# Water in the Okanagan: Perceptions of Governance

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# WATER IN THE OKANAGAN: PERCEPTIONS OF GOVERNANCE

by

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## Preface

This document was created with the intention of serving dual purposes: a professional project required in part for graduation from the Masters program at the School of Community and Regional Planning, and a document providing resources for the development of a policy recommendations paper to be published by Simon Fraser University's (SFU) Adaptation to Climate Change Team (ACT) in March 2011. The audience for this document is composed of individuals in the water resource community who are generally familiar with the Canadian water governance and management context, and with commonly used water and governance related language. The policy recommendations paper, to which this document contributes, is being created by a team of post-graduate students (specializing in hydrology, policy, current water issues and urban planning) recruited by ACT, and led by an established policy author – Robert Sandford, Chair of the Canadian Partnership Initiative of the United Nations International "Water for Life" Decade. This forthcoming SFU publication is intended to provide government officials and individuals in water management with knowledge of current Canadian water-related innovations, along with updated information on the state of fresh-water supply and quality within specific regions and the availability of resources used in its management.

## Executive Summary

With some areas receiving only approximately 300mm of rainfall per year, the Okanagan Basin is one of the driest and most water stressed regions in Canada. Despite its relatively low water supply, the Okanagan has been recorded as having very high water use rates. Over the last decade, individuals and organizations in the region have come together to address issues affecting water, including quality, shortages, population growth and climate change. In order to most effectively consider the dynamic and complex situation water management presents the Okanagan region invested in the formation of the Okanagan Basin Water Board (OBWB) in 1970, a unique form of local government designed to direct and connect action based members of the local water management and governance community. Over the years, the goals of the OBWB have evolved to become network oriented, making use of multi-level and collaborative techniques as well as some social learning principles. The implementation of network governance strategies has engaged the OBWB in developing formal and informal relationships throughout the water management and governance community, exposing important water related issues and bringing together individuals and organizations with complementary skills and technical expertise. These connections have helped produce a number of strategies and data that aid in the management of Okanagan water resources. The OBWB's various initiatives have had such impact on the Okanagan that it warrants study.

Despite little documentation on whether or not network governance is creating positive change for Canadian water resources, academic literature often portrays it as an effective governance tool. Proponents of network governance state that it promotes the development of relationships between individuals and organizations, which furthers knowledge sharing and brings about the creation of legitimate and appropriate policies and procedures. However, a growing body of literature is developing a case against network governance. Arguments cite that it has the potential to undermine basic principles of democracy by utilizing collaborative processes for the purposes of legitimizing bad policies; that it has the potential to start as many conflicts as it quells; and that, in the presence of differing managerial styles it can quickly become ineffective. Various failures and successes in network governance techniques also make up a component of the history of collaborative processes in British Columbia.

As part of an ongoing climate change policy recommendations program, the Adaptation to Climate Change Team (ACT) at Simon Fraser University chose to investigate the Okanagan's water governance and management innovations. The study involved a series of roundtable discussions, one of which focused on the Okanagan Basin. The results of the roundtable discussions were documented and a series of policy recommendations developed for the purpose of distribution to government officials and individuals or organizations involved in water governance and management throughout Canada. In order to document information on the usefulness of the region's network governance strategies, an electronic survey designed to informally collect perspectives on Okanagan governance strategies was distributed to the attendees of the roundtable discussions. The survey showed that individuals within the Okanagan water governance and management community were mostly optimistic about the network governance techniques that had been implemented in the community. The results highlighted the importance of the integration of various water related institutions and government departments and the discontinuation of siloed water resource governance. Long-term management and governance positions were seen as essential resources, and individuals who were able to champion and create momentum for important water-related issues were viewed as indispensable to the furthering of better management. Despite a relatively high satisfaction level with Okanagan water institutions, respondents had concerns about the future of the region's water, including: a lack of funding for projects or data production, little public understanding for effective water conservation and, importantly, concern about the low or non-existent levels of public and Aboriginal involvement in the Okanagan water sector thus far.

The results of the survey provide further documentation of how network governance is perceived in the Okanagan. Also, the results create additional evidence pertaining to next steps Okanagan institutions might take within the water sector.

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## Introduction

As the Okanagan Basin faces growing demands, constrained supplies and the threat of further climate change, it is revising its decision-making processes regarding water resources, understanding that there is an urgent need to change the behaviour of water users in the region. Due to drastic water limitations relative to the rest of Canada, the Okanagan Basin has organized and implemented a number of initiatives currently regarded as successful innovations in water governance strategies in the Canadian context. These innovations generally fall into the category of network governance, a governance style that is characterized by informal and formal relationship building within multiple levels of government or other institutions for the purpose of expediting management processes, building trust, creating understanding and knowledge, and developing better methods of governance. The goal of the research report here is to identify perceptions of the performance of these innovations.

Over the last decade a number of shifts have occurred in the Okanagan Basin water governance sector that have caused it to become recognized as having developed one of Canada's more innovative water management infrastructures. Network governance techniques, primarily facilitated by the Okanagan Basin Water Board (OBWB) have become a major mechanism in furthering activities such as water-oriented research and the effective dissemination of formal and informal knowledge among experts. In order to collect data on the perceived performance of these initiatives within the water management and governance community, Simon Fraser University's (SFU) Adaptation to Climate Change Team (ACT), while focusing on water, posed a series of questions to participants in an ACT roundtable in late October 2010. Taking the form of an electronic survey, almost half of the Okanagan attendees at the roundtable responded to questions focused on the perceived performance of water management in the Basin as it relates to the region's relatively new governance strategies and their potential outcomes for the basin communities.

Most questions in the survey were structured to be qualitative in nature in order to accommodate complex responses to multi-faceted scenarios. Given the nature of current governance infrastructure in the Okanagan, most responses centered on network governance focused on the Okanagan Basin Water Board and its coordination on water

related issues within the Basin. The survey often provided results that echoed both the benefits and drawbacks of network governance that have been cited in the academic literature. While network governance has done much for relationship building and a shared understanding of issues within the management and governance community, it has not facilitated connection with the general population or with the Aboriginal community.

### Simon Fraser University's Adaptation to Climate Change Team

The Adaptation to Climate Change Team (ACT) is an initiative produced by Simon Fraser University operating under the auspices of an advisory board and management team. The advisory board is composed of five experts from various backgrounds including public service, and academia. The management team is led by Deborah Harford who acts as the primary correspondent in the coordination and facilitation of ACT's events and documents.

### Purpose

Operating as a multi-disciplnary research initiative with support from various SFU departments, including the Public Policy and Dialogue Programs, ACT generates policy options and increases education capacity with regard to adaptation to climate change issues (Canadian Underwriter 2007). Currently operating under the direction of Deborah Harford, ACT is the brainchild of Richard Lipsey, professor emeritus of economics at SFU and a former senior economic advisor with the C.D. Howe Institute, SFU economist Nancy Olewiler, director of the university's Public Policy program (Postmedia Network 2008), and Deborah herself. ACT is designed to conduct roundtable discussions, bringing together leading experts, industry, community and government to increase understanding of the risks associated with climate change, and to generate recommendations for sustainable adaptation (Adaptation to Climate Change Team 2010). In order to pursue these goals, ACT receives funding from a variety of sources, including government, foundations and industry (Simon Fraser University 2010).

### Justification for a Discussion on Water

With one of the world's largest reserves of freshwater, water resources in Canada are often taken for granted, and it is increasingly possible the nation will not be prepared to deal with changes to freshwater supplies resulting from climate change, such as: shifting hydrological

scenarios; increasing risk of drought and flooding; decreasing snow packs; melting glaciers and sea level rise. Impacts from these and other possible climate change results on freshwater include: increasing imbalance in freshwater supply and demand, especially regarding summer and fall supplies; issues surrounding reliable hydropower; increased pressure on sewage treatment and management; and contamination and other health risks, especially on First Nations reserves. Also, as it is generally estimated that climate change will have an increasingly severe impact on the global south, and therefore also on Canada's neighbor – the United States of America – it is important to note that Canadian's may have to consider national and local water policy and transboundary issues increasingly in the context of national and foreign policies on energy and agriculture (Adaptation to Climate Change Team 2010).

## Issue Engagement

The previous concerns have led ACT to focus one of its roundtable research sessions on water and climate change. In order to fulfill the goals of the water discussion, ACT has partnered with and received sponsorship from insurer Zurich, Indian and Northern Affairs Canada (INAC), Environment Canada (EC), and the Real Estate Foundation of British Columbia. ACT has organized three roundtables across Canada in locations where significant work is being done on the topic of freshwater and climate change: one in Kelowna, British Columbia during October 2010; one in Sydney, Nova Scotia during November 2010; and one in Yellowknife, Northwest Territories during January 2011. The purpose of these sessions is to facilitate discussions among ACT, local organizations, citizens, and experts. Discussions focus on barriers, motivators and recent progressions that have either aided or hindered the sustainable management of water resources already under pressure from climate change (Adaptation to Climate Change Team 2010). In addition, ACT has co-organized two roundtables with the Center for Indigenous Environmental Resources (CIER), one in Toronto and one in Vancouver, during the summer months of 2010. This joint effort was made to ensure that indigenous voices were adequately represented and documented throughout the water discussions. The partnership between CIER and ACT was funded by INAC's adaptation to climate change group (Adaptation to Climate Change Team 2010).

## Structure of ACT's Investigations

ACT is designed to operate over a five-year term, composed of six-month long investigations into various topics on climate change and adaptation. Each six-month investigation is composed of inter-disciplinary, multi-stakeholder gatherings to which practitioners, industry, communities, non-governmental organizations, First Nations and leading scientific researchers are invited to engage on current and potential future concerns or scenarios and key issues on the session topic, as well as in-depth research into science and policy. Public dialogue is incorporated into the sessions, providing various opportunities for engagement and sharing of knowledge based resources. These engagements provide a foundation for the policy development portion of the roundtable sessions. A team of graduate students is led by a policy expert in the exploration of current research, knowledge gaps, and policy options in order to facilitate further knowledge in the field on effective adaptation solutions. Each six-month investigation delivers a major report and briefings geared toward appropriate authorities. ACT publishes the findings in order to provide resources for decision-makers that bridge from science to policy to action, and makes these available for public and educational purposes as well. Other deliverables include the establishment of formal and informal networks within the sector of interest, as well as raised public and decision-maker awareness of "issues, impacts and options for action" (Adaptation to Climate Change Team 2010).

## Team

In order to gather and formulate the best possible results within the allotted six-month time frame for the Water specific investigation, ACT invited Bob Sandford to serve as policy author. Bob Sandford is the Former Chair of the United Nations International Year of Fresh Water and Wonder of Water Initiative in Canada in 2003 – 2004. He is presently the Chair of the Canadian Partnership Initiative of the United Nations International "Water for Life" Decade. The only Canadian to sit on the Advisory Committee for the prestigious Rosenberg International Forum on Water Policy, Bob is also Director of the Western Watersheds Climate Research Collaborative (Adaptation to Climate Change Team 2010). Sandford and Harford have led a team of graduate students in the research and writing of a policy recommendations report, of which this document is part.

The graduate students were chosen for their varied backgrounds in hydrogeology, policy, governance and planning. Each student helped to develop, research and write a segment of the final ACT report under the direction of Deborah Harford and Bob Sandford. Asrai Ord developed the electronic survey on perspectives on governance strategies in the Okanagan, compiled and formatted the responses and contextual literature into this document on perspectives on governance, and presented the main findings at one of ACT's roundtables in Sydney, Nova Scotia. Also integral to the development of the ACT policy recommendations paper are Laurie Neilson-Welch, a hydrogeologist who compiled information on the current state of water resources in the Okanagan; Jon Robinson, a policy student who compiled information on national and local water governance infrastructure and aided in the development of policy recommendations; and Cedar Morton, who was integral to the compiling, writing and editing of the final report alongside Bob Sandford and subsequent co-author Linsay Martens, a senior ACT researcher and Public Policy graduate who took over from Cedar Morton due to illness. This document on perspectives on governance in the Okanagan, especially the results of the electronic survey, will be used to inform the final ACT policy recommendations report, to be published in May 2011.

## Regional Overview

### Physical Context

The approximately 180 km long and 100 km wide Okanagan Valley, located in the southern interior of British Columbia, contains both Okanagan Lake and the Okanogan River within the south central plateau area (Cohen, Neilsen and Welbourn 2004). The valley lies in the rain-shadow of the Coast and Cascade Mountain Ranges. Higher elevations of the valley tend to be forested and far wetter than the valley bottom, which is characterized as semi-arid (Cohen 2006). Precipitation and runoff varies in the Basin depending on elevation and location and is quite low in comparison to the rest of Canada with an average of approximately 600 mm per year, while the valley bottom usually receives only about 300 mm per year. Approximately 85% of this 30 mm of rainfall is lost through evapotranspiration and evaporation (Environment Canada 2001). Due to climate, the Okanagan is often subjected to either drought or flood. Stream base-flows are maintained through the winter at a decreased level from their peak runoff in springtime as a result of snowmelt (Summit

Environmental Consultants Ltd. 2005). Basin drainage is primarily facilitated by the Okanogan River, which moves water through a series of lakes from the Vernon area where it proceeds to cross the United States Border. The river itself finishes when it meets the Columbia River located near Brewster (Summit Environmental Consultants Ltd. 2005).

Figure 1. Map of the Okanagan Basin


(Okangan Basin Water Board 2010)

## Allocation

The residents of the basin are organized in thirteen municipalities, three regional districts, four First Nations communities and 59 improvement districts, with each community bearing separate responsibility for managing their water sources. In addition, there are over 45 community watersheds in the Okanagan region, each overseen by different water managers (Environment Canada 2001). Water allocation is generally carried out through licenses, as it is throughout the rest of British Columbia. There are presently 6900 license registrations and over 385,000 acre feet recorded as in use, leaving most water sources in the Okanagan basin either short of further usable water, or listed as suffering from water shortage (Environment Canada 2001). Current population versus infrastructure woes are projected to increase due to probable future increases in the numbers of residents in the Okanagan Basin Region. Already the Okanagan has undergone intense growth, expanding its population from 210,000 people in 1968 to 310,000 in 2001. In 2031 it is expected that 450,000 people will reside in the Okanagan region (Cohen and Neale 2006).

## Consumption

Water use in the Okanagan varies: while some communities use as little as 470 liters per capita per day (Lpcd), others use up to 789 Lpcd. During drought years, water use in certain irrigation districts has been recorded as high as 1,370 Lpcd (Cohen and Neale 2006). Despite its relatively high water use per capita compared to most other communities in Canada, the Okanagan has the lowest water supply per person in the country (Okanagan Basin Water Board 2010). Furthermore, industrial users, such as agriculture, are increasingly tapping into the Okanagan River and local communities are starting to experience problems with a lessening availability of water supply.

## Governance

Governance of the water system in the Okanagan is complex, partly due to three sets of factors affecting various Okanagan watershed management processes: Canada's binational water system; involvement of multiple levels of government; and, the existence of a multitude of in and out of stream uses by a variety of types of organizations (Cohen 2006, Environment Canada 2001). Concerns about possible negative effects of climate change on the Okanagan Valley have spurred various institutions and levels of government into

action regarding research, participatory discussions, and new governance techniques (Cohen and Kulkarni 2001). Regarding techniques, the implementation of network governance has provided a major foundation for changes within the Basin, of which the Okanagan Basin Water Board (OBWB) is a primary proponent. The OBWB is joined by several other agencies involved in some version of water management or governance in the region.

