

## **Groundwater and Surface Water Management in the Fraser Lowlands: Policy and Rights**

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**Abstract:** Development and urban growth within the Fraser Lowlands in both Canada and the United States, is putting increased pressure on shared water resources. The transboundary nature of surface watersheds and aquifers creates a dynamic management situation. Mismatched responsibility between levels of government in British Columbia B.C. and Washington State (WA) and different policy regarding management of watershed and aquifer use and protection can lead to conflict between watershed users at local and international levels. For example, a lack record of surface and groundwater withdrawal rates for private individuals in B.C has led to an information void. This has implications for management regarding flow rates of transboundary surface watersheds, as well as sources of long-term transboundary aquifer depletion. This paper explores management policy on both sides of the border, as it pertains to individual, community and province/state rights to surface and groundwater withdrawal, and the implications this has on transboundary water management.

**Keywords:** Groundwater, Surface Water, Fraser Lowland, British Columbia, Washington State, Transboundary.

### Introduction

Transboundary ground and surface water resources present a provocative resource management situation. Differing government structures and regulatory agency control make for a ‘scalar mismatch’ between nations sharing watershed resources (Norman and Bakker 2005). Population growth and urban expansion is threatening groundwater and surface water resources within the Fraser Lowlands. Increased consumption, reduced water quality and abnormal seasonal flows are causes of degradation of the water resources. This paper examines regulatory water legislation of British Columbia and Washington State, to gain insight on how water use is regulated. The respective legislation and statutes are compared and contrasted, as is the authoritative control over, and regulatory monitoring of watershed use in both regions. A second purpose of this paper is to outline the current management and cooperation mechanisms in place between British Columbia and Washington State.

### Washington State Water Law

The first water laws in Washington State stemmed from original resettling of the North America, the ‘riparian doctrine’ and ‘appropriate doctrine’ (Washington State Department of Ecology, 2006). The riparian doctrine simply stated that landowners adjacent to watercourses could use the water within the watercourses. The appropriate doctrine dealt with water that was to be diverted to areas considered remote from a watercourse. In order to satisfy the appropriate doctrine one was required to post a notice at the location of diversion, and if no complaints were brought forth protesting the proposed water use, water use rights were granted (Washington State Department of Ecology, 2006).

It was through the appropriate doctrine that the idea of priority over water rights emerged. That is rather than water use shared proportionally, those with senior rights would have their needs served first. From this conflict arose, creating the need for water law not strictly focused on the historic right. As a result, the Water Code of 1917 was formed (Washington State Department of Ecology, 2006). While this water code did not affect existing water rights, it did create a formal application process, which was subject to any existing rights (Allen, 2008). Four criteria had to be met, water use could not be wasteful, water had to be available, existing rights could not be impaired and water use could not be detrimental to the public. An adjudication system was also implemented to determine the validity of existing water rights, which would be overseen by a newly formed centralized state administration (Washington State Department of Ecology, 2006).

It was not until 1945 that groundwater use was deemed significant enough to merit the formation of the Ground Water Code. The Ground Water Code was an extension of the Surface Water Code permitting process (Allen, 2008). There are groundwater code exemptions. Groundwater water uses that are exempt from water right permitting requirements include, providing water for irrigational purpose, water for domestic purposes, both limited to 5000 gallons per day (gpd) or less, the watering of a non-commercial lawn or garden a ½ acre or less, and a no gallon restriction on the provision of water for livestock (Allen, 2008).

Current regulation, management and planning for surface and ground water use is based on 1917 Surface Water Code and the 1945 Ground Water Code (Washington State Department of Ecology, 2006). In 1967, the state government wanted to increase the accuracy of the records of water rights established prior to 1917 and 1945, as the inaccurate records did not properly represent actual water use. As a result, The Water Right Claims Registration Act was implemented (Allen, 2008). Between 1967 and 1974 the state documented the location and volume of water right claims that existed prior to the formation of the 1917 and 1945 Acts. This registration occurred again in September 1997 to July 1998 (Washington State Department of Ecology, 2006).

During the same time period, the Minimum Water Flow and Level Act was formed, which allowed the Department of Ecology prescribe minimum flow levels as directed by the Department of Fish and Wildlife (Washington State Department of Ecology, 2006). In 1971 the Water Resources Act allowed the department of Ecology to determine instream flow levels, which have to be maintained for ecological, environmental and in some cases, navigational purposes (Allen, 2008). The Well Construction Act was also formulated in 1971, which requires all well construction to be properly permitted through the state. This allows the state the right to refuse well construction in areas of stressed groundwater resources. More recently the Growth Management Act was formulated which requires land developers to provide evidence of an adequate water supply, for the purpose of the development (Washington State Department of Ecology, 2006). In 1998 the Watershed Planning Act was created. This Act allows for local governments and stakeholders to collectively address water issues with Water Resource Inventory Areas (Watersheds), under a state guided framework. This is done through the formation of region watershed organizations charged with assisting with management of the local watershed water resources (Allen, 2008).

