flood of the 20<sup>th</sup> century. This flood realized the vulnerabilities that had been inherent in the dike-dependent economy of the valley since its codification at the end of the 19<sup>th</sup> century. Ultimately, the society of independent farmers in the valley was never able to afford the maintenance costs of flood control infrastructure, which deteriorated dramatically during the Great Depression and the Second World War. The failure to maintain the dikes largely determined the scale of the disaster. By the time of the flood, the independent farmer was being replaced by corporate agriculture, and the many parts of the Fraser Valley were industrializing

and urbanizing. These transformations were due partially to the productivity boom of the Fordist model of development that took hold in Canada during the postwar years. I argue that new forms of state expertise were deployed to transfer flood control to this new epoch. In this way, the constitutive vulnerabilities of a dike-dependent society were reproduced in a new political economy in the valley.

In a brief conclusion, I discuss some of the criticisms that have been levelled against diking and land reclamation, particularly by the First Peoples of the valley, in the last decade. Many First Peoples have called for certain floodplains to be returned to land uses that are compatible with flooding. While I do not evaluate these arguments, I reflect on them in relation to the history I have traced.

My ambition in undertaking this study is to demonstrate that hazards like floods are often constituted by the fundamental relations a society maintains with the natures it produces and in which it exists. A hazard can almost never be eliminated by the progressive, technical management of the environment if these fundamental relations remain intact. The point, then, is to form new relations that are not predicated on the production of hazardous natures and vulnerable peoples. This is not a matter of the progress of our current society, which is predicated on these relations. It demands the actualization of an entirely different form of social life.

## Chapter 1: Vulnerability Revisited

For the last several decades, social scientists have widely deployed the concept of *vulnerability* to describe how a population is susceptible to various environmental dangers.<sup>1</sup> This concept particularly describes how susceptibility is socially differentiated in relation to various potential hazards. To give a common example: older people who live alone are more vulnerable to heatwaves. Generally, within this rubric of vulnerability, certain identities or types of people are construed as inherently more vulnerable to particular hazards.

Although this conception of vulnerability has attained a degree of social science orthodoxy, my goal in this chapter is to contest it and offer an alternative. In short, I argue that vulnerability is not an inherent property of particular identities but is produced by the social and ecological relations in which individuals exist. More, I argue that infrastructures like dikes, dams, and highways are crucial sites for the production of vulnerability to the extent that they embody and constitute these relations.

This argument is carried out in two major sections. First, I outline the genealogy of vulnerability in geographic thought from the 1940s to the present. I undertake this survey to demonstrate that the concept of vulnerability was introduced by radical geographers in the 1970s to describe the way that specific social and ecological relations produce groups of people as vulnerable to the environment.<sup>2</sup> In the intervening decades, this valence has been neglected.

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<sup>1</sup> See several touchstone texts. Ben Wisner et. al. *At Risk: Natural Hazards, People's Vulnerability, and Disasters, Second Edition*. (London: Routledge, 2004); Keith Smith, *Environmental Hazards: Assessing Risk and Reducing Disaster* (London: Routledge, 2004 [1991]); Kathleen Tierney, *The Social Roots of Risk: Producing Disasters, Promoting Resilience*. (Stanford: Stanford Business Books, 2014). I provide a definition of resilience later in the chapter.

<sup>2</sup> A secondary reason is because geographers too often neglect their (our?) own history. Innes M. Keighren, Christian Abrahamsson, and Veronica della Dora. "On canonical geographies," *Dialogues in Human Geography* 2, no. 3 (2012): 296-312.

Second, I argue that any relational account of vulnerability must attend to the ways that infrastructure plays a pivotal role in producing and distributing vulnerability across a population.

I elaborate this relational, infrastructure-based theory of vulnerability to facilitate my historical geography of flooding in the lower Fraser Valley, which I pursue in the following two chapters. As I discuss in Chapter 2, the formation of a society of independent farmers in the lower Fraser Valley was dependent on dikes and other flood control infrastructure. At the same time as these infrastructures facilitated this way of life, they also became a point of vulnerability for this society. It seemed difficult to track this development without a concept of vulnerability; and yet, prevailing concepts struck me as insufficient. This chapter thus serves the necessary purpose of theorizing vulnerability to this end—and ensures that when I describe dikes and other infrastructures as vulnerable in the following chapters, it will be possible for the reader to follow my meaning.<sup>3</sup> As such, although this chapter takes place at a relatively high level of abstraction, the concrete examples that I deploy throughout are generally pulled from the flooding and diking of the Fraser Valley in the 19<sup>th</sup> and 20<sup>th</sup> centuries.

## **1.1 The Concept of Vulnerability in Geographic Thought**

Here I provide an overview of the development of vulnerability and its interrelation with other concepts, primarily hazard, in geographic thought from the 1940s to the present.

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<sup>3</sup> Vulnerability is, of course, not a concept that existed during the period of British Columbia history that the subsequent chapters of this thesis concern. It is something furnished by the present that permits this particular history to come into view. Walter Benjamin writes that every fact “became historical post-humously, as it were.” By using a (renewed) concept of vulnerability, it is possible to “grasp the constellation” that the moment in which I am writing forms with this past. In other words, to use vulnerability as a cypher allows a certain relation between my present and the past to come into view. I discuss this further in the introduction to this thesis. Walter Benjamin, *Illuminations: Essays and Reflections*. (New York: Schocken, 1968): 263.

There are four stages in the conceptualization of vulnerability in geographic thought. The first is the work of geographer Gilbert F. White on flood hazards in the 1940s. Second, I turn to critiques of the hazard paradigm by radical geographers in the 1970s and '80s. Against the relatively technocratic edifice of the hazards paradigm, these radical geographers conceived of vulnerability to disaster as socially produced in the organization of human relations with the environment. Third, I demonstrate how vulnerability was connected to new concepts like risk and resilience in the 1990s.<sup>4</sup> I suggest that this version of vulnerability naturalized disaster and placed the burden of preventing and responding to disaster on communities rather than state actors—an unintentional gift to neoliberal governance. Fourth, I examine recent, radical approaches to disaster that emerge from critiques of the vulnerability approach. I suggest that, while these approaches highlight the way that the institutionalized vulnerability approach fails to adequately account for the role of capitalism, colonialism, and neoliberal governance in creating (and failing to respond to) disaster, these new approaches have tried to 'denaturalize' disaster at the price of dematerializing it. I end by suggesting a renewed concept of vulnerability as produced by the social and ecological relations that constitute a particular social formation.

### 1.1.1 **Gilbert F. White, Hazards, and the New Deal**

Gilbert White is today most widely known as the “father of floodplain management.”<sup>5</sup> He wrote widely and influentially on both natural resource management and hazards, particularly the problems posed by flooding. His work was deeply influenced by the New Deal, in which a variety of federal agencies like the Soil Conservation Service were formed in an effort to assuage

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<sup>4</sup> Blaikie et. al., *At Risk*.

<sup>5</sup> Robert W. Kates and Ian Burton, “Gilbert F. White, 1911-2006: Local Legacies, National Achievements, and Global Visions,” *Annals of the Association of American Geographers* 98 no. 2 (2008): 451.



the interlinked environmental and social disasters of the Great Depression. Like many US geographers in the 1930s and '40s, White held posts in Roosevelt's government (primarily concerning land and resource management) while writing his dissertation at the University of Chicago.<sup>6</sup> The conception of natural hazards that White developed in his dissertation was born within this institutional context. He always understood his work as a response to concrete policy and environmental management problems—not idle “curiosity.”<sup>7</sup>

White, and later other geographers like Robert Kates and Ian Burton, defined the dangers posed by the natural world in quantifiable terms and incorporated them into the sphere of environmental management. White's path-breaking dissertation “Human adjustment to floods,” extending his earlier work on flood management, argued that “floods are “acts of God,” but flood losses are largely acts of man.”<sup>8</sup> Floods are ‘natural;’ that certain bodies of water tend to flood is beyond human control. But the damage caused by floods is caused by the concrete organization of human society. It is therefore possible to institute adaptations that render hazards less harmful. This idea of adaptation was to be guided by rational management, using scientific research to determine the rational interventions that would eliminate a natural hazard.

The concept of hazard for White required singular events, like a flood, to be broken into quantifiable properties. Much of his dissertation was dedicated to the problem of how to quantify hazards and what forms of quantification were useful. How should one, for instance, calculate the probable frequency of a flood of a certain magnitude? Extensive knowledge of the hazard

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<sup>6</sup> Robert E. Hinshaw, *Living with Nature's Extremes: The Life of Gilbert Fowler White*. (Boulder: Johnson Books, 2006): 17.

<sup>7</sup> Robert W. Kates and Ian Burton, “Introduction,” in *Geography, Resources, and Environment volume 1: Selected Writings of Gilbert F. White* edited by Robert W. Kates and Ian Burton. (Chicago: University of Chicago Press, 1986): xii.

<sup>8</sup> Gilbert F. White, “Human Adjustment to Floods: A Geographical Approach to the Flood Problem in the United States,” University of Chicago Dissertation, 1942: 2.

was, for White a precondition for formulating an appropriate adjustment to it. These adjustments comprise a “range of alternatives,” including feats of human engineering like systems of dams and dikes as well as reforms in land use that minimize flood damage.<sup>9</sup>

White was not, however, Promethean. He chided those who viewed floods as “watery marauders” against which “society wages a bitter battle.”<sup>10</sup> He “strove continuously for a holistic understanding of the physical environment and the human place within it—the ‘fit’ between nature and society.”<sup>11</sup> Adjusting to floods involved a rational search for an organic fit between a society and its physical geography. A dam was one possible solution, but a violent one that disrupted the prevailing ecology. White emphasized the “sobering finality” of such infrastructure projects and cautioned against the ecological effects of human-created lakes.<sup>12</sup> Indeed, he even argued that federal investment in dams and levees led to an *increase* in flood damage by encouraging the settlement of floodplains.<sup>13</sup> Hazards research, as conceived by White, was a project of rationally determining the right set of adjustments necessary to protect a given society given the hazards that threaten it.

White’s faith in technical, expert management of the natural world should be placed in the context of the New Deal and wartime state in which it developed. His dissertation took shape while he was working in Roosevelt’s New Deal government on river management and the

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<sup>9</sup> James K. Mitchell, “Perspectives on Alternatives: Differentiation and Integration in Pursuit of a Better Fit between Society and Nature.” *Progress in Human Geography* 32, no. 3 (June 2008): 452. White’s dissertation outlines no less than 8 possible adjustments. Gilbert F. White, “Human adjustment to floods,” 47.

<sup>10</sup> *Ibid.*, 1.

<sup>11</sup> James K. Mitchell, “Perspectives,” 452.

<sup>12</sup> Gilbert F. White, “A new stage in resources history,” in *Selected Writings of Gilbert F. White volume 1* edited by Robert W. Kates and Ian Burton, (Chicago: University of Chicago Press, 1986 [1953]): 28; William C. Ackermann et. al., (1973) “Summary of symposium and recommendations,” in *Man-made lakes: their problems and environmental effects, volume 17*.

<sup>13</sup> Gilbert F. White, *Changes in urban occupance of flood plains in the United States*. (Chicago: University of Chicago Press, 1958).

construction of dams.<sup>14</sup> Here he walked a fine line. On the one hand, White fully embraced the technical management of the natural world that was demanded by the large-scale hydroelectric and river management projects on which he worked. On the other, he was troubled by the way that the US Army Corps of Engineers conceived of river management almost exclusively through dams and other large-scale infrastructural interventions.<sup>15</sup> Through his experience working on river management for Roosevelt's New Deal government, White simultaneously developed faith in technical management of the natural world *and* a belief that this technical management should work to understand and adapt to the existing physical geography.<sup>16</sup>

White argued that losses from flooding in the US continued to increase because the managers of floodplain properties “do not receive technical advice” and “do not know the precise character of the flood hazard.”<sup>17</sup> The solution, then, was to provide technical advice and help to those who controlled property on floodplains to make rational adjustments. The first step was to understand the hazard scientifically; the second was to select the proper adjustment. Ultimately, this was still a *technical* problem—but a technical problem requiring intimate understanding of the environment, and a sensitivity to the multitude of possible solutions.

This conception of natural hazard was generalized beyond flooding and became paradigmatic in the 1960s. Ian Burton and Robert Kates defined natural hazards as “those elements in the physical environment, harmful to man [sic] and caused by forces extraneous to

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<sup>14</sup> Hinshaw, *Living with Nature's Extremes*, 24-6.

<sup>15</sup> *Ibid.*, 36. These disagreements largely concerned flood control, where the Corps tended to default to altering the river rather than considering land use changes on floodplains.

<sup>16</sup> The role of the Second World War in these developments is perhaps also important, but for reasons of space I do not consider it at length here. At any rate, it is clear that his experience of the war, in which White was a conscientious objector, was less immediately relevant for his thought than his role in the New Deal government. *Ibid.*, 44.

<sup>17</sup> Gilbert F. White, “Strategic aspects of urban floodplain occupance,” in *Selected Writings of Gilbert F. White* volume edited by Robert W. Kates and Ian Burton, (Chicago: University of Chicago Press, 1986 [1974]): 93-94.

him [sic].”<sup>18</sup> As they note, the “definability of a hazard [...] is more than mere awareness and often requires high scientific knowledge.”<sup>19</sup> In a number of articles, working papers, and edited collections, Burton, Kates, and White generalized the idea of natural hazards to include droughts, volcanoes, tsunamis, snow, avalanches, hurricanes, earthquakes—the list is quite long.<sup>20</sup> In each of these cases, however, the procedure was the same: the generation of scientific knowledge and the selection of proper adjustments by experts. The conception of hazard elaborated by White, Burton, and Kates was the hinge of their technocratic approach.

### **1.1.2 Radical Geography: Vulnerability Against Technocracy**

In the 1970s, the technocratic program of the hazards paradigm was subjected to sustained criticism by radical geography. These geographers were radical in that they coalesced around contemporary social justice movements—occurring in and outside the academy—including the civil rights, feminist, environmental, and anti-war movement.<sup>21</sup> Radical geographers tended to be inspired by these movements and used their research to intervene in social justice struggles. While they had a number of guises and political concerns, the period that

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<sup>18</sup> Ian Burton and Robert W. Kates, “The Perception of Natural Hazards in Resource Management,” *Natural Resources Journal* 3 no. 3 (1963): 413.

<sup>19</sup> *Ibid.*, 414.

<sup>20</sup> Ian Burton, Robert W. Kates, and Gilbert F. White “The human ecology of extreme geophysical events,” The University of Toronto Department of Geography. Natural Hazard Research Working Paper no. 1 (1968); Robert W. Kates, “Natural Hazard in Human Ecological Perspective: Hypotheses and Models,” *Economic Geography* 47, no. 3 (July 1971): 438-451; Gilbert F. White, *Natural hazards: local, national, global* (Oxford: Oxford University Press, 1974); Ian Burton, Robert W. Kates, and Gilbert F. White, *The Environment as Hazard* (New York: The Guilford Press, 1978).

<sup>21</sup> Trevor Barnes and Eric Sheppard (2019) *Spatial Histories of Radical Geography: North America and Beyond* (Oxford: Wiley, 2019): 8-12. In particular, they suggest that the civil rights movement, the feminist movement, the environmental movement, and the anti-war movement—each of which has a long history prior to the postwar period—fomented a critical consciousness among young geographers.

concerns me here (the '70s and '80s) was largely Marxist, typified by figures such as David Harvey and Richard Peet.<sup>22</sup>

One area of study for these new geographers was hazards, particularly outside of North America. Kenneth Hewitt was the first to map hazards around the entire world, concluding that areas like Iran, East Pakistan, and Tanzania were much more urgently afflicted by hazards than anywhere in North America. "We need," he argued, "to test and evaluate the theoretical generality behind local solutions to hazard problems in western countries."<sup>23</sup>

Empirical research conducted by young radical geographers like Ben Wisner and Phil O'Keefe vindicated Hewitt's skepticism. Writing on a series of droughts across the African continent, Wisner and O'Keefe argued that there was no technical fix to the problem that droughts posed for peasant farmers; the only way to end the damage caused was to alter the social structure.

The reconstruction of the *status quo* can only mean further increase in the vulnerability of the poorest strata of the peasantry in Africa's dry areas. The alternative is programmatic rehabilitation and reconstruction of the area built on releasing the productive energies of the inhabitants of the dry zone. Such programmes demand *new modes of production*, and they in turn demand *new social relations*.<sup>24</sup>

The focus is therefore not on the particularities of the drought hazard itself, but rather on the social conditions that produce people as vulnerable to this hazard. The problem is not one of an irrational fit between society and nature, but rather of socioecological relations. Vulnerability is

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<sup>22</sup> The connection between Marxist radical geography, which many of the figures I discuss in this section fully embraced, and environmental concerns is clearly brought out by Ben Wisner. Ben Wisner, "Does radical geography lack an approach to environmental relations?" *Antipode* 10, no. 1 (March 1978): 84–95.

<sup>23</sup> Kenneth Hewitt. "A pilot study of global natural disasters in the past twenty years." University of Toronto Department of Geography. Natural Hazard Research Working Paper #11: 2.

<sup>24</sup> Phil O'Keefe and Ben Wisner (1975) "African drought—the state of the game," in *African Environment: problems and perspectives* edited by Paul Richards, (London: International African Institute: 1975): 38 (emphasis my own).

thus introduced by radical geographers to explain the social elements of hazards. The concept is not introduced to get rid of the idea of hazards, but to complement it. In an article titled “Taking the naturalness out of natural disaster” (which geographers have evidently been trying to do for half a century now), O’Keefe et. al. argued that “disaster marks the interface between an extreme physical phenomenon and a vulnerable population. It is of paramount importance to recognize both of these elements.”<sup>25</sup> The extreme phenomenon is the hazard.<sup>26</sup> Radical geographers argued that hazards always confront specific, socially-produced vulnerabilities. It was not a question of how an undifferentiated society was threatened by flooding, for instance, but of how the organization of a society, the social relations that comprised it, rendered certain populations vulnerable to the hazard. It was necessary

to see disaster as the extreme situation which is implicit in the everyday conditions of the population. Drought for instance, is too little water and flood is too much, but peasant farmers are trying to utilize the water regime for essential agricultural production; drought and floods are simply the extremes of this everyday condition.<sup>27</sup>

Drawing on development theorists like Walter Rodney, they argued that the insecure access to everyday water provision for the peasant was a product of centuries of European and American capitalism enriching itself by colonizing Africa.<sup>28</sup> That process “leaves the underdeveloped population more vulnerable than it was earlier [prior to colonization] to the vagaries of the environment.”<sup>29</sup> In other words, it was not possible to understand the specific ways in which a

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<sup>25</sup> Phil O’Keefe, Ken Westgate, and Ben Wisner, “Taking the naturalness out of natural disaster,” *Nature* 260 (April 1976): 566. An article with a very similar title and argument was published by Neil Smith exactly 30 years later. Neil Smith, “There’s no such thing as natural disaster,” *Items: Insights from the social sciences.*, June 11, 2006.

<sup>26</sup> Alec Baird, Phil O’Keefe, Ken Westgate, and Ben Wisner, “Towards an Explanation and Reduction of Disaster Proneness,” University of Bradford Disaster Research Unit Occasional Paper #11 (1975): 2. They use the phrase “extreme physical event” more frequently, but “hazard event” is used interchangeably on page 2.

<sup>27</sup> Ibid.

<sup>28</sup> Walter Rodney, *How Europe Underdeveloped Africa*, (London: Bogle-L’Ouverture Publications, 1972); Samir Amin, *Accumulation on a world scale: A critique of the Theory of Underdevelopment Volumes 1 and 2 Combined* (New York: Monthly Review Press, 1974).

<sup>29</sup> Baird et. al., “Towards an Explanation...,” 29.

social group was rendered vulnerable to the environment without examining the multiscale socioecological relations in which it existed, and the historical geography of how these relations came to exist. Likewise, it was not possible to ameliorate the vulnerability without transforming these relations.

The concept of vulnerability thus placed the problem of hazards largely in relation to political-economic structures, and more specifically the way that these structures organized environmental relations. Terry Cannon, for instance, examined the Sahel drought of the 1970s, and argued that this drought was not an effect of climactic variation but that “the disaster and the imperialist penetration [of the region] are the same phenomenon.”<sup>30</sup> Cannon suggested that the shift to producing export commodities led to much of the agricultural land in the region—which was vital for the livelihoods of the people—to be overused, exhausting the soil and leading to famine. These social transformations were the root cause of the famines. Cannon thus critiqued the hazards approach by showing that it could not adequately explain its object of investigation (i.e., hazards) without recourse to social processes.

With the publication of Hewitt’s edited collection *Interpretations of Calamity from the Viewpoint of Human Ecology*, this confrontation with the hazards paradigm became explicit. Hewitt’s introduction to the collection served as a searing indictment of the technocratic assumptions of the hazards paradigm, and his collection acted as an unabashed attempt to dislodge its hegemony. Perhaps above all else, he emphasized that rendering hazards in a siloed, techno-scientific language “roped [them] off from the rest of man-environment [sic] relations.”<sup>31</sup>

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<sup>30</sup> Terry Cannon, ““Natural” Disasters and the Third World,” in *Geography, Social Welfare and Underdevelopment* edited by Neil Smith, Malcolm Forbes and Michael Kershaw. St. Andrews Department of Geography (1977): 77.

<sup>31</sup> Kenneth Hewitt, *Interpretations of Calamity from the Viewpoint of Human Ecology* (Boston: Allen & Unwin, 1983): 12. See also Michael Watts, “On the poverty of theory: natural hazards research in context,” in

By abstracting hazards from the constitutive socioecological relations of a social formation, the hazards paradigm was (and still is) unable to see how hazards are situated in these broader relations. Hewitt argued that the “initiation of calamity” lies with society rather than nature:

There are natural forces and some damages in most disasters that lie beyond all reasonable measures any society could make to avoid them. What I believe to be definitive of the disasters I have examined is, however, that most of them would not be disasters [...] except as a direct result of characteristic and vulnerable human developments.<sup>32</sup>

This was a total reversal of the hazards paradigm. While for White and others the extremes of the natural world were a hazard to be reckoned with and adapted to by human society, for Hewitt it was fundamentally the organization of human society that initiates disaster. This inaugurated a shift in disaster research from the scientific study of extremes of the natural world to the sources of social vulnerability. This is the germ of what became known as the “vulnerability approach.”

A crucial feature of this concept of vulnerability was the idea that it was coextensive with socioecological relations, not a contingent effect separate from these relations. It is important to emphasize this as I turn to the institutionalization of the concept of vulnerability in the following decades, during which this valence was forgotten.

### **1.1.3 Resilience, the Institutionalization of Vulnerability**

Hewitt exposed the technocratic underpinnings of the hazards paradigm. In conversation with other radical geographers, he demonstrated that disasters engendered by ‘extreme’ weather events have much more to do with social structures than with external hazards. Although the concept did not disappear, hazards became relatively subsidiary to the idea of social

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*Interpretations of Calamity from the Viewpoint of Human Ecology* edited by Kenneth Hewitt, 232-262 (Boston: Allen & Unwin, 1983).

<sup>32</sup> Ibid., 27.



vulnerability.<sup>33</sup> This is above all clear in the book that cemented the vulnerability approach as a new paradigm (in the Kuhnian sense), *At Risk: Natural hazards, people's vulnerability, and disasters*, coauthored by Piers Blaikie, Ben Wisner, Terry Cannon, and Ian Davis (all of whom were involved in the vulnerability turn outlined in the previous section). *At Risk* offered the following formulation: “vulnerability is generated by social, economic and political processes that influence how hazards affect people in varying ways and with differing intensities.”<sup>34</sup> They went on, however, to emphasize that vulnerability is the operative term: their “approach does not deny the significance of natural hazards as trigger events, but puts the main emphasis on the various ways that social systems operate to generate disasters by making people vulnerable.”<sup>35</sup> A number of contemporaneous articles and books similarly shifted the emphasis away from hazards and towards vulnerability.<sup>36</sup>

In the decades after Hewitt's pivotal volume, vulnerability became an increasingly influential concept.<sup>37</sup> This period, however, also saw vulnerability associated with several other concepts, particularly *risk* and *resilience* (or capacity). Risk is “the potential for loss [...] that is actualized in the presence of ‘triggers’” like extreme weather events (i.e., hazards); resilience is “the ability of social entities [...] to absorb the impacts of external and internal system shocks

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<sup>33</sup> This statement should be understood in a qualified way. Certainly, there are to this day researchers doing important work on hazards (see any recent issue of the journal *Natural Hazards* for proof of this). However, from around the time of *At Risk* on, a focus on social vulnerability is increasingly indispensable (one might look at the journal *Disasters* for a multitude of examples on this front).

<sup>34</sup> Blaikie et. al., *At Risk*, 7.

<sup>35</sup> Ibid., 10.

<sup>36</sup> See for instance: Greg Bankoff, Georg Frerks, and Dorothea Hilhorst. *Mapping Vulnerability: Disasters, Development and People*, (London: Earthscan, 2013); Antony Oliver-Smith, “Anthropological Research on Hazards and Disasters,” *Annual Review of Anthropology* 25, no. 1 (October 1996): 303–28; W. Neil Adger, “Vulnerability,” *Global Environmental Change* 16, no. 3 (August 2006): 268–81.

<sup>37</sup> Ben Wisner and Henry R. Luce, “Disaster Vulnerability: Scale, Power and Daily Life,” *GeoJournal* 30, no. 2 (June 1993): 127.

without losing the ability to function.”<sup>38</sup> At the same time as vulnerability became institutionalized, however, its meaning shifted to describe apparently inherent qualities of individuals rather than the relations in which these individuals exist. This, as I demonstrate below, was a convenient development for emerging neoliberal governance.

*At Risk* is perhaps the most significant instance of this transformation.<sup>39</sup> First and foremost, its coauthors were themselves some of the loudest voices in the radical geography critique of hazards. It is difficult not to read certain formulations in *At Risk* as a retreat, or at least tactical shift, from these earlier positions. In addition to becoming a touchstone of the emerging vulnerability approach, it was taken up by policy circles, governments, and NGOs.<sup>40</sup> There are two primary steps in which *At Risk* begins to link the concept of vulnerability to the concept of resilience. The first is by shifting the source of vulnerability from socioecological relations to certain types of individuals or groups in specific situations. Blaikie and others define vulnerability as “the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard,” and go on to specify several variables that determine this vulnerability (class, occupation, caste, ethnicity, gender, disability/health, age, immigration status, and several others).<sup>41</sup> These variables therefore express the “root causes” of vulnerability, which Blaikie et. al. list as economic, demographic, and political processes at multiple scales, in their specific situational

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<sup>38</sup> Tierney, *The social roots of risk*, 6

<sup>39</sup> *At Risk* is often cited as the pinnacle of the vulnerability approach, often as a direct successor to Hewett’s edited volume. The tensions between these works are not always emphasized. See Rasmus Dahlberg, Olivier Rubin and Morten Thanning Vendelø, “Disaster research: an introduction,” in *Disaster Research: multidisciplinary and international perspectives* edited by Rasmus Dahlberg, Olivier Rubin, and Morten Thanning Vendelø, 1-17, (London: Routledge, 2016).

<sup>40</sup> The authors of the book were involved in many of these efforts. Blaikie et. al., *At Risk*, 13

<sup>41</sup> *Ibid.*, 11.

manifestations. At bottom reducing vulnerability (as conceived in this model) remains “about dealing with the awkward [sic?] issue of poverty in society.”<sup>42</sup> The awareness of political-economic structures underlying vulnerability never disappears. But there is a shift in emphasis. Vulnerability becomes a contingent effect, something correlated with but not immanent to, various situations like poverty in the developing world. For instance, Blaikie et. al. write “poverty is not synonymous with vulnerability, although the two conditions are often highly *correlated*” (emphasis mine).<sup>43</sup> The relation of the root cause of vulnerability becomes one of correlation rather than one of immanence. Where vulnerability was conceived by radical geography as immanent to particular kinds of socioecological relations, here it is conceived as correlating with certain qualities of individuals and groups in specific situations.

This subtle shift is important because vulnerability began to be conceived as something separable from the relations that produce it. Vulnerability is no longer treated as an aspect of these relations but rather as a consequence or contingent effect. Although they allude to the possibility that disasters bring attention to root cause, Blaikie et. al. focus overwhelmingly on how families and communities can build “self-reliance” and draw on “local knowledge” to reduce their vulnerability to future events.<sup>44</sup> This is accompanied throughout the book by a general privileging of community capacities over governmental interventions in hazards.<sup>45</sup> This is in some ways laudable, rooted as it is in community empowerment and elevating the voices of affected vulnerable groups contra the expert-driven technocracy of the hazards paradigm. However, when the socioecological relations that engender disaster are set aside, as they are in

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<sup>42</sup> Ibid., 56.

<sup>43</sup> Ibid., 78.

<sup>44</sup> Ibid., 315-6.

<sup>45</sup> Ibid., 83-4; 299.

this approach, disaster is naturalized and treated as inevitable. The only solution is to become more resilient.

Although *At Risk* uses the term resilience sparingly, its shift from socioecological relations to community-centered, capacity-building analysis forges a connection between vulnerability and resilience. W. Neil Adger, for instance, points to the “synergies” between vulnerability and resilience, in particular emphasizing their focus on “socio-ecological systems.”<sup>46</sup> Resilience thinking is essentially predicated on making systems more capable of withstanding turbulent extremes. It is “less about planning and controlling but more about preparing for opportunity or creating conditions of opportunity for navigating transformations.”<sup>47</sup> Communities in civil society, rather than governments, emerge as the key scale at which resilience is built. The role of government is to foster this community behavior.<sup>48</sup> Further, the downscaling of responsibility for disaster to communities—abetted by the concept of resilience—dovetailed easily with early rounds of “neoliberalization,” by which I mean a general retreat of the state from functions of social welfare and an “intensification of market rule” beginning in the 1980s.<sup>49</sup> As Walker and Cooper suggest in their fascinating genealogy, the concept of resilience acts as a justification, a sort of pivot point that permits the state to stop trying to prevent disasters. In resilience discourse the

catastrophic event (natural, social, or economic) becomes a sign not of the occasional failure to predict, prevent, and manage crisis but of the systemic limits to public management and state planning [...] what is called for instead is a ‘culture’ of resilience that turns crisis response into a strategy of permanent, open-ended responsiveness,

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<sup>46</sup> Adger, “Vulnerability.”

<sup>47</sup> Carl Folke, “Resilience (Republished),” *Ecology and Society* 21 no. 4 (2016): 44.

<sup>48</sup> Robert Bach et. al., “Policy Challenges in Supporting Community Resilience,” Working Paper by Multinational Community Resilience Policy Group (2010).

<sup>49</sup> Neil Brenner, Jamie Peck, and Nik Theodore, “Variegated Neoliberalization: geographies, modalities, pathways, *Global Networks* 10 no. 2 (2010): 184.

integrating emergency preparedness into the infrastructures of everyday life and the psychology of citizens.<sup>50</sup>

The fact that resilience arises in relation to ‘communities’ rather than government responsibility permits its incorporation into the apparatus of neoliberal governance, predicated as it is on shifting responsibility for social services (like disaster response and preparedness) from the state to civil society.<sup>51</sup> Resilience therefore “dissolves directly into neoliberalism understood as a way of life:” it is an aspect of the ethics of well-trained neoliberal subjects who know it is their responsibility, as individuals, to prepare for possible disaster.<sup>52</sup> It is for this reason that Kathleen Tierney, formerly one of the strongest advocates for the resilience framework in disaster research, says “narratives that elevate resilience as a primary goal for disaster risk reduction have little meaning within this context [the retreat of the state from social services].”<sup>53</sup> They can ultimately only refer to voluntary, decentralized actions taken by communities to decrease their own susceptibility to disaster. Policy strategies that rely on building resilience thus ultimately mean downgrading responsibility for disaster response from the state to communities.<sup>54</sup>

I am not suggesting that the authors of *At Risk* (and others doing similar work) played a conspiratorial role in the rise of neoliberalism. It is clear from the meticulous ways in which the

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<sup>50</sup> Jeremy Walker and Melinda Cooper, “Genealogies of Resilience: From Systems Ecology to the Political Economy of Crisis Adaptation,” *Security Dialogue* 42, no. 2 (April 2011): 154.

<sup>51</sup> Peer Illner, *Disasters and Social Reproduction: Crisis Response Between State and Community*, (London: Pluto Books, 2020).

<sup>52</sup> Michael Watts, “Now and then: the origins of political ecology and the rebirth of adaptation as a form of thought,” in *The Routledge Handbook of Political Ecology* edited by Tom Perrault, Gavin Bridge, and James McCarthy (London: Routledge, 2015): 40.

<sup>53</sup> Kathleen Tierney, “Resilience and the Neoliberal Project: Discourses, Critiques, Practices—And Katrina,” *American Behavioral Scientist* 59, no. 10 (September 2015): 1339.

<sup>54</sup> This is a somewhat contested view of resilience. Some scholars see resilience more as a “patterned adjustment,” something emergent from a network of institutional and community actors. On this perspective, see Philippe Bourbeau, “A Genealogy of Resilience,” *International Political Sociology* 12, no. 1 (March 1, 2018): 19–35; Marco Kruger and Kristoffer Albris, “Resilience unwanted: between control and cooperation in disaster response,” *Security Dialogue* 52 no. 4 (2020): 343–360. It seems clear to me that, even if resilience is an emergent behaviour, its deployment in policy reiterates and reinforces the neoliberal deprovisioning of social services and, for that reason, ought to be treated with immense suspicion.

authors attempted to build on Hewitt's work that Blaikie et. al. were searching for ways to make the concept of vulnerability both more systematic and usable. They did this while moving beyond a crude class reductionism that inhered in the radical geography approach to vulnerability. I am nonetheless suggesting that *At Risk* was one node in a "strategy"—to borrow Michel Foucault's term, meaning the emergence of a 'global' political program through a range of 'local' negotiations—through which resilience became a prominent solution to the problem of vulnerability.<sup>55</sup> Resilience became a dominant framework precisely because people in a variety of institutional contexts agreed, likely for very different reasons, that community resilience was a more workable response to disaster than state management.<sup>56</sup>

The effect was to articulate the concept of vulnerability to the concept of resilience and to treat vulnerability separately from socioecological relations. Where the radical geographers saw vulnerability as a constitutive aspect of the socioecological relations comprising a social formation, and therefore as a problem demanding the transformation of these relations, the

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<sup>55</sup> Michel Foucault, *History of Sexuality Volume 1: An Introduction*, trans. Robert Hurley (New York: Vintage 1980): 55; 73. Strategy is a recurrent, if somewhat underdeveloped concept in *History of Sexuality*. Much of the book concerns various "strategies of power," but what I have in mind specifically here is his description of how "so many local tactics [...] as if by superimposition and through a last-minute detour, gave paradoxical form to a fundamental position to know." Uncoordinated efforts by a variety of actors in distinct fields can congeal into an agreement, understanding, or strategy. In much the same way, *At Risk* was a 'local' development that fit into the emerging neoliberal strategy.

<sup>56</sup> This reading may be overly generous and at the same time not generous enough. The deleterious effects of resilience policies have been clear for the better part of two decades, and the authors of *At Risk* have, to my knowledge, not yet fully repudiated the idea of resilience. In certain places they seem to continue to embrace it, at least tacitly. See for instance Christophe Béné et. al. "Resilience as a Policy Narrative: Potentials and Limits in the Context of Urban Planning." *Climate and Development* 10 no. 2 (2018): 116-133; Ben Wisner and Ilan Kelman, "Community Resilience to Disasters," *International Encyclopedia of the Social & Behavioural Sciences (Second Edition)*. Elsevier (2015): 354-360. However, it seems that the concept of resilience has trickled out of some more recent writings by these authors in favor of a primary focus on vulnerability. See Terry Cannon, "Vulnerability and Disasters," in *The Companion to Development Studies 3<sup>rd</sup> Edition* edited by Vandana Desai and Rob Potter, (London: Routledge, 2014); Ben Wisner "'Build back better?' The challenge of Goma and beyond." *International Journal of Disaster Risk Reduction* 26 (December 2017): 101-105. Interestingly, and perhaps marking a break with this pattern, a recent edited collection featuring many of these figures seeks to rehabilitate vulnerability by distancing it from resilience. Geoff Bankoff and Dorothea Hilhorst *Why Vulnerability Still Matters: The Politics of Disaster Risk Creation* (London: Routledge, 2022).

institutionalized vulnerability approach construes vulnerability as a quality of certain kinds of people in situations that can be treated separately from these relations. Many of the criticisms of the concept of vulnerability do not distinguish between the institutionalized vulnerability approach (connected as it is to resilience) and the more radical conception of vulnerability that preceded it. I consider these criticisms next.

#### **1.1.4 “Fully Socialized” Disaster?**

The very moment of vulnerability’s triumph was marked by retreat. The ramparts stormed by Hewitt were shortly abandoned for a more modest theoretical abode. Perhaps unsurprisingly, a new generation of scholars began to criticize the institutionalized vulnerability approach for *naturalizing* disaster. These new critical approaches, which include disaster capitalism, social reproduction theory, and ‘critical’ disaster studies, argue that the institutionalized vulnerability approach still treats disaster as something natural, divorced from the social relations that engender disaster. Here I briefly review these theories and suggest that—despite their important contributions—they focus on the social at the expense of the socioecological. In attempting to denaturalize disaster, they abstract away from the role of social relations with the environment in causing disaster.

Naomi Klein’s now-famous concept of “disaster capitalism” is an important instance of this pattern. Disaster capitalism primarily concerns the rise of a complex of private firms capitalizing on disaster relief and the neoliberal governments that contract them.<sup>57</sup> Periodized roughly from 9/11 forward and closely tied to neoliberalism, this approach studies “not the

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<sup>57</sup> Naomi Klein, *The Shock Doctrine: The Rise of Disaster Capitalism*, (Toronto: Alfred A. Knopf Canada, 2007); Naomi Klein, *The Battle for Paradise: Puerto Rico Takes on the Disaster Capitalists* (Chicago: Haymarket, 2018).

disaster itself, but rather the disaster *after* the event that reproduced social inequalities.”<sup>58</sup> It is a kind of “chronic disaster syndrome” in which the disaster never ends because the political economy of the response is predicated on prolonging the situation.<sup>59</sup> Although Klein and others began by focusing on the political economy of disaster response in the 21<sup>st</sup> century, recent scholarship has extended these insights to argue that profiteering from disaster has a long colonial history, that “the accelerated forms of extraction and dispossession” characteristic of modern disasters are produced by “subjectivities and technologies of the colonial encounter.”<sup>60</sup>

Alongside this work is a Marxian approach that reads disaster relief as a form of social reproduction. Peer Illner is the primary proponent of this approach. Drawing on Nancy Fraser’s articulation of social reproduction in activities like education, healthcare, and community building that make economic and political life possible, he argues that disaster relief is itself a form of social reproduction.<sup>61</sup> Illner avows that disaster is the meeting point of “capitalism’s ecological degradation and the organized neglect of the state,” focusing on popular struggles over the provisioning of social services for disaster relief.<sup>62</sup> He examines and to some degree critiques Occupy Sandy—a mutual aid group that emerged from Occupy Wall Street during Hurricane Sandy with the intention of providing material relief to people afflicted by the

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<sup>58</sup> Mark Schuller and Julie K. Maldonado, “Disaster Capitalism,” *Annals of Anthropological Practice* 40, no. 1 (May 2016): 61.

<sup>59</sup> Vincanne Adams, Taslim Van Hattum, and Diana English, “Chronic Disaster Syndrome: Displacement, Disaster Capitalism, and the Eviction of the Poor from New Orleans,” *American Ethnologist* 36, no. 4 (November 2009): 615–36; Vincanne Adams, *Markets of Sorrow: Labors of Faith: New Orleans in the Wake of Katrina* (Durham: Duke University Press, 2013).

<sup>60</sup> Yarimar Bonilla, “The Coloniality of Disaster: Race, Empire, and the Temporal Logics of Emergency in Puerto Rico, USA,” *Political Geography* 78 (April 2020): 2; Kevon Rhiney, “Dispossession, Disaster Capitalism and the Post-Hurricane Context in the Caribbean,” *Political Geography* 78 (April 2020); Gustavo A. García López, “Reflections on Disaster Colonialism: Response to Yarimar Bonilla’s ‘The Wait of Disaster’,” *Political Geography* 78, (2020).

<sup>61</sup> Nancy Fraser, “Contradictions of capital and care,” *New Left Review* 100 (July-August 2016): 99–117.

<sup>62</sup> Illner, *Disasters and Social Reproduction*, 3.



hurricane—for inadvertently justifying the US government’s decision to cut FEMA’s funding. He argues that, in an age of resilience governance in which communities are increasingly made to be responsible for their own disaster response, mutual aid groups run the risk of demonstrating that communities really are better than the government at responding to disaster.<sup>63</sup> To avoid this tacit cooptation, “social movements providing disaster aid” must “enter into real conflict with existing capitalist relations.”<sup>64</sup> In other words, disaster response is one zone of possible popular engagement with the state, and one in which demands for more social services ought to be made. Although Illner does allude to the ways in which capitalism causes various sorts of disasters, his focus remains on disaster relief rather than the root causes of disaster.

Lastly, a nascent body of “critical” disaster studies has adopted the thoroughgoing constructivist perspective that “there is no such thing as disaster.”<sup>65</sup> It is constantly reiterated, and has been for many decades, that there are no natural disasters: every disaster is constituted by its pivotal social moment. Horowitz and Remes want to push this further. They argue that since the idea of disaster is a social construction to categorize an exceptional or dangerous moment, it plays a performative role, giving “license for state and nonstate actions that might otherwise be absent.”<sup>66</sup> In this sense, the naming of something as a disaster has material effects, and can be used to galvanize various kinds of action from both governments and social movements.<sup>67</sup> Likewise, naming particularly places as more hazardous or prone to disaster

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<sup>63</sup> Peer Illner, “The Locals Do It Better? The Strange Success of Occupy Sandy,” in *Eco Culture: Disaster, Narrative, Discourse* edited by Robert Bell and Robert Ficociello, (Lanham: Lexington Books, 2017): 49-72.

<sup>64</sup> Illner, *Disasters and Social Reproduction*, 109-110

<sup>65</sup> Andy Horowitz and Jacob A.C. Remes, “Introducing Critical Disaster Studies,” in *Critical Disaster Studies* edited by Jacob A.C. Remes and Andy Horowitz (Philadelphia: University of Pennsylvania Press, 2021): 1.

<sup>66</sup> *Ibid.*, 4.

<sup>67</sup> Peer Illner, “Who’s Calling the Emergency? The Black Panthers, Securitisation and the Question of Identity,” *Culture Unbound* 7, no. 3 (October 28, 2015): 479–95. Illner seemed to be heading for a critical disaster studies-adjacent position before turning more definitively towards the social reproduction approach.

constructs those areas—very often colonized countries in the Global South—as intrinsically dangerous.<sup>68</sup> These strong constructivist perspectives are less concerned with what a disaster ‘really’ is or who is ‘really’ vulnerable, and are more concerned with how these constructions are deployed and what effects they generate.<sup>69</sup>

Each of these critical movements offers potentially important correctives to the institutionalized vulnerability approach. However, they each in different ways tend to substitute a dematerialized social world for what I have called throughout this chapter the socioecological (and others call the hybrid or cyborg).<sup>70</sup> For all of its many problems—which, again, are well described by these critics, particularly Illner—the institutionalized vulnerability approach tried to situate the vulnerability to disaster in the material world of complex, metabolic interactions between human social formations and the natures in which they are embedded. It recognized, as Cannon put it, that “many of the locations that are favorable to production are also prone to hazards: flood plains provide flat land for settlement.”<sup>71</sup> In short, many of these radical

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<sup>68</sup> Greg Bankoff, *Cultures of Disaster: Society and natural hazard in the Philippines*, (London: Routledge, 2003); Greg Bankoff, “The historical geography of disaster: ‘vulnerability’ and ‘local knowledge’ in western discourse,” in *Mapping Vulnerability: Disasters, Development and People* edited by Greg Bankoff, George Frerks, and Dorothea Hilhorst (London: Earthscan, 2004); Tim Frewer, “From Vulnerability to Immunization-A Genealogy of Early Attempts to Deal with the Climate: Climates of Vulnerability,” *Singapore Journal of Tropical Geography* 37, no. 1 (January 2016): 43–58.