## Okanagan Basin Water Board

In 1969 the Okanagan Basin Water Board (OBWB) was formed to deal with water resource issues. Then, OBWB duties included finding funding for proposed water management projects and increasing the collaboration between various government agencies related to water. The joint Federal-Provincial Okanagan Basin Water Study, considered a breakthrough for public involvement, took place between 1969 and 1974 shortly after the creation of the OBWB. This study initiated some of the first movement toward a basin-wide and coordinated approach to water in the region (Okangan Basin Water Board 2010). Changes to the OBWB occurred mostly within the last decade during which a number of other water related initiatives were taking place. In 2003 the focus of the Board expanded to include the study of climate change impacts on water supply (Water Bucket 2005). In 2006 the OBWB formed the Okanagan Water Stewardship Council (OWSC), which acts as an advisory council to the board in order to capitalize on current management knowledge for the improvement of long-term decision-making (Okanagan Water Stewardship Council 2010).

Table 1. 2009-2010 Members of the Okanagan Water Stewardship Board

| OWSC Member Name | OWSC Member Title |
|---|---|
| Alan Boreham / Daniel Millar (alt) | Environment Canada - Pacific and Yukon Region |
| Anna Page / Anthony Kittel (alt) | Regional District of North Okanagan |
| Bal Poonian | Urban Development Institute |
| Bernie Bauer – Chair | UBC Okanagan |
| Bob Hrasko | Water Supply Association |
| Brian Guy | Canadian Water Resource Association |
| Bryn White | South Okanagan Similkameen Conservation Program |
| Chris Radford | Regional District of Central Okanagan |
| Denise Neilsen | Agriculture and Agri-Food Canada |
| Doug Edwards / Kirby Rietze (alt) | Agriculture and Agri-Food Canada |
| Doug Geller | BC Groundwater Association |
| Hans Buchler | BC Agriculture Council |
| Howie Wright / Gwen Bridge (alt) | Okanagan Nation Alliance |
| Jillian Tamblyn | Regional District of Okanagan-Similkameen |
| Ken Cunningham | Ministry of Environment, Water Stewardship |
| Kerry Rouck | Shuswap Okanagan Forestry Association |
| Lee Hesketh | BC Cattlemen's Association |
| Lorne Davies / Aron Chatten (alt) | OCEOLA Fish and Game Club |
| Lorraine Bennest | BC Fruit Growers Association |
| Magnus Bein | Okanagan Collaborative Conservation Program |
| Mark McKenney | Osoyoos Lake Water Quality Society |
| Mark Watt / Don Degen (alt) | City of Kelowna Water Conservation Program |
| Mike Adams | Interior Health Authority |
| Steve Matthews | Section Head, Fish and Wildlife Science and Allocation Section |
| Ted van der Gulik – Vice Chair | Ministry of Agriculture and Lands |
| Vic Harwood / Don Main (alt) | CFDC - Okanagan Similkameen |

(Okanagan Water Stewardship Council 2011)

The OWSC is responsible for producing the Okanagan Sustainable Water Strategy, an influential document that outlines potential guiding principles and key actions for addressing various factors impacting the Okanagan's fresh water supply. The following table provides a brief introduction to the document.

Table 2. Guiding Principles for the Okanagan Sustainable Water Strategy

| | |
|---|---|
| Recognize the value of water. | Water is a common good that is essential to the survival of people and ecosystems. The consumptive and non-consumptive values of water will be recognized and respected in all water management decisions. |
| Control pollution at its source. | Water quality in lakes, streams, and aquifers will be protected for the benefit of healthy ecosystems and to help ensure clean, safe, and reliable drinking water is available to all residents of the Okanagan Basin. |
| Protect and enhance ecological stability and biodiversity. | Natural processes in healthy watershed ecosystems are the most effective and cost-efficient means to maintain instream water quality and quantity. Water management will commit to protecting and restoring ecosystems and will ensure that local and cumulative impacts on sensitive habitats are considered in land and water management decisions. A watershed-based approach will be taken to identify the natural features that are essential to protecting water quality and quantity (e.g., wetlands, waterways, adjacent uplands, and riparian areas). |

| | |
|---|---|
| Integrate land use planning and water resource management. | Integrated water resource management means recognizing the interrelationship between land use and water quantity and quality. Land use decisions will work to minimize the impact of urbanization and reduce the human footprint on the environment, which will in turn reduce impacts on water resources. |
| Allocate water within the Okanagan water budget in a clear, transparent, and equitable way. | Identifying how and when water will be allocated is critically important to prepare for the possibility of increasing drought conditions in the Okanagan. Sufficient water must be available for the environment, agriculture, basic human needs, and economic development now and in the future. Existing historical inequities of water supply in the Basin need to be addressed and policies should be developed to prevent the emergence of new inequities as a result of increasing competition over water. |
| Promote a Basin-wide culture of water conservation and efficiency. | Reducing water waste and promoting water use efficiency is central to sustainable water management. Water saved through improved water use efficiencies by a water use sector should be held for that sector |
| Ensure water supplies are flexible and resilient. | Even with improved Basin-wide water conservation and efficiency, water storage capacity will need to be increased in some sub-basins to meet the joint challenges of |

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|---|---|
| | population growth and climate change. |
| Think and act like a region | Local decisions must consider watershed and aquifer interconnections with the larger Basin. Work towards a governance system that integrates existing institutions from the sub-basin level to the Basin as a whole, and provincial and federal government. Specific types of decisions are appropriate at each level of this nested system of governance institutions and a reasonable balance of authority must be achieved. |
| Collect and disseminate scientific information on Okanagan water. | The best available technology and science will be used to inform water management decision-making. Information will be managed in an integrated manner that is readily available to stakeholders Basin-wide. |
| Provide sufficient resources for local water management initiatives. | Sufficient financial resources will be allocated to support better use of supplies of water that we have already developed, to employ new technology and infrastructure, to improve and refine management practices, and to draw on better information. |
| Encourage active public consultation, education, and participation in water management decisions. | Transparent decision-making processes and opportunities for information sharing and open communication are essential to a collective understanding and acceptance that we are part of the environment and our activities have implications on clean |

| | |
|---|---|
| | available water. A culture of accountability needs to inform everything from high level planning to individual perceptions and patterns of consumption. |
| Practice adaptive water and land management | Continuous learning, innovation, and improvement are essential to effective and efficient implementation of the Sustainable Water Strategy. An ongoing monitoring and reporting program will be developed for the Strategy. In addition, a comprehensive review of the Strategy needs to be conducted every five to seven years. |

(Okanagan Water Stewardship Council 2008)

Today the OBWB is a unique form of local government involved with a host of other water-affiliated organizations and levels of government and showing great leadership in water issues within British Columbia, most recently in its unveiling of a new water use reporting tool for the valley, SWURT (Peachland News 2011). Although it has no regulatory powers, it does have taxation powers as established under British Columbia's Provincial legislation (Okanagan Basin Water Board 2010).

## Okanagan Research

While the OBWB was readapting its mandate during the early 2000's, research on climate change and population growth impacts began in the Okanagan. The research provided momentum that continues today, as a variety of researchers in the Okanagan continue to generate data on the current status and future projections of fresh water supply and demand (Cohen and Kulkarni 2001). In addition to research on supply and demand, a Participatory Integrated Assessment (PIA) also took place with a variety of stakeholders who were invited to evaluate the region's water resources through a network context (Cohen, Neilsen and Welbourn 2004). A wide variety of issues were defined and discussed by the participants, who utilized the information they gained to better incorporate mitigation

strategies for climate change risks into planning and policy development. One of the products of the PIA sessions was a shared learning experience between the researchers who hosted the workshops and the participants, where all participants were positive about the experience and recommended the work and process be shared with the larger community (Cohen and Neale 2006).

## Theoretical Context

### Network Governance

Network governance is defined as a coordination of informal relationships between individuals and organizations, replacing traditional hierarchical and bureaucratic relationships (Jones, Hesterley and Borgatti 1997). Literature on the topic of network-based systems has lauded its ability to increase the efficacy of learning, resource use, problem-solving and service delivery (Brass, et al. 2004). Many of the water-affiliated institutions in the Okanagan have begun to institute a series of network-related governance strategies to promote more effective decision-making regarding climate change. These strategies include collaborative governance, social learning and multi-level governance.

Within Canada, governance roles with respect to network systems and collaboration can be seen as having evolved through two, perhaps three, separate stages of evolution (Dorcey, 2010):

1. The mid-1960's to the late 1980's: Policy was motivated by social and environmental concerns and citizen involvement was desirable. Discussions about whether the general public should be involved in environmental discourse prevailed.
2. The mid-1980's to the mid-1990's: the publishing of the Brundtland report and a re-emergence of environmental concerns, which spawned a new generation of participatory techniques and interest in business, civil and government realms. A general focus was on enhancing negotiation and other participatory techniques.
3. Following the new milliennium: a realization of the increasing complexity of intertwined social, environmental and economic issues which have brought about reflection on the democratic process. The third wave will most likely be about whether or not the democratic system can effectively support any of the techniques developed in the preceding two phases.

## Collaborative Governance

The act of collaboration between stakeholders is a strategy increasingly used in governance, especially regarding environmental policy. Common issues regarding environmental management are often aggravated by a general lack of information. It is this lack of information that collaborative governance attempts to address through the provision of connections, communication and the initiation of further enterprise regarding knowledge seeking and development (Karkkainen 2003). Replacing more adversarial forms of governance, collaborative strategies aim to increase the knowledge of all stakeholders in their pursuit of solutions, and bring legitimacy to policy solutions in environmental issues (Ansell and Gash 2007). The complexity of the technical aspects of most environmental issues along with prevailing social interests and agendas mean that current governance also requires collaborative consensus building in environmental problem solving; the central component of effective management and solutions development regarding environmental issues lies with interdependent engagement of the stakeholders (Bouwen and Taillieu 2004).

The use of collaborative action within government indicates a breakdown of well defined, traditional boundaries originally initiated as a result of the postwar governance system between public and private sectors, state, market and community (Healey 1998). As public participation becomes increasingly an essential facet of everyday governance, trending after phenomenon such as the "'hollowing out' of the nation state and the emergence of multi-level governance" (Newman, Sullivan and Barnes 2004), collaborative techniques increasingly find their way into discussions on the future of governance.

Collaboration opens formal and informal lines of information sharing, allowing for greater understanding by the stakeholders of the complexity of the situation and an increase in self-confidence due to acquisition of greater responsibility and new skills or techniques. This act allows for the increased potential of the application of environmental principles in the future and joint decision-making as promoted by collaborative governance creates the opportunity for new social dynamics where "information exchange, shared construction of reality, empowerment and

internalization" become elements of resource management (Bouwen and Taillieu 2004). Collaborative governance efforts such as: community visioning, consensus rule making, collaborative network structures, roundtables, study circles, online forums, participatory budgeting and large scale community meetings are perhaps most effective when implemented alongside traditional government processes (Booher 2005). However, in order for collaborative governance to have the potential to fulfill expectations laid out in writing, certain requirements for consensus building activities must be properly put in place:

1. Inclusion of a full range of stakeholders;
2. A task that is meaningful to the participants and that has promise of having a timely impact;
3. Participants who set their own ground rules for behavior, agenda setting, making decisions and many other topics;
4. A process that begins with mutual understanding of interests and avoids positional bargaining;
5. A dialogue where all are heard and respected and equally able to participate;
6. A self-organizing process unconstrained by conveners in its time or content and which permits the status quo and all assumptions to be questioned;
7. Information that is accessible and fully shared among participants;
8. An understanding that 'consensus' is only reached when all interests have been explored and every effort has been made to satisfy these concerns.

(Innes 2004)

The development and implementation of collaborative and consensus processes are a part of British Columbia's history. In the 1990's, the BC Round Table on Environment and Economy produced their "Guiding Principles of Consensus Processes". Listed below, these processes formed a foundation for the development of other consensus processes and have been reflected in Innes' work:

1. *Purpose-driven*: People need a reason to participate in the process.
2. *Inclusive, not exclusive*: All parties with a significant interest in the issue should be

involved in the consensus process.
3. *Voluntary participation*: The parties affected or interested participate voluntarily.
4. *Self-design*: The parties design the consensus process.
5. *Flexibility*: Flexibility should be designed into the process.
6. *Equal opportunity*: All parties must have equal access to relevant information and the opportunity to participate effectively throughout the process.
7. *Respect for diverse interests*: Acceptance of the diverse values, interests, and knowledge of the parties in the consensus process is essential.
8. *Accountability*: The parties are accountable both to their constituencies, and to the process that they have agreed to establish.
9. *Time limits*: Realistic deadlines are necessary throughout the process.
10. *Implementation*: Commitment to implementation and effective monitoring is essential for any agreement.

(Dorcey 2010)

## Social Learning

Albert Bandura first developed his influential theory of social learning in the late seventies. Bandura's theory differed from other theories of social learning at the time, all generally founded on theories of education and human development, due to his inclusion of the concept of social persuasion, and a theoretical framework built on the following principles: the ability to learn through observation; the importance of mental states to learning capacity; and, that learning does not necessarily lead to a change in behaviour (Bandura 1977). Regarding its application to resource management, social learning has become key to altering cultural beliefs and behaviour; recent studies have shown that governance is more important than technological advancement in effective water resource management (Pahl-Wostl 2002).

The activity of social learning can occur in a variety of forums, occurring in both virtual groups and face-to-face interaction. Wenger defines groups that people belong to in order to take action on a shared interest and in which social learning takes place as communities of practice. It is different from other social units in that it is "defined by knowledge rather than task, and exists because participation has value to its members" (Wenger 1998). Wenger's vision of social learning takes into account the complexity of social networking

and problem solving which facilitates the application of social learning to resource management.

In her paper on social learning and resource management, Claudia Pahl-Wostl discusses the use of social learning in governance, specifically in water management. She notes that the integration of learning strategies and governance tactics promote social management to the same level of importance as content management (Pahl-Wostl 2004). Including social management in the process of resource management aids stakeholders in their development of strategies to negotiate the conflicts and decision-making that is inherent in all resource management processes. In order for effective social learning to take place Pahl-Wostl cites the following requirements to be in place: awareness of each other's sometimes different goals and perspectives; shared problem identification; understanding of the actors' interdependence; understanding of the complexity of the management system; learning to work together; trust; the creation of informal as well as formal relationships (Pahl-Wostl 2004). Social learning is gaining popularity as a non-coercive tool for use in governance and water management in the European Water Framework Directive (Ison, Rolling and Watson 2007).

## Multilevel Governance

Effectively governing complex ecological issues is a necessary but difficult task. Due to the nebulous character of ill effects associated with water quality and quantity, hydrological issues are no exception to this requirement. The misuse of water affects social, moral, environmental, and political realms both temporally and spatially. Problems with water bring sharply into focus problems of scale and cross-scale dynamics in governance, and call for more integrated approaches to decision-making for effective problem solving (Cash 2004). Multilevel governance has been adopted by numerous institutions worldwide in order to better address the issue of scale and to bring to light the plethora of knowledge, strategies, opinions and agendas that often permeate the world of water. This governance strategy has been broadly defined as: "political structures and processes that transgress the borders of administrative jurisdictions, aiming to cope with interdependencies in societal development and political decision-making which exist among territorial units" (Newig and Fritsch 2009).

Multilevel governance brings together actors from the public and private sectors, government and non-government institutions, ideally with the goal of forming more accepted or efficient results of governing. This governance strategy has been linked to increased entrepreneurial policy making in the European Union, where cross boundary engagement has resulted in increased fulfillment of opportunities, providing the region has a history of strong municipal authority (Perkmann 2007). Multi-level governance is also partially based on a framework of social learning where social interaction of the stakeholders is strongly linked to the success of the decision-making process and its effective future implementation. It is therefore often most effective when: "the authority of user-run institutions is recognized and supported by legislation and policy enacted at regional and national levels"; and, when:

> "It is understood at all levels in the governance system that decision-making processes are informed, not only by formal institutional rules, but also by a set of principles and practices that have evolved over time and that include the need to achieve a reasonable degree of consensus among local, regional and state level institutions" (Wagner and White 2009).

Multi-level governance, collaborative governance, and social learning are seen to be inherently linked concepts that have the capacity to promote resilience. Their linking factor is the preeminence of social systems and influence these social systems have on governance and decision-making.

