

# Watersheds 2014

## Towards Watershed Governance in British Columbia and Beyond

A forum for water practitioners, watershed groups,  
First Nations, and other decision-makers



JANUARY 27–29, 2014  
QUW'UTSUN' CULTURAL AND CONFERENCE CENTRE  
DUNCAN, BRITISH COLUMBIA

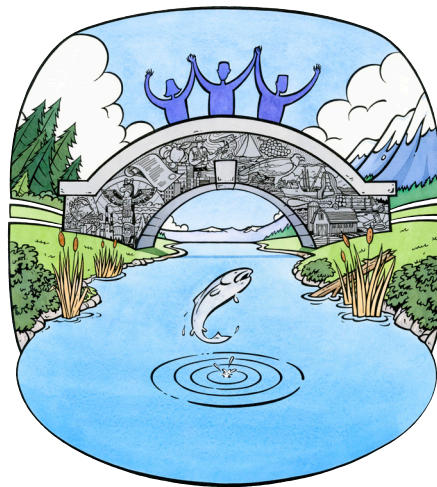
## Edited Proceedings

#WATERSHEDS2014



# Watersheds 2014: Towards Watershed Governance in British Columbia and Beyond

A forum for water practitioners, watershed groups,  
First Nations, and other decision-makers



JANUARY 27–29, 2014  
QUW'UTSUN' CULTURAL AND CONFERENCE CENTRE  
DUNCAN, BRITISH COLUMBIA

## Edited Proceedings

Edited by Jesse Baltutis, Laura Brandes, Oliver M. Brandes,  
Michele-Lee Moore, Natasha Overduin, and Ryan Plummer



Environmental Sustainability  
Research Centre



**POLIS Project**  
on  
**Ecological Governance**  
University of Victoria



## ACKNOWLEDGEMENTS

This proceedings report provides a written record of the three-day forum *Watersheds 2014: Towards Watershed Governance in British Columbia and Beyond*, which was held on Cowichan Tribes territory in Duncan, B.C. in January 2014. This event would not have been possible without the support of a number of partners and supporters (see facing panel). In creating this proceedings report, we gratefully acknowledge the efforts of the team of volunteer note takers who diligently captured the presentations and discussions at each of the sessions at the forum: Rosanna Breiddal, Christine Twerdoclib, Matt Murray, Lauren Fegan, Natalya Melnychuck, Brett Dimond, Karina Dracott, and Carys Pinches. The contents of these proceedings have been peer-reviewed, and we thank all those presenters who took the time to provide comments and suggestions during the development of the report. In particular, we want to thank Joanna Reid and Kelly Bannister for their substantial reviews and revisions. Thank you, also, to Raluca Hlevca and Megan Spencer, as well as to Arifin Graham (Alaris Design) for his layout and design work. It is through the collective efforts of this large team that this proceedings report has been made possible.

### Citation

Baltutis, J., Brandes, L., Brandes, O.M., Moore, M-L., Overduin, N., & Plummer, R. (Eds.). (2014). *Watersheds 2014: Towards Watershed Governance in British Columbia and Beyond—Edited Proceedings*. Victoria, Canada: POLIS Project on Ecological Governance, University of Victoria.

## PARTNERS AND SPONSORS





# Preamble

The three-day forum *Watersheds 2014: Towards Watershed Governance in British Columbia and Beyond* was held on Cowichan Tribes territory in Duncan, British Columbia from January 27th to 29th, 2014. It focused on bringing forward new and innovative ideas, skills development and capacity-building for watershed groups, First Nations, and community watershed champions. The delegates who attended are part of a network of engaged leaders, volunteers, and professionals working to better collaborate with stakeholders and rights holders, government, industry, and not-for-profits to improve collaborative governance as it pertains to their home waters. This national event featured speakers from across the country and around the world, with a particular emphasis on watershed governance opportunities in B.C. It explicitly integrated perspectives from First Nations, researchers, practitioners, government, community organizers, and funders from across the public and private spheres.

*Watersheds 2014* built on a significant body of research from the four-year collaborative cross-Canada research initiative *Governance for Watershed-Based Source Water Protection*, funded by the Canadian Water Network (CWN) and led by researchers at the University of Waterloo, Ontario.<sup>1</sup>

It also built on momentum established by the 2012 event *A Water Gathering: Collaborative Watershed Governance in B.C. and Beyond*<sup>2</sup> and was informed by a number of foundational research reports, including *The State of the Water Movement in British Columbia: A Waterscape Scan & Needs Assessment of B.C. Watershed-Based Groups* (July 2013)<sup>3</sup> and *A Blueprint for Watershed Governance in British Columbia* (January 2014)<sup>4</sup>; many of the themes and dialogue at the event built on this latter document.

As part of the lead-in activities prior to *Watersheds 2014*, the POLIS Water Sustainability Project at the University of Victoria organized a webinar featuring David Rapport (Principal, EcoHealth Consulting), who brought a global perspective to current freshwater issues and priorities, and shared some of his extensive research and ongoing work on ecosystem health.<sup>5</sup> In advance of the forum, a comprehensive *Readings*

and *Research* package<sup>6</sup> was also provided to all delegates to ensure they had access to a good foundation of resources from many of the leading thinkers and researchers in this field.

This proceedings report contains a synthesis of themes, perspectives, and accounts of first-hand experiences heard at *Watersheds 2014*. It is based on the presentations given, questions raised, and discussions held during the event, which touched on a broad spectrum of issues related to watershed governance in B.C., across Canada, and internationally. This written record of *Watersheds 2014* is not simply a summary for those who attended. It is also designed to be a substantial resource and reference document for anyone researching or working on implementing innovative new decision-making practices and processes within their watershed in the pursuit of healthy, functioning aquatic systems and communities.

This report is organized thematically, with the name and affiliation of each speaker and moderator listed at the beginning of each section. In some sections, the narrative weaves together the presentations with the discussion that followed; in other cases, the distinction between the presentation and discussion is more pronounced. This was done purposefully to recreate the different approaches used by presenters at the various panels, workshops, and keynote presentations at the event. Biographies of all the presenters can be found in Appendix 1, and a list of delegates who were in attendance at the forum can be found in Appendix 2.

An important outcome of the event—beyond new understanding, connections, and networks—was the *Watersheds 2014 Forum Consensus*, provided on the following pages. This statement captures the core sentiments and primary conclusions from the event. It is meant to have longevity beyond the forum to signal to others the emerging importance and priority of fresh water for the health and prosperity of our communities, our economy, our sense of place, and, critically, our environment.

*Watersheds 2014* was co-organized by the POLIS Water Sustainability Project, based at the University of Victoria's Centre for Global Studies, the University of Victoria's Department of Geography, and Brock University's Environmental Sustainability Research Centre, along with the support of numerous partners and sponsors, including Cowichan Tribes and the Cowichan Watershed Board.

# The Watersheds 2014 Forum Consensus

*Watersheds 2014: Towards Watershed Governance in British Columbia and Beyond* was held on Cowichan Tribes territory in Duncan, British Columbia from January 27th to 29th, 2014<sup>1</sup>. This forum attracted nearly 200 delegates, plus an additional over 75 virtual participants via online satellite events across the country. The delegates came from a diversity of backgrounds—including watershed groups, researchers, professional resource managers, and decision-makers at all levels of government, including First Nations—who came together to re-envision the way we use, share, and respect our freshwater and watershed resources. This consensus represents the general spirit of common understanding of values, principles, and priorities by those at the forum and is supported by a number of organizations which were partners on the event.

## Our Common Values

Water is life. Water is our relation. Water bonds us across time and place to our ancestors, to our descendants, and to our land. Water nourishes, replenishes, cleanses, and refreshes. It is the source of food, sustains our salmon, supports our rich environment, and powers our economy. It is critical to our community and economic prosperity.

Water cannot be owned as it is shared by all life on Earth. It is a public trust that provides a universal link between all cultures and species, requiring us to understand each other's experiences, histories, and identities. As such, we each have a duty of stewardship and share a mutual responsibility to ensure water is protected and stewarded to provide for its availability for the health and resilience of all life.

## Towards a New Approach—Watershed Governance

Watershed governance is emerging as a viable approach to achieving long-term ecological and economic sustainability and better engagement of local communities, including both rights holders and stakeholders, in critical decisions that affect us all—upstream and down. A key factor for its success is improved collaboration and connections between citizens and decision-makers at the watershed scale. The approach has many benefits, including **building resilience** to adapt to change and enable innovation; **leveraging expertise** and a diverse range of resources; **clarifying roles and responsibilities**, thus increasing accountability; creating **opportunities for shared learning** and capacity building; and **reducing conflict** and increasing public confidence. It need not be yet another layer of government or bureaucracy. Rather, the overarching goal is to provide an alternative to current systems of governance and planning that focus too narrowly on single sectors, thereby isolating water and watershed resources from their broader interactions across communities and within ecosystems.

At the *Watersheds 2014* forum the following **key principles** were revealed that underpin watershed governance:

- **Water for Nature**—building resilience in ecosystems as the foundation of the economy
- **Connected Systems**—including surface and groundwater, land-water interactions, and cumulative impacts

<sup>1</sup> *Watersheds 2014* was organized by the POLIS Water Sustainability Project, situated at the Centre for Global Studies at the University of Victoria, the University of Victoria's Department of Geography, and Brock University's Environmental Sustainability Research Centre, with significant funding from the Canadian Water Network and the Real Estate Foundation of British Columbia, and with the support of numerous other partners and sponsors.



Cowichan Watershed Board



FIRST NATIONS FISHERIES COUNCIL



- **Transparency and Collaboration**—community engagement and deliberation with all key rights holders and stakeholders, involving public, non-profit, and private actors, ensures cross-sector perspectives and solutions
- **Clear Roles and Responsibilities**—involving nesting watershed organizations and institutions across scales
- **Knowledge of Watershed Health**—reliable, consistent monitoring and reporting of the function of local watersheds
- **Sustainable Financing and Capacity**—maintains longevity and ongoing capacity to respond to new and emergent issues
- **Accountability and Oversight**—ensures legitimacy in decision-making and is the foundation of good governance

The following **challenges** were also identified at the forum:

- **Inadequate Legal Framework**—to enable watershed organizations and local roles in decision-making to thrive
- **Difficulty in Delegation of Appropriate Powers**—to ensure those impacted have a say and that water is secured as a public trust for today and future generations
- **The Role of First Nations**—in formal watershed decision-making
- **Lack of Comprehensive Monitoring and Reporting**—of surface and groundwater use
- **Reconciliation of Aboriginal Rights and Title**—as a constitutional priority
- **Access to Sustainable Funding and Long-Term Capacity**—for science-informed and locally appropriate decision-making

These challenges can be overcome and, along with the principles identified, offer a genuine opportunity to move past the current logjam of inaction to ensure better governance, and ultimately the sustainability, of our home watersheds.

### Priority Actions

Forum engagement and dialogue identified the following priority actions as essential for making progress towards watershed governance:

1. **Support of a new British Columbia *Water Sustainability Act***, including the development of its supporting regulations, that enables watershed governance, recognizes and respects aboriginal rights and title, strengthens oversight, and implements strong minimum standards to ensure watershed governance reflects upstream and downstream community interests to ensure basic ecological function.
2. Urgent need to **integrate resilience thinking in planning and governance processes** at all levels of government and community action.
3. **Ongoing commitment to, and participation in, a growing water movement**, including sharing experiences and knowledge to support innovation in governance and watershed stewardship.
4. **An annual forum of watershed-based groups and users from across B.C.** to build capacity and knowledge and exchange best practices and lessons on the ground.
5. **Improved public engagement and education** to build a common water culture and ensure active citizen participation in watershed governance.
6. **Research on and viable models for sustainable funding** of watershed governance entities.
7. **Identification and support for pilot initiatives** aimed at developing Water Sustainability Plans, as articulated in the new B.C. *Water Sustainability Act*.



# Table of Contents

PREAMBLE iii

WATERSHEDS 2014 FORUM CONSENSUS iv

INTRODUCTION xi

## UNDERSTANDING THE ISSUES AND IDENTIFYING THE EMERGING OPPORTUNITIES 1

### WATERSHED GOVERNANCE AND ATTITUDES AROUND WATER 3

#### **Taking the Pulse and Setting the Scene:**

#### **Water Attitudes and the Emergence of Watershed Governance 3**

*Introductory Big Ideas Keynote (Day One):* By Angus McAllister (Fathom6 Research) & Oliver M. Brandes (POLIS Project on Ecological Governance)

#### **Water as Our Relative: Redefining How We View Water in Governance Processes 6**

*Big Ideas Keynote (Day One):* Moderated by Margot Parkes (University of Northern B.C.), with presentations from Carrie Terbasket (South Okanagan-Similkameen Syilx Environmental Committee), Tessa Terbasket (youth representative) & Kelly Bannister (POLIS Project on Ecological Governance)

#### **Our Living Waters: Collective Impact for a Sustainable Water Future 7**

*Big Ideas Lunch Keynote (Day Three):* By Tony Maas (Maas Strategies)

### WATERSHED GOVERNANCE IN PRACTICE 9

#### **Successes and Challenges: From the Front Lines of Watershed Governance 9**

*Panel (Day One):* Moderated by Tim O’Riordan (University of East Anglia), with presentations from Jason Alexandra (Australia’s Murray-Darling Basin Authority), Barbara Veale (Conservation Halton), Anna Warwick Sears (Okanagan Basin Water Board) & Lydia Hwitsum (Cowichan Watershed Board)

#### **The Cowichan Experience: An Adventure in Governance Evolution 14**

*Concurrent Panel (Day Two):* Moderated by Rodger Hunter (Cowichan Watershed Board), with presentations from Rob Hutchins (Cowichan Valley Regional District), Andy Thomson (Department of Fisheries and Oceans), Lorna Medd (OneCowichan), David Anderson (Cowichan Watershed Board) & Larry George (Cowichan Tribes Perspective)

### FIRST NATIONS AND WATER GOVERNANCE 16

#### **First Nations and Water Governance: Understanding the Framework 16**

*Panel (Day Two):* Moderated by Carrie Terbasket (South Okanagan-Similkameen Syilx Environmental Committee), with presentations from Marlowe Sam (University of British Columbia Okanagan & En’owkin Centre), Deanna Machin (First Nations Fisheries Council) & Larry George (Cowichan Tribes)

#### **Lunch Keynote Address (Day Two) 19**

by Regional Chief Jody Wilson-Raybould (British Columbia Assembly of First Nations)

**Making it Real: Going Beyond Including Traditional Knowledge in Watershed Management, Towards Shared Leadership in Watershed Governance 22**

*Concurrent Workshop (Day Three):* Moderated by Kelly Bannister (POLIS Project on Ecological Governance) with presentations from Arvid Charlie *Luschiim* (Cowichan Tribes), Joan Morris (Songhees Nation), Nancy Turner (School of Environmental Studies, UVic), Carrie Terbasket (Lower Similkameen Indian Band of the Okanagan Nation), Tim Kulchyski (Cowichan Tribes), Cheri Ayers (Cowichan Tribes), Brian Huntington (Skeena Watershed Conservation Coalition) & Eli Enns (North American ICCA Consortium & POLIS Project on Ecological Governance)

**WATER LAW AND B.C.'S WATER ACT 26**

**What's Law Got to Do With It? Recent Legal Changes Affecting Watersheds 26**

*Concurrent Panel (Day Two):* With Deborah Curran (Environmental Law Centre, University of Victoria) & Linda Nowlan (WWF-Canada)

**Legal Tools for Watershed Protection 28**

*Concurrent Workshop (Day Three):* With Deborah Curran (Environmental Law Centre, University of Victoria), Calvin Sandborn (Environmental Law Centre, University of Victoria) & Martin Hoffman (University of Victoria)

**A New Water Sustainability Act and the Future of Watershed Governance in B.C. 31**

*Concurrent Workshop (Day Three):* With Jennifer Viganò (B.C. Ministry of Environment) & Ted White (B.C. Ministry of Environment)

**RESILIENCE AND CLIMATE CHANGE ADAPTATION 35**

**Planning for Resilient Watersheds in a Climate-Changed World 35**

*Concurrent Workshop (Day One):* With Deborah Harford (Adaptation to Climate Change Team), Jon O'Riordan (Adaptation to Climate Change Team & POLIS Project on Ecological Governance) & Stephen Tyler (Adaptive Resource Management Ltd.)

**Navigating Governance in a Changing World:**

**Resilience Thinking and the Future of Watersheds 36**

*Big Ideas Keynote (Day Two):* Moderated by Michele-Lee Moore (University of Victoria) with keynote presentations from Ryan Plummer (Environmental Sustainability Research Centre, Brock University) and discussion lead by Simon Mitchell (WWF-Canada) & Tim Kulchyski (Cowichan Tribes)

**SKILLS-BUILDING SESSIONS 39**

**WATERSHED PLANNING AND SOURCE PROTECTION 41**

**Straight from the Source: Drinking Water Source Protection Planning 41**

*Concurrent Panel (Day Two):* Moderated by Brian Wilkes (Brian Wilkes & Associates Ltd.), with presentations from Mike Donnelly (Regional District of Nanaimo), Reg Whiten (InterraPlan Inc., Dawson Creek) & Mike Fox (City of Kimberly)

**Developing a Water Conservation Plan for Your Community 42**

*Concurrent Workshop (Day Three):* With Madelaine Martin (B.C. Ministry of Community, Sport & Cultural Development)

**Collaborative Planning and Action for Healthy Watersheds and Communities 43**

*Concurrent Workshop (Day Three):* With Steve Litke (Fraser Basin Council), Margaret Birch (City of Coquitlam), Graham Watt (Regional District of Kootenay Boundary) & Amanda Karst (Centre for Indigenous Environmental Resources)



## WATERSHED ASSESSMENTS, REPORT CARDS, INDICATORS AND WATER USE REPORTING 45

### **Learning together to Address the Health and Well-Being Dynamics of Watershed Governance 45**

*Concurrent Workshop (Day One):* With Margot Parkes (University of Northern B.C.), Wayne Salewski (Nechako Environment and Water Stewardship Society) & Reg Whiten (Watershed Steward, City of Dawson Creek)

### **Water-Use Reporting for the 21st Century 47**

*Concurrent Workshop (One):* With Nelson Jatel (Okanagan Basin Water Board), Anna Warwick Sears (Okanagan Basin Water Board) & Renee Clark (Regional District of North Okanagan)

### **Making the Grade: Watershed Report Cards and Indicators 48**

*Concurrent Panel (Day Two):* With Barbara Veale (Conservation Halton), Steve Litke (Fraser Basin Council), Margot Parkes (University of Northern B.C.) & Tom Rutherford (Department of Fisheries and Oceans)

### **Pooling Our Water Knowledge: Assessing the Health of Canada's Water Wealth 50**

*Concurrent Workshop (Day Three):* With James Snider (WWF-Canada) & Simon Mitchell (WWF-Canada)

## COMMUNITY ENGAGEMENT 52

### **A New Bag o' Tricks: Engaging "the Public" in Watershed Governance 52**

*Concurrent Workshop (Day One):* With Susi Porter-Bopp (Canadian Freshwater Alliance), Kirsten Harma (Lake Windermere Ambassadors) & Sheila Muxlow (WaterWealth Project)

### **A Community Role in Decision-Making: Connecting Water Science and Policy 54**

*Concurrent Workshop (Day Three):* With Ryan van der Marel (Wildsight) & Heather Leschied (Wildsight)

## SOCIAL FINANCING 57

### **Social Financing 101: Emerging Ideas to Support Community-Led Governance Initiatives 57**

*Big Ideas Keynote (Day Two):* Session introduction by Kelly Lerigny (Real Estate Foundation of British Columbia), with presentations from Ken Gauthier (Urban Matters), Tim Morris (Morris Consulting) & Paul Emerson (Vancity)

## WHERE TO NEXT AND FINAL THOUGHTS 59

### **Creating a Watershed Culture: Reflections from Beyond Canada 59**

*Big Ideas Dinner Keynote (Day One):* By Tim O'Riordan (University of East Anglia)

### **Where Do We Go from Here? The Future of Watershed Governance 60**

*Closing Panel (Day Three):* Moderated by Oliver M. Brandes (POLIS Project on Ecological Governance), with presentations from Tim Morris (Morris Consulting), Jon O'Riordan (POLIS Project on Ecological Governance), Susi Porter-Bopp (Canadian Freshwater Alliance) & Tim Kuryschuk (Cowichan Tribes)

## CONCLUDING REMARKS 61

## APPENDICES 62

**Appendix 1: Watersheds 2014 Presenter Biographies 62**

**Appendix 2: Watersheds 2014 Participant List 73**

**Appendix 3: Sources and Citations 76**



# Introduction

From January 27th to 29th, 2014, nearly 200 delegates (plus an additional 75 virtual participants via online satellite events across the country) came together for the *Watersheds 2014: Towards Watershed Governance in British Columbia and Beyond* forum. The delegates came from a diversity of backgrounds—including watershed groups, researchers, professional resource managers, and decision-makers at all levels of government, including First Nations—to re-envision the way we use, share, and respect our freshwater and watershed resources. They gathered at the Quw’utsun’ Cultural and Conference Centre on Cowichan Tribes territory in Duncan, B.C. to engage with current challenges and emerging concepts in water and watershed governance, and to share ideas, research, practical governance tools, and stories and lessons learned from their personal experiences.

