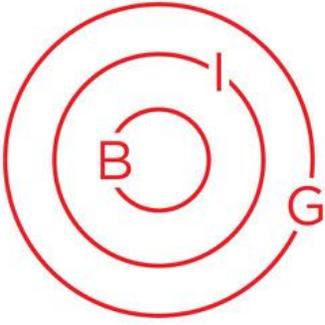




**BORDERS IN  
GLOBALIZATION**





**Borders in Globalization Research Project 27**

---

**Transborder Water Governance in  
the Pacific Northwest: The Case of  
Point Roberts Washington**

**Michael K. Lang**

**University of Victoria**

**Supervised by Emmanuel Brunet-Jailly**

*There may be a time down the road, once Point Roberts has water, when the demand keeps growing; you're dealing then with the size of the pipe. As Point Roberts' demand increases, the size of the pipe across the Fraser has to be increased — both arms of the Fraser. The size of the pipe at First Narrows has to be increased, our reservoir supply has to be increased, and so on. So at some point, if you proceed with this, we may feel that it doesn't make any sense to continue delivering water to Point Roberts, because the cost of the new supply will be excessive. Or there may not be a supply. Then we have a very serious problem on our hands.*

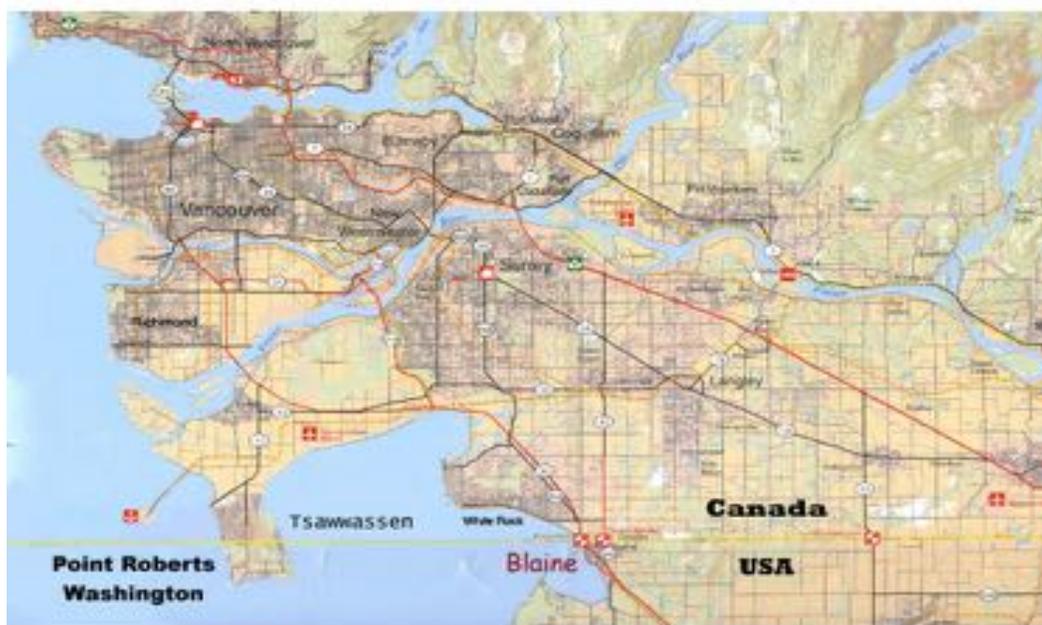
*Robert Arthur Williams, New Democratic Party Member of Assembly, 1987*

## **Introduction**

Point Roberts, Washington occupies an interesting space in transboundary relations between Canada and the United States. Located in the Northwest corner of Washington State, Point Roberts has no physical connection to the U.S, and must be reached by crossing two international borders when travelling over land (see Figure 1). This particular geographical identity requires an ongoing relationship between Canada and its Southern neighbour, as certain challenges that accompany life in Point Roberts require complex cooperation. Perhaps most significant is the transborder water transfer agreement that exists in the region. Point Roberts purchases its fresh water from the City of Vancouver, Canada, supported by a relatively unique and challenging transboundary relationship spanning nearly three decades (Minghi 2010).

The Pacific Northwest region is just one of many points across the continent that require ongoing transboundary water governance of this sort. Indeed, Canada and the U.S have cooperated formally on this vital task since creating the Boundary Waters Treaty in 1909 and the International Joint Commission (IJC), the board established by Canada and the United States for collaborative management of border-related issues, shortly thereafter. Over a century of collaborative management has resulted in many successful outcomes (for example, in the Great Lakes Region), however numerous “flashpoints”, or locations of growing concern (Clamen 2013; Norman et al. 2013) remind us of the need for research on this unavoidable type of collaboration.

**Figure 1: Point Roberts, Washington and Surrounding Region**



Source: Point Roberts Chamber of Commerce 2010

Transboundary water management is an issue of pressing inter and trans-national importance (Conway 2013; Pentland 2013), intersecting multiple empirical and theoretical streams. The politics of governance that comprise transboundary water management and the dynamics of decision-making that impact the resource's use (Norman, Bakker, and Cook 2012) are a main theme for this research. Drawing on the “politic of scale” literature predominant in the discipline of geography, scholars point to the devolution of environmental governance in recent decades from the state level to the local level, and in doing so problematize both the superiority of the state in matters of “local” governance and the political outcomes of such rescaling (Swyngedouw 2000). Furthermore, recent local research demonstrates that while an increase in sub-state governance activities has occurred along the divide, it has not resulted in increased local authority in water management (Norman and Bakker 2008). As such, the case in question exemplifies the continuities, particularities, and challenges facing contemporary water governance in the borderlands, where multiple levels of government purview overlap to create a complex governance arrangement.

Water security is a second important focus of attention. While the definition of this term is itself fluid and often used with contextual specificity (see Cook and Bakker 2012), water *insecurity* is generally recognized as lacking the sufficient volume of water to sustain the ongoing social and ecosystem needs of a watershed- a result that is forecasted for much of the Southwest United States in the coming decades. Point Roberts in particular has experienced water insecurity since the 1960s, requiring water be imported into the community, in one fashion or another, since the early 1970s (Forest 2010b).

Disturbingly, this phenomenon is now increasingly linked to climate change. Research conducted by the Intergovernmental Panel of Climate Change (2008) predicts that human-induced greenhouse gas inputs will likely alter weather patterns in such a way that drought is intensified in arid regions and rainfall increases in the North. Thus, Canada will likely receive more rain (albeit much will flow North towards the Arctic) and the United States less, which will only intensify the water stress currently experienced in the U.S (Bates et al. 2008). While this is not currently a pressing issue, it is increasingly noted as a concern for sustainable transborder water governance (Draper and Kundell 2007; Cooley and Gleick 2011; Pentland 2013) and thus, is a key motivation for conducting this research.

Indeed, the history of water security in Point Roberts has developed a distinctive *inter-local* (Forest 2010a) relation between these two locales, yet one marred by multiscalar complexity and uncertainty for the future. This will be brought to the forefront here by examining various aspects of the relationship including the legal context in which water transfers across the border now occur, the different degrees of policy and legislation that complicate a seemingly 'local' agreement, such as the North American Free Trade Agreement (NAFTA), and what lies ahead in light of these conditions. Taken together, these core foci elucidate an interesting and timely case study of sustainability in the Pacific Northwest region.

## Research Questions and Design

This research was guided by three questions:

1. **What challenges exist on both sides of the territorial border that might effect the existing supply and demand for fresh water in Point Roberts?**
2. **What is the forecast for the future hydrosocial relationship between the City of Vancouver and Point Roberts, considering the changing political and economic climate in which it exists?**
3. **What insights can be gathered from this case that will help us develop research focusing on sustainability in the borderlands, both in Canada/ US and elsewhere?**

Though this study is inherently transnational, in conducting the research it became clear that a significant component of the agreement delved from the politics and water governance practices in Canada. This was emphasized in the both case study methodology and theoretical framing that supported this research.

### Strategy of Inquiry: Case Study

This research followed an instrumental case study methodology (Creswell 2007; Stake 1995; Yin 2003) to the study of the water export relationship between Point Roberts, Washington and Vancouver, British Columbia. According to Yin (2003), case study involves the investigation of a “technically-distinctive situation” (13) of multiple variables and sources of evidence, thus requiring convergence through triangulation and a solid theoretical foundation. Stake (1995) recognizes this methodology as the “study of the particularity and complexity of a single case” (xi), ranging from a single person to a political process. Taking these definitions into account, this approach is recognized as the most suitable for the research at hand, for two key reasons.

First, following Stake (1995), instrumental case studies seek information about a wider issue— such as the ramifications of multiscalar governance changes on water exporting relationships between Canada and the United States – through the analysis of a particular case. While the case in question is valid, it is strategically selected to enlighten the greater issue. Second, because of the flexibility provided by case study design may not be afforded by other approaches (Creswell 2007). Following Yin (2003), case study methodology is adept when: (1)

answering ‘how’ or ‘why’ questions; (2) you cannot manipulate the behaviour of the actors involved and; (3) you want to uncover the contextual conditions of the phenomena because you believe they are relevant to the study (Baxter and Jack 2008). Considering these parameters, using a case study to research Canadian water agreements through a focused analysis of the Point Roberts context was the best methodological fit.

To emphasize the utility of the case study approach, I outlined the research design through a modified two-component research design structure offered by Yin (2003:20). This structure combines the study’s (a) questions and (b) units of analysis as a guide for thinking about a new case study project. Working through these components supported my choice of doing a case study and assist in selecting the most suitable research methods for this research topic (Yin 2003). This is discussed below.

Yin (2003) recommends case study design for research questions that seek to answer the ‘how’ of phenomena, or those that focus on process and change. This dialectical aspect is compatible with the epistemological foundations of the proposed research and is demonstrated in the following research questions; first, *what challenges exist on both sides of the territorial border that might effect the existing supply and demand for fresh water in Point Roberts?* Second, *what is the forecast for the future hydrosocial relationship between the City of Vancouver and Point Roberts, considering the changing political and economic climate in which it exists?* Finally, I seek to determine *what insights can be gathered from this case that will help us develop research focusing on sustainability in the borderlands, both in Canada/ U.S and elsewhere?* Taken together, these research questions elicit information about the agreement’s full term and provide insight into the challenges it, and perhaps others, now face due to the evolving conditions of contemporary transboundary water governance.

According to Yin (2003), determining the units of analysis is one of the most important elements in the case study research design process. The core unit of analysis for this research will be the water agreement between Point Roberts and Vancouver, and this unit involves select sub-foci that help to delineate the study’s scope. For example, the ‘agreement’ will include analysis of the original rationale for the export and the ongoing relationship between the two localities during the course of the agreement, until this point, and informed speculation about its future. Similarly, Stake (1995) stresses the importance of clarifying the “boundaries” of the case

in advance, so as to anticipate “key problems, events, attributes, spaces, persons, [or] vital signs” (52) that are particular to the context being studied. This can involve both temporal and spatial boundaries, as is the situation here. Indeed, the temporal boundaries of this research span nearly fifty years, from when Point Roberts first began to experience water scarcity and until present day. More so, however, the dialectical contributions of the theoretical frame used allow us to expand these boundaries beyond the present. This will be explained below. The spatial boundaries of this case are largely contingent on the borderland region in question (see Figure 1).

### **Data Collection and Analysis**

Case study methodology offers numerous forms of data. Yin (2003) argues that six specific forms are particularly suitable for case study: documents, archival records, interviews, direct observation, participant observation, and physical artefacts. This array provides a great deal of flexibility in collecting qualitative data. In considering the strategy of inquiry posed above, this research used a two-pronged approach to data collection, drawing on archival information and secondary source documents to study the case.

While the water export agreement in question was established in 1987, it was the result of many years of study and assessment leading up to this point (IPRB 1973). As such, collecting archival information detailing this process from regional and university libraries and in Whatcom County helped contextualize the historical conditions surrounding the necessity of the agreement. For example, archives provided information concerning how much ground water was available before the deal, therefore providing vital information about the conditions of water scarcity in Point Roberts (Gacek 1985). Next, secondary source documents were collected in order to better understand the contemporary context of water governance. Academic literature complimented government policy reports discussing relevant issues such as the NAFTA or sub-federal water management approaches that may impact the transborder agreement. In sum, these varied sources offered a comprehensive account of the Point Roberts waterscape.

### **Ethical Concerns**

This research was considered ‘low risk’ because the research did not involve human participants; therefore no ethics review was conducted.

## Theoretical Framing: The Hydrosocial Cycle

This research is rooted in a realist-constructivist conception of reality, with a firm footing in materialism (Foster and Clark 2008). Here, reality is viewed as an ongoing product of one's interaction with the concrete, tangible world, as a productive being (Marx 1971), yet a 'world,' as an ontological category, that is largely of our making. It is in this sense, the 'world' is not viewed as comprising two distinct categories of society and nature, but instead as one unified field of materially-informed social construction in which the 'world' beyond the social, namely, nature itself, has been actively constructed through historical and political process (Biro 2011; Vogel 1996). Thus, to speak of society is to speak of nature, and one cannot be separated from the other, because they are one and the same. Said differently, "all social . . . projects are . . . projects about environment, and vice versa" (Harvey 1996:189), and positioning 'nature' or even water in this way can help clarify this socially constructed divide.

The importance of political process and its role in constructing reality emphasizes the relevance of dialectical thinking for the research at hand. Bracketing the discussion above, dialectics offers a vantage point from which to view social or natural phenomena – such as water – not as stable or fixed in time, but instead as constantly in flux. This suits the general study of water because of the shared fluidity, yet it is also particularly fitting for this specific context. To use the history and current trajectory of governance and sustainability to discuss the *potential* implications of current or future transboundary water transfers requires a methodology that, following Flacks (1982), "stresses change, tension, conflict, and contradictions as basic elements of reality, rather than stability, harmony, consensus, and equilibrium" (18). Dialectics, therefore, supports a methodological starting point at which historical moments in the politics of water governance construct, over time, the existing 'waterscape' – or the socio-ecological intersection of power, capital and water, over space and time<sup>1</sup> – in which inter-local water transfers are now occurring.

Thinking relationally is also central to this framework; its helps clarify that 'things' become what they are via interaction with other 'things', through an emergent "process of

---

<sup>1</sup> See Budds and Hinojosa (2012), Loftus (2007), and Baviskar (2007) for recent interdisciplinary applications and critiques of this concept.

mutual becoming” (Linton and Budds 2014:5). This view lends itself to the analysis of water and its political interactions for it allows for the recognition of water’s constitutive role in, and for, social processes. According to Linton and Budds (2014), water is not simply acted *on*, for example through the use of dams or large-scale irrigation, but also acts *upon* societies, by encouraging flood mitigation strategies or necessitating migration due to climate-induced precipitation change, for example.