### Arguments Against Network Governance

Little has been documented about the effects of network governance and how it affects change regarding climate change, policy, implementation and decision-making. Those who have started to write in this arena note that although much academic literature generally supports network governance strategies, the empirical evidence of its effectiveness has yet to make itself reassuringly apparent (Newig and Fritsch 2009). Arguments against the usefulness of network governance propose that it weakens core values of democracy such as accountability, legitimacy and equality (Bogason and Musso 2006). Implementation plans for most types of network governance often neglect ordinary citizens in its

participatory schemes, and restrict approved sectoral stakeholder groups to a consultative role thereby relegating the process to the simple generation of consensus, as opposed to true democratic policy development and implementation; the process inherent in network governance is seen therefore not as a method with the primary focus of increasing democratic information exchange, but as a method of building legitimacy in an expert driven policy making process (Bevir 2006). Furthermore, network governance might dictate a decreased level of accountability as an increase in formal and informal networks among government can further diffuse responsibility through the process Dennis Thompson titled: "the problem of many hands", which occurs when policy formation and implementation occurs as the result of a series of decisions made by many individuals, thereby blurring responsibility of each person in the development process (Thompson 1980).

Naturally, there is no consensus on whether or not collaborative governance truly has the capacity to bring together effective problem solving approaches. This is unsurprising as collaboration is not necessarily simple to carry out or achieve results from, and parallels in many ways the diverse complexity of the ecosystems it is often attempting to manage. A collaborative approach potentially can be to used to justify and legitimize bad policies as well as attempt to produce effective ones, and certain techniques that fall into the collaborative classification, such as negotiated rule-making, sometimes only quell some conflicts while still inciting others (Coglianese 1997). Furthermore, it has happened that the implementation of collaborative governance can become constrained and ineffective by its subordination in the presence of other managerial styles, such as the priority of performance improvement and national inspection regimes for local processes or standards (Newman, Sullivan and Barnes 2004).

The province of British Columbia has implemented various collaborative governance processes in its past, especially regarding water related issues. Just as the OBWB can act as a successful case study for multi-level governance, various lessons have been learned throughout British Columbia's history regarding implementation of collaborative processes. In the 1980's, coastal resource governance was undergoing increasing attention. In his analysis of marine resources in British Columbia's, Tony Dorcey identifies four important characteristics in resource based governance processes: the involvement of many different

stakeholders; the actions of these stakeholders are directed through many loosely organized groups; the actions of the groups create several decision-making arenas; and, the stakeholders and their organizations are tied to each other through the action of bargaining. It is important to note that marine coastal resource management in the 1980's exhibited a multiplicity of governmental and non-governmental, loosely organized organizations. Dorcey notes that this seems to be "the preferred way of organizing [resource management] in Canada" (Dorcey 1986).

The presence of ever complicating water related problems were also very evident more than two decades ago, when issues surrounding water-affiliated resources were undergoing immense changes in complexity as a result of population growth, economic development, and decreased abundance (Dorcey 1986). The resolution of the problems associated with complex water issues have been and still is of central concern to individuals operating within governance. Tony Dorcey identifies four causes of conflict that can arise as part of the governance of resources:

> 1) Cognitive conflict is rooted in different understandings of the situation. It results from inherent cognitive failings that can lead to differences in technical judgment.
> 2) Value conflict stems from different judgments about the ends to be accomplished by the action contemplated.
> 3) Interest conflict occurs when there is a disagreement about the distribution of the costs and benefits. It results from differences in judgments about who should pay and who should benefit.
> 4) Behavioural conflict is rooted in the personalities and circumstances of the interested parties. Even though all parties desire a resolution of the conflict it may elude them for a number of reasons.
>
> (Dorcey 1986)

Bargaining, as a component of collaboration, is a tool that has the potential to either mitigate a poorly constructed participatory process, or partly redeem it. Regarding the management of coastal resources in British Columbia, Dorcey outlines several components

that have aided in the failure of collaborative bargaining processes: poorly informed participants, weak leadership, low accountability, and the increasing complexity of governance issues. Dorcey notes that in British Columbia, there was perceived potential to alter negative outcomes if bargaining processes were "explicitly structur[ed]" (Dorcey 1986). Additionally, in order for bargaining to proceed effectively, participants must be able to "communicate effectively, challenge each other constructively and bargain successfully" (Dorcey 1986).

## A Water Ethic

Deliberations regarding water management, allocation and policy are becoming ever more crucial in the face of climate change, growing global populations and escalating water insecurity. Increasingly, especially within the last decade, people have been turning to the realm of ethics to help inform these decisions. The Okanagan is not exempt from this phenomenon requiring a shift in ethics, or perhaps more importantly, the implementation of ethical behaviour.

In Western tradition, the concept of ethical behaviour has been adopted generally as precepts and principles that govern the trajectory of societal conduct. Ethics have an ability to shape decision-making processes in these types of societies because they have become entrenched as common behavioural norms within a society (Callicott 1997). Lacey argues that developing an ethical framework for decision making for water issues can be drawn from a foundation of contractualism. In this situation a new water ethic can be adhered to by a group of individuals because it is based on pre-existing moral principles with which people can easily identify. Contract theory allows us to "[negotiate] our moral principles where a collective of individuals or groups might hold or be motivated by different sets of desires and concerns but also share fundamental concerns" ( Lacey 2007).

Globally, the United Nations has adopted an increasingly large role as an advocate for a global water ethic. They have declared the 10 years between 2005 and 2015 the 'Water for Life' Decade, focusing on water issues surrounding food, health, environment, disaster prevention, energy, transboundary water issues, scarcity, culture, sanitation, pollution and agriculture (United Nations 2010). In 2000, the United Nations published a report

specifically on water ethics and freshwater resources. In this report they laid out a set of guiding ethical principles in water use. The report states that the principles were written as initiators to further dialogue while keeping in mind people and 'fundamental concerns that go beyond science' (Selborne 2000). The principles include: using ethics to inform every aspect of freshwater use; that human beings have a right to freshwater as a common good; that governments have the responsibility to set out clear regulations for freshwater use and that they should enforce the polluter-pays-principle; that transnational companies must be held accountable; and that water scarcity should be fought using local resources, experience and skills. A United Nations sub-commission on the ethics of freshwater use has identified certain fundamental components of ethical behaviour regarding freshwater use. It states that ethical freshwater behaviour must promote: human dignity and equality; participation; solidarity; common good; stewardship; transparency and universal access to information; inclusiveness; and empowerment (Brelet 2004).

### Traditional Ecological Knowledge

The wealth of the developed nations has allowed for the production of a new environment that is disassociated with the natural environment, as well as its indicators of change (Sandford 2010). This new environment of material production and mainstream, corporate-driven environmental values has become obviously incongruous to many of the values held by communities still adhering to 'indigenous' or 'traditional' principles. Adequately defining the word indigenous partly requires a definition of those who are labeled as indigenous (Ellen and Harris 2000), a topic that has legal, political, and cultural parameters that are beyond the scope of this report.

Through its affirmation of indigenous rights, The Earth Charter – first drafted in 1997 and endorsed by institutions such as UNESCO – is able to clarify differences in Western and indigenous values regarding the environment. The charter states that indigenous peoples have a right to "their spirituality, knowledge, lands and resources and to their related practice of sustainable livelihoods" (Earth Charter Commission 2010), markedly differentiating the concept of indigenous rights from those traditionally conceived for Western peoples. Further distinguishing indigenous, aboriginal or traditional populations from current, mainstream Western culture is the consistently cultivated desire of First

Peoples to maintain a more symbiotic relationship with traditional lands and territories (Westra 2008), whereas within mainstream Western culture, where parameters of environmental ethics are often defined through anthropocentric decision making, the realities of environmental consequences have started to be taken into consideration only recently (Brennan and Lo 2008). The above points are by no means a summation of the differences between Western and indigenous perspectives on ethical decision-making regarding the environment, but instead are basic highlights that help to distinguish the gulf that often exists between the paradigms of the two parties.

Current interest of Western culture in indigenous or traditional knowledge is two-fold. While the highly accepted trend of modernism embraced a worldview that sees nature and culture as unnecessary and science as an absolute truth, the post-modernist thinking that proceeded (and reacted against) modernism embraces concepts of culture, nature and indigenous or traditional knowledge (Friedman 1992). Western culture's interest can be partly explained as a reflection of post-modern thinking and a general malaise with absolute reliance on a (Western) science-based school of thought. However, this is by no means the only motivator: indigenous peoples and organizations have become increasingly present on the political and global stage and are becoming adept at voicing their concerns, traditions and values about their changing lifestyle and lands (Kalland 2000).

Many of today's water resource management styles cause serious conflicts for individuals and communities (Lacey 2008). Increased diversity, participation and collaboration within and external to management and other decision-making structures have the opportunity to mitigate negative effects of current infrastructure and governance.

## A Canadian Water Ethic

In 1983, the World Commission on Environment and Development (WCED), led by Gro Harlem Bruntland, released what would come to be known as the Brundtland Report, which sparked worldwide discussion on the implications of sustainable development. In Canada, discussion regarding sustainable development was accompanied by recognition of its ethical implications, such as "a greater acceptance of responsibility toward present

and future generations", and recognition "of the rights of minorities and other species" (Dorcey 1991).

In 2002 the Canadian government voted against the decision to declare water a human right at the United Nations Commission on Human Rights. By doing so, the Canadian government became the only member to take this position, and has come under fire by a number of social rights organizations for its stance. The Walkerton Inquiry, a result of the Walkerton, Ontario water contamination event, was a tragic reminder to Canada that the Canadian legislation does not include any mention of water as a human right (The Council of Canadians 2006). Robert Sandford, Chair of the Canadian Partnership Initiative of the United Nations International Water for Life Decade and author of the ACT Water report, argues that Canada is in desperate need of a national water ethic.

## SURVEY

### Introduction

In order to collect data on the perceived status of initiatives in the water management and governance in the Okanagan, Simon Fraser University's (SFU) Adaptation to Climate Change Team (ACT) posed a series of questions to attendees of an ACT roundtable on Okanagan water issues in late October 2010. Taking the form of an electronic survey, almost half of the Okanagan session attendees responded to questions focused on water management in the Basin as it relates to the region's relatively new governance strategies and their potential outcomes within the governance and public communities.

### Goals

The goal of the survey was to document perspectives of individuals working within the water sector in the Okanagan. The focus was on current governance strategies and motivators in decision-making and external impacts. The survey is intended to add to information on water governance in water sensitive regions in Canada.

### Design

The survey was developed by the author and shaped by an interdisciplinary team from hydrological sciences, policy, and water ethics and planning. After the initial development of

a range of possible basic survey questions, the survey was piloted within the ACT team. The team was composed of individuals from a variety of disciplines involved with water management: hydrogeology; policy development; resource and environmental management; and, urban and resource planning. Questions were selected dependent on their perceived long-term usefulness to the Okanagan community and other individuals working in water sensitive regions in Canada, and to the end goals of the policy document. Questions that were difficult to comprehend, double-barreled or otherwise poorly phrased were replaced or edited out by the various members.

This survey was mostly qualitative in nature. This approach was chosen in order to allow for as much respondent flexibility as possible. As with most issues including elements of social organization, water management issues are complex in nature and often require detailed explanations of social, environmental or technical mechanisms. The survey was composed entirely of verbal task elements (written questions, numbered scales, etc) and devoid of visual elements (arrows, colors, pictures etc), which were considered in this case to be potential distractions (Couper, Tourangeau and Kenyon 2004). Stylistically, the survey depended entirely on the online software (in this case: Google Spreadsheets) that was used to create it and was almost devoid of aesthetic components, utilizing only a light grey background, normal sized and legible sans-serif font, and an introductory paragraph on the purpose and proposed use of the survey. Appendix B contains a copy of the survey results.

### Sample

Non-random selection was chosen for this survey as it is intended to document the perceptions of individuals working within water governance in the Okanagan. The sample population was composed of invitees to a three-day symposium hosted by the Adaptation to Climate Change Team held in Kelowna in late October 2010. The survey was distributed via email by attending members of the team to each volunteer respondent and collected within a time frame of two weeks.

The number of conference attendees ultimately decided the sample size, although discussions on appropriate individuals to contact regarding survey distribution began in the months leading up to the symposium. Sample size was constrained by a number of things, the most important of which were: the individuals who attended (or who did not attend) the symposium; the communication networks of the team members and the communication networks of the team member's contacts; the timing and location of the conference; and, any bias inherent in the conference invitation list.

The individuals attending the conference were experts and stakeholders in Okanagan water issues. The following is a list of individuals invited to attend the conference. Not all of the individuals listed below responded to the survey. Individuals were not asked to identify themselves on the survey and none of the individuals listed below has been linked to any of the responses provided on the survey. Members of the general public were not invited to participate in the survey.

Table 3. Okanagan 2010 Conference Attendees

| NAME | TITLE | ORGANIZATION |
|---|---|---|
| Dr. Andrew Larder | Senior Medical Health Officer | Interior Health Authority |
| Angela Reid | Councilor | City of Kelowna |
| Anna Warwick-Sears | Executive Director | Okanagan Basin Water Board |
| Dr. Bernard Bauer | Associate Provost and Professor | UBC Okanagan |
| Bob Sandford | Lead Policy Author and Conference Chair | ACT |
| Dr. Brian Guy | Director | Summit Environmental Inc., BC Branch |
| Buffy Baumbrough | Councilor | City of Vernon |
| Dr. Darlene Sanderson | Post Doctoral Research Associate | Centre for Aboriginal Health Research, University of Victoria |
| Dallas Goodwater | Projects Coordinator | Okanagan Nation Alliance |
| Darwin Horning | Senior Planner and Sessional Lecturer | UBC Okanagan |
| Deborah Harford | Executive Director | ACT |
| Dr. Denise Neilsen | Research Scientist | Agriculture and Agri-Food Canada |
| Dion McKay | Councilor | Fisher River Cree Nation |

| | | |
|---|---|---|
| Doug Edwards | Regional Water Resources Engineer | Agriculture and Agri-Food Canada |
| Dr. Doug Owram | Deputy Vice Chancellor and Principal | UBC Okanagan |
| James Baker | Mayor; Vice Chair | Lake Country; Regional District of Central Okanagan |
| Dr. Jeannette Armstrong | Executive Director | En'owkin Centre |
| Jocelyn Wagner | Program Coordinator | ACT |
| Dr. John Wagner | Assistant Professor | UBC Okanagan |
| Kent Jorgensen | Board Member | Okanagan Mainline Real Estate Board |
| Laurie Neilson-Welch | Research Associate | ACT |
| Mark Watt | Manager Strategic Projects - Infrastructure | City of Kelowna |
| Mike Watson | Board Member | BC Wine Grape Council |
| Nelson Jatel | Water Stewardship Director | Okanagan Basin Water Board |
| Paulette Fox | Manager, Environmental Protection Division | Blood Tribe |
| Pauline Terbasket | Executive Director | Okanagan Nation Alliance |
| Robert Evans | Developer | Site 360 Consulting Inc |
| Roger Mayer | Vice Chair | B.C. Agricultural Land Commission |
| Sarah Cooper | Planner and Research Associate | Centre for Indigenous Environmental Resources |
| Sharon Shepherd | Mayor | City of Kelowna |
| Grand Chief Stewart Phillip | President | Union of BC Indian Chiefs |
| Toby Pike | Vice Chair | Water Supply Association of B.C. |

Conference attendees of the October 2010 Roundtable held in the Okanagan, British Columbia (ACT).

## Distribution

The survey was distributed via email, through publicly available online software hosted by Google. The benefits of using the Google Spreadsheet online survey development application includes: the easy and effective creation of (verbal) task elements; an organized structure; easy distribution (either as the full survey document with respondent text boxes or as a link within the body of the email); and easy collection of data, as respondent

answers are directly added to a Google Spreadsheet available either as a shared or private document available only to the creator of the survey. In this case, the respondent answers remained private and available only to the author until summarized and made available within this document. No names were collected in the survey, and Google does not record or link any personal information (including email addresses) to the answers.