## **Watersheds 2014: A Traditional Welcome**

Chief William Seymour of Cowichan Tribes welcomed participants with a traditional Cowichan blanketing ceremony and calling of witnesses. Historically, because the Cowichan was an oral society, members of the audience would officially witness all significant events and agreements. At *Watersheds 2014*, witnesses were responsible for “looking after” the workshop and for keeping an oral history of what participants discussed. This process of witnessing, which has been part of Cowichan oral traditions for generations, means that the history of the event can be carried forward through generations to come. In support of this idea of “carrying forward,” we also offer this written account of the proceedings, which we hope will enable forum participants and other interested individuals to further learn and apply insights from this three-day gathering.

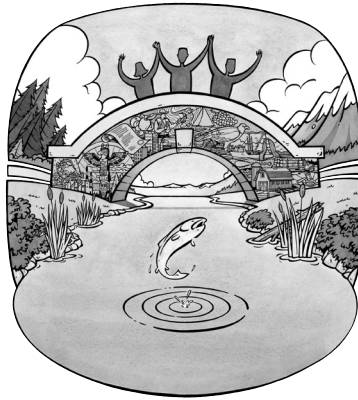
## **Gathering in the Cowichan**

The forum took place in the Cowichan Valley, on the banks of the Cowichan River, which is designated as both a B.C. and Canadian Heritage River. The Cowichan watershed, a region of rich natural and cultural heritage, faces development pressures and threats to its long-term health and resilience. It is also a site of innovation in governance, and of new partnerships and networks among people trying to protect social and ecological values. For these reasons, the Cowichan is a very appropriate place to draw together people from across B.C., Canada, and the world to discuss the issues, contexts, and tools of contemporary water governance.

The Cowichan People have been stewards of the Cowichan watershed for thousands of years. Over the past century, Chief Seymour explained, the watershed has faced the impacts of clear-cut logging, pollution, poor infrastructure management, and other developments. In response to the degradation of the landscape, his community is engaging with the local and provincial governments and the Cowichan Watershed Board to help the rivers, creeks, and lands become healthy again. The Chair of the Cowichan Valley Regional District, Rob Hutchins, also emphasized the idea of health, noting the interconnectedness of human and watershed well-being. The future of our children, economy, and health relies on our watersheds, Hutchins emphasized. That ultimately means that we must all play a role—working as both teachers and students—to learn how to repair the harm we’ve caused.

The following pages provide an account of what was heard at *Watersheds 2014* in the various keynotes, presentations, and discussions. Each section is organized around a primary theme, and contains narrative accounts from those specific forum sessions that focused on an aspect of that theme.





Understanding the Issues  
and Identifying  
the Emerging Opportunities





# Watershed Governance and Attitudes around Water

The presentations described in this section revealed the powerful attachment Canadians have to water, based on recent research and public opinion polls. The presenters discussed ways in which water advocates can mobilize broad sectors of the population to develop effective processes of watershed governance and make a “collective impact” towards achieving long-term water sustainability. Connecting with our deeper, more spiritual or emotional, relationship to water can ultimately support the development of a new ecological ethic—one that makes space for new relationships and the intersection of beliefs in collaborative approaches to decision-making.

---

## IN THIS SECTION

### **Taking the Pulse and Setting the Scene: Water Attitudes and the Emergence of Watershed Governance**

*Introductory Big Ideas Keynote (Day One):* By Angus McAllister (Fathom6 Strategies) & Oliver M. Brandes (POLIS Project on Ecological Governance)

### **Water as Our Relative: Redefining How We View Water in Governance Processes**

*Big Ideas Keynote (Day One):* Moderated by Margot Parkes (University of Northern B.C.), with presentations from Carrie Terbasket (South Okanagan-Similkameen Syilx Environmental Committee), Tessa Terbasket (youth representative) & Kelly Bannister (POLIS Project on Ecological Governance)

### **Our Living Waters: Collective Impact for a Sustainable Water Future**

*Big Ideas Lunch Keynote (Day Three):* By Tony Maas (Maas Strategies)

---

## **Taking the Pulse and Setting the Scene: Water Attitudes and the Emergence of Watershed Governance**

*Introductory Big Ideas Keynote (Day One):* By Angus McAllister (Fathom6 Strategies) & Oliver M. Brandes (POLIS Project on Ecological Governance)

During this opening keynote, the presenters alternated portions of their presentations back and forth, thus creating an evolving dialogue and weaving a story about what Canadians tend to think about water, including attitudes and concerns about our freshwater resources and the emerging understanding about, and potential for, new and innovative forms of governance. The presenters also discussed how to better engage Canadians around critical issues, and provided an introduction to the concept of watershed governance and hallmarks for its success.

The session opened by emphasizing that 97 per cent of British Columbians agree that water is an issue that matters, while 93 per cent say water is our most precious resource (Figure 1). Presenter Angus McAllister conducts public opinion research, and has found a powerful underlying sentiment of emotional connection when it comes to British Columbian’s understanding of the role of water in their lives. This passionate, collective response to water is often underpinned by the knowledge that water is essential to life and, thus, personally meaningful to British Columbians.

McAllister explained that the language people use to describe water reveals this connection. Public discussion of water transcends political ideology and often reveals a unified, collective sense of the importance of water.



Water and watershed governance in Canada are evolving. Although government is still a key actor, top-down regulation is no longer the only (or in some cases even the predominant) mechanism for water-related decision-making; governance is now much broader, and involves formal and informal networks—including First Nations, citizen groups, non-governmental organizations, watershed boards with various degrees of statutory decision-making authority, and a host of other influencers and actors. In Canadian water governance there has been some limited experimentation with market-based approaches (particularly in Alberta), and an increasing emphasis on collaboration and partnerships. One reason for this shift from government-driven, top-down approaches to multiple frameworks of governance is because of uncertainties and risks, including a changing climate, decreased funding and capacity of senior government, and increasing industrial use of fresh water. In a fast-changing socio-political context, Canadians must learn to adapt and be resilient to future uncertainties and risks.

Brandes suggested there is no single approach to water governance that will be universally effective. Changing governance practices and processes is neither a quick nor an easy process. But, overall, good governance seeks to incorporate knowledge of social and geographical dynamics and engage citizens in shared decision-making, thus ensuring those impacted by decisions have a say. There are three key conditions for an effective shift in watershed governance:

Local control, including place-based watershed entities (e.g. boards, roundtables, councils) with First Nations co-governance and local support;

Powers delegated from senior government that are context appropriate and can be used in an accountable way; and Sustainable long-term funding.

Water is essential—socially, ecologically, economically, and spiritually. To become adaptable, and to protect water resources in a fast-changing environment, we need to move towards shared decision-making and become the architects of our freshwater future.

### How Do We Analyze Our Audiences When Seeking Support for Water Initiatives?

To succeed with shared decision-making, water advocates must be aware of differences among

audiences, who vary in their knowledge, beliefs, and receptiveness to environmental protection messages. Citing a frequently used social movement framework, McAllister shared a model of four public audience types:

1. **The Choir.** Fifteen per cent of Canadians have a great deal of sustainability knowledge and believe that environmental protection and economic growth can go hand in hand.
2. **The Atheists.** McAllister's poll results show that five per cent of Canadians reject the notion of sustainability. They believe that difficult trade-offs exist between the economy and the environment. The people in this group are mostly men and are very knowledgeable. Members of "the choir" are frequently engaged in debates with the atheists.
3. **The Heathens.** Fifteen per cent of Canadians have little knowledge about (or interest in) sustainability. This group, typically comprised of young men, believe that the world is a "dog-eat-dog" place where people do not care about each other.
4. **The Congregation.** McAllister's research shows that 65 per cent of Canadians have little knowledge about sustainability, but do believe it can be achieved at the same time as economic growth. This group is stereotypically the suburban population.

In an era of freshwater crises, water advocates must galvanize the congregation to help mitigate climate-related water risks and other freshwater priorities.

### How Can Watershed Sustainability Advocates Engage the "Congregation" and Connect with the Strong Affective Connection Citizens Have to Water?

In B.C., engaging the congregation on water issues can be an important part of the strategy to reforming current approaches to freshwater management. To engage the congregation, water advocates should make use of the emotional connection Canadians have to water. The powerful thing about water is that it is something we all love, and that can bring us together. McAllister advises that water champions will be more effective in mobilizing public support for changes that protect water quality and quantity by focusing on what makes people proud, instead of

shaming people into action by creating conflict. In this way, we can personalize the issue and encourage people to visualize and relate to changes in their home watersheds.

## Water as Our Relative: Redefining How We View Water in Governance Processes

*Big Ideas Keynote (Day One):* Moderated by Margot Parkes (University of Northern B.C.), with presentations from Carrie Terbasket (South Okanagan-Similkameen Syilx Environmental Committee), Tessa Terbasket (youth representative) & Kelly Bannister (POLIS Project on Ecological Governance)

In the session “Water As Our Relative: Redefining How We View Water in Governance Processes,” presenter Carrie Terbasket brought water to life, both as a spiritual force with core indigenous and holistic values, and as something dynamic and present everywhere – all around and within us, nourishing us and keeping us alive. This theme of water as a force of nature and spirit, as nurturing and connective, and as an entity beyond a “resource” or “commodity,” carried through the discussion.

In the Lower Similkameen Valley, the human-water connection is communicated through story and language. From her experience as a First Nations woman, Carrie Terbasket spoke of the cultural importance of water. She shared the message that we are all connected by water, and that this cross-cultural recognition can draw people together to face water-related challenges collaboratively. Most contemporary water governance processes are centralized, and exclude many people, including First Nations. Terbasket instead argued for participatory decision-making informed by indigenous values that recognize the human-water connection, engage diverse perspectives, and embrace subjectivity. She believes that our tendency towards objectivity depersonalizes decisions that have real outcomes for people, places, and future generations. By focussing on “thinking” and ignoring “feeling,” we are not engaging our capacity to work together and come up with innovative solutions.

Terbasket also believes that there is a distinct role for First Nations women and youth in these processes. Drawing parallels between women and water, Terbas-

### What is missing from governance processes in your communities?

In the session “Water as Our Relative,” moderator Margot Parkes asked participants the question: “What is missing from governance processes in your communities?”

Answers from *Watersheds 2014* participants included: commitment, leadership, ownership, understanding, agreement, emotion, shared vision, connection, adequate funding, trust, accountability, and respect.

ket highlighted that both are life giving and nurturing, but also forces to be reckoned with. Therefore, she insisted that women must have a more elevated role in decision-making. Women can help bring heart and feeling back into the governance process. She then invited her niece Tessa Terbasket to share her perspectives; she echoed these sentiments while emphasizing the need to also involve and mentor youth in these discussions. It is today’s youth who are inheriting the future outcomes of present-day governance and decision-making processes. Encouraging the younger generation to become involved in these discussions can empower present and future youth leaders.

Presenter Kelly Bannister pointed out that water is a chemical mediator of reciprocal relationships at multiple levels—within our bodies, between us and others, and between us and the natural world. She encouraged us to embed this understanding of interrelationship and reciprocity in our decision-making and action, and suggested that an ecological governance perspective means not only treating the environment as all encompassing and all pervasive, but as integrally connected to each of us through water. By connecting to our personal relationships with water and reciprocating all it provides for life, this perspective can help



CARRIE TERBASKET, 2014



move us from “thinking” to “feeling” when carrying forth a new ethic in ecological governance, and can encourage more mindful decision-making processes at the watershed scale.

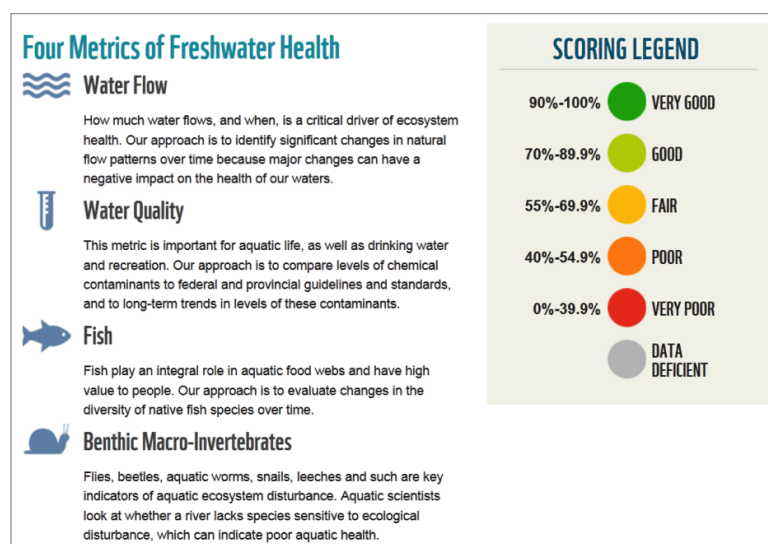
With regards to integrating indigenous knowledge into governance processes that tend to be dominated by western scientific systems, Terbasket recognized that this will always be a challenge because the two knowledge systems are based on different and often distinct ways of knowing the world. Much can be lost in attempts to translate and integrate one into the other. One suggested approach that would respect these differences involves creating parallel decision-making processes. In this way, each knowledge system can “walk its own path” towards its own conclusions, and then the outcomes can be compared and contrasted. We need to move forward in the spirit of collaboration, which must respect the autonomy of distinct groups, and acknowledge and embrace strength in diversity.

Collaboration is not about integration, suggested Bannister in conclusion, but rather about making the space for relationships and intersections in collaboration. We should think of collaboration as an “ethical space,” as described by Willie Ermine: a space in which two distinct and possibly divergent spheres of culture and knowledge can interact.<sup>10</sup> Within this type of space, Bannister encouraged participants to seize “a moment of possibility” in understanding water as our relative in governance processes, and shifting towards participatory democracy and collaboration.

## Our Living Waters: Collective Impact for a Sustainable Water Future

*Big Ideas Lunch Keynote (Day Three):* By Tony Maas (Maas Strategies)

Keynote presenter Tony Maas suggested that in this critical “socio-political moment”—as we move towards more watershed-based, collaborative decision-making—Canadians need to ask themselves, “What is our collective impact?” Many people—in non-governmental organizations and business, for example—work independently and can have isolated impacts. In contrast, Maas said, collective impact is a structured and strategic collaboration in which



**Figure 3:** The four metrics of freshwater health used in WWF-Canada’s Freshwater Health Assessment process. Source: WWF-Canada, 2014.

diverse organizations align their efforts under a common vision and agenda for change. According to Maas, achieving collective impact within water governance requires five key actions.

- 1. Pooling water knowledge.** There seems to be less and less information (including specific data) available about water resources, particularly aquatic ecosystems. This places a premium on connecting existing information and putting it to good use. WWF-Canada’s *Freshwater Health Assessment* represents positive steps in this direction (Figure 3).
- 2. Creating a new water framework.** Around the world, many efforts are being made to devolve certain decision-making responsibilities to the watershed scale and the local-government level. While there may be diminishing capacity within higher levels of government, senior government must remain active and is certainly required to create an enabling environment to support this devolution of responsibilities. The European Union’s *Water Framework Directive* (WFD) might serve as a useful model for Canada. Two particularly relevant attributes of the WFD are that it 1) establishes a *measurable and understandable goal* and 2) addresses *jurisdictional fragmentation*. The Canadian Forum for Leadership On Water (FLOW) is one example of the efforts being made to integrate the concept of “shared water” into a single relevant framework for Canada.<sup>11</sup>

- 3. Making use of networks of networks.** In order to reach out to the “congregation,” we must first build better connections between members of the “choir” (see *Taking the Pulse and Setting the Scene: Water Attitudes and the Emergence of Watershed Governance*, p. 3). To this end, organizations such as the Canadian Freshwater Alliance<sup>12</sup>, whose goal is to facilitate networking across Canada, are invaluable.
- 4. Fostering (hydro)citizenship.** This involves thinking about how we act in a relationship with water and our watershed. We are first and foremost citizens, not consumers. The future health and well-being of our environment requires citizen preferences, not just consumer preferences. This goes far beyond simply feeling guilty when taking long showers. Decisions being made today will define the future health of our local waters and watersheds. Our role as hydro-citizens is to make our preference known by engaging with our elected leaders and in decision-making processes – from public consultations, to other localized engagement forums through watershed boards or local stewardship groups – to play an active role in charting the course toward a sustainable future.
- 5. Having a Big, Hairy, Audacious Goal (BHAG).** Maas encourages any group involved in water to have clear and ambitious aspirations for water governance. For example, the U.S. *Clean Water Act* explicitly highlights the goal of achieving swimmable, drinkable, and fishable water for all. Following the example of the European Union’s WFD, perhaps a goal for Canada could be “All waters in good health or better within a generation.”



# Watershed Governance in Practice

**F**our specific watershed governance case studies were put on centre stage at the outset of the forum to highlight successes and challenges faced by existing innovative watershed-scale planning and governance approaches. A common theme throughout each of these examples was that a range of people with disparate expertise, interests, backgrounds, and experiences were engaged to help develop these collaborative governance arrangements that reflect the complex local needs and circumstances.

Each presentation focused on the specific evolution of watershed governance in that region, and also on successes, failures, and future opportunities. Certain challenges were universal among the case studies, including the need for better data, sustainable funding, public awareness, and community participation. Presenters also highlighted their specific successes regarding building relationships and working within institutional and financial constraints. Thus, these practical experiences provided insight into possible tools and frameworks for effective watershed governance in other regions, and offered “proof of possibility” to others looking to follow a similar path.