<sup>69</sup> These three approaches are far from exhaustive, but they represent some of the more radical alternatives to the institutionalized vulnerability approach. There is also an approach concerned with hybridity and assemblages, that I have not examined here because—although it challenges human/nature/technology distinctions—it seems to continue the institutionalized vulnerability approach with few modifications (i.e., focused on community adaptation rather than systemic change). Sarah J. Whatmore and Catharina Landström, “Flood Apprentices: An Exercise in Making Things Public,” *Economy and Society* 40, no. 4 (November 2011): 582–610; Sarah J Whatmore, “Earthly Powers and Affective Environments: An Ontological Politics of Flood Risk,” *Theory, Culture & Society* 30, no. 7–8 (December 2013): 33–50; Amy Donovan, “Geopower: Reflections on the Critical Geography of Disasters,” *Progress in Human Geography* 41, no. 1 (February 2017): 44–67; Peter McGowran and Amy Donovan, “Assemblage Theory and Disaster Risk Management,” *Progress in Human Geography* 45, no. 6 (December 2021): 1601–24.

<sup>70</sup> Bruno Latour, *We Have Never Been Modern* (Cambridge: Harvard University Press, 1991); Donna Haraway, “A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century” in *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York: Routledge, 1991): 149–181.

<sup>71</sup> Terry Cannon, “Vulnerability and Disaster,” 301.

departures abstracted away from the material world in a way that the proponents of the vulnerability approach never did.

It is thus paradigmatic when Vincanne Adams, drawing on Klein's conception of disaster capitalism, writes about Hurricane Katrina as a "second-order disaster" in which the "market-driven infrastructures of recovery assistance," not the hurricane itself, is the real catastrophe.<sup>72</sup> However, as Nathan Jessee argues, oil and gas development on floodplains in Louisiana seriously exacerbated erosion and increased the possibility of flooding during hurricanes: the social element was not only in the response, but in the changes to the physical geography that rendered the hurricane more destructive.<sup>73</sup> While this in no way absolves the obvious failures of the neoliberal management of Katrina, it is crucial to understand this event in terms of the socioecological history of the region. Thus, although these approaches make a serious effort to embed disaster even more concretely in everyday processes than the vulnerability approach, their singular focus on disaster as a social event inadvertently detaches it from the constitutive socioecological relations of the social formation at hand.

One of the underlying themes of these approaches is the idea that fostering community resilience is a tool of neoliberal governance. This has led to a conflation between vulnerability and resilience, and an erasure of the brief (but important) prehistory of the idea of vulnerability. Illner writes, "vulnerability and resilience imply each other," meaning that social vulnerability inevitably carries with it the idea of building resilience.<sup>74</sup> But as I showed above, this is not quite

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<sup>72</sup> Adams, *Markets of Sorrow, Labors of Faith*, 1; 72.

<sup>73</sup> Nathan Jessee, "Community Resettlement in Louisiana: Learning from Histories of Horror and Hope," in *Louisiana's Response to Extreme Weather*, ed. Shirley Laska, *Extreme Weather and Society* (Cham: Springer International Publishing, 2020), 147–84; Rachel Phillips and Susanne Soederberg, "Making and Mastering Violent Environments: Following the Infrastructures of Accumulation in Coastal Louisiana," *Antipode* (online; 2022).

<sup>74</sup> Illner, *Disasters and Social Reproduction*, 17.

right. The concept of vulnerability has an important history prior to its articulation with resilience. Letting go of this concept because it has become connected to resilience (and by proxy certain aspects of neoliberal governance) is to lose an extremely powerful way of thinking about how humans are rendered vulnerable to their environment (in events like floods, forest fires, droughts, etc.) precisely because of the relations they have to this environment, which are themselves social. Therefore, although there are important correctives to be made to the institutional vulnerability approach by these thinkers, it is imperative to keep the concept of vulnerability in play.

#### **1.1.5 Summary: Vulnerability Reconceived**

I have tried to demonstrate that vulnerability has been subject to several conflations over the decades. Having cleared the ground, I propose my own synthetic conception here.

Vulnerability is, at bottom, a property of *relations between people*, and *relations between people and the natures in which they are embedded*: it is a property of socioecological relations. Just as Marx said that a machine only becomes capital in certain relations, people only become vulnerable in certain socioecological relations.<sup>75</sup> If a person is vulnerable, it is because they exist in relations that produce them as vulnerable; likewise, as long as these relations persist there will be vulnerable people. This formulation marks a return to the concept of vulnerability proposed by radical geographers, insofar as it conceives of vulnerability as belonging to socioecological relations—not as an inherent quality of certain types of people.

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<sup>75</sup> Karl Marx, “Wage Labour and Capital” in *Karl Marx & Frederick Engels Selected Works in One Volume*, 72-94 (New York: International Publishers, 1986).

Precisely because vulnerability is produced by socioecological relations, it is produced by the infrastructures that undergird these relations. Posthumanist scholars and theorists of hybridity have shown that it is a mistake to speak of relations between ‘humans’ and ‘nature;’ every entity is a complex mixture of elements that cannot be definitively separated.<sup>76</sup> Therefore, when I say that vulnerability is produced through socioecological relations, it must be understood that these relations are not between an always-already delineated ‘human’ and ‘nature,’ but instead composed of a variety of actors, both human and non-human. These non-human entities play a role in the production of vulnerability. To give a concrete example: the draining of Sumas Lake, which I will discuss further in Chapter 3, is an ongoing process dependent upon a variety of infrastructures like dikes, canals, and pumps, which prevent the lake from returning (and occasionally fail). Precisely because these infrastructures enable a network of farms, roads, schools, and other dry places, they are a point at which this metabolism can be disrupted. Because they constituted the socioecological relations that define this place, they also produce vulnerability within those relations.

Vulnerability, even when it is conceived relationally, is always vulnerability *to* something. In the same motion that socioecological relations produce people as vulnerable, they produce the environment as a hazard. Therefore, I do not let go of the idea of hazards, but I embed it in socioecological relations. What is lived subjectively (i.e., by people) as vulnerability is confronted objectively (i.e., in things in the world) as a hazard. The socioecological relations that produce the resident of the floodplain as vulnerable *also* produce the river as a flood hazard. The hazard is no less fully social than vulnerability: it is the ecological aspect of these relations.

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<sup>76</sup> Donna Haraway, “A Cyborg Manifesto;” Bruna Latour, *We Have Never Been Modern*; Bruce Braun and Sarah Whatmore, *Political Matter: Technoscience, Democracy, and Public Life* (Minneapolis: University of Minnesota Press, 2010).

In the remainder of this chapter, I turn to how infrastructure constitutes socioecological relations and, in doing so, produces vulnerability.

## 1.2 Infrastructures of Vulnerability

In this section I argue that infrastructure is a pivotal moment in the production of vulnerability because it enables or enacts new socioecological relations. As such, infrastructural development is subject to immense social struggle, particularly in relation to the state, which is often the only entity capable of organizing and financing such projects.<sup>77</sup> I suggest that the production of infrastructure is rife with tension: it often dispossess some groups at the same time as it enables or privileges others. Even those it privileges, however, are potentially subject to future disasters that are made possible by the metabolism these infrastructures facilitate. Floodplains in the Fraser Valley, for instance, were settled more densely by colonizer-farmers once they were protected by a system of dikes. The failure of this system in the flood of 1948 therefore precipitated a disaster far worse than anything imaginable prior to the diking of the valley—precisely because these infrastructures permitted denser settlement.

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<sup>77</sup> In recent literature the concept of infrastructure has been expanded to include everything from traditional water infrastructures like dams and water treatment plants to oysters (perhaps capable of stopping hurricanes) to ecosystem services to ‘informal’ economies of waste removal. See Karen Bakker, “Constructing ‘Public’ Water: The World Bank, Urban Water Supply, and the Biopolitics of Development,” *Environment and Planning D: Society and Space* 31, no. 2 (April 2013): 280–300; Stephanie Wakefield and Bruce Braun, “Oystertecture: Infrastructure, Profanation, and the Sacred Figure of the Human,” in *Infrastructure, Environment, and Life in the Anthropocene*, ed. Gregg Hetherington (Duke University Press, 2020), 193–215; Sara H. Nelson and Patrick Bigger, “Infrastructural Nature,” *Progress in Human Geography* 46, no. 1 (February 2022): 86–107; Vinay Gidwani, “The Work of Waste: Inside India’s Infra-Economy,” *Transactions of the Institute of British Geographers* 40, no. 4 (October 2015): 575–95; Kathryn Furlong, “Geographies of Infrastructure 1: Economies,” *Progress in Human Geography* 44, no. 3 (June 2020): 572–82. An almost endless variety of technologies, natures, and activities can be considered infrastructure, and there is much excellent work across geography on this subject. My approach in this section is somewhat more limited.

Infrastructures have a “peculiar ontology” because “they are things and also relations between things:” they are defined partially by their support or enabling of something else.<sup>78</sup> My contention is that because infrastructure partially constitutes socioecological relations, anything considered infrastructure plays a role in producing vulnerability. Infrastructure here refers to any built system, either material or immaterial, that is necessary to facilitate the objective of some social entity, including the state. Classical examples include transportation systems, power grids, sewage works, and flood control networks.<sup>79</sup>

My concern here is infrastructure that produces nature on a large scale, often requiring the coordinating efforts of the state. Paradigmatic examples include dikes, canals, floodgates, and pump stations, which sometimes are involved in land reclamation efforts that produce developable land by draining water.<sup>80</sup> In this section, I use the flood control infrastructures of the Fraser valley, which is the larger subject of this thesis, to concretize my arguments. The paradox of these infrastructures is that at the same time as they seek to prevent flooding by delineating land and water, they produce new vulnerabilities to flooding. Of course, in the Fraser Valley this infrastructural strategy developed in concert with other infrastructural and governmental

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<sup>78</sup> Brian Larkin, “The Politics and Poetics of Infrastructure,” *Annual Review of Anthropology* 42 (2013), 329.

<sup>79</sup> Ashley Carse, “Keyword: infrastructure: How a humble French engineering term shaped the modern world,” in *Infrastructures and Social Complexity* edited by Penelope Harvey, Casper Jensen, and Atsuro Morita (London: Routledge, 2016): 28.

<sup>80</sup> The idea of produced landscapes as infrastructure is here borrowed from Michael Ekers and Scott Prudham. Michael Ekers and Scott Prudham, “The Metabolism of Socioecological Fixes: Capital Switching, Spatial Fixes, and the Production of Nature,” *Annals of the American Association of Geographers* 107, no. 6 (November 2, 2017): 1385 fn1. If agricultural land must be produced by way of labor then I consider it infrastructure. Such landscapes do not only have a use-value, i.e., can be used for farming, but also contain the value of the capital advanced to produce this use. This could be considered, following James O’Connor’s evocative phrase, “the production of the conditions of production.” James O’Connor, “Capitalism Nature Socialism: A theoretical introduction,” *Capitalism Nature Socialism* 1 (1988): 11-38. See also Don Mitchell, “Dead labour and the political economy of landscape—California living, California dying,” in *Handbook of cultural geography*, 233-248 (London: Sage, 2003).

systems: a network of roads, the Canadian Pacific Railway, land surveys, and a market in agricultural goods. Here I treat the flood control infrastructures in isolation for reasons of clarity.

For my purposes there are two salient features of infrastructure. The first is how infrastructure constitutes a metabolism between human societies and the natures in which they are embedded. John Bellamy Foster defines metabolism as “the complex, interdependent process linking human society to nature.”<sup>81</sup> As Jason Moore stresses, metabolism does *not* therefore indicate an absolute divide between humans and nature, but instead indexes the fact that every social formation arranges the material world in a particular way: it is thus also an ecological system.<sup>82</sup> Social and ecological processes form a unity, and it is this unity that I call metabolism.

Infrastructure facilitates this metabolism. It is a “heterogeneous assemblage” of humans and non-human materials organized in particular relations.<sup>83</sup> A dike, for instance, is a material construction (generally rocks, dirt, or clay) to prevent water from encroaching on land. As dikes enable new uses of the land it produces, it also produces new vulnerabilities. Of course, these vulnerabilities are not often realized immediately: dikes and adjacent flood control infrastructures in the Fraser Valley have successfully prevented flooding for decades at a time. Nonetheless, by encouraging the development of the land, any failure of the dike (whenever it occurs) produces a greater catastrophe than if it had never been built.<sup>84</sup>

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<sup>81</sup> John Bellamy Foster, “Marx’s Theory of Metabolic Rift: Classical Foundations for Environmental Sociology,” *American Journal of Sociology* 105 no. 2 (1999): 381.

<sup>82</sup> Jason Moore, “Metabolic rift or metabolic shift? Dialectics, nature, and the world-historical method,” *Theory and Society* 46 no. 4 (2017): 285-318; Jason Moore, *Capitalism in the Web of Life: Ecology and the Accumulation of Capital* (London: Verso, 2015): 75-77. Although I presented their views as complementary, Moore and Foster (as well as Foster’s adherents) have been engaged in something of a polemic for a decade now. I discuss this polemic elsewhere. Nick Gandolfo-Lucia, “Eco-Marxism and regulation: one approach to ecological crisis,” in *Regulation theory, space, and uneven development: conversations and challenges* edited by, Brandon Hillier, Rachel Phillips, and Jamie Peck, 77-98 (Vancouver: 1984 Press, 2022).

<sup>83</sup> Eric Swyngedouw, “Circulations and metabolisms: (Hybrid) Natures and (Cyborg) cities,” *Science as Culture* 15 no. 2 (2006): 113.

<sup>84</sup> Gilbert White made this point very frequently. See “Strategic aspects of urban floodplain occupance.”



Second, given the costs, infrastructure is often built by the state.<sup>85</sup> Consequently the state becomes a site of social struggle over these infrastructures. Following Antonio Gramsci and recent calls for a Gramscian political ecology, I suggest that infrastructural development is a terrain on which social groups compete to articulate a hegemonic project.<sup>86</sup> The outcome of this competition is often the rendering of certain groups more vulnerable to their environment.

In short what I've described are *infrastructures of vulnerability*. The term describes both the way that infrastructure produces particular kinds of vulnerability *and* the way that vulnerability structures the metabolic relation between a social formation and nature. In my case, diking infrastructure produces new vulnerabilities at the same time that it enables a new metabolism.

### 1.2.1 Infrastructure I: Metabolism and Difference

Infrastructures are assemblages of non-human entities produced by human labor that facilitate the production and circulation of life.<sup>87</sup> They are an indispensable aspect of the metabolism of contemporary human societies. Consequently, they also represent fragility, points at which the metabolic process can be interrupted or fail. Antony Oliver-Smith writes

[s]ocial, political and economic power relations are inscribed through material practices (construction, urban planning or transportation) in the modified and built environments,

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<sup>85</sup> Ekers and Prudham, "The metabolism of socioecological fixes," 1377; Ekers and Prudham, "Towards the Socio-Ecological Fix," *Environment and Planning A: Economy and Space* 47, no. 12 (December 2015): 2438–45; David Harvey, *The Limits to Capital* (Oxford: Blackwell, 1982).

<sup>86</sup> Geoff Mann, "Should Political Ecology Be Marxist? A Case for Gramsci's Historical Materialism," *Geoforum* 40, no. 3 (2009): 335–44; Michael Ekers and Alex Loftus, "Revitalizing the Production of Nature Thesis: A Gramscian Turn?" *Progress in Human Geography* 37, no. 2 (2013): 234–52.

<sup>87</sup> Maan Barua, "Infrastructure and Non-Human Life: A Wider Ontology," *Progress in Human Geography* 45, no. 6 (December 2021): 1467–89.

and one of the many ways in which they are refracted back into daily living is in the form of conditions of vulnerability.<sup>88</sup>

Vulnerability is not separate from metabolic processes but inscribed in their materiality; it is contained within the socioecological pathways through which a society secures food and shelter. For example, during the recent BC floods of 2021, when the Barrowtown Pump Station was unable to clear the incoming floodwaters from Sumas Prairie and the lake reclaimed farmland, and submerged houses, schools, and highways, the prevailing metabolism was catastrophically disrupted.<sup>89</sup> By making this metabolism contingent upon the functioning of a network of infrastructures, it became vulnerable to the possibility that these infrastructures would fail.

Infrastructures plays this role in metabolism because it is a site of what Neil Smith calls the “production of nature:” it effects and enforces a transformation in the material world.<sup>90</sup> This is not to say that nature is produced in opposition to humanity as a simple binary, but rather that the non-human world is always known by humans through their practical relation to it. Thus, Noel Castree writes that the production of nature thesis is “intended to oppose the idea of an independent, non-social nature.”<sup>91</sup> A dike is a product of human labor that shapes some material into a hill or mound—levee, a synonym for dike, after all only means “to raise”—thereby dividing the aquatic from the terrestrial realm. It is simultaneously a transformation of the material world *and* an object that itself transforms the material world. It is a produced nature (an

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<sup>88</sup> Antony Oliver-Smith, “Theorizing Vulnerability in a Globalized World: a political ecological perspective,” in *Mapping Vulnerability: Disasters, Development and People* edited by Greg Bankoff, George Frerks, and Dorothea Hilhorst, 10-24, (London: Earthscan, 2004): 16.

<sup>89</sup> See the Introduction of this thesis for more.

<sup>90</sup> My use here emphasizes only certain aspects of this theory—and perhaps not the most central ones, which are (1) a critique of the idea of an external nature beyond human practical activity, and (2) the argument that as capitalism develops “nature becomes a *universal means of production* [...] [it becomes] in its totality an appendage to the production process,” which is to say subsumed by the process of capital accumulation. See Neil Smith and Phil O’Keefe, “Geography, Marx and the Concept of Nature,” *Antipode* 12, no. 2 (1980): 30–39.; Neil Smith, *Uneven Development: Nature, Capital and the Production of Space* (Oxford: Blackwell, 1990 [1984]): 49.

<sup>91</sup> Noel Castree, “Marxism and the Production of Nature,” *Capital & Class* 24, no. 3 (October 2000): 25.

assemblage of non-human entities created through labor) that *produces* nature (enacts an effect beyond that labor): the separation of land and water.<sup>92</sup> This salient effect enables the metabolism of the social formation.

The creation of infrastructure, and the double production of nature contained within this process, is not neutral. It is striated by power with uneven effects. Erik Swyngedouw writes:

social power and conflict unfold around the processes by which access to nature is socially organized, the way the metabolic transformation of nature is socio-ecologically structured and managed, and the mechanisms through which the results of this process are distributed.<sup>93</sup>

Because infrastructures produce nature, they produce certain people vulnerable *to* nature. This is illustrated in Laura Pulido's work on environmental racism.<sup>94</sup> She analyzes how contaminated water was channeled through the deteriorating hydrological infrastructure of Flint, Michigan into the homes of overwhelmingly Black residents.<sup>95</sup> The exposure to poisoned water was not only an effect of an existing racial formation, but was also a crucial moment of "racial production" in which racial difference is iterated and (de)valued.<sup>96</sup> The vulnerability of racialized people to

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<sup>92</sup> Some might feel that this formulation still ultimately resorts to a human-nature binary. However, it is worth noting that those, like Andreas Malm, who endorse a human-nature binary see the production of nature thesis as a hopelessly constructivist and hybrid. Andreas Malm, *The Progress of This Storm: Nature and Society in a Warming World* (London: Verso, 2017). Noel Castree in particular has tried to tease out the hybrid possibilities of Smith's formulation by emphasizing that his account is really about how ideologies of nature are constructed by and through capitalist social relations. Noel Castree, "Unfree Radicals: Geoscientists, the Anthropocene, and Left Politics," *Antipode* 49 (January 2017): 57-59.

<sup>93</sup> Eric Swyngedouw, *Liquid Power: Water and Contested Modernities in Spain, 1898-2010* (Cambridge: MIT Press, 2015): 25.

<sup>94</sup> Laura Pulido, "Rethinking Environmental Racism: White privilege and urban development in Southern California," in *Annals of the Association of American Geographers* 90 no. 1 (2000): 12-40.

<sup>95</sup> Laura Pulido, "Flint, Environmental Racism, and Racial Capitalism," *Capitalism Nature Socialism* 27, no. 3 (July 2, 2016): 1-16; Pavithra Vasudevan, "An Intimate Inventory of Race and Waste," *Antipode* (2019, online).

<sup>96</sup> Laura Pulido, "Geographies of Race and Ethnicity II: Environmental Racism, Racial Capitalism and State-Sanctioned Violence," *Progress in Human Geography* 41, no. 4 (2017): 527. On devaluation, Rosemary-Claire Collard and Jessica Dempsey, "Politics of Devaluation," *Dialogues in Human Geography* 7 no. 3 (2017): 314-318.

hazards is produced by the socioecological relations in which they exist, which are themselves constituted by infrastructures that organize their metabolism with nature.<sup>97</sup>

With lead pipes this connection is relatively clear. But this insight must be extended to apparently more innocuous infrastructures like dikes. Particularly in colonial settings—like the lower Fraser valley—dikes produce vulnerability in two registers. First, by working in concert with other spatial technologies like Indian Reserves to separate indigenous peoples from their ancestral territories and establishing settler ecologies.<sup>98</sup> As such, these infrastructures contribute to the dispossession of an entire population.<sup>99</sup> At the same time, they protect settler farmers from the possibility of flooding while simultaneously producing increased vulnerability to future flooding—often unevenly, which is to say some settlers are displaced as well.

Given these effects, where and who (not to mention whether) these infrastructures are built is a key zone of social struggle. The state is crucial to this struggle because it is often—although certainly not universally—the primary actor capable of organizing these investments.

### **1.2.2 Infrastructure II: State, Hegemony, Vulnerability**

Since perhaps the 18<sup>th</sup> century in England, unfolding gradually and unevenly with the spread of capitalist modernity, the state has been largely, although not exclusively, tasked with directing and funding infrastructure projects.<sup>100</sup> Following Nicos Poulantzas, I see the state as “a

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<sup>97</sup> Of course, race is not the only point of articulation with vulnerability. For instances of the coproduction of gender, coloniality, and vulnerability by way of infrastructure, see Matti Siemiatycki, Theresa Enright, and Mariana Valverde, “The Gendered Production of Infrastructure,” *Progress in Human Geography* 44, no. 2 (2020): 297–314; Michael Ekers, “Financiers in the Forests on Vancouver Island, British Columbia: On Fixes and Colonial Enclosures,” *Journal of Agrarian Change* 19, no. 2 (2019): 270–94.

<sup>98</sup> Levi Van Sant, Richard Milligan, and Sharlene Mollett, “Political Ecologies of Race: Settler Colonialism and Environmental Racism in the United States and Canada,” *Antipode* 53 no. 3 (2021): 629–642.

<sup>99</sup> Ali Nobil Ahmad, “Infrastructure, development, and displacement in Pakistan’s “southern punjab,”” *Antipode* (2022, online).

<sup>100</sup> Jo Guldi, *Roads to Power: Britain invents the infrastructure state* (Cambridge: Harvard University Press, 2021).

material condensation of a particular relationship of force.”<sup>101</sup> That is, the state does not stand outside the multitudinous relations of (class) struggle that constitute a capitalist society, but embodies these relations at a particular point in time. It is both a site of ongoing social struggle and an outcome of the history of these struggles. Likewise, following Ruth Wilson Gilmore, I suggest that it is for this reason that the state is the bearer of particular “capacities” in particular conjunctures, for instance, the capacity to tax certain activities, to police its population, to provide particular forms of education, etc.<sup>102</sup> The capacities a state possesses at a particular point in time are related to the social struggles that historically and presently shape that state. Both of these aspects of the state are in play in infrastructural formation and therefore in the production of vulnerability.

It will first be useful to see why the state is a privileged entity for pursuing infrastructure projects in capitalist social formations. Capital flows in three circuits simultaneously: a primary circuit of commodity production; a secondary circuit of investment in the built environment; and a third circuit of investment in social reproduction (like schools and medicine).<sup>103</sup> Capital switching, the movement of capital from one circuit to another (generally from the first to the second), is a way of delaying the periodic crises of capitalism (more on this below). However, it is generally not in the interest of any individual capitalist to undertake this switch—even though it is in the interest of the capitalist class as a whole because it both creates infrastructure that

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<sup>101</sup> Nicos Poulantzas, *State, Power, Socialism* (London: Verso, 1980): 73.

<sup>102</sup> Ruth Wilson Gilmore, *Golden Gulag: Prisons, Surplus, Crisis, and Opposition in Globalization California*, (Berkeley: University of California Press, 2007). Michel Foucault provides an important complement to this view, emphasizing that the state is only one level at which government is practiced (another is the government of the self). The capacities available to the state are intimately tied to how its governing function is conceived and what objects and people it is supposed to direct. (Of course, these questions are themselves tied to social struggles.) Michel Foucault, *Security, Territory, Population: Lectures at the Collège de France 1977-1978* trans. Graham Burchell, (New York: Picador, 2007): 88.

<sup>103</sup> Ekers and Prudham, “The metabolism of socioecological fixes,” 1376. See Harvey, *Limits to capital*.

facilitates production/circulation and delays crisis. Ekers and Prudham argue that the state is often tasked with organizing this investment, thus producing a “complex politics of struggle and contestation [over] the specific trajectory and ultimate legacy of such projects.”<sup>104</sup> The state-led formation of infrastructure “plays a vital role not only in facilitating economic function but also in helping to secure the legitimacy of a particular social ordering and the consolidation of specific socioecological relations.”<sup>105</sup>

Infrastructure formation—precisely because it establishes a metabolism constituted by efficiencies and vulnerabilities—becomes a crucial part of the construction of *hegemony*. This slippery and contested concept is most closely associated with the Sardinian militant Antonio Gramsci and refers, basically, to the leadership and domination of one social group over all other groups in a social formation. Hegemony traverses every level of a social formation, from the economic to the political (which can be identified with the state for my purposes) and cultural: “though hegemony is ethical-political, it must also be economic, must be based on the decisive function exercised by the leading group in the decisive nucleus of economic activity.”<sup>106</sup> It involves the articulation of economic goals in connection with “intellectual and moral reform,” a patchwork of beliefs, a particular way of life.<sup>107</sup> Stuart Hall, an ardent reader of Gramsci in the anglophone world, described Thatcherism as a “hegemonic project” because it linked free market absolutism and the rollback of social services to nationalist ideas about English identity.<sup>108</sup>

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<sup>104</sup> Ekers and Prudham, “The metabolism of socioecological fixes,” 1377.

<sup>105</sup> Michael Ekers and Scott Prudham, “The Socioecological Fix: Fixed Capital, Metabolism, and Hegemony,” *Annals of the American Association of Geographers* 108, no. 1 (2018): 29.

<sup>106</sup> Antonio Gramsci, *Selections from the prison notebooks* (trans. Quintin Hoare and Geoffrey Nowell-Smith), (New York: International Publishers, 1971): 161.

<sup>107</sup> *Ibid.*, 133.

<sup>108</sup> Stuart Hall, *The hard road to renewal: Thatcherism and the crisis of the left* (London: Verso, 1988). The concept of the “integral state,” highlighted by Peter D. Thomas, is useful here for thinking about the state in this way. The integral state is the dialectical synthesis of the state and civil society, in which the state is a crucial site at which

The play for hegemony is constituted by a passage from the economic to the political, cultural, and ideological levels of a social formation. A “hegemonic apparatus” must be constructed, consisting of “articulated institutions and practices” that gives political consciousness to a class, like newspapers and educational organizations.<sup>109</sup> Following Ekers and Prudham, infrastructure projects also function as an element in class’s hegemonic apparatus because they contain a solicitation to the state. Likewise, infrastructure should “be understood not only as a consolidation of physical ‘stuff’ nor strictly in terms of its economic function but also as a cultural creation that intervenes in the domain of meaning.”<sup>110</sup> Thus, for instance, the construction of prisons (and reengineering of the landscape) described by Ruth Wilson Gilmore cemented an economic, political, and cultural project—stretching from the rollback of the Keynesian welfare state to racist ideologies of crime—into prison infrastructure.<sup>111</sup>

The production of vulnerability, the exposure of a portion of the population to a hazard, is part of the hegemonic project of the leading class.<sup>112</sup> The hegemonic class “dominates antagonistic groups, which it tends to ‘liquidate’ [...] [while] it leads kindred and allied groups.”<sup>113</sup> The construction of hegemony by a leading social group involves forming a coalition of allied groups, whose interests the leading group can partially secure, and define enemy groups

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hegemony is exercised. No group can lead without taking control of the state, but this leadership cannot be confined to the state and must be grounded in civil society. See Peter D. Thomas, *The Gramscian Moment: Philosophy, Hegemony, Marxism* (Chicago: Haymarket, 2010): Chapter 5.

<sup>109</sup> Thomas, *The Gramscian Moment*, 226.

<sup>110</sup> Ekers and Prudham, “The Socioecological Fix,” 28.

<sup>111</sup> Gilmore, *Golden Gulag*.

<sup>112</sup> An important, if parenthetical, point of clarification could be made here. One of Stuart Hall’s enduring points regarding Gramsci is that hegemony does not always exist; part of what interested Gramsci in the study of hegemony is that it does not always exist (and perhaps did not exist in Italy). It remains the case that various classes or social groups undertake hegemonic projects that may or may not succeed. Thatcherism seems to be an instance of such a success. Stuart Hall, “Gramsci’s Relevance for the Study of Race and Ethnicity,” *Journal of Communication Inquiry* 10 no. 2 (1986): 5-27.

<sup>113</sup> Gramsci, *Selections from the prison notebooks*, 57. It should be noted that Gramsci does not see this as a transhistorical condition of human social organization, but as a property of class society.

whose interests will be sacrificed. To stay with Gilmore, the prison fix won the consent of unemployed people who were told prisons would bring jobs to abandoned agricultural areas at the same time as it liquidated, rendered vulnerable, and imprisoned, overwhelmingly Black and Latino men.<sup>114</sup> When Gilmore writes that “racism is the state-sanctioned and/or extralegal production and exploitation of group-differentiated vulnerability to premature death,” she is in part referring to the process by which vulnerability is distributed within the infrastructure as a component of class’s hegemonic project.<sup>115</sup> The process of diking the lower Fraser Valley at the end of the 19<sup>th</sup> century, as I discuss in the following chapter, was likewise a process of leadership and liquidation. It was a leadership of small settler-farmers by capitalists in the timber and mining industries, facilitated by a deep-seated attachment to the agrarian good life achieved through ‘improving’ the land. This project therefore incorporated economic, political, and ideological aspects. At the same time, it was a dispossession of First Nations peoples from their traditional lands and waters. The dikes secured an environment suitable for the former while disrupting the ancestral ecologies of the latter. In other words, the production of vulnerability constitutive of a hegemonic project can be effected by the creation of infrastructure.

The formation of infrastructure as the bulwark of a hegemonic project is one way that organic social crises are resolved: it can serve as a “socioecological fix,” as Ekers and Prudham put it.<sup>116</sup> A crisis is not “objectively bad or good:” it is a situation in which social (better:

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<sup>114</sup> They become, as Gilmore says elsewhere, “public enemies.” Ruth Wilson Gilmore, “Public enemies and private intellectuals: Apartheid USA,” *Race & Class* 35 no. 1 (1993): 69-78.

<sup>115</sup> Gilmore, *Golden Gulag*, 247. Gilmore suggests that this understanding of racism is taken from Cedric Robinson. Ruth Wilson Gilmore, “Abolition geography and the problem of innocence,” in *Futures of Black Radicalism* edited by Gaye Theresa Johnson and Alex Lubin, (London: Verso, 2017).

<sup>116</sup> I am playing a little bit fast and loose with the socioecological fix as conceptualized by Ekers and Prudham. For them, this concept is closely tied to Harvey’s spatial fix and generally caused by the contradictory processes of capital. Here, I am suggesting that this kind of infrastructure formation may also, in certain contexts, respond to other social crises that articulate with capital but are not solely determined by its processes.



socioecological) relations must be reconstituted—if they can be.<sup>117</sup> A classic example is the crisis of Fordism in the 1970s, a crisis that was attenuated in England by the rise of Thatcherism.<sup>118</sup> Precisely because crises involve the transformation of socioecological relations, they are moments in which vulnerability is redistributed, produced in new and different ways, through the articulation of a new metabolism. At the admittedly much finer scale of the lower Fraser Valley, it is possible to see in the floods of the 1890s as an organic (i.e., real) crisis for the settler colonial project in the region. Flooding became a threat to settlement and therefore to the possibility of a farming population producing agricultural commodities. It was ultimately only by making the state responsible for diking projects, by making it organize and largely finance infrastructural development, that the crisis was attenuated. This was done by transforming the prevailing socioecological relations through the introduction of diking infrastructure, a process that differentiated the population, leading and incorporating certain groups while dispossessing others.

It was in this sense that the state played a pivotal role in the production of vulnerability. This production was always a process of differentiation, of difference-making in the sense of valuing some lives by devaluing others.<sup>119</sup> But it is equally a process fraught with contradiction, in which the formation of infrastructure and the metabolism that it establishes renders those it seeks to protect vulnerable to future calamities.

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<sup>117</sup> Gilmore, *Golden Gulag*, 54; Stuart Hall and Bill Schwartz, “State and society 1880-1930,” in *The Hard Road to Renewal*, 95-122 (London: Verso, 1988).

<sup>118</sup> Stuart Hall et. al., *Policing the Crisis: Mugging, the State, and Law and Order* (London: Macmillan, 1978); Stuart Hall and Doreen Massey, “Interpreting the crisis: Doreen Massey and Stuart Hall discuss ways of understanding the current crisis.” *Soundings* 44 (2010): 57-71.

<sup>119</sup> Rosemary-Claire Collard and Jessica Dempsey, “Accumulation by Difference-Making: An Anthropocene Story, Starring Witches,” *Gender, Place & Culture* 25, no. 9 (2018): 1349–64.

### **1.3 Conclusion**

I suggested in this chapter that it is necessary to rehabilitate the concept of vulnerability articulated by 1970s radical geographers. Vulnerability must be conceptualized as something that inheres in socioecological relations. I further argued that one of the key sites of the production of vulnerability is infrastructure, to the extent that infrastructure is crucial to the metabolism of a particular social formation. The state, as the entity generally tasked with organizing infrastructure projects, is therefore a major force in the production and distribution of vulnerability across a population. In fact, the rendering of some groups as vulnerable to calamity while (apparently) protecting others from danger by way of infrastructures like dikes is one way in which hegemony is built and maintained.

The Fraser Valley saw these processes play out historically between the mid-19<sup>th</sup> and mid-20<sup>th</sup> centuries. The development of flood control infrastructure in the 19<sup>th</sup> century was undergirded by an inter-class belief in the need to protect the valley from flooding to facilitate the development of the province. Of course, it was the creation of these infrastructures and the settlement of floodplains that they facilitated that led to the major flood disaster of 1948. Having developed a theoretical apparatus for thinking vulnerability in relation to infrastructure, I now move to the historical geography of the Fraser Valley. This historical-geographic investigation both elucidates the problem of flooding in the region and acts as a striking case of the theory of vulnerability I have argued here.

## Chapter 2: The Flooding and Diking of the Fraser Valley

In 1873, a solicitation for immigrants to the province of British Columbia was published in the *Victoria Daily Standard*. It describes the land of the Fraser Valley as “alluvial, principally formed by the annual overflow of the Fraser river [...] forming a soil from one to ten feet deep, almost exhaustless, and the fertility of which we can challenge the world to excel.”<sup>1</sup> The article is pseudonymously signed “ILLITERATE PLOUGHBOY,” intimating that one need not be a learned gentleman to cash in on this farming paradise. Perhaps this is because the yearly flood, more than the workings of new settlers, was thought to ensure tremendous agricultural productivity in the region: “Large tracts of land on the Fraser [...] subject to annual overflow [...] have proved to produce spontaneously in endless quantity without any cost or labor.”<sup>2</sup>

Here, as in many newspapers, essays, immigration guides, and naturalist publications from the 1860s and early 1870s, the Fraser Valley is represented as a fertile agricultural region precisely because of the yearly flooding of the Fraser River.<sup>3</sup> Agriculture did not stand opposed to flooding but depended upon it. For European settlers in the 1860s, owning land that flooded was (with small qualifications) considered a boon. Thus Thomas York, one such white settler,

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<sup>1</sup> “Agricultural Resources of British Columbia,” *Victoria Daily Standard*, February 21, 1873.

<sup>2</sup> “British Columbia. To the editor of the Aberdeen Journal,” *The Aberdeen Journal*, September 25, 1872. Even when the floods are not portrayed in such glowing terms, they tend to be rendered as an idyllic feature of farm life. “Stock are getting along swimmingly, there being now several feet of water on the meadows. The first overflow from the river commenced last week.” “Lower Fraser Letter,” *Victoria Daily Standard*, May 23, 1873.

<sup>3</sup> See for instance R.C. Mayne, *Four Years in British Columbia and Vancouver Island: An Account of their Forests, Rivers, Coasts, Gold Fields, and Resources for Colonisation*, (London: John Murray, 1862), 87; C. Forbes, *Prize Essay: Vancouver Island: Its Resources and Capabilities as a Colony*, (Colonial Government, 1862), 8; J. Keast, *The Naturalist in British Columbia* v. 2., (London: Richard Bentley, 1866), 64. This is not to say that there are no references during this period to the possible dangers of flooding (especially to navigation) or the possible advantages of diking the land, but only that a strong positive connection existed between flooding and agriculture.

became the center of public life in Sumas Prairie precisely because his land was “ideally situated for grazing operation; seasonal flooding rejuvenated the yearly growth of grasses.”<sup>4</sup>

But this state of affairs did not last. Over the next three decades flooding announced itself as an existential threat to the settler colonial project in British Columbia. Even prior to the major floods of 1894 and 1896, floods in 1875, 1876, and 1882 brought “ruin and desolation and dismay to the once happy fireside of many a settler.”<sup>5</sup> The emerging European settler society shortly turned to diking as the principle means for stopping these floods. Dikes, which aimed to shield agricultural land from the river to which they owed their fertility, became the nexus of a new set of socioecological relations, a new metabolism between human society and the Fraser River predicated on European-style agriculture. Far from relegating flooding to the dustbin of history, these relations would in a matter of decades codify it as a persistent but unevenly distributed danger to life in the valley.

At the same time as these dikes protected farmers, they produced new social vulnerabilities. The successful construction of a system of dikes was simultaneously a dispossession of the First Peoples of the valley because they interrupted traditional ecologies and sources of food. Likewise, the interaction of dikes and Indian Reserves produced unique forms of social vulnerability for First Peoples due to the erosion caused by the Fraser River. I therefore argue that dikes produced First Peoples as vulnerable at the same time as they achieved relative security for farmers. What is more, the dikes themselves became a source of vulnerability for the farmers, who were now tasked with constantly maintaining the dikes to avoid calamity.

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<sup>4</sup> Chad Reimer, *Before We Lost the Lake: A Natural and Human History of Sumas Lake* (Halfmoon Bay: Caitlin Press, 2018), 100.

<sup>5</sup> “The floods,” *The British Columbian*, June 14, 1882.

This chapter proceeds in four major parts. I begin with a brief history of the lower Fraser Valley prior to 1873, focusing on how the ancestral and traditional relations between First Peoples and the river were disrupted by colonizers during the gold rush of 1858. The gold rush led, violently and almost overnight, to colonization of the Fraser Valley by European, American, and Canadian newcomers, who began to form an agricultural society in the valley. Next, I show how this new society of farmers began to experience flooding as a threat in the 1870s. This culminated in private efforts to dike the valley, most notably that carried out by Edgar Derby. Almost without exception, these projects failed. In the third section, I look at a series of floods that occurred in the 1890s, especially the flood of 1894. I argue that the social transformations that occurred in the 1880s, particularly the completion of the Canadian Pacific Railway, the rise of Vancouver, and the formation of a tacit coalition between farmers and capitalists in other sectors, led the provincial state to take over crucial flood control projects in the Fraser Valley at the end of the 1890s. Lastly, I show how the apparent success of these projects simultaneously produced new vulnerabilities. The traditional means of subsistence of the First Peoples of the valley was often disrupted by dikes and other infrastructures. Likewise, these structures had to be constantly maintained, which became a source of anxiety and economic stress for the new society of settler-farmers.

## **2.1 The Invention of the Fraser Valley**

The Fraser Valley is located in the southwest corner of British Columbia, just north of the 49<sup>th</sup> parallel. Strictly speaking, it extends from Hope to Abbotsford, encompassing the Fraser River. However, here I refer to the entire area from Hope to the delta, where the river empties

into the Strait of Georgia, as part of the valley due to the similarities of the region in the period under consideration here (see Appendix, Map 1).

I primarily use colonial names throughout this section only because I am tracing colonial processes. What settlers call the Fraser River has been known, since time immemorial, as the Stó:lō by the First Nations of the valley. One might say that the Fraser and the Stó:lō have been bound together in a “coloniality of being” since the colonization of the valley, which is to say that these names describe the same physical geography but index very different relations to it.<sup>6</sup>

Around 100 million years ago the North American tectonic plate began to drift westward. In a geologic struggle carried out over tens of millions of years, the Cordillera (i.e., Cascade) mountains erupted (often literally) from the crust of the earth. More recently, a scant two million years in the past, glaciers set in on top of this craggy terrain, with the Fraser glaciation descending into the valley some 30,000 years ago.<sup>7</sup> This icy epoch sanded the jagged tips of mountains and established fjords and deltas that brought ice flows down to the Pacific Ocean. Having smoothed the valley and rearranged its waterways, the glaciers began to recede 13,000 years ago.<sup>8</sup> What the Stó:lō call S’ólh Téméxw—the halq’emélem word for Stó:lō lands—had begun to take shape. Although this land continued to shift and change, according to the *Stó:lō-Coast Salish Historical Atlas*, the “physical presence of Aboriginal people within the deglaciated landscape of S’ólh Téméxw can be traced back approximately 10,000 years.” Therefore the roots

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<sup>6</sup> Sylvia Wynter, “Unsettling the Coloniality of Being/Power/Truth/Freedom: Towards the Human, After Man, its Overrepresentation—An Argument,” *CR: The New Cenennial Review* 3 no. 3 (2006): 257-337.

<sup>7</sup> Richard Cannings and Sydney Cannings, *British Columbia: A Natural History of Its Origins, Ecology, and Diversity with a New Look at Climate Change*, (Vancouver: Greystone Books, 2015): 32-45.

<sup>8</sup> Olav Slaymaker, et. al., “The primordial environment,” In *Vancouver and Its Region* edited by Tim Oke and Graeme Wynn, (Vancouver: UBC Press, 1992): 18-21.

of Stó:lō connection to this territory “clearly lie beyond the limits of memory and reside, in Sxwōxwiyám, in time immemorial.”<sup>9</sup>

The Stó:lō River was (and remains) the center of this world—and it has always flooded. It drains 232,000 square kilometers of south-central BC. From its peak around Mt. Robson (the highest peak in the Canadian Rockies) it flows 1375km in an S-shaped arc to empty into the Pacific Ocean. The last 160km flow through Stó:lō territory.<sup>10</sup> These floods have a basic physical geography: snow accrues in the Cascade, Cariboo and Rocky Mountains over the course of the winter and, when temperatures rise in the spring, the snow melts, swelling the river. Under certain conditions, these floods can be exceptionally large and destructive. If there is a high volume of snow and temperatures rise very quickly in the spring or early summer, as occurred in the floods of 1894 and 1896, the volume of water entering the river causes it to greatly exceed its normal boundaries, causing destruction (as we shall see). Less frequently and less predictably, there are rainfall floods which generally occur during the rainy season between November and January.<sup>11</sup>

Flooding is therefore a constitutive rhythm of this physical geography that extends deep into the past: the expansion and movement of the river has occurred for as long as the river has existed. It is a rhythm that coexisted with First Peoples, whose semi-nomadic patterns did not

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<sup>9</sup> Keith Thor Carlson, *A Stó:lō-Coast Salish Historical Atlas*, (Vancouver: Douglas & McIntyre, 2001): 20.

<sup>10</sup> Michael Church, “Fraser River: History in a Changing Landscape.” In *Landscapes and Landforms of Western Canada* edited by Olav Slaymaker 381-393, (Springer International Publishing, 2017), 381. As of the early 21<sup>st</sup> century, 80% of British Columbia’s population lives within the watershed of this river.