### Quantification

Due to the small sample size of respondents, quantification was not made a component of the survey analysis. The benefit of the survey lies in the collection of qualitative responses and the documentation of perspectives on governance strategies in the Okanagan.

### Control

Effective control in a survey is often difficult to accomplish. Attempting to ensure the elimination of confounding variables while still extracting specific responses can create a difficult and lengthy survey, and the possibility of the reinvention of a new set of confounding variables. Although it can be almost impossible to entirely diminish the effect of variables, it is possible to mitigate their effect on survey results. A number of possible hindrances were taken into consideration during the construction of this survey.

Email surveys have been used often in the last few decades and have been known to increase response times over surveys delivered by postal service by approximately seventy-five percent and allow for easy tracking (whether the email was read and responded to; read only and discarded; discarded without reading; etc.), cost efficiency, and increased respondent candidness (Sheehan and McMillan 1998). Although distribution of surveys through email provides a number of benefits, this process may in fact no longer be in vogue. Sheehan shows that response rates to emailed surveys have decreased since 1986, citing a variety of factors as possible reasons for this phenomenon: survey length, respondent contacts, design issues, research affiliation and compensation (Sheehan 2006).

The Water Governance and Decision Making Survey was composed of nineteen questions, requiring multi-sentence or paragraph answers. Many respondents will not have the time or patience to respond to all the questions in a very long or involved survey, potentially

resulting in non-sampling errors or a failure to respond. Vicente and Reis discuss survey characteristics that can be implemented in order to combat non-response error in web-based surveys. Vicente and Reis discuss two possibilities for altering design survey so as to decrease non-response error:

> *(a) proactively, either by offering the individuals some kind of incentive that indeed seduces them into cooperating or by implementing a contact strategy with the respondents that convinces them of the importance of cooperating (e.g., conducting multiple contacts)*
>
> *or*
>
> *(b) alternatively (or additionally) defensively, by manipulating certain aspects of the survey in order not to put the individuals off cooperating*
>
> (Vicente and Reis 2010)

It was acknowledged that this survey needed to be mid-sized so as to balance the time restrictions of respondents with busy schedules while still allowing for complexity and flexibility in respondent entries. In order to further promote entries that allowed for best encapsulation of respondent perspectives on governance strategies, it was ensured that the online software used for survey distribution and collection utilized user-friendly components such as text boxes with large entry capacity. Although a few questions went unanswered, most responses were composed of multiple sentences and a few even composed of multiple paragraphs.

There is considerable debate on whether or not surveys are effective enough to be warranted, especially when compared to face-to-face interviews. Descriptions of successful response rates vary within academic literature. While some sources note that a fifty percent response rate merits success, others mention that eighty-five percent is easily achievable when utilizing correct methodological approaches (Goyder 1985). In order to increase response rate of this particular survey, reminder emails were sent three times: three days

after; five days after; and one week after the first distribution of the electronic survey and accompanying descriptive statement. Both times the reminders appealed to the respondents to complete the survey in order to help document the evolution of governance in the Okanagan and to aid in the advancement of knowledge of other water stressed regions in Canada. Also, since the survey was sent out electronically via email after the completion of the conference, it was relayed to the attendees by one of the conference organizers, as were the reminders to complete the survey. It was hoped that by accessing the conference attendees via one of the main organizers some semblance of continuity and momentum could be maintained despite the completion of the official conference proceedings and the recommencement of the attendee's daily obligations and time restrictions. Finally, the survey was sent out the day after the conference ended so as to capitalize as much as possible on the momentum built by the preceding three days.

### Concerns

Failure to respond occurred several times in the case of one particular question. Question number thirteen asked respondents to discuss whether or not they felt there was a particular governance strategy from the Okanagan that could be transferred to another region. This question was often left unanswered. It is assumed that the current preference within academic and professional water-related agencies for region-specific solutions is a possible reason for the respondent error on this particular question. When the question was answered, it was answered with positive, solutions based responses, as opposed to negative remarks about the question itself (see Appendix B for survey results).

The author's choice of wording was a concern for two questions which were linked in the survey: question two and question four. These questions asked respondents to rank motivators for change regarding shifts in water governance in the Okanagan. While many of the motivators were factors that had been developed by various water boards or other organizations within the Okanagan, such as increased access to scientific data or better relationships, two motivators were external factors: existing water stressors and population growth. Respondents were asked to discuss whether or not they felt which, if any, motivators had positively or negatively impacted decision-making in the Okanagan. The wording of the questions made use of the words "positive" and "negative", which created

confusion for at least one respondent. This respondent noted that the motivators themselves could be perceived as being positive (increased access to scientific data) and negative (existing water stressors). Although this may have affected the answers to both questions two and four, both questions yielded answers that clearly outlined concerns and beliefs held by the respondents of the survey and are therefore still considered of value.

A lack of precise demographic and background information on the exact respondents removes certain avenues of analysis with regards to the survey responses. Without precise information on the respondents it is impossible to know what personal or professional background might be directing any particular view on governance resources. Should a survey of this nature be carried out again in the Okanagan, it is suggested that demographic information be included in the survey.

## RESULTS

The Perspectives on Water, Governance and Decision-Making survey presented respondents with a variety of questions on water in the Okanagan. Appendix A contains a copy of the survey questions. This survey was distributed electronically, via email, to all attendees of the ACT Water Session roundtable held in late October 2010. 13 of 32 individuals (40%) responded to the survey.

### Water is not yet valued enough in the Okanagan

One component of the survey focused on collecting perceptions on the value of water and nature of the water ethic in the Okanagan. Several survey respondents noted that changing perceptions of water were underway within certain demographic pockets, particularly amongst those who are involved with water management on a regular basis, such as "leaders of the agricultural, planning and health communities".

Regarding development of a water ethic within the general public, there is evidence of a "raised awareness about the importance of sustainability… and the issue of water management is [one of] the catalyzing topic[s]." Water scarcity concerns within the general public seem to be translating into an increased awareness and implementation of water management tools, such as "xeriscape landscaping, rain barrels and other water

conserving practices." These conservation tools are potentially limited however, by a "sense of entitlement" within the community regarding how each individual might make use of their water resources, Survey respondents also indicated that although the general population has made progress toward a more sustainable lifestyle, many do not yet value water resources enough, suggesting that it would be "false" to state that the general public had developed "principles and values regarding water".

The implementation of many water conservation strategies might be aided by a fair amount of "outreach and interagency collaboration to engender [increased value for water resources] into the public realm".

All respondents believed that Okanagan residents would pay more for water in the future. The perception of potential or appropriate reasons for increased cost borne by the community ranged from environmental and moral obligation, to enforcement of increased rates by a managing authority. Some respondents believed that although "a minority [of residents] will complain" about imposed water rates, once appropriate explanations are given "no one will care." Some respondents were emphatic that Okanagan residents "should" pay for water and that the cost should be reflective of the "real cost" of water, including the costs to preserve ecosystems, the costs of regional water management, the costs of preparing for the future, and the costs of data collection and research, etc.

Although all respondents believed residents should be paying for water, it is important to note that several cited concerns about the social, economic and ethical ramifications that could result from the imposition of cost. As such, a basic level of water should be "available to all at minimal cost". Furthermore, it was noted, "that the main constituency that will object [to paying for water, will be] the agriculture sector, [which is] already operating at the [financial] margin, especially small, independent farmers."

### More Aboriginal and Community Involvement

The use of the word 'community' within the survey raised the issue of Aboriginal involvement. One respondent noted that the use of the term "Okanagan community" was

not inclusive of "the Okanagan Nation or the seven bands that comprise the Okanagan Nation." It was noted more than once that the Aboriginal community had not had any input into the development of a new water ethic in the region and that some of the large gaps in the current [Okanagan water management] activities" included the lack of any "First Nations [individuals] in a leadership role". Essential to the success of any future water planning in the region is the incorporation "of First Nations' views on water in the Okanagan ecosystem and their future needs for water diversions" into water management and governance strategies. It was noted that increased efforts to build lasting relationships between the two communities would be of benefit to future, more integrated water management strategies.

There is concern that the public has not yet been adequately engaged, and that this reality might create difficulties regarding future decision-making in the Okanagan. Public support for difficult decisions regarding the region's water resources is essential, and new ethical frameworks and paradigm shifts are necessary components of positive impacts on decision-making. Substantial public engagement is likely needed to develop a new culture of water conservation in the Okanagan, an issue made even more difficult to address due to the large influx of people moving into the region and the sizable demographic of part-time residents. Regarding implementing conservation strategies, one survey respondent voiced the concern that "public involvement and public knowledge of water supply systems and the local environment are not sufficient to support the level of innovation necessary to realize adaptation goals". Respondents noted that meaningful changes to the Okanagan population's perception of the value of fresh water resources have been successfully initiated in the past through increased collaboration and communication, and that the pursuance of further engagement would be beneficial to further success in sustainable water management. In order to take action on this front the OBWB, who has been seen success in the generation of much needed water-related data, will also need to expend energy gaining "expertise & knowledge on how to truly engage residents."

### Uses of Okanagan Water

Overwhelmingly, according to this survey, the most important uses of Okanagan water include: domestic use; the promotion of human and ecological health; agricultural uses; and the fulfillment of Aboriginal rights. Least important uses for Okanagan water include

watering lawns and “general water wasting”. Respondents often noted that despite their willingness to answer the question, the reality of applying a hierarchy of uses is complicated and entangled with a host of other issues regarding economy and lifestyle.

### Motivation For Change Multifaceted

Respondents were asked to rate what they perceived to be the most influential motivators for management changes in the Okanagan. No one motivator garnered a substantial amount of support as most influential. However, “Existing Water Stressors” received the largest proportion of votes; with “Discussion” and “Relationships” as secondary motivators; and a “Focus on Water” as a close third. Additional discussion on further motivators brought to light the perceived benefit of a “water crises” as motivation for change, specifically the “pivotal” occurrence of droughts and fires in 2003 as bringing urgent and public insight into the need for increased conservation and more efficient water technologies. However, one respondent also noted that “[w]ithout proper planning already in place, the response to an extreme condition can be quite political and not necessarily representative of the best course of action.”

The driving force of the economic crises relating to license holders and increasing competition for water resources and the positive impact of increasing stewardship values and the momentum provided by the Water Act Modernization were also cited as being substantial motivators for change.

### Okanagan Water Institutions

A majority of respondents felt that substantial change had occurred in water-related institutions and government agencies as a result of the Okanagan Basin Water Board’s focus on collaboration and communication sharing. Although it was repeatedly stated by most of the respondents that much remains to be done regarding the creation of a sustainable water cycle, survey results provided an overwhelming sense of positivity that effective coordination of water governance and policy was taking place as a result of the OBWB’s “collaborative efforts to create and implement basin wide planning [and] identify clear priorities.”

Although much encouragement seems to be drawn from the initiatives of the OBWB, other encouraging actions include recent source protection policies and management initiatives in other Okanagan water institutions. The “combined partnership of the senior government with the OBWB”, the increased effort to produce “water oriented data”, and the “activities of the OBWB Water Stewardship Council” were also among the specifics mentioned by respondents. Despite the encouragement the respondents felt, many recognized challenges facing the region’s water institutions, including the need for greater public engagement and collaboration with the First Nations communities, and the lack of focus on water in other government sectors, as was elucidated by the lack of Provincial commitment “in [the] 1999 Auditor [G]eneral’s Report” on water governance.

The OBWB was mentioned as a possible model for other areas. As a regionally based, collaborative, multi-stakeholder board, many respondents cited the OBWB as a major player in most of the Okanagan’s recent successes in water governance and claimed that the internal relationship building and subsequent problem solving has allowed for positive progress that has the potential to be replicated successfully in other Canadian regions. Many respondents felt it important to add that although they may have suggested other regions consider the OBWB model, solutions founded on region specific strengths and weaknesses were far more likely to succeed than a direct adopt-and-implement approach.

### Cultivating Relationships Is Essential

Respondents noted that increased communication and partnership within the region’s various governance structures has allowed for an increasing realization that senior levels of government are not able to easily affect positive change within the Okanagan or lead local initiatives. This has led to an increase in local motivation to change how water is being managed. One respondent mentioned that a collaborative position had allowed for the creation of a “model of self-empowerment based on a very pragmatic assessment of the current fiscal and environmental realities.”

At the helm of many local initiatives are passionate individuals, who take on leadership roles in water governance. These individuals, who become water champions and work to “keep water issues on the public agenda” were cited as being an extremely important resource

for the Okanagan. Individuals who maintain long-term roles in water governance also help to create long-term relationships and networking potential and allow for honest discussion on “awkward” problems regarding water management. These factors allow for the development of trust and honest consideration of opinions by all players, despite the employing level of government or institution.

### Poor Integration Reduces External Support

Respondent assessment of leading barriers to institutions or governments in the provision of support for Okanagan water management practices or frameworks resulted in relatively even rankings. Poor legislation was perceived as the leading barrier to institutions or governments. Poor integration, fragmented roles, and lack of power sharing were all selected as the second most prevalent barriers, and overlapping agencies ranked third.

More specific discussion on these barriers indicated that the lack of an integrated vision for water and land management, and the “absence of governance structures that might support that vision” were proving detrimental. The lack of collaboration and the conflict caused by “overlapping agencies at the Provincial level” is seen as prohibitive to effectively dealing with issues of complexity in water management, although one respondent mentioned that some overlap can be beneficial as it might promote socio-ecological resilience in the region.

### Many Resources Are Still Required

Unsurprisingly, approximately two-thirds of respondents felt they needed more information and resources to deal with possible future scenarios caused by climate change. The remaining respondents felt they were either adequately prepared for the present moment, or that they felt positive about the progress being made in this arena. However, respondents who felt positive about progress generally included the caveat of needing to know much more about climate change in order to be able to properly deal with the issue. An increase in knowledge about climate change scenarios and the further development of data on issues such as groundwater, and biodiversity were called for. Increased funding for pre-tested initiatives such as those being experimented with or used in Australia among other initiatives and

research were cited as being resources that might help the region become more prepared for climate change.

In order to adequately prepare for possible climate change scenarios respondents stated they still require funding for climate change research, data collection and monitoring of the current state of water resources in the Okanagan. Other concerns included furthering the development of infrastructure developed for climate change scenarios; ensuring proper drainage and water quality; and the development of climate change resistant crop varieties. Respondents noted that valuable funding was delivered to the community as a result of the drought-crisis of 2003, which helped to contribute to the success of the OBWB's initiatives.

Several resources were cited as being essential or important to current success in the advancement of collaborative, basin-oriented governance. Some respondents discussed what they felt were needed resources, while some discussed resources already in place or available:

- Current water governance institutions are a central resource to current and future successes in the region. As a possible future institutional resource, one respondent proposed the formation of a "Ministry of Water" at the Provincial level, but mentioned that without effective legislation allowing it reasonable power over other ministries, it would most of its potential efficacy. Currently successful institutional resources included the OBWB and various other water oriented institutions such as the Kelowna Joint Water Committee.
- Many felt that the collaboration, outreach initiatives and integrated conferences developed or led by "passionate and reasonable people from public and private sectors" in the basin area have been essential resources.
- The taxation rights of the OBWB, which allows for the continued functioning of the organization was also cited as important, although the need for increased funding in order to increase the scope and time-frames of the initiatives currently underway within Okanagan water governance institutions was raised.
- Increasing collaboration with Aboriginal communities in the region was a topic that was brought forth as a needed resource, not only on the basis of practicality but for ethical considerations as well.

- Regional water supply and demand modeling was also often cited as a useful resource that other water stressed regions might want to adopt. Fish water management tools and a focus on institutional evolution instead of top-down governance were also mentioned once each by two separate respondents as potentially good strategies or resources to transfer to other regions.

### Not Enough Funding For Climate Change

A large proportion of respondents felt they, as citizens, were prepared to deal with future negative impacts on their water supply. However, most of the comments associated with this question related to the quantity of water the respondent felt they could live with in the future; many individuals who answered yes to this question stated they felt they could easily get by with less water use in the future. One respondent also stated that citizens "are more aware and have been more active in source water protection and water conservation."