## British Columbia

Surface and groundwater use in British Columbia is controlled through the Water Act, an overarching piece of legislation that historically focused on surface water resources. Surface water and groundwater are recognized as vested property of the Provincial Government, with only those registered with the Provincial Water Act are permitted to use water resources. That is, those who have had private rights established through licensing. Holders of water licences are permitted to beneficially use and divert the quantity of water specified by the licence for the time specified by the licence (Water Act, 1996). Working with the Water Act is the Water Regulation which applies to licensing, and industrial, commercial uses and charges for use of water resources, as stipulated in the Water Act. As the water act was historically fashioned to regulate surface water, management of groundwater extraction was largely ignored.

The Groundwater Protection Regulation (GWPR), Section 5 of the Water Act was added in 2004, in order to maintain groundwater quality and quantity (Cairns, 2008). The option for groundwater regulation was put into the Water Act in the 1960's but was not exercised until 2004. It still has not been fully implemented, as well permitting and extraction metering has yet to be implemented (Wei, 2008). Ecology and physical environment of watersheds are protected by the provincial Fish Protection Act (Fish Protection Act, 1997). This act is separate from the Water Act but works in relation with it. The Fish Protection Act cannot limit actions of the controller, which is representative of the Ministry of the Environment (MOE), but can supersede the Water Act if a conflict between the two Acts were to arise (Cairns, 2008).

Water withdrawal volumes from ground and surface water sources in B.C. are not monitored for regulatory purposes. According to Cairns (2008), B.C. is the only province in Canada without ground water jurisdiction, opposite of the surface water regulations and licensing which are some of the most extensive in Canada. Landowners are not required to apply for permits to drill new wells or monitor volumes of water removed from wells. However, the GWPR now requires that all new wells must be installed by a properly certified and registered driller (Ground Water Protection Regulation, 2004). Once drilled, a well must now be registered with the Provincial Government. In the 1960's amendments to Section 3 of the Water Act put in the ability to formulate regulations for groundwater. However, not until recently has any sort of regulation been drafted. Part Four of the Water Act allows for a permit process for new wells and monitoring of water volume used in new and existing wells to be developed. It also allows for the development of community watershed management plans. This legislation, enacted in November 2004, will allow for communities to develop individual water management plans that are legally enforceable (BC Ministry of the Environment, 2008). As a result, communities will have the ability to create local initiatives, solve conflicts between users, and monitor water quality and meter quantities used. Part Four also requires that users not adversely affect ground water of an aquifer that they are using, or adversely affect prior users of the aquifer (BC Ministry of the Environment, 2008). Negative feedback concerning metering of well and surface water use has been prevalent (Cairns 2008).

Both surface and groundwater use in B.C. are not metered. However, during the application process for surface water withdrawals and diversions, applicants have to specify and provide evidence for a needed volume (Cairns, 2008). If no specifications are given, domestic

surface water licences are given a maximum eligible quantity of 500 gallons per day (gdp), while irrigation or industrial purposes are given a maximum eligible quantity of 2500 gdp, or 1 acre foot per year (Water Act, 1996). Water use allocation is determined through 'First in Time, First in Right', meaning that individuals with senior water right licences have first priority over water in a watercourse. New applicants will have their applications evaluated against the remaining usable water in a watercourse. When considering applications, the controller also must consider the necessary volume of water needed to maintain ecological and environmental standards within the watershed (Water Act, 1996). Streams that are determined 'sensitive' under the Stream Protection Act are considered excluded from the water rights licensing process, as water withdrawal from these systems could further jeopardize the ecosystem (Fish Protection Act, 1997).

### Comparison and Contrast

The most significant difference between the British Columbia and Washington State water legislation is the lack of permitting, and registering of wells in British Columbia. In 2006, approximately 70% of exempt groundwater users were recorded and registered (Washington State Department of Ecology, 2006). While the only knowledge that B.C. has of existing water wells are those that have been voluntarily reported by landowners or well drillers, and those wells that have been drilled following the implementation of the GWPR into the Water Act in 2004 (Wei, 2008). The lack of groundwater information and legislation, until recently, could be the result of historic freshwater wealth creating a mentality of excessive surface water and undepletable groundwater resources. Only recently has increased population and urbanization necessitated the creation of legislation for groundwater protection and monitoring within B.C.

Both B.C. and WA use 'First in Time, First in Right' to determine water allocation of water resources. In both instances those who have senior water rights have priority over others applying for water rights. Beneficial use of a water right is also part of both regions water legislation. That is, water licensees are required to provide evidence of beneficial use of licensed water upon request of their respective governing body. Within WA, maintenance of instream flows to provide for ecological and environmental aspects of the water course is clearly defined through the Water Resources Act. The maintenance takes precedence over new applicants to water rights. However, the adoption of instream flows for a given watercourse do not supersede senior water rights, instead they are given priority based off of the date adoption. This is similar in BC, in that the Fish Protection Act can dictate if a water removal licence will be issued, based on the amount of flow in the watercourse, and the impact water withdrawal would have on the respective watercourse.