Linton and Budds (2014) recognize this dialectical-relational process as an important component of the *hydrosocial cycle* (Swyngedouw 2009; Boelens 2014; Linton and Budds 2014), such that the “relationship between water and politics is repositioned in a way that compels an examination of how water and its circulation internalizes and expresses politics, opposed to simply treating water as the *object* of politics” (8). Doing so works to demystify the ‘nature’ of water, as merely an element of the hydrologic cycle (or hydrosphere) (Linton 2008), and to challenge the polarization of nature-society through problematization and politicization – in short, to expose how water is socially and politically constructed. This then allows for varied understandings of the meaning of water for different actors or in different contexts (Linton and Budds 2014). Further, this vantage can help expose various recent historical moments of ‘hydrosociality’, or as Swyngedouw states, recognition of “the circulation of water as a combined physical and social process, as a hybridized socionatural flow that fuses together nature and society in inseparable manners” (2009:56). For example, Budds (2008) applies a hydrosocial analysis to show how competing demands for groundwater in Chile construct a waterscape that mirrors the antagonisms concerning mining development that exist in the region. Similarly, Boelens (2014) examines the anthropological significance of water for Andean indigenous communities, arguing that local metaphysical understandings of water are coopted by western interests, in order to exploit the resource.

As these examples demonstrate, thinking ‘hydrosocially’ helps for viewing water management not simply as a technical or administrative objective, nor solely as a product of social and political processes, but also as a constitutive element in these processes. With these insights in mind, hydrosocial analysis will be useful in characterizing the case at hand. Take, for example, the following statement made during a 1987 BC Legislative meeting by the Honourable Rita Johnson, then Minister of Municipal Affairs and Transit, where the feasibility of allowing the Point Roberts transfer was deliberated:

I think it's important for members in the House to realize that regardless of the routing, water will be taken to Point Roberts. It can either go from Blaine by way of an undersea pipe or it can go via the Greater Vancouver Water District, through British Columbia and through Delta. The costs are relatively comparable, but the maintenance of the undersea pipeline is more costly, and therefore the approach was made to enter into this agreement. *Regardless of the outcome of our discussion, there will be water going to Point Roberts. I think it's important that it can be controlled if the water goes through Delta; if it goes from Blaine undersea to Point Roberts, there's no Canadian input at all, no British Columbia input on the quantity of water.* I think that that pretty well sums up the argument. (Legislative Assembly of BC 1987:9)

Though brief, this quote is insightful. It illuminates the beginnings of a hydrosocial relationship between Point Roberts and the Greater Vancouver Regional District, one where water began as the object of political process and, as will be explored below, became *the determinant* of future relations. Indeed, water insecurity in Point Roberts necessitated the formation of a relatively unique political arrangement in the Pacific Northwest, but the availability, volume, and meaning of the water created a specific hydrosocial cycle of its own.

## Selected Themes in Water Management

In the following section we introduce various literatures relevant to the case study. Beginning first with information concerning trends in water management and the ‘scale’ at which it now takes place, each subsequent topic builds on those that come before in an attempt to offer comprehensive and linear contextualization of the Point Roberts case. However, some topics, such as transborder water governance, are relevant across the themes, so there is a certain degree of overlap as well.

### Scale and Governance

Discussions of ‘governance’ (Rhodes 1996; Gibbins 2001; Jessop 2004) and its impact on water management have increased in recent years (e.g. Sneddon and Fox 2006; Bakker 2010), as have debates pertaining to the ‘politics’ of scale in water management (Norman et al. 2015, 2013; Norman, Bakker, and Cook 2012; Norman and Bakker 2009). ‘Governance’ characterizes a distinctly different type of (environmental) management from what has traditionally occurred, one that moves beyond mainly state-led administration and operationalization of collective needs towards the diversification of stakeholders responsible for accomplishing these tasks.<sup>2</sup> This transition has occurred over the past three to four decades as economic and political understandings of the necessary roles of government have themselves changed. For example, Bakker (2010) argues that traditional water management authority has been superseded by arrangements reliant on dispersed responsibility; that “roles previously allocated to governments are now (controversially) categorized as more generic activities carried out by political institutions or other actors” (45). In some instances this has involved the decentralization of authority to lower levels of government, such as the shift from provincial to municipal (Furlong 2010; Norman and Bakker 2008). Governance changes in Canada have also encouraged the inclusion of private-sector participants in these sub-federal practices (Bakker 2007; Loxley 2010; Lang 2013).

The shift from ‘government’ to ‘governance’ in water management is largely related to the ‘scale’ at which such practices occur. Following Bakker, Norman, and Cook (2012) scale is a concept used to explain the spatial middle ground of geographic-environmental units and social-

---

<sup>2</sup> Defining this term can be difficult, and space does not permit a detailed examination of the various forms or interpretations of governance practices. See Rhodes (1996) if this is of interest.

political units of governance. To this end, they argue “scale is important because the size of and relationships between natural and social units is critical to understanding and evaluating environmental governance, in general, and water governance in particular” (2012:2). This statement indicates that scale – and the ‘rescaling’ of environmental governance overall – is not a fixed determination, and thus, that its relevance and role in management should be exposed and critiqued.

Recent debate surrounding the ‘politics of scale’ seeks to do just that – to flesh out the incongruences that arise from rescaling, or to challenge its existence all together. For some researchers the commonly held belief that devolution, or rescaling is beneficial for sub-federal governments – for they are often recognized as the most adept at making choices that suit their own needs (Harrison 1996; Paehlke 2001; Wismer and Mitchell 2005) – is not taken as a given, and they have offered critiques of ‘localizing’ governance that problematizes the assumption that it is the most suitable scale for environmental management (see Brown and Purcell 2005). As such, this critical approach has been used to examine the implications that rescaling environmental governance has for resources such as water (e.g. Maddock 2004). For example, structural political-economy analyses indicate that rescaling is not a linear, apolitical process but instead is thoroughly multi-scalar and often motivated by the interests of stakeholders like NGOs or private business (Swyngedouw 1997, 2000; also Cohen and McCarthy 2015). In a recent study of transboundary water governance along the Canada-US border, Norman and Bakker found that the empowerment of local actors that accompanied increased stakeholder involvement did not equate to increased authority. Their findings indicate “that significant and systemic barriers exist to effective transboundary water governance at a local scale, including asymmetrical participation, mismatched governance cultures and structures, spatial distance, and limited capacity (Norman and Bakker 2008:112; also Norman and Bakker 2015). In sum, the literature concerning governance and scale indicate that while involvement in water management practices has diversified, this does not always translate to more equity, nor should it be a given that the local scale is paramount to others. This insight will help elucidate the relational complexity of transboundary water governance that impacts the Point Roberts case.

## **The Business of Water**

For roughly two decades, and to varying degrees, water management has transitioned to a new model of governance characterized by the incorporation of non-governmental, private sector actors in a variety of management practices. Concomitant changes now present in the water sector include the re-articulation of operating principles through ‘best practice’ commercial management norms; the reallocation of authority away from government purview, and an increasing degree of private-sector control in service provision- all trends that characterize what is referred to as ‘market environmentalism’ (Bakker 2014; Furlong 2010). Critics associate the rationale for this shift with the ongoing trend of public-sector ‘neoliberalization’, or the market-oriented re-calibration of principles and practices concerning water management around the world (Bakker 2010; Furlong 2010). In Canada, advocates of this governance approach, like the Federal Government and private industry, argue that there is great economic imperative to adopt these norms, as the fiscal pressures of providing water services – exemplified by the staggering infrastructure deficit of between \$50-145 billion (Mackenzie 2013) – preclude exclusively public provision (Dupuis and Ruffilli 2011). This in part has prompted the uptake of user fees being assessed by sub-federal governments as cost-recovery measures for mitigating the financial burden local water services (Furlong and Bakker 2010).

The literature exploring market-based water governance is vast (see Bakker 2003, 2010, 2013; Barlow 2007; Castro 2008; Harris et al. 2013) and beyond the scope of this report, however it is important to note that the domestic results of one aspect, privatization, have been less than ideal. Research has demonstrated that regulatory lapses in effective governance have had ill effects for human health (Prudham 2004) and water conservation (Furlong and Bakker 2010), and recent economic analyses calls into question the efficacy of privatizing water infrastructure and service delivery as a necessary alternative to public provision (Loxley 2010; Lang 2013). Indeed, ‘public’ water provision in Canada occupies a precarious space, one of competing motivations, ineffective outcomes, and uncertainty for future autonomy. Its converse, commodified water, therefore garners a great deal of attention in Canada, and this will be explored in more detail below.

## **The Watershed Approach**

Though the watershed is now increasingly recognized in the water management literature as a paramount scalar boundary for effective ecological governance (Barrow 1998; Mitchell 2005;

Warner 2008; Parkes et al. 2010), it is not necessarily novel. In fact, records show that basins were demarcated in ancient China (Molle 2009), indicating the long-standing history of application to water management needs. More locally, this approach is embraced by federal environmental institutions like the US EPA (2008), Environment Canada (2013), and the International Joint Commission (Clamen 2013), thus indicating the success of this comprehensive approach for managing both domestic and shared water resources.

As Davidson and de Loë (2014) make clear, this popularity is in large part due to the perceived ‘naturalness’ of the basin as a territory, with boundaries that are delineated through topography, hydrology, and gravity, all affecting the drainage of water into a common body (Warner et al. 2008; Parkes et al. 2010). It is the path of least resistance; the physical boundaries created by geology and by water itself. Subsequently, some studies have argued that the watershed boundary approach should be used to contour social and political boundaries, forming a more holistic. “post-sovereign, hydrologically based approach to water governance” (Norman et al. 2013:14; also Schmidt and Morrison 2012). This is endorsed by the belief that adhering to this scale or governance will align the various priorities impacting water management (Davidson and de Loë 2014), in practice this is not always the case. A growing body of literature calls into question the supremacy of the watershed as a spatial scale, and largely because of its incompatibility with political boundaries (Davidson and de Loë 2014; Cohen and Davidson 2011; Norman and Bakker 2008; Warner et al. 2008; Blomquist and Schlager 2005). For example, Blomquist and Schlager (2008) find that applying a watershed approach is often not achieved in practice, a shortcoming that is often attributed to political shortcomings in the selection of determination of boundaries, stakeholder accountability, and decision-making. Cohen and Davidson (2011) use the term ‘policy-shed’ to characterize the geographical area over which a government entity has authority to address these sort of *governance* issues, as opposed to more technical or scientific pursuits of hydrological management. More so, Warner and co-authors recognize watersheds as the *product of politics all together*, and one that imbues this scale with an unquestionable hegemony that often interferes with using more suitable scales of governance (2008). Thus, they call for a re-politicization of water governance “through democratic deliberation on desirable institutional configurations for water management” (2008:124). Therefore, as this research seems to indicate, there is nothing truly ‘inherent about

the watershed’ (c.f. Brown and Purell 2005) as the best scale of governance in the context.<sup>3</sup> Political boundaries of good governance – both material, like a border, or institutional, like competing legislation – may interfere, but they may also help lift the scale to new, polycentric (Blomquist and Schlager 2005:109) forms like that which has developed in the Pacific Northwest, where the ‘thickening’ of governance now involves collaboration between governments at various levels, different forms of sovereignty (including First Nations), and the diversification of stakeholders, all of whom are working through existing borders to manage shared waters (Norman and Bakker 2015).

### **Water Insecurity and Climate Change**

Viewed historically, the Point Roberts agreement was created because water scarcity became unmanageable in the region, requiring outside supply, so it is pertinent that we review contemporary research on water security here in order to sufficiently characterize the case study. At that time there was little mention of ‘water security’ or ‘scarcity’ on the Point; the lack of groundwater or surface flow was simply discussed as “insufficient” (IPRB 1974:2) for current needs. Now, after nearly forty years, this issue has developed a focused, yet complex meaning in scientific practice and political discourse. Indeed, water security is now a leading priority of transnational research organizations, such as UNESCO’s *Institute for Water Education* (Griffiths and Lambert 2013), and the collective goal of providing water security has had political support since a meeting of government officials at the 2000 World Water Forum, where water security was declared a common goal of the 21<sup>st</sup> century (World Water Forum 2000).

Water security has also garnered extensive and diverse academic attention as of late (Grey and Sandoff 2007; Cook and Bakker 2012; Zeitoun 2011; Bakker 2012; Lankford et al. 2013). Following many leading experts on the issue (see Lankford et al. 2013), we recognize here that defining water security is a challenging task, largely because of the resource’s imbrication in so many different facets of *human* security, like food systems, national security, energy sovereignty, and ecosystem health (see Zeitoun 2011). Cook and Bakker (2012) have identified four themes relating to water security in published research: water availability, human vulnerability to hazards, human needs, and sustainability. With these insights in mind, we adopt the following as a working definition of water security: the availability of a suitable amount of water for domestic,

---

<sup>3</sup> See Cohen and Davidson (2011) for a recent in-depth review of the many critiques raised against watershed management.

economic, and ecosystem needs, while assuring all are secure from preventable water-related hazards (Grey and Sandoff 2007). The review here review can only scratch the surface of the issues requiring this emerging multidisciplinary field, so focus will be given to a key driver for much of this research: climate change and its impact of water security.

It is now axiomatic to state that climate change poses a serious threat to securing water resources around the world. Indeed, there is growing consensus that humanity, through its ever-developing capacities, has caused an epochal geologic shift into the ‘anthropocene,’ an irreversible state of environmental change (Crutzen 2002; Rockström et al. 2009) in which water systems hold a significant degree of the impact (Nemec and Shaake 1982; Arnell 1999; Vörösmarty et al. 2004; Rockström et al. 2015). Changes in atmospheric temperature and greenhouse gas composition have been shown to cause major shifts in the hydrological cycle, effecting patterns of precipitation, global ice melting, and weather predictability (Zhang et al. 2007; Bates et al. 2008; Field et al. 2012; also Conway 2013). For example, a recent *Special Report on Extreme Events* published by the IPCC states with medium confidence that some regions of the world have experienced more intense drought events, and that significant high levels of precipitations have been reported in some regions, both as a result of climatic change (Field 2012). Interestingly, the only projections reported with *high confidence* are those detailing the social and economic impact of extreme weather (Field 2012). Thus, this highlights the *certainty of climate uncertainty* concerning water – that regardless of the discrepancies in understanding its manifestations, its effects on human settlement and behaviour will be extreme and will challenge efforts towards water security.