Several respondents did not feel the local water authorities were prepared to deal with future negative impacts on their water supply. This perspective was mostly stimulated by the belief that water authorities "need more funding" in order to adequately prepare for future impacts, although other reasons for potential lack of preparedness were cited as well. One respondent did not feel that adequate decision-making would happen unless there was significant stress forcing the decision. Another saw too many conflicts of interest for water authorities in their "enabling of the development community and pursuit of community growth" to truly prepare for climate change scenarios. The remainder of respondents were evenly divided in their perspectives: they either believed the water authorities were still in the process of preparing for climate change, or that authorities were adequately prepared.

### Allocation

Respondents were asked whether or not they supported British Columbia's First in Time, First in Right approach (FITFIR). About half of respondents did not support FITFIR, while the remainder partly supported it with the caveat that the allocation strategy would require modification to work efficiently. One respondent mentioned the possible use of FITFIR in the promotion of agriculture and local food production. Civil law was clearly the preferred method of allocation under drought circumstances, while common law was the least

preferred. Water markets and FITFIR were the second and third most preferred allocation methods, respectively.

## Discussion

The Perspectives on Water, Governance and Decision-Making survey results provide insight into the functionality of Okanagan water institutions as facilitators of network governance in British Columbia. In the Okanagan, as highlighted within the literature, network governance has indeed allowed for increased communication and collaboration within the water management and governance sector. Relationships between individuals have provided many people affiliated with water with a more comprehensive understanding of current water issues and a better grasp on how to effectively cope with climate change. Collaborative problem solving has allowed the Okanagan Basin Water Board to develop substantial momentum within the region as well as with external water-affiliated institutions. Despite concerns that the action being taken thus still does not provide adequate protection of water resources from climate change, general perception of the work being done by the OBWB is positive.

### Potential Future Actions

The functionality of the OBWB has thus far been efficient and operable for those involved in the network. However, as is reflected within documents such as the Okanagan Sustainable Water Strategy, the OBWB has not thus far been able to make adequate connections with the community outside of the water sector. Concerns within the literature about network governance include its potential inability to properly include the core values of representative democracy in its approach to governance. Thus it may be pertinent for the OBWB, as well as other water-oriented institutions in the Okanagan to form stronger connections with the general community so that the public can stay aware and become engaged with various processes being formed or implemented. As already demonstrated in the history of collaborative governance in British Columbia, stronger connections to various groups allow for social learning opportunities and the development of a deeper and more comprehensive understanding of the issues surrounding water and climate change in the Basin. Also, in order to ensure democratic values of transparency are being pursued, the OBWB may choose to make as many of their processes as accessible as possible.

Providing the public with the most approachable and open management and governance mechanisms can only serve to aid in legitimizing many future actions. It will also serve to potentially buffer water management institutions against future criticism as arguments against collaborative governance push further into the applied realm.

The OBWB also has the potential to play a strong role in connecting with the Okanagan's Aboriginal community and the traditional ecological knowledge they might provide the various water governance processes or management techniques currently being developed. TEK has been able to provide beneficial insight into Western water management and governance, and has produced valuable documents such as the Northwest Territories Water Strategy, an innovative water strategy founded on Aboriginal principles and predicated on prevention of environmental disaster instead of mitigation. Many forms of TEK also have connections to a more robust and sustainable perspective on the ethical use of water resources. Ethics are a resource unto themselves that Western governance and management regimes are increasingly encouraged to make use of, but whose development requires a formidable foundation of previous knowledge and cultural perspectives. Should the Okanagan community be prepared to accept the regional Traditional Ecological Knowledge, it presents an opportunity to tap into pre-developed knowledge and could have a significant effect on the way the Okanagan views and manages its water resources.

## Further Explorations

It is possible that shifts in governance in the Okanagan have created obvious discrepancies between the governance styles of those who adhere to a more network based system, and those who continue to follow a more traditional, bureaucratic approach. It is pertinent to mention further exploration should be provided to whether or not the bureaucratic approach is having any effect on network governance in the Okanagan Basin. Topics that could be addressed might include investigations into whether or not a traditional approach is stifling the growth of network governance in the region, or whether or not it may be negating some of the potential pitfalls of network governance, such as decreased transparency of process.

The movement toward a more sustainable water program in the Okanagan is still relatively new; many initiatives have only developed over the last ten years. Repeatedly respondents discussed the importance they place on having passionate individuals in long-term decision-making positions. Perseverance and determination borne from a belief in better water governance have allowed certain individuals within the water sector to promote and create change within the region. However, the question of how the Okanagan might operate in the absence of these individuals is not one that has been addressed within this document. As the nature of water governance changes within the region, it may be pertinent to investigate efficient means of maintaining momentum and innovation in times between strong leadership. The development of a strong sense of sustainable water ethic in the Okanagan might be one means of providing ambient direction during periods of lessened leadership.

## Conclusion

The survey provides some further evidence that a sustainable water ethic still has yet to form within the Okanagan. This result echoes academic literature portraying Canada as a nation that still has yet to develop a water ethic that promotes real conservation of water for future generations. Effective management and governance of Canada's water supplies are one means of altering national perception and behaviour towards this most essential resource, and the Okanagan is making strides in what they hope is the right direction. In the pursuit of effective and sustainable water management and governance, the Okanagan region has implemented several modes of network governance. Although those within the water sector in basin view most current initiatives as successful, they also recognize how many initiatives still need to still be enacted as well as some of the failings of the current system. Although there has been much increased collaboration within the water sector, there has been little extension of that collaboration into the general public, despite success with social learning initiatives in the form of Participatory Integrated Assessments. Furthermore, the Aboriginal community has to date had little involvement in the development of governance and management techniques and knowledge sharing in the community. Regarding the development of a sustainable Okanagan water ethic, the Aboriginal community has much to contribute and it is important that the OBWB find ways to effectively acknowledge this input.

Ultimately, the factors affecting the Okanagan's success in the effective governance of its water resources will be dependent on the ebb and flow of the environmental, economic, social and political climates. However it is likely that positive and focused relationship building between all stakeholders will always play a large part in the Okanagan's success in the management and governance of its water.

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# Appendices

# SURVEY:
## PERSPECTIVES ON WATER, GOVERNANCE AND DECISION-MAKING IN THE OKANAGAN

The Okanagan Valley is being faced with considerable challenges regarding water supply, especially in the face of population growth and climate change. In order to address future issues, the Okanagan has begun to change how it governs water. This survey aims to produce a snapshot of current perspectives on present-day water governance and decision-making strategies in the Okanagan.

Building on the goals and implemented strategies of several guiding principles of various Okanagan water institutions, and covering a breadth of water-related topics, it is hoped that the information collected by this survey will be of additional aid to other water sensitive or water-concerned regions in Canada and potentially provide input to the Water Modernization Act.

*We understand that this survey may not cover all aspects of Okanagan water governance issues. If you have any comments or further considerations you feel should be added that have not already been covered in any of the following questions please number the responses clearly and add them below or on the reverse side of paper.*

1. Using as many or as few words as you are comfortable with, please explain your thoughts on the following statement: "The Okanagan community has developed new principles and values regarding water".

2. Below is a list of possible motivators in the shift towards more sustainable water management strategies in the Okanagan. Please rank, 1 being the most influential, according to your perception of which motivators have promoted the most changes in Okanagan water management or decision-making strategies.

   *If you feel one of the factors on the list has not occurred within the Okanagan, please cross it off instead of ranking it.*

   a. A concerted effort to focus on water issues
   b. Relationship building
   c. Participatory discussions
   d. Public engagement
   e. Increased access to data on climate change
   f. Increased funding opportunities
   g. Population growth
   h. Existing water stressors

i. Other (please describe)

3. Please explain whether or not you feel the motivators from Question #2 (either those listed, or those you have added) have positively or negatively impacted decision-making regarding water issues in the Okanagan? *Please feel free to add possible motivators that were not discussed in Question #2.*

4. What in your opinion is the most important use for Okanagan water?

5. Do you think Okanagan residents will pay more for water?

6. What do you feel were the most essential or important resources to current success in the advancement of collaborative, basin-oriented governance in the Okanagan?

7. Do you feel you have the resources and information to deal with possible future changes caused by climate change?

8. What resources do you still require in order to adequately prepare for possible climate change scenarios?

9. Please explain whether or not you believe changes in the Okanagan (e.g. changes to governance, decision-making, relationship building, stakeholder involvement, etc.) have affected institutions or governments who work with the Okanagan on water related issues.

10. Below is a list of possible barriers that might hinder institutions or governments in providing support for Okanagan water management practices or frameworks. Please rate the barriers, 1 being the most influential, according to which you perceive to be of greatest hindrance.

    *If you feel any of these barriers do not apply whatsoever, please cross off the list instead of rating.*

    a. Fragmented roles and responsibilities
    b. Overlapping agencies
    c. Lack of provincial power sharing
    d. Ineffective provincial legislation

e. Lack of integration of the numerous organizations involved in water management
f. Other (Please describe and explain)

11. While taking into consideration that there are regional differences in economic, political and development priorities, if another water-sensitive region in Canada were inquiring about adopting one of the Okanagan's most successful water management strategies, which would you advise they attempt to adopt?

12. Please explain whether or not you feel prepared to deal with future negative impacts on your water supply?

13. Please explain whether or not you feel your local water authorities are prepared to deal with future negative impacts on your water supply?

14. Do you think the Okanagan community, institutions or government are making changes to water governance that will continue to be effective for future generations?

15. Please explain whether or not you feel encouraged by any of the governance or management initiatives implemented by any water related Okanagan institutions.

*We understand that this survey may not cover all aspects of Okanagan water governance issues. If you have any comments or further considerations you feel should be added that have not already been covered in any of the above questions please number the responses clearly and add them on the reverse of this survey.*

*Thank you very much for the time and consideration you given this survey. If you have any questions please direct them to Asrai Ord, an Adaptation to Climate Change Team research assistant.*

*She can be contacted at: spring.asrai@gmail.com*

# Appendix B  Survey Responses

***All typos that have been corrected appear within square brackets.*

**Question 1**

**Using as many or as few words as you are comfortable with, please explain your thoughts on the following statement: "The Okanagan community has developed new principles and values regarding water".**

1. Unless there is a crisis then I believe that this assertion is not [true]. i believe we have some way to go through outreach and [interagency] collaboration to engender this thought into the public realm.

2. This is a rather bold statement in the sense that it suggests that there has been some sort of radical introduction of new, novel ideas into the debate.  I think what has happened is that there has been raised awareness about the importance of sustainability more generally in the Okanagan, and the issue of water management is the catalyzing topic (although there are many more things going on like urban sprawl, preservation of agriculture, the climate change debate, mountain pine beetle, species at risk, air quality, etc. etc.).  What has happened is that there has been a shift in public attitude away from rampant development and more toward sustainable living.  Along with this comes a heightened ethic about the importance of managing water for future generations.  In this sense, the statement is true, and following on the heals of this has been the implementation of 'new' strategies to achieve the overall objectives.

3. No response.

4. Our community has a great understanding of water [issues] relating to conservation, stream health,food production,even recreation and the need for proper [watershed] management of water in all its forms. We have developed bylaws and educational and informational policies that engage our population at all age levels to ensure our water sources are protected.

5. I [believe] that there is a slow general movement towards water stewardship but to say that there has been a development of principles and values regarding water would be false.

6. I would say that the community has developed a new collaborative approach for discussing the issues and has been good at sensitizing the public.

7. From my experience, I would say that some components of the Okanagan Community are in the process of developing new principles and values regarding water.  Leaders of the agricultural, planning and health communities are at the forefront of exploring new ways to manage water in the region. The development and tourism communities are less engaged.  A major hurdle for us to overcome is how to incorporate of First Nations' views on water in the Okanagan ecosystem and their future needs for water diversions.

8. I would reword to say that "portions" of the Okanagan community have developed new values - mainly awareness of the need for conservation. This include developers who do not want water supply to become a development constraint. And it includes people who are not in favour of continuing rapid development - who would like to see more water left in the streams, etc. It also includes water managers and politicians who understand the costs associated with water supply.

9. I would hope that the okanagan community will [develop] new values regarding water

10. The term "Okanagan community" does not include the Okanagan Nation or the seven bands that comprise the Okanagan Nation. Therefore, the local Indigenous peoples were not a part of the development of the principles and values regarding water.

11.I think the Okanagan has developed new principles and values regarding water but it has been a long-term process. The "new" principles and values include thinking regionally, learning to engage with the OBWB, learning what the OBWB can offer, and developing a greater appreciation for the sensitive nature of the Okanagan's water supply. These principles and values, however, are not necessarily the primary driving forces for local/community water managers.

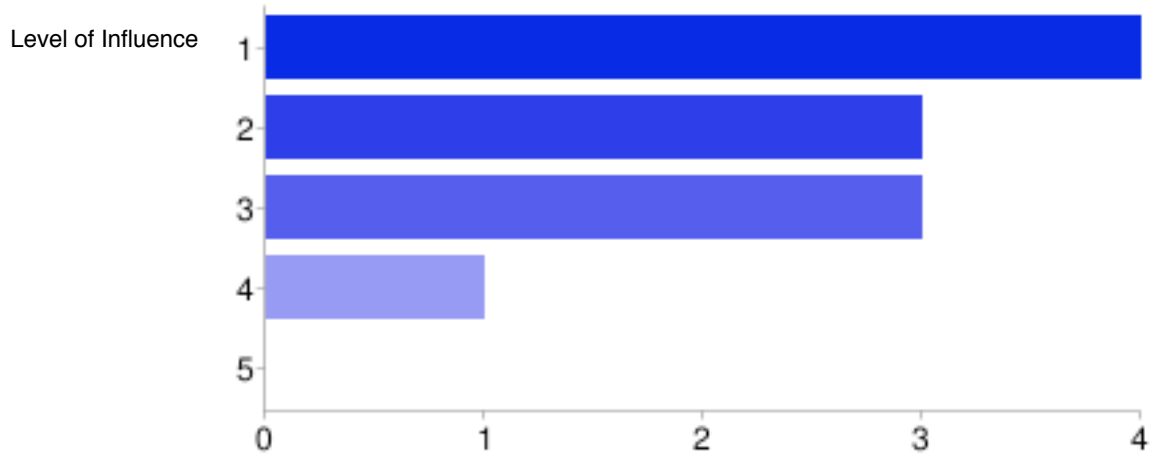
12. I believe that awareness around water scarcity is growing in the Okanagan. There is increasing interest in xeriscape landscaping, rain barrels and other water conserving practices. On the other hand, I feel that a strong sense of entitlement (i.e., a sense of "it is my right to access as much water as i wish to water my outdoor landscaping and maintain my backyard pool") remains prevalent. As such, though we are making progress in terms of education and awareness around water issues, there is still significant need for dialogue around how we value water and the nature of our relationship to water.