---

## IN THIS SECTION

### Successes and Challenges: From the Front Lines of Watershed Governance

*Panel (Day One):* Moderated by Tim O’Riordan (University of East Anglia), with presentations from Jason Alexandra (Australia’s Murray-Darling Basin Authority), Barbara Veale (Conservation Halton), Anna Warwick Sears (Okanagan Basin Water Board) & Lydia Hwitsum (Cowichan Watershed Board)

### The Cowichan Experience: An Adventure in Governance Evolution

*Concurrent Panel (Day Two):* Moderated by Rodger Hunter (Cowichan Watershed Board), with presentations from Rob Hutchins (Cowichan Valley Regional District), Andy Thomson (Department of Fisheries and Oceans), Lorna Medd (OneCowichan), David Anderson (Cowichan Watershed Board) & Larry George (Cowichan Tribes Perspective)

---

## Successes and Challenges: From the Front Lines of Watershed Governance

*Panel (Day One):* Moderated by Tim O’Riordan (University of East Anglia), with presentations from Jason Alexandra (Australia’s Murray-Darling Basin Authority), Barbara Veale (Conservation Halton), Anna Warwick Sears (Okanagan Basin Water Board) & Lydia Hwitsum (Cowichan Watershed Board)

### Case Study: Governance In the Murray-Darling Basin

Governance in the Murray-Darling Basin has reflected Australia’s changing relationship with nature. Its early phase of water resource development was largely shaped by colonialism, in which navigation, irrigation, and economic development were the primary purpose. More recently, emphasis has been on ecological restoration, care for nature, and meeting international obligations around biodiversity and wetland conservation.

In his explanation of the history of Australian water policy, presenter Jason Alexandra focused on a three-phase transition. Recurring droughts in Australia have driven water policy to have a focus on improving water resources infrastructure (including dams for irrigation) and improving water reliability for human uses. This was the dominant focus for approximately one hundred years, until the 1980s. In the early 1990s, Australia adopted

a reform agenda around the environment, environmental flows, liberalizing water markets, corporatization of water authorities, and cost recovery. Ten years later, in 2004, a National Water Initiative reaffirmed a commitment to continue substantial management reform of the water sector. This second phase lasted until about 2008, at which point policy shifted toward basin-scale planning and more focus was put on governance, including the creation of the Murray-Darling Basin Authority (MDBA). This shift was seen to be needed because Australian river health assessments had revealed that most rivers are highly modified and have degraded habitats, and because the basin had recently experienced one of the most severe droughts in recent history. As well, Australia had national and international obligations to protect wetlands and aquatic systems.

Changes in Australia's water sector were driven by a variety of priorities, including a broader economic reform agenda that emphasized economic efficiency. Other priorities included increased demands to implement ecologically sustainable development, as well as improved environmental protection, to overcome increasingly apparent ecological degradation and address issues such as water quality, species loss, and wetlands conservation. More significant changes have revolved around commitments to achieve integrated catchment management, which emphasizes better community involvement.

The last decade has seen a number of assessments of river health across Australia, and results consistently show that rivers are in poor condition and conditions are declining due to high levels of nutrient and suspended sediment loads and degraded habitat.

Like in many other countries, Australian agriculture is a major consumer of fresh water. This agricultural use is often at the expense of nature, as is apparent in the Murray-Darling Basin. Upwards of 70 per cent of water used in the Murray-Darling Basin is allocated for irrigation in the agricultural sector, which is considered central to Australia's nation-building efforts. Stunningly, about half the profit from Australian agriculture comes from irrigated agriculture and horticulture, but it uses less than 0.05 per cent of the land.

One future direction for governance reform in the Murray-Darling Basin involves developing capacity for more robust decision-making processes and more adaptable water policy, given greater levels of uncertainty due to the changing climate. This involves using a "scenarios" approach to plan for a variety of potentially different futures. Part of this approach focuses on extremes, such as floods, droughts, and other climate change impacts. In addition, these scenarios focus on the social side of a watershed, including changing communities and changing demographics. Other important future directions include institutional and policy innovation, to ensure genuine community involvement in integrated catchment management, as well as multiple-scale water planning from the local to basin scale.

#### **Key challenges:**

- Combating "reform fatigue" in the various stakeholders, rights holders, and communities due to the need to gain broad community support for changes;
- Developing policies that support adaptation to address greater uncertainties associated with climate change; and
- Effectively assessing both social and biophysical aspects of watersheds.

#### **Successes:**

- Increased focus on securing water allocations for nature;
- Increases in water availability and increased efficiency of water use through the help of new technologies, environmental engineering, and better modelling;
- Multi-pronged strategies for water quality management, to address diffused sources of water pollution, and other serious water quality concerns (e.g. algal blooms, salinity levels); and
- Water markets that have allowed water to move between different users and uses, which is particularly important in recent drought conditions (e.g. irrigation rights have been sold from users with low-value crops to growers of high-value crops); such water markets, though widely unpopular, have been regarded by those who have used the markets as highly successful.

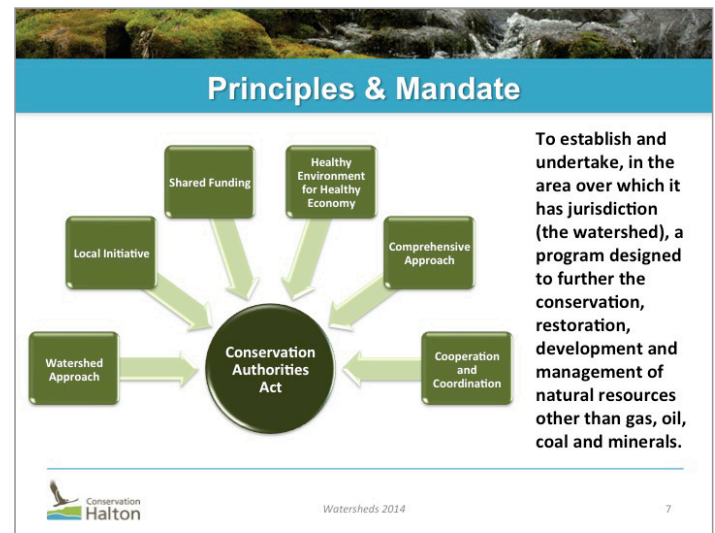


**Figure 4:** Map of Ontario's 36 Conservation Authorities, which represent over 90 per cent of the population of the province or about 12 million people. Source: Conservation Ontario, 2014.

### Case Study: Ontario's Conservation Authorities

Ontario passed the *Conservation Authorities Act* in 1946, formalizing watershed management institutions in the province. Presenter Barbara Veale explained that this initiative had its roots in the early 1900s, when Ontario water resources faced serious risks from urbanization and development. These issues were acute in the Grand River watershed and, as a result, in 1932 the community came together to form the Grand River Conservation Commission, which was the first watershed management agency of its type in Canada. The commission carried out studies and undertook water conservation projects to ensure a sufficient supply of water for municipal, domestic, and manufacturing purposes, including during periods of drought and to control floodwaters. In 1941, participants at a conference in Guelph, Ontario suggested that the province needed “conservation authorities” more broadly for comprehensive water management, which directly led to the creation of the 1946 *Conservation Authorities Act*. The act is based on six key ideas (Figure 5) borrowed from the Grand River Conservation Commission, the Tennessee Valley Authority, and Conservancy Districts in Ohio:

- Watershed approach;
- Local initiative;
- Shared funding;
- Healthy environment for a healthy economy;
- Comprehensive approach; and



**Figure 5:** The six key principles of the Ontario Conservation Authorities Act. Source: Veale, 2014.

- Cooperation and coordination.

There are now 36 Conservation Authorities across Ontario that represent 12 million people (90 per cent of the population) across the province (Figure 4). Issues vary by watershed and the activities of each Conservation Authority are guided by local watershed plans.

Funding for Conservation Authorities is derived from a variety of sources but, on average, 38 per cent comes from self-generated revenues; 45 per cent is provided through municipal levies; 14 per cent comes from provincial grants and special projects; and three per cent is provided by federal grants or contracts. Funding for capital projects, maintenance of infrastructure, and program delivery is obtained from watershed municipalities, the provincial government, and self-generated revenues. Watershed municipalities decide what level of funding they provide to their local conservation authority through an annual vote by the board of directors.

Certain activities are eligible for shared funding with the Province, including maintenance on water control infrastructure, major maintenance and capital costs, and drinking water source protection planning. The Province also allows tax exemptions on conservation lands and tax reductions on farmland and managed forests (25 per cent of residential rate).

Conservation authorities can also raise money by renting land, generating hydro-electricity, charging user fees at conservation areas (parks), and extracting

gravel. Many conservation authorities have associated charitable foundations that help raise funds to support special projects.

#### Key challenges:

- Finding consistent expertise and decision-support tools;
- Accessing resources for modelling and monitoring in the face of inconsistent programming across the province;
- Addressing public perception of a lack of accountability/legitimacy in the board of directors due to concern that they are not always elected or represent the full range of interests in their watershed;
- Better engaging First Nations (e.g. through representation on decision-making boards); and
- Raising public awareness of the roles and responsibilities of conservation authorities.

#### Successes:

- Ability to assess cumulative impacts through watershed-scale work in collaboration with different actors—including the Ministry of Natural Resources, First Nations, and local fishers—to develop priorities and use both science and local knowledge to improve the operation of dams for ecological health;
- Local programs are responsive to community needs that build strong partnerships and adapt

- provincewide programs to local circumstances; and
- Local people and communities provide some degree of reporting on enforcement issues in a context of limited resources.

#### Case Study: The Okanagan Basin Water Board

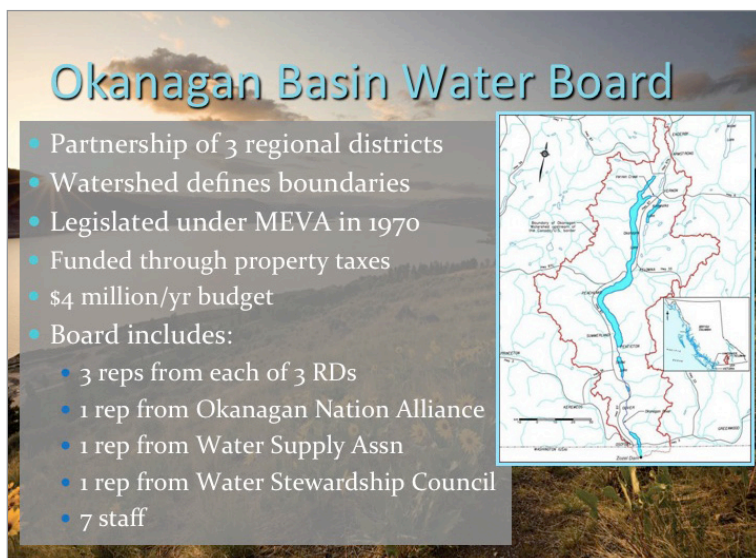
The Okanagan Basin Water Board (OBWB), created in 1968, is a property tax-funded partnership among three regional districts in the Okanagan Valley region in British Columbia (Figure 6). Presenter Anna Warwick Sears described the history and role of the OBWB, explaining that the group functions as an administrative mechanism to pool tax resources and distribute them via grants for the betterment of the whole watershed. The OBWB's overall mandate is broad: coordinate government actions, present recommendations, define advocacy roles, and receive proposals for grants.

From 1975 to 2005, two significant issues dominated the mandate of the board: invasive aquatic weeds (milfoil) and sewage pollution. These were challenges faced in the basin in its early days and there was little political will to extend its mandate to other issues at that time.

The primary benefit of the administrative structure of the OBWB is that it acts as a mechanism that can pool resources (e.g. tax dollars from residents of the Okanagan Valley) and then redistribute these resources to a variety of different projects and grants that benefit the whole watershed. The Board also has the ability to develop funding agreements with senior government agencies to undertake certain projects of basin-wide benefit. The Board provides both large infrastructure grants and smaller grants for water conservation and water quality initiatives to local communities.

The Okanagan watershed faces pressures from erratic annual water flow, climate change, forest fires, and human population growth. To help address these issues, the OBWB created the Water Stewardship Council in 2006. Its primary role is to provide high-level technical advice from a range of local experts. The Council is also a tool that allows the Board to better connect with the broader community and other stakeholders to communicate new or emerging issues and increase awareness about water use, the need to conserve, and the general state of the basin.

The Okanagan Valley is an interesting place to



**Figure 6:** The Okanagan Basin Water Board's partnership involves three regional districts within an area bounded by the 8,000 km<sup>2</sup> Okanagan watershed. Source: OBWB, 2014.



work on water issues, explained Warwick Sears, as there is tension between a variety of different needs for a limited supply of water. The Okanagan region is looking at a 50 per cent increase in population over the next 25 years, which will require careful planning to ensure the water needs of communities can be met for generations to come.

Recent work to help address some of these drivers of water scarcity has involved in-depth modelling of the water supplies in the valley through the Water Supply and Demand Project.<sup>13</sup> This project looks at the different places and ways that water moves through the landscape, and all the different ways it is used, both in the natural environment and for human uses. The biggest challenge to managing the water, Warwick Sears described, is not the lack of data (though data is critical to effectively manage resources), but the social challenges related to making policy decisions that need to be accepted by the communities.

#### Key challenges:

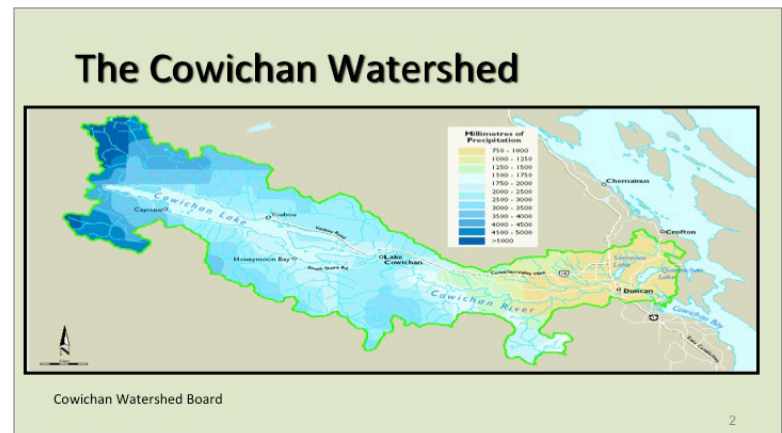
- Managing the social challenges of implementing new policies and decisions (e.g. making shifts understandable and acceptable to communities);
- Need for better collaboration with the Okanagan Nation; and
- Effectively engaging the public and mobilizing the intellectual resources of the community.

#### Successes:

- OBWB's inter-jurisdictional structure allows it to share resources well;
- Ability to collect and organize scientific data and act as a communications hub; and
- Decision-making authority on how money is spent.

#### Case Study: The Cowichan Watershed Board

In the context of climate change, population pressure, and diminishing capacity for provincial government oversight over natural resource management in B.C., the Cowichan Watershed Board (CWB) was established in 2010 as an informal watershed governance and management mechanism, co-chaired by the Cowichan Valley Regional District (CVRD) and Cowichan Tribes. The Board has already had success with developing clear watershed goals, engaging diverse local actors, and encouraging an ecosystem-based approach to watershed management and health (and not just aiming for potable water at the end of



**Figure 7:** The Cowichan watershed, located on southeast Vancouver Island, B.C. Source: Cowichan Watershed Board, 2014.

the system).

In her lifetime and in the lifetime of many other Cowichan Tribes People, former Chief of Cowichan Tribes Lydia Hwitsum explained, she has seen the watershed's ability to sustain the Cowichan People spiritually, economically, socially, and culturally. However, over time additional pressures on the watershed have changed the dynamic of these connections, and the sustainability of the Cowichan watershed (Figure 7).

With over 4,600 members, Cowichan Tribes is the largest First Nation in B.C. and its reserve land straddles the lower Cowichan River and Koksilah River. As in most of B.C., aboriginal rights and title are unresolved in the Cowichan Valley, and there is

#### COWICHAN WATERSHED: FACTS

- The Cowichan watershed is located in the heart of the CVRD on Vancouver Island.
- Forty-six per cent of the CVRD's 82,000 residents live within the 93,000 hectare watershed.
- The 32 kilometre-long Cowichan Lake (Vancouver Island's second largest lake) feeds the 51 kilometre-long Cowichan River, which flows east to the Cowichan estuary at Cowichan Bay.
- These water bodies and their tributaries drain 30 per cent of the CVRD, including the municipalities of Duncan, Lake Cowichan, and the southern portions of North Cowichan.
- There is wide variation in precipitation across the watershed, from five metres of rain a year in the west, to 800 millimetres of rain or less in the east and coastal flood plain.

very little Crown land. However, all those who live in the valley are connected, are neighbours, and depend on the resources of the valley. This realization should be the emphasis for collaboration on a number of issues, explained Hwitsum, keeping in mind the context in which rights and title exist in B.C. and in the valley. Recently, Cowichan Tribes has moved forward in asserting its inherent rights and responsibilities within its territories.

In the early years of the formation of the CWB, the members of the Board and local government representatives worked together to develop and nurture a relationship with the federal government to ensure it was engaged in the process of collaborative governance in the watershed. The need for “whole-watershed thinking” was a foundation behind the creation of the CWB, and this mindset continues to inform the actions and activities of its members. This worldview is also consistent with the philosophy and teachings of Cowichan Tribes. Currently, CWB members include representatives from Cowichan Tribes, local government (CVRD), federal government (Department of Fisheries and Oceans), as well as a number of special advisors.

#### Key Challenges:

- Working within a patchwork of authorities, jurisdictions, and responsibilities while moving towards a collaborative approach to water governance;
  - The capacity of the federal and provincial governments to coordinate a local solution was much less than the CWB had anticipated when it started;
- Securing funding for core operations (especially in the short term); and
- Sustaining momentum towards watershed governance while overcoming resistance to change in the local communities.

#### Successes:

- Took time to study the watershed and develop the *Cowichan Basin Watershed Management Plan* (March 2007)<sup>14</sup>, which led to a deeper understanding of regional issues, as well as the development and nurturing of trust between Board members; and
- Partnerships between local government and

Cowichan Tribes, with inclusion of senior levels of government and other sectors represented.

### Achieving Collaborative Watershed Governance Arrangements

During this session, discussion at the forum revealed a number of critical issues that must be addressed in order to achieve collaborative watershed-scale governance to better protect water resources. These issues include:

- Uncertainty about how best to build social **partnerships and relationships among aboriginal and non-aboriginal peoples**;
- **Development pressures**, such as the water-related impacts of B.C.’s liquified natural gas strategy<sup>15</sup>, problems of watershed ownership (e.g. the fact that two logging companies control the Nanaimo watershed), or lack of source water protection in uplands (as seen in the Okanagan, where the Province advocates multiple use, but the First Nations would like to see stronger protections);
- The need for decision-making that considers **how community plans fit into provincial planning processes**, and the need for federal and provincial funding for local watershed entities; and
- **Data needs**, a lack of funding for monitoring, and the lack of enforcement of water regulations and the resulting negative cumulative impacts; there is a need to create a compiled database of, for example, all existing water quality and quantity data that could be shared by all interested parties across the province, since currently it is challenging for watershed groups to measure progress.

---

### The Cowichan Experience: An Adventure in Governance Evolution

*Concurrent Panel (Day Two):* Moderated by Rodger Hunter (Cowichan Watershed Board), with presentations from Rob Hutchins (Cowichan Valley Regional District), Andy Thomson (Department of Fisheries and Oceans), Lorna Medd (OneCowichan), David Anderson (Cowichan Watershed Board) & Larry George (Cowichan Tribes Perspective)

This session built on the introduction provided by former Chief of Cowichan Tribes Lydia Hwitsum



as part of the *Successes and Challenges: From the Front Lines of Watershed Governance* opening panel (see p. 9). As this session opened, moderator Rodger Hunter reminded the audience of some of the key elements of the Cowichan Watershed Board (CWB). All members of the CWB are elected, or have been appointed by an elected official, and are accountable to either Cowichan Tribes or the Cowichan Valley Regional District (CVRD), who co-chair the Board. The CWB does not have management or decision-making authority. It is currently strictly advisory in nature and supports and provides recommendations to individuals and organizations within the watershed that do have authority. However, new powers and authorities are being considered given recent changes to B.C.'s water laws. In 2013, in order to help harness the resources of the community, the CWB also created a complementing registered society.<sup>16</sup>

Decision-making at the board level is consensus driven, and is guided by the Cowichan Tribe chiefs and elders, who have taught many of those involved about the connection between communities and individuals and their home waters. This collaborative, consensus-driven approach is part of what brought and kept Cowichan Tribes at the table. Consensus establishes relationships and is an important first step toward true partnership and co-governance.