Canada will not likely be spared from this, regardless of the supposed ‘water abundance’ that lives in our collective imaginary (Sprague 2007). Though it is commonly stated that Canada holds twenty five percent of the world’s fresh water, this is false. When the distinction between water stock – water in lakes, that can only be used once – and water supply – that which regenerates via the hydrological cycle – are taken into account, Canada hold only 6.5 percent of the renewable flow on earth (Sprague 2007). Of this volume, less than half is readily available for human use. Therefore, the Great White North is not nearly as ‘white’ as once thought; it too is susceptible to water insecurity.

As noted above, The IPCC projects that precipitation patterns will continue to change across much of the continent. Drought events of increasing intensity are likely to occur in the South-Western United States, and rainfall is very likely to increase in high altitudes (Bates et al. 2008), much of which will drain north towards the Arctic. Studies project, with high confidence, that river run-off is likely to decrease as a result of climate change, and this forecast is even more worrisome when groundwater is taken into account. Recent research indicates that despite an overall lack of sound science concerning the relationship between climate change groundwater levels in North America, withdrawals are estimated to increase in the coming decades (Taylor et al. 2012). Therefore, the water security of Western North America is highly uncertain, with more eyes likely looking north as the future source of water supply.<sup>4</sup>

### **Climate Change and Transboundary Water**

This uncertain future of climate change and water availability pulls the debates surrounding transborder water governance into the present discussion.<sup>5</sup> This type of governance arrangement, usually involving two or more countries working to manage a shared waterway, is receiving increased attention as climate change forces us to question their fixity and stability (Falkenmark and Jägerskog 2010; Cooley and Gleick 2011; Gleick 2011; Zentner 2012; Earle et al. 2015). Water expert Peter Gleick has gone so far as to state that “existing agreements and international principals for sharing water will not adequately handle the strain of future pressures, particularly those caused by climate change” (2011).

This potential inadequacy is largely due to the assumptions of longevity and stability inherent in such agreements from the time of formation. Nemeč and Shaake (1982) recognized this early, characterizing this assumption as the ‘stationary’ problem; the fallacy in water management that hydrological conditions under which agreements were created would not change over time. Recent studies have demonstrated the challenges arising from ‘stationary’ governance agreements impacted by climate change, like precipitation variability in Sub-Saharan Africa (Conway et al. 2009) or drought in Australia’s interior (Vernon Kidd and Kiem 2009). Cooley and Gleick (2011) argue that existing treaties or agreements must be evaluated and amended so to include measures aimed at improving their flexibility; effectively ‘climate-

---

<sup>4</sup> The severe drought in California has revived debate concerning the feasibility of piping more water from the North. Much of this discussion does not cross the line from popular media to the policy realm (Dembicki 2015; Stockton 2015), and rarely does it involve a critique of climate change and the impact it has on global water issues.

<sup>5</sup> This topic will be introduced in the next section.

proofing' them for success in the future. Taken together, this research indicates that determining how transboundary water agreements can accommodate changing climatic conditions will be a leading focus of water management practices in the future. As Conway summarizes well, "climate change undermines the basic assumptions and principles of resource management – the practice of relying on observations from the past to develop statistical distributions to represent current and future conditions" (2013:81), and this is indeed the case for transboundary water governance practices, including those along the Canada-U.S border.

The Columbia River Treaty, now up for renegotiation after fifty years of mitigation, offers a fitting example of both the stationary nature of transboundary water governance and the necessity to incorporate knowledge of climate change into future agreements. The initial conditions for the agreement – flood control and hydroelectric generation – are still present in discussions of a new treaty (see Shurts and Paisley 2013), though added are concerns about the unpredictability of snowpack melting precipitation in the region, and calls for institutional mechanisms for adapting to them (Osborn 2012; Sandford et al. 2014). Thus, what lies ahead in Columbia River governance is still unknown, though policymakers would be remiss not to foreground climate change adaption in a transboundary agreement that covers another fifty years.

### **Transboundary Water Governance**

Transboundary water governance and management practices constitute a field of growing importance around the world. Indeed, 263 international river basins and over 270 transboundary aquifers exist around the world (Jarvis and Wolf 2010), demanding the need for cooperation in managing water resources and for diversification in knowledge production and stakeholder involvement via transboundary water governance. The United Nations (UN) estimates that more than 3,600 treaties or agreements have been signed in response of this shared responsibility, and its designation of transboundary water as a focus area for the *International Decade for Action 'Water for Life' 2005-2015* indicates the pressing importance promoting this vital task (UN 2004).

Of the 3,600 treaties that have emerged over the past 700 years, those signed in the last century have dealt primarily with water use, development, and sustainability, while earlier agreements concerned navigation (UN 2004). Thus, the dominant focus of transboundary water governance is now on coastal landward waters and on inland waters such as rivers, lakes, and

groundwater. Giordano and Wolf (2003) note that a total of 145 countries are riparian (or border another by waterway), covering 45 percent of the lands surface and account for approximately 60 percent of global river flow (also Wolf et. al 1999). Recognition of this hydrological interconnectedness, coupled the challenges of population growth, unequal development, and climate uncertainty have spurred the exaction of numerous initiatives, like declarations for organization collaboration (such as the *Decade for Action* noted above) and interdisciplinary conventions, all in an attempt to mitigate growing water ‘crises’ (Gleick 1993; Bakker 2010; Lankford et al. 2013).

As such, a breadth of information on transboundary water governance has been compiled in the past decades, to which I now turn. This will be divided into two sections, and along scalar lines. The first section will take stock of the literature impacting large-scale transboundary water management between Canada-and the U.S, highlighting some interrelated issues like scale and governance, and water insecurity and climate change. Attention is first given to an important institutional apparatus of transboundary governance, the IJC. The second section introduces a somewhat less-developed literature concerning the particular type of transboundary water effecting Point Roberts, namely ‘trans’ or ‘inter-local’ water sharing agreements (Forest 2010; Conca 2008).

### **Canada-U.S Transboundary Water Governance**

As Jarvis and Wolf (2010) remind us, “water management is, by definition, conflict management” (125), and this is a suitable way to characterize the history of shared governance along the Canada-U.S border. This is perhaps easier to recognize when we considering that 40% of the boundary is composed of water (Environment Canada 2013) (see figure 2 below). While no significant impasse has been met in discussions between these two countries, their shared geography has necessitated the creation of intergovernmental agencies responsible for mitigating water-related conflict.

Indeed, the U.S and Canada share a geologic history of glaciation that formed much of the landscape now influencing waters management in both countries. Take the Columbia River in the West and the Great Lakes of the East as examples; both are the legacy of glacial retreat that finalized roughly 20,000 years ago. The Columbia, fed mainly by the Canadian Rocky Mountain Basin, is one of the largest rivers by volume in Western North America, and an

integral vein for the ecologies, cultures, and economies that rely upon it (Shurts and Paisley 2013). Similarly, the U.S Environmental Protection Agency (EPA) estimates that the Great Lakes hold an estimated 21 percent of the world's total surface water and covering an area of 244,000 square kilometers, with a regional population of roughly 35 million people (EPA 2012) (see Figure 2). With only these two examples in mind, the scope of cooperation needed to manage shared water along the Canada-U.S border becomes apparent, and helps clarify why this has been a concerted federal focus for over one hundred years (IJC 2011).

**Figure 2: Shared Surface Waters Along the Canada-U.S Border**



Source: Wikipedia 2011

### **The International Joint Commission (IJC)**

Growing realization in Canada of the need for a concrete plan for managing water resources shared with the United States led to the creation of the Boundary Waters Treaty (BWT) and the IJC (Norman et al. 2013). The BWT was initially crafted to solidify existing provisions between Canada and the U.S concerning navigation and the regulation of transboundary diversions (Knox

2008). Disputes pertaining to the St. Mary and Milk Rivers were already causing tension between the two countries, and necessitated formal government attention (IJC 2011). Therefore, following nearly a decade of deliberation involving the creation of the short-lived International Waterways Commission and some conflict resolution, the BWT was signed in Washington on January 11, 1909, providing the authority to establish the jointly appointed IJC (IJC 2009).

The IJC was created as a governing body designed to investigate transboundary water disputes between the Canada and the US, to monitor their existence, and to offer recommendation on equitable solutions (Norman et al. 2013). The committee structure has not changed; it is comprised of 3 members assigned by each country, which, in its time, has set up more than 20 boards to assist in achieving its mandate (IJC 2013). The first 50 years of IJC activity largely focused on water governance issues pertaining to development, like irrigation and hydroelectric power.

**Figure 3: Borderland Territory Governed by the IJC**



Source: Clamens 2005 [click to expand possible???](#)

As Clamen (2013) notes, work during these decades involved a more technocratic approach, seeking to resolve issues through engineering initiatives and via legal avenues. The last 50 years, however, have seen a diversification of issues needing joint attention, such as pollution, water quality, and river basin development (Clamen 2013). During this period the IJC has also become more involved in research and, as a result, has dedicated more attention to stakeholder engagement and participation (Clamens 2005; Wolf and Newton 2010). In fact, this has become a specific objective of the IJC over the last two decades; as stipulated in the report *The IJC and the 21<sup>st</sup> Century*, the IJC has developed a quasi political framework that endeavours to increase consultation and consensus building, engage local governments, and provide a forum for public participation (IJC 1997).<sup>6</sup> This development is indicative of changes in water management away from exclusively Federal, top-down management and towards a more inclusive, multiscale approach to water governance between Canada and the US (Norman et al. 2013; Norman and Bakker 2009; Pentland and Hurley 2007).

IJC investigations have focused primarily on issues occurring in the Great Lakes Region, with limited involvement in disputes on the West Coast. A notable case occurred in 1942, however, when the committee deliberated on the feasibility of raising the Ross Dam in Canada to increase hydroelectric output (Alper and Monahan 1987). The Point Roberts context also received IJC attention in the 1970s, and will be discussed in more detail below.

While the IJC has had many successes in transboundary water management over the past century, it is important to note that the treaty is not without potential flaws. One critique lies in the scalar distribution of reporting power for issues that warrant its involvement. The IJC cannot act on problems raised by provinces, territories, states or municipalities, so a local problem getting much attention and requiring an expedited response can only be pursued once a federal referral is made (Wolf and Newton 2010). According to the Institute for United States Policy Research (2007), this leads to situations where formal political authority is exercised instead of engaging the IJC, which limits its institutional capacity to remedy disputes. Another significant criticism is that the treaty has limited geographic authority in determinations concerning river basins, ostensibly limiting their ability to adopt an ecosystems-based approach to water

---

<sup>6</sup> There are six elements total. The remaining three include: joint fact finding; objectivity and independence, and; flexibility. For more information see the IJC (1997) and Clamens (2005).

management (Wolf and Newton 2010). However, Clamen (2013) argues that an ecosystems approach has been incorporated in the relatively recently formed International Watershed Board and its associated initiatives, which seeks to draw together ecosystems planning, local involvement, and increased integration within a defined hydrological drainage area (see Figure 3). Though considering the popularity and successes of the ecosystems approach to date (eg. Roy, Barr, and Venema 2011; Reyers et al. 2013) this possible shortcoming may become more significant as climate patterns change and regional water uses policies subsequently adapt, requiring a more flexible approach to governance. Nevertheless, the IJC has helped remedy over 120 issues arising between Canada and the US over the last century and is recognized internationally as a pillar of ‘good governance’ in transboundary water management.

### **Bulk Water Export**

*Concerns over bottled water and NAFTA swirl during British Columbia drought* (Walton 2015). This editorial headline epitomizes the ongoing popular sentiment in Canada surrounding water exports to the U.S. With much of the western U.S and Canada experience lower than average rainfall and, in the case of California, crippling drought conditions, water sovereignty is receiving increased attention in the region. For good reason, perhaps, as the structure of legislation controlling the large-scale transfer of water in Canada is incongruent at different governance scales, and, according to some critics (ex. Barlow 2007), is therefore vulnerable to exploitation. Others, however, argue that because of the strong ‘hydro-nationalist’ sentiments in Canada and the current stability of water management in Canada and the U.S, large-scale diversions are not likely to occur in the foreseeable future (Lasserre 2013). Here we review these opposing views by exploring the history of Canadian legislation concerning continental water transfers.

The debate surrounding water export is really a debate about water rights – who, under various levels of legislation and trade policy (such as the NAFTA), has the right to divert bulk water resources across international borders?<sup>7</sup> This is a somewhat complex matter in Canada, because even in the constitution – which divides jurisdictional authority between federal and provincial governments – the language pertaining to water is unclear and contradictory. For

---

<sup>7</sup> Here ‘water export’ refers to the removal and sale of water for profit, and ‘bulk water’ refers to the diversion of large volumes of water, though not necessarily across international borders. A bulk transfer can constitute an export if it derives from economic exchange.

example, while it stipulates that provinces have jurisdiction over matters concerning property, the sale of public land, and the issuing of water use licences, it also mandates that the federal government have superseding authority over matters like trade and commerce, boundary and transboundary water, and ‘peace, order and good government’ (Johansen 2001). According to Johansen (2001), this final field of control would give the federal government the capacity to intervene in provincial affairs on matters of ‘national interest’.

According to critics, the lack of firm legislation declaring federal opposition to bulk water exports leaves the door open for such agreements in the future (Barlow 2007; Quinn 2007). This is because while many related forms of legislation exist, such as the *International Boundary Water Treaties Act* (Environment Canada 2015), nothing has been passed into federal law that specifically bans bulk water exports. Interestingly, a *Federal Water Policy* was endorsed for legislative approval in 1987, and similarly, the *Canada Water Legislation Act* bill was tabled in 1988. However, according to Quinn (2007), both were overwhelmed by Conservative political redirections; the former by the federal pursuit of the NAFTA, which was enacted in 1989, and the latter when a general election was called that year. Since then, no legislation has been signed which specifically bans bulk export.

This issue came to a head in the late 1990s after some provinces began to float the idea of permitting water exports. Commercial proposals between 1986-1996 by firms in BC, Ontario, Newfoundland, and Quebec to divert water to the US drew the attention of various groups like environmentalists and legal scholars, and also the federal government, all who were concerned about the potential for precedence to be set under the NAFTA that would solidify the sub-federal sale of water (Boyd 2003; Quinn 2007). Some provinces went as far as issuing licences for export, including some from the Great Lakes that prompted the involvement of the IJC (IJC 2000), however no scheme of this nature materialized in the 1990s.<sup>8</sup> Nevertheless, the belief that ‘once the taps were turned on, they could not be turned off’ was still a matter of legal importance (see Boyd 2003) and prompted policy responses at the federal and provincial level in attempts to prevent the export of Canadian water.