<sup>11</sup> As precipitation patterns change in the 21<sup>st</sup> century due to climate change, it is likely that the Fraser River will see more and more rainfall floods and fewer snowmelt floods—a reversal of the pattern that prevailed throughout the 19<sup>th</sup> and 20<sup>th</sup> centuries. See Donald H. Burn, Paul H. Whitfield, and Mohammed Sharif. “Identification of Changes in Floods and Flood Regimes in Canada using a Peaks Over Threshold Approach.” *Hydrological Processes* 30, no. 18 (2016): 3303-3314.

generally encounter the floods as a hazard.<sup>12</sup> The seasonal expansion of the river helped salmon, an incredibly important food source and cultural centerpiece of Stó:lō life proceed up the river and access floodplains (although floods also caused the movement of sediment and gravel, which could disrupt spawning grounds).<sup>13</sup> More saliently, Katzie First Nations engineered “productive wetland niches” fed by the freshets to boost wapato (a tuber) yields.<sup>14</sup> While these practices were both diverse and dynamic, changing between Nations and across time, it can be said without too much flattening that freshets were intrinsic to the practices of many First Peoples in the valley. The Stó:lō River, and especially its floods, was thus a source of food and the center of life: its rhythms constituted the natural base of the production of life.

I do not relate this deep history to posit an originary moment in which flooding was not a problem and people lived in perfect harmony with the river. After all, Stó:lō oral history abounds with tales of disastrous floods.<sup>15</sup> But it is striking to consider the depths of this socioecological relation between the First Peoples of the valley and the yearly rhythm of the river given that, in the space of a few brief decades after the 1858 goldrush, it would be completely interrupted by the colonization of the valley. As Cole Harris says, “time is telescoped in British Columbia”; transformations that elsewhere took centuries happened in a single generation.<sup>16</sup>

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<sup>12</sup> Bret McGillivray, *Geography of British Columbia: People and Landscapes in Transition* (Vancouver: UBC Press, 2005), 75-6. “

<sup>13</sup> Riley J.R. Finn et. al., “Quantifying lost and inaccessible habitat for Pacific salmon in Canada’s Lower Fraser River.” *Ecosphere* 12 no. 7 (2021); Katya C. Macdonald, “Crossing Paths: Knowing and Navigating Routes of Access to Stó:lō Fishing Sites,” in *Towards a New Ethnohistory: Community-Engaged Scholarship Among the People of the River* edited by Keith Thor Carlson et. al., (Winnipeg: University of Manitoba Press, 2018).

<sup>14</sup> Natasha Lyons et al., “Were the Ancient Coast Salish Farmers? A Story of Origins,” *American Antiquity* 86, no. 3 (July 2021): 504–25.

<sup>15</sup> Franz Boas, *Folk-tales of Salishan and Sahaptin tribes*, (Lancaster and New York: The American Folklore Society, 1917). See in particular “The Deluge.”

<sup>16</sup> Cole Harris, “The Fraser Canyon Encountered,” *BC Studies* 94 no. 2 (1992): 6.



The presence of European and American settlers in the Fraser Valley did not begin with the goldrush of 1858, however. Fifty years earlier, in 1808, Simon Fraser journeyed down the Fraser Canyon on an exploratory trip to expand the fur trade. The limited presence of Europeans in the years after Fraser's journey was mostly confined to strategically placed settlements, such as Fort Langley, that facilitated Hudson's Bay Company (HBC) fur trade activities. There was no colonial government to speak of. While there was no shortage of quarrels between fur traders and First Nations (invariably caused by the presence of these colonizers in lands that did not belong to them), relations were not as a rule overtly antagonistic, as they were elsewhere in North America at this time. No reserves existed, colonizers made no serious attempts to separate indigenous peoples from their traditional lands, and a system of mutually beneficial trade prevailed. This may well have been otherwise, had a large proportion of the indigenous population of British Columbia not been killed in a smallpox epidemic that traveled up the west coast in the late 18<sup>th</sup> century.<sup>17</sup> Simply put, while certain devastations of settler colonialism had come to the Stó:lō Nations, prior to 1858 no serious efforts were made to take possession of large areas of land.

The gold rush was, bluntly, a mass effort to steal land.<sup>18</sup> Since the early 1850s the Hudson's Bay Company had traded with various First Nations, especially in Haida Gwaii, for gold—but this trade was carried out in relative secrecy. Rumors eventually spread in San

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<sup>17</sup> Cole Harris, *The Resettlement of British Columbia: Essays on Colonialism and Geographic Change*, (Vancouver: UBC Press, 1998): Chapters 1-3.

<sup>18</sup> For Robin Fisher, this distinguished the gold rush from all previous moments of colonization. It was predicated on miners, largely from the Americas, arriving with the sole intention of dispossessing the current inhabitants of the territory. Fisher, "Gold Miners and Settlers," in *A History of British Columbia: Selected Readings* edited by Patricia Roy, 24-48 (Toronto: Copp Clark Pitman, 1989); Jeff Oliver, "Harnessing the Land: The Place of Pioneering in Early Modern British Columbia," in *An Archeology of Land Ownership* Maria Relaki and Despina Catapoti, 170-191, (New York: Routledge, 2013).

Francisco newspapers that gold had been discovered in New Caledonia (i.e., present-day British Columbia). By 1858, failed prospectors from the California goldrush, many of whom had extensive military training, began streaming across the border. As Jean Barmen put it, the rush “represented not the initial discovery of gold but a loss of control” by the HBC and First Nations.<sup>19</sup> And, indeed, the 1858 goldrush ballooned into a brief war between American prospectors and the Nlaka’pamux First Nation. This war was entirely precipitated by American miners trying to drive the Nlaka’pamux off their land.<sup>20</sup> Extensive bloodshed was only avoided through the negotiating skill and patience of Nlaka’pamux elders, who handled the situation long before any colonial power.<sup>21</sup> Nonetheless, to protect HBC trade routes and to prevent the US using the influx of miners as a pretense to annex the territory, the British Empire claimed British Columbia as a crown colony. James Douglas, long time Victoria fur trader, became its first governor.

Douglas, attempting to impose a degree of order on the chaos overtaking the river, enacted laws by which miners could legitimately claim property. Although the goldrush in the valley ended in a matter of years and prospectors moved up the Fraser River to claims in the

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<sup>19</sup> Jean Barmen, *West Beyond the West: A History of British Columbia*, (Toronto: University of Toronto Press, 1991), 63. To be more precise, the HBC and various First Nations mutually benefitted from the secret gold trade. They tried, in tandem, to prevent American miners from disrupting their profitable venture. Indeed, First Nations forcibly drove out American prospectors prior to 1858. The effects of the goldrush on the Stó:lō were immense even prior to the development of a settler agricultural society, as it destroyed fish habitats, disrupted kinship networks, and contributed to some people leaving traditional ways of life to become wage laborers in the emerging boomtowns. Robert James Muckle, *The First Nations of British Columbia: An Anthropological Overview, Third Edition*, (Vancouver: UBC Press, 2014), 78-9.

<sup>20</sup> Daniel Marshall, *Claiming the Land: British Columbia and the Making of a New El Dorado* (Vancouver: Ronsdale Press, 2018). Marshall describes this as the foundational moment of settler colonial society in British Columbia. Most of these hostilities took place upriver of the lower Fraser Valley. Brian Pegg, “The Archeology of 1858 in the Fraser Canyon” *BC Studies* 196 (Winter 2017), 67-87.

<sup>21</sup> Keith Thor Carlson, *The Power of Place, The Problem of Time: Aboriginal Identity and Historical Consciousness in the Cauldron of Colonialism*, (Toronto: University of Toronto Press 2010).

Cariboo, these regulations around claiming property remained and were further developed.<sup>22</sup>

Beginning in 1860, male British subjects (or others who claimed allegiance to the crown) could pre-empt up 160 acres of land prior to it being officially surveyed.<sup>23</sup> To pre-empt land meant to take possession of it and live on it before actually purchasing it. In order for pre-emption to be legitimate, however, the settler claiming it had to occupy the land continuously and commit to “improving” it. As Ellen Meiksins Wood notes, the idea of improvement as a condition for claiming private property stems from the emergence of capitalist social relations in England. When the word ‘improve’ entered the English language, it initially meant to render land profitable by taking it under private ownership.<sup>24</sup> Provided a settler could demonstrate such improvements, he (and in these early years it was often if not always a *he*) would be given first right to purchase the land, generally at a reduced rate, when it was eventually surveyed.<sup>25</sup>

At first this right was technically extended to First Peoples but, in practice, it was nearly impossible for them to claim land. Instead, many continued to live on their traditional lands until a commission laid out Indian Reserves and various organized and unorganized policing methods enforced this spatial confinement.<sup>26</sup> Even then, disputes over the boundaries of the reserves were

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<sup>22</sup> Jean Barmen notes that the Fraser River goldrush was, while pivotal in the history of British Columbia, relatively small compared to the goldrushes of California. It averaged only \$3 million per year compared with California’s \$40 million per year. See Barmen, *West Beyond the West*, 62.

<sup>23</sup> *Pre-emption Act*, SBC 1860 s 2. This would be doubled to 320 acres by 1870. *Land Ordinance*, SBC 1870 s 2. For a detailed treatment of pre-emption specifically, see Phyllis Mikkelsen, “Land Settlement Policy on the Mainland of British Columbia, 1858-1874” UBC Department of History MA Thesis (1950).

<sup>24</sup> Wood writes, “the word ‘improve’ itself, in its original meaning, did not mean just ‘make better’ in a general sense but literally meant to do something for monetary profit, especially to cultivate land for profit (based on the old French for *into*, *en*, and *profit*, *pros*—or its oblique case, *preu*). By the seventeenth century, the word ‘improver’ was firmly fixed in the language to refer to someone who rendered land productive and profitable, especially by enclosing it or reclaiming waste.” Ellen Meiksins Wood, *The Origin of Capitalism: A Longer View*, (London: Verso, 2002):106.

<sup>25</sup> Barmen, J. *West Beyond the West*, 87-88.

<sup>26</sup> Cole Harris, “The Land Policies of Governor James Douglas,” *BC Studies* 174 no. 2 (2012): 110; Cole Harris, *Making Native Space: Colonialism, Resistance, and Reserves in British Columbia*, (Chicago: University of Chicago Press, 2002): Chapter 2.

constant, and many First Peoples continued to have access to some traditional means of subsistence until the end of the 19<sup>th</sup> century. Despite these complex and ongoing arguments over land title for indigenous people in British Columbia, Douglas represented the colony to new settlers as “wild and unoccupied Territories,” an empty wilderness waiting to be claimed. Of course, there was no wilderness and there never has been.<sup>27</sup> As I described above, the lands and waters of Stó:lō territories were already carefully stewarded by their indigenous inhabitants. However, the pre-emption system permitted new colonizers to take possession of any land not already owned by another settler, the province or dominion, or included in an Indian Reserve. Land that was pre-empted by a settler de facto dispossessed First Peoples from its use, because these settlers could now claim that indigenous peoples were trespassing and enlist the state or other settlers in ‘defending’ their land.<sup>28</sup> Once pre-empted, new settlers in the valley invariably engineered the land for European-style, cattle-centric agriculture.<sup>29</sup>

Building dikes was a principal form of improvement (often in tandem with draining) that was undertaken by settler-colonizers. In the 19<sup>th</sup> century a dike was little more than a raised dirt

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<sup>27</sup> *Anno Vicesimo Primo & Vicesimo Secundo Victoria Reginae CAP, XCIX*, An Act to provide for the Government of British Columbia 1858. Apparently, this preamble was read by James Douglas to miners during the summer of 1858. For the contrast between Douglas’ words and the very real, sovereign presence of First Nations, see Carlson, *The Power of Place, The Problem of Time*, 160-3. The classic statements on wilderness-as-ideology—the idea that ‘wilderness’ was largely a way of representing the teaming ecological worlds of indigenous peoples as something empty, waiting for settlement—are William Cronon, “The Trouble with Wilderness: Or, Getting Back to the Wrong Nature.” *Environmental History* 1 no. 1 (1996): 7-28, and William M. Denevan, “The Pristine Myth: The Landscape of the Americas in 1492.” *Annals of the Association of American Geographers* 82, no. 3 (1992): 369-385. For BC specifically see Douglas Deur and Nancy J. Turner, *Keeping it Living: Traditions of Plant Use and Cultivation on the Northwest Coast of North America* (Seattle: University of Washington Press, 2005).

<sup>28</sup> These overtures were not always successful, however. One rather spineless settler wrote to the province in 1876 complaining that an indigenous man known as “Sore-Necked Jim” had repeatedly driven him off the land he pre-empted. It is unclear if the state intervened on his behalf against Sore-Necked Jim. BCARS GR 0868 Chief Commissioner of Lands and Works correspondences (CCLW from here), Reel B16902, Box 2, Folder 16.

<sup>29</sup> Although writing about New England rather than BC, William Cronon has catalogued the environmental engineering associated with the introduction of cattle-centric agriculture, particularly clearing the land, planting new grasses, and erecting fences. Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill and Wang, 2003): 127-130.

embankment, buttressed with stakes and clay. Nonetheless its effect was clear: to separate land from water, to mark the terminus of the river. In other words, it interrupted the multi-millenia rhythm of flooding that constituted the physical and cultural geography of the region. Because much of the land that was claimed in these early years was in the floodplains (principally because this provided easy access to water), claiming the land often meant entering into conflict with its rhythms.

It is said, perhaps apocryphally, that the first dike in the Fraser valley were erected on Lulu Island by Hugh McRoberts. McRoberts was an Irishman who hopped from goldrush to goldrush until he pre-empted land and established an orchard in 1861.<sup>30</sup> It is not surprising that early settlers like McRoberts erected dikes, as the flattest land in need of the least clearing generally lay next to the river.<sup>31</sup> Shortly thereafter the first “systematic” attempt to dike the lowlands of Lulu Island was carried out by Samuel Brighthouse. All of these dikes appear to have been destroyed almost immediately in subsequent freshets, but they served their purpose as improvements.<sup>32</sup>

Diking was thus contemporaneous with colonial settlement. Its function was to claim land and establish private property as much as it was to protect land from floods. Although diking was not a colonial technology—it first became widespread in Holland and the

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<sup>30</sup> Thomas Kidd, *History of Lulu Island and Occasional Poems* (Wrigley Printing Company Ltd., 1923): 21-22.

<sup>31</sup> These lands were called “prairies,” although as Sproat comments in his guide this is out of step with what is meant by prairie almost everywhere else in North America. Gilbert Malcolm Sproat, *British Columbia: Information for Emigrants* (London: Agent-General of the Province, 1874): 9.

<sup>32</sup> J.L. MacDonald, “History of Dykes and Drainage in BC,” BCARS, Guy Constable papers, Reel A00671, Volume 21, Folder 5. It should be noted that there is some disagreement here, as Kidd’s *History of Lulu Island* suggests that the first systemic diking effort was carried out by William McNeely. MacDonald claims that Brighthouse was so successful that others followed suit; Kidd says McNeely’s dikes failed immediately and no one bothered to rebuild them.

Netherlands—in British Columbia it played a decisively colonial function.<sup>33</sup> It became incorporated into the practices that constituted the image of an idyllic, agricultural life for European settlers at the same time as it dispossessed First Nations from their ancestral territories. Diking condensed the elaboration of private property, the delineation of land and water, and the imposition of European agriculture (and likewise the family unit) into a single technology.<sup>34</sup>

A dike is, therefore, more than a mound of dirt. It is at bottom a bundle of interdependent socioecological relations. Beginning in the 1870s, it became the condition of development of the Fraser Valley, the instrument through which these relations could be extended.

## 2.2 Flooding as Disaster

In June of 1875, Land Agent William Ralph wrote that

the water in the Fraser at present is exceptionally high and has exceeded the point of high water marking the summer of 1871 [...] At no period since the Province has been settled by the white people have they witnessed the water at so high a mark [as] at present and the River is still rising with startling rapidity [...] And the damages in consequence are indeed serious to contemplate. The Road between Yale and Boston Bar in places is impassable [...] For the current is dashing on with deepening swiftness, huge trees and logs are tossed and whirled about like corks...<sup>35</sup>

The “white people” had only lived in the valley in really significant numbers for 17 years.

Although HBC traders had occasionally been displaced from Fort Langley by the Fraser’s freshets, William’s letter is one of the first documents of colonial society in which the river is

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<sup>33</sup> Eduardo F.J. De Mulder, “Water,” in *The Netherlands and the Dutch: A Physical and Human Geography* edited by Eduardo F.J. De Mulder, Ben C. De Pater, and Joos C. Droogleever Fortuijn. (Springer International Publishing, 2019): 21-30.

<sup>34</sup> It could therefore be considered a nexus of what Alfred Crosby calls “ecological imperialism” in the Fraser Valley. Alfred Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900-1900* (Cambridge: Cambridge University Press, 1986).

<sup>35</sup> BCARS, CCLW, Reel A0062, Box 2, Folder 12. The Department of Lands and Works was a major provincial department in British Columbia for much of the late 19th century, tasked with most infrastructure construction.

represented as something seriously dangerous to settler society.<sup>36</sup> The bucolic wandering of a gentle body that so often characterized the relation between flooding and agriculture in the 1860s began to give way to a different understanding of the floods.

And the flood threat did not abate. William Ralph was dispatched to the field from Victoria again almost exactly a year later. Once again he wrote (in almost identical language) that the “high stage of the water in the Fraser” was “unprecedented in the annals of the Province [...] six feet higher than any previous year.”<sup>37</sup> The “wild and furious” current returned, leaving “proof [...] of the rapidity of the inundations [in] the destruction of Buildings, Bridges, and Property.”<sup>38</sup> Much of the farmland between New Westminster and Yale was submerged, and many farmers lost their crops entirely.<sup>39</sup>

Beginning in the 1870s, and particularly after the floods of 1875 and 1876, the experience of flooding began to change. Flooding as occasional inconvenience was replaced by flooding as disaster. Flooding became a collective problem, shared by settlers throughout the valley. That flooding was a collective problem, even though it was also the source of the region’s fertility, began to be registered in representations of the Fraser valley. The *Guide to the Province of British Columbia for 1877-8*, for instance, boasts of a miraculous twenty-eight pound head of

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<sup>36</sup> Morag MacLachlan, *The Fort Langley Journals: 1827-1830* (Vancouver: University of British Columbia Press, 1998): 149. In May of 1830, Archibald McDonald wrote in his diary that the “incessant rise of the water has Compelled us to abandon our Garden, and Commence making a new one in the woods behind.”

<sup>37</sup> BCARS, CCLW, Reel A0062, Box 2, Folder 15.

<sup>38</sup> Ibid.

<sup>39</sup> UBC Archives, Fraser River Model Project fonds, Box 1, File 12B. Fraser River Board, *Interim Report: Investigations into Measures for Flood Control in the Fraser River Basin, Appendix C History of Floods in the Fraser River Basin*, (Victoria, 1956): C27-8. This appendix includes excerpts from the *Victoria Colonist* the flood of 1876.

cauliflower grown on the alluvial soil of the delta—but goes on to emphasize that the land must be protected from overflow before it can be settled.<sup>40</sup>

In this section I examine the first effort to collectively confront the problem of flooding—and the immediate failure of this attempt. I focus on E. L. Derby's scheme, the first of its kind, to dike a major section of the Fraser Valley. Particularly, I discuss how this privately funded and organized effort failed because it was more of a profiteering scheme for Derby than a serious effort to protect the farms of the valley. Drawing on the work of Antonio Gramsci, I suggest that this failure was due to the relation between state and civil society prevailing during this period, and the way that diking work was largely left to private enterprise. Although this project failed, it was an important moment in which farmers began to develop a kind of class consciousness, particularly around the necessity of diking.

In 1869 there were only 300 settler farms in the lower Fraser Valley, but these quickly formed into communities and municipalities.<sup>41</sup> In the floods of the 1870s, these small communities became for the first time seriously concerned that the freshets of the valley represented an insurmountable obstacle to farming.

In the midst of the flood of 1876, a letter to the editor appeared in the *Mainland Guardian* calling on the provincial government to fund a survey of the valley and draw up plans for diking it. The anonymous letter also suggested that the government should guarantee loans to finance the project.<sup>42</sup> Only the first half of this (quite diplomatic) letter would be taken up. The capacities

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<sup>40</sup> *Guide to the Province of British Columbia for 1877-8, Compiled from the Latest and Most Authentic Sources of Information* (Victoria: T.N. Hibben & Co. Publishers, 1878): 29. Guides such as this were generally published to provide potential immigrants with information. Of course, their overt aim was to convince potential settlers (of the right variety) to come to the province. If anything, this renders more salient the warnings against settlement prior to extensive diking.

<sup>41</sup> Barmen, *West Beyond the West*, 88.

<sup>42</sup> "Dyking Lands on Lower Fraser," *Mainland Guardian*, June 28, 1876.



of the provincial state were, at this point, “geared largely to the development of a legal framework to regulate land settlement and staple extraction.”<sup>43</sup> Infrastructure development, with the exception of a few roads and bridges, was not within its purview during the 1870s.<sup>44</sup> It is therefore significant that the state coordinated and even funded a survey on diking.<sup>45</sup>

By the end of September, surveyor and engineer Edgar Dewdney was trudging along the Fraser River determining the feasibility of dike construction.<sup>46</sup> His immediate finding was that a system of dikes, floodgates, and pumps could protect these agricultural areas from flooding and also reclaim large swaths of land from Sumas Lake. Such a system would require an estimated 227,686 cubic yards of dike construction, 5 floodgates, at least 1 pump, and an intimate understanding of the hydrology of the many intersecting rivers and creeks that crossed the prairie.<sup>47</sup> He also suggested that the dike be built *behind* the Indian Reserves in the area, thus exposing them to the freshets.<sup>48</sup> Of course, his plans were never realized, and this is more

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<sup>43</sup> Rennie Warburton and David Coburn, *Workers, Capital, and the State in British Columbia: Selected Papers*. (Vancouver: University of British Columbia Press, 1988): 13.

<sup>44</sup> During this period, beyond securing the economic base of land settlement and staples extraction, the provincial state was mainly concerned with the relation between British Columbia and the dominion as a whole. The railway and immigration, particularly the immigration of Chinese laborers, were salient sites of this struggle. Flooding and diking would not come to dovetail directly with these primary concerns until 1894. See Robert A. McDonald, *A Long Way to Paradise: A New History of British Columbia Politics*. (Vancouver: UBC Press, 2021): Chapters 1-2.

<sup>45</sup> It appears that settlers had been requesting such a survey for several years prior to 1876, however. Sproat, *British Columbia: Information for Immigrants*, 92.

<sup>46</sup> This survey was but a footnote to Dewdney’s subsequent career dispossessing indigenous peoples as Indian Commissioner and Lieutenant-Governor of the North-West Territories in the 1880s and ‘90s—which should give a sense of the mentality with which he approached this work. Jeffrey Monaghan, “Settler Governmentality and Racializing Surveillance in Canada’s North-West,” *Canadian Journal of Sociology* 38, no. 4 (2013): 487–508.

<sup>47</sup> *BC Sessional Papers*, “Report of the Chief Commissioner of Lands and Works of the Province of British Columbia,” (1876): 269-275.

<sup>48</sup> By the end of the 1860s, most of the reserves in the lower Fraser valley had been laid out. They would continue to be adjusted through the end of the century, but (unlike elsewhere in the province) they had already been created. See Harris, *Making Native Space*, 37-42. What is more, it seems that most of the reserves that sat along the Fraser were known to flood, often quite violently. The placement of the dike on the ‘wrong’ side of the reserve likely reflected the belief (widely held among settlers) that indigenous people would either assimilate or die out. Province of British Columbia, *Papers Connected with the Indian Land Question 1850-1875*, (Victoria: Richard Wolfenden, Government Printer 1875).

indicative of who the dikes were actually supposed to protect in this period than the projects that followed.

Dewdney ends his technical report with a disclaimer. “Every care should be taken against the possibility of future breaks from defective work.” Should the land be reclaimed, settlers would flock to the district and a break in the dike would then cause “universal ruin and destruction.”<sup>49</sup> A most competent engineer was therefore needed to bring this scheme to completion.

Perhaps a most competent engineer could not be found. Enter Ellis Luther Derby. Unlike Dewdney, his qualifications were uncertain at best; Derby’s credentials amounted to a handful of second-hand reports alleging that he performed some diking work in California.<sup>50</sup> Nonetheless, he proposed to undertake the diking of the entire Sumas and Chilliwack areas in addition to draining Sumas Lake. (Draining the lake alone, it should be mentioned, would require herculean feats of engineering that were at this time totally unprecedented in British Columbia.) In 1878, Derby won the hearts of white settlers throughout the Fraser valley and obtained the passage of the Sumas Dyking Act of 1878, inaugurating his diking scheme.

Derby’s was not the only diking scheme of the 1870s. In 1873 the legislature passed the Drainage, Dyking, and Irrigation Act and settlers immediately began petitioning for dikes at Sumas and a floodgate at Delta.<sup>51</sup> In essence, this act empowered the province or settlers to appoint a commissioner to carry out diking works. These projects were to be directly funded by settlers; the state did little more than outline the rules by which private diking contracts could be

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<sup>49</sup> *Sessional Papers*, “Report of the Chief Commissioner of Lands and Works,” (1876): 274.

<sup>50</sup> Reimer, *Before We Lost the Lake*, 156.

<sup>51</sup> BCARS, CCLW, Reel B16901, Box 1, Folder 6; CCLW Reel B16902, Box 2, Folder 12. Particularly the petition for a floodgate at Delta received an overwhelming number of signatures, indicating that diking was never at any point a top-down operation.

drafted.<sup>52</sup> It is, however, clear that the government wanted the valley diked, and hoped that this act would be successful at “encouraging others to enter into such undertakings [i.e., diking] on a still larger scale.”<sup>53</sup>

Derby’s project was significant because it demonstrated, somewhat histrionically, the limitations of the private enterprise (with little state oversight) approach to diking the valley. Derby was to be paid by the settlers of the valley between \$0.50 and \$5.00 per acre (depending on the area). He was empowered to hire labor, use private roads, conduct surveys, and engineer the land and water in whatever manner he saw fit. In return, he was slated to receive an unbelievable 45,000 acres of land, including the entire lakebed of the drained Sumas Lake. The state itself played no role in funding the project, stipulating that Derby must refund all costs incurred by the Chief Commissioner of Lands and Works for overseeing the project.<sup>54</sup>

The imbroglio began at once. Derby’s plans for the project were submitted late and with little discernable understanding of the task at hand. They were rejected outright. The plans that would ultimately be used were instead drawn up by a Lands and Works agent who, apparently, conducted the necessary surveys and propelled the scheme through various committees, but was unceremoniously removed from the project when construction began.<sup>55</sup> Once the project commenced, the work performed was limited, with poorly constructed earth embankments and large stretches replaced by bulkhead. Although much of Chilliwack and Sumas was planned, the only work actually begun in 1878 was the comparatively simple task of diking Matsqui Prairie.<sup>56</sup>

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<sup>52</sup> *Drainage, Dyking, and Irrigation Act*, SBC, 1873 s 1-8. The Act also empowered the commissioner to take over and lease lands in the diked areas to recoup expenditures.

<sup>53</sup> BCARS, CCLW, Reel B16901, Box 1, Folder 6.

<sup>54</sup> *Sumas Dyking Act*, SBC, 1873, see especially s 2-4, 8-13, 36.

<sup>55</sup> BCARS, CCLW, Reel B16902, Box 3, Folder 25. Whether this was Derby’s doing or not is a matter of speculation, but it is clear that this agent, whose signature is illegible, had a strong dislike of Derby.

<sup>56</sup> *BC Sessional Papers*, “Correspondence Dyking Scheme,” (1879): 360-364.

Settlers and government agents quickly became skeptical of Derby's capacity to carry the scheme to completion.<sup>57</sup>

What is more, for most of 1879 Derby was embroiled in a legal dispute with the provincial government. The dispute initially hinged upon the various means by which the state could extract repayment from Derby for the services it rendered, but Derby eventually paid this sum (perhaps perceiving that he would lose the case, which he did).<sup>58</sup> At any rate, the damage was done. Government and settlers alike came to regard the scheme more with anxiety and annoyance than the fervor with which it was initially received. Chilliwack farmers informed the government that they planned to dam the river themselves, saying "we have given up all hope of Mr. Derby doing the work, and would like him to be set aside at the earliest possible opportunity as he is only an obstruction."<sup>59</sup>

Then, in 1880, most of the work Derby had completed was washed out in an exceptionally mild freshet. The dike was literally and figuratively broken. Joseph Hunter, one of the Lands and Works agents overseeing the project, generally non-judgemental in his reports, wrote that "all efforts to repair the break proved futile [...] My experiences [...] fully convince me that the practical management of these important works have from first to last been far from satisfactory."<sup>60</sup> Later, he was more direct: "it cannot be denied that failure has thus far been the

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<sup>57</sup> BCARS, CCLW, B16902, Box 3, Folder 26; CCLW, B16903, Box 4, Folder 34.

<sup>58</sup> W.E. Hodgins, *Correspondence Reports to the Ministers of Justice and Orders in Council Upon the Subject of Dominion and Provincial Legislation 1867-1895*. (Ottawa: Government Printing Bureau, 1896): 1073.

<sup>59</sup> BCARS, CCLW, Reel B16903, Box 4, Folder 31. Another settler wrote to Victoria contesting the assessment of taxes for dikes on his land, as he said the dikes due to their faulty construction made his farm flood even worse than before.

<sup>60</sup> BCARS, CCLW, Reel B16903, Box 4, Folder 34.

unquestionable result” of Derby’s project.<sup>61</sup> The ambitious plans of 1878 would not be completed.

Miraculously, Derby did repair and finish the Matsqui dike in 1881, a year late. He took his leave from the project at this point, abandoning all pretense of diking the rest of the valley (much less draining Sumas Lake), and transferred control of the project to a certain Colin Buchanan Sword. The Chief Commissioner of Lands and Works pronounced the dike “satisfactory,” and Derby was awarded 6,000 acres of crown land.<sup>62</sup> It seemed, for a moment, that Derby had at least partially confined the Fraser and fairly won his reward.

One year later, in 1882, the Fraser’s floods returned again. Sword, the lone proprietor of the dike now that Derby had abandoned it, watched in dismay as the freshet swelled.<sup>63</sup> It rose well above the highwater mark of 1876 and, in short order, the water crested over the dike. The embankments gave way in several places, and much of the dike collapsed.<sup>64</sup> The entirety of the Fraser valley once again lay under water, and to a greater extent than in any previous year. “Crops are destroyed, live stock in some instances perishing, and even buildings are wrecked [...] Everywhere ruin and consternation reign. And the water is still rising!”<sup>65</sup> Thus stood the outcome of five years of concerted attempts to stop flooding, beginning with Dewdney’s survey and concluding with the failure of Derby’s dike.

The failure of Derby’s attempt to dike the lower Fraser Valley was due to a particular delineation of state and civil society. To be sure, the state was involved in this effort: it passed

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<sup>61</sup> Ibid. There is no shortage of praise for Derby’s attempts sprinkled throughout these correspondences, and it is clear that some important work was successfully completed.

<sup>62</sup> *BC Sessional Papers*, “Report of the Chief Commissioner of Lands and Works for the Year Ending 31<sup>st</sup> December 1881,” (1882): 369.

<sup>63</sup> “Matsqui Dyke,” *The British Columbian* June 7, 1882.

<sup>64</sup> “Matsqui Dyking Scheme,” *The Victoria Daily Times* March 10, 1888.

<sup>65</sup> “The Floods,” *The British Columbian* June 14, 1882.

multiple laws around diking and provided officials to report on the project. But the construction itself was left to private enterprise, i.e., civil society, and could therefore be exploited by someone (like Derby) interested in the reward but uninterested in the actual goal of the project: diking the valley.

State and civil society are not static poles. Their relationship is always historically specific: the powers and duties that belong to each change from epoch to epoch. Antonio Gramsci developed the concept of the “integral state” to refer to the fit between state and civil society.<sup>66</sup> In Peter D. Thomas’s helpful summation, the integral state is “a dialectical unity of the moments of civil society and political society.”<sup>67</sup> Political society is generally identified with the government as such (including the law, the police, and the military), while civil society contains all of the other elements in a society, including most economic production, churches, schools, media, culture, etc. Thus, it is important to consider not what the state does or does not do, or what private enterprise does or does not do, but how the labor of the diking project was distributed between these two aspects of the integral state.

With the case of diking in British Columbia throughout the 1870s and 80s, political society (i.e., the state) outlined the terms of contracts, arbitrated civil disputes, and provided a very small degree of oversight for the construction process. Private enterprise was left to organize and execute the project. It failed, largely because in this context individuals like Derby

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<sup>66</sup> As Anne Freeland notes, Gramsci infrequently if ever used the term integral state, although the concept is present throughout his work. Following Christine Buci-Glucksmann, I use it here to denote the expanded sense of the state used by Gramsci. Freeland, “Motley Society, Plurinationalism, and the Integral State: Álvaro García Linera’s Use of Gramsci and Zavaleta,” *Historical Materialism* 27 no.13 (2019): 108-9; Christine Buci-Glucksmann, *Gramsci and the State*, (London: Lawrence and Wishart, 1980).

<sup>67</sup> Thomas, *The Gramscian Moment*, 137.

were more interested in personal gain than successfully creating a new metabolism between settlers and the river—one that frees settler society from flooding.

Derby's failure was therefore not seen as the failure of the *idea* of diking the valley as it was the particular way that this idea was executed. It was the failure of private enterprise to build dikes and the failure of the state to provide the necessary administrative oversight to ensure the success of the project. But it was not the failure of dikes to shield settlers from the river. Although the dike itself failed, the project had important social effects. It began the process by which farmers constituted themselves as an economic class seeking political expression. Diking became a passage into politics.<sup>68</sup>

### **2.3 Hegemony and Vulnerability: The Farmer and the Flood**

After the flood of 1882 destroyed the Matsqui dike and immiserated farmers, the Fraser valley waited in anticipation of the provincial government's response. Editorials ran constantly in the *British Columbian* calling on it to provide various forms of relief. But months passed and this relief did not materialize; the state showed no interest in continuing to involve itself in the problems of diking. In the years after 1882, the *Sessional Papers* barely reference flooding and diking. As it became clear that the government would not act, one caustic editorial read "they [the government] appear determined to be consistent in their policy of heartless disregard for the people's interests and wishes."<sup>69</sup>

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<sup>68</sup> I argued in Chapter 1 that the pursuit of infrastructure construction can play an important role in consolidating social groups as political entities, which is to say as groups making a direct claim on the state that expresses shared interests. See Ekers and Prudham, "The Socioecological Fix."

<sup>69</sup> *British Columbian* August 16, 1882.

The complete lack of provincial response to the flood of 1882 is comprehensible, if surprising, in light of its activity during the 1870s. It is much more difficult to understand when one considers that a short fourteen years later, after the floods of 1894 and 1896, the state would leap into action, providing over \$30,000 in relief (perhaps over a million in 2022 dollars), and immediately embarking on a wide-ranging state funded diking scheme across the Fraser valley. While the flood of 1894 was larger than the flood of 1882, one must avoid telling history in the future anterior. Both floods were, at the time of their occurrence, the worst to have occurred in the Fraser valley by a wide margin. The question is simple: what changed in these twelve years? Why did the same type of event in 1882 elicit no response at all but in 1894 excite a massive expansion of state capacity?

In this section, I show how the diking of the Fraser Valley became connected to a range of political and economic projects core to the development of British Columbia in the 1870s, 1880s, and 1890s. By the late 1880s diking projects were on the rise around the valley, despite Derby's failure. With the disastrous flood of 1894, and the almost equally severe flood of 1896, however, the settler colonial project in BC suffered what Stuart Hall and Ruth Wilson Gilmore call an "organic crisis:" the long-term socioecological relations undergirding capitalist development in BC could no longer be reproduced and had to be reconfigured.<sup>70</sup> A hegemonic bloc was formed in which capitalists in the mining, timber, and fisheries industries led the farmers of the valley in pressuring the state to make dike construction a public good. I suggest that these developments were largely due to core social changes in British Columbia during the

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<sup>70</sup> Gilmore, *Golden Gulag*; Hall et. al., *Policing the Crisis*.



1880s, most particularly the completion of the railway, the rise of Vancouver, and the growth of the population precipitated by these events.

I proceed in two parts. First, I trace the connection of diking to the constitutive social struggles of British Columbia through the 1880s and early 1890s. In the second part I look at the floods of the 1890s and the process by which diking became a public good in the wake of these events.

### 2.3.1 The Figure of the Farmer

Prior to the goldrush of 1858, there was very little permanent settlement by colonizers in the Fraser Valley. There were some Hudson's Bay Company settlements involved in the fur trade, like Fort Langley, which was constructed in 1827. But these were sparse and relatively confined. It was only with the goldrush of 1858 that colonizers began to settle throughout the valley. I discussed the early developments of this society, including the pre-emption of land, in the first section of this chapter. From 1858 forward the independent farmer was a figure of immense economic and ideological importance to British Columbia. Who was the farmer?

Before all else, an immigrant. Overwhelmingly: a *white* immigrant.<sup>71</sup> Agent-General of British Columbia Gilbert Malcolm Sproat, in his years before joining the Joint Indian Reserve Commission, wrote a guide to for immigrants to the province.<sup>72</sup> "Go to British Columbia and be

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<sup>71</sup> Theodore Allen argues that whiteness was essentially an 18<sup>th</sup>-century invention emerging from the institution of slavery in the Americas. I refer to his construction here, mainly to draw a distinction between the American, Canadian, English, and European colonizers who were able to take possession of land through pre-emption, and the indigenous peoples and Asian immigrants who were largely (but again, not totally) excluded, de facto or de jure, from these laws. Allen, *The Invention of the White Race, Volume I*, (London: Verso, 1994).

<sup>72</sup> The Joint Indian Reserve Commission was a federal-provincial organization tasked with outlining and adjusting reserves in BC. Sproat realized quickly that the government, both provincial and federal, was uninterested in taking the concerns of First Nations people seriously in this process and eventually resigned in protest. For this, Cole Harris casts him as the hero of Part 2 of *Making Native Space*.

a free man,” Sproat opined.<sup>73</sup> Outlining who should immigrate to the province, he emphasizes that the province does not need ‘professional men’ like doctors and lawyers, and the government has no need for more agents. What the province needs is a “smart, active, capable man,” willing to work for a wage until he can support himself on his own farm.<sup>74</sup> The province wants farmers and those who can become farmers. Sproat continues:

To farmers’ sons, or persons with moderate means, qualified for the life of a settler in a new country, who cannot see openings in older countries [...] I say—“go to the province, set to work at something—no matter what; give up old country notions: by-and-by take up a farm; grow a field of grain; have an orchard; establish a dairy; rear pigs and poultry; get a band of cattle or a flock of sheep; subscribe to a library; avoid whisky; be industrious and patient and success in your case is certain.”<sup>75</sup>

Sproat is directly addressing the Englishman with no future in England. By the 1870s English agriculture had more or less ceased to expand, its capitalist revolution already completed. Those who did not have sufficient capital to compete were unlikely to find it, and therefore faced the possibility of falling into the ever-expanding proletarian masses.<sup>76</sup> But by immigrating to British Columbia this man can live on ‘his own’ land, grow food, raise cattle, read and culture himself during his leisure time. He can become a farmer.<sup>77</sup> Unlike Chinese immigrants, who would—with some important exceptions—by and large remain laborers throughout their lives, white men who came as laborers could aspire to owning and working their own land.<sup>78</sup>

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<sup>73</sup> Sproat, *British Columbia: Information for Emigrants*, 4.

<sup>74</sup> *Ibid.*, 24.

<sup>75</sup> *Ibid.*

<sup>76</sup> Eric Hobsbawm, *The Age of Capital: 1848-1875*. (New York: Vintage Books, 1996): 179.

<sup>77</sup> Cole Harris notes that this allowed people who otherwise would have been trapped in wage labor to become landowners. The dispossessions of colonialism were simultaneously repossessions by settlers who generally had no opportunity to build wealth in their home country. Harris, “How did Colonialism Dispossess? Comments from an Edge of Empire,” *Annals of the Association of American Geographers* 94 no. 1 (2004), 165-182.

<sup>78</sup> This was particularly the case for the construction of the Canadian Pacific Railway. Kornel S. Chang, *Pacific Connections: The Making of the U.S.-Canadian Borderlands*, American Crossroads (Berkeley: University of California Press, 2012): 24-7. There thus prevailed in the Fraser valley, and throughout British Columbia, a kind racial capitalism. Where wage labour existed, skills and industries were heavily coded by race; no interracial general

The farmer was, consciously or otherwise, the foot soldier of colonialism in the Fraser Valley. It was through farmers that land was occupied, nature transformed, and a new way of life installed. A distinctive masculinity developed around these practices, predicated on the concrete labor of engineering a new environment and instituting a colonial society.<sup>79</sup> However, in 19<sup>th</sup> century British Columbia white men far outnumbered white women in the province and, as such, often married indigenous women. This practice was distasteful to colonial elites, who were self-consciously trying to engineer a white province. White women (often working class) were therefore encouraged to immigrate to the province to marry farmers.<sup>80</sup> In short order an equally distinctive white femininity emerged with its own civilizing mission: to “eradicate interracial sexual practices,” stimulate men to become productive, liberal subjects, and “encourage white men to become permanent colonists.”<sup>81</sup> In the farmer, these gender roles were literally married, the core unit of liberal society enunciated: the white nuclear family.<sup>82</sup>

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working class was fomented so much as racial difference was codified in class relations. See on this concept Cedric Robinson, *Black Marxism: The Making of the Black Radical Tradition*, (Chapel Hill: University of North Carolina Press, 2021 [1983]); Nancy Fraser, “Roepke Lecture in Economic Geography—From Exploitation to Expropriation: Historic Geographies of Racialized Capitalism,” *Economic Geography* 94 no. 1 (2018): 1-17; Peter James Hudson, “Racial Capitalism and the Dark Proletariat,” *Boston Review* February 20, 2018.

<sup>79</sup> Jarett Henderson, ““No Money, but Muscle and Pluck”: Cultivating Trans-Imperial Manliness for the Fields of Empire, 1870-1901,” in *Making It Like a Man: Canadian Masculinities in Practice* edited by Christine Ramsay, 17-38 (Waterloo: Wilfried Laurier University Press, 2011).

<sup>80</sup> Women were encouraged to immigrate as servants, which paid relatively well, with the understanding that they would marry before long. An immigration guide published in 1890 wrote that “young women coming to the colony, and prepared to take their share of duties of life as the wives of settlers in the back districts, do not long remain as servants or factory girls.” Canadian Pacific Railway. (1890) *British Columbia, Canada, Its Resources, Commercial Position and Climate (And Description of the New Field Opened Up By the Canadian Pacific Railway) With Maps and Information for Intending Settlers*, 27. Indeed, in Sproat’s guide to British Columbia, he provides a list of advice for young farmers. Item one reads: “get a wife.”

<sup>81</sup> Adele Perry, “Fair ones of purer caste”: White women and colonialism in nineteenth-century British Columbia. *Feminist Studies* 23 no. 3 (1997): 505.

<sup>82</sup> As Raymond Williams notes, the word “family” did not take on the primary meaning of a “small kin-group in a single house” until the 19<sup>th</sup> century in relation to the rise of the economic role of the family in English capitalism. Williams, *Keywords: A Vocabulary of Culture and Society*. (London: Fontana Press, 1988): 132-133.

These independent family farming units took up a form of agriculture that was, unsurprisingly, entirely different from the agricultural practices of the First Peoples of the valley (see the first section of this chapter). Settlers used European-style agriculture of “enclosed fields and monocultures,” or planting only one crop in a given area.<sup>83</sup> Settlers also relied on cattle and dairy farming, particularly in the Fraser Valley, which itself produced profound ecological changes.<sup>84</sup> Although dairying was common, farmers also grew fruits, grains, root crops and vegetables throughout the valley.<sup>85</sup> Many of these family farms produced for subsistence at first but, by the 1890s, produced at least partially for market as demand for agricultural goods increased (see below). As this form of settler agriculture increased in prominence, the ecological transformations it precipitated in the valley rendered the land and water unusable for many First People’s traditional subsistence activities.<sup>86</sup>

From the 1860s all the way through to at least the mid-twentieth century, the farmer played both an important *economic* role in the establishment of settler colonialism and an equally important *mythological* function for settler society as a whole. The farmer was the figure of the agrarian good life, the ambassador of a liberal utopia of free and independent producers. The

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<sup>83</sup> Murton, *Creating a Modern Countryside*, 24.

<sup>84</sup> William Cronon describes how cattle grazing tended to increase the growth of weeds in New England. He notes that the ecological effects of this practice are “quite complex,” but in brief the introduction of European cattle precipitated ecological changes. Cronon, *Changes in the Land*, 145. See also John Ryan Fischer, *Cattle colonialism: An Environmental History of the Conquest of California and Hawai’i* (Chapel Hill: The University of North Carolina Press, 2015).

<sup>85</sup> *BC Sessional Papers* Department of Agriculture Report (1891).