The Cowichan Watershed Board Advisory Council (CWBAC) was established to represent basin-wide interests, maintain ongoing dialogue among a range of stakeholders, and help guide implementation of the *Cowichan Basin Water Management Plan*. It has relationships with both the federal and provincial governments, as well as a number of special expert advisors and a strong technical advisory committee. The aim of the Council is to foster whole-watershed thinking. Through its work, CWBAC has found that water governance involves a patchwork of authorities and jurisdictions, and that the capacities of federal and provincial governments to assist with watershed-scale decision-making are lower than the CWB had originally imagined. As a result, multiple jurisdictions and actors at various levels need to work together for local solutions.

The model of governance used in the Cowichan watershed may not work for all jurisdictions. However, watershed boards can play a significant role in

the coordination of efforts and activities between local initiatives and higher levels of government. Furthermore, this approach to watershed governance emphasizes a place-based connection to decision-making, in which local people—who often know more about their watershed than more distant senior-level government—play a critical role in governance processes.

The experiences of the CWB provide insight for successful watershed management and demonstrate some opportunities that could be created if the Province decides to delegate certain responsibilities to local-level groups under B.C.'s new water legislation. Senior governments wishing to support the development of watershed boards should, for example:

- Set clear enforceable objectives and standards;
- Monitor inventory and maintain databases;
- Conduct local research and engage with research from elsewhere;
- Negotiate clear allocations of responsibility for addressing compliance and enforcement; and
- Enable effective delegation and adequate funding mechanisms.

Recognizing that the many other watersheds in the region might face the same issues as the Cowichan, the CVRD is currently looking to develop a regional watershed management strategy. It is anticipated that the lessons and experiences from the CWB will contribute to this regional district-led initiative.

#### **Key challenges:**

- Engaging with the federal and provincial governments to support local management actions;
- Finding consistent funding;
- Sustaining momentum; and
- Overcoming resistance to change in the local communities.

#### **Successes:**

- Building relationships by alternating meeting locations between local government offices and Cowichan Tribes, and using consensus-style decision-making;
- Strengthening relationships and trust amongst government, rights holders, and stakeholders; and
- Establishing a foundation of knowledge about local issues, concerns, and priorities in the watershed.

# First Nations and Water Governance

**F**irst Nations in B.C. and across Canada have a unique connection to the land and water, built over thousands of years of use and occupancy. The constitutionally enshrined rights of First Nations to be meaningfully consulted on any use of resources from non-treaty lands have not been satisfactorily upheld. In many instances, economic and private interests have taken precedent over the sustainable use of resources, further eroding First Nations' rights and title. Presenters discussed the importance of watershed governance processes based on a foundation of trust, good relationships, meaningful engagement, and proper consultation. The incorporation of spirituality into governance processes is critical to working across cultures and converging different worldviews.

---

## IN THIS SECTION:

### **First Nations and Water Governance: Understanding the Framework**

*Panel (Day Two):* Moderated by Carrie Terbasket (South Okanagan-Similkameen Syilx Environmental Committee), with presentations from Marlowe Sam (University of British Columbia Okanagan & En'owkin Centre), Deanna Machin (First Nations Fisheries Council) & Larry George (Cowichan Tribes)

### **Lunch Keynote Address (Day Two)**

By Regional Chief Jody Wilson-Raybould (British Columbia Assembly of First Nations)

### **Making it Real: Going Beyond Including Traditional Knowledge in Watershed Management, Towards Shared Leadership in Watershed Governance**

*Concurrent Workshop (Day Three):* Moderated by Kelly Bannister (POLIS Project on Ecological Governance) with presentations from Arvid Charlie *Luschiim* (Cowichan Tribes), Joan Morris (Songhees Nation), Nancy Turner (School of Environmental Studies, UVic), Carrie Terbasket (Lower Similkameen Indian Band of the Okanagan Nation), Tim Kulchyski (Cowichan Tribes), Cheri Ayers (Cowichan Tribes), Brian Huntington (Skeena Watershed Conservation Coalition) & Eli Enns (North American ICCA Consortium & POLIS Project on Ecological Governance)

---

## **First Nations and Water Governance: Understanding the Framework**

*Panel (Day Two):* Moderated by Carrie Terbasket (South Okanagan-Similkameen Syilx Environmental Committee), with presentations from Marlowe Sam (University of British Columbia Okanagan & En'owkin Centre), Deanna Machin (First Nations Fisheries Council) & Larry George (Cowichan Tribes)

### **Bringing Indigenous Thought Processes into Decision-Making**

Understanding what was traditionally done to sustain the land is important as we look toward the future. For example, for many generations enforcing the harvesting of and controlling access to various resources within First Nation communities was done by specifically identified members of the community, with the main purpose being to ensure the sustainability of the harvest. In each village along the Cowichan River, families were traditionally given responsibilities and roles, which were passed down through the generations. When issues related to harvesting arose, it was the responsibility of the elders to gather and ensure the harvest was shared amongst the community.

Today in B.C., the harvesting of various resources is focused on economics with little thought put into the sustainability of resource use. Cowichan Tribes believe that the importance of sustainability needs to be brought back, so resources can be maintained for many generations. There is a need for B.C.'s First Nations and non-

First Nations governments to work together so that the direction provided by elders can be followed and sustainable resource use achieved.

First Nations would like to bring a different ethic and thought processes into decision-making, as current governance processes do not always work to sustain watersheds. Each watershed is unique and needs specific localized policies, which need to be identified at the community level. For example, in the Cowichan watershed the Cowichan Watershed Board was created in 2010 to support collaborative local decision-making at the regional/watershed scale and guide the implementation of the *Cowichan Basin Water Management Plan*. Since that time, the Board has dealt with some major problems in the watershed, with some major achievements. Cowichan Tribes were there at the start of the process, are full partners and co-chair the Board, and will continue to be there.

The groups that comprise the Cowichan Watershed Board are all involved to sustain the environment and to deal with some of the things that were not done correctly over the years within the watershed. Cowichan Tribes looks forward to working with the other local groups in the area, and to further learning from one another. A unified message of sustainable resource use will go much further than each group sending its own separate message.

### Understanding Aboriginal Rights

Deanna Machin of the First Nations Fisheries Council (FNFC) is a member of Okanagan First Nation. She notes that in her work she is often one of the only aboriginals in the room, one of the youngest individuals, and also the only woman. This situation illuminates the current imbalance in how decisions are made around water and watersheds. Providing a map of B.C., she asked the audience to identify where many of the province's First Nation bands are located. Many people in the audience could not identify these bands – even ones within their own watersheds. Machin compared the number of municipalities in B.C. (116) to the number of distinct First Nation communities in B.C. (203) (Figure 8). She used this comparison and a map of B.C. to stress the disconnect between First Nation and non-First Nation society in the province.

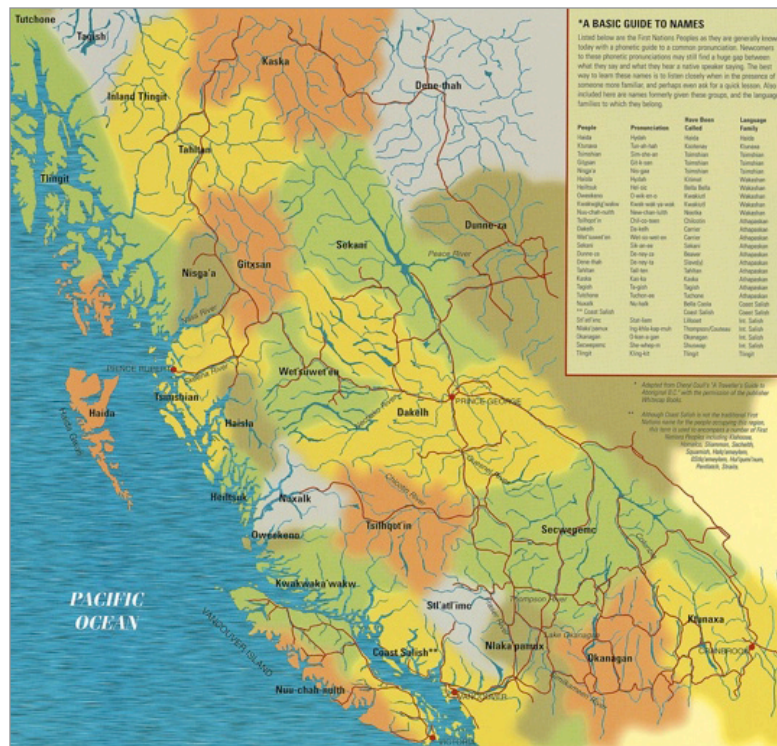




Figure 8: A map of B.C. illustrating the diversity and spatial distribution of some of B.C.'s First Nations. Source: Machin, 2014.

She argued that conversations about First Nations' rights are not easy to have, since the history and cultural differences are not very well taught in schools. An aboriginal right is a practice, custom, or tradition that is integral to the distinctive aboriginal group in question. It is important to note that these rights come from First Nation (indigenous) laws (inherent rights).

Rights and responsibilities include aboriginal rights to use land and choose how it will be used, and, critically, to be engaged in the decision-making process for resource use on their land. There is also a responsibility to other First Nations who also depend on these resources to sustain their livelihoods and cultural traditions.

Aboriginal rights are not frozen in time; they can evolve, Machin clarified. Section 35 (1) of the *Constitution Act, 1982* enshrines these rights, but does not attempt to define them, as this is often done on a case-by-case basis in the courts. The Constitution affirms these rights (including aboriginal treaty rights), which cannot be infringed upon. In this regard, provincial and federal decision-makers have to work with



First Nation Geographic Scale	Strength of Authority	Government Organizations	Strength of Authority
	<b>HIGH</b>		<b>LOW</b>
Local (Nation Level)		Field Officer	
Regional/Aggregate Level		Field Officers/Managers Area Chief/ Area Director	
B.C. Wide Level		RDG/Regional Director ADM/DM/Minister	

**Figure 9:** The scale of First Nation governing authority compared to the Department of Fisheries and Oceans Canada governing authority shows a distinct difference in where decision-making authority is vested. Source: Machin, 2014.

Aboriginal People to respect these rights. Though these rights exist, it does not mean that they are followed all the time, as evidenced in the *R. v. Van der Peet* case (1996)<sup>17</sup>. Aboriginal rights are those not extinguished by a treaty and the Crown has a legal obligation to consult and accommodate in relation to any action or decision that has the potential to infringe constitutionally protected aboriginal rights, including title and treaty rights.

The structure of First Nations' governing authorities is distinctly different than the structure of European/colonial governing authorities, such as the various ministries in provincial and federal government (Figure 9). At the local community level, First Nation authority is very strong since rights and title reside with individual nations, rather than with higher-level political leadership bodies. Moving to broader-scale jurisdiction (e.g. regional or provincial), authority decreases. The strength of governing authority in relation to scale is the opposite within the provincial government. For the Province, authority is strongest at senior executive levels or through statutory decision-makers that often operate at the province-wide scale, and weakest at local levels, where field staff often engages most directly with First Nations. Provincial authority is also much more hierarchical. For example, a Deputy Minister or Director might have significant powers while field staff might have only minimal authority and require lengthy processes to actually engage decision-making powers.

For fisheries management in B.C., the FNFC developed a collaborative management approach based on:

- aboriginal and treaty rights;
- First Nation jurisdiction and authority;
- cooperative collaboration and capacity development;
- aboriginal knowledge;
- conservation and stewardship;
- trust and relationship building;
- transparency and accountability; and
- communication.

The practice of trust and relationship building between B.C.'s First Nations and the governments in Canada has had a poor history. There has been success with First Nations and local communities working together, as they often have shared interests. However, when it comes to working with higher levels of government, the trust needs to be enduring, and relationships cannot just be a one off. First Nations and non-First Nations are not going anywhere, and the need to trust each other over the long term is critical. There is a crucial need to take the time needed to listen to each other and respect what is being said without only thinking about the end goal.

### First Nations Oral Tradition and Historical Rights

Marlow Sam, from the University of B.C.-Okanagan and En'owkin Centre and a long time indigenous rights activist, began his presentation by acknowledging his ancestors. One of Sam's areas of expertise is looking at First Nations oral tradition and understanding the indigenous laws embedded in those traditions. *Watersheds 2014* is evidence that non-First Nation people are beginning to recognize and understand First Nations' approaches to resource stewardship when talking about water management and governance. It also shows an increasing awareness about the integral connection and deep relationship that First Nations have with the land and water.

First Nation people are land speakers who speak for the land, giving voice to the plants, animals, and life forces on the land. First Nations are looking at a method of communication with non-First Nation peoples that will lead to collaboration and a deep understanding that is urgently needed to address the concerns of the land. It has been, and will be, a strug-

gle. Sam challenged the participants at the forum to know and understand their local watershed, camp on that land, and bathe themselves in that water, which will result in a better understanding and appreciation of the nature around us.

Meaningful consultation with First Nation communities is more than simply informing First Nations about what is going to happen on the land. First Nations are more than stakeholders: They are the senior rights holders to the land and water resources. Further, there is no separation between land and water rights. First Nations in the province are still waiting for the Government of B.C. to provide the evidence that gives the Province rights to these lands.

The discussion in this session brought forth a number of critical concerns, including the issue of eroding First Nations rights and private interests taking precedence over sustainable management, the importance of meaningful communication and consultation that takes into consideration First Nations as a priority and a senior resource manager, and that use and occupancy can be used as legal evidence for the right to be considered a senior resource manager.

---

## Lunch Keynote Address (Day Two)

By Regional Chief Jody Wilson-Raybould  
(British Columbia Assembly of First Nations)

What follows is a direct transcript of the lunch keynote address given by Regional Chief Jody Wilson-Raybould at *Watersheds 2014*.

*Gilakas'la. Greetings Elders, Chiefs, delegates.*

*I would like to acknowledge the territory of the Hulqiminum Peoples' and in particular the Cowichan Tribes and our host, Chief Seymour as well as the Cowichan Watershed Board and the Cowichan Valley Regional District.*

*Water is the life blood of this planet. Along with the air it is the most important resource we all share. However, from the actions of governments around the world one would be forgiven for thinking otherwise. There may be a UN Environmental Program and UN Resolutions on the human right to water and sanitation – indeed there is a UN water rights special rapporteur – but it remains a global challenge for nation states and their sub-national governments to govern in a manner*

*to ensure sustainable development and the protection of our natural resources – our inheritance.*

*We can do better. And Canada – with approximately 20 percent of the world's fresh water but where less than half is considered renewable – will have an important role to play in the international discussion around water use, governance and management – a discussion which will only become more intense as global warming continues and as we continue to deplete our existing sources of non-renewable fresh water.*

*To meaningfully participate in this conversation internationally – with both authority and influence – Canada needs a more vigorous and informed discussion domestically – to develop a national vision and water strategy, recognizing regional diversity and local water management knowledge – where our respective laws support and reflect that common vision.*

*In Canada, both the federal and provincial governments have constitutional responsibility for aspects of jurisdiction over water.*

*Into this governance mix we must now, of course, consider the place of Aboriginal governments.*

*As Aboriginal peoples we are in an exciting period of rebuilding – taking our rightful place within confederation.*

*To help understand Aboriginal issues with respect to water, conceptually, I have found it useful to make a distinction between 1) who “owns” the water and has access to it and 2) which laws govern the purveying of water from source to tap – notwithstanding who may legally own it.*

*Looking at questions of ownership first – under western legal traditions, water is typically viewed as a commodity and can be owned. At common law there are riparian rights. Indeed water rights can be included in and run with title to land.*

*In BC, this was the case up until the legislature changed the laws where water was no longer included with title and governed under separate statute. The first Water Act was enacted in 1909, a statute the province still uses today – although woefully out of date – and is only now actively looking to update with the proposed Water Sustainably Act expected to be introduced late February / early March.*

*In BC, there is, of course, still the outstanding “Indian land question” and issues of Aboriginal title – including Aboriginal title or ownership to water. Simply stated, because there were few or no treaties through*

which our ancestral lands were lawfully acquired by the Crown much of the land and resources in BC remain subject to Aboriginal title.

While the courts have said, legally, Aboriginal title exists, the question now is “where and to what extent?”

We may have an answer soon. This past November the Supreme Court of Canada heard a case concerning the Tsilhqot’in title – William. We are awaiting the decision. For those of us that were in the court room – although often unwise to predict – many believe the court will find that Aboriginal title will not be the “small spots” or “postage stamp” areas that the province or Canada argued it should be – nor will it be the entire extent of the traditional territory that the Tsilhqot’in occupied – rather it will be somewhere in between. But it will be significant and a lot larger area than the small reserves that were unilaterally set aside for them in the absence of treaty.

My hope is that William will create the impetus for true reconciliation that has been so elusive despite the modern treaty-making process. William, however, is unlikely to answer conclusively the question of Aboriginal title to water. It is, I believe, reasonable to assume that Aboriginal title includes water. This principle is already well established south of the border where through what is called the Winters’ doctrine, the US Tribes own water associated with their reservations. In the true reconciliation discussions that must inevitably ensue following the first title declaration in Canada, the question of the ownership of water will be an essential subject.

To date, in Canada, there has been no political recognition of Aboriginal title to water. First Nations have often struggled to ensure fair access to water and have influence over its use by others – although there has been some recognition of the need to consult and accommodate First Nations interests when decisions affecting water allocations are made. In the modern treaties that have been negotiated in BC, the issue of First Nations access to water is addressed by the province creating what is called a water reservation for the Nation. Governance of water in these treaties is addressed separately – both in terms of on-settlement lands and in terms of involvement in decisions off-settlement lands.

Interestingly, in 1909, when the province enacted the Water Act, federal Indian Agents sought to acquire water licenses for the reserves to be registered within the new provincial system. In this way limited access to water for domestic and agricultural purposes on-reserve were recorded.

Today, and notwithstanding Aboriginal title to water, for the most part, this is still the case and the way water rights for reserves are limited and recorded. However, some of our Nations simply exercise their Aboriginal title to water drawing from sources adjacent to or on their reserves regardless of how other governments have determined water is owned and controlled.

Before I move away from issues around water ownership, it is important to appreciate that many of our Nations – through our teachings and our cultural beliefs – do not actually see natural resources, such as water, as commodities that can be owned in the western sense. Rather we are caretakers – resources are being borrowed from future generations. In many of our cultures, we believe objects in the natural world have their own identity and spirit – including bodies of water.

Internationally, such Indigenous perspectives on the natural world are now beginning to influence environmental stewardship and even in some cases reflected in legal codes – perhaps best encapsulated in the evolving legal concept of the “Rights of Nature”.

No doubt many of you are familiar with Ecuador’s constitutional amendments in 2008 that provide rights for the natural world. Amendments brought about by their indigenous President Rafael Correa. The Indigenous concept of “Buen Vivir” or “good living” – which focuses on social, environmental and spiritual wealth as opposed to material wealth – guided the new constitutional provisions where “nature” has fundamental and inalienable rights, reflecting the Indigenous beliefs that nature is the mother and must be respected and consequently protected with legal standing.

As Indigenous Nations’ here in Canada rebuild no doubt so too will our Nations develop laws that reflect differing perspectives on ownership, the environment and the management and protection of natural resources – our Indigenous legal traditions. I would submit that these perspectives will help all of us to find the right balance between the need for exploiting natural resources to support economic growth and development with the need to ensure the preservation of the environment.