### Implications for Transboundary Water Governance

The regulatory legislation of B.C. and WA are similar in underlying theory. However, there are significant variations in individual statutes. For instance, the differences in monitoring and licensing processes lead to information gaps. The lack of information concerning the number of wells and volume of water withdrawn is a serious void concerning the allocation of water rights and maintenance of flows. If one does not know how much water is being removed from a watershed through ground water it would be difficult to determine base flow levels

necessary for maintenance of habitat, while also trying to determine how much water can be removed from the system by licensed users. This can affect transboundary management relationships. It is difficult for downstream, separate nation users to effectively manage their water resources when it is not known how much water is being, or will be removed from a system at any given time.

Riparian management and development regulations also play an important role in evolution of flow in watersheds. The Water Act in B.C. in part addresses this, but it also falls under the Environmental Assessment Act, the Federal Fisheries Act, and municipal bylaws. Concurrently, within WA development in and about a stream falls under Federal, State and County legislation. While not the focus of this paper, legislation, regulations and bylaws affecting development in and about watercourses is important to mention due to the ‘scalar mismatch’ between international governing bodies, much like those found with the statutes of groundwater and surface water withdrawal legislation of B.C. and WA.

Borderland regions of similar geographical environment, but with separate governing systems, like that of the Fraser Lowlands provide unique natural resource management settings. The recognition of ‘borderland regions’ (Morris 1999), involves the recognition of regions sharing a regional distinction; cultural, social and environmental resources across a border. Within the literature discussing transboundary watershed management, the common underlying theme identified is cooperation between stakeholders affected by the resource use. Cooperation between stakeholders, government regulatory agencies and NGOs is paramount to successful management of transboundary watershed resources (Norman and Bakker 2005; Kenney 1999; Scott 1999). Draper (1997) describes the duties and obligations of sovereign nations when discussing transboundary watershed sharing. Sovereign nations or states, when entering discussions concerning watershed ‘sharing’ have four responsibilities (Draper, 1997); including, “...the duty to operate and negotiate in good faith...the duty to prevent unreasonable harm...the duty of equitable utilization and the duty to exchange data and information...”. How these duties should occur is something that should be discussed.

#### Current Management and Cooperation Mechanisms between B.C. and WA

There are existing organizations and mechanisms formulated to promote cooperation and mitigate against conflict over transboundary environmental resources. The Boundary Water Treaty, implemented through the International Joint Commission (IJC) in 1909, is a neutral organization with an equal amount of commissioners from both the United States and Canada ([www.ijc.org](http://www.ijc.org)). The IJC is tasked with investigating and providing solutions to conflicts over transboundary water quality and quantity, but only allowed to do so when requested by both nations ([www.ijc.org](http://www.ijc.org)). The IJC operates mainly at the federal level, and was originally formed to deal with environmental issues concerning the surface water in the Great Lakes region (Norman and Bakker 2004). The IJC has also been involved in other transboundary environmental issues, such as conflicts over air pollution. A similar but regionally local organization formed between WA and B.C. is the Environmental Cooperation Council (ECC) (B.C. Ministry of the Environment, 2008b).

The ECC was formed as part of the Environmental Cooperation Agreement (ECA) in 1992 between Washington State (WA) and British Columbia (B.C.) (B.C. Ministry of the Environment, 2008b). The ECC was designed to provide an institutional framework for regulatory cooperation over transboundary environmental resource use (B.C. Ministry of the Environment, 2008b). Six task forces have been formed under the IJC in response to transboundary environmental issues that were deemed high priority by the ECA. According to Norman and Bakker (2004), there are three emerging issues which have the potential to promote the formation of new task forces, waste management, wetland protection and water resource management. The Abbotsford-Sumas Aquifer Taskforce, one of the six ECC task forces, deals directly with management and monitoring of the transboundary Abbotsford Sumas Aquifer. The taskforce has members from federal and state/provincial governments, as well as municipal governments and First Nations of the region, from both B.C. and the US. The purpose of the task force is to develop management strategies for the aquifer, and create educational programs and tools for protection of the aquifers groundwater resources (B.C. Ministry of the Environment, 2008b).

These two organizations operated at different geographical and government levels may be tools by which the duties and obligations illustrated by Draper (1997) should occur. Local level non-governmental organizations and local stakeholders that successfully cooperate in a cross border setting may also provide an example of a framework by which transboundary watershed could occur.

### Conclusion

Close attention must be paid to the intricate differences in the function and design of institutions developed to facilitate cooperation regarding to transboundary ecological management (Fraser, David A. 2008). I believe that this can be carried over to the regulations and policy dictated by each nation's water and watershed management legislation. One must understand the law governing the use of water, and the differences in law between neighbouring nations, prior to attempting to formulate a transboundary watershed agreement. Only when all governing agencies and stakeholders are educated in the regulatory statues of the neighbouring nation can successful management occur. This paper only briefly touches on the main statues of B.C. and WA. Further research of parallel statues in both B.C. and WA is necessary in order to understand what other legislation exists at both the federal and provincial/state level that influences water shed resources use.

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