<sup>86</sup> Murton, *Creating a Modern Countryside*, 24-27.

farmer represented, simultaneously, tradition and progress, sublating their contradiction.<sup>87</sup> In this figure the violence of colonialism covered its bloody hands in dirt: it appeared pious and meek.<sup>88</sup>

In the 1880s and early 1890s, the economic and ideological importance of farming continued to grow. The Canadian Pacific Railway was completed in 1885; by the end of the decade, Vancouver had risen as an important shipping town. The transformations in British Columbian society implied by these interlinked events were massive, but I focus on only one aspect here: the greatly increased domestic demand for agricultural goods.<sup>89</sup> This demand led to an even greater need for agricultural production, and new immigrant farmers.<sup>90</sup>

As demand for agricultural goods grew, capitalists in the mining, timber, and forestry sectors began to see the importance of developing a domestic supply of agricultural commodities. The British Columbia Board of Trade, a lobbying group composed largely of these capitalists (but also some merchants and professionals), repeatedly advocated for bringing further land into agricultural production and adopting more technologically advanced farming methods to reduce food imports.<sup>91</sup> This group, perhaps more than any other in British Columbia at the time, represented and lobbied for the interests of the most powerful capitalists in the province.

Likewise, in 1889, the *Victoria Daily Times* ran an article titled “A Fertile Valley: Rich

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<sup>87</sup> Harris, *The Resettlement of British Columbia*, 225-7; Murton, *Creating a Modern Countryside*, 10-11. David Demeritt, “Visions of Agriculture in British Columbia,” *BC Studies* 108 no. 4 (1996): 29-59. Ellen Meiksins Wood makes an important point of clarification here, suggesting that the “very possibility of idealizing rural life in the English manner” presupposes the specificities of capitalist agriculture in England, which emerged in the 16<sup>th</sup> century. Wood, *The Pristine Culture of Capitalism: A Historical Essay on Old Regimes and Modern States* (London: Verso 1991), 110-111.

<sup>88</sup> As Roland Barthes says, this is the function of mythic speech, to allow one meaning to hide in the fullness of the image. The image of the farmer carried with it the aspirations of settler society, and erased from them their inherent violence. Compare, for instance, the construction of the farmer offered by Sproat with the dispossession of First Peoples it implied. Barthes, *Mythologies*, trans. Annette Lavers (New York: Hill and Wang, 1972).

<sup>89</sup> McDonald, *A Long Way to Paradise*, 41; Jay Allen Sherwood, “A Political and Economic History of British Columbia, 1871-1903.” MA History Thesis University of Montana (1976), 31.

<sup>90</sup> *Sessional Papers*, Immigration Report (1883); *Sessional Papers*, Immigration Report (1886)

<sup>91</sup> British Columbia Board of Trade. *Annual Report of the British Columbia Board of Trade, Together with Various Appendixes, List of Members, Office Bearers, Bye-Laws, Etc* (Victoria: The Colonist Press, 1893): 25-7.

Agricultural Lands Waiting to be Reclaimed by Dyking,” arguing that “the [Fraser] valley must be reclaimed from the destructive overflow [of the river] by a system of dyking *before it can properly contribute to trade and commerce which it was destined by nature that it should.*”<sup>92</sup> In short, capitalists in the principal industries of British Columbia began to explicitly advocate for the concerted development of agriculture to secure the economic wellbeing of the province. While this is not the place for a complete recapitulation of these industries in British Columbia, the salient point is that as a political collective these capitalists shared the goal of fomenting a domestic market in agricultural goods to reduce reliance on imports. In what follows, I refer to them as resource-extraction capitalists as a shorthand. The Fraser Valley was, in the 19<sup>th</sup> century, the center of this scheme, as it was some of the only easily accessible agricultural land in British Columbia—as well as the best.<sup>93</sup>

A bloc began to form between capitalists in these resource extraction sectors and the farmers of the valley. To be clear, I do not mean by this that farmers and capitalists in these sectors formed a new political party and began to collectively appeal for political power. Nothing so dramatic as that occurred. However, as Antonio Gramsci argues, distinct social groups can form a political bloc when a shared interest or project unites them. These blocs are usually temporary, and forming and dissolving according to changing conditions.<sup>94</sup> Likewise, each bloc has “leaders and led,” a group or groups that lead less powerful groups towards an apparently shared end.<sup>95</sup> In 19<sup>th</sup> century British Columbia, capitalists in the mining, timber, and fisheries

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<sup>92</sup> “A Fertile Valley: Rich Agricultural Lands Waiting to be Reclaimed by Dyking” *The Victoria Daily Times* June 14, 1889, emphasis my own.

<sup>93</sup> Colin J.B. Wood, “Agriculture in Perspective,” in *British Columbia: The Pacific Province, Geographical Essays* edited by Colin J.B. Wood. *Canadian Western Geographical Series* 36 (2001): 311.

<sup>94</sup> Gramsci outlines one such process in which an urban bloc of industrialists and workers was dissolved, and a new bloc formed between industrialists and farmers. Gramsci, *Selections from the Prison Notebooks*, 94-6.

<sup>95</sup> *Ibid.*, 144.

industries acted as the hegemon (although they did not exercise true hegemony), while farmers were able to articulate their project with them.<sup>96</sup> The farmers were themselves operating in a capitalist framework, particularly by the end of the 19<sup>th</sup> century, as they produced increasingly for a market and within the competitive pressures of a market economy.

The point is this: capitalists in resource extraction sectors wanted to encourage a domestic supply of agricultural commodities. Given that most of British Columbia is unfit for agriculture for one reason or another, the Fraser Valley was the primary possible place for an agricultural society capable of supplying these goods to take shape. Diking the valley was therefore viewed as a necessary step. Farmers, as I shall discuss in the next section, wanted to dike the valley because by the 1890s the floods had led to so many crop losses that it was nearly impossible for farmers to survive, particularly due to the debt burden many carried. A bloc thus formed among capitalists in mining, timber, and fisheries, in alliance with farmers around the project of diking the valley.

By the end of the 1880s, new diking projects were springing up around the valley, more or less in the same model as Derby's failed scheme.<sup>97</sup> Many of these projects were brought to a further degree of completion than any of Derby's schemes. With the new bloc beginning to solidify and these projects underway, the Drainage, Dyking, and Irrigation Act was passed in April 1894. Unlike all previous provincial acts, this one empowered the commissioner of the diking project to borrow a certain amount of money to carry out the work. The lender would

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<sup>96</sup> Stuart Hall emphasizes that true hegemony, when one social group exercises near complete and frictionless control over a social formation, is extremely rare. However, there are still dominant and subordinate classes in all modern societies. Hall, "Gramsci's Relevance for the Study of Race and Ethnicity," 15.

<sup>97</sup> Derby himself fled to Oregon as settlers began to demand that he relinquish the land he was awarded for the botched diking project. *Sessional Papers* "Petition," (1886): 357. The petition received 133 signatures. "From the Mainland," *Victoria Daily Times* December, 8, 1886. It seems Derby fled to Oregon at this point. He mysteriously fell ill on a train in 1886 and died suddenly. "City and Province," *The Victoria Daily Times* October 13, 1886.

receive a bond, the interest of which was guaranteed by the provincial government.<sup>98</sup> Between the longstanding agitations of the farmers as a class and the increased interest by resource capitalists and urban dwellers to increase the domestic food supply, diking the Fraser Valley was perhaps feasible.

A month later, in May of 1894, the Fraser valley was overtaken by the most calamitous flood in its short history.

### 2.3.2 The Great Flooding and the Great Diking

“The inundations on the mainland, which at first it was hoped were nothing more than a spring frolic on the part of the Fraser, have developed into a catastrophe the like of which has not hitherto been known in the history of the province.”<sup>99</sup> The flood of 1894 peaked at 25.75 feet by the Mission gauge in early June, the highest water recorded in settlement history.<sup>100</sup> In the span of a week, the flood destroyed almost every dike that had been built since individual farmers began to construct dikes in the 1860s. Dikes and dams at Hatzic, Langley, Matsqui, Pitt Meadows, Lulu Island, New Westminster—practically every extant settlement and municipality in the valley—collapsed into the river. Bridges, roads, and the recently completed railway followed suit.<sup>101</sup> It was a rout.

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<sup>98</sup> *Drainage, Dyking, and Irrigation Act*, 1894, SBC, s 55.

<sup>99</sup> “Men and Things,” *The Province*, June 9, 1894.

<sup>100</sup> The flood of 1948, by contrast, would only peak at 24.73 feet at the same point. That being said, it would stay above 20 feet (the point at which flooding begins) for over a month. W.R.D. Sewell, *Water Management and Floods in the Fraser River Basin*. University of Chicago Department of Geography Research Paper No. 100. (Chicago: University of Chicago Press, 1965): 16; 28.

<sup>101</sup> See K. Jane Watt, *High Water: Living with the Fraser Floods* (Abbotsford: Dairy Industry Historical Society of B.C., 2006): 31-41. Watt’s book is the most empirically detailed, comprehensive account of flooding in the Fraser Valley that is ever likely to be written, and I draw on her research throughout my account of the 1894 flood.



The farmers became the central character in representations of the disaster. Already buffeted by an agricultural depression and mortgages, “the terrible calamity of the flood came upon them as a climax to their unfortunate condition. We now find them with their crops utterly destroyed, their fences gone, their cultivated lands in many places covered with huge piles of driftwood.”<sup>102</sup> “Every farmer will lose more by the flood than he can afford, and many of the new settlers haven’t a dollar.”<sup>103</sup> “There were a good many small farmers on [Nicomen Island], who were getting on nicely [...] all working away industriously when the destroying waters came and overwhelmed the labours of weeks in a few days.”<sup>104</sup> “Waste and destruction everywhere, fine farms lost beneath the waters, and only here and there a house standing out from the flood to mark the fact that human habitations ever existed there.”<sup>105</sup>

These images indexed a real crisis beginning to unfold. Although few lives were lost, the farmers could not survive the flood. Due to debt and failed crops, many would be forced to abandon their land, and the colonization of the valley faltered. The debt situation of the farmer in the 1890s was difficult before the flood. As the First Annual Report of the Farmers Institute of British Columbia outlines, the average settler-farmer advanced somewhere between \$500-1000 to clear land and prepare it for agriculture. This expenditure usually depleted whatever the farmer had saved, and they had to borrow at very high interest for seed, machines, and cattle. Once they carried debt from this loan “that was the beginning of the end:” many would go broke before they could produce profitably enough to pay the loans.<sup>106</sup>

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<sup>102</sup> *Vancouver Weekly World* 14 June 1894.

<sup>103</sup> *Daily Columbian* May 30, 1894.

<sup>104</sup> *Daily Columbian* June 4, 1894.

<sup>105</sup> *Daily Columbian* June 2, 1894.

<sup>106</sup> *Sessional Papers*, First Report of the Farmers’ Institutes of British Columbia (1897): 718.

At this point, approximately 2,360 farmers lived in the valley, of whom at least 650 were directly affected by the flood.<sup>107</sup> Since the early 1880s, many new farmers had come to the valley and settled in flood-prone areas (see Appendix, Map 2 for specific settlement patterns). Many of these farmers carried debt prior to the flood for one of two reasons. First, to buy the land they pre-empted when it was eventually surveyed. Second, and more perniciously, to purchase land from speculators who had already somehow obtained the land. The *Chilliwack Progress* worried that due to the flood, farmers would be unable to pay their mortgages: “many will be compelled to leave their land, and thus the hitherto rapid progress of this fertile district will be greatly impeded.”<sup>108</sup> In short, the flood of 1894 struck a society of farmers who were already trying to dig themselves out of multiple forms of debt.

I suggest that this flood consequently represented an organic crisis for the settler colonial project in British Columbia. For Ruth Wilson Gilmore, crisis “signals systemic change whose outcome is determined through struggle.”<sup>109</sup> A crisis occurs when it becomes impossible to reproduce a social formation within the existing set of social and ecological relations. To be resolved it therefore requires the articulation of new relations that once again make the social formation ‘go.’ Stuart Hall writes that “crises are the means by which social relations are

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<sup>107</sup> The number of farmers in the valley is estimated from the *Sessional Papers*, “First Report of the Department of Agriculture of the Province of British Columbia” (1891). The number of settlers provided with governmental assistance after the flood is given in the *Sessional Papers*, “Fraser River Relief” (1894).

<sup>108</sup> “Disastrous Work of the Waters,” *Chilliwack Progress* November 7, 1894.

<sup>109</sup> Gilmore, *Golden Gulag*, 54. Elsewhere, Gilmore elaborates what she sees as the privileged relation between crisis and surplus: “Crisis and surplus are two sides of the same coin. Within any system of production, the idling, or surplusing, of productive capacities means that the society dependent on that production cannot reproduce itself as it has in the past.” These idled capacities must be made productive again in order to end the crisis. See Ruth Wilson Gilmore, “Globalization and US Prison Growth: From Military Keynesianism to Post-Keynesian Militarism,” in *Abolition Geography: Essays Towards Liberation* edited by Brenna Bhandar and Alberto Toscano, 199-223 (New York: Verso, 2022): 209-210. This sense of crisis has recently been quite important in geography, see Farhana Sultana, “Progress Report in Political Ecology II: Conjunctures, Crises, and Critical Publics.” *Progress in Human Geography* 45 no. 6 (2021): 1-10.

reconstituted [...] the emphasis on crisis is at the same time an emphasis on the remaking of the social formation.”<sup>110</sup> As I argue in what follows, flooding became an obstruction to development in a society of already-indebted farmers, and new relations had to be forged that would prevent flooding from threatening agricultural production.<sup>111</sup> This culminated in the creation of a society predicated on flood control, which I discuss in the next major section of this chapter.

The crisis was, at bottom, a crisis of the socioecological relations that constituted farming in the Fraser valley. It was the inability of farmers to impose European-style agriculture on the physical geography of the Fraser River, which could not support this form of production without major alterations, within the prevailing property relations of colonial society. The yearly freshets of the Fraser River destroyed crops and drowned cattle. Flooding was a colonial problem not in the sense that it did not exist in Europe, but in the sense that it only became a problem in British Columbia through the processes of colonization. (I have emphasized above that the cultural and economic practices of many First Peoples were essentially harmonious with the freshets, for instance the growing of wapato on floodplains.) Likewise, flooding was particularly catastrophic for farmers because of the debts they carried from engineering and acquiring the land for European agriculture. It was, in short, the combination of the imposition of European-style agriculture on the physical geography of the Fraser Valley *and* the indebted state of many

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<sup>110</sup> Hall, *The Hard Road to Renewal*, 104-5. It is worth emphasizing, parenthetically, that this is to some degree a historically specific understanding of crisis. It derives from Marx’s argument that crises are basically internal to capitalist social formations, that capital accumulation leads to periodic moments of paralysis due to contradictions within the relations of production. With Hall and Gilmore, by way of Gramsci, they revise this formulation to include the political and ideological reactions that can obstruct continued growth. See Karl Marx, *Theories of Surplus Value: Selections* (New York: International Publishers, 1952): 368-402.

<sup>111</sup> At least one other solution was theoretically possible: the curtailment of land speculation and the extension of easy credit to the farmers. For a variety of reasons, speculation was not deterred during this period—possibly because many of the politicians and capitalists who ran the province were themselves speculators. “Provincial Legislature: Second Session of the Sixth Parliament of British Columbia,” *Vancouver Daily World* February 4, 1892.

farmers due to loans and paying speculators that rendered flooding an obstacle to the development of the province.

It is here that the shared interest of farmers and capitalists in the mining, timber, and fisheries industries in diking the land, which began to solidify in the 1880s, tempered itself in the crisis. I have already discussed the way that farmers solicited the government. On June 12 the British Columbia Board of Trade convened a meeting to “to guard against floods.”<sup>112</sup> To give a sense of the degree of influence this organization had over the provincial government, both the current Premier, Theodor Davie, and the man who would succeed him in 1895, John H. Turner, attended the meeting. (Both men were long time members of the organization.) The Board felt that the provincial government had to take over the diking of the Fraser valley. Davie himself spoke, saying that they “had to consider how the settlers’ homes are to be placed in a safe position [...] What we want is something permanent and abiding and it is evident that it must be on a very different scale from anything yet undertaken.”<sup>113</sup>

Even before this meeting the government had acted. (It may have helped that the flood occurred during an election year.)<sup>114</sup> The steamer *Gladys* was dispatched to the Fraser, riding the

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<sup>112</sup> “Fraser Still Falling,” *The Weekly News-Advertiser*, June 20, 1894. While less influential than the British Columbia Board of Trade, by the 1890s Vancouver also had its own Board of Trade, which likewise called for the diking of the Fraser valley. Vancouver Board of Trade, *Report of the Vancouver Board of Trade for the year 1897-1898* (Vancouver: Province Publishing Company, 1898). It seems that the Board of Trade was a prominent feature of 19<sup>th</sup> century Canadian political life. The first such organizations were established in eastern Canada in the 19<sup>th</sup> century, with the Montreal Board of Trade potentially being the first in 1822.

<sup>113</sup> Ibid.

<sup>114</sup> The significance of the 1894 election for the events being discussed here is difficult to assess without a lengthy digression into BC politics. On the one hand, a number of important political trends gained expression in this election. To name a few: the first Labour party candidates won seats in this election as control of the province shifted away from the colonial elites who had inherited it during the goldrush; likewise, BC became a majority-white province for the first time in 1891, and anti-Asian sentiment grew and solidified in legislation. At the same time, the election returned the governing coalition with a large majority (political parties in the proper sense did not exist in BC until 1903), and as I have discussed this coalition was already beginning to pursue diking. It seems to me that the election itself was much less significant for the flooding/diking dialectic than the social changes that began to appear in it, which I attend to in my analysis below. See McDonald, *A Long Way to Paradise*, Chapter 2; Patricia

flood waters, distributing food, potatoes, and seed to ruined farmers.<sup>115</sup> Provincial Secretary James Baker journeyed along the river, distributing tents and lumber to distraught settlers.<sup>116</sup> State-led disaster relief had arrived (and as it turned out, this would be a favored adjustment to floods for the next 127 years). That the state provided this aid is itself significant, but it was only the first of several expansions of the state precipitated by the floods. I consider them as an ensemble at the end of this section.

Going beyond this aid, the state began to see itself—with the support of capitalists, unified in the British Columbia Board of Trade, and farmers—as the only entity capable of providing a permanent solution to the problem of flooding. Thus, Premier Davie wrote to Prime Minister John Thompson:

What is plainly the lesson of the floods is the necessity of a comprehensive system of dyking which will include the whole inundated area of the Fraser Valley. The magnitude of the task places it beyond, more particularly at the present time, the ability of private enterprise, and makes it clearly the duty of the State to undertake.<sup>117</sup>

A government for the first time existed in British Columbia that would say, plainly and unambiguously, that the diking of the valley could not be successfully carried out with the current division of responsibilities between civil and political society. Private enterprise, left to its own devices, could not be trusted to complete this work.

Nonetheless, in the aftermath of the flood, diking projects were still pursued according to the 1894 Drainage, Dyking, and Irrigation Act. In outline, this act permitted settlers to elect commissioners to undertake diking works. These commissioners could sell a certain number of

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Roy, *A White Man's Province: BC Politicians and Chinese and Japanese Immigrants, 1858-1914*. (Vancouver: University of British Columbia Press, 1989): Chapter 4.

<sup>115</sup> BCARS, GR 1665 Correspondence and Reports from the Department of Provincial Secretary, Box 3, Folder 1.

<sup>116</sup> *Sessional Papers* "Fraser Flood Relief," (1894): 447.

<sup>117</sup> *Sessional Papers*, "Papers relating to the protection from overflow of the Fraser River," (1894): 431.

bonds, the interest of which was partially guaranteed by the provincial government. Provided the project was (relatively) successful, the principal would then be gradually paid off by settlers who benefitted from the works, the idea being that the land would be rendered more profitable by being protected from the river.<sup>118</sup> The province could also provide an engineer to oversee the project.

This arrangement produced an important dynamic: the purchasers of the debentures wanted the government to oversee the project to ensure that settlers would repay the balance they were owed. Edward Mahon, a Vancouver-based investor and one such purchaser, wrote to Premier John H. Turner to report on the progress of the Matsqui dike. He was “more than ever impressed with the necessity of the government exercising a strong control over the carrying out of these works for their own protection, and for that of the landholders.”<sup>119</sup> Mahon wanted the government to provide “independent supervision” to ensure the dikes were correctly engineered.<sup>120</sup> If the project was not properly completed, the investors were likely to lose their money. Likewise, the province would become responsible for paying the interest itself—which, in its indebted condition, it was not particularly eager to do.

The early days of these attempts did not inspire confidence. The works proceeded at a slow pace, and the project went over budget almost instantly, leading to sale of more debentures and the reworking of contracts.<sup>121</sup> The Maple Ridge Dyking Commission had, by 1896, granted \$165,000 in bonds—fully twice as much as was originally proposed. They had also, in the

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<sup>118</sup> *Drainage, Dyking, and Irrigation Act* SBC 1894, s 2-12; *Dyking Debentures Act* SBC 1897.

<sup>119</sup> BCARS, John H. Turner Records (JHT from here), Box 2, Folder 1, Item 4. Edward Mahon was a Vancouver-based investor, who should be distinguished from Edward Mohun, an engineer occasionally employed on these projects.

<sup>120</sup> Ibid.

<sup>121</sup> BCARS, JHT, Box 2 Folder 1, Item 9.

estimation of engineers Frederick Tytler and Edward Mohun, failed to build dikes to the specifications of the contract.<sup>122</sup> The other diking commissions fared little better.<sup>123</sup> Although not as dramatic as Derby's scheme, these projects already seemed to be tilting into a nosedive.

Then, impossibly, the Fraser's floods flowed across the valley once again in 1896. Although not as severe as 1894, the flood hit an exhausted, indebted, and demoralized population. The papers cried out for more aid as ruined farmers boarded steamers, leaving the valley for good.<sup>124</sup> "Those who had pluckily pulled through 1894's loss were not in a good position to stand the loss of 1896 [...] unless something were done immediately there would be a large exodus of practical farmers [...] The farming population, already too small, was liable to reach a vanishing point."<sup>125</sup> The crisis that began in 1894, whose roots in the new socioecological relations imposed on the valley I have already discussed, had only intensified. Two years after Premier Theodor Davie's pronouncement that an extensive, state-led diking approach was absolutely necessary, such an approach had not yet materialized. And the province was losing its farming population.

The 1896 flood triggered massive agitations directed not only at the provincial government but also the dominion. Residents of the lower Fraser valley gathered on August 21<sup>st</sup>, called the press, and declared that the Fraser River was currently an "enemy" to farmers and had to be controlled.<sup>126</sup> A new theory as to the cause of the recent inundations was proposed: the

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<sup>122</sup> BCARS, Premiers' Papers, Box 2, Folder 2, "Report of F. J. L. Tytler;" BCARS, Premiers' Papers, Box 2, Folder 2, "Report of E. Mohun."

<sup>123</sup> Settlers at Hatzic rejected the appointed commissioner; the Pitt Meadows Dyking District rejected engineers' salaries; settlers were too indebted and destitute from the flood to contribute—the problems mounted. BCARS, Premier's Papers, Box 3, Folder 3, Item 150/96; BCARS, Premier's Papers, Box 3, Folder 2, Item 70/96; BCARS, Premier's Papers, Box 2, Folder 2, Item 104/95.

<sup>124</sup> "The Fraser Floods: What Residents of the Valley Have to Say on the Subject," *Victoria Daily Times* July 17, 1896.

<sup>125</sup> "Friend or Foe? The Fraser May Be Either to the Farmers," *Vancouver Daily World*, August 21, 1896.

<sup>126</sup> *Ibid.*

Fraser's bed was gradually rising due to sediment carried by the river. New bars were forming, the channel was growing smaller, and the river was therefore unable to accommodate its freshets.<sup>127</sup> Most sinister, settlers began to suspect that this increase in sedimentation was due to hydraulic mining in the North of the province and research conducted by the dominion lent credence to this theory.<sup>128</sup> Whether hydraulic mining actually contributed to the sedimentation of the river enough to explain the floods of the 1890s is to some degree still an open question.<sup>129</sup> Whatever the case may be, the farmers of the valley decided not to press the issue; they were reluctant to "antagonize the mining interest."<sup>130</sup> They felt that blaming the flood on mining would potentially antagonize the capitalists in the mining sector who they hoped would help convince the provincial state to undertake diking. This is an important sense in which the farming class fell under the leadership of the capitalist resource extraction sector, which primarily drove economic development in the province. Whether this was an accurate assessment of their situation is perhaps less important than what it reveals about how farmers saw themselves in relation to capitalists in resource extraction. They needed to work with and rely on them—not stoke conflict.

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<sup>127</sup> "Improvement of the Fraser River: Causes of Overflow—Sound Advice to All Concerned," *The Weekly News-Advertiser* September 2, 1896. This fact was allegedly attested to, even before official surveys, by the steamer captains who found themselves unable to proceed as far up the river as they could years earlier.

<sup>128</sup> "Friend or Foe?" *Vancouver Daily World* August 21, 1896; *Dominion of Canada Sessional Papers* Volume 7, Number 9, "Report of the Department of Public Works," (1897): 95..

<sup>129</sup> Michael Church and Darren Ham have argued that mining caused significant changes in the sedimentation processes of the Fraser River from the mid-19<sup>th</sup> century on. Church and Ham, "Atlas of the alluvial gravel-bed reach of Fraser River in the Lower Mainland showing channel changes in the period 1912-1999." University of British Columbia Department of Geography (2004), 2. Andrew Nelson and Michael Kennedy have shown continuities between placer mining begun in the goldrush and the development of hydraulic mining; but it remains unclear if hydraulic mining—which was relatively new on the Fraser before the 1894 flood—had a definitive impact. Nelson and Kennedy, "Fraser River Gold Mines and Their Place Names," *BC Studies* 172 (Winter 2011/2012): 105-108; Andrew Nelson and Michael Church, "The Geomorphic Impact of Placer Mining Along Fraser River, British Columbia," *Geological Society of America Bulletin* 124 no. 7-8 (2012): 1212-1228.

<sup>130</sup> "Friend or Foe?" *Vancouver Daily World* August 21, 1896.



Farmers therefore agitated in two directions. Firstly, and for a time primarily, towards the dominion to dredge the Fraser River, thus increasing its depth. The Fraser falls largely under the purview of the dominion partially because it is (in places) a navigable waterway, and partially because the dominion held certain jurisdiction in the salmon fisheries. Although the province could pursue diking, ‘improvement’ to the Fraser had to be carried out by the dominion. Secondly, the farmers agitated for the government to undertake a comprehensive diking project, the likes of which had perhaps been started but stood far from completion.

It was, as far as I can determine, close to an accident that the Fraser River was not dredged by the dominion at this point.<sup>131</sup> Between 1896 and 1898, dominion money was appropriated for surveys of the river. Engineers were dispatched to the Fraser, where they performed various experiments to determine the velocity, sedimentation rates, and tidal effects on flooding in the river.<sup>132</sup> Allegedly, they drew up plans to dredge the river from these experiments. The plans and surveys were, however, completely destroyed in the Great Fire of 1898, which flattened part of New Westminster.<sup>133</sup> The project appears to have died here,

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<sup>131</sup> Even before the 1896 freshet, it seems there were ongoing talks between the province and the dominion on surveying and potentially dredging the river. See BCARS, Premier’s Papers, Box 2, Folder 2, Item 82/95.

<sup>132</sup> *Dominion of Canada Sessional Papers* Volume 8, Number 9, “Report of the Department of Public Works,” (1898): 107-108. While certainly not a huge amount of money to a government the size of Canada’s, they did appropriate \$20,000 and then \$70,000 for surveys, which suggests a degree of seriousness. See also the *Dominion of Canada Sessional Papers* from 1896-1897. It is likely that there was a degree of cooperation between the province and the dominion, given that the *BC Sessional Papers* for 1896 list a \$25,000 appropriation for the Fraser River Land Protection Commission contingent upon the dominion offering a like sum, which it appears to have done. Some dredging was carried out on the Fraser River as far up as Chilliwack, but nothing as extravagant or as impactful as settlers hoped. BCARS, GR 4074 Fraser River Board Library 002503-0020 18.0.1 “Fraser River System Province of British Columbia History of Improvements 1871-1948” by K.W. Morton (1949).

<sup>133</sup> “Aiding Navigation on Fraser River: Mr Jardine Recalls that Dominion Government Had Plans for Deepening Channel,” *Vancouver Daily World* May 28, 1907. It is necessary to take this with a grain of salt, perhaps a few grains of salt, however. In 1909, a certain Captain S.F. MacKenzie, on behalf of Ottawa, expressed his view that it was effectively impossible to dredge the Fraser. “Big Dredge To Start Work in False Creek: Ottawa Not Prepared at Present to Undertake Extensive Improvement Measures on Burrard Inlet.” *The Province* March 15, 1909.

suggesting that whatever political will existed to pursue the dredging of the river was not great enough to suffer this setback.

With the dominion out, it was clear that the provincial government would face the problem of flooding alone. The province decided to do something that had not been attempted before: make diking public. With the passage of the Public Dyking Act of 1898, they summarily fired the commissioners, consolidated their roles into a single government position—the Inspector of Dykes—and took over the debt of the project.<sup>134</sup> The state itself became responsible for building diking infrastructure. Privately funded and organized diking projects proved, at this critical juncture, incapable of resolving the crisis because they could not build technically sound dikes on a reasonable budget and timeline.

Between 1898 and 1900, most of the diking projects began in the previous ten years (and destroyed many times in the intervening freshets) were brought to completion. While the intervention of the state did not magically cause the considerable and omnipresent challenges of infrastructure construction to disappear, it rendered them bearable. F.C. Gamble became the first Inspector of Dykes, and brought to completion diking works, including dams, pumps, and ditches, at Matsqui, Coquitlam, Maple Ridge, and Pitt Meadows by the turn of the 20<sup>th</sup> century.<sup>135</sup> Initially, the jurisdiction of this figure was limited to particular areas in the Fraser Valley and the delta. By 1904, the first dike planned, started, and brought to completion entirely by the provincial government was located in Chilliwack. Self-satisfied, R. F. Green (Gamble's

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<sup>134</sup> *Public Dyking Act* SBC 1898, s 1-5; 13-15.

<sup>135</sup> *Sessional Papers*, "Inspector of Dykes report" (1899).

successor) remarked that it was the “most extensively occupied and flourishing dyking district in the Province.”<sup>136</sup>

Diking became a public good to be (at least partially) secured by the state. On the one hand, this is a classic story of infrastructure development being taken on by the state because, although it benefits private capital, it is not in the interest or capacity of any individual capitalist to take on this expenditure.<sup>137</sup> Harold Innis emphasized that in staples economies like Canada, i.e., resource-rich economies in which accumulation is predicated on the export of unprocessed raw materials, the state is repeatedly tasked with such investments when large corporations will not undertake them.<sup>138</sup> However, it is equally necessary to note that the state actually taking over significant parts of the project of diking the valley was due to the pressure of capitalists in resource extraction sectors and farmers. In other words, this transformation in the state was the outcome of a social struggle and reflected a particular balance of forces in British Columbian society: it was not a passive or automatic development. To return once again to Gramsci, who provides a useful toolbox for thinking through the state/civil society nexus, the integral state, the coupling between civil and political society, was reorganized to reflect the interests of the resource capitalist-farmer bloc.<sup>139</sup> Although contractors were still hired to perform the work, the

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<sup>136</sup> *Sessional Papers*, “Inspector of Dykes report,” (1904) C40. There is an important, and very interesting, caveat to this provincial takeover of diking: the municipality of Delta. Despite being inundated by both the Fraser’s floods and tidal flooding, Delta was not included in the province’s plans. This, ultimately, led to the municipality of Delta taking out a massive loan from the Bank of Montreal to pursue diking projects. See Delta Archives, Corporation of Delta Finance Department fonds, Series 3, File 1, “Diking Expenses.” I would argue that this still represented a moment of centralization and displacement of the privately-led diking projects that dominated the 19<sup>th</sup> century, but also speaks to the considerable diversity encompassed by the idea of state-led infrastructure.

<sup>137</sup> A more detailed treatment of this point is provided in Chapter 1.

<sup>138</sup> Trevor Barnes, (1999) “Industrial geography, institutional economics, and Innis,” in *The New Industrial Geography: Regions, Regulation, and Institutions* edited by Trevor Barnes and Meric S. Gertler, 1-20 (London: Routledge, 1999): 4. Innis writes that the relation of the Canadian government to economic growth has been “unique” because the government has put much capital into public transportation infrastructure to facilitate its staples economy. *The Fur Trade in Canada* (Toronto: University of Toronto Press, 2017 [1930]).

<sup>139</sup> Gramsci, *Selections from the Prison Notebooks*.

state itself took over the administration and financial management of the diking projects. This responsibility was shifted from civil society, the world of private enterprise, to the public realm.<sup>140</sup> Likewise, the relatively unprecedented infusion of aid to farmers after the 1894 flood equally, although on a smaller scale, represented an expansion of the state that facilitated the project of building a society of farmers and therefore a domestic supply of agricultural goods.

Having, apparently, protected the agricultural lands of the valley from overflow, there remained a single aspect of the crisis to be resolved: the indebted situation of the farmers. Settlers had at last been assured that farming in the Fraser valley would not be interminably at the mercy of its “bête noir,” as dominion agent J. Vicars dubbed the floods.<sup>141</sup> But they remained indebted, and the provincial government quickly realized that this was as great a threat as flooding to constructing an agricultural society. Gamble warned the government that if the assessments in the Public Dyking Act “were strictly carried out [...] and the owners compelled to pay their overdue assessments, it would simply mean that the majority would be sold out, lose everything.”<sup>142</sup> These assessments were basically taxes paid annually by settlers who benefited from diking works. In other words, given that the diking of the Fraser valley was carried out explicitly to prevent settlers from leaving, it would render the works pointless the moment they were completed.<sup>143</sup>

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<sup>140</sup> As Louis Althusser notes, the state not only supplies ‘public’ goods, it is also the entity that delineates and enforces the distinction between public and private. Louis Althusser, “Ideology and Ideological State Apparatuses: Notes Towards an Investigation,” in *Lenin and Philosophy and other essays* (New York: Monthly Review Press, 2001): 97.

<sup>141</sup> *Sessional Papers of the Dominion of Canada* Volume 10 Number 13, “Department of the Interior report” (1897): 31.

<sup>142</sup> *Sessional Papers*, “Inspector of Dykes report” (1904): C41.

<sup>143</sup> The lower Fraser Valley was at this point divided into diking districts, which were basically areas that benefitted from specific diking projects. Some were identical with municipalities, some were in unincorporated territory, some were stretched across various municipalities. The dominion was tasked with dike construction on the Indian Reserves. The boundaries between these various districts became a source of tension in later years.

Thus, in 1905, the debts incurred by the various diking districts were cut, time for repayment extended, and all debt incurred in the diking process not held by the government cancelled.<sup>144</sup> So would begin a cycle of cancelling debt from diking districts that would endure until, and largely invite, the flood of 1948. With the cancellation of debt, a ten-year-long crisis was brought to a close.

## **2.4 Socially Differentiated Vulnerability in the Flood Control Society**

With the construction of the first system of dikes in the lower Fraser Valley and the provincial state taking over the administration of many of these dikes, a new kind of society emerged in the valley. I call it the *flood control society* because a new administrative apparatus was developed by the state to prevent flooding. As it turned out, the successful diking of the valley did not relegate flooding to the past, but made it a constant, low-grade threat requiring new forms of administration and expertise to manage. This development was heralded by the Inspector of Dykes. With the capacities invested in this figure, the socioecological relations tentatively and stochastically articulated in the 1860s, the relations in which flooding became problematic for European-style agriculture, the relations that in 1894 entered a profound crisis affecting the entire settler-colonial project, were objectified and personified. In this final section, I discuss the new forms of social vulnerability generated and unevenly distributed, above all to the First Nations of the valley, by this dike-dependent society.

The Inspector of Dykes consolidated a range of functions that were previously distributed and decentralized between state and civil society. The Inspector of Dykes knows where all the

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<sup>144</sup> *Dyking Assessments Act* SBC 1905, s 1-5

diking infrastructure is located and where new construction is occurring; its condition (is it working properly? are the dikes damaged?); when, why, and for whom it functions (“there being no settlers on this tract [in Pitt Meadows], the pump was not run during last season”); when it falls into disrepair; and the availability of money that might be put towards these projects.<sup>145</sup> Simultaneously, this figure knows the average height and duration of freshets on the Fraser; the high point of the river at various points over a series of years; the high water marks from 1894, 1882, and 1876; and which infrastructures are exposed to which water hazards.<sup>146</sup> The Inspector of Dykes tracks the expenditures of each diking district; what work has been performed by whom on which infrastructures for what cost; the status of debts incurred by settlers for the works; the history of each diking district and the works completed there; which contractors have fulfilled their obligations and which have not; the multiplicity of laws bearing on diking activities; the various responsibilities of the dominion and the province.<sup>147</sup> For the first time, all of these disparate knowledges are centralized in a single state administrator.

In short, the Inspector of Dykes made these activities legible to the state in relation to the goal of flood control. As James C. Scott argued at length, states must make the populations that they govern legible. This is often achieved through processes of “simplification,” which render a multifaceted concrete reality as a one-sided abstraction. For instance, a forest may be treated as a

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<sup>145</sup> *Sessional Papers*, “Report of the Chief Commissioner of Lands and Works—Dykes,” (1901): 700-701. “The dyke is in good condition;” “The gate near the pump house has been renewed with one of approved design;” “the river is encroaching upon the dyke, and the bank should be protected [...] [t]here is, however, no money available for this necessary work.”

<sup>146</sup> *Sessional Papers*, “Report by the Inspector of Dykes,” (1905): C42-C43. See the table of heights of recent freshets. “The height of the freshet this year was below the average;” “the principal danger to be apprehended [to the Chilliwack dike from the Fraser River] is due to the formation of log jams, which deflect the current against the bank, causing rapid and extensive erosion.”

<sup>147</sup> *Sessional Papers*, “Report of the Chief Commissioner of Lands and Works—Dykes,” (1904): C18-C27. See the table of expenditures on C27, as well as the various histories of the diking districts throughout, e.g. Chilliwack on C25. See also *Sessional Papers*, “Report by the Inspector of Dykes,” (1905): C44.

mere quantity of possible lumber.<sup>148</sup> The Inspector of Dykes makes the people, natures, and history of the lower Fraser Valley legible to the state in a way that facilitates the project of flood control. As such, it permits certain interventions that the state can take. First of all, it permits the Inspector of Dykes to maintain and reproduce existing dikes. It also enables consistent countermeasures to be taken during high water. E. A. Wilmot, Inspector of Dykes in 1906, warned “it is necessary that, during high water, those portions of the river contiguous to the dyke be constantly watched, and whenever a lodgement of drift logs, etc., is effected, steps be at once taken for its removal.”<sup>149</sup> Likewise, anyone who “trespasses upon” or “actively interfere[s]” with dikes or workers related to dikes will be fined and imprisoned.<sup>150</sup> Imperatives and powers are therefore conferred on this position: the Inspector of Dykes must “watch” the dykes, but is also permitted “at his discretion” to “summon” those who benefit from the dikes to protect or repair them.<sup>151</sup> In the event that a “sudden breach occurs in the works [...] the immediate attendance of proprietors shall be required by the following alarm signals given from the Pump House on the threatened dyke.”<sup>152</sup> Refusal will result in fines or imprisonment. The knowledge that the Inspector of Dykes produces and makes legible to the state therefore empowers new forms of governance and even policing in the service of flood control.

The institutionalization of the Inspector of Dykes and the completion of the first system of diking works in the Fraser Valley rendered particular groups in the province vulnerable in new ways. First, a new form of vulnerability spread out over the floodplains of the valley as a whole:

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<sup>148</sup> James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1998).

<sup>149</sup> *Sessional Papers*, “Report by the Inspector of Dykes,” (1905): C43.

<sup>150</sup> *Sessional Papers*, “Report of the Chief Commissioner of Lands and Works—Dykes,” (1904): C38.

<sup>151</sup> *Ibid.*

<sup>152</sup> *Sessional Papers*, “Report of the Chief Commissioner of Lands and Works—Dykes,” (1899): 420.

the need to maintain the dikes and protect them from failure. Second, the First Peoples of the valley were rendered vulnerable to the Fraser River in entirely new ways due to the confluence of confinement to Indian Reserves and the diking of the valley.

Throughout the 1870s, 1880s, and even the early 1890s, there was a prevalent idea in settler society that diking the valley would end the flood hazard. However, as soon as the dikes were constructed and the Inspector of Dykes tasked with maintenance, it became clear that flooding would remain a threat—albeit in a transformed way. As Edgar Dewdney commented in his initial survey of the valley after the 1876 freshet, failed diking works would lead to greater catastrophe because they would encourage new settlement. He was absolutely correct that new dikes would lead to new settlement: Inspector of Dykes R.F. Green wrote after the completion of the Chilliwack dikes that the “beneficial effect of the dykes is shown by reference to the large number of settlers who have bought land in the dyked areas during the past few years.”<sup>153</sup> He was equally correct that this represented a new danger. Dikes, being little more than graded and packed earth mounds, were subject to constant erosion. The threat of the Fraser River and its tributaries became not only the occasional extreme flood, but the persistent dragging of water against the dikes, constantly weakening them. Dikes and other attendant infrastructures therefore needed to be constantly maintained. A new economic burden for the farmers of the valley, who would be tasked with paying maintenance costs, was created.

As I alluded to above, and as I will discuss in detail in the following chapter, farmers often could not afford these maintenance costs, which left the dikes susceptible to collapse during a freshet. A new vulnerability had been created by the very infrastructure that was meant

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<sup>153</sup> *Sessional Papers*, “Report by the Inspector of Dykes,” (1905): C42.



to end vulnerability to flooding: the need for maintenance. Failure to meet this need would be met, sooner or later, with catastrophic flooding on a scale much larger than was conceivable prior to the construction of the dikes. This is exactly what happened during the 1948 Fraser flood, which I discuss in Chapter 3. Notably, both the costs and risks of diking would be borne by the farmers, rather than the capitalists in mining, forestry, and fisheries, who also advocated for this solution.

There was, however, a more fundamental, more immediate, and more violent production of vulnerability at play. The First Peoples of the valley, who had since time immemorial benefited from the bounties of the river, were forced into new relations with their ancestral territories. The primary vehicle of this—which was resisted and contested at every moment, as multiple historians have shown—was the Indian Reserves.<sup>154</sup> However, the particular articulation that occurred between diking and the reserves exposed the Stó:lō to unique forms of vulnerability.

It was well known from the 1850s on that the reserves created in the lower Fraser valley were subject to flooding, and generally created on the lands that flooded most severely.<sup>155</sup> In the 1860s and 1870s, this was experienced as more of an inconvenience than an outright danger. Many First Nations participated in wage-labour on the fisheries as a supplement to, not a replacement for, traditional and ancestral means of subsistence—like wapato grown on the floodplains of the Fraser.<sup>156</sup> It was only with the completion of the Canadian Pacific Railway and

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<sup>154</sup> John Price and Nick Claxton, “Whose Land Is It? Rethinking Sovereignty in British Columbia,” *BC Studies* 204 (2020): 115-138.

<sup>155</sup> *Sessional Papers*, “The Indian Land Question 1850-1875” (1876).

<sup>156</sup> John Lutz, “After the Fur Trade: The Aboriginal Labouring Class of British Columbia, 1849-1890,” *Journal of the Canadian Historical Association* 3, no. 1 (2006): 69–93. Lutz goes so far as to argue that this class of First Nations laborers were basically key to the industrialization of British Columbia. See also Steven High, “Native

the influx of Chinese immigrants towards the end of the 19<sup>th</sup> century that indigenous workers began to be entirely replaced by Asian immigrants.<sup>157</sup> For much of the previous three decades, Department of Indian Affairs officials had downplayed the flooding of reserves because it encouraged First Nations peoples to participate in wage labor.<sup>158</sup>

But with their involuntary exit from the labor market, Stó:lō peoples were forced to make do with their often-flooded reserves. According to the Department of Indian Affairs,

owing to Chinese labour, many channels, heretofore open to the Indian [sic], are now closed. This must necessarily drive him [sic] to rely more and more upon the cultivation of the soil; but a great difficulty is met, on many of the reserves, in obtaining sufficient arable land, *and in some places the tilled lands are so situated as to render them liable to be flooded during the stages of high water. This flooding in some cases not only entails the loss of the crops, but also a great deal of labour in restoring the lands to such a state as they may again be worked.*<sup>159</sup>

Unlike both white farmers and Chinese laborers who were affected by floods, First Nations were barred from using wage labor as a way to weather crop failures due to floods—in addition, of course, to the colonial violence of being spatially confined to reservations. Exposure to flood hazards was in fact an intrinsic aspect of this colonial violence.