---

<sup>8</sup> Interestingly, one licensee in BC brought legal action against the Government of Canada, arguing that the cancellation of their contract to import water from BC infringed upon their rights under NAFTA’s Chapter 11 trade law. To date, this case involving Sunbelt water has not proceeded to arbitration. See Quinn (2007) or Boyd (2003) for discussion of this case, and others.

In order to avoid further entanglement in international trade disputes, the Government of Canada turned to the ecological boundaries afforded by watersheds as a means of preventing water exports (Government of Canada 2001). This bill specifically restricts ‘bulk removal’ from transboundary watersheds, arguably the most feasible site for transborder exports. As Johansen (2001) indicates, this language was specifically used to emphasize the ecological importance of restricting transboundary transfers from drainage basins, irrespective of the reason. At that time the federal government urged the provinces to also adopt the same measures. Most followed suit, except for New Brunswick and BC (Boyd (2003), though the inaction in BC was not for lack of concern over water sovereignty but because they had already passed their own *Water Act* (and *Water Protection Act*) in 1996. Though contrary to the federal approach, this act uses both ecological boundaries and political boundaries to prevent bulk removal, stating that water is not to be diverted out of the province or between ‘major watersheds’ under BC law (Government of BC 1996).

As this review sought to emphasize, the export, diversion, or removal of water from Canada is a complex, multiscalar issue. Space does not permit for a detailed review in its entirety (See Boyd 2003), though it is safe to assume that this topic will not drift away in the near future, as threats to water scarcity such as drought and climate change maintain the importance to Canadian water sovereignty. However, it is importance to stress that regardless of existing concerns surrounding future water exports, *such agreements already exist* between Canada and the U.S, albeit on a much smaller scale.

### **Inter-local Transboundary Water Agreements**

Export controversy aside, a particular type of small-scale transboundary water agreement currently exists in Canada-US borderland that involves distinct institutional and relational characteristics making them relevant to this review. These arrangements involve the ongoing uni- and bi-directional transfer of small volume, bulk water across the international border, specifically for local use. Forest (2010a) has termed these as ‘inter-local’ transboundary agreements, and while they have received little domestic research attention to date (see Forest 2010a, 2010b, 2012), what is available sheds light on the ongoing relationship between Point Roberts and Vancouver.

Inter-local water transfers have a small, yet enduring history in North American

transborder water governance.<sup>9</sup> The oldest began in 1903, and involved the transfer of water from St. Stephen, New Brunswick to Calias, Maine until 2000 (Forest 2010a). Forest (2012) determines that there are now twelve unique transfers of this kind occurring across the border, with daily volumes ranging from 26.8 to 331,835.6 m<sup>3</sup>/day.

Canada-US inter-local transfers exist for a variety of reasons, involving economic, socio-geographical, and hydrological motivators (Forest 2012). For example, the location of a town in the borderlands can inhibit state managers from connecting them to the state water system, so transborder transfers afford the way to provide water services at a much cheaper cost. Also, geographical proximity is a motivator; as Forest (2010a) states, “having close social relationships and frequent interactions has helped to craft a strong sense of neighbourly togetherness” (3) that promotes cooperation, regardless of political difference. However, the most significant motivator for establishing inter-local transfers is water scarcity (Forest 2010b, 2012; Day and Quinn 1992). Many of the twelve cases recently documented (Forest 2012) exist because of a lack of sufficient water resources in one locality. To that end, though all are ‘local’ in terms of their proximity to the border, the scale of governance is not always such. Most exist between municipal governments, however some arrangements involve cities, such as the Point Roberts-Vancouver context. According to Forest (2012), this is one reason why these transfers have received so little attention- they simply do not fit the image of the large-scale water exports that are the focus of academic and civil society research. Nevertheless, the legal status of these arrangements – and their location within the debate surrounding water commodification and export from Canada to the US – will be explored in more detail in the case study below.

---

<sup>9</sup> Other terminology has been used to describe similar arrangements, such as ‘interlocal cooperation’ (Bothe 1979) or ‘local transborder supplies’ (Pearse et al. 1985). See Forest (2012) for a more complete review.

## The Point Roberts Case

The small American exclave of Point Roberts came into existence in 1846, when the controlling powers of Britain and the United States agreed to divide the territory west of the Rocky Mountains along the 49<sup>th</sup> parallel (Minghi 2010). At that time it was host to a colourful existence as an strategic military site for the U.S, as a magnet for criminality and Icelandic immigrant squatters, and, until recently, as a site of agricultural self-subsistence for their families (Clark 1980). Point Roberts now hosts a mixed population of seasonal Canadian vacation property owners, American retirees, and other intrepid folks for whom the political and geographical detachment of life on The Point was not a deterrent from settlement.

The permanent population of Point Roberts is relatively low, last recorded at 1314 people in 2010 (US Census 2010). This number triples in the summer months as Canadian property owners take advantage of this local getaway (30 minutes from Vancouver, BC). Subsequently, the economy of Point Roberts is largely moderated by these demographics, as most local employment opportunities cater to cross-border services, such as parcel delivery, real estate, and tourism. According to Pettus (cited in Minghi 2010), state and federal services in Point Roberts are very limited and cost the Washington State more than is provided through local taxation and service fees. This has caused tension among residents, both Canadian and American, concerning who benefits most from the services provided through sparse local revenues. In sum, these characteristics mean that life on ‘the Point’ is not without challenges<sup>10</sup>. Here we discuss one that arose in the late 1960s when Point Roberts began to run out of water.

### Water Security in Point Roberts

The root of water insecurity in Point Roberts can be traced to a lack of renewable supply on the peninsula sufficient to meet local needs. A central component of this is geographical; Point Roberts, at only 6 square miles in size, has no current-fed surface water flows such as streams or rivers (Grimstad 1975). The significant topographic elevation increase from the South and North means that, regardless of its geographic location in the Fraser River watershed, natural southern

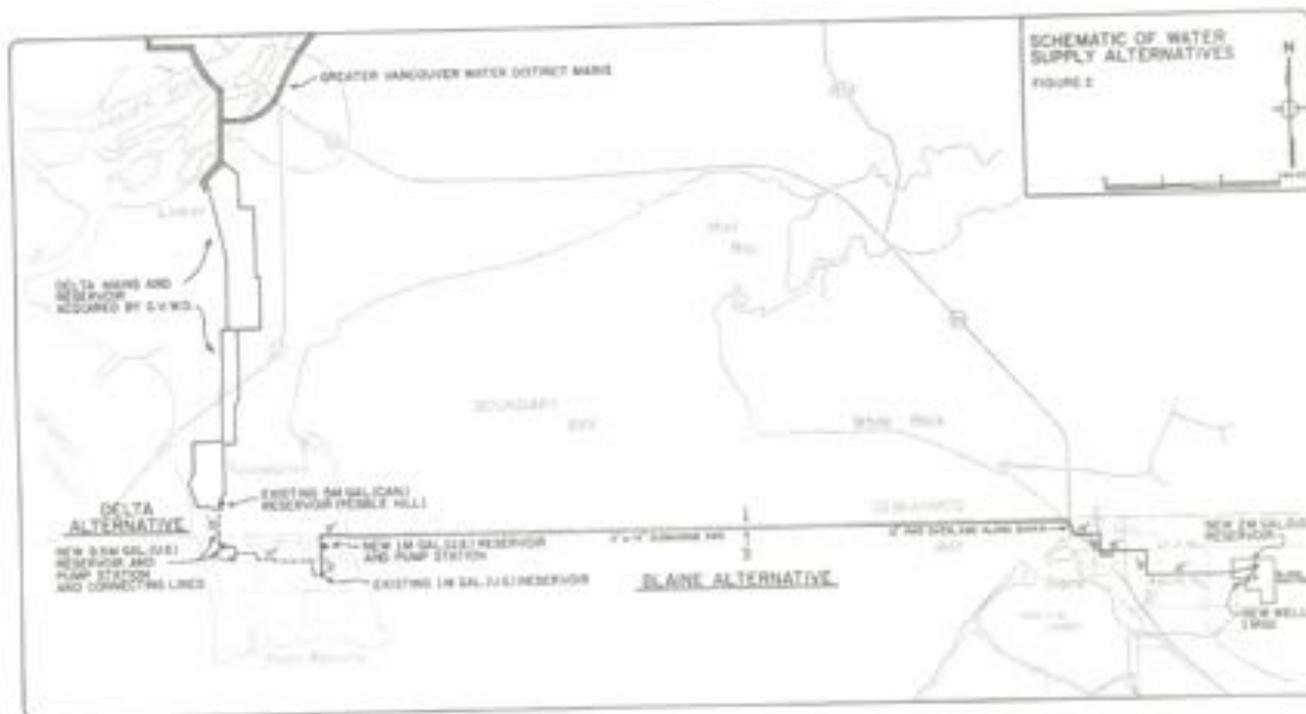
---

<sup>10</sup> The need to bus children to Blaine, Washington for school is a fine example – an eighty kilometer round trip that crosses two international borders and takes upwards of an hour in each direction. See Minghi (1962) for a more detailed historical-geographical account.

groundwater flows into Point Roberts remain impossible. Furthermore, this inadequacy is compounded by poor aquifer storage. The geological composition of the peninsula – primarily quaternary glacio-fluvial and glacio-lacustrine sediments – prevents water from being retained and transported locally by the aquifer before it leached into the surrounding ocean (Grimstad 1975).

For most of the 20<sup>th</sup> century the community's water needs were accommodated by only nine wells operated by the Point Roberts Water District No. 4 (PRWD), with a combined output of approximately 205 gallons per minute (PRWD 1985). This flow was sustainable until the late 1960s when groundwater withdrawals became harder to maintain, particularly in the summer months when the population swelled. Subsequently, only six wells were producing potable water by 1975 (Grimstad 1975), and eventually these public wells became choked with sand and stopped producing the volume required by Washington State law to support the population (approximately 1,100 people) (IJC 1973). New private wells were drilled, yet flows were either inadequate to offset demand or contained salt water (Gacek 1985).

**Figure 4. Proposed Water Delivery Options for Point Roberts**



Source: Gacek 1985

Thus, following a lively community public hearing in the 1971 it became clear that the most pressing issue for Point Roberts was securing an adequate supply of fresh water, prompting the community to look elsewhere for water (IJC 1973).

### **The Foundation of Multiscalar, Transboundary Governance**

Though the Vancouver-Point Roberts transfer agreement can be classified geographically as ‘inter-local’, the governance practices involved in bringing it to fruition are very much multiscalar. As Forest (2012) has identified, few inter-local transfers involve communities of significant size, most connecting small borderland entities separated from large-scale urban areas. The case at hand is much different, as it required the cooperation of numerous different scales of governance including local, regional, and provincial governments, and various federal agencies. In fact, it began at the international level, with the involvement of the IJC.

Point Robert water scarcity became an international political issue in 1971 when numerous problems “created by the presence and location of the international boundary at Point Roberts, Washington” (IJC 1973:1) necessitated joint inquiry, one of which was the inadequacy of the local water supply.<sup>11</sup> On the behest of both countries, the IJC formed the International Point Roberts Board (IPRB) in November of that year. Following two years of study the Board determined that establishing an agreement with authorities in BC was the most ‘logical’ solution for remedying water scarcity in the community. They asserted, however, that such it would most likely need to benefit BC; that “there must be a strong attraction for the British Columbia Government to accommodate Point Roberts needs” (IPRB 1974:22). This facet of the relationship is significant, for as one can assume, based on its inclusion in the report, that being a ‘good neighbour’ (Norman and Bakker 2015) was not the only Canadian motivation for facilitating this trans-local water relationship.

A decade later the PRWD formally requested access to the adjacent water supply, beginning three years of political negotiation and regulatory change. Metro Vancouver (then the Greater Vancouver Regional District (GVRD)) first received notice from Point Roberts in October of 1984 (Woods 2013), and discussions between the PRWD and the GVWD occurred

---

<sup>11</sup> Most of the issues raised in the study resulted from geographical separation from the rest of the state. These included the lack of local services (such as medical treatment, telephone, and electricity provision), cross-border trade, and the presence and application of law enforcement. See the *Report to the International Joint Commission On Solutions to the Problems Facing Residents of Point Roberts* (IPRB 1973) for a detailed review.

until March of the next year, when a tentative agreement was created. At the outset, the deal would require the building of a new reservoir in Point Roberts, and their own expense. It also required revisions to the GVWD Act allowing water to be sold to a non-member at member rates. At this time a draft was then sent to the Board of Delta Council, the municipality adjacent to Point Roberts, as their authority was needed to build the infrastructure necessary for transporting water across the border. Approval was also sought from both the International Boundary Commission and Canadian Transport Commission (Wood 2013); the former an intergovernmental agency responsible for approving development at the border, and the later a regulatory body overseeing land-based transport in Canada. The proposal went before the BC Legislature on July 6, 1987 for final approval and was approved later that year.

It is important to note that the PRWD studied options other than a transborder transfer for meeting its water needs. According to Wallace (2007), a 1978 plan to transfer water across Boundary Bay via a submarine pipe from Blaine, Washington was negotiated before the eventual agreement with the GVWD (see Figure 4), mainly because of the initial refusal from Canadian parties to entertain the idea of a transborder transfer. However, this pipeline was later determined not to be the most viable option as it required more detailed environmental assessments (of the Boundary Bay sea floor, for example) and more infrastructure to be built in Blaine and Point Roberts (Gacek 1985). In the meantime, Point Roberts had begun to experience significant water scarcity, requiring overland deliveries from Blaine costing \$US 1000 per day (McCullough 1974). Trucking water across two international borders was not a viable long-term solution, though it continued until 1987 when a transborder agreement was final reached. The agreement permitting the sale and transfer of freshwater from the GVWD to the PRWD was ratified on September 30, 1987 (Woods 2013), almost twenty years after scarcity became a concern for the exclave.