Now I want to talk briefly about water governance from the perspective of the purveying of water from source to tap – the municipal side of water management, separate from the question of ownership.

As you are all aware, in BC, the provincial government establishes and regulates which entities can own and operate local water systems and sets the rules for

how they are governed. The Province also sets water quality standards.

On reserve, it is not so clear. The designing of governance structures, systems for water management and the purveying of water is one of the many aspects of local government our peoples are grappling with. For bands that are not self-governing, the Indian Act still governs most aspects of reserve life. For water, as for most areas that need to be governed appropriately and effectively, the Indian Act provides very little guidance. While there are bylaw-making powers for Chief and Council – which some Nations have relied upon – these powers are limited, and there is nothing describing the governance structure for water. There are no legislated water quality standards.

To fill this gap, Canada recently passed Bill S-8, the Safe Drinking Water for First Nations Act. The Act is a not a recognition of self-government – there are no recognized law-making powers. The fundamental problem with this Act, like so many being developed by this government, is that the bill was for the most part developed unilaterally by federal civil servants with limited consideration of First Nation's perspectives.

The Act contemplates that federal regulations will be developed for each province. There are serious questions about First Nations' capacity, the cost of meeting the new rules and building and maintaining infrastructure.

The impetus for this federal initiative was the continuing embarrassment of unsafe drinking water on so many reserves in Canada and the media attention this garners. There is no question that developing appropriate governance structures and standards for water quality on-reserve is a shared objective of the government of Canada and First Nations, but with any reform respecting our Nations comes the need for developing systems jointly and not simply transferring responsibility from one party to another. My hope is that First Nations will be able to address their governance more comprehensively, and become self-governing and that the Act will not operate as a distraction from the larger objective – that of Nation rebuilding.

In addition to title to water and local governance, there is, of course, a whole other related conversation about industrial uses of water and water management where water is used in processes such as fracking, or where water quality is impacted by other industrial activities. With industrial water use, there are the same

questions of ownership and jurisdiction that I have already talked about but with an even greater need to address the environmental impacts and broader watershed management issues. How each of our Nations will be and are involved in governance over our title lands, including reserves, and within their broader territory, through shared decision-making or otherwise, with respect to industrial development is a live and on-going issue.

Clearly the movement to managing water based on watersheds as opposed to other geo-political boundaries is the right way to go. It becomes more of a challenge where watersheds cross boundaries – whether international, between provinces or, indeed inter-tribal. It is also complicated where multiple jurisdictions have concurrent authority regardless of boundary.

As all governments, First Nation, federal, provincial and local, are actively engaged in governance reform and updating their laws with respect to water...it is incumbent on all governments to coordinate and work together. To understand how our various governments with overlapping and concurrent jurisdiction will operate.

As we all look to develop improved systems for watershed governance, and the process of legal and administrative reform occurs, I am sure in no small way many of you will continue to be involved in the discussion – whether it be at the federal, provincial or First Nation level in determining ownership of rights and creating licenses for the use of water, or whether you are coming to the issue from the perspective of a municipality or band or local government regulating or administering the purveying of water from source to tap, or you are coming from the perspective of environmental protection and fish habitat or indeed an industrialist that needs water to extract resources.

Conferences such as this play an important role in exchanging ideas and developing and maintaining networks. I would like to thank the organizers for your insight and recognize the numerous partnerships between First Nations, local government and other bodies that are represented here today. Through our offices at the BCAFN, we are committed to sharing best practices and ideas, supporting partnerships and our Nations in their Nation rebuilding efforts. Here in BC, and indeed Canada, through our combined wisdom and efforts, we can set an example for the world when it comes to responsible and sustainable resource management.

– Gilakas'la



## Making it Real: Going Beyond Including Traditional Knowledge in Watershed Management, Towards Shared Leadership in Watershed Governance

*Concurrent Workshop (Day Three):* Moderated by Kelly Bannister (POLIS Project on Ecological Governance) with presentations from Arvid Charlie Luschiim (Cowichan Tribes), Joan Morris (Songhees Nation), Nancy Turner (School of Environmental Studies, UVic), Carrie Terbasket (Lower Similkameen Indian Band of the Okanagan Nation), Tim Kulchyski (Cowichan Tribes), Cheri Ayers (Cowichan Tribes), Brian Huntington (Skeena Watershed Conservation Coalition) & Eli Enns (North American ICCA Consortium & POLIS Project on Ecological Governance)

The workshop “Making it Real: Going Beyond Including Traditional Knowledge in Watershed Management, Towards Shared Leadership in Watershed Governance” explored the question, “*What does working together on watersheds look like based on First Nations’ cultural knowledge and values, natural law, and reciprocal rights and responsibilities?*”

This session opened with presenter Tim Kulchyski, in the local Hul’qumi’num language, welcoming and thanking everyone for coming to listen with open minds and hearts. He went on to explain how cultural knowledge and knowledge of one’s land and environment is passed down orally, though the teachings of older people for younger generations. Kulchyski told a story of his uncle *Luschiim* paddling from his village to the ocean in a wooden one-person canoe when he was young, at a time when Chinook salmon were so plentiful that they would hit the canoe because the schools were so dense. For the Cowichan People, this area was viewed as their pantry. Human impacts, such as logging in the lower end of the lake in the early 1900s led to a serious crash in the salmon population. Although this practice has recently been stopped, the impacts are still felt today, particularly through diminished fish populations and increased flooding. Seven Cowichan villages have been moved over the last 60 to 100 years, since the river has been so heavily impacted and is negatively affecting those living next to it. Kulchyski emphasized that there needs to be smarter flood planning to help find new solutions.

Elder and presenter Joan Morris offered an opening prayer to guide us in working together with open minds and hearts. Subsequently, presenter Eli Enns reflected on the cultural importance and meaning of prayer.

In the traditional teachings of Tla-o-qui-aht First Nations, gatherings begin with a prayer to gather past and future ancestors to bear witness to the work. This fosters mindfulness and provides a moral guide for making decisions, based on the idea that our great grandchildren will live with the consequences of our decisions. Presenter Eli Enns explained that these prayers help people to work together in meaningful ways and look after one another. Humans are born into this world as the most needy of species; we rely fully on other species for our survival. So, we need to humbly recognize that our resilience depends on each other and the earth, and embrace an interconnected way of thinking about ourselves in relation to the natural world.

Enns further explained that indigenous-led processes purposely make an effort to create a distinction between what is going on in the daily lives of participants and the group work. This is done by including an opportunity to get something off our hearts and minds that might skew our hearing or vision during the session. This practice helps create a space to enable the purpose of the gathering (in this case, an effective exchange about co-leadership in managing watersheds based on indigenous knowledge and western science) and a more meaningful experience. Lengthy introductions are typical and important to explain familial and wider connections and, ultimately, how we are all connected, since the purpose of gathering is not just about individual well-being, but also our collective well-being. Enns noted the ironic absence of spirituality from university and government processes, and suggested it is a vital part of finding common ground across cultures to move forward together in a spirit of convergence of worldviews. More important than traditional ecological knowledge about this planet are the values that are infused into how we come together and how move forward together. These values are the most critical contribution that indigenous traditions can bring to watershed management processes.

Due to the future needs of our grandchildren for fish and water, presenter Joan Morris explained, we



must talk to others to spread our water messages. Morris expressed how blessed we are to grow up with elders, as they teach us to listen and not speak. We must have an open mind and open ears, because when these are blocked our hearts will not open.

Presenter Carrie Terbasket spoke of her connection to her home, the Lower Similkameen, and how her river is connected to her health, life, and family, but the river is deteriorating in a frightening way. Where there used to be lots of snow and clear water, now there is sludge on rocks, less trees, a smaller snowpack, a mine, a proposed dam, and other threats. Although there is talk of a watershed plan, her First Nation community has not yet been included in the process. Watershed governance, Terbasket explained, should include co-decision-making, based on government-to-government relationships between the Province and First Nations, built on a foundation of trust, good relationships, meaningful engagement, and proper consultation. These foundational pieces need to be present, intact, and given the proper time to form and be nurtured. The acknowledgement of First Nation governments and indigenous ways of knowing and being all need to be a part of the process.

Cheri Ayers, who is non-aboriginal and working for Cowichan Tribes as a biologist to restore side channels on the river, explained how important the relationship-building process is for working with and learning from Cowichan elders and community members. She shared her sense of honour in being told by *Luschiim* that her role is to be a bridge and an “in-between person” and to learn all she can about Cowichan ways and culture so that she can communicate that out and bring back the other side of the equation to Cowichan. In terms of this process of exploring watershed co-governance, Ayers can offer what has been shared with her through spending time with Cowichan elders and knowledge keepers over the years.

Communities in the Skeena River basin in north-west B.C. have worked together to protect the health and resilience of the largely untouched watershed, successfully barring fish farms from the area ten years ago, explained presenter Brian Huntington of the Skeena Watershed Conservation Coalition. However, profound changes have taken place. The people of the Skeena have found that the victory of keeping

fish farms away is not enough, since fish from other regions, where farms are present, are migrating to the Skeena River and threatening the local salmon. Salmon stocks are now witnessing exceptionally high mortality rates, and First Nations of the Skeena River temporarily halted their sustenance fishing. Researchers are also worried about Norwegian salmon virus migrating up the coast and infecting wild salmon in the Skeena watershed.

Presenter Nancy Turner, an ethnobotanist from the University of Victoria, indicated she has had the privilege of learning from scientists and many knowledgeable elders in B.C., and expressed her understanding that First Nations’ knowledge systems are far more than a complement to western science. First Nations’ knowledge systems embrace everything from the natural and social sciences, to political science and linguistics. These knowledge systems serve as a fundamental way of organizing watershed management effectively, providing not just detailed practical knowledge but a fundamental philosophy or worldview that includes spiritual connections and ways of relating to other species. This philosophy is known as “kincentric ecology,” and recognizes that the trees, insects, and fish are our relatives and that we have a responsibility to look after them in the same way as our human relatives. This is part of the respect and responsibility of the indigenous knowledge system, which also includes the responsibility of passing on that knowledge, beginning with training small children for their future roles. This training lasts their entire life. Indigenous knowledge systems underlie indigenous institutions. This was evident on the Clayoquot Sound Scientific Panel, which used Nuu-chah-nulth protocols for making decisions and used a consensus model. Turner believes the scientific panel serves as an effective model for making decisions on watershed management and co-governance.

### Break-Out Sessions

After the opening presentations, the workshop participants and presenters divided into four concurrent breakout groups, each facilitated by two resource people. The discussions from these breakout sessions are summarized below. The groups explored three key questions:

1. What values have guided watershed management in its current form?

2. Which values need to stay/go in shared leadership and watershed co-governance?
3. What alternative or complementary values/principles from indigenous or other worldviews/traditions are needed?

Participants discussed a range of values and perspectives that currently dominate decision-making processes, and scales at which values differ. Current values and perspectives mentioned included:

- Economically driven resource extraction and capitalism (wealth seen as money);
- Overemphasis on science as truth (reductionist, linear);
- Myth of abundant water quality (lack of a scarcity value for water);
- Human-centric thinking, “command and control” mentality;
- Engineering-based and mitigation-based management (harm reduction);
- Reactive rather than proactive mindset (crises as the driver for change);
- Disrespect for the environment;
- Exclusive rather than inclusive decision-making processes; and
- Isolated (not recognizing interconnected nature of water and land, watersheds and groundwater), fragmented, siloed thinking (looking at our landscape as if we were in a lab).

While crises and current values can lead to innovations in watershed management, a change in values is seen as critical for real change to occur. Most of the current values discussed in response to the first question were seen as negative, and values seen as particular impediments included the commoditization of nature and uncooperative/disinterested senior governments where decision-making is counter to local knowledge and needs.

Values seen as necessary in shared leadership and watershed co-governance include:

- Greater understanding;
- Local knowledge and local control;
- Multigenerational thinking (protection of nature for the benefit of future generations and common good);
- Multigenerational learning (particularly the perspectives of youth and elders);

- Mutual respect for humans and nature (stewardship), continuous learning, whole-of-watershed thinking (respect and honour of water, respect for each other), holistic management;
- Eco-centric or kincentric thinking (recognition that the watershed sustains all life, every creature reliant on the watershed is considered in decision-making processes), not including past grievances in decision-making, inclusion of spirituality and ritual (often missing in western conceptions of management, can be awkward but is essential); and
- Balance among economic, spiritual, environmental, social, and cultural values (requires rethinking what it means to be a human rather than just a consumer, that we are all in this together, and that everything about us is connected to water).

To support these values, a change in our approach to management is required. Management needs to be inclusive, open, embrace connectivity, and be committed to including other peoples’ points of view. Society needs to revisit our meaning of protocol and work on creating spaces for relationship building—not through integration but through shared spaces to listen and learn (ethical spaces, which have a spiritual base and embody consensus). The opportunity to learn globally from different cultures (particularly from First Nations) and generations (youth and elders) is vital to this space, not only to further our understanding as a collective, but also to work on converging values.

Practically, this involves recognizing the legitimacy of civil society, learning from past lessons, enabling knowledge transfer, and recognizing that this management shift will be slow and require hard work. Also important are: getting to know one another individually, rather than following a processes from a manual or making assumptions; an emphasis on collaboration and sharing, which is already a fundamental part of First Nations governance; not trying to fit one governance model into the other, but recognizing and respecting both ways separately and cooperatively; understand the priorities of each government; understanding where a community is coming from, such as the history of the land; recognizing colonization and its effects (e.g. poverty, economic choices);

understanding that considerations are not “black and white.”

It was acknowledged by participants that a slow shift to incorporate longer-term views is happening. However, what is still needed is an understanding of how we deal with conflict as it relates to watershed governance at multiple scales. There is a need to build trust and recognize that a common vision can help align groups, but time is needed to build that strong level of trust and understanding.

Arvid Charlie (*Luschiim*) closed the session by speaking about the Cowichan experience and problems in the watershed that need to be addressed. He explained that while some parts of aboriginal history are negative, we must find ways to get along and work together. He spoke about the problems that Cowichan Tribes has experienced over the years with the river flooding—exacerbated by development that has increased erosion of the riverbank—and the problem of having to now control the river rather than let it wander. His final message was both a word of caution to the audience to know what is happening to your neighbours on reserves, and a thanks for taking interest in water and for continuing to work together for the benefit of all. *Luschiim* closed the session with a prayer.

# Water Law and B.C.'S Water Act

**L**aw, like many aspects of society, is always in flux. And water law is just emerging as an important field – a result of our legal, regulatory, and governance systems beginning to recognize the importance of protecting freshwater resources as an important foundation of a robust economy, healthy communities, and resilient ecosystems. Recent federal legal changes, such as the passing of Bill C-3 (the *Jobs, Growth, and Long-Term Prosperity Act*), reveal critical risks to the protection of our lakes and rivers. These changes have been met by concern; society is increasingly aware of the urgent need to ensure the health and function of our freshwater systems. Provincially, numerous jurisdictions have established new laws that are beginning to fill this void by recognizing the fundamental role that water plays in our ecosystems, ensuring attention to environmental flows when mandating priority use, and providing a greater degree of delegated power to regional watershed authorities to better govern and manage water as a local priority. This section introduces some aspects of this emerging water law regime and explores B.C.'s evolving water regulation system, which is currently undergoing a major transformation with the passing of the new B.C. *Water Sustainability Act* and the development of its numerous regulations. (At the time of the *Watersheds 2014* forum, this new act had not yet been passed; the *Water Sustainability Act* was passed in March 2014 and implementation is expected by April 2015.)

---

## IN THIS SECTION:

### What's Law Got to Do With It? Recent Legal Changes Affecting Watersheds

*Concurrent Panel (Day Two):* With Deborah Curran (Environmental Law Centre, University of Victoria) & Linda Nowlan (WWF-Canada)

### Legal Tools for Watershed Protection

*Concurrent Workshop (Day Three):* With Deborah Curran (Environmental Law Centre, University of Victoria), Calvin Sandborn (Environmental Law Centre, University of Victoria) & Martin Hoffman (University of Victoria)

### A New *Water Sustainability Act* and the Future of Watershed Governance in B.C.

*Concurrent Workshop (Day Three):* With Jennifer Vigano (B.C. Ministry of Environment) & Ted White (B.C. Ministry of Environment)

---

## What's Law Got to Do With It? Recent Legal Changes Affecting Watersheds

*Concurrent Panel (Day Two):* With Deborah Curran (Environmental Law Centre, University of Victoria) & Linda Nowlan (WWF-Canada)

### Ecosystems at Risk: Changes in Federal Law

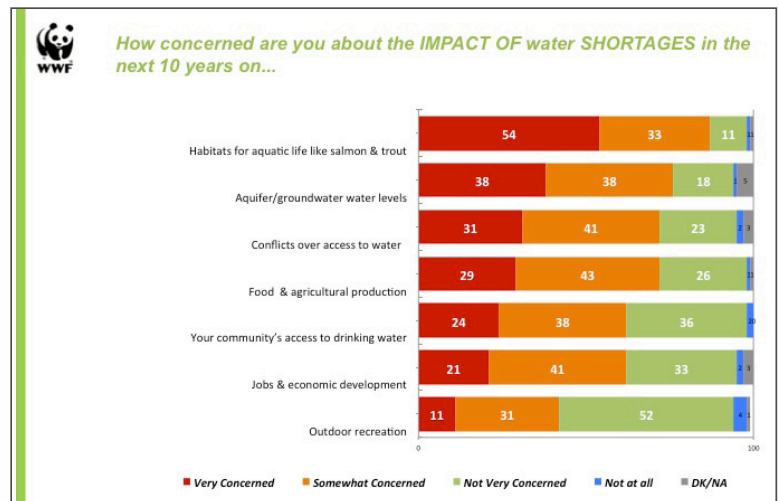
The presenters opened the session by providing the context that, in 2012, the Canadian federal government passed Bill C-38 (the *Jobs, Growth, and Long-term Prosperity Act*). This had a severe negative impact on legal protections for ecosystems across Canada. In particular, said presenter Linda Nowlan, the act has served to “gut” the federal *Fisheries Act*, which was one of Canada's most ecologically robust pieces of legislation. Bill C-38 also changed governance structures related to transparency and decision-making by changing who can participate in National Energy Board hearings.

## Changes to the Fisheries Act

The federal *Fisheries Act* was enacted in 1868 and was strengthened over the next century to protect fisheries and fish habitat (protection of fish habitat was incorporated in 1977). Section 35(2) originally prohibited the “harmful alteration, disruption, or destruction” (HADD) of fish habitat, but Section 35 has been significantly weakened by recent legislation, Nowlan explained. New decision-making or triggering criteria are predicated on the contribution of fish to economic productivity and management objectives. No longer are all fish habitat protected. Instead, protected habitats are only those that can be directly connected to preventing serious harm to fish in commercial, recreational, or aboriginal fisheries. The federal Department of Fisheries and Oceans (DFO) interprets “serious harm to fish” as death or *permanent* alteration of fish habitat. Furthermore, changes to the *Fisheries Act* now give the federal government the power to exempt some bodies of water from the law. These changes will have serious environmental repercussions. According to *Nature* magazine, 80 per cent of the endangered fish in Canada are no longer protected by the *Fisheries Act*.<sup>18</sup> Research from WWF-Canada found that Canadians are deeply concerned about impacts to aquatic ecosystems from changes in the federal Fisheries Act (Figure 10).

## Decision-Making and Transparency

The National Energy Board (NEB) has significant power over resource-related decision-making. Bill C-38 changes who can participate in NEB hearings that are critical to the decision-making process of the Board. The NEB is now charged with deciding who is affected, and who, therefore, can participate in the hearings. Forest Ethics has made a legal challenge on the grounds that such a restrictive notion of participation is contrary to freedom of expression. A further example of the fundamental changes that are occurring is the Memorandum of Understanding between the NEB and DFO regarding cooperation in the administration of the *Fisheries Act*; some critics are concerned that the NEB has no experience in making fisheries decisions and is more focused on developing energy reserves for commercial gain.