Even more profoundly, the construction of dikes often negatively affected First Nations living on reserves by either directly harming their traditional means of subsistence or rendering the land *more* exposed to the river. During the Royal Commission on Indian Affairs between

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Wage Labour and Independent Production during the ‘Era of Irrelevance,’” *Labour / Le Travail* 37 (1996): 243. For his part, Robert J. Muckle seems to disagree, suggesting that First Nations generally only entered wage labor when traditional ways of life were completely obstructed. Judging from the evidence provided, I tend to side with Lutz on this point—but it is by no means a totally settled issue. Muckle, *The First Nations of British Columbia*, 84.

<sup>157</sup> Lutz argues that the transition to factory work incentivized this. Lutz, J. *After the Fur Trade*, 83.

<sup>158</sup> *Sessional Papers*, “Report of the Government of British Columbia on the Subject of Indian Reserves,” (1875): 64. “Reserves of agricultural land for such labourers [i.e., First Nations] would be worse than useless, for if they got them they would be bound to occupy and cultivate them, and this they could not do without loss to themselves and loss of valuables and trained labour to the Province.”

<sup>159</sup> *Sessional Papers of Canada*, “Department of Indian Affairs Annual Report” (1896): 52, emphasis my own. This trend is continually documented in Department of Indian Affairs Reports for the next 10 years.

1912 and 1916, First Nations on reserves along the Fraser River expressed that the relation between dikes, reserves, and the river was a major source of vulnerability. A Sumas man testified in this way:

Q. Could there be any land reclaimed here by dyking?

A. I could not say. I am against the dyking because that mean more starvation for us.

Q. Why do you think you would be starved out if this land dyked?

A. Because the lake is one of the greatest spawning grounds there is and this dyking would cut it off and in that way would cut off our fish supply.<sup>160</sup>

Others in the Upper Sumas band testified that the construction of dikes reduced the size of their reserve and exposed them to further flooding.

Q. Now you spoke of reserve being eaten away by the Fraser river, and that orchards and cultivated land were washed away. Is that washing away going on all the time?

A. Yes, all the time. This last summer there was 200 feet of my land that went into the river about ½ mile long.

[...]

Q. Now you spoke of the dyking which had been done by the whites and you say this had injuriously affected the reserve?

A. It made the land so much smaller. The water is coming in on the inside of the dyke as much as ever and it has made the land smaller.<sup>161</sup>

I have already mentioned that diking, and particularly the static allocation of property lying behind the dike, renders the process by which the river erodes the land hazardous. This is only more profoundly the case on small reserves, where land lost to the river every year is land no longer capable of housing or feeding people. The violence of the reserves was therefore multiplied and compacted by the transformation of the Fraser River, an ancestral source of life and community, into a potential hazard.

Therefore, although new vulnerabilities to flooding were produced throughout the valley, First Peoples were rendered significantly more vulnerable due to their confinement on reserves.

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<sup>160</sup> Union of BC Indian Chiefs (UBCIC from here), Royal Commission on Indian Affairs (RCIA from here), 154.

<sup>161</sup> UBCIC, RCIA, 169. This story is also described on 166.

Flooding could shrink the reserve through erosion; but diking foreclosed traditional means of subsistence at the very moment when many indigenous people were pushed out of the labor force. First Peoples were forced into new socioecological relations, predicated on reserves and a system of dikes in which traditional means of subsistence disappeared or became potential hazards. It is these relations that produced them as vulnerable. Lastly, while the various forms of policing and violence that enforced life on the reserves cannot be recounted here, exposure to flood hazard must for these reasons be understood as constitutive of this violence, not its contingent effect.

In sum, the flood control society, predicated on a system of dikes and a new system of state administration, differentially produced new vulnerabilities and spread them across the lower Fraser Valley.

## **2.5 Conclusion**

In this chapter I outlined the flooding and diking of the Fraser Valley. My purpose was twofold. First, I traced the process through which flooding became an existential threat to the colonization of the Fraser Valley. A coalition of farmers and capitalists in the forestry, mining, and fisheries industries pressured the state to take up the working of diking crucial parts of the valley at this juncture. When the state ultimately did take up diking, a new administrative apparatus, personified by the Inspector of Dykes, was created to maintain these vulnerable infrastructures and make the populations responsible for their maintenance legible to the state. Equally important, the creation of a dike-dependent economy simultaneously produced new vulnerabilities in the valley. First, as the need to maintain the dikes, without which their failure will cause catastrophic damage. Second, as the rendering vulnerable of First Peoples confined to

reserves to the erosion caused by the river and to the disruption of traditional forms of subsistence implied by a system of dikes.

My second purpose in this chapter was to empirically substantiate the theoretical arguments I advanced in Chapter 1. In short, I suggested that the formation of new infrastructure produced and distributed new vulnerability at the same time as they secured resources for a population. The dikes of the Fraser Valley played precisely this role: agricultural land was secured as a resource, but new vulnerabilities were also inaugurated. In the following chapter, I discuss how the vulnerability inherent in the need to maintain the dikes was realized in the flood of 1948.

But already a basic point must be made. The vulnerabilities of the flood control society are basically the same vulnerabilities that exist in the Fraser Valley in the 21<sup>st</sup> century. The exposure of the valley to periodic flood disasters is constitutive of its fundamental relations, the way in which settlers have tried to demarcate the boundary of the Fraser River through a system of dikes, thus separating the river from its usual floodplains. The catastrophes inherent in this form of society will not disappear until its fundamental relations are superseded.

### Chapter 3: From Rural Modernity to Fordist Flood Control

Honorable Premier,

I am a flooded-out fruit farmer of Matsqui Prairie [...] I beg to herewith state my own case, plus some generalities.

My father settled in Matsqui 50 years ago. We commenced growing small fruits and rhubarb and some tree fruit commercially 40 years ago, and have stayed with it every year since [...] My father died 13 years ago, and I took over where he left off [...] Since the flood everything grown on the farm is dead or dying except about 100 trees [...]

I am 50 years old, my wife is 51. No doubt many of the other victims are in a similar situation. We cannot do a full or hard days work any more. The heart is willing but the body is not [...]

Since the dike broke I have paid all my bills except my income tax. My funds will last only one more month [...] No doubt I could borrow against my assets, but why should I start at the bottom of the ladder again at my age with no end in sight? [...]

I contend the Fraser freshet was an act of Nature. But I also maintain the flooding of the Valley was *not* an act of God. The flooding was due to the carelessness of man [sic]; to the carelessness of farmers and townsfolk, and the negligence of Governments past and present, Provincial and Federal. Over the years since the dikes were first constructed at the request of the farmers, the whole National economy has changed. For 25 years or more those dikes have been national assets because of the wealth in highways and businesses other than farming that has developed behind them which they were expected to protect. For a quarter century they should have been a government responsibility [...]<sup>1</sup>

This letter to Premier Byron Johnson, signed only “Haish,” expresses the condition of the small farmer in the Fraser Valley after the 1948 Fraser flood. This flood was the most costly and destructive of the 20<sup>th</sup> century, and perhaps the worst in the history of the valley. Narratives like the one Haish relates to the Premier were common: many independent farmers had lost everything in the flood and were too old to simply start over again.<sup>2</sup>

As Haish suggests, the character of the region was changing. The system of dikes in the Fraser Valley, which I argued in Chapter 2 was constructed at the end of the 19<sup>th</sup> century to facilitate a society of small farmers, had gradually come to protect a range of other businesses

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<sup>1</sup> BCARS, GR 1222 Premiers’ Papers, Box 202, File 6.

<sup>2</sup> Cole Harris shows that the median age of the Fraser Valley farmer was over 50 years old at this point. Harris, *The Resettlement of British Columbia*, 244.

and infrastructures. In the 1940s, this process accelerated. The 1948 Fraser flood coldly demonstrated this fact when manufacturing facilities in New Westminster and Lulu Island flooded, throwing over 3,000 wage laborers out of work.<sup>3</sup>

From the colonization of the Lower Mainland (which is to say the Vancouver area plus the lower Fraser Valley) after the 1858 gold rush to the Second World War, the small, independent farmer played a central economic and ideological role in British Columbia. Efforts to engineer the environment to create a society of small farmers began with the diking of the Fraser Valley in the 19<sup>th</sup> century and continued through the first half of the 20<sup>th</sup> century, most dramatically with the draining of Sumas Lake to produce more farmland and reduce flood hazard.<sup>4</sup> Many farmers, like Haish, came to the valley at the end of the 19<sup>th</sup> century and successfully supported themselves, passing their farms onto their children. By the time of the 1948 flood, however, this form of agriculture was in decline (due to multiple factors that I shall discuss in detail later).

In this chapter I argue that the 1948 flood occurred at a moment of economic transition. The lower Fraser Valley's older economy of small, independent farmers was in decline, increasingly replaced by an emerging integrated Fordist economy and society of corporate agriculture, manufacturing, and interconnected urban and rural spaces.<sup>5</sup> In effect, the flood demonstrated that the independent farmer and their form of production could not finance the maintenance of the flood control infrastructure on which they depended. This gave yet further impetus to the new corporate Fordist form of economic organization developing within the

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<sup>3</sup> Stan J. Moncrieff, "Queensborough," in *Nature's Fury: The Inside Story of the Disastrous B.C. Floods May-June 1948* (South Hill Publishers, 1948): 40.

<sup>4</sup> Murton, *Creating a Modern Countryside*.

<sup>5</sup> On the definition of Fordism, and the particular mode of Fordism that took hold in the Lower Mainland of British Columbia in the postwar years, see the third section of this chapter.

Valley. Although Fordism in British Columbia is largely associated with the government of W.A.C Bennet and the Social Credit Party (and particularly their state-led infrastructure projects), I show how the state deployed new forms of flood management expertise as a direct result of the 1948 flood to facilitate the urbanization and industrialization of floodplains in the Lower Mainland. That form of state management became central to flood prevention in the Fordist society of the postwar years, as well as debates around the management of the Fraser River as a whole. Ultimately, I argue that the 1948 flood was a pivotal moment of transformation: the project of flood control was detached from its original purpose of facilitating an agrarian society of independent farmers in the Fraser Valley and instead articulated with the Fordist development of the Lower Mainland as a whole.

This chapter is divided into three sections. I begin by tracing the expansion of state-led flood control expertise used in the creation of an agricultural society during the first half of the twentieth century, most saliently with the draining of Sumas Lake. Next, I turn to the flood of 1948. Through a close reading of the media discourse surrounding the flood, I suggest that the flood was constructed as a war between humanity and nature. I argue that this ideological frame, likely provided by the recent memory of the Second World War, identified ‘humanity’ with the dikes and other flood control infrastructure that facilitated the economy of the valley, and ‘nature’ with the Fraser River and its tributaries. The narrative of a war between humanity and nature dramatized the fact that the dikes had not been adequately maintained in the years prior to the flood, which was itself due to the inability of farmers to afford maintenance costs. Finally, I turn to the reconstruction of the dikes under the new regime of Fordism in the Lower Mainland in the 1950s. I argue that the floods of 1948, and to a lesser extent 1950, expanded state flood control expertise that was then harnessed in the service of the Fordist transformation.



With the destruction of the dikes in the 1948 flood, the theoretical circuit I outlined in Chapter 1 is complete. In brief, I argued there that any infrastructure created to mitigate a hazard becomes a point of future vulnerability even though it might facilitate new productive uses. Concretely, in the Fraser Valley, dikes produced the land as a resource for small farmers by insulating it from the periodic flooding of the Fraser. At the same time, and precisely because dikes facilitated new production, they constituted a point of vulnerability: they must be constantly maintained and protected to ensure that the agricultural world they facilitated continued. In Chapter 2, I demonstrated how a dike-dependent agricultural society was created in the lower Fraser Valley during its colonization in the 19<sup>th</sup> century. In this chapter, I demonstrate that the form of government and economy associated with that colonization was inadequate in dealing with that vulnerability. The point of vulnerability was only (temporarily) resolved under a new government form associated with the emerging Fordist regime.

### **3.1 Flood Expertise and Rural Modernity**

During the early 20<sup>th</sup> century, diking and draining had facilitated the expansion of an agricultural society in the lower Fraser Valley. Between 1901 and 1921, the population of the valley increased from 12,521 to 43,616.<sup>6</sup> Around 1915, a pamphlet of somewhat uncertain origins, perhaps printed by the provincial government, appeared proclaiming that the government take over of diking in the valley “had made a success where private effort failed.”<sup>7</sup> At the same time as the growth of the valley was predicated on the apparently successful diking of the valley

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<sup>6</sup> Barmen, *West Beyond the West*, 371. Over the same period, the value of agricultural production in the province increased from about \$6.5 million to nearly \$60 million, no doubt due in part to the growth of the lower Fraser Valley. See Provincial Bureau of Information, *Manual of Provincial Information: Province of British Columbia*. (Victoria, 1930): 87.

<sup>7</sup> “Fraser Valley Dykes” (1915?). The pamphlet is available at the BC Legislative Library.

at the end of the 19<sup>th</sup> century, it simultaneously demanded more rigorous protection from the seasonal floods as farmers expanded into more flood-prone areas. In this section, I demonstrate how the growing agricultural society in the Fraser Valley was predicated on new forms of state expertise in flood control.

Particularly during and after the First World War, the British Columbia provincial state expanded and increasingly deployed scientific expertise to engineer more farmland. As James Murton details, the province attempted “to use state expertise on the natural world to re-work the natural environment into new forms, as the basis for an alternative, rural—yet modern—society.”<sup>8</sup> The champions of New Liberalism during this period, particularly premier John Oliver, expanded the role of the state to include the pursuit of major infrastructure projects.<sup>9</sup> In the Fraser Valley, these engineering projects took the form of flood control, which is to say increasingly ambitious attempts to order the relation between land and water, to actualize rural modernity.

The expansion of the state and deployment of new forms of expertise, as occurred in British Columbia with the New Liberals, is often a condition of economic development. James C. Scott argues that the state deploys processes of “simplification” that make the changing population and environment that it governs legible. These simplifications have salient effects and enable state-led developmental projects. During the rationalization of forests in Prussia in the

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<sup>8</sup> Murton, *Creating a Modern Countryside*, 16.

<sup>9</sup> Murton provides a useful overview of New Liberalism. In brief, it involved reconceiving the role of the state and moving “beyond the mere delineation and defence of the individual’s right to focus on the protection of entire societies and communities.” The state was therefore licensed to undertake environmental and social engineering projects that would have been unthinkable before. Murton, *Creating a Modern Countryside*, 13. See also Weiler, *The New Liberalism: Liberal Social Theory in Great Britain 1889-1914* (London: Routledge, 1982). Robert McDonald contests this interpretation of the 1910s, arguing that Oliver’s ideas about government had more to do with his rural upbringing than a new political philosophy. McDonald’s position is that “new liberalism” did not appear in British Columbia until the 1930s with Duff Pattullo. McDonald, *A Long Way to Paradise*, 110, 136-7.

18<sup>th</sup> century, for instance, he argues that “an actual tree with its vast number of possible uses was replaced by an abstract tree representing a volume of lumber or firewood.”<sup>10</sup> The multifaceted concrete thing is thus replaced by a simplified abstraction. In British Columbia, as the population grew through immigration and the normal processes of capitalist development, the state expanded to manage and facilitate this growth, deploying various forms of simplification.<sup>11</sup>

Flood control is one example: complex interrelations between rivers and land, which facilitated complicated mixed ecosystems, were simplified into “acres of land” that could be reclaimed for agriculture. This simplification enabled engineering projects, as Murton alludes to above, to be mobilized towards the creation of a modern countryside.

This was nowhere clearer than in the draining of Sumas Lake. Edward Dodsley Barrow, Minister of Agriculture during the project, wagered that “the value created” by the draining of the lake “is in exact proportion to the removal of flood risks.”<sup>12</sup> While the long history of the lake has been ably told many times before, I revisit it here as a pivotal moment in which flood control acted as a vector for the technoscientific production of the environment to facilitate a society of small farmers.<sup>13</sup> Sumas Lake, which covered approximately 132 square miles east of

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<sup>10</sup> Scott, *Seeing Like a State*, 13.

<sup>11</sup> Marx long ago argued that capitalist development is a driver of population growth. The increase in productivity engendered by the constant revolution of the productive forces permits population increases; at the same time, however, some part of this population inevitably falls into unemployment due to the intrinsic need for a “relative surplus population,” a group of normally unemployed workers that can be brought into the workforce during periods of expansion. Karl Marx, *Capital: A Critique of Political Economy, Volume I* (New York: Penguin 1976), 786. As Ellen Meiksins Wood puts it, with the birth of capitalist social relations in 16<sup>th</sup> century England “millennia of Malthusian cycles were broken by a wholly new pattern of self-sustaining economic growth.” Wood, *The Pristine Culture of Capitalism*, 119.

<sup>12</sup> Chilliwack Archives (CA from here), Edward Dodsley Barrow collection, Add.Mss 646, 986.202.8.1, “Notes on Sumas Project.” Barrow was also a long-time proponent of draining Sumas Lake, and spearheaded efforts to get the state to undertake this project even before he took up a position in government.

<sup>13</sup> The draining of the lake has been a favorite topic of British Columbia historiography since shortly after its completion. The earliest colonial histories of Sumas Lake were written by engineers and administrators affiliated with the drainage project. More recently, several histories of the lake have been written representing a variety of perspectives. See Laura Cameron, *Openings: A Meditation on History, Method, and Sumas Lake* (Montreal and

present-day Abbotsford and south of the Fraser River, was formed through a combination of tectonic activity and glacial retreat 8,000 years ago.<sup>14</sup> It provided sturgeon and other food to the Sumas First Nation. In the words of Sumas First Nations Chief Dalton Silver, Sumas Lake was “our supermarket, a teeming ecology rich in food sources.”<sup>15</sup> It grew, shrank, and was transformed for thousands of years prior to colonization.<sup>16</sup> For most settler-colonists after the 1870s, however, the lake was seen as an inconvenience and obstruction to development. It sat on top of 32,000 acres of what they presumed to be the most productive land in the province.

Plans to drain Sumas Lake stretch back to the early settlement of the lower Fraser Valley. As I discussed in Chapter 2, E. L. Derby was the first to attempt draining the lake in the 1870s. His efforts ended in unambiguous failure. Various entrepreneurs and construction companies would periodically revive the dream of a reclaimed lakebed over the next four decades, but to no avail. Even the BC Electric Railway, which considered the project in 1908 to facilitate extending its streetcar line from New Westminster to Chilliwack, ultimately walked away from the drainage scheme.<sup>17</sup>

That the Sumas project would be taken up again in 1919, this time successfully, was due to interrelated political-economic and technical factors. In 1917, the province created the Land

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Kingston: McGill-Queen’s University Press, 1997); Murton, *Creating a Modern Countryside*, Chapter 4; Reimer, *Before We Lost the Lake*. Importantly, *A Stó:lō-Coast Salish Historical Atlas* features a section on Sumas Lake from the perspective of the Sumas First Nation. Woods, “Sumas Lake Transformation.” Lastly, a short documentary was recently made about the Lake. Bricklight Films (2021) *Lost Lake – Gone But Not Forgotten (Sumas Lake)*.

<sup>14</sup> Reimer, *Before We Lost the Lake*, 12.

<sup>15</sup> “Sumas First Nation chief reflects on ‘disaster’ B.C. flooding where lake used to be,” *Global News* November 18, 2021.

<sup>16</sup> Woods, “Sumas Lake Transformations,” 104.

<sup>17</sup> Reimer, C. *Before We Lost the Lake*, 166-170. The BCER was a powerful force in British Columbia, owning and operating an electric light and streetcar system throughout Victoria and the lower Mainland. It was the largest company in British Columbia at the time, and its decision not to pursue the draining of Sumas Lake is a good indication that no private enterprise in Western Canada would be willing to take on the risks of this venture. By 1903, the BCER had already dammed and reversed the flow of the Coquitlam River for hydro-electric development. Matthew Evenden, *Fish Versus Power: An Environmental History of the Fraser River* (Cambridge: Cambridge University Press, 2004): 60.

Settlement Board (LSB) in the Department of Agriculture to establish “an organized system of land settlement and development” to increase the agricultural production of the province.<sup>18</sup> The LSB was responsible for bringing new land into cultivation, partially by resettling veterans of World War I.<sup>19</sup> The board was driven simultaneously by the pursuit of economic development and a belief in the virtue of rural life: the board was explicitly seeking to foster a society of independent farmers to this end. With the expansion of the state inaugurated by the New Liberals, the LSB could pursue ambitious engineering projects that had been passed over by private enterprise—like the draining of Sumas Lake. What is more, by the 1910s, much of the land that was suitable for European-style agriculture in British Columbia had been brought into cultivation. The land necessary for increased agricultural production simply did not exist. This limitation could be overcome, as Theo Clair and Kevin Surprise note, by the state “marshalling the power of science, expertise, and engineering” to produce new suitable land.<sup>20</sup> With the Land Settlement Board, a state apparatus able to direct this power now existed.

Earlier attempts to drain the lake consistently ran into two technical obstacles. The first was a lack of machinery capable of carrying out the job.<sup>21</sup> The development of more powerful dredges and steam shovels in the United States, which were used to complete the Panama Canal a few years earlier, meant that such machinery had become available.<sup>22</sup>

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<sup>18</sup> Murton, *Creating a Modern Countryside*, 37-8.

<sup>19</sup> Paul M. Koroscil, “Soldiers, Settlement, and Development in British Columbia, 1915-1930.” *BC Studies* 54 no. 2 (1982): 63-87.

<sup>20</sup> Theo Claire and Kevin Surprise, “Moving the Rain: Settler Colonialism, the Capitalist State, and the Hydrologic Rift in California’s Central Valley.” *Antipode* 54 no. 1 (2022): 3.

<sup>21</sup> Minister of Agriculture Edward Dodsley Barrow lists this as the first obstacle to the project, although he also includes an adequate pumping system as a technical obstacle. CA, Edward Barrow fonds, add.mss 986.202.8.1.

<sup>22</sup> Bennett and Hammond, *History of the Panama Canal: Its Construction and Builders* (Historical Publishing Co., 1915). See also Reimer, C. *Before We Lost the Lake*, 186-7.

The second obstacle was the lack of a feasible plan for managing the tangle of rivers that fed the lake. Engineers had for a long time argued about where it was most feasible to divert these bodies of water away from the lake without creating massive new flood risks. In the years prior to the draining of the lake, new forms of measurement were developed that allowed these various potential points of intervention to be compared abstractly and quantitatively. These forms of measurement “opened up a certain distance,” to use Timothy Mitchell’s phrase: they created an abstract realm in which potential interventions in the material world could be quantitatively compared.<sup>23</sup> Frederick Nigel Sinclair, a BCER engineer and the person who ultimately planned the draining of Sumas Lake, invented a means to measure water levels, known as the Sumas Datum Plane in 1907. It provided a baseline for calculating water height around the Sumas area. The 1882 freshet was given “an assumed elevation of 100 feet.” With that baseline, other measurements were possible.<sup>24</sup> The height of a historical flood became the foundation for comparing water levels at different points in the river system of the valley.

A long-standing point of contention was Vedder River, one of the primary rivers feeding Sumas Lake (see Map 2).<sup>25</sup> When the Land Settlement Board decided to pursue the drainage projects, two plans were considered, one by Sinclair and one co-authored by H.C. Brice and W.C. Smith. Both plans used the Sumas Datum Plane. While very similar, these plans differed on the crucial question of where to divert the Vedder away from the lake. An (apparently)

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<sup>23</sup> Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley: University of California Press, 2002): 92.

<sup>24</sup> CA, F.N. Sinclair fonds, Add.Mss 12 “A History of Sumas Reclamation,” 3-6. The purpose of a datum plane is to create a reference point for elevation. Although the base is arbitrary, it provides the point of reference for all other measurements and therefore represents an important form of standardization.

<sup>25</sup> The Vedder itself has an interesting and very complex history. Its course changed multiple times during the 19<sup>th</sup> century due to logjams. At first, it was a small creek near the Chilliwack River. After the 1894 flood, the Chilliwack River was blocked by debris and much of the water diverted into the Vedder. It remained on this course until the draining of the lake began. Sharon Lawrence, *Vedder Crossing, British Columbia: A Community History* (Chilliwack: Chilliwack Museum and Archives, 2005).

impartial engineer, C.E. Cartwright, adjudicated between them. He determined that Sinclair's plan effected a more gradual diversion of the Vedder into Sumas River and away from the lakebed. Going by the Sumas Datum plane, Sinclair's plan provided "2 feet extra depth" at the outlet. This extra depth buffered the surrounding dikes against the possibility of both rivers being in flood by providing a deeper channel to accommodate more water. Consequently, the surrounding dikes would not need to be as high and would be less threatened by high water.<sup>26</sup> The Sumas Datum Plane thus engendered an abstract space in which theoretical interventions in the course of the river could be compared in terms of how they affected potential flood conditions.<sup>27</sup>

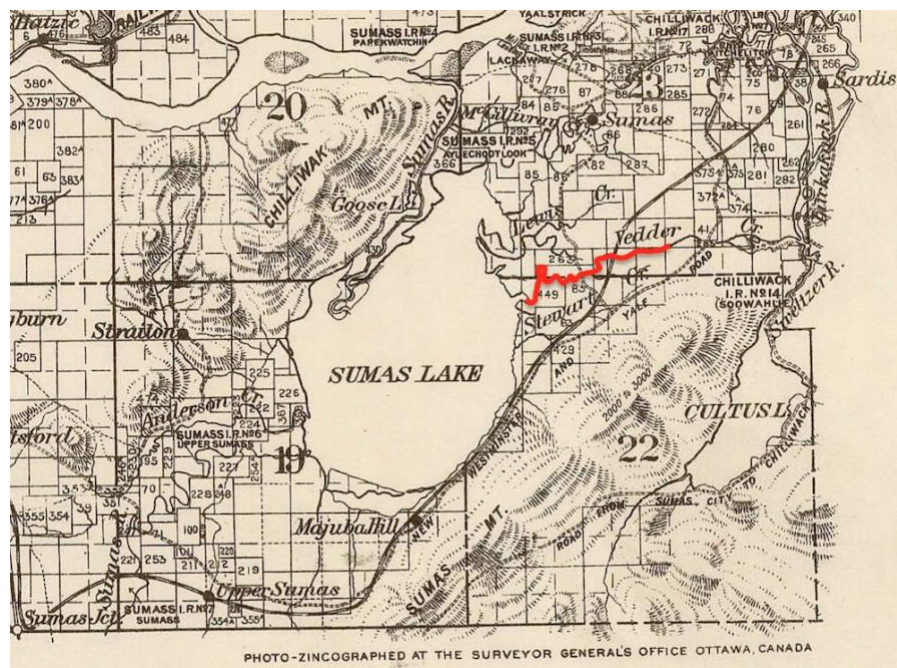


Figure 1. Sumas Lake, 1920. Vedder shown in red.<sup>28</sup>

<sup>26</sup> BCARS, GR 0929 Land Settlement Board, Box 48, File 5, "Report on Sumas Reclamation Project with Special Reference to Differences in Plans" by C.E. Cartwright, Master Engineer, 9.

<sup>27</sup> This is a very light brush with the hydrological complexity of the draining of Sumas Lake used to draw out a conceptual point. See Reimer, C. *Before We Lost the Lake* for a more detailed picture.

<sup>28</sup> Base map accessed from Gordon Logie, "Sumas Lake Reborn: A Tale of Topography" *Sparkgeo* (2021). Original held at City of Vancouver archives.

Taken together, these two developments—access to more powerful machinery and new forms of measurement— allowed the lake to be drained. In effect, the forces of production were amplified: new machines made it possible to transform the natural world more extensively, quickly, and precisely than ever before. But this mechanical power was mobilized within a scientific practice that constructed the natural world as a series of calculable objects. Machinery, no matter how advanced, could not be made to change the course of a river at any random point. Procedures of calculation and standardization offered rational points of intervention. Scientific practice, therefore, did not seek unilaterally to subjugate the natural world, but to carry out negotiations with its power by way of abstractions. The goal was never to dominate nature, but to *produce* a new kind of nature according to rules that were, in fact, coproduced with nature.<sup>29</sup>

The idea of producing nature through scientific practice to create an agricultural society is prevalent throughout the writings of engineers and administrators of the Sumas Lake project. Minister of Agriculture Edward Dodsley Barrow, in a report written shortly after the project was completed, describes how “a thoroughly modern system of massive earth dykes was constructed, a complete interior system of drainage provided, and a pumping system operated by powerful electric motors, was designed and built” to reclaim the land beneath Sumas Lake. With the installation of these machines,

the Sumas lands present the best all-around farming opportunity in British Columbia today [...] Mild rainy winters—long sunny growing seasons with no extremes of heat or cold—absence of destructive storms or prevailing periods of drought—unusual fertility in the deep alluvial soil of the Valley [...] and last but not least, a beautiful setting of mountain, river and pastoral scenery, all combine to attract the farmer.<sup>30</sup>

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<sup>29</sup> Mitchell argues that human and non-human agencies “emerge together in a variety of combinations” and therefore the “universalizing force of human projects,” like science, tends to obscure the fact that these projects are coproduced with the non-human world. Mitchell, T. *Rule of Experts*, 29.

<sup>30</sup> CA, Edward Dodsley Barrow fonds, add.mss 986.202.8.1. “Notes for Sumas Folder.”



A certain kind of nature was produced by the project. The dikes, drains, and pumps conspired to produce agricultural land where none existed, and this land was seamlessly incorporated into the “natural” landscape of British Columbia. The goal of the project was to produce *this* nature. One might say, as Timothy Mitchell said of the irrigation projects along the Nile, “nature was not the cause of the changes taking place. It was the outcome.”<sup>31</sup>

The actual labor of draining the lake occurred between 1920 and 1924. The process as a whole cost over \$3 million.<sup>32</sup> Even once the lake had been completely drained, the production of nature continued. The lakebed was covered in willow and thus still inhospitable to the agricultural settlement it was supposed to facilitate. It required extensive clearing and cultivation before it could be sold; even then, the sale of reclaimed land did not meet provincial expectations.

What is more, the draining of the lake was an unabashed act of colonialism, a de facto dispossession of the Sumas First Nation who relied on the lake. In Edward Barrow’s description of the Sumas lands produced by the intervention of new machines, he described the land as he hoped it would appear to the farmers who will bring it into cultivation. He was not describing it as it appeared to the Sumas First Nation, for whom the drained lakebed stood not as opportunity but as tragedy. Although the Sumas First Nation survived this profound transformation of their ancestral territory, the world of sturgeon, salmon, trout, ducks, and geese inhabiting the lake was gone.<sup>33</sup>

With the draining of Sumas Lake, the role of state expertise in managing flood control was expanded to create more farmland for independent farmers—despite the shortcomings and

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<sup>31</sup> Mitchell, *Rule of Experts*, 35.

<sup>32</sup> Chilliwack Archive, F.N. Sinclair fonds, Add.Mss 12 “A History of Sumas Reclamation,” 20.

<sup>33</sup> Cameron, *Openings*, 23.

difficulties of the project. Sumas farmers celebrated that they would no longer “be jeopardized by the flood waters.”<sup>34</sup> The salient point here is that the expansion of flood control expertise deployed by the state remained tied to the original purpose of flood control in the Fraser Valley: creating an agricultural society of independent producers. The goal of creating this society stretched back to the colonization of the valley in the 19<sup>th</sup> century (see Chapter 2). The mobilization of state flood control expertise towards this end continued through the Great Depression and World War II. This would not change until the calamitous flood of 1948 revealed in dramatic fashion that a society of independent farmers was incapable of maintaining the infrastructures on which their way of life depended.

### **3.2 1948: The “Battle of the Fraser” and the Decline of the Small Farmer**

On May 24<sup>th</sup>, 1948, in Agassiz, a small town towards the east end of the lower Fraser Valley, a Victoria Day dance was held at Memorial Hall. The orchestra was playing a waltz when a policeman appeared at the door and began to lead men away. After an interval it became clear that they were being recruited to stack sandbags at the dike. The Fraser River was rising and threatened to flood the town. As they left their early summer merriment behind and trekked out to the dikes, it is unlikely that these men knew that they had been drafted for a war.<sup>35</sup>

The 1948 flood was one of the most destructive events in British Columbia during the 20<sup>th</sup> century. Between May and June, around 70,000 acres flooded and 2,300 homes went under water. The lower Fraser Valley was most affected, with 50,000 acres flooded—approximately

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<sup>34</sup> CA, Edward Dodsley Barrow collection, add.mss 986.202.8.2 “Great Reclamation at Sumas Lake Makes Room for 7,000 Homes,” in *Country Life in B.C.* 9 no. 5.

<sup>35</sup> Scharder, T.(1948) “Agassiz,” in, *Nature’s Fury: The Inside Story of the Disastrous BC Floods May-June 1948*. Canada: South Hill Publishers Ltd., 17.

10% of the area of the valley. At its most intense, the Fraser River flowed at 536,000 cubic feet per second and reached a maximum height of 24.73 feet by the Mission gauge. The water stayed above 20 feet at Mission, the danger zone for flooding, for a full 32 days.<sup>36</sup> Dikes that were painstakingly constructed over the better part of a century failed up and down the river. The cost of repairs after the flood and aid during the flood topped \$17.5 million (over \$227 million in 2022 dollars).<sup>37</sup>

Well before the event was rendered in statistics and cemented in the history of British Columbia, however, it was lived as a war with nature. On May 26<sup>th</sup>, two days after men began stacking sandbags at Agassiz, the crisis was dubbed “The Battle of the Fraser” by CJOR radio broadcaster Dick Diespecker. CJOR’s reporters intensively covered the first week of the floods, framing each broadcast as a battle, bringing this narrative to radio waves around the Lower Mainland and across Canada.<sup>38</sup> Kay Cronin, one such reporter, compared men protecting a dike to England during World War II—except England was “fighting a human enemy.” Along the Fraser River, “these boys have an even greater task. They are fighting against nature itself.”<sup>39</sup>

Newspapers adopted the language of “battle” at the same time.<sup>40</sup> Settlers around the valley, when interviewed about the unfolding crisis, spontaneously deployed the imagery of war

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<sup>36</sup> These figures are pulled from dominion chief engineer C.E. Webb’s report. BCARS, GR 4074 Fraser River Board library 002503-0015, “Flood of 1948” by C.E. Webb. Although the flood peaked at 24.73 by the Mission gauge, the more commonly cited figure for the height of the flood is 24.98, since 0.25 feet must be added to the Mission gauge to reach height above sea level.

<sup>37</sup> Fraser River Board, *Final Report of the Fraser River Board on Flood Control and Hydro-Electric Power in the Fraser River Basin* (Victoria, 1963): x.

<sup>38</sup> BCARS, Tim Hood radio broadcast collection (TH from here), Item AAAC – Battle of the Fraser: [part 1&3]; Item AAAB7090 – Battle of the Fraser [parts 2, 3&4]. CJOR apparently broadcasted 24 hours a day for 10 days during the flood.

<sup>39</sup> BCARS, TH, Item AAAC – Battle of the Fraser: [part 1&3].

<sup>40</sup> Between May 25<sup>th</sup> and 29<sup>th</sup>, newspapers around the lower mainland adopted the narrative framing of war for the event. See, for instance, “Aid Flown to Flood-Stricken Interior Cities,” *The Province* May 25, 1948; “A Country Highway Now Rushing Stream,” *The Province* May 26, 1948; “New Westminster ‘Ready for Worst.’” *The Vancouver Sun* May 28, 1948,

to articulate their experience. Lindsay McCormick, for instance, described a dike at Mission breaking “like a bomb had exploded under it.”<sup>41</sup> On May 31<sup>st</sup>, Premier Byron “Boss” Johnson declared a state of emergency and Colonel T.E. D’O. Snow, army commander in BC, took charge to “combat” the Fraser.<sup>42</sup> The settlers of the valley, or at least a major faction of them, were at war with nature.<sup>43</sup>

The construction of a war between Humanity and Nature thus thematized the event. As postcolonial, posthumanist, and feminist scholars have emphasized, the discursive antagonism between nature and humans was ultimately rooted in colonialism, Christianity, gender, race, the rise of capitalist modernity, and new forms of scientific inquiry from the sixteenth century.<sup>44</sup> It was by no means invented during the 1948 Fraser flood. That this discourse was mobilized with such force around this event was due to a confluence of factors, including recent end of the Second World War. Certain prevailing ideas about the relation between humans and nature in British Columbia, particularly the rendering of the Fraser River as a vast, unutilized

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<sup>41</sup> “Dyke on Nicomen Island Bursts Like Atomic Bomb” *The Fraser Valley Record* May 29, 1948.

<sup>42</sup> “Army Takes Control of B.C. Flood Areas: Premier Calls Office State of Emergency,” *The Globe and Mail* June 1, 1948; Eric Sanderson, “Nature’s Fury,” in *Nature’s Fury*, 12. Premier Johnson himself took on a somewhat mythical status during the flood, simultaneously raising morale and negotiating federal aid. According to Bruce Dixon “in the middle of the night he would appear out of the rain on a piece of threatened dyke at Matsqui and an hour after at Chilliwack or Sumas [...] then almost as if by magic he would telephone from Ottawa.” *Sessional Papers*, “Report of the Deputy Minister of Lands,” (1948): 165.

<sup>43</sup> Although I maintain that this narrative structure was widely disseminated and effortlessly adopted by many settlers, it was not total: some groups never bought into it. One example is the pacifist Mennonites, who had lived in Chilliwack since the 1870s. Even the pacifists, however, approved of the army’s intervention and worked side by side with them to stop the flood “like brothers.” Al Kipnes, “Hatzic,” in *Nature’s Fury*, 31.

<sup>44</sup> Kate Soper pulls out this dynamic very clearly. Soper, *What is Nature? Culture, Politics and the Non-Human*. (London: Blackwell, 1995): 73-79. See also, Maria Mies, *Patriarchy and Accumulation on a World Scale: Women in the International Division of Labor* (London: Zed Books, 1986); Donna Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (London: Blackwell, 1989); Timothy Brewster Vasko, “Nature and the Native.” *Critical Research on Religion* 10 no. 1 (2022), 7-23; Mauro Scalercio, “Dominating nature and colonialism: Francis Bacon’s view of Europe and the New World.” *History of European Ideas* 44 no. 8 (2018): 1076-1091.

hydroelectric resource containing immense power, also contributed.<sup>45</sup> I am less interested, however, in the sources of this construction than the underlying social transformations to which it gave expression.

The narrative reflected real anxieties around changes to the economy of the valley. What was represented as a war between Humanity and Nature was the outward expression of the failure of the political economy of the valley to fund the costs of flood control infrastructure maintenance. Through a close reading of radio broadcasts and newspaper clippings, I argue that the use of the war trope in this particular context—and it was no doubt used far more widely in Canada during this period—gave expression to the decline of the independent farmer, who, since the 19<sup>th</sup> century, had been the economic center of the valley, of ideological importance for the colonial project in British Columbia, and the very symbol of Progress. This is not to say that the war trope *exclusively* referred to this phenomenon, but only that in this local setting it was encoded with this meaning (among others).

As Stuart Hall argues in a discussion of broadcasting and the media, the “raw historical event [...] must become a ‘story’ before it can become a communicative event.”<sup>46</sup> Complex historical events, particularly events that disrupt prevalent ideas about the order of the world, first take a narrative form in the media. The war narrative was adopted, not invented, from a variety of contexts, most proximately World War II. Like most narratives, it is overdetermined,

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<sup>45</sup> Evenden, M. (2004) *Fish Versus Power: An Environmental History of the Fraser River*. Cambridge: Cambridge University Press, 119-124. Murton also argues that in the 1930s a certain fit between humans, machines, and nature was established in the popular imagination. James Murton, “What J.W. Clark Saw in British Columbia, or, Nature and the Machine,” *BC Studies* 142/3 (2010): 129-152. Aspects of these ideas about nature in British Columbia have 19<sup>th</sup>-century roots, as Bruce Braun cogently argues. Braun, “Buried Epistemologies: The Politics of Nature in (Post)colonial British Columbia,” *Annals of the Association of American Geographers* 87 no. 1 (1997): 3-31.

<sup>46</sup> Stuart Hall, “Encoding and Decoding the Television Discourse,” in *Essential Essays Volume 1* edited by David Morley, 257-276 (Durham: Duke University Press, 2019 [1973]): 258.

carries a multitude of possible meanings, and can be interpreted or decoded according to a variety of strategies, each of which reveals different meanings.

Methodologically, this section follows the model of cultural analysis articulated by Stuart Hall and the Centre for Contemporary Cultural Studies, most famously in their book *Policing the Crisis*. Hall et. al. read the discourse of “mugging” in England in the 1970s to show how “real fears and anxieties” about race and British identity during the decline of the British empire were condensed in this construction.<sup>47</sup> Real social transformations, as Hall argues, are distorted in the world of ideology, which mobilizes representations that “are not so much false” as “a *false inflection*” of the “real relations” on which they depend.<sup>48</sup> Mugging, for Hall and his coauthors, is a discourse that encodes crime, which (to be clear) was not actually increasing in England at this time, with tensions around race, class, capitalism, and the decline of the British Empire. Anxieties around changes in British society are thus channeled into anxiety around mugging, and it is only by decoding the discourse that these anxieties can be traced back to their objects. Interestingly, mugging did not appear *ex nihilo* in Britain during this period: it was lifted from the US, where it had long been “a central symbol for the many tensions and problems besetting American social and political life.”<sup>49</sup> Deployed in Britain, it simultaneously preserved this “referential context” and encoded it with new anxieties.<sup>50</sup>

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<sup>47</sup> Hall et. al., *Policing the Crisis*, vii.

<sup>48</sup> Stuart Hall, “Culture, Media, and the “Ideological Effect”” in *Essential Essays vol. 1*, 298-336 (Durham: Duke University Press, 2019 [1977]): 308, emphasis in original. Hall’s use of ideology here borrows from Louis Althusser. For Althusser, ideology is both a system of ideas that organizes reality and “the imaginary relationship of individuals to their real conditions of existence.” There is no pure, unmediated access to reality, it is always refracted in the prism of ideology. Ideology therefore represents something real about the world, but in a basically distorted form. Althusser, “Ideology and Ideological State Apparatuses,” 109.

<sup>49</sup> Hall et. al., *Policing the Crisis*, 19.

<sup>50</sup> Ibid.

The narrative of a war between human and nature that dominated the 1948 Fraser flood likewise imported several ideas that directly concerned the situation of the independent farmer. Most immediately, the idea that nature can be shaped, produced, and largely controlled by human interventions. The farmer in the Fraser Valley had long been responsible for the transformation of the environment into one amenable to European-style agriculture. That this produced nature, supposedly under a degree of human control, became a threat was expressed as nature becoming an enemy combatant. In what follows, I decode this discourse and show how the rendering of nature as an enemy expressed the inability of farmers to maintain the flood control infrastructures that insulated them from the yearly freshet. While this is only one possible interpretive strategy, one with a limited, local significance, it is an important one for understanding the flood.

The war between settler society and the Fraser River was fought over a simple technology: the dikes. These vital infrastructures were the focal point of the conflict: “the battle of the Fraser” was in fact alternately, and perhaps more commonly, called “the battle of the dikes.”<sup>51</sup> On CJOR and other radio broadcasts, reporters described the “tremendous burst of activity” overtaking these vulnerable infrastructures. Jeeps carried men to and from the river, army trucks transported sand, and men shoveled it into bags and stacked them on the dike.<sup>52</sup> It was estimated that over 30,000 civilian volunteers joined army, navy, and air force troops to create an articulated and organized system defending the dykes: “every able-bodied man over the age of 14 worked on the dyke or at the huge sandpit set up at the south end of the dyke.”<sup>53</sup>

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<sup>51</sup> Sanderson, “Nature’s Fury” 9; BCARS, TH, Item AAAC1794 – Battle of the Fraser: [part 1&3].

<sup>52</sup> BCARS, CKWX radio fonds, Item AAAC2139 – Fraser Valley flood, 1948: Premier Byron Johnson.

<sup>53</sup> Sanderson, “Nature’s Fury,” 9; Bill Gill, “Sumas,” in *Nature’s Fury*, 58.