### **The Vancouver-Point Roberts Inter-local Transfer Agreement**

The details of the agreement are as follows. Point Roberts is connected the GVWD system via a new 1.3 kilometer, 26 inch diameter pipeline laid through Tsawwassen, BC. Water is stored in a new 22,730 m<sup>3</sup> reservoir built near the border in Tsawwassen in 1987 (Forest 2010b). This infrastructure was installed by the GVWD, though financed by the PRWD. This was afforded by a one time ‘connection fee’ paid to the GVWD “equal to the aggregate of all the costs and

expenses incurred by GVWD in designing and constructing the GVWD Main and Reservoir and the preparation and execution of this agreement” (GVWD & PWD 1987:4), totaling CAN \$2.8 million. Per the agreement, responsibility for this South Delta water system, including the then existing Ferry Road Pump Station, was transferred to the GVRD when the transfer began (Fraser 2004).

The water – 3182.2 m<sup>3</sup> per day or just over 840,000 US gallons – is sourced primarily from the Seymour catchment and distributed from the Tsawwassen reservoir upon demand. As per the deal, Point Roberts is not permitted to withdraw more than this volume, and it can be terminated should they do so and fail to stop (GVWD & PRWD 1987). In accordance with article 5.(1) of the original agreement, the PRWD pays a member’s fixed volume rate that set annually by the GVRD per cubic meter of water (GVWD & PRWD 1987). Reflecting the rates for 2015, the rough cost for 3182.2 m<sup>3</sup> is CAD \$63,300 per month, for an annual sum of CAD \$780,000 (averaged over the wet and dry seasons) (Metro Vancouver 2014). The agreement has a 50-year term and will end on either August 30<sup>th</sup>, 2037 or at the end of the ‘useful life’ of the infrastructure required for the transfer, whichever comes first (GVRD & PRWD 1987). During this term the PRWD would be considered a ‘non-member’ of the GVWD.

Though at first glance they may seem arbitrary, the conditions of this agreement such as daily volume, infrastructure development, and term reflect over three years of deliberation and assessment necessary to satisfy the various interests involved while meeting the ongoing water needs in Point Roberts. More broadly, they also exemplify the complexity arising from transboundary water governance between two sovereign states when different governments at multiple scales are involved. Indeed, this web of political relations has had significant implications for water management in Point Roberts; though, perhaps even greater, it has influenced transborder hydrosocial relations in the region for the past 28 years. In the following section we focus on how this influence was institutionalized by examining the provincial political process regarding the agreements approval and by discussing the subsequent water policy that continues to govern these relations.

### **Point Roberts, Water, and Transborder Politics**

The Government of British Columbia was the final signatory in this agreement, and documentation of the BC Legislative Assembly (BCLSA) debates and vote regarding its

approval provides noteworthy insight into the politics involved in selling water to the U.S. More so, these foci of the debate help to elucidate the foundation of a somewhat unique transborder relation between these two localities. The main themes of the sessions will be discussed briefly below.

A central focus of the discussion regarded the economics of administering the transfer over the long-term. Much debate revolved around the proposed annual fee of CAN \$40,000 and whether it would hold as an accurate valuation of the water in the future.<sup>12</sup> This concerned whether Point Roberts would be joining the already established water system in Metro Vancouver and not paying for infrastructure after the initial investment for the reservoir (BCLA 1987b). Debate also touched on the topic of property relations, highlighting the fact that it was then well known that a large number the property owners in Point Roberts were Canadian citizens. Here, the delineation of political responsibility for constituents was raised; namely, should the government be looking after the property rights of citizens south of the border (BCLA 1987b)? Unsurprisingly, water sovereignty was also touched on, albeit briefly. Water exports had not gained much political traction at this point, yet nationalist sentiments about selling ‘Canadian water to the Americans’ pepper the rebuttals made during the session (BCLA 1987). As one minister emphasized, “[t]his is a British Columbia water resource being sold to the Americans for the first time in history” (BCLA 1987b:2186).

Aside from these important issues, the July 6<sup>th</sup> session involved a great deal of debate about the impact such an agreement would have on development in Point Roberts. In particular, how a steady flow of water would facilitate the increase of population on the peninsula, and thus, an increased burden on Canadian services in the Delta area (BCLA 1987a, 1987b). At the time Point Roberts was relatively under-developed in comparison to other communities in the region, and the concern was that should water be made readily available, land speculation would pull more investment, and therefore more people, to the peninsula. Perhaps the most telling feature of the debate, however, concerns committee acknowledgement that the early agreement involving the Corporation of Delta stipulated that the population on Point Roberts could not exceed 4000 people (BCLA 1987a). As stated by Robert Williams of the NDP in 1987, “development is

---

<sup>12</sup> As noted below, Point Roberts had always paid a non-member’s rate per cubic meter set annually by the GVWD, and therefore not a fixed cost in perpetuity. However, at the time of debate this was not determined.

effectively frozen in Point Roberts because they don't have any water" (BCLA 1987a:2155), and to a large extent this continues to this day. Indeed, the PRWD acknowledged in 2005 that the transfer volume could not support more than 2050 equivalent residential units by issuing a moratorium suspending new licences, stating that new land development proposals required "evidence that adequate water supply is available to serve such new development" (PRWD 2005:2). The moratorium was lifted in 2007, however development is still fully contingent on the fresh water access.<sup>13</sup>

To this end, the availability of water in Point Robert is now largely governed by Provincial legislation. In fact, the 1996 BC *Water Protection Act* has a central role in managing not only the flow of water to the Point but also any transborder exports that might occur in the province. As a review, this Act was created to protect BC from losing sovereignty over its water because of the discrepancies in the NAFTA that might permit national bulk water exports should a provincial government allow it to happen first. The Act worked in tandem with the BC Water Act, prohibiting the licencing of extractions and diversions from one watershed to another that exceed 10 m<sup>3</sup> or more a second of water (Government of BC 1996). It is relevant here because the Point water transfer was explicitly noted as an acceptance to this legislation, under the condition that the transfer would at no point exceed the existing volume of 3182.2 m<sup>3</sup> a day (Government of BC 1996).<sup>14</sup> As a result, no other transfers have been formed in BC since 1987, nor can they legally operate under the purview of the federal government's declaration against water exports or BC provincial law. Therefore, the Point Roberts transfer constitutes a legislated exception to the national commitment to preventing transborder water exports.

### **Point Roberts Hydrosocial Relations**

The two sections above outline the technical, then political aspects of transboundary water management involved in creating the inter-local water transfer to Point Roberts. Indeed, the water and its various capacities is the material focus of an extensive undertaking of hydrological and political complexity. Though, as the deliberation surrounding population growth and

---

<sup>13</sup> For example, a new 58-lot vacation property development in progress for over two years recently stalled because of a discrepancy concerning water access (Olsen 2015). Surprisingly little has been made public on how this development will impact seasonal water usage in the community, once it is fully operational.

<sup>14</sup> This restriction has been carried forward under the 2014 *Water Sustainability Act* (Government of BC 2014).

development in Point Roberts made clear, this water – highly regulated, specifically quantified, and economically valued – also *internalizes* the foundational political relations between the Province of BC and Point Roberts, forming a inimitable hydrosocial cycle of transborder relations. As Linton and Budds (2014) remind us, “the hydrosocial cycle [...] is a dynamic historical and geographical process, meaning that the assemblage that gives rise to a particular kind of water and a particular socio-political configuration is always changing” (7). The socio-political assemblage here was formed through Canadian control over the hydrological future of Point Roberts, and this continues to this day.

This context can be clarified by drawing parallels between the water moving across the border and the relations maintaining it. Each day, as water flows into the community, so to does a fixed and stable reminder of the inhibition of local autonomy concerning water use. Attempts to withdraw more water are met with notice, and the agreement can be ended should this occur and not be halted. Therefore, the water can be seen to have a different significance on each side of the divide: in Canada it signifies *an allowance* by a ‘good neighbor’; in Point Roberts, the acceptance of extra-sovereign *control* over many conditions of existence in the territory. Thus, in this hydrosocial cycle, the flow of power, capital, and of course water is predominantly unidirectional, and will likely remain that way for another 22 years.

### **Sustainability and the Point Roberts Transfer Agreement**

So what lies ahead for the Point Roberts transfer agreement? This is an important question when assessed within the scope of Canada-US transboundary water governance, for while the *power relations* constituting this hydrosocial cycle appear to be fixed in the short term, this does not simply equate to long-term *sustainability* for the transfer. The hydrosocial cycle, much like the hydrological cycle, is amenable to transformation as water’s value, meaning, or use is altered over time, and much can change over the course of a 50-year period. Although the parameters of control were well established in the original agreement, it made no mention of sustainability, let alone specific ecological foci of water management like conservation, watershed governance, and certainly not climate change mitigation. However, these are now key issues in contemporary transboundary water management (Earle et al. 2010; Norman, Cohen and Bakker 2013) that must be addressed in order to reach equitable and successful cross-border water governance. This raises questions about the sustainability of the Point Roberts transfer, both of its constitutive relations and of the water itself. To this end, what existing factors might cause a ripple in the

governance of this interlocal agreement, and how might this impact sustainable water use in Point Roberts and the GVRD? Thinking long-term, could water scarcity and advancing climate change impact the cycle of hospitable relations between these two localities? These are important questions, not just for this case but also for others that exist, or may later exist, along the Canada-US border. Each will be addressed below.

### **From Scarcity to... Burden?**

In building on the dialectical-relational character of the hydrosocial cycle and its concerns for power and control, we begin by reviewing how the transborder conditions of governance – specifically, the transfer’s volume and fee structure – impact the value, meaning, and possibly the sustainable use of water in Point Roberts.

In 2013 the PRWD issued a formal request to the Metro Vancouver Utilities Committee (MVUC) to amend the rate structure of the agreement. Citing the high financial burden of buying water year round, the request stipulated that the community wished to implement a pay per-volume-used method instead of the existing lump sum cost currently paid, regardless of usage, for the daily allotment of 3182.2 m<sup>3</sup>. This volume would remain as the upper limit of available water, however. According to Olsen (2014), Point Roberts used only 85 of the available 307 million gallons in 2014, and the request for change aligns with this figure, noting that average recent use equals approximately one third the total volume paid for (PRWD 2012). This financial burden is aggravated by State and Federal laws that require a fee structure that promotes conservation and limits water use. Finally, the PRWD Board of Commissioners also mentioned the implementation of individual water metering for the Canadian municipal members served by the GVWD, arguing that because of this precedence they too should be billed at a per-volume-used rate (PRWD 2012).

Deliberation by the MVUC was largely based on Article 5.(1) of the initial agreement (Woods 2013) which states that Point Roberts must pay for the set volume regardless of use. The rationale provided emphasized the many financial and legal obligations held by the GVRD in order to deliver water across the border such as ownership and maintenance of the water mains. After reviewing the case in detail the MVUC denied the request for amendment, leaving residences with an estimated average water cost of US \$ 610 per year (Woods 2013).

The decision not to amend the rate structure for Point Roberts may have some interesting implications for hydrosocial relations here. First, it is necessary to emphasize the economic motivation for the requested change; because of the fixed volume, the monthly cost of water, especially for year-round residents, is significantly higher than it would be should they each household pay per-volume-used. This is compounded by the fact that the community is mandated to adopt conservation-oriented water pricing in an attempt to encourage individual efficiency. The US EPA states that water rates are one of the most effective ways of reducing the demand for water (2015). This policy directive, and the water use habits it is meant to stimulate, is predicated on *incentivizing the economic benefits of behavioural change* (Brandes et al. 2010). Essentially, consumers are billed for the water they use, and at a rate that encourages using less. However, these benefits that are not afforded to residents in Point Roberts because of the conditions of the water transfer agreement in place. Regardless of their residential water use habits, user rates are fixed per month. Therefore, by removing the capacity for residents to benefit financially from reducing their water use, the core goal of this demand-side water conservation initiative – to reduce water use and promote sustainable behaviours – is jeopardized by the incompatibility in water governance practices intersecting in Point Roberts. While stateside legislation forces the PRWD to monetize water so as to pursue conservation, the rate structure applied by the GVRD effectively encourages the opposite.

More so, the potential for unsustainable use is heightened because of the in-group, out-group effect created when water users such as Point Roberts are classified as ‘non-members’<sup>15</sup>, especially at times when conservation is most necessary. At the time this report was written the Metro Vancouver Region was experiencing the worst drought in over a decade, and this has revitalized the discourse and practice of conservation in Metro Vancouver. As a result, the GVWD’s many municipal governments are enacting restrictions on superfluous residential water use, per the conditions of the GVWD Water Shortage Response Plan (GVWD 2015). The responsibility to adhere to these recommendations only extends to members, however, and the GVWD cannot require Point Roberts to enforce water use restrictions during periods of shortage. In fact, the original agreement makes no reference to conservation at all. Other than the stipulation that the PRWD adhere to the “provisions of section 57 of the Greater Vancouver

---

<sup>15</sup> Other GVWD non-members include the BC University Endowment Lands and the Capilano Salmon Hatchery.

Water Act” (GVRD & PRWD 1987:19) that grants the GVWD the ability to alter the flow in times of emergency, the PRWD nor its members have any legal responsibility to conserve water at times of shortage.<sup>16</sup>

This creates an interesting dynamic that is worth reflecting on more broadly. Here, residents of Point Roberts effectively buy more water than they can use, and while they do not at present use the full amount, they have no economic incentive to conserve because they can financially benefit from doing so. At the same time, water shortage is prompting the GVWD to issue usage restrictions to members, though they cannot limit the consumption of water in Point Roberts without amending the economic conditions of the contract. This indicates that the governance structure regulating this agreement is not conducive to individual-level conservation, and could actually impede the institutional capacity of governing bodies at different scales from implementing sustainable policies. This argument is on par with previous research noting the multiscale and fragmented constraints of achieving water conservation at sub-federal level in Canada (Furlong and Bakker 2010). Further, however, it raises concern about the adaptability of existing inter-local water agreements to changing environmental conditions, and to the need for policy harmonization concerning all shared resources.

### **Transborder Transfer and the Boundaries of the Watershed**

As stressed in the literature on watershed governance presented above, political boundaries often interfere with attempts to manage water resources from within the confines of the watershed (Blomquist and Schlager 2008), and this has raised recent debate concerning the utility of this scale as a governance tool (Cohen and Davidson 2011). However, it is still a key approach to managing sovereign and shared water resources around the world, including along the Canada-US border where notable examples like the Great Lakes show the utility of this approach for managing transboundary water affairs (Linton and Hall 2013). With this success in mind, this section endeavors to discuss the compatibility of watershed governance with the Point Roberts transfer. More specifically, how the conditions of ‘membership’ like those discussed above further might complicate regional approaches to sustainable water governance.

---

<sup>16</sup> The Chair of the MVUC recently acknowledged this when reflecting on the Stage-3 drought conditions currently experienced in Metro Vancouver. See Sinoski (2015) for a brief report.