**Figure 10:** This graph illustrates the extent to which Canadians are deeply concerned about changes to the federal Fisheries Act and the impacts these will have on ecological and social services during times of water shortages. Source: Nowlan, 2014.

## Colonial Law and Indigenous Law

British Columbia is a multi-juridical system consisting of two types of law, explained presenter Deborah Curran. Colonial law consists of three components: common law (in the British tradition), civil law (as in Quebec), and indigenous rights and title. The second type of law is indigenous law, which was developed by Aboriginal People. In contrast, the colonial laws of

### Water Tensions: Halalt First Nation v. British Columbia

In the case *Halalt First Nation v. British Columbia*, 2012 BCCA 472, the B.C. Supreme Court ruled that Halalt had prima facie title to the land and the groundwater associated with it, and that the B.C. Environmental Assessment Office had not fulfilled its duty to consult and accommodate Halalt regarding the effects of year-round pumping to be undertaken by the District of North Cowichan.

The ruling by the B.C. Supreme Court reflected a well established legal doctrine within the United States known as the “Winters Doctrine” (see *Winters v. United States*, 207 U.S. 564 [1908]), which states that American Indians have senior water rights within their reservations by virtue of promoting self-sufficiency, of which the reservation system was intended to promote.

The Halalt decision was later overturned on technical grounds by the B.C. Court of Appeal, when the Court stated that the Environmental Assessment Certificate only applied to winter pumping and, hence, consultation regarding the effects of year-round pumping was not required.



“indigenous rights and title” are a western construct that is applied to Aboriginal Peoples. Colonial and indigenous legal systems are in ongoing tension with many Aboriginal People contesting the application of colonial law and the inherent assumption of Crown “ownership” of the lands and waters of Canada (see *Water Tensions: Halalt First Nation v. British Columbia*, p. 27).

Today, many First Nations in B.C. operate within a colonial legal context, said Curran. However, traditional indigenous forms of law are still practiced in many First Nation communities in B.C. and act as an ongoing way of regulating social, economic, and environmental activities. Indigenous law is legitimate in its own right, and B.C. is very unique in this regard in Canada. In B.C., there are only two historic treaties and a few modern ones (e.g. the Nisga’a Treaty). However, aboriginal rights and title are contested and unresolved in most cases, although the Crown retains control of approximately 95 per cent of B.C.’s landmass—a fact contested by First Nations’ claims. This tension has been very apparent as the provincial government has sought to bring in the new *Water Sustainability Act*, which reinforces the notion of Crown ownership of B.C.’s water.<sup>19</sup>

## Legal Tools for Watershed Protection

*Concurrent Workshop (Day Three):* With Deborah Curran (Environmental Law Centre, University of Victoria), Calvin Sandborn (Environmental Law Centre, University of Victoria) & Martin Hoffman (University of Victoria)

Several legal tools exist for watershed protection within local (municipal) and senior government legislative systems, and fourteen such tools are introduced in this section. For more information, or to access the forthcoming primer for tools for local governments, please visit the website for the University of Victoria’s Environmental Law Centre: [www.elc.uvic.ca](http://www.elc.uvic.ca).

### Tools For Municipalities

#### *Regional Growth Strategies (RGSs)*

These land-use strategies attempt to provide a unified vision for all municipalities within a Regional District. RGSs apply mostly to private land and are generally associated with the more populated regions of the province. They tend to be one of the most effective ways to protect watersheds from certain developments. For example, they can limit the extension of services (such as water or urban development) beyond a pre-established growth boundary. Metro Vancouver, the Capital Regional District, and the Regional District of Nanaimo are a few examples of places where RGSs are working to limit impacts on local watersheds and water bodies. The enforcement of provisions, however, remains a key challenge. For example, when collaboration and consensus among municipalities within a Regional District fails, often the only recourse is to bring the issue to the courts, as Metro Vancouver has done with the Township of Langley.

#### *Official Community Plans (OCPs)*

An OCP applies to an individual municipality and demarcates the kind of development that can and

## CONTENTS FOR “LEGAL TOOLS FOR WATERSHED PROTECTION” SECTION

### TOOLS FOR MUNICIPALITIES

Regional Growth Strategies (RGSs)	page 28
Official Community Plans (OCPs)	28
Bylaws	29
Zoning	29
Environmental Development	
Permit Areas (EDPAs)	30
Riparian Areas Regulation (RAR)	30
Rainwater Management Plans and Bylaws	30
Management of Services and Utilities	30
Conservation Covenants	30

### TOOLS FOR SENIOR GOVERNMENT

Community Watershed Designation	30
Water Management Plans (WMPs)	31
Drinking Water Protection Plans (DWPPs)	31
Section 9 of the <i>Water Act</i> (Section 12 of <i>Water Sustainability Act</i> )	31
Federal Fisheries Act	31



cannot happen. It addresses land-use issues by establishing zoning requirements, designating Urban Containment Boundaries (UCBs), and creating Environmental Development Permit Areas (see below). As with RGSs, the politically sensitive nature of drafting OCPs can result in the use of very generic language, which makes them difficult to enforce. The B.C. courts have essentially ruled that it is the prerogative of a municipal council to determine whether or not an action is consistent with its OCP. This is a potentially problematic situation given that few elected councilors have any special expertise in urban planning or sustainability issues. By making the implementation of an OCP a political process, the courts have essentially limited the ability to enforce these provisions.

### **Bylaws**

Regulation in the form of bylaws is another tool that local governments can use. For example, the City of Kelowna has a bylaw mandating setbacks of a prescribed distance from specified bodies of water. Kelowna has also implemented a habitat-banking program, which seeks to offset the negative impacts of development on ecosystem services by requiring developers to create, restore, or enhance these services in another location within a specified geographic area. The City has a “no-net-loss-of-habitat” policy embedded within its OCP, which outlines the conditions under which habitat banking is to be used. The flooding in Kelowna that occurred in June 2012 made the importance of such a policy clear, as wetland areas serve to mediate the rate at which water is released into a river.

### **Zoning**

Zoning is one of the simplest tools for protecting watersheds, water quality, and ecosystem values, and it can be implemented with very little cost by ensuring that certain types of development do not happen in environmentally sensitive places. Municipalities decide where development should happen and what type of development is appropriate for a specific site. Zoning is a foundational tool in realizing one of the fundamental principles of environmental development—namely, location is a pass-fail criterion. Section 9(14) of the *Local Government Act* stipulates that if the value of a parcel of land changes as a result

### **The Babine Watershed Monitoring Trust**

Non-governmental entities can play an important role in an era of declining government capacity. This idea broadens the concept of local control from simply one of local *government* to one of local *governance*. An example is the Babine Watershed Monitoring Trust (BWMT). The Trust emerged from the convergence of different interests, including fisheries, landowners, and logging. The Gitksan First Nation was also initially involved in its creation, and was supportive of the effort, but ultimately decided not to participate due to its potential implications for larger land-use issues.

The BWMT is a registered charitable organization that funds and coordinates monitoring efforts surrounding the use of natural resources and land use within the watershed. It has no formal decision-making authority; its focus is on defining priorities for monitoring.

Its members assume the role of “trustee” and seek to manage the Trust on behalf of its beneficiaries, and, thus, do not represent any particular interest. The BWMT serves to generate knowledge, which is then fed into regulation, planning processes, and other decisions by the various government agencies and resource companies. In one monitoring effort, for example, the Trust found 15 per cent of culverts within the watershed to be deficient. Within the year, the B.C. Ministry of Forests, Lands and Natural Resource Operations had repaired them. Through its monitoring efforts, the Trust also found a direct correlation between the density of roads and grizzly bear survival rates.

of zoning, local government does not have to provide compensation. This is a fundamentally different legal context than in the United States, and ensures zoning remains an effective tool for Canadian municipalities.

Down-zoning is one type of zoning that seeks to reduce the density of development on a parcel of land and can be used to protect vulnerable ecosystems (though its effectiveness is highly dependent on the context and the manner in which it is implemented). The opposite approach of increasing the permitted zoning density on a site—referred to as amenity bonusing—can also be a powerful incentive to provide effective protection to vulnerable or important ecosystem or watershed features. For example, one developer on British Columbia’s Gulf Islands donated 500 hectares of land to the Islands Trust to be used for conservation purposes in exchange for density bonusing on another parcel of land.

**Environmental Development Permit Areas (EDPAs)**

Whereas zoning deals with the *location* of development, EDPAs deal with *site-specific restrictions* on development. In practice, they provide a series of overlays of specific environmental restrictions on the established zoning of a site. They prohibit any land alterations without first acquiring a permit. Whistler is a good example of a municipality that has made extensive use of EDPAs. (Its entire rural area is subject to them.)

**Riparian Areas Regulation (RAR)**

The RAR's purpose is to prevent development on a site from jeopardizing the ecosystem services provided by a body of water. It is applicable only in the southern third and western portion of B.C. Local governments can exceed RAR requirements (the District of Saanich has done so in a few areas), but very few do. If a body of water is present on a specified parcel of land and construction is to occur, the RAR is automatically triggered. It requires an assessment process by a registered professional (a.k.a. "professional reliance") who will assess the land and make a determination regarding the appropriateness of setbacks and impose any additional conditions they deem necessary. A common critique of professional reliance revolves around the inconsistency of professional judgments. The District of Saanich has attempted to address this issue by providing residents with two options: hire registered professionals or ask District staff to conduct the assessment. An interesting note is that the result, thus far, has been that the registered professionals have generally produced more stringent assessments.<sup>20</sup>

**Rainwater Management Plans and Bylaws**

Rainwater management plans and bylaws apply to private land and attempt to increase the amount of water that infiltrates into the soil, thus providing sufficient water recharge of aquifers, ensuring baseflow, and helping to filter harmful contaminants. As a province, B.C. has taken an infiltration-based approach, which seeks to minimize the coverage of impervious surfaces. This approach demonstrates the importance of not separating rainwater management efforts from land use. Fisherman's Wharf Park in Victoria is an example of a rain garden that serves an ecological function, while also being a valuable community amenity.

**Management of Services and Utilities**

Local governments can shape utilities in a multitude of ways. One example is the Capital Regional District's Regional Parks Land Acquisition Fund, which, as the name implies, seeks to purchase parcels of land within the region for the purpose of converting them into parks for recreational use and environmental preservation.<sup>21</sup> Another example involves decoupling a stormwater tax from a lump-sum property tax and placing it into residents' utility bill. The criterion used to determine the amount of the tax is the percentage of impervious surface coverage on a property owner's land. Since impervious surfaces are widely known to contribute to stormwater run-off, implementing a separate stormwater tax, without increasing overall taxes, serves to create a useful financial incentive for people to limit their impervious surface coverage.

**Conservation Covenants**

Conservation covenants are restrictions or obligations regarding land management or use that are imposed upon landowners in exchange for monetary compensation or different tax incentives. These covenants can be controlled by either local governments or non-governmental organizations (NGOs) and remain with the land. In other words, private ownership of the land may change hands, but the covenant is a legal obligation that must be honored by the new owner.

**Tools For Senior Government****Community Watershed Designation**

This tool primarily applies to drinking water and is designated by the B.C. Ministry of Forests, Lands and Natural Resource Operations. It has the potential for strong protection, but remains largely untapped, and it has not been implemented very frequently; ten per cent of watersheds throughout the province currently have such a designation. Community watershed designation primarily applies to forestry practices and does not apply to, for example, off-road vehicle use. Any action that might materially adversely affect the community watershed is prohibited, as long as the prohibition of these activities does not impact timber supply.

**Water Management Plans (WMPs)**

WMPs are implemented by the B.C. Ministry of Environment as part of the old *Water Act* and deal with conflicts between users. One major limitation is the inability of WMPs to regulate activities under the *Forest and Range Practices Act*. One of its major benefits, however, is that it does apply to private land. The new *Water Sustainability Act* also has provisions for similar plans (Water Sustainability Plans), which do provide the potential for more rigorous protection but have yet to be implemented.

**Drinking Water Protection Plans (DWPPs)**

DWPPs, part of the *Drinking Water Protection Act*, are in theory the strongest level of water protection, but a plan has yet to be implemented in the province. If implemented, a DWPP would override all other legislation. However, some of the use criteria in developing a DWPP include that a municipality must first exhaust all other options available, and there must be a threat to public health (Sections 35 to 38 of the B.C. *Drinking Water Protection Act* deal with implementation). The City of Courtenay and the Town of Comox attempted to implement a DWPP, but failed to meet the “imminent threat” requirement; it was determined that the municipalities did face a threat, but not an imminent threat. The notion of imminent threat does not appear to mesh with the idea of proactive protection. An additional challenge in creating and implementing these plans is the lack of ministerial capacity due to budget cuts.

**Section 9 of the Water Act (Section 12 of Water Sustainability Act)**

Section 9 of the *Water Act* (now section 12 of B.C.'s new *Water Sustainability Act*) requires permits for changes to be made in and about streams. It applies on both Crown and private land, and is particularly applicable to the installation and maintenance of culverts. One of its limitations is that its effectiveness is directly tied to the degree of collaboration between different levels of government. Additionally, there often tends to be little follow-up, monitoring, and enforcement. Section 9 of the *Water Act* will typically be used in conjunction with the Riparian Areas Regulation (RAR), which requires minimum setbacks for construction along a water body. The RAR differs from Section 9 because it only applies to private lands.

The City of Kelowna has done considerable work in restoring riparian areas by using habitat banking to enhance and restore wetland habitat to serve a flood-mitigation function.

**Federal Fisheries Act**

The federal *Fisheries Act* applies on both Crown and private land. Section 35 previously defined “serious harm” to fish as the harmful alteration, disruption, or destruction (HADD) of fish habitat. With the passage of Bill C-38, “serious harm”—defined as the death of fish or the *permanent* destruction or alteration of fish habitat—is now prohibited. Furthermore, the definition now only applies to fish within commercial, recreational, or aboriginal fisheries. The act was previously one of Canada’s most powerful pieces of environmental legislation, but the latest revisions have made it very difficult to prosecute violators.

**A New Water Act and the Future of Watershed Governance in B.C.**

*Concurrent Workshop (Day Three):* With Jennifer Viganò (B.C. Ministry of Environment) & Ted White (B.C. Ministry of Environment)

Significant water policy changes are underway at the provincial level in B.C. The B.C. Ministry of Environment recently released Bill 18—*Water Sustainability Act* (WSA), which has now passed the third and final reading in legislature and replaced the previous *Water Act*. While source water protection is covered under the *Drinking Water Protection Act*, the WSA covers the vast majority of other water-related issues, including the allocation of water. It also pertains to the Oil and Gas Commission, who will allocate water for oil and gas operations under the auspices of the WSA. The other government agency that is responsible for water allocation is the Ministry of Forests, Lands and Natural Resource Operations. The WSA and its related regulations connect to many other governmental and non-governmental water initiatives within the province, which are also important pieces of the overall governance framework in B.C. (Figure 11).

Extensive public engagement in October 2013 produced over 3,000 pages of comments, thoughts,

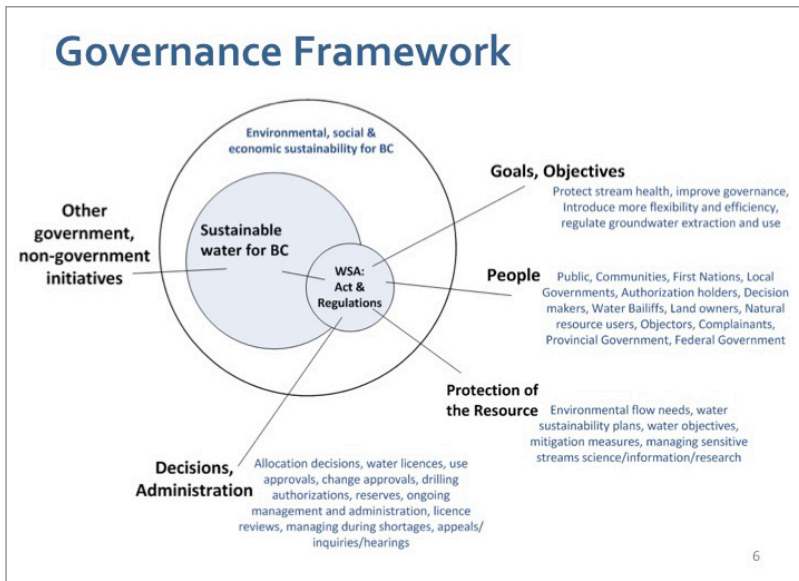


Figure 11: The four major areas of B.C.'s Water Sustainability Act, situated within the broader context of environmental, social, and economic sustainability for the province. Source: Ministry of Environment, 2014.

and suggestions to help inform this new legislation. A number of key issues related to water management and new legislation in B.C. were also identified during discussions at the *Watersheds 2014* forum. Delegates identified the following key issues as critical for effective and sustainable water management in B.C.:

- **Environmental flows:** Decision-makers should be required to consider adequate environmental flows that include allocations for fish and the whole aquatic system. Public consultation suggests a widespread desire to make environmental flow requirements part of a formal process.
- **Provincial water objectives:** There is a need to develop water objectives that apply provincially and then can be used on a regional basis for certain indicators and standards. The goal would be to create a level of consistency and a better framework to enforce that consistency.
- **Flexible water management plans:** The *Water Sustainability Act* has plans to build a more scalable and flexible approach to water management plans, including opportunities for community groups to lead some of these planning processes.
- **Regulating groundwater:** Another consideration is regulating groundwater through integrating

with surface water regulation to achieve a more holistic approach. Regulating groundwater is important, but regulating during scarcity and having a greater range of tools to manage low flows is also critical.

- **Dedicated agricultural water:** A planning process that dedicates certain water allocations for agricultural purposes would increase overall water protection for the agricultural sector.
- **Measurement and reporting:** A key priority for water measurement and reporting is the volumes used by large water users (i.e. those that use more than 250 cubic metres per day) in the context of a commitment to conserve critical environmental flows during times of scarcity.
- **User Obligation:** In terms of user obligations, there needs to be beneficial and efficient water use that is open and transparent to the terms and conditions set by licences. There is a proposal for this to be expanded to all users, not just large ones. Moreover, water use needs to be reduced to conserve critical environmental flows during times of scarcity. This requires information on water demands on the stream, and those minimum required flows under which low water levels start to inflict serious damage. Another user obligation is licences and fees for large groundwater use, where water users would pay fees and rentals just like surface water users.
- **Engagement:** Engagement is another very important aspect that requires well-informed decision-making. The ability to influence decisions is achieved through the information that is available. Advisory groups are important and can be used for topics such as groundwater and surface water planning. Lastly, proper planning needs to be initiated for engagement.

### Discussion: Shared Responsibility and Accountability

Participants' questions and contributions reflected a shared set of concerns regarding the current role of government in water governance processes. An overview of this discussion provides key insight into the perspectives of water advocates on the provincial policy environment. The discussion focused on two main issues: needed reforms in provincial water



arrangements and the role and capacity of local groups.

#### **A. Provincial Water Governance Arrangements**

**Management vacuum:** There is a widening gap between government capacity and the need for water protection. For example, the B.C. Ministry of Environment requires water users to submit specific information as part of their “beneficial use declarations.” The Ministry checks these declarations, but doesn’t have enough staff to collect or follow up on them.

**First Nations’ ties to water resources:** Discussion participants agreed that it is up to everyone involved in water governance to maintain connections, ask questions, and build dialogue with First Nations. First Nations are not just another stakeholder. Rather, they are a key decision-maker. Participants expressed concern about whether actual co-management and co-governance arrangements lived up to their expressed aims. There is a need for greater transparency in order to see exactly how decisions are made.