Appendix B

**Question 2**

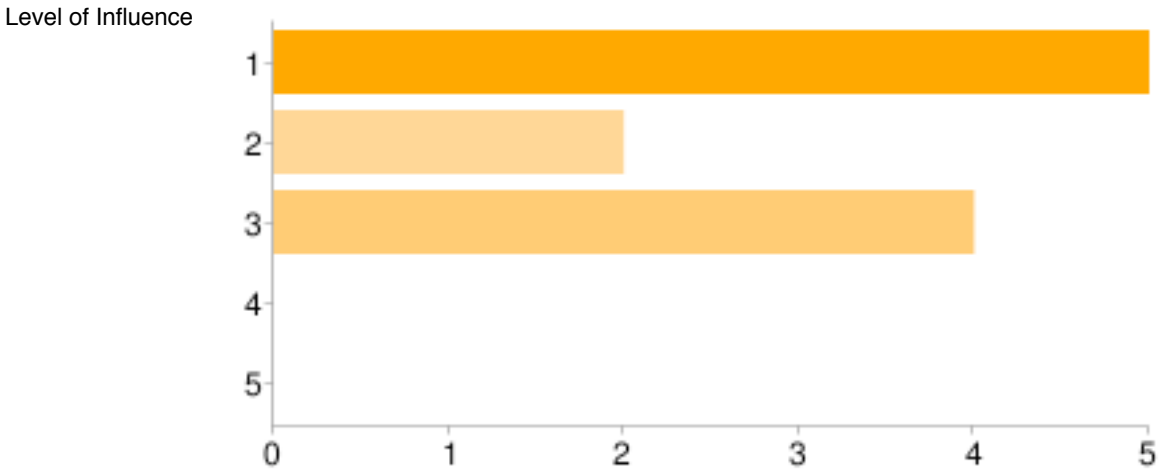
**Below is a list of possible motivators in the shift towards more sustainable water management strategies in the Okanagan. Please rank, 1 being the most influential, according to your perception of which motivators have promoted the most changes in Okanagan water management or decision-making strategies.**

A concerted effort to focus on water issues




Number of times Level of Influence was selected

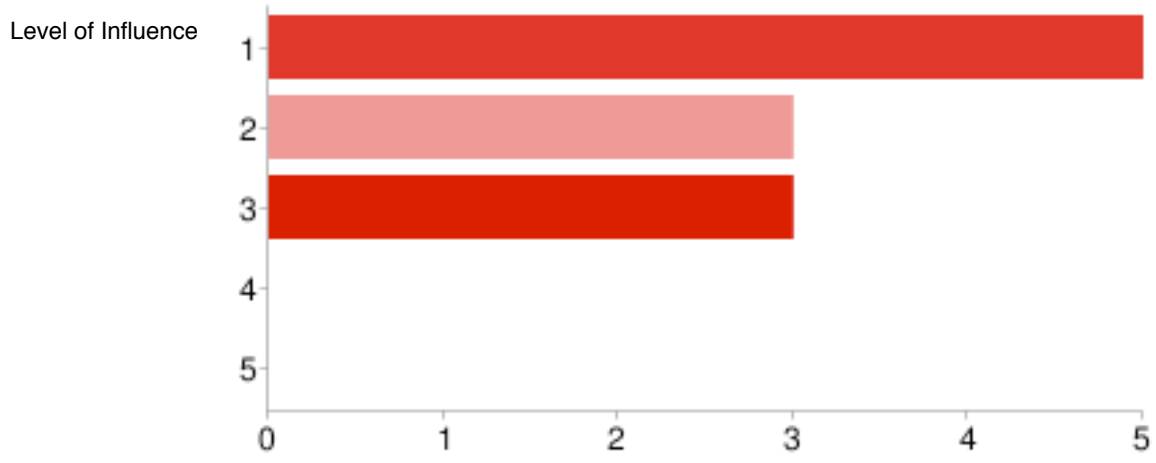
Relationship building




Number of times Level of Influence was selected

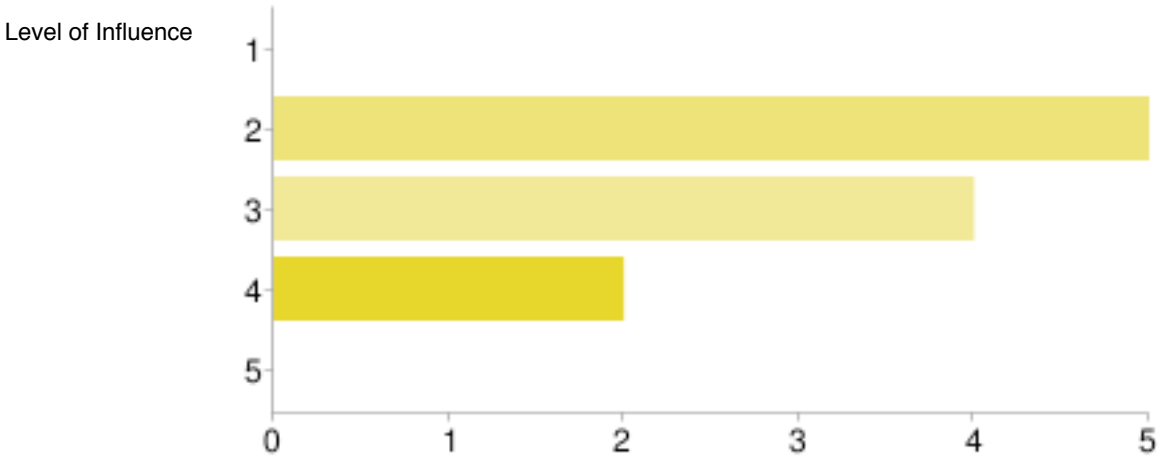
Appendix B

## Participatory discussions




Number of times Level of Influence was selected

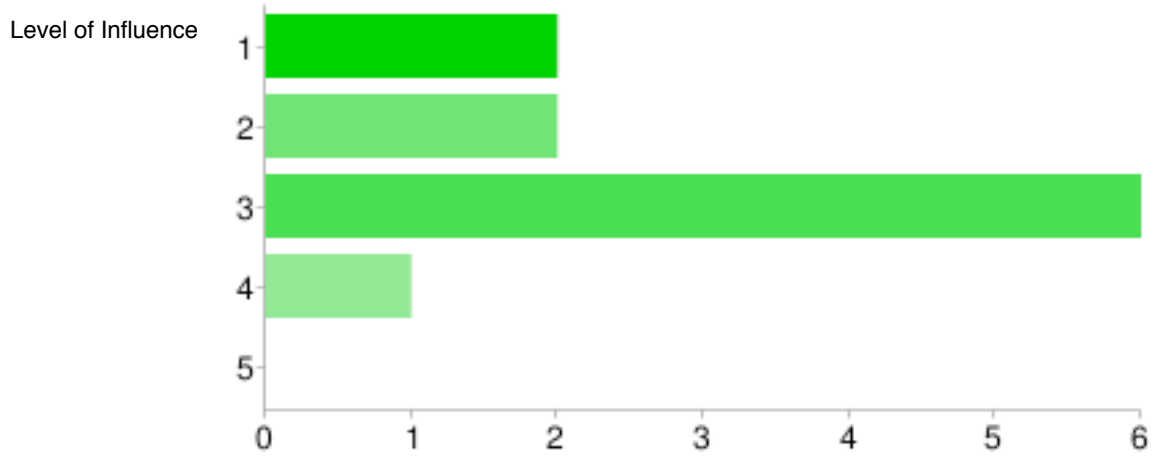
## Public engagement



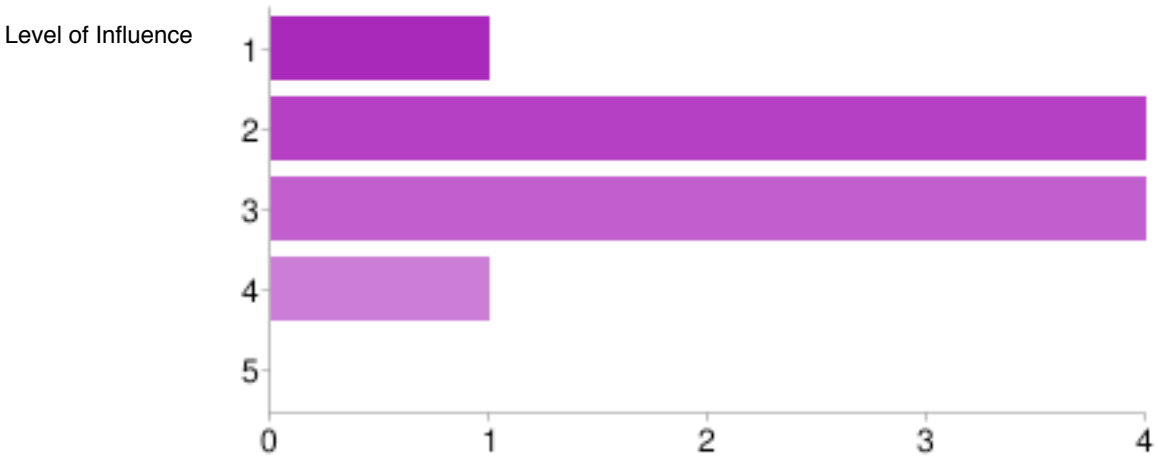

Number of times Level of Influence was selected

Appendix B

## Increased access to data on climate change

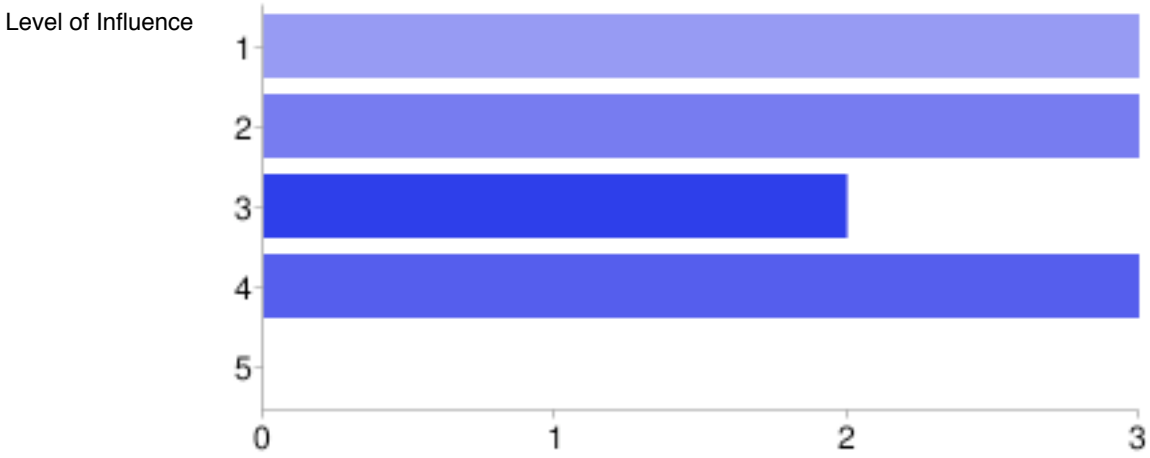



## Increased funding opportunities



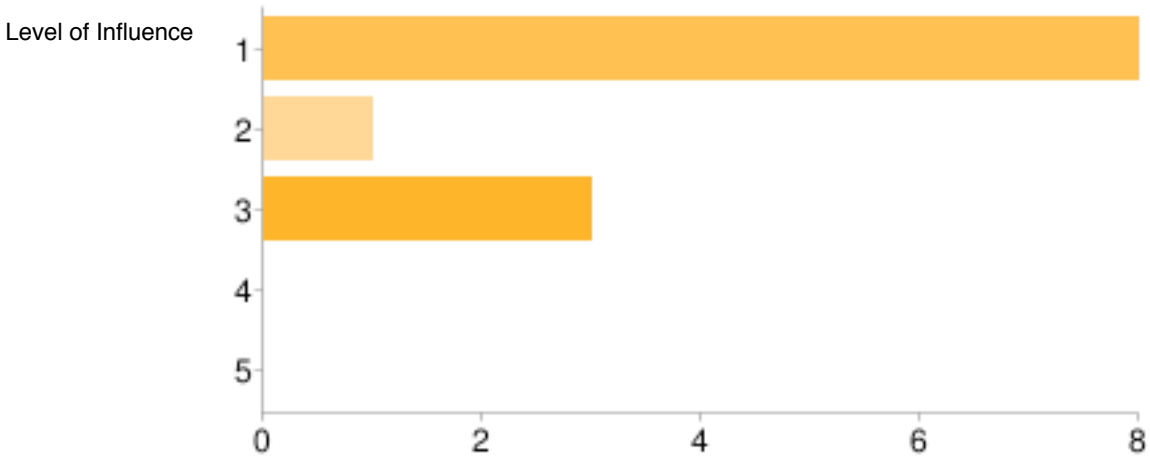
Appendix B

## Population Growth




Number of times Level of Influence was selected

## Existing water stressors




Number of times Level of Influence was selected

**Question 3**

**If you marked "Other" as one of the motivators in Question 2, please use the space below to explain. Also, if you feel any of the motivators from Question 2 do not apply, please indicate so here.**

1. No response.

2. Leadership by select individuals and groups that keep water on the public agenda for action. This leadership (mostly from folks affiliated with the OBWB and OWSC, but not exclusively so--Sharon Shepherd being a case in point)has been long-term and unwavering, and I think there is a trust factor that has built up over the years. This is why I rated 'relationship building' as #1, and the relationships extend from the personal all the way through the highest levels of government (B.C. Ministry of Environment, Environment Canada, Agriculture Canada). Everyone knows each other, and we can talk about really awkward problems knowing that all opinions will be taken seriously and considered.

3. No response.

4. No response.

5. No response.

6. No response.

7. Sense of competition for water resources and economic threats to current licence holders. Stewardship values with a range of sectors. Water Act Modernization

8. The fires of 2003 were pivotal in the Okanagan. Media coverage of the Trout Creek fiasco in Summerland were especially notable for highlighting the fact that we (some communities at least) could run out of water. The Town of Summerland came into very public conflict with Federal Fisheries over water flow levels in Trout Creek - an opening chapter in future water wars? This was how it played in some local media and it mobilized a lot of people towards awareness of the need for conservation, more efficient water technologies, etc. Paved the way for water metering in Summerland specifically and elsewhere in the valley.

9. No response.

10. I've attended three water meetings this year. UVIC, UBCO and SFU have led the discussions. It seems that the water discussion is just beginning. That is, the discussion is at the amount of use vs. how much available water there is. As far as I can see, the discussion has not gone further. Perhaps, people are waiting for the new water legislation before acting.

11. No response.

12. No response.

**Please explain whether or not you feel the motivators from Question 2 (either those listed, or those you have added) have positively or negatively impacted decision-making regarding water issues in the Okanagan? Please feel free to add possible motivators that were not discussed in Question 2.**

1. No response.

2. Perhaps I misinterpreted the exercise, but I rated the motivators according to their positive impact. However, 'existing water stressors' such as drought and the anticipated management challenges that go along with it are certainly negative motivators, as is population growth. Another negative motivator is that folks in the Okanagan have decided to take action, in small part, because there is the general recognition that senior levels of government can't possibly solve our problems (by personal admission of the people we have gotten to know in the various Ministries). Although this is not really a 'trust' issue, it is the pragmatic realization that we have to learn how to help ourselves and when appropriate, ask senior levels of government to do their part. We have taken a strong partnership position, which entails showing other levels of government what they should be doing with us. It's a model of self-empowerment based on a very pragmatic assessment of the current fiscal and environmental realities.

3. Recent drought [experience] (2003 2009) has made the population more receptive to change.

4. All positive.

5. Positively for the relationship and dialogue but negatively with respect to funding.

6. Definitely positive due to the way people have been engaged.

7. All of the motivators have had the effect of increasing dialogue and keeping water quantity issues at the forefront of regional discussions. It needs to be [remembered] that, with the exception of the Okanagan Basin Study in the 1970s, most of the focus in the region had previously been on water quality.

8. All the factors I ranked had positive impacts. In my opinion their impact has been felt most strongly at the level of water managers, utilities, OBWB, etc. The public overall is still less aware than they might be of water issues - enough public support has been mobilized to support current, modest initiatives, but overall per capita water consumption has not changed significantly.

9. I think we need an ethics framework on water and water management and a [paradigm] shift on how we view water in its role in the ecosystem

10. No response.

11. I think public support is [crucial] for the Okanagan to continue with progress toward sustainable water management because at some point some tough decisions will need to be made. I think there could be more engagement/education of the public to generate support/ acceptance for future water decisions. I think that relationship [building] and participatory

discussions have played a huge positive role in moving forward with decision-making. I think that population growth and existing water stresses create urgency which promotes moving forward with decisions.