The GVWD offers a fitting example of how watershed boundaries and political boundaries often overlay. Its membership is determined by a municipality's location in relation to the Seymour, Capilano, and Coquitlam watersheds that nourish the Metro Vancouver region. Further, the GVRD is committed to managing these watersheds in an ecologically sensitive manner (GVRD 2002), and ensuring that sustainable practices are upheld by its membership is a leading priority of both the Metro Vancouver political unit and the GVWD (Metro Vancouver 2011). It should be noted that due to its location and the defining feature played by topography in delineating watershed boundaries, Point Roberts is not located within the greater watershed from which the GVWD draws water, namely the Fraser River Basin. In fact, the geography of the exclave means that it is not contained in *any* watershed, and yet, water still flows to Point Roberts. Indeed, the physical infrastructure in place and the transfer agreement to regulate its use ostensibly fuse Point Roberts to the adjacent watersheds, allowing water to traverse both the political and geographical boundaries most commonly used in governing transborder water. However, as noted above, what makes this case stand out is that the regulatory capabilities of the GVRD to enforce sustainable water use practices – in practice, the authoritative boundaries of its 'policy-shed' (Cohen and Davidson 2011) – do not extend across the border. As such, the ecological initiatives undertaken by the GVWD and its members to act as a sustainable region may be impeded by the current agreement. This constitutes what Griffin (1999) has characterized as a 'problem-shed' in determining watershed boundaries – how to delineate the most suitable geographical boundaries so that the issues are contained *and* management practices are feasible. Here the issues challenging sustainable watershed governance – albeit, on that is particular in its hydrology – arise not from geographical limits but from the political (and economic) conditions of the original agreement. Of course, this is not to say that residents of Point Roberts cannot and do not use water sustainably. According to Sinoski (2015), Point Roberts has voluntarily lowered its water usage during the current drought. Instead, it is meant to emphasize that the political border is an impediment to regional harmonization and administration of sustainable water use practices.

Nuances aside, this facet of the Point Roberts hydrosocial relation demonstrates the challenges involved in advancing regional sustainable water governance in light of the complexity arising from the politics of this transborder transfer. While Point Roberts may be a hydrological 'island unto itself', however, as Forest (2010a) has identified, many other

transborder transfers exist within the same watershed and still require inter-local cooperation. Thus, attention should be given to the way the watershed as an ecologically defined, and often regionally adopted governance unit coalesces with the political need to regulate relations across the border. While the watershed is often touted as the most tool managing water resources sustainably (EPA 2008), *as a scale of governance*, it may be incompatible with inter-local border politics. Indeed, as this case has demonstrated, the complexities of non-membership in a cross-border political body – here, with a regional water board – indicate that political delineations of access may exceed attempts to manage water in an ecologically sound way.

## Looking Ahead- Supply, Uncertainty, and the Limits of ‘Good Neighbour’ Relations

So far, this case study has detailed the environmental and political histories through which the water transfer agreement between Point Roberts and Vancouver were established. It has focused on how the existing relations of governance overseeing the transfer contour the current capacity for sustainable water management in Point Roberts. This analysis has demonstrated that the politics and power relations are relatively fixed, and while control over water, and subsequently, over the *hydrosocial cycle* of the peninsula, remains in Canada, this does not mean that the initiatives directed at sustainability in Canada also flow south. What has not been discussed so far, however, is what motivates the need for sustainable water management practices in the first place. As Robert Williams indicated on the floor of the BC legislature in 1987, this transfer agreement is predicated on the available flow of water from Canada; if this should cease, “then we have a serious problem on our hands” (1987:2158). Indeed, the GVWD has a legal responsibility to supply water to the PRWD, but what if the supply runs dry? Here we briefly assess this possibility; namely, the sustainability of water itself in the supplying territory, and what this means for the future of the Point Roberts agreement.

Stated concisely, the South Coast, Vancouver region is water secure – for now. Aside from annual fluctuations causing extreme conditions like the drought currently stressing the region, little evidence exists to indicate that the Southwest BC region faces water insecurity in the near future. However, ongoing research indicates that while some parts of the province are getting wetter, the abundance currently experienced in this region is in fact declining because of the ongoing warming caused by climatic change. Studies show that flow rates are decreasing from receding snow packs and declining river outflows and groundwater reserves, and the intensity and frequency of drought events are becoming more pronounced (Zhang et al. 2001; Mote 2003; Environment Canada 2004; Moore et al. 2007; Pike et al. 2010; Jost and Weber 2012), therefore decreasing water availability during peak times and increasing competition for the resource. The region also faces many other threats to water security, both direct and indirect. For example, growing urbanization, and industrialization in the energy sector in particular (Campbell and Horne 2011; Parfitt 2011) are adding to the already high provincial demand for water (Environment Canada 2004). These conditions, coupled with projections for ongoing

climate warming in Western North America over the long-term (Bates et al. 2008), indicate that the South Coast region of BC faces an uncertain future of water security.

It is important to note there is *little chance* that these hydrological changes will impact the transfer for the extent of the current agreement. This is supported by the fact that Point Roberts residents currently use less water than they are allotted each year. However, we cannot say with certainty that the exclave will not face increased development, and thus, an increase in demand. The summer months also see the highest demand for water in both locales, and this is when water stress is projected to be the most pronounced in the coming decades (Pike et al. 2010). Further, the analysis above has shown that mandating sustainable water use on the Point is challenged by the administrative limitations arising from the political and economic conditions of the existing contract. Yet, if a severe weather event should occur the GVRD would be within its legal boundaries to decrease or terminate the transfer. Article 12 of original document states that any “act of god”, occurrence of “inclement weather”, or matter of similar nature “beyond the control of the GVWD which adversely affects GVWD’s ability to perform its obligations under the agreement” shall be grounds for change or termination of the transfer (GVWD & PRWD 1987:18-19). Therefore, with no stipulated recourse for the reversal of a decision to change or terminate the transfer rate, the hydrosocial future of Point Roberts would be at risk, as the economy, the culture, the ability to reside on the peninsula at all are governed by the water management practices of the GVRD and its water security future.

Taken together, this uncertainty raises important questions relating to the longevity of the relation and what type of agreement might follow. Primarily, how might a subsequent agreement be adequately ‘climate-proofed’, and is this even possible considering the uncertainty of climate change? Like all questions concerning the long-term impact of climate change, answering these will require attentive, adaptive, and resilient management attuned to the ways that hydrological systems interact and adjust (Rockström et al. 2014). At the same time, however, it requires an approach to governance that acknowledges the dependency that is created by this inter-local transfer – how the conditions of the agreement shape life on the Point – and thus strives to find an equitable solution to a challenging political dynamic of transborder water relations.

To that end, deliberation must take into account the contingencies arising from the political limitations of transborder water governance, and should strive for an agreement that

allows for the shared objectives of each locale, namely water conservation, to be achieved from within the parameters of the contract. Here is where further hydrosocial analysis would be beneficial, as it offers a lens that allows for the multiple means of water – in this case, as an economic good, a political tool, and a ecological necessity – to be drawn upon to develop an equitable and holistic transborder agreement.

This is also an issue that tests the inter-scalar limits of governance, so research and policy engagement from the federal level and downwards may also bolster the capacity for transborder collaboration. As Canada and the U.S already negotiate transborder issues via the IJC, it would be wise to dedicate resources to inter-local water transfers in particular. This is particularly relevant in light of the projected future precipitation trends involving precipitation trends; indeed, transfers of this type might become more common in the future, therefore necessitating cooperation. To this end, the recently established IJC International Watershed Board (Koop, Trowbridge, and Bailey 2005) might offer a fruitful avenue for mitigating the incompatibilities that arise from the border misalignment discussed above.

## References

- Alper, Donald.K. and Robert L. Monahan. 1986. "Regional Transboundary Negotiations Leading to the Skagit River Treaty: Analysis and Future Application." *Canadian Public Policy* 12(1):163-174.
- Arnell, Nigel W. 1999. "Climate Change and Global Water Resources" *Global Environmental Change* 9: S31-S39.
- Bakker, Karen. 2014. "The Business of Water: Market Environmentalism in the Water Sector." *The Annual Review of Environmental Resources*:469-494.
- Bakker, Karen. 2013. "Neoliberal Versus Postneoliberal Water: Geographies of Privatization and Resistance." *Annals of the Association of American Geographers* 103(2):253-260.
- Bakker, Karen. 2012. "Water Security: Research Challenges and Opportunities". *Science* 377:914-915.
- Bakker, Karen. 2010. *Privatizing Water: Governance Failure and the World's Urban Water Crisis*. Ithaca, New York: Cornell University Press.
- Bakker, Karen. 2007. *Eau Canada: The Future of Canada's Water*. Vancouver, BC: UBC Press.
- Bakker, Karen. 2003. "A Political Ecology of Water Privatization". *Studies in Political Economy* 70:35-58.
- Barlow, Maude. 2007. *Blue Covenant: The Global Water Crisis and the Coming Battle For the Right to Water*. Toronto: McClellan and Stewart.
- Bates, Bryson, Zbigniew W. Kundzeqicz., Shaohong Wu, and Jean Palutikof. 2008. "Climate Change and Water." *Intergovernmental Panel on Climate Change*. Retrieved from <http://ipcc.ch/pdf/technical-papers/climate-change-water-en.pdf>.
- Baviskar, Amita, ed. 2007. *Waterscapes: The Cultural Politics of a Natural Resource*. Delhi, India: Permanent Black.
- Baxter, Pamela and Susan Jack. 2008. "Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers." *The Qualitative Report* 13(3):544-559.
- Brandes, Oliver M., Steven Renzetti, and Kirk Stichcombe. 2010. "Worth Every Penny: A Primer on Conservation-Oriented Water Pricing". *POLIS Project on Environmental Governance*.
- Boelens, Rutger. 2014. "Cultural Politics and the Hydrosocial Cycle: Water, Power and Identity in the Andean Highlands". *Geoforum* 57:234-257.
- Bothe, M., 1979. "La Coopération Locale En Matière de Problèmes d'Environnement Dans les

- Régions Frontalières.” In: OCDE (Ed.), *La Protection de l’Environnement Dans les Régions Frontalières. Organisation de Coopération et de Développement Economiques*, Paris, pp. 84–104.
- Budds, Jessica. 2008. “Whose Scarcity? The Hydrosocial Cycle and the Changing Waterscape of La Ligua River Basin, Chile”. In M. K. Goodman, M. T. Boykoff, and K. T. Evered, eds. *Contentious Geographies: Environmental Knowledge, Meaning, Scale*. pp. 59–68. Surrey, UK: Ashgate,
- Budds, Jessica, and Leonith Hinojosa. 2012. “Restructuring and Rescaling Water Governance in Mining Contexts: The Co-Production of Waterscapes in Peru.” *Water Alternatives* 5(1):119-137.
- Boyd, David R. 2003. *Unnatural Law: Rethinking Canadian Environmental Law and Policy*. Vancouver: UBC Press.
- Campbell, Karen, and Matt Horne. 2011. Shale Gas in British Columbia: Risks to B.C.’s Water Resources. *The Pembina Institute*. Retrieved from <http://www.pembina.org/pub/2263>.
- Castro, Esteban. 2008. Neoliberal Water and Sanitation Policies As a Failed Development Strategy: Lessons From Developing Countries. *Progress in Development Studies* 8(1): 63-83.
- Clamen, Murray. 2013. “The IJC and transboundary water disputes: Past, present, and future.” In E. S. Norman, A. Cohen, and K. Bakker, eds., *Water Without Borders? Canada, The United States, and Shared Waters*, 70-87. Toronto: University of Toronto Press.
- Clamens, Murray. 2005. “The International Joint Commission: A Model for Inter-American Cooperation?” *Vertigo- La Revue Électronique en Sciences de L’Environnement*, September 2005. Accessed from <https://vertigo.revues.org/1885>.
- Clark, Richard E. 1980. *Point Roberts, USA: The History of an American Enclave*. Bellingham, Washington: Textype.
- Cohen, Alice, and James McCarthy. 2015. “Reviewing Rescaling: Strengthening the Case For Environmental Considerations”. *Progress in Human Geography*, 39(1): 3-25.
- Cohen, Alice, and Seanna L. Davidson. 2011. “The Watershed Approach: Challenges, Antecedents, and the Transition From Technical Tool to Governance Unit”. *Water Alternatives* 4(1):1-14.
- Conca, Ken. 2006. *Governing Water: Contentious Transnational Politics and Contentious Institution Building*. Cambridge, Massachusetts: MIT Press.