#### **B. The Roles and Capacities of Local Groups**

**Delegation to local groups:** Overall, participants agreed that there was a need to delegate responsibility and authority to groups on the ground, which depends on a clear division of responsibilities. The Province is statutorily required to retain ultimate responsibility and accountability, and so it faces two challenges when seeking to delegate: the limited capacity of some local governments and NGOs, and the need to develop accountability structures so that these groups pursue the common good, rather than their own self interest. The *Forest and Range Practices Act* manages this balance between delegating authority while retaining overarching accountability by providing a detailed list of requirements or principles for resource users. Overall, participants agreed, devolution needs to be done on a case-by-case basis through an incremental approach.

**Types of local groups:** One specific concern amongst participants involved the capacity and type of local groups that would be effective. Roundtables and water boards are useful, but often lack authority. The importance of a broker acting in a coordinating role

and bringing stakeholders together was discussed. Other ideas included the potential of improvement districts and a “water parliament.” A key question was, *how do watershed groups get a “stamp of approval” from the Province?* If the Province has to legally grant groups authority, on what basis would they make these decisions? Participants suggested that a “principle-based approach” would help generate a common framework; others suggested pilot projects. Overall, more work is needed on this topic. A working group within the Ministry of Environment has been proposed to examine some of these issues in more detail.

**Scale of local groups’ jurisdictions:** Because there are many different scales of ecological units, any devolution strategy must allow for regional specificity. But, a question was raised about how to coordinate between scales and levels? For example, some watersheds transcend provincial boundaries. One member mentioned there are 30 watersheds in the region where he is from, illustrating the point that each watershed will not have its own group. Size is an important determining factor. Entire coastal watersheds tend to be smaller than sub-watersheds in the north of the province, which are often the size of small countries. Population matters too. It is highly improbable that a watershed entity would be established for a watershed with ten residents, for instance.

**Building local capacity:** The Fraser Basin Council has conducted a number of case studies on a variety of on-the-ground groups within different contexts, and found that seed money plays an important role in speeding up a group’s evolutionary process from a “fledgling” organization to a more institutionalized one. “Umbrella” concepts (i.e. highly theoretical or abstract ideas) need translation to be made meaningful on the ground. If there isn’t the necessary capacity within a local group, other organizations might be willing to help (e.g. universities with graduate students).

**Jurisdictional fragmentation:** In B.C., participants suggested, there is a need to develop a common framework but also allow for diversity and difference amongst a of watershed groups with varying capacities. There is a difference, participants discussed,



between undesirable fragmentation and “sensible differentiation.” Another discussion regarding jurisdictional fragmentation focused on the need for coordination among departments in provincial government, as well as between the Province and community groups. The Ministry of Environment has made significant efforts to connect with community groups.

#### **Administrative versus ecological boundaries:**

The matching of administrative boundaries to ecological boundaries risks potentially disrupting other functions of administrative units. For example, one pilot project in northeast B.C. covered eighteen hectares and four jurisdictions. This dilemma of increasing complexity, participants suggested, is one that needs to be made explicit. One example of an attempt to address this kind of complexity is the *Resource Management Act* of New Zealand,<sup>22</sup> which attempted to integrate 165 separate pieces of legislation. Overall, participants discussed, things are not as clear as one might first assume when using the watershed as an organizing boundary. Watersheds are relevant boundaries, but they are not the only boundaries. Thus, it is important to differentiate between using the watershed as a *management* unit and using the watershed as a *governance* unit. Watershed boundaries are not going to trump other boundaries. Thus, water advocates need to find a way to align watershed boundaries with politico-administrative jurisdictions.

#### **Further Points of Discussion**

A number of participant questions during the breakout session focused on the regulation development phase of the *Water Sustainability Act*. With regards to timeframes, the first round of regulations will be drafted and implemented roughly within a year of the WSA becoming law. Additional rounds of drafting and implementation will occur over the next several years.

Another participant inquired about the use of input from public engagement during the *Water Act* modernization process. The Ministry of Environment received approximately 3,000 pages of submissions during the most recent round of public engagement

(held from October to November 2013) on the Province’s *Legislative Proposal for B.C.’s Water Sustainability Act*, and key messages from the submissions helped inform further development of the WSA, and will help inform regulation development.

Participants suggested that the WSA should not be seen as a new regime but as an evolutionary process. The question should be, *what can groups implement now, and how can we plan to implement in the future?* Watershed management is currently not as advanced as forestry practices, so the shift toward local groups taking more responsibility for governance needs to be gradual, to allow for capacity development.

# Resilience and Climate Change Adaptation

**T**he impacts of climate change are escalating, and often manifest as water-related crises. Watersheds are complex, dynamic systems with the potential to undergo rapid transformations, and climate change is only accelerating these changes. Often, the extent and rate of these changes are entirely unpredictable. As a result, watershed planning needs to shift away from a “projecting the past into the future” approach and instead focus on dealing with uncertainty, scenario modelling, building resilience, and, critically, engaging diverse actors at multiple scales to develop flexible arrangements that are responsive to local changes and needs. Resilience planning can assist watershed governance entities and motivate them to continue in the face of these kinds of unpredictable changes within our complex social-ecological systems. Social Network Analysis is one emerging approach that organizations can take to build resilience in their watersheds; this approach was applied, tested, and refined in the St. John River basin in New Brunswick, as discussed in this section.

---

## IN THIS SECTION:

### Planning for Resilient Watersheds in a Climate-Changed World

*Concurrent Workshop (Day One):* With Deborah Harford (Adaptation to Climate Change Team), Jon O’Riordan (Adaptation to Climate Change Team & POLIS Project on Ecological Governance) & Stephen Tyler (Adaptive Resource Management Ltd.)

### Navigating Governance in a Changing World: Resilience Thinking and the Future of Watersheds

*Big Ideas Keynote (Day Two):* Moderated by Michele-Lee Moore (University of Victoria) with keynote presentations from Ryan Plummer (Environmental Sustainability Research Centre, Brock University) and discussion lead by Simon Mitchell (WWF-Canada) & Tim Kulchyski (Cowichan Tribes)

---

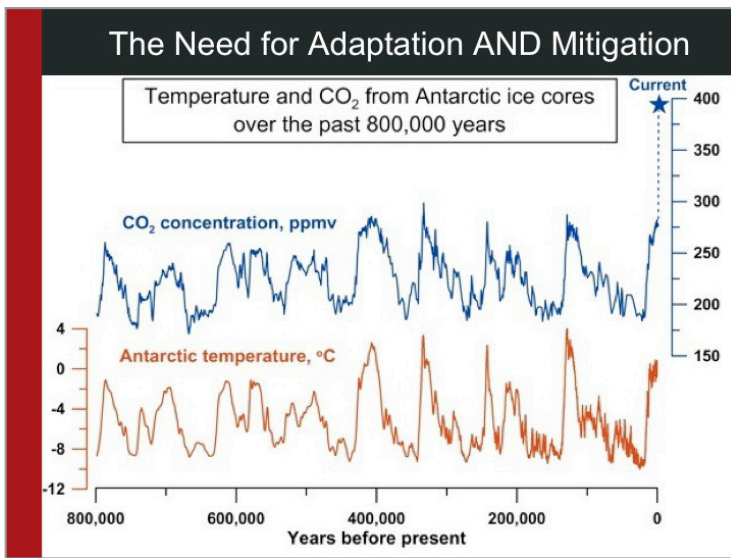
## Planning for Resilient Watersheds in a Climate-Changed World

*Concurrent Workshop (Day One):* With Deborah Harford (Adaptation to Climate Change Team), Jon O’Riordan (Adaptation to Climate Change Team & POLIS Project on Ecological Governance) & Stephen Tyler (Adaptive Resource Management Ltd.)

## Global Climate Impacts and the Need for Adaptation

Global temperatures, carbon dioxide levels, and methane emissions are rising, global moisture circulation patterns are changing, extreme weather events (e.g. floods, droughts, hurricanes, water shortages) are increasing, and global sea ice is diminishing. Observed impacts from these changes include increased wildfires, infrastructure damage (as seen with the major flooding in Calgary and Toronto in 2013), changing water levels, and more invasive species or changes in species (e.g. altered spawning and blooming patterns). Yet, climate science is far from exact in its predictions of future weather patterns.

Because of these rapid climate-related changes and the associated uncertainty of future weather patterns, the notion of stationarity – the idea that seasonal weather and long-term hydro-climatic conditions fluctuate predictably within an established range<sup>23</sup> – no longer applies. This concept is illustrated in Figure 12, which depicts the difficulty of relying on past conditions to predict future climate patterns. Presenters noted that our frame of



**Figure 12:** Historical and current CO<sub>2</sub> and temperature values, illustrating the difficulty of relying on past climatic conditions to predict future climate patterns. Source: ACT, 2014.

reference for how we plan, design, and build our water and water-related infrastructure can no longer be relied upon, thus leading to the notion that “stationarity is dead.” Extreme weather and storm events cannot be predicted and the damage they can cause is beyond our experience to date. Furthermore, human populations are increasingly centralized in urban areas and more centrally dependent on infrastructure services and, thus, increasingly more vulnerable to climate change impacts.

Even if emissions were miraculously reduced to zero overnight, global temperatures would still

#### **Plan2Adapt: A Tool for Communities**

The Plan2Adapt tool, developed by the Pacific Climate Impacts Consortium (PCIC) and available online, pulls together in visual form information from different climate models. It allows users to select a time period (e.g. 2080, when many of the users’ grandchildren are likely to be in the primes of their lives) and display likely or possible climate changes and impacts that may be present in that period. The tool is designed to start a conversation about what climate change impacts mean for a given watershed.

Source: PCIC (2013). Plan2Adapt. Available online: <http://www.pacificclimate.org/analysis-tools/plan2adapt>

likely increase for years to come since carbon dioxide would remain in the atmosphere for a long time. The certainty of further warming provides ample justification for a need to adapt to our changing climate. The global aim should be to reduce emissions, while simultaneously figuring out how to adapt to the impacts and changing conditions we’re facing.

#### **Resilience Thinking**

The presenters emphasized that watersheds are complex, uncertain, and often socially contested systems. Thus, society must develop different ways of thinking that focuses on the ability to persist (and adapt) in the face of change. This requires us to adapt, learn, and self-organize in new ways. In the context of watershed governance, resilience thinking involves the ability to deal with change or disturbance in a watershed. It focuses on the way different actors come together, the decision-making context, and the accountability and transparency of decision-making processes.

This kind of resilience thinking has practical application in water governance contexts from coast to coast, as different groups navigate different challenges. Learning from experiences and experiments with innovative governance strategies can help build capacity for adaptation and transformation.

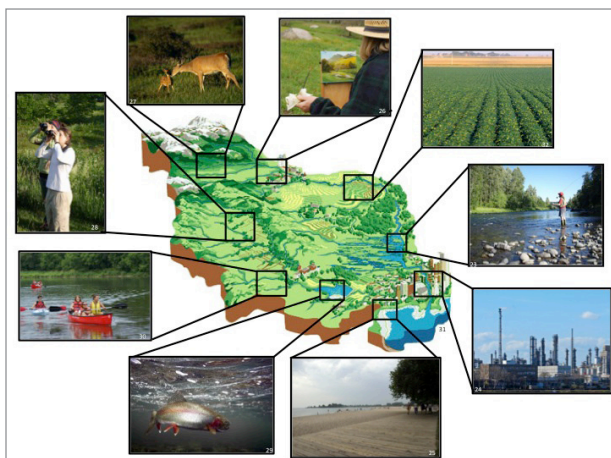
---

### **Navigating Governance in a Changing World: Resilience Thinking and the Future of Watersheds**

*Big Ideas Keynote (Day Two):* Moderated by Michele-Lee Moore (University of Victoria) with keynote presentations from Ryan Plummer (Environmental Sustainability Research Centre, Brock University) and discussion lead by Simon Mitchell (WWF-Canada) & Tim Kulchyski (Cowichan Tribes)

#### **What is Resilience Thinking and How Does it Relate to Watershed Governance?**

Ryan Plummer opened the session by explaining that with the rise of socio-ecological crises seen around the world, induced by climate change and the unsustainable management of natural resources, it is time to embrace a new way of thinking about the environment. This requires a fundamental shift from



**Figure 13:** An example of the numerous social and ecological factors that make up a watershed system. Source: Plummer, 2014.

a “nature balance” perspective to a “nature evolving” perspective, he emphasized, whereby a given system is understood as complex and able to shift from one system to another. Plummer defined this “resilience thinking” approach as understanding the capacity of a system to absorb disturbances while retaining the same fundamental “identity” or characteristics. At its core, resilience thinking recognizes the interconnectedness of social and ecological systems and is centred on the concepts of resilience, adaptability, and transformability. It offers a whole suite of innovative possibilities for real-world practice. For watershed governance, resilience thinking can be utilized to better understand and bridge those social and ecological factors in a system (Figure 13). Socially, it can help identify stakeholder synergies and potentials for networking and collaboration. Ecologically, resilience thinking can help communities to better understand a system’s current health status and threats, its ability to persist in the face of change, its vulnerabilities, and its ability to transform when the current configuration becomes untenable. In this way, resilience thinking encourages us to move towards adaptive governance of watersheds by continuously bridging social and ecological factors with the ultimate aim of healthy, resilient watersheds. Recent research informed by resilience thinking in the St. John River Basin illuminates what can be learned from co-examining social and ecological factors at the watershed scale.<sup>24</sup>



**Figure 14:** The St. John River is an international waterway crossing both international and interprovincial jurisdictional boundaries. Source: Plummer, 2014.

### The Application of Resilience Ideas: The St. John River Basin and Cowichan Watershed Board

The St. John River, which flows through New Brunswick, Quebec, and Maine, is 670 kilometres long and faces numerous challenges, including damming (Figure 14). As researchers sought to study the river’s health, they realized that the joint functioning of social and ecological systems was poorly understood. As a result, researchers from Brock University and WWF-Canada undertook a Social Network Analysis to better identify the different actors and understand the relationships among different organizations in the basin as a way to build resilience in the watershed.

In the St. John basin, Simon Mitchell explained, management systems that had formed by default over the long settlement history of the area would not continue to work with rising climate-related uncertainties; diverse actors recognized the need for a more adaptive approach. Good baseline data existed on the ecological dynamics of the area, but there was no empirical data on the people and the connections among them in the watershed. In particular, there was little knowledge about the connection between key water practitioners across the Canada-U.S. border, as these two groups were not communicating.

The results of the research partnership between Brock and WWF-Canada are proving useful by explaining how different people act as “bridges” in the basin system. Information on these connections helps to determine how different groups can work together and where the collective system is headed. For Plum-



### Engagement in U.K. Watershed Initiatives

In the United Kingdom, there are three types of watershed initiatives, and each requires a different type of engagement:

1. **Site-specific.** As an example, hydraulic fracturing in the U.K. is a site-specific initiative about which the public is wary. For site-specific engagement, there needs to be a legislative basis that allows for secure, open, and transparent engagement.
2. **Strategic planning.** For planning initiatives, engagement needs to be based around training the next generation of water professionals. The social context is shifting, and there is a lack of continuity and changes in resources and staff.
3. **Value-based (e.g. stewardship).** For value-based initiatives, people must first identify their values for authentic communication. Initiatives must not be consultative as this can be alienating. Rather, they need to be semi-formal and avoid asking the same questions over and over again.

mer, social network analysis plays a vital role in identifying key actors involved in watershed governance, and who may serve as important agents in dialogues about governance approaches. A “space” or “learning platform” for that dialogue will depend on the group; it might be electronic or it might be face-to-face. The next step, Mitchell explained, is to connect these findings regarding partnerships to a larger network of actors in different sectors in order to create an informed citizenship in the basin.

### Engaging Partners

Research can be used as a vehicle to engage key actors in discussions about watershed health. Research outputs can take many forms, Mitchell explained, including articles in journals (often open source), reports, websites, and presentations. WWF-Canada often shares research findings through dialogue and discussions with specific groups. Mitchell also suggested that research can be a key way to make contacts and build connections.

Watershed-based partnerships involve making connections between various actors, sectors, and resource users. Plummer suggested exploring how other similar organizations across Canada are working to engage different actors. He also noted that

the initiative of local groups can spur government involvement. For example, on Canada’s east coast, the retreat of provincial and federal government from regulatory initiatives and commitments has created a void in which some watershed groups are now beginning to undertake governance initiatives. By working together as a coalition of groups, they are formalizing and gaining decision-making power and control. The idea of “shared learning” is important; there may be a need for a common location (perhaps an online hub) where ideas can be shared, rather than individual groups attempting to reinvent the wheel in their respective communities.





# Skills-Building Sessions



# Watershed Planning and Source Protection

**W**ith increased water use demands from a variety of sectors, changes to the hydrological cycle, and increasing recognition of the importance of water for nature, water conservation and watershed planning is being undertaken at the community level across the country. This session offered a number of tools and practical skills to inform watershed planning in communities. Municipalities and regional districts are increasingly recognizing the importance of source water protection for community and ecological health. A few important cross-cutting conclusions are that watershed planning processes must include shared objectives between stakeholders, governments, and First Nations; building trustful relationships; and recognition of the importance of incremental progress.

---

## IN THIS SECTION:

### **Straight from the Source: Drinking Water Source Protection Planning**

*Concurrent Panel (Day Two):* Moderated by Brian Wilkes (Brian Wilkes & Associates Ltd.), with presentations from Mike Donnelly (Regional District of Nanaimo), Reg Whiten (InterraPlan Inc., Dawson Creek) & Mike Fox (City of Kimberly)

### **Developing a Water Conservation Plan for Your Community**

*Concurrent Workshop (Day Three):* With Madelaine Martin (B.C. Ministry of Community, Sport & Cultural Development)

### **Collaborative Planning and Action for Healthy Watersheds and Communities**

*Concurrent Workshop (Day Three):* With Steve Litke (Fraser Basin Council), Margaret Birch (City of Coquitlam), Graham Watt (Regional District of Kootenay Boundary) & Amanda Karst (Centre for Indigenous Environmental Resources)

---

## **Straight from the Source: Drinking Water Source Protection Planning**

*Concurrent Panel (Day Two):* Moderated by Brian Wilkes (Brian Wilkes & Associates Ltd.), with presentations from Mike Donnelly (Regional District of Nanaimo), Reg Whiten (InterraPlan Inc., Dawson Creek) & Mike Fox (City of Kimberly)

The protection of drinking water sources is a priority for municipalities and regional districts throughout B.C. Presenters provided an overview of issues and actions being pursued across the province, and Table 1 profiles the challenges faced by three different regions and highlights government initiatives to address these issues.

	<b>NANAIMO</b> Presenter: Mike Donnelly, Regional District of Nanaimo	<b>DAWSON CREEK</b> Presenter: Reg Whiten, InterraPlan Inc., Dawson Creek	<b>KIMBERLY</b> Presenter: Mike Fox, City of Kimberly
<b>WATER CHALLENGES</b>	-Surface and groundwater pollution	-Water shortages, including a severe drought in 2012. -Community needs to decide whether to look for a new water source (or continue competing with industry)	-Logging in the region -Increased turbidity measures in the Mark Creek and Matthew Creek watersheds -Increased motorized vehicle use in the watersheds
<b>KEY ACTIONS</b>	-Creation of a research program -Change of land-use decision-making system -Development of a water management plan	-Water source protection plan -Risk assessment -Groundwater monitoring	-Updating the Integrated Watershed Plan (originally completed in 1993)
<b>ACHIEVEMENTS</b>	-Improved monitoring -Better understanding of water flow and threats to water	-Work done towards a water stewardship initiative, water conservation metering, and water management plan -Creation of an advisory committee, technical watershed working group, and regional drinking water team -Some land set aside to protect head-waters	-Working relationship with forestry companies -City aquatic scientist consultant working with companies on their water quality design and budget
<b>WORK PLANNED</b>	-Development of the plan -More consultation with First Nations	-Building relationships with industry and the Oil and Gas Commission, and partnerships with universities -Coordination with the <i>Northeast Water Strategy</i>	-Plan to address future climate change-related impacts

Table 1: Challenges to protection of drinking water sources faced by three different municipalities in B.C.