12. I believe that most of the motivators have positively influenced decision-making, in that they have motivated agencies to increase knowledge, understanding, and awareness of the issues and possible solutions. However, I feel that 'existing water stressors' may, in some cases, have a negative impact on decision making (e.g., an immediate need to enact water restrictions because of drought conditions). Without proper planning already in place, the response to an extreme condition can be quite political and not necessarily representative of the best course of action.

**Question 5**

**What in your opinion is the most important use for Okanagan water?**

1. Domestic

2. Wow, what a loaded question!! Obviously it has to be personal domestic requirements pertaining to basic living needs such as drinking water and sanitation. However, these do not account for a large fraction of water supply, and they are easily met and I don't think there is any controversy. Following that there has to be a commitment to sustaining water for the environment, but this is a rather difficult area to address with any certainty. Beyond that, it's a question of what kind of lifestyle we wish to support, and this is where we get into debates about allocations to agriculture, industry, development, golf courses, etc., etc.

3. Basic sustenance, health/sanitation and agriculture.

4. [Support for] life in all forms. Sustainable ecosystems start with the watershed.

5. Drinking.

6. Equally between ecosystem, agriculture and domestic.

7. [Fulfill] ecosystem function in the best possible way, given that human settlement and food production are a necessary part of the ecosystem.

8. Environmental flows first. Basic domestic use second (i.e. drinking water. Indigenous water rights third. Agricultural flows fourth.

9. Health - ecosystem health and human health.

10. My body needs water to live.

11. I don't think there is a most important use. I think that, ideally, people and ecosystems should be able to use (only) what they need. However, I do have opinions with respect to the least important water uses - lawn watering, and using more than we actually need (general water wasting).

12. Very difficult to answer and most critical to answer when faced with extreme conditions. In an ideal world, under extreme conditions, we would find a balance - basic needs of domestic users are met, there is enough water to grow food (or, in very extreme conditions enough to keep perennial crops and livestock alive), and fish habitat remains functional.

**Question 6**

**Do you think Okanagan residents will pay more for water?**

1. Yes

2. Absolutely. A minority will complain, but once rates are raised (with appropriate explanations), no one will care. Relative to other 'commodities' the price of water is so small that it is almost inconsequential. The main consituency that will object is the agriculture sector, who are already operating at the margin (especially the small, independent farmer).

3. Yes, they won't have a choice.

4. Yes.

5. Yes, reluctantly

6. Yes, eventually.

7. Probably - although for sectors such as agriculture, there may be considerable financial hardship.

8. Yes. The majority will pay much more but there should be a basic level of water available to all at minimal cost.

9. Yes they should

10. They should pay for water.

11. Yes, I think they should and they will pay more for water. I think that the cost of water should reflect the "real cost" of water including costs to preserve ecosystems, costs of regional water management, costs of preparing for the future, costs of data collection and research, etc.

12. Yes.

**Question 7**

**What do you feel were the most essential or important resources to current success in the advancement of collaborative, basin-oriented governance in the Okanagan?**

1. To establish Ministry of Water in Provincial Gov. I oppose another level of governemnt at the basin level.

2. Leadership and vision (as mentioned above). The fact that the OBWB exists and the fact that it has taxation authority to sustain its operations (which includes salaries for staff and money for the various grant programs).It's also nice to have the occasional crisis (i.e., sustained drought) to motivate people into action!  We had one in 2003 that seemed to catalize action, and we narrowly escaped another drought this year (which, in some strange way is a shame that it didn't last well into the summer).

3. The new water management initiative of the OBWB.

4. Continued opportuity of integrated collaborative conferences for all levels of jurisdiction and players in the larger basin area.

5. Not sure

6. The OBWB and the WSC have bee important resources, a model for other areas.

7. Passionate, reasonable people from public and private sectors. Funding to carry out studies

8. OBWB has been able to step forward and begin the process of basin wide planning and collaboration. Other voluntary organizations like the Joint Kelowna Water Commmittee have also made important contributions. These are intitiatves that have been able to proceed on the basis of existing funding formulas but their scope is unfortunately limited in that respect so the future of these initiatives is uncertain.

9. No response.

10. Since towns, regional districts are neighbours with Indian bands and are located within the Okanagan Nation perhaps, building a good working relationship would be the neighbourly thing to do; rather, than legally required to because of title and rights issues.

11. I think the best "resource" is innovation. Without ideas and innovation we would not be at the point at which we are at today (e.g. there would be no OBWB, relationships and communication may be less effective, there would be little data with respect to our supply and demand projections and climate change projections, etc.)

12. The Okanagan Basin Water Board and the Water Stewardship Council combined with leveraged funds for research and outreach from other levels of government and academic institutions.

**Question 8**

**Do you feel you have the resources and information to deal with possible future changes caused by climate change?**

1. Yes

2. No, but gosh, I'm an academic and we always need more information and money!

3. Yes.

4. Beginning to accumulate a decent resource of knowledge, policies and technologies but funding woefully inadequate.

5. No

6. We are still learning about climate change but have some ideas.

7. Probably not - climate variability is the issue that is most important and yet the most difficult to characterize.

8. No. Not nearly. Getting close as regards information but climate change impacts will continue to be very unpredictable. We need to understand groundwater characteristics way better than we do. We need to understand the impact of guaranteed stream flows on biodiversity. We need to set clear, realizable targets for per capita water consumption and move more quickly towards achieving those targets.

9. No.

10. An earlier meeting held at UBCO included a presentation by Dr. Hans Schrier and another presentation based on the Australian water status quo. Dr. Shrier's talk included practical solutions for water conservation. As did the Australian example showed what would happen without quick action. Since alot of the same people were at all discussions, if water conservation was an important topic they would have codified Dr. Schrier's water use solutions, so the Okanagan does have water.

11. As an individual, I can predict that I will have to make future changes to how I use water here in the Okanagan, but I will rely on local/regional government to tell me what to do. Whether they have the resources and information to make tough decisions would be better commented on by government staff.

12. No.

**Question 9**

**What resources do you still require in order to adequately prepare for possible climate change scenarios?**

1. Infrastructure funding, drainage, water quality.

2. As mentioned above, an 'almost crisis' would certainly help if it doesn't do any permanent damage. Not sure how we could organize this, but it would be helpful in motivating public support for some radical changes in how we manage water resources for the future. The Water Supply & Demand Study has given us a pretty good idea of what to expect, but just like the climate change issue, the general public doesn't quite get it. In order for organizations like the OBWB to get in front of the public and actually do some decent planning for the future, we will need to extend the modeling tools to smaller sub-basins, which will require more money and expertise. We also need better data and hydrometric monitoring tools to let us know what is going on in our watersheds, both long term trends (i.e., years to decades) as well as short-term status for drought management (i.e., weeks to months).

3. Better hydrological forecasting.

4. Funding.

5. Better understanding.

6. Much research needs to done - e.g. developing new crop varieties.

7. Funding to carry out research.

8. More public awareness of the issues and awareness of local environmental characteristics. We have too many newcomers who don't understand the region and too many people who spend only part of the year here. Improved understanding at the Provincial level of local needs and more support for local and regional planning; devolvement of some provincial authority to regional levels is critical; integrated water and land use planning is essential and provincial line ministries are currently the biggest impediment to achieving this at a watershed scale.

9. A change in how resources are viewed.

10. Collaboration between all of the communities, regional districts, bands with the Okanagan to problem solve the issue.

11. I think there needs to be continued monitoring and quantification of water supply and demand. Thus we need continued and improved data collection along with monitoring and updating of supply and demand projections in light of better climate change predictions and improved data. The supply and demand projections do not end with the 2010 study as they can always be refined to be more accurate. [Accurate] data is a key to success of climate change adaptations.

12. More resources need to be put towards education leading towards a cultural shift in our attitude towards water and its value.

**Question 10**

**Please explain whether or not you believe changes in the Okanagan, such as changes to governance, decision-making, relationship building, stakeholder involvement, etc. have affected management strategies in institutions or governments who work with the Okanagan on water related issues.**

1. Not yet

2. Yes, absolutely.  But I don't have time to elaborate.  There is much more that needs to be done.

3. I think that the OBWB (under its current authority) has done a lot to coordinate local/regional/ provincial water resource management in the basin.

4. Change is recent and decent compared to policies just 10 years ago.

5. No because we are continuing to approach problem with old thinking.

6. Yes, they have a adopted a more collaborative and pro-active approach.

7. The most change has occurred within the Okanagan Basin Water Board which has had a large change in direction since around 2003, when the realization came that water quantity was a major issue that the Board had the authority and responsibility to deal with. At the [federal] and provincial levels several departments, notable AAFC at the federal level and BCMOE and BCMAL have directed considerable cash and in-kind [resources] in to the basin for research and for programs such as metering. NRCan, EC and DFO have also funded studies and provided in-kind support.

8. Yes, definitely. The water stewardship council created by the OBWB has [facilitated] a great deal of powerful work and served as a bridging institution across all scales of involvement. This does translate into a more coordinated approach to water conservation, metering, research, groundwater management, drought management, etc.

9. No response.

10. No response.

11. I think that all of these changes have influenced water management to some degree.

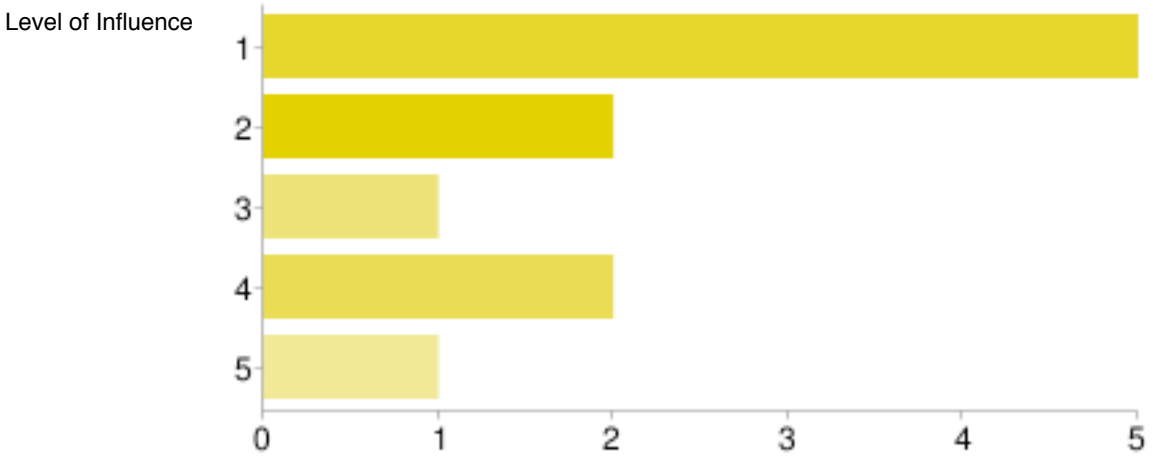
12. I believe that the work done by OBWB changes decision-making at the local government level with respect to water related issues.

Appendix B

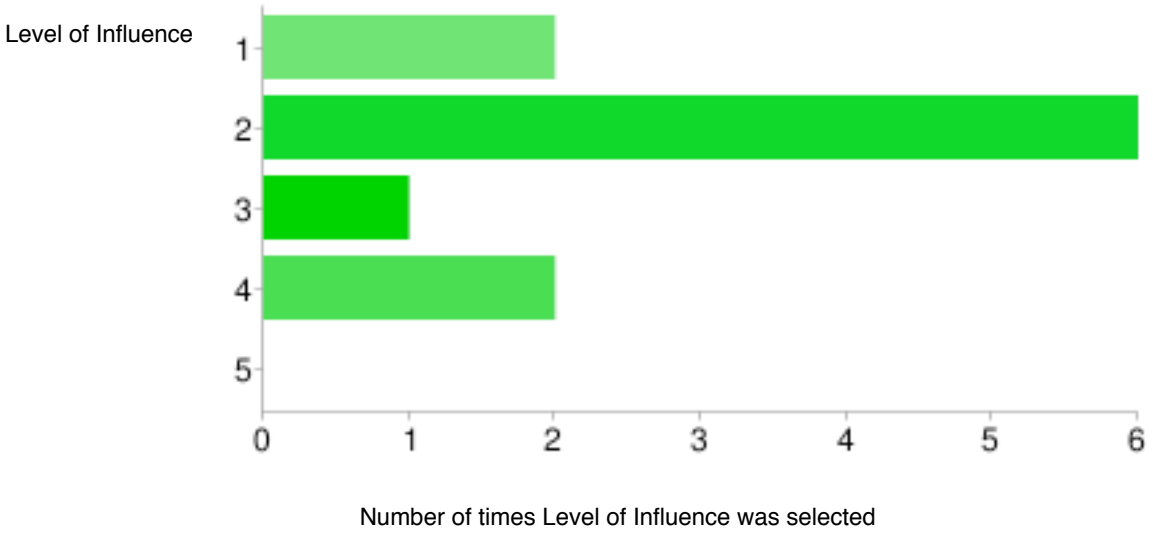
**Question 11**

**Below is a list of possible barriers that might hinder institutions or governments in providing support for Okanagan water management practices or frameworks. Please rate the barriers, 1 being the most influential, according to which you perceive to be of greatest hindrance.**