- Conca, Ken. 2008. "The United States and International Water Policy". *The Journal of Environment and Development* 17(11): 215-237.
- Conway, Declan. 2013. Water Security in a Changing Climate." In B. Lankford, K. Bakker, M. Zeitoun, and D. Conway, eds., *Water Security: Principles, Perspectives, and Practices*, 80-100. New York, NY: Routledge.
- Conway, Declan, Aurelie Persechino, Sandra Ardoin-Bardin, Hamisai Hamandawana, Claudine Dieulin, and Gil Mahe. 2009. "Rainfall and Water Resources Variability in Sub-Saharan Africa during the Twentieth Century." *Journal of Hydrometeorology* 10:41-59.
- Cook, Christina and Karen Bakker. 2012. "Water Security: Debating An Emerging Paradigm." *Global Environmental Change* 22:94-102.
- Creswell, John. 2007. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Thousand Oaks, CA: Sage Publications.
- Crutzen, Paul. 2002. "Geology of Mankind". *Nature* 415:23.
- Davidson, Seanna L., and Rob C de Loë. 2014. "Watershed Governance: Transcending Boundaries." *Water Alternatives* 7(2):367-387.
- Day, J. C. and Frank Quinn. 1992. *Water Diversion and Export: Learning from Canadian Experience*. Department of Geography Publication Series No.36, University of Waterloo.
- Dembicki, Geoff. 2015, April 7. "How Canada Could Cash in On California's Drought: America's Water-Rich Neighbour to the North is Seeing Green In the Golden State's Dry Rivers and Dead Crops". *Foreign Policy*. Accessed from <http://foreignpolicy.com/2015/04/07/how-canada-could-cash-in-on-californias-drought/>.
- Draper, Stephen D., and James E. Kundell. "Impact of Climate Change on Transboundary water Sharing". *Journal of Water Resource Planning and Management*: 405-415.
- Dupuis, Jean and Dean Ruffilli. 2011. "Government of Canada Investments in Public Infrastructure." *Parliament of Canada*. Retrieved March 1, 2013 (<http://www.parl.gc.ca/content/lop/researchpublications/cei-24-e.htm>).
- Earle, Anton, Ana Elisa Cascao, Stina Iansson, Anders Jägerskog, Ashok Swain, and Joakim Öjendal. 2015. *Transboundary Water Management and the Climate Change Debate*. New York: Routledge Earthscan.
- Environment Canada. 2015. "Water Governance & Legislation: Federal Policy & Legislation." Accessed from <https://www.ec.gc.ca/eau-water/default.asp?lang=En&n=E05A7F81-1#Section1>.
- Environment Canada. 2013. "Great Lakes Quickfacts". Accessed from <http://www.ec.gc.ca/grandslacs-greatlakes/default.asp?lang=En&n=B4E65F6F-1>

- Environment Canada. 2010. "Integrated Watershed Management." Accessed from <https://www.ec.gc.ca/eau-water/default.asp?lang=En&n=13D23813-1>
- Environment Canada. 2004. "Threats to Water Availability in Canada". National Water Research Institute, Burlington, Ontario. NWRI Scientific Assessment Report Series No. 3 and ACSD Science Assessment Series No. 1. Accessed from <https://www.ec.gc.ca/inre-nwri/default.asp?lang=En&n=0CD66675-1&offset=16&toc=show>
- EPA. 2008. "Handbook for Developing Watershed Plans to Restore and Protect Our Waters". *Office of Water Nonpoint Source Control Branch*. Retrieved from [http://water.epa.gov/polwaste/nps/upload/2008\\_04\\_18\\_NPS\\_watershed\\_handbook\\_handbook-2.pdf](http://water.epa.gov/polwaste/nps/upload/2008_04_18_NPS_watershed_handbook_handbook-2.pdf)
- Falkenmark, Malin, and Anders Jägerskog. 2010. "Sustainability of Transnational Water Agreements in the Face of Socioeconomic and Environmental Change." In A. Earle, A. Jägerskog, and J. Öjendal, eds., *Transboundary Water Management: Principles and Practice*, pp. 157-170. London, UK: Earthscan.
- Flacks, Richard. 1982. "Marxism and Sociology." In B. Ollman and E. Vernoff, eds., *The Left Academy: Marxist Academics of American Campuses*, 9-52. New York: McGraw-Hill.
- Field, Christopher B, Vincente Barro, Thomas F. Stocker, Qin Dahe, David J. Dokken, Kristie L. Ebi, Michael D. Mastrandrea, Katharine J. Mach, Gian-Kasper Plattner, Simon K. Allen, Melinda Tignor, and Pauline M. Midgley, eds. 2012. "Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaption". *International Panel of Climate Change, Working Group I and II*. Cambridge, MA: Cambridge University Press.
- Forest, Patrick. 2012. "Transferring Bulk Water Between Canada and the United States: More Than a Century of Transboundary Inter-Local Water Supplies." *Geoforum* 43:14-24.
- Forest, Patrick. 2010a. "A Century of Sharing Water Supplies between Canadian and American Borderland Communities." *Program on Water Issues, Munk School of Global Affairs, University of Toronto*. Retrieved from <http://powi.ca/powi-research/canada-us-transboundary-water-issues/>.
- Forest, Patrick. 2010b. "Inter-Local Water Agreements: Law, Geography, and NAFTA." *Le Cahiers De Droit*, 51(3-4):749-770.
- Foster, John Bellamy, and Brett Clark. 2008. "The Sociology of Ecology: Ecological Organicism Versus Ecosystem Ecology in the Social Construction of Ecological Science, 1926-1935." *Organization and Environment* 21(3):311-352.
- Fraser, Hugh. 2004. "Council Report: Regular Meeting". *The Corporation of Delta*. Retrieved from <https://delta.civicweb.net/document/35304/May%205,%202004%20South%20Delta%20Servicing%20Capacity>
- Furlong, Kathryn. 2010. "Neoliberal Water Management: Trends, Limitations, Reformulations." *Environment and Society: Advances in Research* 1:46-75.

- Furlong, Kathryn, and Karen Bakker. 2010. "The Contradictions of 'Alternative' Service Delivery: Governance, Business Models, and Sustainability in Municipal Water Supply." *Environment and Planning C* 28:349-368.
- Gacek, Ted S. 1985. "Point Roberts Water District # 4 Water Delivery Alternatives: Final Environmental Impact Statement". *Board of Commissioners, Point Roberts Water District #4*.
- Gibbins, Roger. 2001. "Local Governance and Federal Political Systems." *International Social Science Journal* 53(167):163-170.
- Giordano, Meredith A., and Aaron T. Wolf. 2003. "Sharing Waters: Post-Rio International Water Management". *Natural Resources Forum* 27:163-171.
- Gleick, Peter. 2011. "Climate Change Will Worsen Water Conflict Across Borders". *Pacific Institute Research for United Nations Cites Strategies for Reducing Risk of Tensions over Shared Water Resources*. Retrieved from [http://pacinst.org/wp-content/uploads/sites/21/2013/02/Transboundary\\_Water\\_Climate\\_Change\\_and\\_Conflict\\_press\\_release.pdf](http://pacinst.org/wp-content/uploads/sites/21/2013/02/Transboundary_Water_Climate_Change_and_Conflict_press_release.pdf).
- Gleick, Peter H. 1993. "Water and Conflict: Fresh Water Resources and International Security." *International Security*, 18(1):79-112.
- Government of BC. 2014. "Bill 18- 2014 Water Sustainability Act". Accessed from [http://leg.bc.ca/40th2nd/3rd\\_read/gov18-3.htm#section3](http://leg.bc.ca/40th2nd/3rd_read/gov18-3.htm#section3).
- Government of BC. 1996. "Water Protection Act, [RSBC 1996] Chapter 484". Accessed from [http://www.bclaws.ca/Recon/document/ID/freeside/00\\_96484\\_01#section4](http://www.bclaws.ca/Recon/document/ID/freeside/00_96484_01#section4).
- Government of Canada. 2001. "Bill C-6. An Act to Amend the International Boundary Waters Treaty Act". Retrieved from [http://www.parl.gc.ca/About/Parliament/LegislativeSummaries/bills\\_ls.asp?lang=E&ls=C6&Parl=37&Ses=1&source=Bills\\_Individual](http://www.parl.gc.ca/About/Parliament/LegislativeSummaries/bills_ls.asp?lang=E&ls=C6&Parl=37&Ses=1&source=Bills_Individual).
- Grey, David and Claudia W. Sandoff. 2007. "Sink or Swim? Water Security For Growth and Development". *Water Policy* 9: 545–571.
- Griffiths, Jacqui and Rebecca Lambert, eds. 2013. "Free Flow: Reaching water security Through Cooperation. *United Nations Education, Science, and Culture Organization*. Retrieved from <http://unesdoc.unesco.org/images/0022/002228/222893e.pdf>.
- Grimstad, Pedar. 1975. "A Geohydrologic Reconnaissance of Point Roberts Area Whatcom County, Washington." *Department of Ecology, State of Washington*. Retrieved from <https://fortress.wa.gov/ecy/publications/summarypages/oftr7502.html>
- GVRD and PRWD. 1987. "Agreement Made the 28th Day of August, 1987 Between Greater Vancouver Water District and Point Roberts Water District No. 4."

- GVRD. 2002. "Watershed Management Plan". Retrieved from [http://www.belcarra.ca/reports/2002\\_Watershed\\_Management\\_Plan.pdf](http://www.belcarra.ca/reports/2002_Watershed_Management_Plan.pdf).
- GVWD. 2015. "GVWD Water Shortage Response Plan: At A Glance". Retrieved from <http://www.metrovancouver.org/services/water/WaterPublications/WRSP-AtaGlance.pdf>.
- Harris, Leila, Jacqueline A. Goldin, and Christopher Sneddon, eds. 2013. *Contemporary Water Governance in the Global South: Scarcity, Marketization, and Participation*. New York, New York: Routledge.
- Harrison, Kathryn. 1996. *Passing the Buck: Federalism and Canadian Environmental Policy*. Vancouver: UBC Press.
- Harvey, David. 1996. *Justice, Nature, and the Geography of Difference*. Oxford, UK: Blackwell.
- IJC. 2013. "Who We Are". Accessed from [http://www.ijc.org/en/backgroundX/ijc\\_cmi\\_nature.htm](http://www.ijc.org/en/backgroundX/ijc_cmi_nature.htm).
- IJC. 2011. "Origins of the Boundary Water Treaty". Accessed from [http://www.ijc.org/en/\\_Origins\\_of\\_the\\_Treaty](http://www.ijc.org/en/_Origins_of_the_Treaty).
- IJC. 2000. *Protection of the Waters of The Great Lakes*. Final Report to the Governments of Canada and the United States, Ottawa and Washington. Retrieved from <http://www.ijc.org/files/publications/ID1560.pdf>
- IJC. 1997. "The IJC and the 21st Century: Response of the IJC to a Request by the Governments of Canada and the United States for Proposals on How To Best Assist Them to Meet the Environmental Challenges of the 21st Century." Accessed from <http://www.ijc.org/php/publications/html/21ste.htm#Sec1B>.
- Institute for United States Policy Research. 2007. "Transboundary Water Policy Issues: The Western North American Region." *Conference Report, Institute for United States Policy Research, Calgary, Alberta*.
- IPRB. 1973. "Report To The International Joint Commission On Solutions To the Problems Facing Residents of Point Roberts". *International Joint Commission*. Ottawa, Ontario and Washington, DC.
- IPRB. 1974. "Supplemental Report of the International Point Roberts Board to the International Joint Commission of Canada and the United States". *International Joint Commission*. Ottawa, Ontario and Washington, DC.
- Jarvis, Todd and Aaron Wolf. 2010. "Managing Water Negotiations and Conflicts in Concept and Practice". In A. Earle, A. Jägerskog, and J. Öjendal, eds., *Transboundary Water Management: Principles and Practice*, pp. 126-141. London, UK: Earthscan.
- Jessop, Bob. 2004. "Hollowing Out the 'Nation-State' and Multilevel Governance." In P. Kennett, ed., *A Handbook of Comparative Social Policy*, 11-25. Cheltenham, UK: Edward Elgar Publishing.

- Johansen, David. 2001. *Bulk Water Removals, Water Exports, and the NAFTA*. Retrieved from [http://publications.gc.ca/Collection-R/LoPBdP/BP/prb0041-e.htm#FEDERAL WATER POLICY OF 1987\(txt\)](http://publications.gc.ca/Collection-R/LoPBdP/BP/prb0041-e.htm#FEDERAL_WATER_POLICY_OF_1987(txt)).
- Jost, Georg, and Frank Weber. 2013. Potential Impacts of Climate Change on BC Hydro's Water Resources". *BC Hydro*. Retrieved from [https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/about/climate\\_change\\_report\\_2012.pdf](https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/about/climate_change_report_2012.pdf)
- Knox, John H. 2008. "The Boundary Waters Treaty: Ahead of its Time, and Ours." *The Wayne Law Review* 54:1591-1607.
- Koop, Rudy, Russ Trowbridge, and Ted Bailey. 2005. "A Discussion Paper on the Interantiona; Watersheds Initiative". *International Joint Commission, Canada and The United States*. Retrieved from [http://www.ijc.org/files/tiny\\_mce/uploaded/ID1582.pdf](http://www.ijc.org/files/tiny_mce/uploaded/ID1582.pdf)
- Lang, Michael. 2013. *Capital, Accumulation, and Crisis: Surveying the Neoliberal Waterscape of Municipal Privatization in Canada*. Unpublished masters thesis.
- Lankford, Bruce, Karen Bakker, Mark Zeitoun, and Declan Conway. 2013. *Water Security: Principles, Perspectives, and Practices*. New York, NY: Routledge.
- Lasserre, Frederic. 2013. "Continental Bulk Water Transfers: Chimera or Real Possibility?" In E. S. Norman, A. Cohen, and K. Bakker, eds., *Water Without Borders? Canada, The United States, and Shared Waters*, pp. 88-118. Toronto: University of Toronto Press.
- Linton, Jamie. 2010. *What is Water? The History of a Modern Abstraction*. Vancouver: UBC Press.
- Linton, Jamie. 2008. "Is the Hydrologic Cycle Sustainable? A Historical-Geographical Critique of a Modern Concept". *Annals of the Association of American Geographers* 98(3):630-649.
- Linton, Jamie, and Jessica Budds. 2014. "The Hydrosocial Cycle: Defining and Mobilizing a Relational-Dialectical Approach to Water". *Geoforum* 57:170-180.
- Loftus, Andrew. 2007. "Working the Socio-Natural Relations of the Urban Waterscape." *International Journal of Urban and Regional Research* 31(1):41-59.
- Loxley, John. 2010. *Public Service, Private Profits: The Political Economy of Public-Private Partnerships in Canada*. Halifax, Nova Scotia: Fernwood Publishing.
- Mackenzie, Hugh. 2013. "Canada's Infrastructure Gap: Where It Came From and Why It Will Cost So Much To Close." *Canadian Centre for Policy Alternatives*. Retrieved from <http://www.policyalternatives.ca/sites/default/files/uploads/publications/National%20Office/2013/01/Canada's%20Infrastructure%20Gap.pdf>.
- Maddock, Tara. 2004. "Fragmenting Regimes: How Water Quality Regulation is Changing Political-Economic Landscapes." *Geoforum* 35:217-230.