(Although many articles focus on the masculine image of burly men lugging sandbags to the dikes, women were often equal participants in the sandbag stacking.<sup>54</sup>)

The dikes formed the focal point of this struggle because they undergirded the agricultural economy of the lower Fraser Valley. As the authors of the *Interim Report* of the Fraser Valley Dyking Board wrote after the flood, the life of the valley “is intimately tied to the growth of the dyking and drainage systems, for the simple reason that life in this area without dykes and drainage would be highly precarious and certainly not acceptable under present day living standards.”<sup>55</sup> Diking infrastructure enabled agricultural life in the Fraser Valley by providing security against the seasonal freshet. They achieved this by “denying” the Fraser access to its floodplains and, in Richard Bocking’s apt phrase, “decoupling” land and water.<sup>56</sup>

Precisely because these infrastructures undergirded the agricultural economy of the valley, they constituted its point of vulnerability to flooding. I discussed this point theoretically in Chapter 1 and examined the formation of the dike-dependent metabolism of the Fraser Valley in Chapter 2. With the construction of a network of dikes at the end of the 19<sup>th</sup> century, vulnerability to flooding was in a sense transferred from the farms and houses in the valley to the dikes and other infrastructures. The dikes became the line at which the flood hazard was held back or realized. If the dike failed, farms and houses would surely be washed out; if it withstood the water, they would remain safe. The destruction of these dikes amounted to the momentary

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<sup>54</sup> “Pluck Won Battle of Lulu Island: How 1200 Volunteers Including Women, Girls Held Out Flood,” *The Vancouver Sun* 31 May 1948. The reproductive labor of the battle—brewing coffee, cooking meals and inoculating against typhoid those on the dikes and “refugees” displaced by the flood—was, however, invariably performed by women and the Canadian Red Cross. BCARS, TH, Item AAAC1794 – Battle of the Fraser: [part 1&3]; Reta Myers, “The Red Cross,” in *Nature’s Fury*, 62.

<sup>55</sup> Fraser Valley Dyking Board, *Interim Report on the Activities and Progress of the Fraser Valley Dyking Board from its Inception on July 22<sup>nd</sup> 1948 to January 31<sup>st</sup> 1949: A period of six months and nine days* (1949), 7.

<sup>56</sup> Richard Bocking, *Mighty River: A Portrait of the Fraser* (Vancouver: Douglas & MacIntyre 1997): 191-192.



“disarticulation,” which is to say the disruption of the usual production processes of the agricultural economy of the valley, because this economy could only function on the condition of adequate flood control infrastructure.<sup>57</sup>

Just as dikes enabled the conversion of floodplains into agricultural lands, they simultaneously produced the normal expansions and wandering of the Fraser River as a hazard. Gilbert F. White grasped this tension when he demonstrated that dikes encouraged the settlement of floodplains, thereby ensuring that a flood that destroyed the dikes would be significantly more destructive than floods prior to dike construction.<sup>58</sup> Every dike contains the potentiality of the flood that overcomes it, and infrastructures that enable a form of production simultaneously become a source of vulnerability for that form of production.

Dikes served as the frontlines of the “battle of the Fraser” for ideological reasons as well. As I discussed in Chapter 2, in the earliest years of the colonization of the Fraser Valley, diking was a principal “improvement” implemented by settler-colonists to preempt land.<sup>59</sup> The very word improvement suggests that these simple infrastructures, which were little more than packed earth mounds, connoted the ordering of unruly nature into something productive.<sup>60</sup> The dikes thus represented progress, the development of a society of independent farmers in a previously disordered and unimproved nature. Of course, nothing of the sort was actually true: First Peoples throughout the valley had extensive agricultural practices, and what colonizers regarded as

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<sup>57</sup> Jennifer Bair and Marion Werner, “Commodity Chains and the Uneven Geographies of Global Capitalism: A Disarticulations Perspective,” *Environment and Planning A: Economy and Space* 43, no. 5 (2011): 988–97.

<sup>58</sup> White, “Strategic Aspects of Urban Floodplain Occupance.”

<sup>59</sup> See for instance, *Pre-emption Act*, SBC 1860 s 2. This would be doubled to 320 acres by 1870. *Land Ordinance*, SBC 1870 s 2.

<sup>60</sup> Wood, *The Origin of Capitalism*.

‘unimproved’ nature was in fact already stewarded and managed by indigenous peoples.<sup>61</sup>

Nonetheless, in the settler mind the dike was a symbol of improvement and human progress.

This is equally evident in the draining of Sumas Lake, where the system of dikes and pumps produced an improved nature amenable to European-style agriculture. These interlocking economic and symbolic functions rendered flood control infrastructures and the farmland they facilitated as part of the human world that had to be defended from the violent Nature of the Fraser River. Perhaps more strongly: the dikes were a central piece of infrastructure that allowed this distinction to be clearly drawn by facilitating the world of settler ‘improvements.’

Because of its genealogy and economic function, the dike represented the distinction between Human improvement and unruly Nature. The 1948 flood revealed, however that the dike could not maintain this apparently clear (if constructed) binary. A monologue from CJOR reporter Dorwin Baird, recorded after his first trip out to the dike during the flood, bears witness to this:

I had been thinking of dikes as long and completely bare, with the rushing river lapping at the outer edge. I had suspected, I suppose, to hear the river, the dull thunder perhaps [...] and perhaps that’s why the actuality was so much more terrible [...] The dike, instead of being bare, is heavily overgrown, and there are trees growing at intervals along its sinuous length.<sup>62</sup>

Baird is not only confused but terrified to discover nature where he expected to see humanity.

The dike was supposed to be a pristine and well-maintained marker of improvement over unruly nature. But instead it is overgrown and covered in trees: unruly nature is interwoven into its matter. The poles of Human and Nature that the dike is supposed to hold apart collapse.

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<sup>61</sup> Lyons et. al. “Were the Ancient Coast Salish Farmers? A Story of Origins,” 507-9.

<sup>62</sup> BCARS, TH, Item AAAB7090 – Battle of the Fraser [parts 2, 3&4].

Baird's confusion is significant because the overgrown dikes were themselves partially responsible for the flood: an overgrown, poorly maintained dike is much more susceptible to failure in a flood event. For a long time, the dikes around the lower Fraser Valley had not been adequately maintained. While the freshet in 1948 was significantly higher than usual, the extensive damage suffered throughout the valley is almost certainly due to poor dike maintenance.<sup>63</sup> Why, then, were the dikes not maintained?

Since diking districts were created at the end of the 19<sup>th</sup> century, they were in perpetual debt, which stood as a constant obstacle to their maintenance. A letter from Deputy Dyking Commissioner W.R. Meighen concluded that the history of diking districts in the Fraser Valley has "provided costly proof that they are not now, have never been, and will never be, self-sufficient and able to provide for and maintain their own dyking works."<sup>64</sup> By the 1940s the province's goal to create a self-sustaining system for maintaining dikes and other flood control infrastructure by way of taxes on the residents in the protected district largely failed.

The inability adequately to fund the maintenance of dikes was particularly apparent in the years leading up to 1948. By 1946, diking districts around the Fraser Valley had become so indebted that a University of British Columbia Dean of Agriculture, F. M. Clement, was appointed to determine how (and if) the diking districts could pay off their debts. He concluded that they would likely never amortize the debt as it stood and payments should be restructured in

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<sup>63</sup> Although much less well known than the 1948 flood, a freshet of similar strength struck the valley in 1950 but caused very little damage because the entire system of dikes had been reconstructed and maintained only a year before. I discuss this further in the next section. Premier Byron Johnson said "we must never again allow the dykes to fall into disrepair or allow any of them to become covered with trees," citing this as a cause of the failures. "Government Will Study Methods of Keeping Dykes in Good Order," *Fraser Valley Record* December 2, 1948

<sup>64</sup> RBCA, GR-4075 Fraser River Board records, 002503-0027 File 8 "Dyking committee report." This picture can also be assembled from a (lengthy) perusal of the Inspector of Dykes records. RBCA, GR-1988 Inspector of Dykes Tax Assessments and Financial Records.

line with the financial capacities of the farmers.<sup>65</sup> Due to these persistent financial difficulties, according to Dyking Commissioner J.L. MacDonald, “the 1948 freshet came against dykes in many areas overgrown with cottonwood and other growth, burrow pits on the inside, and no roads or tops for transporting repair materials.”<sup>66</sup>

The inability to maintain dikes was a structural aspect of the economy of small farmers populating the Fraser Valley. It was not a conjunctural occurrence. Although the lingering effects of the Great Depression, during which most diking districts fell further behind on payments, exacerbated the situation, by the late 1940s it was clear that the petit-bourgeois agrarian dream of the valley was in its twilight.<sup>67</sup> As Clement argued in his report, half a century of concerted agricultural development in the valley had yet to create a stable and profitable farming society: “Full production, and consequently profitable production, cannot be attained until the winter water and the spring-freshet water are brought under more rigid control.”<sup>68</sup> Even after state and private enterprise had invested heavily in the production of natures suitable for farming (by constructing a system of dikes, draining Sumas Lake, etc.), the land was still not productive enough for individual farmers to be able to afford the yearly dike maintenance tax. In general, farmers simply could not grow enough product to bring to market to meet their subsistence needs and pay the hefty provincial tax for dike maintenance. This was more an issue of the productivity

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<sup>65</sup> F.M. Clement, *Dyking, Drainage, and Irrigation Commission Report Part II. Dyking and Drainage Districts*. (Victoria: Don McDiarmid, 1946): 117-118. Interestingly, Clement also concluded that despite the debt, it was clear “with some marked degree of certainty that a good job had been done in management, operation, repairs, and maintenance [of dikes].” Clement served as the Dean of Agriculture at UBC, and it is unclear from the report how he reached this conclusion, given that he was unable to assess the “engineering” aspects of these problems.

<sup>66</sup> BCARS, Guy Constable papers, Reel A00671, Volume 21, “History of Dykes and Drainage in B.C.” by J.L. MacDonald, 8.

<sup>67</sup> See Harris, *The Resettlement of British Columbia*, 244. See the following section of this chapter for more.

<sup>68</sup> Clement, *Dyking, Drainage, and Irrigation Commission Report Part II*, 118. Clement attributes this inability to render the land profitable enough to support diking to the high water table, which restricts root growth and therefore productivity.

of the soil, given that in many areas the high-water table prevented adequate root development for crops, than the quantity of land available to each farmer.<sup>69</sup> In many places around the valley, the tax simply went unpaid, and the dikes therefore went unmaintained.

For the first half of the twentieth century there was hope that independent farming would become productive enough to overcome this problem. As I discussed in the first section of this chapter, the draining of Sumas Lake was carried out with the belief that creating a self-sufficient society of small farmers was possible. By the late 1940s, however, the small, independent farmer was beginning to be replaced by more commercialized agriculture: enterprises that produced almost exclusively for a market. The causes of this transformation are multifaceted and linked to the transition to a Fordist model of development, which I discuss in detail in the next section. Importantly, the inability of small farmers to afford the dike maintenance on which their production depended contributed to their liquidation as a class. For these farmers, soil is a condition of production. The payments required to maintain dikes are the cost of the production of this condition of production because it is the dikes that permit the land to be farmed. The 1948 flood revealed in dramatic fashion that a society of independent farmers in the Fraser Valley could not afford the maintenance of the flood control infrastructure on which they depended.

Nature's apparent assault on settler society, the attacks of the "berserk Fraser" on farmers, was at bottom a wound settler society inflicted on itself.<sup>70</sup> It was not the river, but the settlers who had constructed dikes they could not maintain in the economy they created—and then been bold enough to call this "progress." The war between "Humanity" and "Nature" was

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<sup>69</sup> Ibid. The productivity of the soil, rather than the quantity of land available, is important here because diking assessments were made on the basis of acres of land owned. Larger farms had larger assessments than smaller farms. Thus, even if more land were available, the diking assessment would increase as well. Productivity was therefore more important.

<sup>70</sup> "Fraser Flood Smashes Through Matsqui Dyke," *The Province*, May 31, 1948.

nothing but an expression of the vulnerabilities inherent in the diking of the valley. As Cole Harris argues, from 1858 forward, the farmer “was closely allied to the idea of progress” and served as an ideological buttress of colonization in British Columbia.<sup>71</sup> The decline of this figure, revealed in the destruction of the very infrastructures that constituted the ‘improvement’ of the valley, jeopardized, if only briefly, the idea that this colonial way of life really constituted progress.

The discourse of this war between Human and Nature reveals this in its symptomatic silence: the erasure of the First Peoples of the Fraser Valley. Throughout the media discourse, and largely throughout governmental reports (with the exception of a brief mention of the flood in the dominion Department of Indian Affairs Report for 1948), First Peoples were excluded from the bulk of the narrative.<sup>72</sup> There were some instances in which the flooding of a reserve was referenced—but unlike settler communities, what befell the inhabitants of the reserve was rarely elaborated.<sup>73</sup>

There is one important and revealing exception here. The *Langley Advance* ran several stories on the Kwantlen First Nation, who were displaced from their reserve on McMillan Island and consequently forced to take up residence at Athletic Hall in Langley.<sup>74</sup> The headline of the central piece read “First Canadians Revert to Former Mode of Living,” and described the Kwantlen peoples living in the hall “as they used to years ago in large cedar community lodges.”

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<sup>71</sup> Ibid. See Chapter 2 of this thesis for more on the ideological importance of the farmer.

<sup>72</sup> *Sessional Papers of Canada*, “Department of Mines and Resources Report of Indian Affairs Branch for the Fiscal Year Ended March 31, 1949” (1949); Schrader, “Agassiz,” in *Nature’s Fury*, 17.

<sup>73</sup> See, for instance, “Fraser River Becomes Vast Lake 10 Miles Wide East of Mission,” *The Province*, June 4, 1948; “Lush Farms Made Lakes As Fraser Tears Dykes,” *The Province*, May 31, 1948.

<sup>74</sup> “Heart-Breaking Flood Damage Reveled by Committee on Inspection Trip,” *The Langley Advance*, August 5, 1948; “First Canadians Revert to Former Mode of Living,” *The Langley Advance*, August 10, 1948. Quotes throughout this paragraph come from the second article.

The unnamed writer of the article posited this displacement of the Kwantlen First Nation to a community center as an adequate simulation of their precolonial life.

At the end of this very same article, however, Kwantlen Chief Gabriel directly contradicted this image. He “recalls that the Indians’ [sic] forefathers were not very much bothered by floods. They just picked up their tents and moved to higher grounds as the water rose.”<sup>75</sup> During the 1948 flood, however, they “did not know what to do [...] the ones who had cattle and their homes could not pick up and go as easily as their forefathers did.” The fact that the Kwantlen First People were displaced by the flood, rather than freely relocating to higher ground, was entirely a function of a decidedly modern/colonial situation: being confined to the reserve and to a mode of subsistence dependent upon cattle-centric European-style agriculture.

The attempt to impose a linear history, a story in which indigenous life was improved by colonialism and could be returned to an earlier, worse state, was an effort to reintegrate the flood event into a narrative of progress. But it could not be done. The contradictions sit, not only unresolved, but unconcealed in the story. The ‘worse’ state was, in fact, the present.

The 1948 Fraser flood revealed the inability of the political economy of independent farmers in the valley to maintain the flood prevention infrastructure upon which they depended. Through the ideological frame of a war between Humanity and Nature, the decline of this figure was dramatized and long-held settler ideas of progress and improvement were temporarily undermined. It should be noted, before closing this section, that the 1948 flood has often been narrated as an immense moment of unity for British Columbia, one in which differences were put

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<sup>75</sup> Ibid. An article in the *Mainland Guardian* from 1876 seems to reference this, remarking that during the flood of that year (see Chapter 2) “Indians [sic] sought the green hillsides,” *Mainland Guardian* July 1, 1876.

aside to help protect and rebuild the valley.<sup>76</sup> My argument is not an effort to contradict this image, but to suggest that other, more esoteric processes were playing out as well. After this event, the project of flood control disconnected from the figure of the small farmer and embraced a more holistic development of the valley along the lines of Fordist production.

### **3.3 Flood Control in a New Conjuncture**

In the final section of this chapter, I trace the reconstruction of the lower Fraser Valley dikes after the 1948 flood and analyze the role of flood control in the shifting political economy of the Lower Mainland (the Fraser Valley and the Vancouver metropolitan area). I argue that the shift to a Fordist model of development entailed the further expansion of state expertise in flood control. This expertise was separated from the project of creating a “modern countryside” in the valley. Rather, it was about meeting the goal of creating a Fordist society and associated industrial, agricultural, and recreational spaces.<sup>77</sup> First, however, it is necessary to see how the devastation caused by the 1948 flood was addressed by rebuilding and how a belief in progress, which was threatened in the flood, was restored.

As the floodwaters of the Fraser River finally receded at the end of June, the Prime Minister, William Lyon Mackenzie King, announced an emergency project to rebuild and strengthen the dikes of the lower Fraser Valley. The project, known as the Fraser Valley Dyking Board, was jointly managed by the dominion and provincial governments, with the dominion bearing 75% of the cost and the province 25%. The board’s three members, one jointly appointed (J.B. Carswell, chairman), one appointed by the dominion (Victor Michie), and one by the

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<sup>76</sup> See, for instance, Watt, K.J. *High Water*. Indeed, the collaboration between Mennonites and the Army mentioned above bears witness to this.

<sup>77</sup> Murton, J. (2007) *Creating a Modern Countryside*



province (Bruce Dixon, provincial Inspector of Dykes), worked over the course of less than two years to reestablish the system of dikes.

The Board was temporary, convened to respond to an emergency; it was not supposed to be long-term. It therefore bypassed “normal engineering practice,” which generally entailed years of preliminary surveys and studies.<sup>78</sup> The rationale for this decision was not purely economic. In their interim report, the board wrote that

immediate and visible action had to be taken, not only to repair the flood damage to the dykes, but to start on the reconstruction of all dykes, so that the residents could recover some measure of confidence in themselves and in future living conditions in the Valley [...] The wisdom of this move has been amply demonstrated during the past six months. Mentally and physically the Valley is today almost back to normal.<sup>79</sup>

The justification for rebuilding the dikes on this highly abbreviated timeline, and circumventing the extensive surveys and studies that would have generally been demanded by such a project, was partially to restore the confidence of residents of the valley after the 1948 flood. Rebuilding the dikes was one way to rehabilitate the idea of improvement—or at least double down on it.

In November, Premier Byron Johnson continued the theme of rebuilding confidence in an address to residents of the lower Fraser Valley. He reassured those displaced by the flood that they “may face the future with a degree of confidence.”<sup>80</sup> The province mobilized great resources—public, private, and by charity—to make this confidence a reality, including the

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<sup>78</sup> Fraser Valley Dyking Board, *Interim Report on the Activities and Progress of the Fraser Valley Dyking Board*, 11. Normal engineering practice would have therefore implied an estimated expenditure of \$10 million, partially due to the costs of surveys and partially due to more comprehensive construction.

<sup>79</sup> Ibid.

<sup>80</sup> “Premier Says Flood Area Residents May Face Future With Confidence,” *Fraser Valley Record* November 11, 1948.

restoration of buildings and fences, the provisioning of seed and other farming necessities, as well as granting a moratorium on certain debts.<sup>81</sup>

Even as these resources were mobilized, and even as the immense solidarity demonstrated by settler society during the flood extended into recovery efforts, a sense of disquiet hung over the valley. The 1948 flood demonstrated that the prevailing political economy of the valley, predicated as it was on small, independent farmers, was incapable of meeting the maintenance requirements of the flood prevention infrastructure that facilitated this economy. This shook the ideological foundations of British Columbian colonialism by undermining ideas of progress and improvement. The 1948 flood showed that the very practices that were considered progress, i.e., European style agriculture and rural modernity (see the first section above), and improvement, i.e., the building of dikes (see Chapter 2), in fact created the conditions of this flood disaster. Although the dikes were quickly reconstructed, it remained unclear how the economy of the valley would be able to support their maintenance, as well as how the ideas of progress and improvement that had been shaken during the 1948 flood would be recovered.

Then, in 1950, mere months after the new dikes were completed, a second flood struck the Fraser Valley.<sup>82</sup> Just as the 1894 flood was succeeded by the 1896 flood, the 1948 flood was succeeded by the 1950 flood: “History has repeated itself,” wrote Bruce Dixon in disbelief.<sup>83</sup> The

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<sup>81</sup> *Sessional Papers* “Progress of the Fraser Valley Rehabilitation Authority: Interim Report” (1949): 9; “Moratorium Covers Debts in B.C. Flood Areas,” *Fraser Valley Record* July 22, 1948; “Cheques for Flood Fund Come from Far and Near,” and “\$225,000 To Assist Evacuees,” *Fraser Valley Record* July 1, 1948.

<sup>82</sup> Bruce Dixon, Inspector of Dikes during the 1948 flood and for the entire period from 1920 to 1953, wrote that the coincidence of floods occurring in 1894 and 1948 was a problem for which “numerologists may have an answer.” One could say something similar about the fact that both of these floods was succeeded, two years later, by an almost equally significant flood event. *Sessional Papers* “Report of the Deputy Minister of Lands” (1948): 164.

<sup>83</sup> BCARS GR 4075 Fraser River Board records, container 002503-0027, File 15 “Dyking lower Fraser.” Dixon was confident that “the year 1950 will line up in memory very closely behind that of the disaster year 1948.” Unfortunately, Dixon’s proclamation proved optimistic: the 1950 flood is rarely mentioned today.

outcome of this flood event was, however, different from 1948. Newspapers were quick to pick up the narrative of “battle of the Fraser,” and once again deployed the constructions that populated the first battle.<sup>84</sup> *The Province* wrote that settlers “were mobilizing in a gigantic effort to tame seething, swollen rivers that wreaked havoc two years ago,” but “confidence remains high.”<sup>85</sup> Although the river peaked at 24.19 feet by the Mission gauge, only 0.54 feet lower than in 1948, very few breaks appeared in the dikes: they successfully held back the Fraser.<sup>86</sup> This was likely because the entire system dikes (as well as accompanying flood control infrastructure) was reengineered immediately before this flood, including raising dikes two feet above the height of the 1948 flood and undertaking long-neglected maintenance work—the very maintenance work that had been neglected prior to 1948.

A different narrative resolution was therefore possible for settlers. The Fraser River was apparently defeated:

BC apparently has won the decision in its no-limit fight with full-flowing rivers, and today is preparing to take off the globes. Two years ago the rivers scored a succession of K.O.’s throughout the Province. This time, flood fighters who won their experience in 1948, trained in 1949 and reached top condition in 1950 parried every blow and threw in a goodly measure themselves to take the verdict.<sup>87</sup>

Here, the plucky settlers of the valley were rendered as the comeback kid who, in a decisive rematch with the enemy, finally emerged victorious. The 1950 flood, precisely because it occurred on the heels of the 1948 flood and encountered an entirely new system of dikes, restored the confidence of the province. The serious doubts sown by the first flood were ironically relieved by the second. Dikes once again became a guarantee of progress and security.

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<sup>84</sup> “Two Dykes Crack Under Pressure,” *The Province* June 20, 1950.

<sup>85</sup> “Dykes Hold Firm; River Still Rises: Confidence Remains High on Fraser Banks,” *The Province* June 17, 1950.

<sup>86</sup> BCARS GR 4075 Fraser River Board records, container 002503-0027, File 15, “Dyking lower Fraser.”

<sup>87</sup> “Flood Fighters Relax as River ‘Defeated,’” *The Province* June 24, 1950.

### 3.3.1 Fordism and Flood Control

The floods of 1948 and 1950 struck the Fraser Valley in a moment of profound transition. Here, I discuss the rise of Fordism in British Columbia, emphasizing the changes in flood control expertise that undergirded this development in the Lower Mainland. I suggest that in the Lower Mainland, Fordism was predicated on the urbanization and industrialization of floodplains. These changes in land use were buttressed by new forms of state expertise in flood control.

To begin with, agricultural production around the valley was in the process of being restructured. In Richmond, for instance, by 1958 barely half of the land was used for agriculture as the municipality industrialized.<sup>88</sup> Between 1951 and 1961 the amount of agricultural land in production for the first time decreased around the valley.<sup>89</sup> Perhaps most concerning from the standpoint of the reproduction of this form of agriculture, the median small farmer was now over fifty years old, and only a quarter were under forty.<sup>90</sup> A process of centralization began as the number of family farmers declined and commercial farms rose in prominence. This was accompanied by an increase in farm laborers, generally racialized immigrants employed seasonally on commercial farms.<sup>91</sup> The small family farm, which since the 19<sup>th</sup> century symbolized the good life in British Columbia, was in relative decline. It was replaced, slowly but inexorably, by the corporate farm.<sup>92</sup>

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<sup>88</sup> Graeme Wynn, "The Rise of Vancouver," in *Vancouver and Its Region*, 84.

<sup>89</sup> McGillivray, *Geography of British Columbia*, 200.

<sup>90</sup> Harris, *The Resettlement of British Columbia*, 244.

<sup>91</sup> Allan Dutton and Cynthia Cornish, "Ethnicity and Class in the Farm Labour Process," in *Workers, Capital and the State in British Columbia: Selected Papers*, edited by Rennie Warburton and David Coburn, 161-176 (Vancouver: University of British Columbia Press, 1988): 165.

<sup>92</sup> There are certain important exceptions here. First, dairy farming, which was significant in the Fraser Valley, tended to be more resilient against corporatization than other forms of farming. As Harris argues, the degree of organization among small producers made it such that large, corporate dairy farms "were not more efficient and did

The corporatization of agriculture was linked to the shifting political economy of British Columbia and Canada more broadly.<sup>93</sup> After World War II, Canada adopted a Fordist model of capitalist development predicated on mass production and consumption. This coupling was achieved largely through increased real wages for the working class, who became for the first time consumers of durable goods like automobiles. Through a generally stable agreement between capital, labor unions, and the state, high wages became normalized.<sup>94</sup> In British Columbia, forestry was the primary industry restructured along Fordist lines and accounted for “50 cents of every dollar made in the province,” although similar changes occurred in the mining sector.<sup>95</sup> As in agriculture, numerous small firms were gradually integrated into large corporations, many of which were owned or directed by foreign capital.<sup>96</sup>

In British Columbia, the Fordist transformation was identified with the electoral victory of W.A.C. Bennett’s Social Credit Party in 1952.<sup>97</sup> Social Credit pursued a “three-stage program centred on transportation, power, and industrial growth as the base for much-needed social

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not yield a higher rate of profit than much smaller farms. Beyond a certain herd size, capital costs per cow did not fall.” Harris, *The Resettlement of British Columbia*, 242. Second, there were pockets of the Fraser Valley in which small farmers expanded. Most notably, this occurred in Pitt Polders, an investment scheme by Dutch and Canadian capital to lease unsettled land in Pitt Meadows to Dutch immigrants. The scheme was so successful that the Prince Bernhard of the Netherlands visited this Little Holland. The saga of Pitt Polders, while very interesting, is somewhat to the side of the discussion here. *Sessional Papers*, “Department of Agriculture Report” (1952); *The Province* 12 May 1958 “Bernhard Visits B.C. Dutch, All Pitt Polder Turns Out.”

<sup>93</sup> These changes were in turn, of course, linked to macroeconomic transformations in global capitalism. On these transformations, see Alain Lipietz, *Mirages and Miracles: The Crises of Global Fordism* (New York: Verso, 1985).

<sup>94</sup> Michel Aglietta, *A Theory of Capitalist Regulation* (London: Verso, 1976).

<sup>95</sup> Trevor Barnes et. al., “Vancouver, the Province, and the Pacific Rim,” in *Vancouver and Its Region*, 174. See also, McDonald, *A Long Way to Paradise*, 198.

<sup>96</sup> Jane Jenson describes Canada’s version of Fordism as “permeable” because it was buoyed by increased foreign capital investment (largely from the US) and the export of raw materials (largely to the US). Jane Jenson, ““Different” But Not “Exceptional:” Canada’s Permeable Fordism.” *Canadian Review of Sociology & Anthropology* 26 no. 1 (1989): 78. See also Barmen, *The West Beyond the West*, 280-281.

<sup>97</sup> There are several factors that allowed Social Credit to defeat the more mainstream Liberal and Conservative parties. The Liberal-Conservative coalition of previous years had just broken down and ranked-choice voting was adopted in the hope of keeping the social Cooperative Commonwealth Federation party out of power. See Barmen, *West Beyond the West*, 270-280.

programs.”<sup>98</sup> An activist state invested heavily in highway construction and hydroelectric development, particularly in the northern and interior parts of the province.<sup>99</sup> Bennett’s dynasty, which lasted until 1972, was also responsible for constructing (or at least expanding) the welfare state in British Columbia, particularly through investments in access to health care and higher education.<sup>100</sup> (One might note, parenthetically, that Bennett’s party represented the *conservative* vision of the welfare state, given that their rise to prominence was partially an effort to defeat the socialist Cooperative Commonwealth Federation party.)

With the decline of the independent agriculturalist and the attendant rise of Fordism, the economy of the Fraser Valley diversified. While agriculture persisted in its corporate form, much of the growth of the Fraser Valley was in urban areas like Chilliwack.<sup>101</sup>

In 1949, the Lower Mainland Regional Planning Board (LMRPB) was formed to articulate a new vision for the holistic development of the region. Its first report, published in 1952, embraced a vision of the Lower Mainland as an articulated region of industrial, agricultural, recreational, and residential spaces. The LMRPB writes,

Man [sic] is a complex being, but from the point of view of regional planning today he has four main needs—work, recreation, home, and opportunity to move easily from one activity to another. No one of these needs can be left unsatisfied if modern man [sic] is to live fully.<sup>102</sup>

Four categories of land use are implied here: industry, agriculture, residence, and recreation (and transit to connect them). Although agriculture, in its new, corporatized form, would remain a

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<sup>98</sup> Ibid., 281.

<sup>99</sup> McDonald, *A Long Way to Paradise*, 242. McDonald notes that this idea that the state should pursue infrastructural “megaprojects” was ascendant throughout Canada at this time.

<sup>100</sup> Ibid., 247.

<sup>101</sup> Barmen, *West Beyond the West*, 292. Barmen notes that by 1971 the population of the Fraser Valley neared 400,000, and this growth was tied partially to the urbanization of certain areas, like Chilliwack and Ladner, and partially to the fact that residents of the Fraser Valley commuted to work in more industrial areas.

<sup>102</sup> LMRPB, *The Lower Mainland Looks Ahead* (New Westminster: 1952): 38.

pillar of the valley, it was no longer the valley's central or sole purpose. (Following the 1952 report, my use of industry and industrialization excludes agriculture, which is treated as a relatively distinct category by planners.)<sup>103</sup>

The Fordist development of the valley implied the urbanization and industrialization of floodplains in the region around Vancouver, particularly Richmond, north Delta, and Maple Ridge. In Richmond, the most dramatic case, the population living in a floodplain more than doubled from 18,652 to 42,400 between 1951 and 1961. W.R.D. Sewell, a researcher with the Fraser River Board, determined that in the aftermath of the 1948 flood, urban population growth on floodplains was 7% per year; the average in the Fraser Valley as a whole was only 3.5%.<sup>104</sup>

The Bennett government facilitated urbanization by investing in highways throughout the Lower Mainland. The changes inaugurated (or at least accelerated) by the highway are typified by the construction of the Deas Island Tunnel, now known as the George Massey Tunnel. Designed to connect Delta (particularly Ladner) directly to the urban core of Vancouver, it precipitated a residential community that commuted to jobs in Vancouver.<sup>105</sup> Although farmers strenuously opposed the highway, citing Ladner's isolation from Vancouver as an asset, the project was pushed by Social Credit and completed in 1959.<sup>106</sup> Suddenly, Ladner was home to commuter residences and a burgeoning tourism industry. While the farmer was by no means

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<sup>103</sup> For those interested in the nuances of this distinction: when I talk about industrialization, I am generally referring to the growth of manufacturing or factory work, and generally in urban areas. Planning documents from this period observe this link between industry and urbanization, associating rural land use mainly with agriculture or recreation, and I adopt their convention here. I do occasionally use the word industry in a broader sense to refer to a specific sector of the economy, e.g., the tourism industry. But when I distinguish between 'agriculture' and 'industry,' I am distinguishing between all forms of rural agricultural work and all forms of factory and manufacturing work, which may include food packaging. It is an uneasy but nonetheless important distinction for understanding this period.

<sup>104</sup> BCARS, GR 4074 Fraser River Board library, container 002503-0020, 17.13.2 "Population Growth in Floodplain of Lower Fraser Valley 1951-1961" by W.R.D. Sewell; 17.13.3 "Effects of Major Flood on Employment in Lower Fraser Valley" by W.R.D. Sewell.

<sup>105</sup> "Ladner: a quiet village at the end of the road," *The Province* October 21, 1961.

<sup>106</sup> "Some Delta residents against Deas tunnel," *The Province* February 18, 1956.

driven out altogether, the construction of the highway ensured that Ladner would no longer be a small farmers' village, distantly connected to Vancouver by a four-hour ferry ride. In the 1960s, dikes were constructed on Deas Island to protect the highway that connected commuters in Ladner to the city.<sup>107</sup> These dikes were to protect commuting and tourism. They facilitated an urban corridor stretching from Vancouver to Ladner across floodplains in Richmond.

At the same time as dikes came to protect urbanizing floodplains, they were also called upon to produce recreational natures. Nature as an outlet for recreation was another feature of the emerging Fordist society.<sup>108</sup> The high productivity guaranteed by Fordist production, combined with the normalization of labor-capital relations, meant that workers had access to more recreation time. A later report from the LMRPB, titled *Land for Leisure*, directly developed this theme. (It should be immediately observed that the title "land for leisure" already marks a decisive break with the image of the farmer, who was always valorized as someone *working* the land, not luxuriating on it.) The report, replete with images of children paddle boarding, men rock climbing, and lovers picnicking, argues that "without careful preparation for proper use of our leisure hours, the prospect before us, it appears certain, is one of deterioration, first physically, then mentally and morally."<sup>109</sup> The production of parks, golf courses, and other recreational natures is a safeguard against this degradation, a way of ensuring that leisure time

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<sup>107</sup> *Sessional Papers* ("Report of the Water Resources Service" (1967): 86.

<sup>108</sup> In Fordism, as Kathi Weeks writes, wages gave "the right to spend" and "working hours authorized leisure time." Weeks, *The Problem with Work: Feminism, Marxism, Antiwork Politics, and Postwork Imaginaries* (Durham: Duke University Press, 2011): 49.

<sup>109</sup> BCARS, GR 4074 Fraser River Board library, 002503-0022 14.15.1 *Land for Leisure* (1961), 2. That this and other reports from the Lower Mainland Regional Planning Board are included in the Fraser River Board library itself speaks to the degree to which the question of how diked land in the Fraser Valley would be used beyond agricultural production was a feature of these post-flood debates. I turn my attention directly to this problem shortly.



instills values of “conservation” and “land stewardship” in the worker.<sup>110</sup> In both Pitt Meadows and Delta, diking was used to enclose marshes and preserve them for game hunting.<sup>111</sup>

Dikes and other flood control infrastructure both facilitated and depended upon these social transformations. It is important to recall that when the project of diking the Fraser Valley was first taken on by the province in 1898, it was with the goal of producing nature fit for a society of independent agriculturalists (see Chapter 2). In the postwar years, flood control became articulated to an entirely different set of social goals as historically agricultural areas urbanized. It no longer served to protect the interests of the small farmer. Instead, dikes facilitated an integrated society of industrial, agricultural, residential, and recreational spaces. Thus, as the figure of the small farmer was replaced by the figure of the Fordist worker-consumer, flood prevention became responsible for protecting the society of the Lower Mainland as a whole—not just its rural, agricultural elements.

This ultimately depended, of course, on the maintenance of dikes and other vulnerable flood prevention infrastructure. New state strategies, prompted by the experience of the recent floods, were deployed to this end. In response to the failure to maintain dikes prior to the 1948 disaster, the “Dykes Maintenance Act” was passed in 1950. This act, somewhat confusingly, created the “Dyking Commissioner” within the Department of Lands and Works alongside the Inspector of Dykes.<sup>112</sup> (These positions would eventually be merged into one, called the Inspector of Dykes, but for several decades the two positions were technically separate, although they were invariably held by the same person.) The Dyking Commissioner, to begin with, had

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<sup>110</sup> Ibid., 35.

<sup>111</sup> “Hunting Area Sought Locally,” *Surrey Leader* December 22, 1965; “Outdoor’s with Lee Straight,” *Vancouver Sun* May 17, 1958.

<sup>112</sup> *Dyking Maintenance Act* SBC 1950, s3.

significantly more powers than the Inspector of Dykes. While the Inspector of Dykes was created to monitor engineering projects and ensure that diking districts paid the costs of these projects, the powers of this position were basically limited to districts managed by the state. There were 9 such districts in the lower Fraser Valley at the time of the 1948 flood, and 20 diking districts managed either by municipalities or private entities.<sup>113</sup> This meant that the majority of the diking districts, and therefore flood control infrastructure, in the Fraser Valley were not overseen by the provincial government during the 1948 flood. These municipal or privately managed districts were beyond the influence of the provincial government.

With the Dykes Maintenance Act, the Dyking Commissioner was given tools to ensure that these districts properly maintained all flood prevention infrastructures in their purview. This position was empowered to order *any* dike or flood prevention infrastructure in the province to be repaired or upgraded at any time. What is more, the Dyking Commissioner could require the municipality or other relevant diking authority to raise the money necessary for these works. Finally, if a diking district refused to pay for the costs of engineering work, the Commissioner was permitted to order that the Minister of Finance to “deduct the said sum of money from any moneys payable by the Minister of Finance to the municipality under any other act.”<sup>114</sup> In other words, if a diking authority failed to repay the province for the cost of work deemed necessary by the Dyking Commissioner, their funding from the provincial government could be cut.

For the first time, the provincial state was granted the authority to force all necessary diking works to be carried out throughout the province, and municipalities or private entities to

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<sup>113</sup> *Sessional Papers*, “Dyking and Drainage” in “the Report of the Deputy Minister of Lands—Dyking and Drainage” (1948): 166-173. To be clear, this meant that the majority of the diking districts in the Fraser Valley were not overseen by the provincial government at the time of the 1948 flood.

<sup>114</sup> *Dykes Maintenance Act* SBC 1950, s4-6 for the sections of the Act discussed here. See also *Sessional Papers* “Department of Agriculture Report,” (1956): 108.

raise the funds necessary to pay for these works. Bruce Dixon's wish, stated forcefully at the end of his report on the 1948 flood, was fulfilled: "there must be a continuing, overriding, powerful authority whose duty it is to firmly and unswervingly see to it that proper maintenance-works are timely undertaken."<sup>115</sup> Dixon became the first Dyking Commissioner, and held this position simultaneously with his position as Inspector of Dykes.

This expansion of powers transformed the role of the state in producing and maintaining flood prevention infrastructure and, equally significantly, extended the role of expertise governance. As I argued in Chapter 2, the creation of the Inspector of Dykes in 1898 was a response to the inability of private enterprise to construct adequate dikes. The state was rather reluctantly pressured into the role of building and overseeing these infrastructures by settlers who solicited its intervention. The Inspector of Dykes, while endowed with the power to deploy his unique expertise in diking districts managed by the state, was basically tasked with managing dikes in areas where the relevant municipality or community was uninterested in performing this administrative work.<sup>116</sup>

The Dyking Commissioner, in contrast, was authorized to wield expertise on any flood prevention infrastructure throughout the province *and* to prescribe actions based on expert opinion. Tania Li argues that treating governance decisions (e.g., should funds be used to maintain dikes in a given situation?) as technical questions, "constitutes the boundary between those who are positioned as trustees, with the capacity to diagnose deficiencies in others, and those who are subject to expert direction."<sup>117</sup> The Dyking Commissioner's expertise thus permits

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<sup>115</sup> *Sessional Papers* "Report of the Deputy Minister of Lands—Dyking and Drainage," (1948) 173.

<sup>116</sup> The masculine pronoun is empirical rather than prescriptive: in the period under consideration, all Dyking Commissioners and Inspectors of Dykes (that I am aware of) were men.

<sup>117</sup> Tania Li, *The Will to Improve: Governmentality, Development, and the Practice of Politics* (Durham: Duke University Press, 2007): 7.

him to direct settlers and coerce them into using resources on dike maintenance. Rendering the maintenance and construction of these infrastructures as technical knowledge, a decision left to experts, amounts to a dramatic extension of the governance power of expertise.<sup>118</sup>

And these powers were used to great effect in the years after the 1948 flood. Every year, prior to the spring freshet, the Dyking Commissioner carried out an inspection of all flood prevention infrastructures and ordered repairs.<sup>119</sup> This involves “supervision of the total 72,400 acres involved in the maintenance, strengthening, and general upkeep of dykes, flood-boxes, and pumping-stations; the cleaning, maintenance, and improvement of several hundred miles of drainage canals and ditches.”<sup>120</sup> Where necessary, repairs are executed. In particular, the dikes are kept clean of “tree growth” by a combination of pruning and chemical sprays.<sup>121</sup> Lastly, in an emergency the Dyking Commissioner orders repairs that prevent catastrophe.<sup>122</sup> The capacity of the Dyking Commissioner to evaluate vulnerability, and then to govern individuals and direct labor towards these vulnerable infrastructures is an immense expansion of the role of state expertise in flood prevention.

This expertise was directly implicated in the industrialization and urbanization of floodplains in the Lower Mainland. Dyking Commissioner and Inspector of Dykes J.L. Macdonald reported that “due to the industrialization of many of the districts in the Lower Fraser Valley, the number of meetings with these authorities and inspections is increasing,” as greater

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<sup>118</sup> Bruce Dixon complained that “the mental standards of share-croppers [farmers leasing land] must not influence decisions and policies regarding the maintenance of any dykes,” suggesting that these matters ought to be left to experts like himself. *Sessional Papers* “Report of the Deputy Minister of Lands—Dyking and Drainage” (1948): 173.

<sup>119</sup> *BC Sessional Papers* 1957 Department of Agriculture Annual Report, 90. I am using “Dyking Commissioner” a bit metonymically here, as this position was accompanied by several assistants.

<sup>120</sup> *Sessional Papers* “Department of Agriculture Annual Report” (1956): 107.

<sup>121</sup> *Sessional Papers* “Department of Agriculture Annual Report” (1957): 91.

<sup>122</sup> In 1960, the Dyking Commissioner ordered the emergency repair of Nicomeki Dam in Surrey. *Sessional Papers* “Department of Agriculture Annual Report” (1960): 56.

works were needed to protect urbanizing areas.<sup>123</sup> This was, as I alluded to above, particularly the case in Richmond, Burnaby, and Delta, but occurred to some degree throughout the Fraser Valley.<sup>124</sup> The “Bring Industry to Richmond” campaign of 1953, for instance, emphasized flood control as a key condition for industries moving to the town.<sup>125</sup> This characterization was evidently apt, as a German steel company pulled out of its agreement to build a plant in Richmond a year later for fear of flooding.<sup>126</sup> The role of the Dyking Commissioner in this conjuncture was partially to facilitate this industrialization and urbanization by providing flood security in these areas.

The way that dike operation and maintenance was funded also came under scrutiny. Historically, as the overwhelming majority of land protected was used for agriculture, maintenance assessments were made by the acre such that, for instance, an individual owning 5 acres would pay half as much as one owning 10 acres. This was thought to be roughly proportional to the benefit each individual received from the dikes. The absurdity of this system was revealed as spatially compact commercial businesses were located next to farms:

Villages are springing up within the confines of improvement districts, with stores, garages, banks, and other places of business located upon a 50-foot lot and contributing \$2.00 per year to operational costs [of diking], and making perhaps more than the average farm business on 40 acres whose contribution is perhaps \$100 per year.<sup>127</sup>

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<sup>123</sup> *Sessional Papers* “Department of Agriculture Annual Report” (1957): 92. Remarks on the progress of industrialization in these areas are frequent in the Dyking Commissioner’s reports throughout the 1950s.

<sup>124</sup> In the 1950s, the urbanization of the Fraser Valley was a significant concern. “Cities Gobble Up Farms in Valley: Rapid Urbanization Poses Threat To Vancouver’s Fresh Food Supply,” *Vancouver Sun* April 24, 1956.

<sup>125</sup> “Richmond Drive Opens March 12, Seeks More Industry,” *The Province* February 13, 1953.

<sup>126</sup> “Loss of Steel Mill Laid to Weak Dyke,” *Vancouver Sun* March 27, 1954.

<sup>127</sup> *Sessional Papers*, “Department of Lands and Works” (1951): 162. This report goes on to describe the striking example of Yarrow, an area in southwest Chilliwack that used to be “a single farm holding” and became, almost overnight, “a business centre with over 100 telephone connections” with “assessed values over \$1,500,000.” *Ibid.*, 167.