Fragmented roles and responsibilities

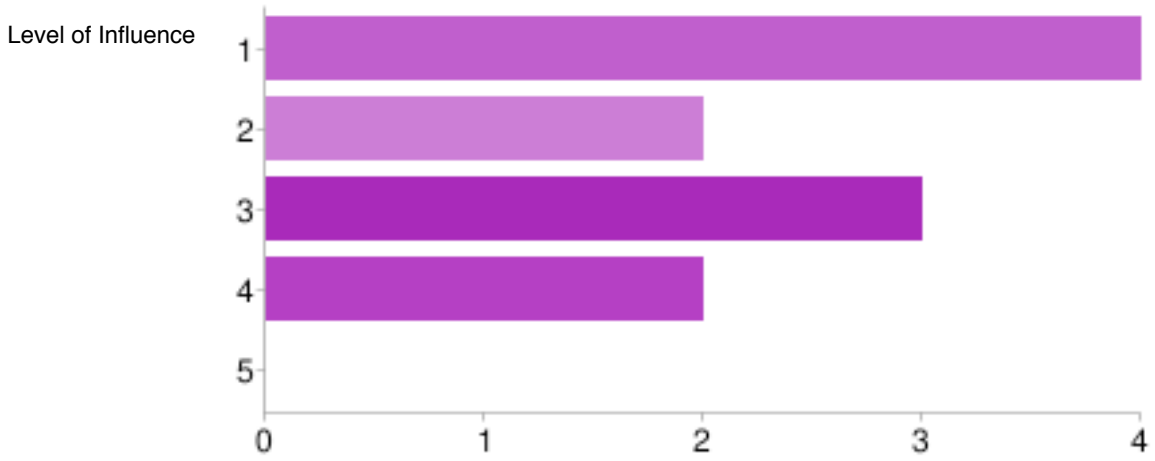



Overlapping agencies

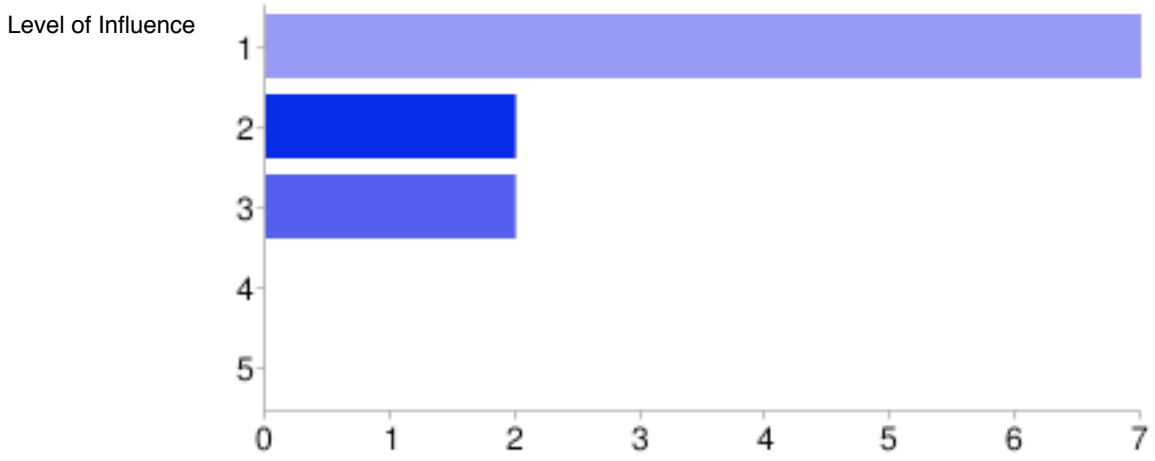


Appendix B

## Lack of provincial power sharing




## Ineffective provincial legislation



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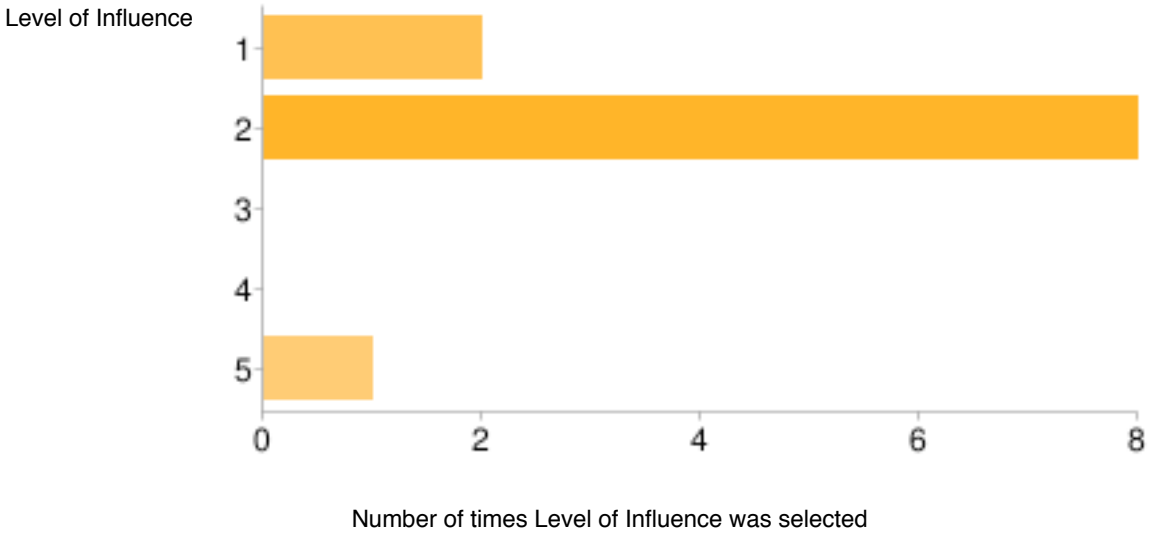
Lack of integration




**Question 12**

**If you marked "Other" as one of the possible barriers in Question 11, please use the space below to explain. Also, if you feel any of the motivators from Question 11 do not apply, please indicate so here**.

1. No response.

2. I think all the barriers listed above are symptomatic of the same thing, which is the lack of an integrated vision for water and land management and the absence of a governance structure that might support such a vision. The legislative and enforcement lines of authority are fragmented and isolated in the sense that various Ministries have specific mandates that are 'inward looking' rather than collaborative. So it is not surprising that any Ministry employee who is faced with a broader question about integrated water management (a very complex issue) will likely re-trench to the simplistic rules and regulations of her/his immediate job responsibilities. "It's not my problem!" I suppose it's just human behaviour and in some senses, a way of coping with complexity. Some have argued for the creation of a Ministry of Water, but without appropriate legislation that puts some teeth into what such a Ministry can do to override the mandates of other Ministries (e.g., Mining, Forestry, Agriculture) one has to wonder how effective such a new structure will be.

3. [Overlapping] agency conflicts at the provincial level is an issue, not on the local or regional authority area. Other: lack of adequate funding for water [resources].

4. No response.

5. No response.

6. No response.

7. No response.

8. Other: public involvement and public knowledge of water supply systems and the local environment are not sufficient to support the level of innovation necessary to realize adaptation goals. "Fragmented roles" and "lack of integration" are almost the same issue but I rank "lack of integration" higher because I think it speaks more clearly to this aspect of the governance 'problem'. Fragmentation is more ambiguous and its characteristics vary a great deal depending on whether you are looking at water utilities or provincial ministries. Some "overlap" (duplication) can be a good thing from the standpoint of socio-ecological [resilience] so I rank that lower as well.

9. No response.

10. No response.

11. No response.

12. No response.

**Question 13**

**While taking into consideration that there are regional differences in economic, political and development priorities, if another water-sensitive region in Canada were inquiring about adopting one of the Okanagan's most successful water management strategies, which would you advise they attempt to adopt?**

1. No response.

2. The value of creating a non-regulatory body such as the OBWB (with the OWSC as the technical arm) can't be over-stated. It provides a venue for discussion, for collaboration, and for trust building among the various [constituencies] that have interests in water management. In each region, the specific nature of an OBWB-like entity will differ, but the fact that there is a body where agreement can be reached amongst all levels of government and various stakeholders is a key ingredient to success. In some sense, the OBWB has the mandate of the Ministry of Water (discussed above) but with the key difference that it works on a regional level, which is the only sensical scale at which to manage water.

3. Really depends on the [water] issues in the affected region.

4. Basin wide supply and demand study.

5. Disagree with approach - BMP may not apply in new context.

6. [Development] of the OBWB can be a model for other areas.

7. Regional water supply and demand modeling as a pre-cursor to regional management. A multi-stakeholder stewardship council.

8. Create a watershed wide institution like OBWB as an advisory body to begin with, if no comparable institution exists. Encourage institutional 'evolution' rather than try to mandate or legislate everything from a top down perspective.

9. Fish-water management tools

10. No response.

11. Create a regional body similar to the OBWB based on watershed/hydrologic boundaries.

12. The [existence] of an agency such as OBWB - would tell a region to consider a basin-wide approach to water management issues and to create an agency that can build relationships with other levels of government on behalf of the basin/watershed.

**Question 14**

**Please explain whether or not you - as a citizen - feel prepared to deal with future negative impacts on your water supply?**

1. Yes

2. Yes.

3. Yes I do, cutting back on my individual consumption would not be a major problem.

4. Yes.

5. No

6. Yes, we are more aware and have been more active in source water protection and water conservation.

7. Depends on what they are. I could certainly manage reduced water availability, by today's standards.

8. Yes.

9. Not prepared

10. No response.

11. I think I already answered this above.  I will rely on government to tell me what to do - restrictions.

12. No

**Question 15**

**Please explain whether or not you feel the local water authorities are prepared to deal with future negative impacts on your water supply?**

1. They cannot afford it.

2. Yes, I think so. There is a lot of planning going on, and generally there is forward movement. I'm pretty optimistic that things will work out fine, and at the moment we still have lots of wiggle room.

3. Yes, I run one of them and we have adapted well to significant water stresses.

4. Yes.

5. No GVW can't even decide how to provide the function without significant stress.

6. Somewhat but they likley need funding.

7. No - Local water authorities have too much conflict of interest in their enabling of the development community and pursuit of community growth to deal with the real implications of reductions in future water supply.

8. They are getting prepared. not there yet.

9. Not prepared.

10. No response.

11. I think that some local water purveyors appreciate the impact climate will have on their water supply - particularly the water purveyors that rely on upstream reservoir storage which reacts obviously to changes in climate. Downstream water purveyors, who obtain water from Okanagan Lake or aquifers for example, may not realize the effects of climate change on their resource replenishment and thus may not employ water conservation measures in a timely fashion. So, I do not think that water purveyors who get water from valley bottom lakes/ aquifers are necessarily aware of the regional implications of climate variability.

12. No.

**Question 16**

**Do you think the Okanagan community, institutions or government are making changes to water governance that will continue to be effective for future generations?**

1. No.

2. Yes, absolutely. I think the Water Act Modernization process is fantastic, and I hope it doesn't get lost in the recent restructuring of Cabinet by Premier Campbell.

3. Yes.

4. Yes.

5. No.

6. Yes.

7. Not yet - given the population expansion discussed in 15. There is a need for basin-wide, integreted land and water use planning in the true sense of the word. Current land use planning is essentially development enablement.

8. Yes.

9. No.

10. No response.

11. I don't think there are any changes occurring with respect to governance structure. With respect to developing new policies - I think there are some well educated and innovative people in various levels of [government] within the region. Thus I do think that future changes to water governance will be effective.

12. No response.

**Question 17**

**Please explain whether or not you feel encouraged by any of the governance or management initiatives implemented by any water related Okanagan institutions.**

1. [Discouraged] by lack of Provincial [commitment] as elucidated in 1999 Auditor general's report regarding water governance.

2. Since I have been centrally involved in some of this initiatives, of course I feel encouraged. With respect to Question 19 below, I think a hybrid system is needed and aspects of all four systems will become essential in some way. However, what we need to do is some 'gaming' and modeling to demonstrate what might happen under certain allocation systems so that the public becomes acutely aware of the consequences of selecting one system over another. This is a very complex issue, and I'm not sure we're prepared to make good choices yet. A lot more work needs to be done, and hopefully we can do this before the crisis hits and we are forced into action (as in Australia).

3. OBWB is great.

4. Very encouraged by the source protection policies and watershed [management] [initiatives] in all aspects.

5. OBWB is a good start but have very little expertise & knowledge on how to truly engage residents. Great at generating data from an academic perspective.

6. Yes.

7. I do feel encouraged by the combined senior government/OBWB efforts in examination of the science around water supply and demand and in the activities of the OBWB Stewardship Council. The trick is going to be to keep the [momentum] going and to start to deal with some of the large gaps in the current activities - most notably, the inclusion of First NAtions in a leadership role.

8. Yes. OBWB and other collaborative efforts to create and implement basin wide planning, identify clear priorities.

9. No response.

10. No response.

11. I think the OBWB has done a lot for the region and I am very encouraged by their work to date.

12. I feel encouraged by several of the initiatives currently being implemented by the OBWB and Water Stewardship council.

**Question 18**

**Do you support British Columbia's current water allocation system - that is, the First in Time, First in Right approach?**

1. No.

2. Yes, but it needs some tuning to achieve optimal water allocation.

3. No.

4.Partly.

5. No.

6. Some modification may be useful.

7. I am most concerned that the major protection under this system in the Okanagan is for agriculture.  If society's decision is that we need to encourage regional food production, then water rights associated with food production must be protected.

8. Modified approach.

9. No.

10. No response.

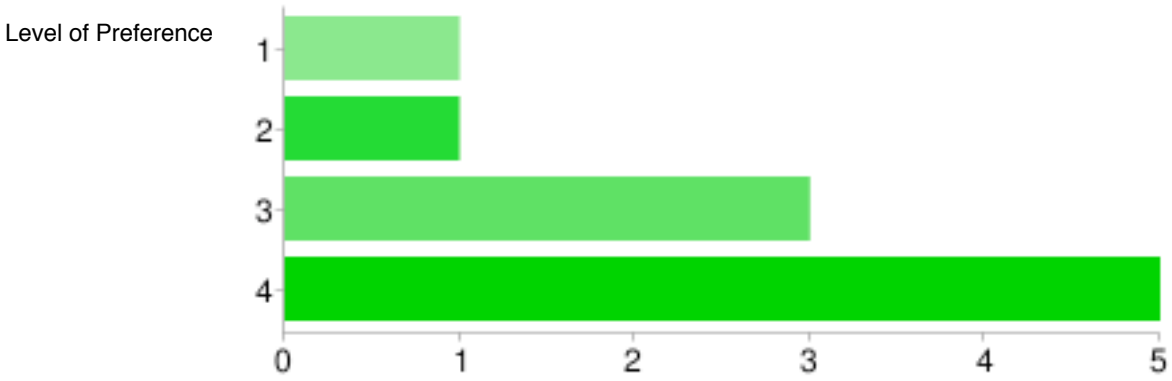
11. No.

12. No.

**Question 19**

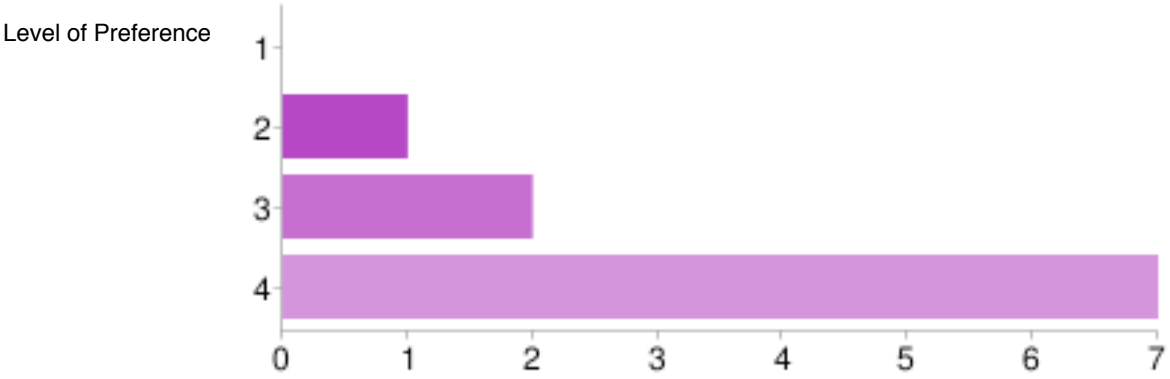
**Consider the following scenario: It is 2020 and the Okanagan region is experiencing a prolonged drought. Water availability is limited and local agriculture, industry, and municipalities are competing over scarce water resources. Under such circumstances, how would you rank the following allocation systems, with 1 being your most preferred system and 4 being your least preferred?**

First in Time, First in Right (FITFIR) - This approach is based on the principle of prior appropriation, which gives the licensee exclusive rights to use the water in a system of seniority based on the age of the license.

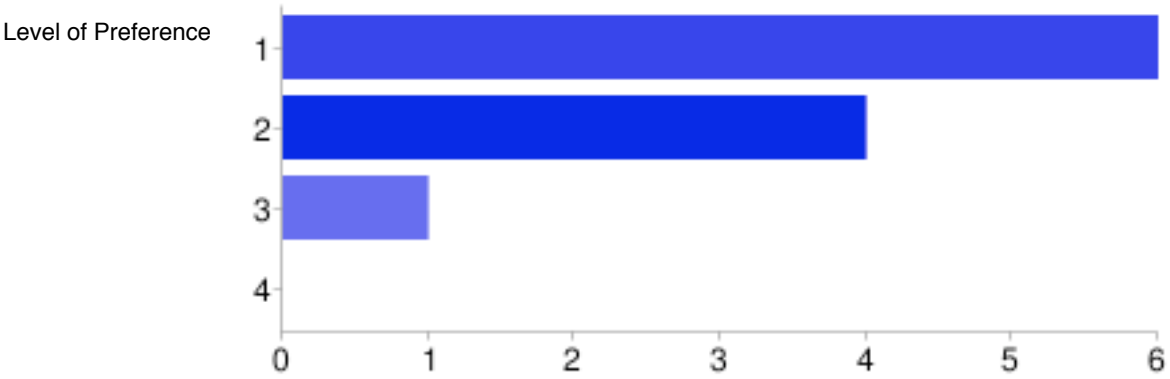


Appendix B

Common Law of Riparian Rights - This approach gives individuals who own or occupy land beside lakes and rivers the right to the natural flow of the water adjacent or through their property, unchanged in quantity or quality.




Civil Law - This approach states that water is not owned by anyone and that its use is common to all. Civil law puts the province in a guardianship role.



Appendix B

Water markets - This approach allows for the transfer of water access entitlements between different entities, for example, agriculture, environmental water managers, and regional water authorities. Entitlements are created and divided by the province and can refer to an ongoing access entitlement or a specific volume of water access entitlement in a given season.