- Marx, Karl. 1971. *The Grundrisse*. Translated by David McLellan. New York: Harper Torchbooks.
- McCullough, Colin. 1974, April 20. "Troubled Times For Point Roberts". *The Globe and Mail*. Retrieved from ProQuest Historical Newspapers.
- Metro Vancouver. 2014. "2015 Budget In Brief: Metro Vancouver". Retrieved from <http://www.metrovancouver.org/about/programsbudget/BudgetPublications/2015BudgetinBrief.pdf>.
- Metro Vancouver. 2013. "Board in Brief: For Metro Vancouver Meetings on Friday, June 14, 2013". Retrieved from [http://www.coquitlam.ca/Libraries/Council\\_Agenda\\_Documents/RegularCouncil\\_2013\\_07\\_08\\_item17.sflb.ashx](http://www.coquitlam.ca/Libraries/Council_Agenda_Documents/RegularCouncil_2013_07_08_item17.sflb.ashx).
- Metro Vancouver. 2011. "Metro Vancouver Drinking Water Management Plan". Retrieved from <http://www.metrovancouver.org/services/water/WaterPublications/DWMP-2011.pdf>
- Minghi, Julian V. 1962. "Point Roberts, Washington – the Problem of an American Exclave." *Yearbook of the Association of Pacific Coast Geographers* 24:29–34.
- Minghi, Julian V. 2010. "Point Roberts, Washington: Border Problems of an American Exclave." In A. C. Diener and J. Hage, eds., *Borderlines and Borderlands: Political Oddities At The Edge of The Nation-State*, 173-188. Plymouth, UK: Bowman and Littlefield.
- Mitchell, Bruce. 2005. "Integrated Water Resource Management, Institutional Arrangements, and Land-Use Planning." *Environment and Planning A* 37(8):1335-1352.
- Moore, R. D., Allen, D. M., and K. Stahl. 2007. "Climate Change and Groundwater Flows: Influenced of Groundwater and Glaciers". *Final Report for Climate Change Action Fund Project A875*. Retrieved from [https://www.sfu.ca/personal/dallen/CCAF\\_A875-FinalReport.pdf](https://www.sfu.ca/personal/dallen/CCAF_A875-FinalReport.pdf).
- Mote, Philip W. 2003. "Trends in Snow Water Equivalent in the Pacific Northwest and Their Climate Causes". *Geophysical Research Letters* 30I(2):3-1–3-4.
- Norman, Emma. S. 2015. *Governing Transboundary Waters: Canada, the United States, and Indigenous Communities*. New York: Routledge.
- Norman, Emma S. and Karen Bakker. 2015. "Do Good Fences Make Good Neighbours? Canada – United States Transboundary Water Governance, the Boundary Waters Treaty, and Twenty-First-Century Challenges". *Water International* 40(1):199-213.
- Norman, Emma S, Alice Cohen, and Karen Bakker. 2013. *Water Without Borders? Canada, The United States, and Shared Waters*. Toronto: University of Toronto Press.

- Norman, Emma S., Karen Bakker, and Christina Cook. 2012. "Water Governance and the Politics of Scale: How Thinking Critically About Scale Can Help Create Better Water Governance." *GWF Discussion Paper 1226, Global Water Forum, Canberra, Australia*. Retrieved from <http://www.globalwaterforum.org/2012/07/16/water-governance-and-the-politics-of-scale-how-thinking-critically-about-scale-canhelpcreate-better-water-governance/>.
- Norman, Emma, and Karen Bakker. 2008. "Transgressing Scales: Water Governance Across the Canada–U.S. Borderland." *Annals of the Association of American Geographers*, 99(1):99-117.
- Olsen, Meg. 2015, February. "Water Costs". *All Points Bulletin*. Accessed from [http://issuu.com/pgrubb/docs/apb\\_editorial\\_2015-02\\_final](http://issuu.com/pgrubb/docs/apb_editorial_2015-02_final)
- Osborn, Rachel P. 2012. "Climate Change and the Columbia River Treaty." *Washington Journal of Environmental Law and Policy* 2(1):75-123.
- Paehlke, Robert. 2001. "Spatial Proportionality: Right-Sizing Environmental Decision-Making." In E. A. Parson, ed., *Governing the Environment: Persistent Challenges, Uncertain Innovations*, pp. 73-125. Toronto: University of Toronto Press.
- Parfitt, Ben. 2011. "Fracking Up Our Water, Hydro Power, and Climate: BC's Reckless Pursuit of Shale Gas". *Climate Justice Project*. Retrieved from <https://www.policyalternatives.ca/fracking>.
- Parkes, Margot W., Karen E. Morrison, Martin J. Bunch, Lars K. Hallstrom, R. Cynthia Neudoerffer, Henry D. Venema, and David Waltner-Toews. 2010. "Towards Integrated Governance for Water, Health and Social-Ecological Systems: The Watershed Governance Prism." *Global Environmental Change* 20(4):693-704.
- Pearse, Peter H., Francoise Bertrand, and James W. MacLaren. 1985. "Currents of Change: Final Report". *Inquiry on Federal Water Policy*.
- Pentland, Ralph. 2013. "Key Challenges in Canada-US Water Governance." In E. S. Norman, A. Cohen, and K. Bakker, eds., *Water Without Borders? Canada, The United States, and Shared Waters*, pp. 119-136. Toronto: University of Toronto Press.
- Pike, Robin G., Katrina E. Bennett, Todd E. Redding, Arelia T. Werner, David L. Spittlehouse, Dan Moore, Trevor Q. Murdock, Jos Beckers, Brian D. Smerdon, Kevin D. Bladon, Vanessa N. Foord, David A. Campbell, and J. Tschaplinski. 2010. "Climate Change Effects on Watershed Processes in British Columbia". In *Compendium of Forest Hydrology and Geomorphology in British Columbia*. Ministry of Forests and Range Research Branch / FORREX Forest Research Extension Partnership, pp. 699-747.
- Point Roberts Chamber of Commerce. 2010. *Maps*. Retrieved August 12, 2014 (<http://www.pointrobertschamberofcommerce.com/maps.php>).

- PRWB. 2015. "Rates and Charges: About Water Bills and Water Use." Retrieved from <http://www.pointrobertswater.com/rates.htm>.
- PRWD. 2015. "Water Quality Report (For the Year 2014)". Accessed from <http://www.pointrobertswater.com/reports.htm>.
- PRWD. 2012, December 14. [Formal Request for Payment Method Change, PRWD to GVRD]. Retrieved following personal communication with Metro Vancouver Water District Representative, July 2015.
- PRWD. 2005. "Resolution No. 573". Retrieved from <http://www.pointrobertswater.com/commissioners.htm>.
- Prudham, Scott. 2004. "Poisoning the Well: Neoliberalism and the Contamination of Municipal Water in Walkerton, Ontario." *Geoforum* 35:343-359.
- Quinn, Frank. 2007. "Water Diversion, Export and Canada-US Relations: A Brief History." *Program on Water Issues, Munk Centre for International Studies*. Retrieved from <http://munkschool.utoronto.ca/research-articles/water-diversion-export-and-canada-u-s-relations-a-brief-history/>.
- Reyers, Belinda, Reinette Biggs, Graeme S. Cumming, Thomas Elmqvist, Adam P Hejnowicz, and Stephen Polasky 2013. "Getting the Measure of Ecosystem Services: A Social-Ecological Approach." *Frontiers in Ecology and the Environment* 11:268-273.
- Rhodes, R. A. W. 1996. "The New Governance: Governing Without Government." *Political Studies* 44(4):652-657.
- Rockström, Johan, Malin Falkenmark, Carl Folke, Mats Lannerstad, Jennie Barron, Elin Enfors, Line Gordon, Jens Heinke, Holger Hoff, Claudia Pahl-Wostl. 2014. *Water Resilience for Human Prosperity*. New York: Cambridge University Press.
- Rockström, J., W. Steffen, K. Noone, Å. Persson, F. S. Chapin, III, E. Lambin, T. M. Lenton, M. Scheffer, C. Folke, H. Schellnhuber, B. Nykvist, C. A. De Wit, T. Hughes, S. van der Leeuw, H. Rodhe, S. Sörlin, P. K. Snyder, R. Costanza, U. Svedin, M. Falkenmark, L. Karlberg, R. W. Corell, V. J. Fabry, J. Hansen, B. Walker, D. Liverman, K. Richardson, P. Crutzen, and J. Foley. 2009. "Planetary Boundaries: Exploring the Safe Operating Space For Humanity." *Ecology and Society* 14(2):32. Retrieved from <http://www.ecologyandsociety.org/vol14/iss2/art32/>.
- Roy, Dimple, Jane Barr, and Henry David Venema. 2011. "Ecosystem Approaches in Integrated Water Resources Management (IWRM): A Review of Transboundary River Basins." *International Institute for Sustainable Development, In Partnership with the UNEP-DHI Centre for Water and Environment*. Retrieved from [http://www.iisd.org/pdf/2011/iwrm\\_transboundary\\_river\\_basins.pdf](http://www.iisd.org/pdf/2011/iwrm_transboundary_river_basins.pdf).
- Sanford, Robert W., Deborah Harford, and Jon O'Riordan. 2014. *The Columbia River Treaty: A Primer*. Victoria, BC: Rocky Mountain Books.

- Schmidt, P. and T. H. Morrison. 2012. "Watershed Management In An Urban Setting: Process, Scale and Administration." *Land Use Policy* 29(1):45-52.
- Shurts, John and Richard Paisley. 2013. "The Columbia River Treaty." In E. S. Norman, A. Cohen, and K. Bakker, eds., *Water Without Borders? Canada, The United States, and Shared Waters*, pp. 139-148. Toronto: University of Toronto Press.
- Sinoski, Kelly. 2015, July 22. "Metro Vancouver's Water Use Now At 'Manageable Levels': Regional District Says it's Unlikely to Move to Stage Four Restrictions." *The Vancouver Sun*. Accessed from <http://www.vancouversun.com/Metro+Vancouver+water+manageable+levels/11234947/story.html>.
- Sneddon, Chris, and Coleen Fox. 2006. "Rethinking Transboundary Waters: A Critical Hydropolitics of the Mekong Basin." *Political Geography* 25(2):181-202.
- Sprague, John B. 2007. "Great Wet North? Canada's Myth of Water Abundance." In K. Bakker, ed., *Eau Canada: The Future of Canada's Water*, pp. 23- 35. Vancouver, BC: UBC Press.
- Stake, Robert E. 1995. *The Art of Case Study Research*. Thousand Oaks, CA: Sage Publications.
- Stockton, Nick. 2015, February 26. "Should California Resurrect a Plan to Pipe Water from Alaska?" *Wired*. Accessed from <http://www.wired.com/2015/02/california-pipe-water-alaska/>.
- Swyngedouw, Erik. 2009. "The Political Economy and Political Ecology of the Hydro-Social Cycle." *Journal of Contemporary Water Research & Education* 142:56-60.
- Swyngedouw, Erik. 2000. "Authoritarian Governance, Power, and the Politics of Rescaling." *Environment and Planning D: Society and Space* 18:63-76.
- Swyngedouw, Erik. 1997. "Neither Global Nor Local: "Glocalization" and the Politics of Scale." In K. Cox, ed., *Spaces of Globalization: Reasserting the Power of the Local*, 137-166. New York: Guilford Press.
- Taylor, Richard G., Bridget Scanlon, Petra Döll, Matt Rondell, Rens van Beek, Yoshihide Wada, Laurent Longuevergne, Marc Leblanc, James Famiglietti, Mike S. Edmunds, Leonard Konikow, Timothy R. Green, Jianyao Chen, Makoto Taniguchi, Marc F. P. Bierkens, Alan Macdonald, Ying Fan, Maxwell M. Reed, Yossi Yechieli, Jason J. Gurdak, Diana M. Allen, Mohammad Shamsudduha, Kevin Hiscock, Pat J. F. Yeh, Ian Holman, and Holger Treidel. 2013. "Ground Water and Climate Change". *Nature Climate Change* 3:322-330.
- UN. 2004. "Backgrounder: Water Without Borders". *United Nations Department of Public Information*. Retrieved from <http://www.un.org/waterforlifedecade/pdf/waterborders.pdf>.
- United States Census Bureau. 2010. "American Factfinder". Retrieved from [http://factfinder.census.gov/faces/nav/jsf/pages/community\\_facts.xhtml](http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml).

- Vernon-Kidd, Danielle C., and Anthony S. Kiem. 2009. "Nature and Causes of Protracted Droughts in Southeast Australia: Comparison Between the Federation, WWII, and Big Dry Droughts." *Geophysical Research Letters* 36(22):
- Vogel, Steven. 1996. *Against Nature: The Concept of Nature in Critical Theory*. New York, NY: SUNY Press.
- Vörösmarty CJ, Lettenmaier D, Leveque C, Meybeck M, Pahl-Wostl C, Alcamo J, Cosgrove W, Grassl H, Hoff H, Kabat P, Lansigan F, Lawford R, Naiman R. 2004. "Human Transforming the Global Water System". *Eos* 85(48):509-520.
- Wallace ,Syd. 2007, July 1. "Local News". *All Point Bulletin*.
- Warner, Jereon. Wester, Philippus. and J. A. Bolding. 2008. "Going with the flow: River basins as the natural units for water management?" *Water Policy* 10(2):121-138.
- Wikipedia. 2011. "Longest Rivers in Canada". Retrieved from [https://en.wikipedia.org/wiki/List\\_of\\_longest\\_rivers\\_of\\_Canada#/media/File:Longest\\_Rivers\\_of\\_Canada.jpg](https://en.wikipedia.org/wiki/List_of_longest_rivers_of_Canada#/media/File:Longest_Rivers_of_Canada.jpg)
- Wismer, Susan, and Bruce Mitchell. 2005. "Community-Based Approaches to Resource and Management." *Environments* 33:1-4.
- Wolf, A., J. Natharius, J. Danielson, B. Ward, and J. Pender. 1999. "International River Basins of the World". *International Journal of Water Resources Development*, 15(4):387-427.
- Wolf, Aaron T., and Jahua T. Newton. 2010. "13.3 The International Joint Commission: A successful Treaty Between Canada and the USA." In A. Earle, A. Jägerskog, and J. Öjendal, eds., *Transboundary Water Management: Principles and Practice*, pp. 198-199. London, UK: Earthscan.
- Woods, Stan. 2013. "Point Roberts Water Supply Agreement, Attachment 3- GVWD Board Consideration of Point Roberts Water Supply Agreement". *Metro Vancouver Utility Planning Department*.
- World Water Forum. 2000. "Ministerial Declaration of The Hague on Water Security in the 21st Century". The Hague, March 22, 2000. Retrieved from [http://www.worldwatercouncil.org/fileadmin/world\\_water\\_council/documents/world\\_water\\_forum\\_2/The\\_Hague\\_Declaration.pdf](http://www.worldwatercouncil.org/fileadmin/world_water_council/documents/world_water_forum_2/The_Hague_Declaration.pdf)
- Yin, Robert K. 2003. *Case Study Research: Design and Methods (Third Edition)*. Thousand Oaks, CA: Sage Publications.
- Zeitoun, Mark. 2011. "The Global Web of National Water Security". *Global Policy* 2(3):286-296.
- Zentner, Matthew. 2012. *Design and Impact of Water Treaties: Managing Climate Change*. London: Springer.

Zhang, Xuebin, K. David Harvey, W.D. Hogg, and Ted R. Yuzyk. 2001. "Trends in Canadian Streamflow". *Water Resources Research* 37(4):987–998.