Maintenance and operational taxes had to be reworked in line with urbanization, but this process took several years and, in the meantime, farmers in these areas struggled to compete with these new businesses.<sup>128</sup> The Dyking Commissioner was tasked with facilitating the transition of flood control infrastructure from protecting agriculture to protecting an integrated society of industrial, agricultural, and recreational elements. In some cases, this just meant that dikes reconstructed after the 1948 flood were appropriated towards new urban ends. Elsewhere, as in the case of the Deas Island Tunnel, new dikes were built to facilitate these new land uses.

Regardless of whether new infrastructure was built or a new maintenance paradigm was adopted to reflect new urban uses, flood control was transformed in line with the new society taking shape in the Lower Mainland. As James C. Scott argues, major expansions in productivity or intense periods of economic modernization in a society demand an expansion of the state and the deployment of state functionaries to make these transformations legible and governable.<sup>129</sup> The revising of assessment strategies, standardization of flood control infrastructure, and multiplication and extension of experts into new areas of flood governance were the concrete form of this expansion within the Fraser Valley.

### **3.3.2 Dikes, Vulnerability, and the Science of River Basin Management**

There is an irony underlying the Fordist transformation of the valley and the various changes in flood management that facilitated and accompanied this transformation. At the very

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<sup>128</sup> Even when change eventually came on this front, it was perhaps not as significant as some farmers had hoped. In 1961, minimum assessments were raised from \$2 to \$5, and the Dyking Commissioner was authorized to assess improvements carried out on land put to non-agricultural uses. See *Dyking Assessments Adjustment Act Amendment* SBC 1961.

<sup>129</sup> Scott, *Seeing Like a State*. Scott, of course, frames this argument as a critique of large state engineering projects pursued within “high modernist ideology.” I am abstracting away from this a bit and pulling out his arguments around how the state must expand to facilitate certain kinds of developmental projects.

moment that these developments were pursued, it became clear that diking could *never* adequately prevent flooding in the valley.

That the dikes would be rebuilt after 1948 was taken for granted. The settlers of the valley, from government officials to displaced farmers to labor unions to engineers, all agreed on this basic fact.<sup>130</sup> Despite the scale of the catastrophe and the obvious insufficiency of the dikes, the rationale of diking was not scrutinized. Dyking was increasingly viewed as inadequate by some scientists unless it also came with a holistic program of river management. One acerbic report begins “there is, as yet, from a strictly technical standpoint, no flood control in British Columbia.”<sup>131</sup> The Fraser Valley Dyking Board agreed that “dyke construction in the Valley below Yale can at best give only relative security to the residents and never absolute security” as long as the Fraser River as a whole is “completely beyond control.”<sup>132</sup> Therefore, there remained the question of whether the reconstruction of the dikes would be tied to the broader scientific management of the Fraser River.

Ultimately, the main stem of the Fraser River would not be dammed in the 20<sup>th</sup> century. Matthew Evenden has already told the intricate story of the debates surrounding the damming of the Fraser River in the postwar years. These debates ultimately became a question of “fish versus power,” preserving the salmon population or damming the river, given that large hydroelectric projects have a tendency to decimate fishing populations (as occurred on the Columbia River).<sup>133</sup>

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<sup>130</sup> See, for a variety of these perspective, BCARS, GR 1222 Premiers’ Papers, Box 202, File 6. The International Workers Association, for instance, sent a number of telegrams to the Premier’s office agitating for “an adequate dyking and flood-control system” as well as “full restitution” for flood victims.

<sup>131</sup> BCARS, Fraser River Board records 002503-0027 9.0.2 “Flood Control in British Columbia: The Lessons of the 1948 Floods” by Major R.C. Farrows.

<sup>132</sup> Fraser Valley Dyking Board, *Interim Report*, 5.

<sup>133</sup> Evenden, *Fish Versus Power*; Richard White, *The Organic Machine: The Remaking of the Columbia River* (New York: Hill and Wang, 1996).

While I will not retrace these debates at length here, it is necessary to revisit the emerging scientific consensus around flood control and the engineering of the Fraser River more broadly in order to understand the role and limitations of dikes in the Fraser Valley.

The Fraser River Basin Board, a joint dominion-provincial effort, was established in 1948. Set up to investigate the possibility of scientifically managing the entire Fraser River basin, the Board sought to maximize the river's resources (power, fisheries, water, and recreation) and reduce its threats (floods).<sup>134</sup>

The philosophy of this venture was in line with the emerging science of integrated river basin development. This philosophy was largely associated with the work of Gilbert F. White (see Chapter 1) and the U.S. Army Corps of Engineers. As White argued, through a scientific approach

each major network of streams draining the land masses of the earth may be viewed as the backbone for a possible planned use of a unified system of multiple-purpose and related projects to promote regional growth.<sup>135</sup>

This integrated approach to river basin management argued that engineering projects executed on a river should be part of a holistic plan that maximizes the river's resources while reducing its danger to surrounding populations. Engineers should consider every proposed project in the context of its effects on the basin as a whole. Thus, and germane to the Fraser, dams for hydroelectric projects could double as flow regulators that reduced the severity of flood.

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<sup>134</sup> Fraser River Board, *Final Report*, 1. The dominion actually proposed the creation of such a board to the province in the fall of 1947. The flood of the following spring evidently made it an actuality. Although the Board was initially titled the Fraser River Basin Board, its name was eventually abbreviated to Fraser River Board.

<sup>135</sup> Gilbert F. White, "A perspective of River Basin Development," in *Geography, Resources, and Environment volume 1: Selected Writings of Gilbert F. White* (1986 [1957]), 40. White by no means invented this paradigm, although he was an important figure in its development. For more on the theme of river basin management in White's writing, see J.C. Day, Enzo Fano, T.R. Lee, Frank Quinn, and W.R. Derrick Sewell, "River Basin Development" in *Geography, Resources and Environment volume 2: Themes from the Work of Gilbert White* edited by Robert W. Kates and Ian Burton (Chicago: University of Chicago Press, 1986).



Within this paradigm, dikes in the lower Fraser Valley should be understood as one aspect of a broader flood prevention strategy that involved significant upstream modifications to the river. Indeed, this was recognized by the members of the Fraser Valley Dyking Board, who acknowledged in their interim report that “[b]y careful engineering methods one can restrain the River in spots, one can nudge it here and suggest to it there, but never without fabulous expenditures can the lower Fraser River be harnessed and controlled by a system of dykes.”<sup>136</sup> Diking, in other words, was understood in the practice of these engineers as a river that remained beyond scientific control. The FVDB suggested that their efforts must be complementary to the Fraser River Board’s work studying “the possibility of impounding and harnessing waters in the upper reaches [of the river].”<sup>137</sup> From the beginning of the reconstruction of the dikes, it was widely believed that this measure would be totally insufficient if it was not accompanied by more profound interventions.

This concern was shared by Dyking Commissioners, who referenced the insufficiency of dikes throughout the 1950s. Dyking Commissioner J.L. Macdonald warned that

the threat of erosion is ever present in the minds of the people living in the Fraser Valley [...] the Fraser River has washed away vast acres of fertile land, replacing homes and farms with gravel-bars [...] it is generally believed that no extensive dyking operations should be undertaken without an attempt to confine the river to a central channel.<sup>138</sup>

In other words, after the quick (but effective) reconstruction of the dikes in the wake of the 1948 flood, it became clear that further diking works would prove fruitless without management of the river itself. Although the newly engineered system of dikes succeeded in holding back the major

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<sup>136</sup> Fraser Valley Dyking Board, *Interim Report*, 6.

<sup>137</sup> *Ibid.*

<sup>138</sup> *BC Sessional Papers*. “Report of the Lands Services,” (1953): 134, emphasis mine; *Sessional Papers* “Report of the Lands Service,” (1954): 134.

freshet of 1950, none of the experts involved in the maintenance or construction of dikes believed that they would withstand later inevitable freshets.

Dikes became that which must be defended from the assaults of the river. Just as dikes protected the floodplains of the lower mainland from the Fraser River, the dikes themselves had to be protected from the river by upstream management. The defender itself must be defended. Thus, one engineer with the Fraser River Board wrote that “flood control is concerned with the safety of the dykes,” from which the safety of society behind the dikes could be inferred.<sup>139</sup>

Although projects were proposed to make this storage capacity a reality, they were not ultimately put into place.<sup>140</sup> As Evenden argues at length, the reasons for this were twofold. First, the mobilization of the fisheries industry, and particularly scientific experts concerned with protecting the salmon population of the river, dissuaded the province and dominion from damming the Fraser. Second, and equally important, was the opportunity of generating hydroelectric power from the Columbia River. Evenden writes that “it is difficult to imagine that dam development would not have proceeded on the Fraser in the 1950s or 1960s had there been no other large river development opportunities.”<sup>141</sup> Through the Columbia River, and particularly joint management of the river with the US, it was possible to meet the growing demand for electric power throughout the province.<sup>142</sup> Primarily for these reasons, the holistic and scientific

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<sup>139</sup> BCARS, GR 4074 Fraser River Board library, 002503-0012 0.0.5 “Problems of the Fraser River” by Thomas Patterson (1961).

<sup>140</sup> The final recommendation of the Fraser River Board proposed a system of reservoirs known as System E. [cite report, maybe describe further]

<sup>141</sup> Evenden, *Fish Versus Power*, 274.

<sup>142</sup> As Richard White details, the fish population of the Columbia River had been decimated long before the mid 20<sup>th</sup> century, and was therefore somewhat less of a concern in pursuing further hydro-electric development. White, *The Organic Machine*. Of course, salmon had also declined precipitously on the Fraser, most notably due to a mudslide (caused by railway construction) that blocked a narrow passage in the river in 1913. Although the salmon population never fully recovered from this event, they remained more populace than the Columbia. Equally important, fisheries in BC had a strong political unity through which they could defend their interests.

management of the Fraser River did not become a reality in the 20<sup>th</sup> century. Dikes remained the main form of flood prevention—even though scientific practice had revealed that they were profoundly inadequate for this end. The vulnerability of these infrastructures was to endure into the 21<sup>st</sup> century.

### **3.3.3 The Reproduction of Vulnerability Across Models of Development**

After the floods of 1948 and 1950, there was hope that the Fraser Valley might be ‘permanently’ protected from flooding by a combination of dikes and integrated river basin management. The state maintenance and operation of the dikes was expanded to facilitate the Fordist transformation of the Lower Mainland, most obviously by way of the creation of the Diking Commissioner. However, the hoped-for management of the entire Fraser River did not materialize. The vulnerability of the Fraser Valley to flooding was carried over from one model development in the valley to the next. Diking outlived the society of small farmers that it was originally deployed to facilitate.

To emphasize the significance of this transition, it is worth briefly recalling the genealogy of the lower Fraser Valley dikes. During the colonization of the valley in the 19<sup>th</sup> century, diking was undertaken to facilitate an agricultural society of small farmers. In addition to providing protection from the Fraser’s freshets, diking was a crucial ‘improvement’ that could be carried out to preempt and claim land. When the stochastic efforts of private enterprise to dike the valley failed in the 1890s, the state stepped in to take over many of these diking projects.

From the 1870s to the 1940s, dikes in the Fraser Valley had one fundamental purpose: to create an agricultural society of independent producers. The diking of the valley was undertaken for this specific reason (see Chapter 2). With the decline of the small farmer and the rise of a

different social organization in the lower mainland, one predicated on articulated spaces of industry, agriculture, recreation, and residence working in ensemble to facilitate Fordist production, these dikes were incorporated into a new form of society. Although their function remained the same—to stop the movements of the Fraser River, to establish a firm boundary between land and water—their purpose changed. Dikes no longer protected small farmers and the ideal of an agrarian life; they protected “potential flood damage areas” or even more abstractly “economic development” and “the population.”<sup>143</sup> This is not to say that they stopped protecting agricultural areas, or even the agricultural areas in which the small farmer endured. But this was no longer their sole purpose. After the reconstruction of the dikes in 1950, the project of flood prevention was appropriated to facilitate the development of an integrated Fordist society.

In the same way that these dikes constituted a vulnerability for the petit-bourgeois agrarian society of the 19<sup>th</sup> and early 20<sup>th</sup> century, a vulnerability that was dramatically realized in 1948, they constituted a vulnerability for the Fordist society of the mid 20<sup>th</sup> century. Precisely because they articulated the boundary between land and water, they had to be constantly maintained to prevent disaster from occurring. The normal movement of the river erodes them, the growth of trees and plants destabilizes them, and the burrowing of muskrats and other creatures undermines them. These vulnerable infrastructures must be constantly attended to, constantly reproduced to prevent disaster from occurring. For at least a little while, this was done successfully within the maintenance paradigm inaugurated by the Dyking Commissioner.

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<sup>143</sup> BCARS GR 4074 Fraser River Board library, 002503-0020 17.13.1 “Population and Industrial Growth in Valley P.F.D. Areas” by LMRPB (1960); 17.13.2 “Population Growth in Flood Plain of Lower Fraser Valley 1951-1961” by W.R.D. Sewell (1963); 17.3.3 “Effects of major Flood on Employment in Lower Fraser Valley” by W.R.D. Sewell (1963).

### 3.4 Conclusion

In this chapter I argued, first, that during the first half of the 20<sup>th</sup> century new forms of state expertise were developed and deployed to produce a society of independent farmers, most notably with the draining of Sumas Lake. Then I turned to the major flood of 1948. I unpacked the media discourse of this flood, which portrayed the event as a war between Humanity and Nature. In reality, the severity of this flood was at least partially due to the failure to maintain dikes in earlier years. This failure was, however, not one of negligence but a consequence of the very social structure of independent farmers—the very society the provincial state sought to engineer during the first half of the century. A society of independent farmers could simply not afford the costs of infrastructural maintenance. Finally, with the decline of the small agriculturalist and the rise of Fordism (including corporate agriculture) I showed how the project of flood control was connected to a new model of development in the Lower Mainland through an expansion of state expertise. In the years after the 1948 Fraser flood, the role and modality of flood control definitively shifted away from its original purpose.

This brings me to the end of my historical geography of flooding and diking in the Fraser Valley. Of course, more floods occurred, more dikes broke down, more infrastructures were built, etc., in the period between the 1950s and the recent flood of 2021. But since the 1870s, certain constants have remained. The Lower Mainland has continued to embrace diking and flood control as the fundamental way to regulate its interactions with the Fraser River.

However, with the flood of 2021, this consensus is, for the first time, being seriously challenged. In a final, very brief concluding chapter, I consider this question and the alternatives that stand before the Fraser Valley in the 21<sup>st</sup> century.

## Conclusion: “That Things Just Keep on Going...”

Walter Benjamin says: “Do not write the conclusion of a work in your familiar study. You would not find the necessary courage there.”<sup>1</sup> There have undeniably been interminable hours slouched in the ‘familiar study.’ I have spun in the swivel chair, paced the hallway, flipped through the usual books, found nothing, rubbed my eyes, patronized the vending machine, even written the occasional coherent sentence—enough. No more of that. Let us get out of the study.

After all, I have been here in a real body the whole time. (It is white, male, and relatively abled, should that interest you.) I want to tell you, the reader, about one of the things this real body experienced while writing this thesis. As a brief conclusion, I reflect on researching the history of flooding in the Fraser Valley during the flood disaster of 2021 and in its aftermath.

I was driving from Vancouver to Mission to go to the community archive. It was the first archival trip of my research, taken in late September of 2021. While driving along Highway 7, I looked to my right and was surprised to see the Fraser River perhaps twenty meters away from the car. Occasionally the highway bends, the trees clear, and the river appears beside you. I considered the flatness of the land. How much would the river need to rise before the highway was underwater? The fragility of the line demarcating the terrestrial and the aquatic was very palpable to me. But soon the highway bent back away from the river. I drove on to the archive, where I read newspaper clippings about the 1948 Fraser flood.

Highway 7 flooded about two months later.<sup>2</sup> The province and particularly the Fraser Valley suffered its most dramatic flood in at least fifty years, which I described in the

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<sup>1</sup> Walter Benjamin, *Reflections: Essays, Aphorisms, Autobiographical Writings* (New York: Schocken, 1978): 81.

<sup>2</sup> Maple Ridge News Staff, “Flooding Closes Lougheed Highway Through Maple Ridge *Maple Ridge-Pitt Meadows News* November 28, 2021.

introduction of this thesis. People rushed to stack sandbags along the river, displaced groups congregated in shelters, and dikes and highways collapsed in floods and landslides. In short, all the scenes from the 1948 flood, scenes I had encountered as a kind of spectacle from the past, preserved in neatly stacked manilla envelopes, calamitously returned in real life.

While this was happening, I was sitting in my office at the University trying to write a thesis proposal to appease my supervisor. I watched the hellacious rain and cursed my luck for moving to Vancouver. Only later when I checked the news did I find out that the valley had flooded and Sumas Lake had reappeared submerging houses, farms, roads, and schools. My wet feet on the bus were, by comparison, little to complain about. Over the next several weeks I continued trying to draft my proposal, but I was constantly distracted by the actual emergency unfolding around me. Increasingly, I felt aware that I was writing about a history that was not really my own. Not only was I a guest to the First Peoples of the valley (like all settlers), but I was an American living in Canada and British Columbia more specifically. What I had chosen as an academic, historical research topic was alive again, an on-going and present disaster.

The people of the Fraser Valley demonstrated overwhelming solidarity in the face of this event. Volunteers from Dukh Nivaran Sahib Gurdwara, a Sikh community group, prepared meals and even rented a helicopter to deliver food to people stranded throughout the valley.<sup>3</sup> Residents throughout the valley worked together once the water receded to clean up the debris and wreckage.<sup>4</sup> Watching from Vancouver, it was impossible not to be deeply moved by the effort. And yet, at the same time, I was haunted by Peer Illner's suggestion that the retreat of the state

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<sup>3</sup> Ben Mijure, "Surrey Sikh community cooks thousands of meals, charters helicopters to help those reeling from severe storm," *CTV News Vancouver* November 18, 2021. <https://bc.ctvnews.ca/surrey-sikh-community-cooks-thousands-of-meals-charters-helicopter-to-help-those-reeling-from-severe-storm-1.5671616>

<sup>4</sup> The Canadian Press, "Volunteers join forces to help clean up after unprecedented flooding in Abbotsford," *The Abbotsford News* December 12, 2021.

from disaster relief has shifted the work of disaster recovery on to community groups.<sup>5</sup> The province supplied some relief, but it was (at best) difficult to access.<sup>6</sup> As I considered these tensions, I was increasingly torn between my critical consciousness, my desire to understand what was happening around me, and the detachment I felt from British Columbia. This place is not my home (I am from New Jersey), and much of the year I spent here prior to beginning my research was alone in my apartment due to provincial COVID-19 restrictions. I was separated from the society I set out to study. Criticism without sustained practical involvement, without an organic attachment to the issue at hand, began to feel like voyeurism.

Perhaps I can briefly and partially atone for this. The material history of flooding in the Fraser Valley that I have undertaken shows that flooding is not a ‘natural’ or ‘inevitable’ problem. It emerged out of the relations forged between settlers and the Fraser River during the colonization of the valley in the 19<sup>th</sup> century. The flood hazard is constitutive of these relations, but they are not the only possible ones. The multi-millenia history of Stó:lō First Peoples coexisting with the seasonal freshet, and even depending on it for agricultural uses, demonstrates this (see Chapter 2). I believe the genealogy of flooding in the Fraser Valley shows that flood disasters will continually occur until new relations with the river are created.

Since the floods of 2021, there have been calls, particularly from First Peoples around the valley, to return floodplains to the Fraser River and its tributaries. Most radically, members of the Lower Fraser River Working Group suggested that a “managed retreat” must be taken from Sumas Prairie, and Sumas Lake must be allowed to return.<sup>7</sup> Sumas First Nation Chief Dalton

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<sup>5</sup> Illner, *Disasters and Social Reproduction*.

<sup>6</sup> CBC, “B.C. flood victims left high and dry as backlog of aid requests clogs approval queue,” *CBC* May 20, 2022.

<sup>7</sup> Tara Martin et. al. “Restoring Sumas Lake is an important step in BC flood recovery,” *The Globe and Mail*, April 14, 2022.



Silver said that settlers “never should have drained that lake in the first place.”<sup>8</sup> Settlers are finally learning what the First Peoples of the valley have long known: dikes and other flood control infrastructure disrupt ecologies and create new forms of vulnerability at the same time as they facilitate new land uses.

Instead of dikes and other human-maintained flood control infrastructure, there are calls—once again led by First Peoples of the valley—for “natural infrastructures.”<sup>9</sup> One project being pursued by the City of Surrey, the City of Delta, and the Semiahmoo First Nation, is to build a “living dike” in Boundary Bay. By depositing sediment in the marsh over several decades, they hope to expand the salt marsh in the bay. Marshes protect against waves and water level rise while also preserving complex ecosystems. The hope of this project is that by intentionally helping the marsh expand, it can protect ecosystems and communities from effects of climate change like sea level rise.

Many of these natural infrastructure projects are framed around impending climate change. A forum in Abbotsford held after the 2021 flood convened community groups, governments, businesses, First Peoples and settlers to discuss “how conventional approaches [to flood control] have not ensured public safety, and note that climate change and current land use practices will only increase risk in the future” Against these conventional methods, like dikes and pumps, these groups favor a “holistic, collaborative approach to flood management that benefits people and other species, like salmon.”<sup>10</sup>

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<sup>8</sup> Kathleen Martens and Tina House, “‘The land is speaking to us, and we need to listen,’ says UBCIC grand chief,” *APTN News* November 19, 2021.

<sup>9</sup> Stephanie Wood, “How to build back B.C.’s flood infrastructure better,” *The Narwhal* November 20, 2021.

<sup>10</sup> Jessica Peters, “Flood recovery forum in Abbotsford focused on ‘breaking down silos,’” *The Chilliwack Progress* July 15, 2022.

It is difficult to say what will come of these developments. I am not in the business of evaluating policy proposals, and find it gauche when academics descend from the tower to weigh in on struggles that they have not directly participated in. Nonetheless, by way of concluding this thesis, I'd like to recapitulate the main points of my argument and draw out some implications.

Flood disasters in British Columbia have been a product of colonialism and capitalist development. Beginning in the 1870s, farmers in the Fraser Valley began to construct dikes to transform the land, insulate it from surrounding waters, and make it suitable for monocropping and European-style agriculture. These dikes were repeatedly destroyed by the Fraser and its tributaries. It was only when the state became directly involved in overseeing these projects that the valley was successfully diked. This 'successful' diking simultaneously destroyed traditional forms of subsistence relied upon by First Peoples in the valley. Combined with spatial confinement on reserves, First Peoples became vulnerable to the Fraser River's floods—something unthinkable prior to colonization. At the same time, the dependence of the agricultural economy of the valley on dikes led to a profound new vulnerability: the constant need to maintain dikes to avoid disaster. New forms of state expertise were deployed to this end throughout the 20<sup>th</sup> century. The inability to maintain dikes ultimately led to the flood disaster of 1948. The inherent vulnerability in the system became disastrous. This vulnerability has continued to persist into the present; it was realized again in 2021.

It seems to me that the issue is not to how to create more solutions to the problem of flooding, but how to stop producing flooding as a problem. This means equally how to stop producing the people of valley as vulnerable to flooding—above all the First Peoples of the land, who were forced into more precarious and harmful relations with the river through colonial processes. Flood disasters will recur, exacerbated by climate change, until the relations that

settlers established with the river in the 19<sup>th</sup> century are abolished and replaced by new relations. Flood disasters are part and parcel of the present society; they will persist until an entirely different form of social life is realized.

Walter Benjamin has served for me as a lighthouse, illuminating the twin dangers of an uncritical belief in progress and the contention that the past can be settled once and for all. For Benjamin, “that things ‘just keep on going’ *is* the catastrophe.”<sup>11</sup> The drama of a given flood disaster always seems spontaneous. But each of these disasters is prefigured by the society that produces them. That this society simply continues to exist, that these relations are not abolished before the next flood appears, is the real disaster: the coming of each successive flood has already been guaranteed.

I end with two quotes that, to my mind, reflect a different ethos. One is from the Union of BC Indian Chiefs grand chief Stewart Phillip, the other from philosopher Franck Fischbach. Fischbach, in an essay on Marx and Spinoza writes: “emancipation does not consist so much in integrating the world into humanity, but to the contrary in becoming human in the world.”<sup>12</sup> Phillip, in the aftermath of the 2021 flood: “the land is speaking to us, and we need to listen.”<sup>13</sup> It is not too late to start listening.

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<sup>11</sup> Benjamin, “N [Re The Theory of Knowledge, Theory of Progress],” 64.

<sup>12</sup> Franck Fischbach, *La production des hommes: Marx avec Spinoza*. (Paris: Libraries philosophique J. Vrin 2014), 21. The French reads « l’émancipation ne consiste pas tant à intégrer le monde à l’homme qu’au contraire à réaliser l’homme dans le monde. » My translation is somewhat liberal.

<sup>13</sup> Martens and House, “‘The land is speaking to us, and we need to listen,’ says UBCIC grand chief.”

## Bibliography

### *Archival and Library Collections*

I accessed the following libraries and archives, some electronically, others analogue. Almost all of them are located in southwest British Columbia. Canadiana, Library and Archives Canada, University of British Columbia Open Collections, and Union of BC Indian Chiefs archives were accessed electronically. The rest were visited in-person. Most books or reports that were found in the archive have been cited below; the archive or library through which they were accessed can be found in footnotes throughout the text.

#### British Columbia Archives and Records Service

- GR 0441 Premiers' Papers
- GR 0868 Chief Commissioner of Lands and Works correspondences inwards 1871-1883
- GR 0929 Land Settlement Board Records
- GR 1011 Inspector of Dykes Records
- GR 1197 Premier John H. Turner Records
- GR 1665 Correspondence and Reports from the Department of the Provincial Secretary
- GR 1222 Premiers' Papers
- GR 4074 Fraser River Board Library
- GR 4075 Fraser River Board Records
- Guy Constable Papers

#### British Columbia Legislative Library

#### Canadiana / Canadian Research Knowledge Network

- Dominion of Canada Sessional Papers

#### Chilliwack Archives

- Casey Wells Fonds
- Chilliwack Archives Oral Histories
- Clarence Berg Fonds
- Edward Dodsley Barrow Fonds
- Frederick Nigel Sinclair Fonds

#### Delta Archives

- Corporation of Delta Finance Department Fonds

#### Library and Archives Canada

- Department of Indian Affairs Annual Reports

#### Mission Community Archive

- Flood Clippings Files

#### University of British Columbia Archives

- Fraser River Model Project Fonds

#### University of British Columbia Open Collections

- BC Sessional Papers
- BC Historical Documents

#### University of British Columbia Rare Books and Special Collections

#### Union of BC Indian Chiefs

- McKenna-McBride Royal Commission

City of Vancouver Archives  
Major Matthews Fonds

*Newspapers*

Like most contemporary historians, I benefited immensely from Newspapers.com, an online repository of clippings. The majority of the newspapers referenced in this thesis were accessed this way. Clippings from the *Fraser Valley Record* and the *Vancouver Sun* were obtained at the Mission Community Archive. I distinguish, perhaps unfairly, between ‘historical’ newspaper clippings and ‘contemporary’ newspaper clippings. All articles related to the BC floods of 2021 and their aftermath have been cited in full to credit their authors. Historical clippings are cited in footnotes throughout by article title, newspaper name, and date.

The Aberdeen Journal  
The British Columbian  
The Chilliwack Progress  
The Daily Columbian  
The Fraser Valley Record  
The Globe and Mail  
The Langley Advance  
The Mainland Guardian  
The Pacific Canadian  
The Province  
Vancouver Daily World  
Vancouver Sun  
The Vancouver Weekly World  
Victoria Daily Standard  
The Victoria Daily Times

*Government and Other Reports and Papers*

I accessed the following reports, which are cited in footnotes throughout the text. I do not cite individual years and sections here for reasons of space.

British Columbia Board of Trade Annual Reports 1883-1900

British Columbia Historical Statutes

British Columbia Sessional Papers 1875-1970, particularly:

- Report of the Commissioner of Lands and Works
- Department of Agriculture Reports
- Immigration Report
- Report of the Inspector of Dykes
- Dyking Commissioner Report

Dominion of Canada Sessional Papers 1895-1905

### *Published Works*

Primary, secondary, and theoretical works that have been published are listed here in alphabetical order. Books and reports that were accessed through the above archives are included.

Ackermann, William C., Gilbert F. White, E.B. Worthington, Loreena J. Ivens. "Summary of symposium and recommendations." *Man-made lakes: their problems and environmental effects, volume 17* (1973).

Adams, Vincanne. *Markets of Sorrow, Labors of Faith: New Orleans in the Wake of Katrina*. Durham: Duke University Press, 2013.

Adams, Vincanne, Taslim Van Hattum, and Diana English. "Chronic Disaster Syndrome: Displacement, Disaster Capitalism, and the Eviction of the Poor from New Orleans." *American Ethnologist* 36, no. 4 (November 2009): 615–36.

Adger, W. Neil. "Vulnerability." *Global Environmental Change* 16, no. 3 (August 2006): 268–81.

Aglietta, Michel. *A Theory of Capitalist Regulation*. London: Verso, 1976.

Ahmad, Ali Nobil. "Infrastructure, development, and displacement in Pakistan's "southern Punjab."" *Antipode* (2022, online).

Allen, Theodore. *The Invention of the White Race, Volume 1* London: Verso, 1994.

Althusser, Louis. "Ideology and Ideological State Apparatuses: Notes Towards an Investigation," in *Lenin and Philosophy and other essays*. New York: Monthly Review Press, 2001.

Amin, Samir. *Accumulation on a World Scale: A Critique of the Theory of Underdevelopment Volumes 1 and 2 Combined*. New York: Monthly Review Press, 1974.

Austin, Ian, and Vjosa, Isai. "Vancouver is Marooned by Flooding and Besieged Again by Climate Change." *New York Times*, November 21, 2022.  
<https://www.nytimes.com/2021/11/21/canada-flooding-climate-change.html>

Bach, Robert, Robert Duran, Laura Gibb, David Kaufman, and Kathy Settle. "Policy Challenges in Supporting Community Resilience," Working Paper by Multinational Community Resilience Policy Group (2010).

Bair, Jennifer, and Marion Werner. "Commodity Chains and the Uneven Geographies of Global Capitalism: A Disarticulations Perspective." *Environment and Planning A: Economy and Space* 43, no. 5 (2011): 988–97.

- Baird, Alec. Phil O'Keefe, Ken Westgate, and Ben Wisner, "Towards an Explanation and Reduction of Disaster Proneness," University of Bradford Disaster Research Unit Occasional Paper #11 (1975).
- Bakker, Karen. "Constructing 'Public' Water: The World Bank, Urban Water Supply, and the Biopolitics of Development." *Environment and Planning D: Society and Space* 31, no. 2 (April 2013): 280–300.
- Bankoff, Greg. *Cultures of Disaster: Society and natural hazard in the Philippines*. London: Routledge, 2003.
- Bankoff, Greg. "The historical geography of disaster: 'vulnerability' and 'local knowledge' in western discourse." In *Mapping Vulnerability: Disasters, Development and People* edited by Greg Bankoff, George Frerks, and Dorothea Hilhorst. London: Earthscan, 2004.
- Bankoff, Greg, Georg Frerks, and Dorothea Hilhorst. *Mapping Vulnerability: Disasters, Development and People*. London: Earthscan, 2013.
- Bankoff, Greg, and Dorothea Hilhorst. *Why Vulnerability Still Matters: The Politics of Disaster Risk Creation*. London: Routledge, 2022.
- Barmen, Jean. *West Beyond the West: A History of British Columbia*. Toronto: University of Toronto Press, 1991.
- Barnes, Trevor. "Industrial geography, institutional economics, and Innis," in *The New Industrial Geography: Regions, Regulation, and Institutions* edited by Trevor Barnes and Meric S. Gertler, 1-20. London: Routledge, 1999.
- Barnes, Trevor, and Eric Sheppard. *Spatial Histories of Radical Geography: North America and Beyond*. Oxford: Wiley, 2019.
- Barnes, Trevor, David W. Edgington, Kenneth G. Denike, and Terry G. McGee. "Vancouver, the Province, and the Pacific Rim." In *Vancouver and Its Region*, edited by Graeme Wynn and Tim Oke, 181-200. Vancouver: University of British Columbia Press, 1992.
- Barthes, Roland. *Mythologies*. Translated by Annette Lavers. New York: Hill and Wang, 1972.
- Barua, Maan. "Infrastructure and Non-Human Life: A Wider Ontology." *Progress in Human Geography* 45, no. 6 (December 2021): 1467–89.
- Béné, Christophe, Lyla Mehta, Gordon McGranahan, Terry Cannon, Jaideep Gupte, and Thomas Tanner. "Resilience as a Policy Narrative: Potentials and Limits in the Context of Urban Planning." *Climate and Development* 10 no. 2 (2018): 116-133.
- Benjamin, Walter. *Illuminations: Essays and Reflections*. New York: Schocken, 1968.

- Benjamin, Walter, *Reflections: Essays, Aphorisms, Autobiographical Writings*. New York: Schocken, 1978.
- Benjamin, Walter. "N [Re the Theory of Knowledge, Theory of Progress]." In *Benjamin: Philosophy, Aesthetics, History*, edited by Gary Smith, 43-83. Chicago: University of Chicago Press, 1983.
- Bennett, I.E., and J.H. Hammond. *History of the Panama Canal: Its Construction and Builders*. Historical Publishing Co., 1915.
- Boas, Franz. *Folk-tales of Salishan and Sahaptin tribes*. Lancaster and New York: The American Folklore Society, 1917.
- Bocking, Richard. *Mighty River: A Portrait of the Fraser*. Vancouver: Douglas & MacIntyre 1997.
- Bonilla, Yarimar. "The Coloniality of Disaster: Race, Empire, and the Temporal Logics of Emergency in Puerto Rico, USA." *Political Geography* 78 (April 2020).
- Bourbeau, Philippe. "A Genealogy of Resilience." *International Political Sociology* 12, no. 1 (March 1, 2018): 19–35.
- Brenner, Neil, Jamie Peck, and Nik Theodore. "Variegated Neoliberalization: geographies, modalities, pathways," *Global Networks* 10 no. 2 (2010): 182-222.
- Bricklight Films. *Lost Lake – Gone but not Forgotten (Sumas Lake)*. 2021.
- Braun, Bruce. "Buried Epistemologies: The Politics of Nature in (Post)colonial British Columbia." *Annals of the Association of American Geographers* 87 no. 1 (1997): 3-31.
- Braun, Bruce and Sarah Whatmore. *Political Matter: Technoscience, Democracy, and Public Life*. Minneapolis: University of Minnesota Press, 2010.
- Burn, Donald H., Paul H. Whitfield, and Mohammed Sharif. "Identification of Changes in Floods and Flood Regimes in Canada using a Peaks Over Threshold Approach." *Hydrological Processes* 30, no. 18 (2016): 3303-3314.
- Buci-Glucksmann, Christine. *Gramsci and the State*. London: Lawrence and Wishart, 1980.
- Burton, Ian, and Robert W. Kates. "The Perception of Natural Hazards in Resource Management." *Natural Resources Journal* 3 no. 3 (Summer 1963): 412-441.
- Burton, Ian, Robert W. Kates, and Gilbert F. White "The human ecology of extreme geophysical events." The University of Toronto Department of Geography. Natural Hazard Research Working Paper no. 1 (1968).



- Burton, Ian, Robert W. Kates, and Gilbert F. White. *The Environment as Hazard*. New York: The Guilford Press, 1978.
- Cameron, Laura. *Openings: A Meditation on History, Method, and Sumas Lake*. Montreal and Kingston: McGill-Queen's University Press, 1997.
- Canadian Pacific Railway. *British Columbia, Canada, Its Resources, Commercial Position and Climate (And Description of the New Field Opened Up By the Canadian Pacific Railway) With Maps and Information for Intending Settlers*. Unknown, 1890.
- Canadian Press. "Volunteers join forces to help clean up after unprecedented flooding in Abbotsford." *The Abbotsford News*. December 12, 2021. <https://www.abbynews.com/news/volunteers-join-forces-to-help-clean-up-after-unprecedented-flooding-in-abbotsford/>
- Cannings, Richard, and Sydney Cannings. *British Columbia: A Natural History of Its Origins, Ecology, and Diversity with a New Look at Climate Change*. Vancouver: Greystone Books, 2015.
- Cannon, Terry. "'Natural' Disasters and the Third World." In *Geography, Social Welfare and Underdevelopment* edited by Neil Smith, Malcolm Forbes and Michael Kershaw. St. Andrews Department of Geography (1977): 73-87.
- Cannon, Terry. "Vulnerability and Disasters." In *The Companion to Development Studies 3<sup>rd</sup> Edition*, edited by Vandana Desai and Rob Potter. London: Routledge, 2014.
- Carlson, Keith Thor. "Introduction." In *A Stó:lō-Coast Salish Historical Atlas*, edited by Keith Thor Carlson, 1-3. Vancouver: Douglas & McIntyre, 2001.
- Carlson, Keith Thor. *A Stó:lō-Coast Salish Historical Atlas*. Vancouver: Douglas & McIntyre, 2001.
- Carlson, Keith Thor. *The Power of Place, The Problem of Time: Aboriginal Identity and Historical Consciousness in the Cauldron of Colonialism*. Toronto: University of Toronto Press, 2010.
- Carrigg, David. "Catastrophic Flood Warning Issued for Sumas Prairie as Pump System Set to Fail." *Vancouver Sun*. November 16, 2021. <https://vancouversun.com/news/local-news/breaking-news-catastrophic-flood-warning-issued-as-pump-failure-leads-to-fraser-river-flooding>
- Carse, Ashley. "Keyword: infrastructure: How a humble French engineering term shaped the modern world." In *Infrastructures and Social Complexity* edited by Penelope Harvey, Casper Jensen, and Atsuro Morita, 27-39. London: Routledge, 2016.
- Castree, Noel. "Marxism and the Production of Nature." *Capital & Class* 24, no. 3 (October 2000): 5-36.

- Castree, Noel. "Unfree Radicals: Geoscientists, the Anthropocene, and Left Politics." *Antipode* 49 (January 2017): 52–74.
- CBC, "B.C. flood victims left high and dry as backlog of aid requests clogs approval queue." *CBC*. May 20, 2022. <https://www.cbc.ca/news/canada/british-columbia/british-columbia-floods-financial-aid-1.6457400>
- Chang, Kornel S. *Pacific Connections: The Making of the U.S.-Canadian Borderlands*. American Crossroads. Berkeley: University of California Press, 2012.
- Church, Michael. "Fraser River: History in a Changing Landscape." In *Landscapes and Landforms of Western Canada* edited by Olav Slaymaker, 381-393. Springer International Publishing, 2017.
- Church, Michael, and Don Ham. "Atlas of the alluvial gravel-bed reach of Fraser River in the Lower Mainland showing channel changes in the period 1912-1999." University of British Columbia Department of Geography (2004).
- Claire, Theo, and Kevin Surprise. "Moving the Rain: Settler Colonialism, the Capitalist State, and the Hydrologic Rift in California's Central Valley." *Antipode* 54 no. 1 (2022): 153-173.
- Clement, F.M. *Dyking, Drainage, and Irrigation Commission Report Part II. Dyking and Drainage Districts*. Victoria: Don McDiarmid, 1946.
- Collard, Rosemary-Claire, and Jessica Dempsey. "Politics of Devaluation," *Dialogues in Human Geography* 7 no. 3 (2017): 314-318.
- Collard, Rosemary-Claire, and Jessica Dempsey. "Accumulation by Difference-Making: An Anthropocene Story, Starring Witches." *Gender, Place & Culture* 25, no. 9 (2018): 1349–64.
- Cronon, William. "The Trouble with Wilderness: Or, Getting Back to the Wrong Nature." *Environmental History* 1 no. 1 (1996): 7-28.
- Cronon, William. *Changes in the Land: Indians, Colonists, and the Ecology of New England*. New York: Hill and Wang, 2003.
- Crosby, Alfred. *Ecological Imperialism: The Biological Expansion of Europe, 900-1900*. Cambridge: Cambridge University Press, 1986.
- Dahlberg, Rasmus, Olivier Rubin and Morten Thanning Vendelø. "Disaster research: an introduction." In *Disaster Research: multidisciplinary and international perspectives* edited by Rasmus Dahlberg, Olivier Rubin, and Morten Thanning Vendelø, 1-17. London: Routledge, 2016.

- De Mulder, Eduardo F.J. "Water." In *The Netherlands and the Dutch: A Physical and Human Geography* edited by Eduardo F.J. De Mulder, Ben C. De Pater, and Joos C. Droogleever Fortuijn, 7-34. Springer International Publishing, 2019.
- Demeritt, David. "Visions of Agriculture in British Columbia." *BC Studies* 108 no. 4 (1996): 29-59.
- Denevan, William M. "The Pristine Myth: The Landscape of the Americas in 1492." *Annals of the Association of American Geographers* 82, no. 3 (1992): 369-385.
- Deur, Douglas. and Nancy J. Turner. *Keeping it Living: Traditions of Plant Use and Cultivation on the Northwest Coast of North America*. Seattle: University of Washington Press, 2005.
- Donovan, Amy. "Geopower: Reflections on the Critical Geography of Disasters." *Progress in Human Geography* 41, no. 1 (February 2017): 44-67.
- Dutton, Rennie, and Cynthia Cornish. "Ethnicity and Class in the Farm Labour Process." In *Workers, Capital and the State in British Columbia: Selected Papers*, edited by Rennie Warburton and David Coburn, 161-176. Vancouver: University of British Columbia Press, 1988.
- Ekers, Michael. "Financiers in the Forests on Vancouver Island, British Columbia: On Fixes and Colonial Enclosures." *Journal of Agrarian Change* 19, no. 2 (2019): 270-94.
- Ekers, Michael, and Alex Loftus. "Revitalizing the Production of Nature Thesis: A Gramscian Turn?" *Progress in Human Geography* 37, no. 2 (2013): 234-52.
- Ekers, Michael, and Scott Prudham. "Towards the Socio-Ecological Fix." *Environment and Planning A: Economy and Space* 47, no. 12 (2015): 2438-45.
- Ekers, Michael, and Scott Prudham. "The Metabolism of Socioecological Fixes: Capital Switching, Spatial Fixes, and the Production of Nature." *Annals of the American Association of Geographers* 107, no. 6 (2017): 1370-88.
- Ekers, Michael, and Scott Prudham. "The Socioecological Fix: Fixed Capital, Metabolism, and Hegemony." *Annals of the American Association of Geographers* 108, no. 1 (2018): 17-34.
- Evenden, Matthew. *Fish Versus Power: An Environmental History of the Fraser River*. Cambridge: Cambridge University Press, 2004
- Evenden, Matthew. "Beyond the Organic Machine? New Approaches in River Historiography." *Environmental History* 23 no. 4 (2018): 698-720.
- Finn, Riley J. R., Lia Chalifour, Sarah E. Gergel, Scott G. Hinch, David C. Scott, and Tara G. Martin. "Quantifying Lost and Inaccessible Habitat for Pacific Salmon in Canada's Lower Fraser River." *Ecosphere* 12, no. 7 (2021).

- Fischbach, Franck. *La production des hommes: Marx avec Spinoza*. Paris: Libraries philosophique J. Vrin, 2014.
- Fischer, John Ryan. *Cattle Colonialism: An Environmental History of the Conquest of California and Hawai'i*. Chapel Hill: The University of North Carolina Press, 2015.
- Fisher, Robin. "Gold Miners and Settlers." In *A History of British Columbia: Selected Readings* edited by Patricia Roy, 24-48. Toronto: Copp Clark Pitman, 1989.
- Folke, Carl. "Resilience (Republished)." *Ecology and Society* 21 no. 4 (2016): 44.
- Forbes, C. *Prize Essay: Vancouver Island: Its Resources and Capabilities as a Colony*. Colonial Government, 1862.
- Foster, John Bellamy. "Marx's Theory of Metabolic Rift: Classical Foundations for Environmental Sociology." *American Journal of Sociology* 105, no. 2 (September 1999): 366-405.
- Foucault, Michel. *History of Sexuality Volume 1: An Introduction*. Translated by Robert Hurley. New York: Vintage 1980.
- Foucault, Michel. *Security, Territory, Population: Lectures at the Collège de France 1977-1978*. Translated by Graham Burchell. New York: Picador, 2007.
- Fraser, Nancy. "Roepke Lecture in Economic Geography—From Exploitation to Expropriation: Historic Geographies of Racialized Capitalism." *Economic Geography* 94 no. 1 (2018): 1-17.
- Fraser River Board. *Interim Report: Investigations into Measures for Flood Control in the Fraser River Basin, Appendix C History of Floods in the Fraser River Basin*. Victoria, 1956.
- Fraser River Board. *Final Report of the Fraser River Board on Flood Control and Hydro-Electric Power in the Fraser River Basin*. Victoria, 1963.
- Fraser Valley Dyking Board, *Interim Report on the Activities and Progress of the Fraser Valley Dyking Board from its Inception on July 22<sup>nd</sup> 1948 to January 31<sup>st</sup> 1949: A period of six months and nine days* (1949).
- Freeland, Anne. "Motley Society, Plurinationalism, and the Integral State: Álvaro García Linera's Use of Gramsci and Zavaleta." *Historical Materialism* 27 no. 13 (2019): 99-126.
- Frewer, Tim. "From Vulnerability to Immunization-A Genealogy of Early Attempts to Deal with the Climate: Climates of Vulnerability." *Singapore Journal of Tropical Geography* 37, no. 1 (January 2016): 43-58.

- Furlong, Kathryn. "Geographies of Infrastructure 1: Economies." *Progress in Human Geography* 44, no. 3 (June 2020): 572–82.
- Gandolfo-Lucia, Nick. "Eco-Marxism and regulation: one approach to ecological crisis." In *Regulation theory, space, and uneven development: conversations and challenges* edited by, Brandon Hillier, Rachil Phillips, and Jamie Peck, 77-98. Vancouver: 1984 Press, 2022.
- García López, Gustavo A. "Reflections on Disaster Colonialism: Response to Yarimar Bonilla's 'The Wait of Disaster'." *Political Geography* 78, (2020)
- Gidwani, Vinay. "The Work of Waste: Inside India's Infra-Economy." *Transactions of the Institute of British Geographers* 40, no. 4 (October 2015): 575–95.
- Gill, Bill. "Sumas." In *Nature's Fury: The Inside Story of the Disastrous BC Floods May-June 1948*. Canada: South Hill Publishers Ltd, 1948.
- Gillett, Nathan P., Alex J. Cannon, Elizaveta Malinina, Markus Schnorbus, Faron Anslow, Qiaohong Sun, Megan Kirchmeier-Young et. al. "Human Influence on the 2021 British Columbia Floods." *Weather and Climate Extremes* 36 (2022): 1-13.
- Gilmore, Ruth Wilson. "Public enemies and private intellectuals: Apartheid USA," *Race & Class* 35 no. 1 (1993): 69-78.
- Gilmore, Ruth Wilson. *Golden Gulag: Prisons, Surplus, Crisis, and Opposition in Globalization California*. Berkeley: University of California Press, 2007.
- Gilmore, Ruth Wilson. "Abolition geography and the problem of innocence." In *Futures of Black Radicalism* edited by Gaye Theresa Johnson and Alex Lubin. London: Verso, 2017.
- Gilmore, Ruth Wilson. "Globalization and US Prison Growth: From Military Keynesianism to Post-Keynesian Militarism." In *Abolition Geography: Essays Towards Liberation*, edited by Brenna Bhandar and Alberto Toscano, 199-223. New York: Verso, 2022.
- Gramsci, Antonio. *Selections from the Prison Notebooks* (trans. Quintin Hoare and Geoffrey Nowell-Smith). New York: International Publishers, 1971.
- Guldi, Jo. *Roads to Power: Britain invents the infrastructure state*. Cambridge: Harvard University Press, 2021.
- Guide to the Province of British Columbia for 1877-8, Compiled from the Latest and Most Authentic Sources of Information* [anonymous]. Victoria: T.N. Hibben & Co. Publishers, 1878.
- Hall, Stuart. "Encoding and Decoding the Television Discourse." In *Essential Essays Volume 1*, edited by David Morley, 257-276. Durham: Duke University Press, 2019 [1974].

- Hall, Stuart. "Culture, Media, and the "Ideological Effect."" In *Essential Essays Volume 1*, edited by David Morley, 298-336. Durham: Duke University Press, 2019 [1977].
- Hall, Stuart. "Gramsci's Relevance for the Study of Race and Ethnicity," *Journal of Communication Inquiry* 10 no. 2 (1986): 5-27.
- Hall, Stuart. *The hard road to renewal: Thatcherism and the crisis of the left*. London: Verso, 1988.
- Hall, Stuart, and Doreen Massey. "Interpreting the crisis: Doreen Massey and Stuart Hall discuss ways of understanding the current crisis." *Soundings* 44 (2010): 57-71.
- Hall, Stuart, and Bill Schwartz, "State and society 1880-1930." In *The Hard Road to Renewal*, 95-122. London: Verso, 1988.
- Hall, Stuart, Chas Critcher, Tony Jefferson, John Clarke, and Brian Roberts. *Policing the Crisis: Mugging, The State, and Law and Order*. London: MacMillan Press, 1978.
- Haraway, Donna. *Primate Visions: Gender, Race, and Nature in the World of Modern Science*. London: Blackwell, 1989.
- Haraway, Donna. "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century." In *Simians, Cyborgs, and Women: The Reinvention of Nature* New York: Routledge, 1991: 149-181.
- Harris, Cole. "The Fraser Canyon Encountered," *BC Studies* 94 no. 2 (1992): 5-28.
- Harris, Cole. *The Resettlement of British Columbia: Essays on Colonialism and Geographic Change*. Vancouver: University of British Columbia Press, 1998.
- Harris, Cole. *Making Native Space: Colonialism, Resistance, and Reserves in British Columbia*. Chicago: University of Chicago Press, 2002.
- Harris, Cole. "How did Colonialism Disposess? Comments from an Edge of Empire." *Annals of the Association of American Geographers* 94 no. 1 (2004): 165-182.
- Harris, Cole. "The Land Policies of Governor James Douglas." *BC Studies* 174 no. 2 (2012): 101-122.
- Harvey, David. *The Limits to Capital*. Oxford: Blackwell, 1982.
- Henderson, Jarett. " "No Money, but Muscle and Pluck": Cultivating Trans-Imperial Manliness for the Fields of Empire, 1870-1901." In *Making It Like a Man: Canadian Masculinities in Practice* edited by Christine Ramsay, 17-38. Waterloo: Wilfried Laurier University Press, 2011.

- Hewitt, Kenneth. "A pilot study of global natural disasters in the past twenty years." University of Toronto Department of Geography. Natural Hazard Research Working Paper #11 (1969).
- Hewitt, Kenneth. *Interpretations of Calamity from the Viewpoint of Human Ecology*. Boston: Allen & Unwin, 1983.
- High, Steven. "Native Wage Labour and Independent Production during the 'Era of Irrelevance.'" *Labour / Le Travail* 37 (1996): 243.
- Hinshaw, Robert W. *Living with Nature's Extremes: The Life of Gilbert Fowler White*. Boulder: Johnson Books, 2006.
- Hobsbawm, Eric. *The Age of Capital: 1848-1875*. New York: Vintage Book, 1996.
- Hodgins, W.E. *Correspondence Reports to the Ministers of Justice and Orders in Council Upon the Subject of Dominion and Provincial Legislation 1867-1895*. Ottawa: Government Printing Bureau, 1896.
- Horowitz, Andy, and Jacob A.C. Remes, "Introducing Critical Disaster Studies," in *Critical Disaster Studies* edited by Jacob A.C. Remes and Andy Horowitz (Philadelphia: University of Pennsylvania Press, 2021): 1-8.
- Hudson, Peter James. "Racial Capitalism and the Dark Proletariat." *Boston Review* February 20, 2018.
- Hunter, Justine. "Cost of rebuilding B.C. after flooding nears \$9-billion." *Globe and Mail*. February 19, 2022. <https://www.theglobeandmail.com/canada/british-columbia/article-cost-of-rebuilding-bc-after-november-storms-nears-9-billion/>
- Illner, Peer. "Who's Calling the Emergency? The Black Panthers, Securitisation and the Question of Identity." *Culture Unbound* 7, no. 3 (October 28, 2015): 479–95.
- Illner, Peer. "The Locals Do It Better? The Strange Success of Occupy Sandy." In *Eco Culture: Disaster, Narrative, Discourse* edited by Robert Bell and Robert Ficociello. Lanham: Lexington Books, 2017: 49-72.
- Illner, Peer. *Disasters and Social Reproduction: Crisis Response Between State and Community*, London: Pluto Books, 2020.
- Innis, Harold. *The Fur Trade in Canada: An Introduction to Canadian Economic History*. Toronto: University of Toronto Press, 2017 [1930].
- IPCC. *Climate Change 2022: Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Ed. H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck,

- A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)). (Cambridge: Cambridge University Press, 2022). In Press.
- Jenson, Jane. ““Different” But Not “Exceptional:” Canada’s Permeable Fordism.” *Canadian Review of Sociology & Anthropology* 26 no. 1 (1989):
- Jessee, Nathan. “Community Resettlement in Louisiana: Learning from Histories of Horror and Hope.” In *Louisiana’s Response to Extreme Weather*, edited by Shirley Laska, 147–84. Extreme Weather and Society. Cham: Springer International Publishing, 2020.
- Jones, G.I. Howerll. “The Urbanization of the Fraser Valley.” In *Lower Fraser Valley: Evolution of a Cultural Landscape: B.C. Geographical Series, Number 9* edited by Alfred H. Siemens, 139-162. Vancouver: Tantalus Research Limited, 1968.
- Kates, Robert W. “Natural Hazard in Human Ecological Perspective: Hypotheses and Models.” *Economic Geography* 47, no. 3 (July 1971): 438-451.
- Kates, Robert W., and Burton, Ian. “Introduction.” In *Geography, Resources, and Environment volume 1: Selected Writings of Gilbert F. White* edited by Robert W. Kates and Ian Burton. Chicago: University of Chicago Press, 1986.
- Kates, Robert W., and Burton, Ian. “Gilbert F. White, 1911-2006: Local Legacies, National Achievements, and Global Visions.” *Annals of the Association of American Geographers* 98, no. 2 (2008): 479-486.
- Keast, J. *The Naturalist in British Columbia* v. 2., London: Richard Bentley, 1866.
- Keighren, Innes M., Christian Abrahamsson, and Veronica della Dora. “On Canonical Geographies,” *Dialogues in Human Geography* 2, no. 3 (2012): 296-312.
- Kidd, Thomas. *History of Lulu Island and Occasional Poems*. Wrigley Printing Company Ltd., 1923.
- Kippnes, Al. “Hatzic.” In *Nature’s Fury: The Inside Story of the Disastrous BC Floods May-June 1948*. Canada: South Hill Publishers Ltd, 1948.
- Klein, Naomi. *The Shock Doctrine: The Rise of Disaster Capitalism*. Toronto: Alfred A. Knopf Canada, 2007.
- Klein, Naomi. *The Battle for Paradise: Puerto Rico Takes on the Disaster Capitalists*. Chicago: Haymarket, 2018.
- Koroscil, Paul M. “Soldiers, Settlement, and Development in British Columbia, 1915-1930.” *BC Studies* 54 no. 2 (1982): 63-87.
- Kruger, Marco, and Kristoffer Albris, “Resilience unwanted: between control and cooperation in disaster response,” *Security Dialogue* 52 no. 4 (2020): 343-360.



- Larkin, Bian. "The Politics and Poetics of Infrastructure." *Annual Review of Anthropology* 42 (2013): 327-343.
- Latour, Bruno. *We Have Never Been Modern*. Cambridge: Harvard University Press, 1991.
- Lawrence, Sharon. *Vedder Crossing, British Columbia: A Community History*. Chilliwack: Chilliwack Museum and Archives, 2005.
- Li, Tania. *The Will to Improve: Governmentality, Development, and the Practice of Politics*. Durham: Duke University Press, 2007.
- Lipietz, Alain. *Mirages and Miracles: The Crises of Global Fordism*. New York: Verso, 1985.
- Logie, Gordon. "Sumas Lake Reborn: A Tale of Topography" *Sparkgeo* (2021) <https://sparkgeo.com/blog/sumas-lake-reborn-a-tale-of-topography/>
- Lower Mainland Regional Planning Board. *The Lower Mainland Looks Ahead*. New Westminster: 1952.
- Lutz, John. "After the Fur Trade: The Aboriginal Labouring Class of British Columbia, 1849-1890." *Journal of the Canadian Historical Association* 3, no. 1 (2006): 69-93.
- Lyons, Natasha, Tanja Hoffmann, Debbie Miller, Andrew Martindale, Kenneth M. Ames, and Michael Blake. "Were the Ancient Coast Salish Farmers? A Story of Origins." *American Antiquity* 86, no. 3 (July 2021): 504-25.
- Macdonald, Katya C. "Crossing Paths: Knowing and Navigating Routes of Access to Stó:lō Fishing Sites," in *Towards a New Ethnohistory: Community-Engaged Scholarship Among the People of the River* edited by Keith Thor Carlson, John Sutton Lutz, David M. Schaepe, and Naxaxalhts'I (Albert "Sonny" McHalsie). Winnipeg: University of Manitoba Press, 2018.
- MacLachlan, Morag. *The Fort Langley Journals: 1827-1830*. Vancouver: University of British Columbia Press, 1998.
- Magione, Kendra. "Livestock death toll from B.C. flooding: 628,000 poultry, 12,000 hogs, 420 cows." *CTV News Vancouver*. December 2, 2021. <https://bc.ctvnews.ca/livestock-death-toll-from-b-c-flooding-628-000-poultry-12-000-hogs-420-cows-1.5691405>
- Malm, Andreas. *The Progress of This Storm: Nature and Society in a Warming World*. London: Verso, 2017.
- Mann, Geoff. "Should Political Ecology Be Marxist? A Case for Gramsci's Historical Materialism." *Geoforum* 40, no. 3 (2009): 335-44.
- Maple Ridge News Staff. "Flooding Closes Lougheed Highway Through Maple Ridge." *Maple Ridge-Pitt Meadows News*. November 28, 2021.

- <https://www.mapleridgenews.com/news/flooding-closes-lougheed-hwy-through-maple-ridge/>
- Marshall, Daniel. *Claiming the Land: British Columbia and the Making of a New El Dorado*. Vancouver: Ronsdale Press, 2018.
- Martens, Kathleen, and Tina House. “‘The land is speaking to us, and we need to listen,’ says UBCIC grand chief.” *APTN News*, November 19, 2021.  
<https://www.aptnnews.ca/national-news/b-c-flooding-british-columbia-sumas-prairie-ubcic/>
- Martin, Tara, Murray Ned, Leah Ballantyne, Ian Hamilton, Janice Kwo, Rayanna Seymoure-Hourie, Deborah Carlson, Riley Finn, and Kristen Walters. “Restoring Sumas Lake is an important step in BC flood recovery.” *The Globe and Mail*, April 14, 2022.  
<https://www.theglobeandmail.com/opinion/article-restoring-sumas-lake-is-an-important-step-in-bc-flood-recovery-climate/>
- Marx, Karl. *Theories of Surplus Value: Selections*. New York: International Publishers, 1952.
- Marx, Karl. *Capital: A Critique of Political Economy, Volume I*. New York: Penguin, 1976.
- Marx, Karl. “Wage Labour and Capital” in *Karl Marx & Frederick Engels Selected Works in One Volume*, 72-94. New York: International Publishers, 1986.
- Mayne, R.C. *Four Years in British Columbia and Vancouver Island: An Account of their Forests, Rivers, Coasts, Gold Fields, and Resources for Colonisation*. London: John Murray, 1862.
- McDonald, Robert A. *A Long Way to Paradise: A New History of British Columbia Politics*. Vancouver: University of British Columbia Press, 2021.
- McGillivray, Bret. *Geography of British Columbia: People and Landscapes in Transition*. Vancouver: UBC Press, 2005.
- McGowran, Peter, and Amy Donovan. “Assemblage Theory and Disaster Risk Management.” *Progress in Human Geography* 45, no. 6 (December 2021): 1601–24.
- McSheffrey, Elizabeth. “Sumas First Nation chief reflects on ‘disaster’ B.C. flooding where lake used to be.” *Global News* November 18, 2021.  
<https://globalnews.ca/news/8385289/sumas-lake-reflection-first-nations/>
- Mies, Maria. *Patriarchy and Accumulation on a World Scale: Women in the International Division of Labor*. London: Zed Books, 1986.
- Mijure, Ben. “Surrey Sikh community cooks thousands of meals, charts helicopters to help those reeling from severe storm.” *CTV News Vancouver*. November 18, 2021.

<https://bc.ctvnews.ca/surrey-sikh-community-cooks-thousands-of-meals-charters-helicopter-to-help-those-reeling-from-severe-storm-1.5671616>

- Mikkelsen, Phyllis. "Land Settlement Policy on the Mainland of British Columbia, 1858-1874" UBC Department of History MA Thesis (1950).
- Mitchell, Don. "Dead labour and the political economy of landscape—California living, California dying." in *Handbook of cultural geography* edited by Kay Anderson, Mona Domosh, Steve Pile, and Nigel Thrift, 233-248. London: Sage, 2003.
- Mitchell, James K. "Perspectives on Alternatives: Differentiation and Integration in Pursuit of a Better Fit between Society and Nature." *Progress in Human Geography* 32, no. 3 (June 2008): 451–58.
- Mitchell, Timothy. *Rule of Experts: Egypt, Techno-Politics, Modernity*. Berkeley: University of California Press, 2002.
- Monaghan, Jeffrey. "Settler Governmentality and Racializing Surveillance in Canada's North-West." *Canadian Journal of Sociology* 38, no. 4 (2013): 487–508.
- Moncrieff, Stan J. "Queensborough." In *Nature's Fury: The Inside Story of the Disastrous B.C. Floods May-June 1948*. South Hill Publishers, 1948.
- Moore, Jason W. *Capitalism in the Web of Life: Ecology and the Accumulation of Capital*. London: Verso, 2015.
- Moore, Jason W. "Metabolic Rift or Metabolic Shift? Dialectics, Nature, and the World-Historical Method." *Theory and Society* 46, no. 4 (September 2017): 285–318.
- Muckle, Robert James. *The First Nations of British Columbia: An Anthropological Overview, Third Edition*. Vancouver: UBC Press, 2014.
- Murton, James. *Creating a Modern Countryside: Liberalism and Land Resettlement in British Columbia*. Vancouver: University of British Columbia Press, 2007.
- Murton, James. "What J.W. Clark Saw in British Columbia, or, Nature and the Machine." *BC Studies* 142/3 (2010): 129-152.
- Myers, Reta. "The Red Cross." In *Nature's Fury: The Inside Story of the Disastrous BC Floods May-June 1948*. Canada: South Hill Publishers Ltd, 1948.
- Nelson, Andrew, and Michael Church. "The Geomorphic Impact of Placer Mining Along Fraser River, British Columbia." *Geological Society of America Bulletin* 124 no. 7-8 (2012): 1212-1228.
- Nelson, Andrew, and Michael Kennedy. "Fraser River Gold Mines and Their Place Names." *BC Studies* 172 (Winter 2011/2012): 105-108.

- Nelson, Sara H., and Patrick Bigger. "Infrastructural Nature." *Progress in Human Geography* 46, no. 1 (February 2022): 86–107.
- O'Connor, James. "Capitalism Nature Socialism: A theoretical introduction," *Capitalism Nature Socialism* 1 (1988): 11-38.
- O'Keefe, Phil, and Ben Wisner. "African drought—the state of the game." In *African Environment: problems and perspectives* edited by Paul Richards. London: International African Institute, 1975.
- O'Keefe, Phil, Ken Westgate, and Ben Wisner, "Taking the naturalness out of natural disaster," *Nature* 260 (April 1976): 566-7.
- Oliver, Jeff. "Harnessing the Land: The Place of Pioneering in Early Modern British Columbia." In *An Archeology of Land Ownership* Maria Relaki and Despina Catapoti, 170-191. New York: Routledge, 2013.
- Oliver-Smith, Antony. "Anthropological Research on Hazards and Disasters." *Annual Review of Anthropology* 25, no. 1 (October 1996): 303–28.
- Oliver-Smith, Antony. "Theorizing Vulnerability in a Globalized World: a political ecological perspective." In *Mapping Vulnerability: Disasters, Development and People* edited by Greg Bankoff, George Frerks, and Dorothea Hilhorst, 10-24. London: Earthscan, 2004.
- Pegg, Brian. "The Archeology of 1858 in the Fraser Canyon." *BC Studies* 196 (Winter 2017): 67-87.
- Perry, Adele. "Fair ones of purer caste": White women and colonialism in nineteenth-century British Columbia. *Feminist Studies* 23 no. 3 (1997): 501-524.
- Peters, Jessica. "Flood recovery forum in Abbotsford focused on 'breaking down silos.'" *The Chilliwack Progress*, July 15, 2022. <https://www.theprogress.com/news/flood-recovery-forum-in-abbotsford-focused-on-breaking-down-silos/>
- Phillips, Rachel, and Susanne Soederberg. "Making and Mastering Violent Environments: Following the Infrastructures of Accumulation in Coastal Louisiana." *Antipode* (online; 2022).
- Plana, Vincent. "Sunday's atmospheric river broke 20 rainfall records across BC." *Daily Hive*. November 15, 2021. <https://dailyhive.com/vancouver/atmospheric-river-rainfall-records-bc>
- Poulantzas, Nicos. *State, Power, Socialism*. London: Verso, 1980.
- Price, John, and Nick Claxton. "Whose Land Is It? Rethinking Sovereignty in British Columbia." *BC Studies* 204 (2020): 115-138.

- Provincial Bureau of Information. *Manual of Provincial Information: Province of British Columbia*. Victoria, 1930.
- Province of British Columbia, *Papers Connected with the Indian Land Question 1850-1875*. Victoria: Richard Wolfenden, Government Printer, 1875.
- Pulido, Laura. "Rethinking Environmental Racism: White privilege and urban development in Southern California." In *Annals of the Association of American Geographers* 90 no. 1 (2000): 12-40.
- Pulido, Laura. "Flint, Environmental Racism, and Racial Capitalism." *Capitalism Nature Socialism* 27, no. 3 (2016): 1-16.
- Pulido, Laura. "Geographies of Race and Ethnicity II: Environmental Racism, Racial Capitalism and State-Sanctioned Violence." *Progress in Human Geography* 41, no. 4 (2017): 524-33.
- Reimer, Chad. *Before We Lost the Lake: A Natural and Human History of Sumas Lake*. Halfmoon Bay: Caitlin Press, 2018.
- Rhiney, Kevon. "Dispossession, Disaster Capitalism and the Post-Hurricane Context in the Caribbean." *Political Geography* 78 (April 2020).
- Robinson, Cedric. *Black Marxism: The Making of the Black Radical Tradition*. Chapel Hill: University of North Carolina Press, 2021 [1983].
- Rodney, Walter. *How Europe Underdeveloped Africa*. London: Bogle-L'Ouverture Publications, 1972.
- Roy, Patricia. *A White Man's Province: BC Politicians and Chinese and Japanese Immigrants, 1858-1914*. Vancouver: University of British Columbia Press, 1989.
- Sanderson, Eric. "Nature's Fury." In *Nature's Fury: The Inside Story of the Disastrous BC Floods May-June 1948*. Canada: South Hill Publishers Ltd, 1948.
- Scalercio, Mauro. "Dominating nature and colonialism: Francis Bacon's view of Europe and the New World." *History of European Ideas* 44 no. 8 (2018): 1076-1091.
- Schrader, Ted. "Agassiz." In *Nature's Fury: The Inside Story of the Disastrous BC Floods May-June 1948*. Canada: South Hill Publishers Ltd, 1948.
- Schuller, Mark, and Julie K. Maldonado. "Disaster Capitalism." *Annals of Anthropological Practice* 40, no. 1 (May 2016): 61-72.
- Sewell, W.R.D. *Water Management and Floods in the Fraser River Basin*. University of Chicago Department of Geography Research Paper No. 100. Chicago: University of Chicago Press, 1965.

- Sherwood, Jay Allen. "A Political and Economic History of British Columbia, 1871-1903." University of Montana MA History Thesis (1976).
- Siemiatycki, Matti, Theresa Enright, and Mariana Valverde. "The Gendered Production of Infrastructure." *Progress in Human Geography* 44, no. 2 (2020): 297–314.
- Slaymaker, Olav, Michael Bovis, Margaret North, Tim Oke, and June Ryder. "The primordial environment." In *Vancouver and Its Region* edited by Tim Oke and Graeme Wynn, 17-37. Vancouver: UBC Press, 1992.
- Smith, Keith. *Environment Hazards: Assessing Risk and Reducing Disaster*. London: Routledge, 2004 [1991].
- Smith, Neil. *Uneven Development: Nature, Capital and the Production of Space*. Oxford: Blackwell, 1990 [1984].
- Smith, Neil. "There's no such thing as natural disaster," *Items: Insights from the social sciences.*, June 11, 2006. <https://items.ssrc.org/understanding-katrina/theres-no-such-thing-as-a-natural-disaster/>
- Smith, Neil, and Phil O'Keefe. "Geography, Marx and the Concept of Nature." *Antipode* 12, no. 2 (1980): 30–39.
- Soper, Kate. *What is Nature? Culture, Politics and the Non-Human*. London: Blackwell, 1995.
- Sproat, Gilbert Malcolm. *British Columbia: Information for Emigrants*. London: Agent-General of the Province, 1874.
- Stober, E., and Boynton, S. "Trudeau says B.C. flooding shows climate change impacts have arrived 'sooner than expected,'" *Global News*, November 24, 2021. <https://globalnews.ca/news/8399294/bc-flooding-canada-emergency-debate/>
- Sultana, Farhana. "Progress Report in Political Ecology II: Conjunctures, Crises, and Critical Publics." *Progress in Human Geography* 45 no. 6 (2021): 1-10.
- Swann-Quinn, J. (2019) More-than-human government and the Tbilisi zoo flood. *Geoforum* 102, 167-181.
- Swyngedouw, Eric. "Circulations and metabolisms: (Hybrid) Natures and (Cyborg) cities." *Science as Culture* 15 no. 2 (2006): 105-121.
- Swyngedouw, Eric. *Liquid Power: Water and Contested Modernities in Spain, 1898-2010*. Cambridge: MIT Press, 2015.
- Thomas, Peter D. *The Gramscian Moment: Philosophy, Hegemony, Marxism*. Chicago: Haymarket, 2010.

- Tierney, Kathleen. *The Social Roots of Risk: Producing Disasters, Promoting Resilience*. Stanford: Stanford Business Books, 2014.
- Tierney, Kathleen. "Resilience and the Neoliberal Project: Discourses, Critiques, Practices—And Katrina." *American Behavioral Scientist* 59, no. 10 (September 2015): 1327–42.
- Van Sant, Levi, Richard Milligan, and Sharlene Mollett, "Political Ecologies of Race: Settler Colonialism and Environmental Racism in the United States and Canada," *Antipode* 53 no. 3 (2021): 629-642.
- Vancouver Board of Trade, *Report of the Vancouver Board of Trade for the year 1897-1898*. Vancouver: Province Publishing Company, 1898.
- Vasko, Timothy Brewer. "Nature and the Native." *Critical Research on Religion* 10 no. 1 (2022), 7-23
- Vasudevan, Pavithra. "An Intimate Inventory of Race and Waste." *Antipode* (2019, online).
- Wakefield, Stephanie, and Bruce Braun. "Oystertecture: Infrastructure, Profanation, and the Sacred Figure of the Human." In *Infrastructure, Environment, and Life in the Anthropocene*, edited by Kregg Hetherington, 193–215. Duke University Press, 2020.
- Walker, Jeremy, and Melinda Cooper. "Genealogies of Resilience: From Systems Ecology to the Political Economy of Crisis Adaptation." *Security Dialogue* 42, no. 2 (2011): 143–60.
- Warburton, Rennie, and David Coburn, *Workers, Capital, and the State in British Columbia: Selected Papers*. Vancouver: University of British Columbia Press, 1988.
- Watt, K. Jane. *High Water: Living with the Fraser Floods*. Abbotsford: Dairy Industry Historical Society of B.C., 2006.
- Watts, Michael. "On the poverty of theory: natural hazards research in context." In *Interpretations of Calamity from the Viewpoint of Human Ecology* edited by Kenneth Hewett, 232-262. Boston: Allen & Unwin, 1983.
- Watts, Michael. "Now and then: the origins of political ecology and the rebirth of adaptation as a form of thought." In *The Routledge Handbook of Political Ecology* edited by Tom Perrault, Gavin Bridge, and James McCarthy, 19-50. London: Routledge, 2015.
- Weeks, Kathi. *The Problem with Work: Feminism, Marxism, Antiwork Politics, and Postwork Imaginaries*. Durham: Duke University Press, 2011.
- Weiler, Peter. *The New Liberalism: Liberal Social Theory in Great Britain 1889-1914*. London: Routledge, 1982.
- Whatmore, Sarah J. "Earthly Powers and Affective Environments: An Ontological Politics of Flood Risk." *Theory, Culture & Society* 30, no. 7–8 (December 2013): 33–50.

- Whatmore, Sarah J., and Catharina Landström. "Flood Apprentices: An Exercise in Making Things Public." *Economy and Society* 40, no. 4 (November 2011): 582–610.
- White, Gilbert F. "Human Adjustment to Floods: A Geographical Approach to the Flood Problem in the United States," University of Chicago Dissertation, 1942.
- White, Gilbert F. "A new stage in resources history." In *Geography, Resources, and Environment volume 1: Selected Writings of Gilbert F. White*, edited by Robert W. Kates and Ian Burton. Chicago: University of Chicago Press, 1986 [1953]).
- White, Gilbert F. "A perspective of River Basin Development." In *Geography, Resources, and Environment volume 1: Selected Writings of Gilbert F. White*, edited by Robert W. Kates and Ian Burton. Chicago: University of Chicago Press, 1986 [1957].
- White, Gilbert F. *Changes in Urban Occupance of Flood Plains in the United States*. Chicago: University of Chicago Press, 1958.
- White, Gilbert F. "Strategic aspects of urban floodplain occupance." In *Geography, Resources, and Environment volume 1: Selected Writings of Gilbert F. White*, edited by Robert W. Kates and Ian Burton. Chicago: University of Chicago Press, 1986 [1974].
- White, Gilbert F. *Natural hazards: local, national, global*. Oxford: Oxford University Press, 1974.
- White, Richard. *The Organic Machine: The Remaking of the Columbia River*. New York: Hill and Wang, 1996.
- Whyte, Kyle P. "Settler Colonialism, Ecology, and Environmental Justice." *Environment and Society: Advances in Research* 9 no.1 (2018): 125-144.
- Williams, Raymond. *Keywords: A Vocabulary of Culture and Society*. London: Fontana Press, 1988.
- Wisner, Ben. "Does radical geography lack an approach to environmental relations?" *Antipode* 10, no. 1 (March 1978): 84–95.
- Wisner, Ben. ""Build back better?" The challenge of Goma and beyond." *International Journal of Disaster Risk Reduction* 26 (December 2017): 101-105.
- Wisner, Ben. and Ilan Kelman. "Community Resilience to Disasters." *International Encyclopedia of the Social & Behavioural Sciences (Second Edition)*. Elsevier (2015): 354-360.
- Wisner, Ben, and Henry R. Luce. "Disaster Vulnerability: Scale, Power and Daily Life." *GeoJournal* 30, no. 2 (June 1993): 127–40.

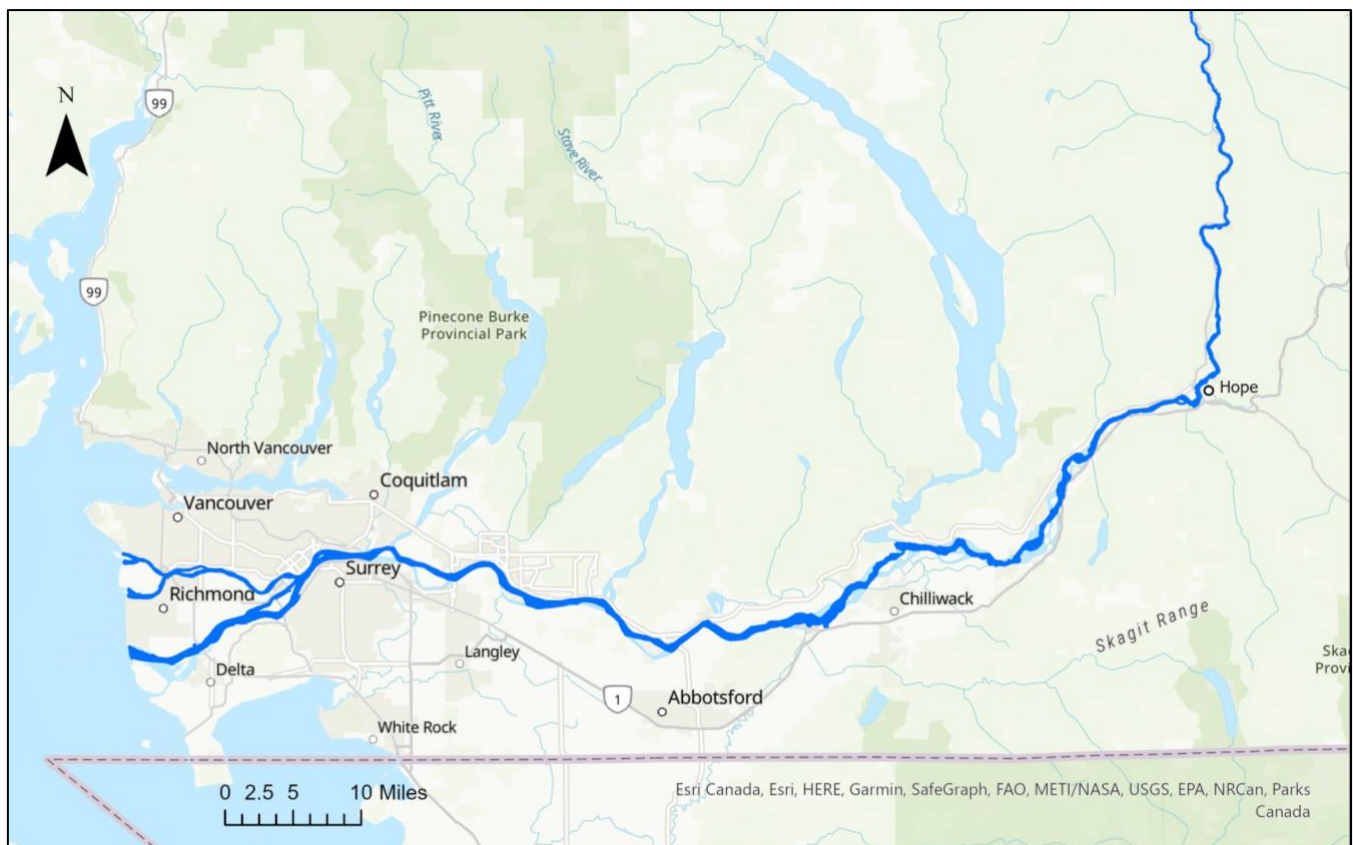


- Wisner, Ben, Piers Blaikie, Terry Cannon, and Ian Davis. *At Risk: Natural Hazards, People's Vulnerability and Disaster, Second Edition*. London: Routledge, 2004.
- Wood, Colin J.B. "Agriculture in Perspective." In *British Columbia: The Pacific Province, Geographical Essays* edited by Colin J.B. Wood. *Canadian Western Geographical Series* 36 (2001).
- Wood, Ellen Meiksins. *The Pristine Culture of Capitalism: A Historical Essay on Old Regimes and Modern States*. London: Verso 1991.
- Wood, Ellen Meiksins. *The Origin of Capitalism: A Longer View*. London: Verso, 2002.
- Wood, Stephanie. "How to build back B.C.'s flood infrastructure better." *The Narwhal*, November 20, 2021. <https://thenarwhal.ca/bc-flooding-2021-infrastructure/>
- Woods, Jodie R. "Sumas Lake Transformations." In *A Stó:lō-Coast Salish Historical Atlas*, edited by Keith Thor Carlson, 104. Vancouver: Douglas & McIntyre, 2001.
- Wynn, Graeme. "The Rise of Vancouver." In *Vancouver and Its Region* edited by Tim Oke and Graeme Wynn, 69-148. Vancouver: UBC Press, 1992.
- Wynter, Sylvia. "Unsettling the Coloniality of Being/Power/Truth/Freedom: Towards the Human, After Man, its Overrepresentation—An Argument." *CR: The New Cenennial Review* 3 no. 3 (2006): 257-337.

## Appendix: Maps

In this Appendix I provide several maps and a brief interpretation to concretize some spatial issues that could not be fully explored in the main text. In the body of the thesis, I provide reference to these maps at points where they are relevant.

*Map 1: The Lower Mainland of British Columbia, 2021*



The Lower Mainland of British Columbia encompasses both the Fraser Valley and Metropolitan Vancouver. The Fraser River is shown here in dark blue. The features of this map, particularly roads, rivers, lakes, and urban areas, are significantly different from how they would have appeared in the period under consideration in Chapters 2 and 3, i.e., the mid 19<sup>th</sup> to the mid

20<sup>th</sup> century. Perhaps most notably, Sumas Lake is missing (although see Figure 1 in Chapter 3, it sat and sometimes still sits in the valley between Abbotsford and Chilliwack). The map is, however, an accurate representation of the Lower Mainland during the floods of 2021, i.e., the present. I offer it here for two reasons: first, to give the reader unacquainted with British Columbia a spatial foothold; second, to demarcate the somewhat ambiguous territory of the Fraser Valley (FV). Today, the FV extends from Hope at the east end of the valley to Langley on both sides of the Fraser River. Metro Vancouver encompasses Vancouver and the surrounding, urban and suburban municipalities, including Delta, Surrey, and Coquitlam. Langley, the western edge of the FV, is also part of Metro Vancouver.

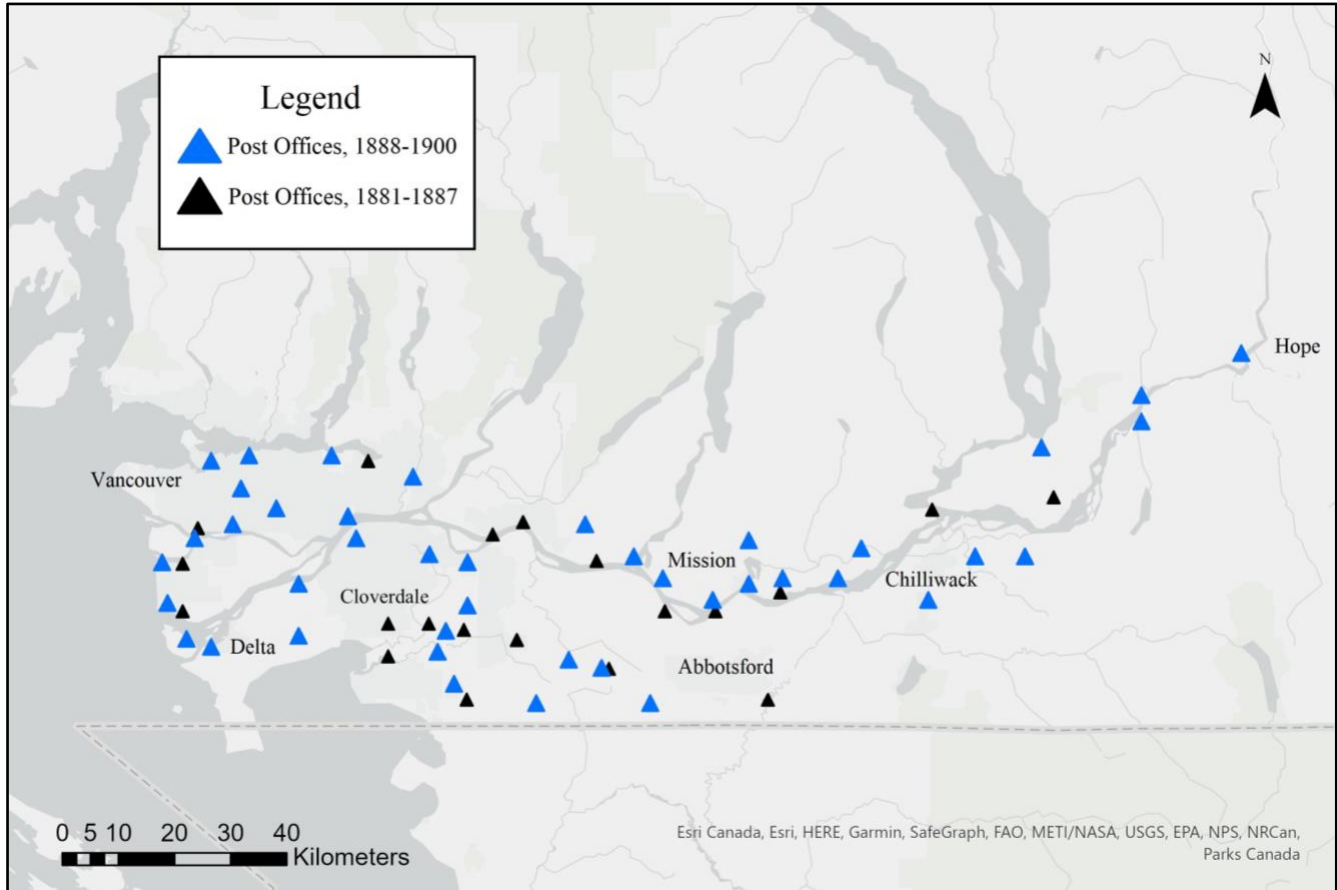
A distinction between relatively urban areas and the rural valley extends back to the colonization of the valley. As G. I. Howell Jones suggested in an excellent but somewhat dated essay, the urbanization of the FV began with the goldrush: an early distinction could be drawn between the relatively urban New Westminster and the agricultural valley.<sup>1</sup>

In Chapter 2, I treat settlers in the delta (i.e., present-day Richmond and Delta) as belonging to the Fraser Valley even though they are within the contemporary Metro Vancouver area. This is because these settlers were often farmers and shared much in common with the farmers in Chilliwack, Abbotsford, Mission, Matsqui, and others in the Fraser Valley. Not least among these shared qualities was a vulnerability to flooding.

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<sup>1</sup> G. I. Howell Jones, "The Urbanization of the Fraser Valley," in *Lower Fraser Valley: Evolution of a Cultural Landscape: B.C. Geographical Series, Number 9* edited by Alfred H. Siemens, 139-162 (Vancouver: Tantalus Research Limited, 1968).

Map 2: New Post Offices in the Fraser Valley, 1881-1900<sup>2</sup>



It is somewhat difficult to catalogue changing settlement patterns in the valley from the 1870s to the turn of 20<sup>th</sup> century. There are, however, a few sources of data. One of these is post office openings, which has been used by several historians to guess at population growth among new settlers in the valley.<sup>3</sup> The advantage to this particular data source is that it exists for most of the period under consideration in Chapter 2, and therefore it is relatively easy to show trends.

When a reasonable density of settlers formed in an area, one of the first things that would be requested was a post office. Given that the primary mode of land transportation was horses,

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<sup>2</sup> Post offices data was obtained by georeferencing maps created by G. I. Howell Jones for his essay “The Urbanization of the Fraser Valley,” 148.

<sup>3</sup> Barmen, *West Beyond the West*; Jones, “The Urbanization of the Fraser Valley.”

post offices needed to be relatively close to settlers. Consequently, mapping openings of new post offices gives a rough sense of new settlement.

The settlement pattern between 1881 and 1900 is particularly interesting due to the changes in the Lower Mainland that occurred during this period (e.g., the completion of the Canadian Pacific Railway, see Chapter 2) and the major floods that occurred in 1894 and 1896. Unfortunately, it is not possible to say from this data whether specific post offices in the 1888-1900 period opened before or after the floods.

A few general points can still be made about the changing human geography of settler-colonists in the valley, as well as the relevance of these changes for the floods of the 1890s and the state-led flood control that succeeded them. The first is quite simply that the population in the Lower Mainland grew, particularly after 1888. A few distinct centers emerge. First, in the delta, particularly due to salmon canneries clustering at the mouth of the river. Second, in Cloverdale and Langley (not listed, but immediately east of Cloverdale). These settlements are at the intersection of Old Yale Road and a recently completed railway line. We know from newspaper clippings that dikes at Langley broke and pasture was flooded, ruining crops. New settlements popped up along Old Yale Road towards Abbotsford (a clear line of triangles is visible). Also important for the 1894 and 1896 floods is the ring of settlements on the north and south side of the Fraser near Mission and Matsqui. Clustered right along river, it is clear from newspaper clippings that they flooded in 1894, washing out many farmers who had been there for less than ten years.

Therefore, although the data is inexact, it is reasonable to hazard that a significant portion of the growth of the population of the Fraser Valley in the period between the 1882 and 1894

floods occurred in flood-prone areas. This undoubtedly contributed to the severity of the 1894 and 1896 floods for settler-farmers relative to those of the 1870s and 1882.