## Developing a Water Conservation Plan for Your Community

*Concurrent Workshop (Day Three):* With Madelaine Martin (B.C. Ministry of Community, Sport & Cultural Development)

This session was aimed at how a local government might create a water conservation plan for their community. The session involved a brief introduction to the *Water Conservation Guide for British Columbia*<sup>25</sup>, released in December 2013, and associated water calculator tool.<sup>26</sup> Madelaine Martin then led a discussion about local water conservation planning constraints and opportunities.

A water conservation planning process is a critical aspect of broader water sustainability and watershed management. *The Water Conservation User Guide* is a seven-step “how-to” manual for water conservation planning that provides a framework for assessing the water demands of all water users in a watershed. The guide has been designed to help small to mid-size communities identify and realize their water conservation goals, and outlines the seven necessary steps for

developing a water conservation plan and running the planning process:

1. Laying the Plan’s Foundation
2. Water System Profile
3. Forecast Demand
4. Set Objectives
5. Review Options
6. Select Measures
7. Implementation Strategy

The guide includes examples, checklists, work-sheets, and additional resources, and helps turn local water-use data into useful resources to inform decision-making. It promotes a flexible planning process that can be adapted to reflect the particular circumstances or priorities of a given community.

The associated water conservation calculator is a free tool that can be used alongside the guide, or independently of the guide. It has been designed to help communities understand their water conservation options and get a sense of how saving water can affect their water future.

## Watershed Management Plans

<p><b>Success Factors</b></p> <ul style="list-style-type: none"> <li>• Burning issue or crisis that demands attention</li> <li>• Awareness of the importance of watersheds and a stewardship ethic</li> <li>• Political will, staff capacity and commitment</li> <li>• Willingness to work with neighbouring communities on a regional basis in a shared watershed</li> <li>• Coordinating body (with adequate funding)</li> <li>• Practical watershed scale</li> </ul>	<p><b>Key Elements and Steps</b></p> <ul style="list-style-type: none"> <li>• Develop a clear vision, goals, objectives and actions</li> <li>• Secure support of relevant decision-makers</li> <li>• Ensure representation of all affected parties</li> <li>• Provide access to relevant information resources</li> <li>• Factor in anticipated future changes (population growth, development, climate change, etc.)</li> <li>• Include socio-economic considerations</li> </ul>
---	---




Figure 15: Success factors for watershed management plans. Source: Litke, 2014.

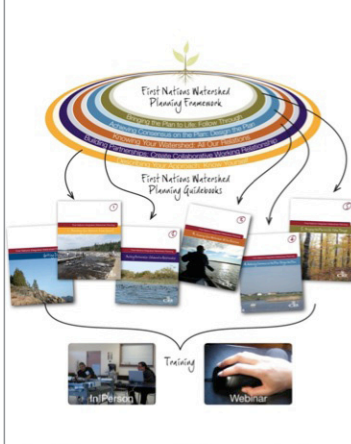
## Collaborative Planning and Action for Healthy Watersheds and Communities

*Concurrent Workshop (Day Three):* With Steve Litke (Fraser Basin Council), Margaret Birch (City of Coquitlam), Graham Watt (Regional District of Kootenay Boundary) & Amanda Karst (Centre for Indigenous Environmental Resources)

### Lessons from the Fraser Basin

The Fraser Basin Council (FBC) is a long-established organization involved in projects at the watershed and sub-watershed scale. Presenter Steve Litke drew on the FBC’s many years of experience to highlight specific suggestions for those involved in watershed planning (Figure 15):<sup>27</sup>

- Identify values, missions, and goals early in the process so that everyone has shared objectives;
- Building trustful relationships takes time, and patience and persistence are essential;
- To maintain the vitality of the process, celebrate milestones and incremental progress along the way;
- Undertaking small, on-the-ground projects can help keep engagement high while larger plans are in development;
- Be careful to manage stakeholder expectations because certain solutions may be slow, difficult, or impossible; and



### What is in the tool?

- Framework
- Guidebooks
- Training
- Webinar

**Indigenous Watershed Planning**

Figure 16: A visual of CIER’s First Nations Watershed Planning Framework. Source: Karst, 2014.

- Consider using an impartial facilitator to mitigate conflicts. Use smaller side discussions to work out conflicts, rather than bringing smaller issues to the entire roundtable.

### The Role of First Nations in Watershed Planning

It is widely agreed that watershed planning processes are richer when they include First Nations’ views and water values. The Centre for Indigenous Environment Resources (CIER) has useful resources for watershed planning for First Nation communities, or for groups or organizations seeking to better involve First Nations in watershed planning (Figure 16). This includes a series of First Nations integrated watershed planning guidebooks:<sup>28</sup>

- Volume 1: Describing Your Approach: Know Yourself
- Volume 2: Building Partnerships: Collaborative Relationships
- Volume 3: Knowing Your Watershed: All Our Relations
- Volume 4: Achieving Consensus on the Plan: Design the Plan
- Volume 5: Bringing the Plan to Life: Follow Through





*Figure 17: The five-step adaptive management cycle that incorporated ecological and well-being goals into the CRWRt planning process. Source: The Conservation Measures Partnership, 2014.*

### **A Watershed Group Start-Up: The Coquitlam River Watershed Roundtable**

The Coquitlam River Watershed Roundtable (CRWRt) is a small collaborative group formed in 2011 as a result of an outcome of the Coquitlam River Watershed Strategy (2007–2011). The Roundtable, explained presenter Margaret Birch, was conceived to improve collaboration among stakeholders and undertake sustainability-advancing activities in the Coquitlam watershed. The Roundtable is guided by a core committee of 18 members, who meet regularly to move forward on projects and activities proposed by the Roundtable. Members work on a voluntary basis, or their participation is supported by the organization they represent. Organizations represented include federal, municipal, provincial, regional and First Nations governments, as well as sectors covering utilities, development, aggregate, outdoor and recreation, education, arts and culture, and stewardship.

Recognizing a need for a plan that was practical and affordable, in 2013 the CRWRt used the “Open Standards for the Practice of Conservation” methodology as its approach for watershed planning.<sup>29</sup>

This methodology incorporates ecological and well-being goals into the planning process through a five-step adaptive management cycle (Figure 17). According to the CRWRt’s website, the next phase, called the Action Plan Step, will “include development of specific strategies the Roundtable will implement as feasible and practical to further their goal for improving health of the watershed”.<sup>30</sup>

Thus far, the CRWRt has operated solely on grants, contributions, and in-kind support from many watershed interests and external organizations, and it relies on the City of Coquitlam to serve as its primary contact and trustee for funding and budget management. However, ongoing capacity building and organizational sustainability remain key challenges.

# Watershed Assessments, Report Cards, Indicators and Water-Use Reporting

**A** holistic and integrated approach to understanding the health and function of watersheds is essential to decision-making and offers an opportunity for the involvement of diverse people in the achievement of watershed protection through raising awareness and finding solutions to existing problems. The development of indicators is a key way to assess priorities specific to each watershed, to make comparisons between watersheds, and even to assess freshwater health in Canada as a whole. Indicator selection should address key linkages between social and ecological systems, and can involve different people from many sectors and backgrounds in order to have maximum public participation and acceptance. Across B.C., there is much competition for water resources and little data on all the different needs and how much water is available. In order to manage a complex water system, it is essential to know how much water is being used and where.

---

## IN THIS SECTION:

### **Learning Together to Address the Health & Well-Being Dynamics of Watershed Governance**

*Concurrent Workshop (Day One):* With Margot Parkes (University of Northern B.C.), Wayne Salewski (Nechako Environment and Water Stewardship Society) & Reg Whiten (Watershed Steward, City of Dawson Creek)

### **Water-Use Reporting for the 21st Century**

*Concurrent Workshop (Day One):* With Nelson Jatel (Okanagan Basin Water Board), Anna Warwick Sears (Okanagan Basin Water Board) & Renee Clark (Regional District of North Okanagan)

### **Making the Grade: Watershed Report Cards and Indicators**

*Concurrent Panel (Day Two):* With Barbara Veale (Conservation Halton), Steve Litke (Fraser Basin Council), Margot Parkes (University of Northern B.C.) & Tom Rutherford (Department of Fisheries and Oceans Canada)

### **Pooling Our Water Knowledge: Assessing the Health of Canada's Water Wealth**

*Concurrent Workshop (Day Three):* With James Snider (WWF-Canada) & Simon Mitchell (WWF-Canada)

---

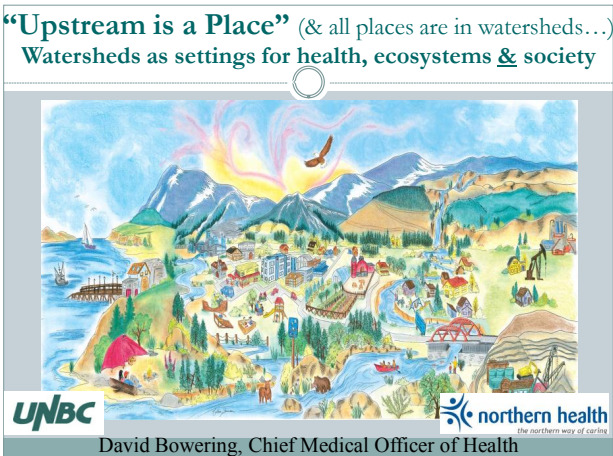
## **Learning Together to Address the Health and Well-Being Dynamics of Watershed Governance**

*Concurrent Workshop (Day One):* With Margot Parkes (University of Northern B.C.), Wayne Salewski (Nechako Environment and Water Stewardship Society) & Reg Whiten (Watershed Steward, City of Dawson Creek)

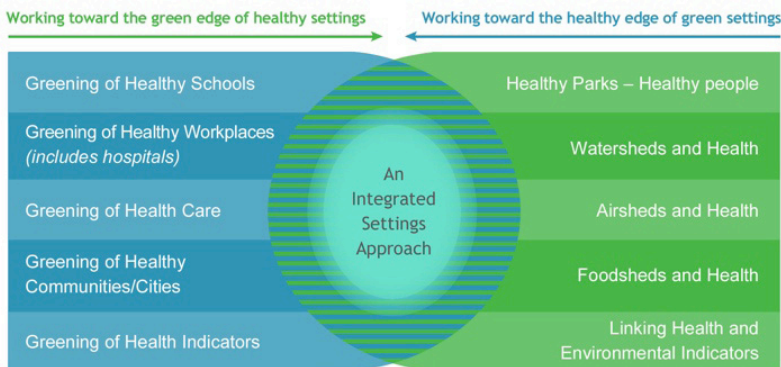
Margot Parkes opened this session by recognizing that watershed governance is an issue that could be considered a “wicked” problems—a problem that is unstable, difficult to define, crosses mandates, involves multiple sectors, and suffers chronic policy failure. The use of a health lens could be one way to move through challenges of watershed governance. Watersheds and health are connected by the “three Ls”: lifestyles, livelihoods, and living systems.

### **Upstream Thinking**

“Upstream thinking” is a term used in the health sector to describe expanding how we think about public health by extending the concept to those larger social, environmental, and economic factors that determine whether people will be healthy or not. The term has a strong ecological focus, but also has foundations in epidemiology



**Figure 18:** Watersheds are understood as the setting for health, ecosystems, and society. Impacts on our watersheds correlate to impacts our communities. Source: Parkes, 2014.



**Figure 19:** Integrating ecosystem health and human well-being provides for an “integrated settings approach.” This can help to overcome isolated settings-based approaches to determinants of health. Source: Northern Health, 2012.

and studies related to social justice, social cohesion, and economic inequality. Health is created in the context of everyday life, where people live, love, work, and play. As such, described Parkes, it is important to situate the health of our everyday life within the context of our watersheds (Figure 18).

### The Northern B.C. Digital Stories Project

Stories resonate with us. Digital stories—those captured on camera or online mediums—about our connections to our watershed may be a way to harness and further communicate the stories and ideas that come from where we work and live. When telling digital stories and talking to others, we need to shift our conception of health from being rooted in *hazards* to instead being rooted in the notion of *home*. In this way, we can situate ourselves as part of the ecosystem

and begin to recognize that what we do in our watersheds impacts our homes.

The Northern B.C. Digital Stories Project sought to draw together diverse people from across a vast territory for the purpose of shared learning. The main purpose, Margot Parkes explained, was to involve people from different sectors in an exploration of how health, ecosystems, and society are linked through watershed governance. The project focused on three specific watersheds: the Nechako/Murray Creek, the Kiskatinaw, and the Skeena-Bulkley.<sup>31</sup>

The drawing together of unusual allies – for example, ranchers, elected officials, and environmental officers—to talk about the same project helped draw out ways in which their different social roles are connected, in some way, to the health and well-being of the watershed. The digital stories project was an expression of unusual allies working and learning together to collectively create stories about their watersheds as a home.

A picture mapping exercise helped participants in the Northern B.C. Digital Stories Project to identify shared points of interest for intersectoral exchange, learning, and action. Through this process, people could share their knowledge. Although, questions did remain regarding how best to disseminate what people shared in a way that would resonate with others. One way this was enabled was through workshops and community events in the watersheds. This allowed relationships to be built and strengthened amongst a diversity of individuals in an environment where they could learn from one another. The project also involved putting together the position paper *The Environment as Context for Health: Towards an Integrated Settings Approach*<sup>32</sup> which sought to reorient thinking from health service-based approaches towards the promotion of health by all sectors and organizations involved in upstream determinants of health. By recognizing that all healthy settings are embedded in the environment, explained Parkes, we are able to see connections between different settings in which we live, learn, work and play. This is known as an “integrated settings approach” to align watershed health with human well-being (Figure 19). Beginning in 2011, a three-phase project was launched to, “establish a knowledge to action partnership between UNBC [University of Northern British Columbia],

Northern Health, other government agencies, non-governmental organizations and community groups across Northern B.C. with a focus on improving social and environmental determinants of health through integrated water governance<sup>33</sup>. The project is currently in its third, and final, phase.

### Further Resources

Knowledge to Action Project: Improving Social and Environmental Determinants of Health through Integrated Health Governance: <http://ecohealthkta.net/knowledge-to-action-project/>

Parkes, M., Morrison, K., Bunch, M., & Venema, H. (2008). *EcoHealth and Watersheds: Ecosystem Approaches to Reintegrate Water Resources Management with Health and Well-Being*. Winnipeg, Canada: International Institute for Sustainable Development. Available at: <http://www.iisd.org/publications/ecohealth-and-watersheds-ecosystem-approaches-re-integrate-water-resources-management>

---

## Water-Use Reporting for the 21st Century

*Concurrent Workshop (Day One)*: With Nelson Jatel (Okanagan Basin Water Board), Anna Warwick Sears (Okanagan Basin Water Board) & Renee Clark (Regional District of North Okanagan)

### Water-Use Reporting in the Okanagan

The Okanagan is a relatively dry region in B.C. that faces many water pressures. Agricultural use accounts for approximately 55 per cent of water use, however the water needs of communities are increasing with increased development and population growth. Key challenges include the variability of inflow and outflow, the lack of storage for flood years, the demands of a growing population, and impacts due to climate change (e.g. reduced snowpack). In the Okanagan, there are many water users (agricultural, municipal, environmental) and, furthermore, there is much variability in water availability among regions.

### The Water Use Reporting Centre: Pilot Program

In response to these pressures and data gaps, the Okanagan Basin Water Board (OBWB), B.C. Ministry of Environment, and many other government, university, and industry partners initiated a water

supply and demand assessment for the valley. The partners soon realized that the large purveyors had poor data, and it was necessary to use modelling to determine how much water was being consumed. The result was identifying the need for a web-based system for water purveyors and large licence holders to report their water use. In response, the Water Use Reporting Centre (WURC) was created to assess the data held by large purveyors. This system was designed to include reporting for both groundwater and surface water, since they are hydrologically linked. The WURC's purpose is to make water-use reporting easier for water licensees and to facilitate more frequent reporting.

The OBWB began work with software developers in 2009 to create the WURC. Currently, about 70 per cent of water use in the Okanagan is being reported using the WURC, with all reporting being voluntary and not required by the Province. The cost to develop the WURC system was approximately \$600,000, with funding from Infrastructure Canada, Environment Canada, B.C. Ministry of Agriculture, B.C. Ministry of Community Development, B.C. Ministry of Environment, B.C. Agriculture Council, and the OBWB.

### Addressing Key Challenges

A key requirement of the WURC is to not add to the existing workloads of water purveyors. However, during preliminary research, the OBWB found that it is time consuming for water purveyors to review all their data to find necessary information. As a result, explained project lead Nelson Jatel, the WURC was designed to produce, at the click of a button, the required form for the Water Stewardship Division of the B.C. Ministry of Environment's Annual Water System Return based on the monthly data that water purveyors enter into the system. Currently, these reports are printed and faxed to the Ministry, and staff there retypes the numbers into their digital system. The system does, however, have the potential to be more efficient if the Ministry were able to access the WURC itself and digitally retrieve the Annual Water System reports.

Jatel explained that the OBWB wanted to design a web-based system that was free, secure, and easy to use, and which tracks data and provides information for reporting. Only those given access by a Basin



Administrator or a Utility Administrator can access the WURC; it is not open to the general public. The WURC system includes information about the profile of a utility (e.g. location, water licences, and types of customers). In the system, data can be entered in a variety of units, and there are a number of reporting functions, a resources page, and a help page.

Other characteristics of the WURC system include:

- Annual water consumption graphs can be overlaid with climate and precipitation information (from Environment Canada);
- It is secure (currently the WURC software is housed on regional government servers);
- It geo-references everything (e.g. it displays water licence info on a map within the system);
- Monthly total water consumption (the month-by-month data entered) can be compared on a yearly basis, and is often used to share information with boards and councils about what is being done with regards to issues such as conservation measures and outcomes;
- Utilities can compare their water use to their neighbours;
- The system can produce customized reports and charts in response to specific questions;
- The research team is now integrating non-government hydrometric data to increase the number of stations used;
- Well locations and registration numbers are included to aid with groundwater reporting; and

#### Highlights of the BC Water Use Reporting Program

- Year 5 of pilot = success
- Account for over 70% of water use in Okanagan
- Prints the provincial annual water systems return form
- Enhanced security
- Live basin reservoir map and new reservoir recording
- New water use reports and bar graphs for internal or external use
- Viewer accounts available for consultants
- Integration with Supply and Demand Study data available
- Currently being used successfully in Nanaimo

- New modules are being developed to address the special needs of agricultural users.

The WURC was modeled on California's Department of Resources Data Exchange Center,<sup>34</sup> which has a statewide data exchange centre that allows it to look at regional trends, as well as the status of resource use in the entire state. In the Okanagan, water utilities wanted a way to get a snapshot of how the entire region's upper reservoirs are doing. Yet, putting reservoir and lake data into the WURC was a challenge, since purveyors were not reporting data on a monthly basis. The WURC was able to overcome this challenge by noting when the data was entered and the ability to integrate real time hydrometric data that was coming off the lake.

#### Scaling up the WURC

The WURC was designed to be scalable, and the more widely used it is, the more cost effective it will be. Jatel explained that, in the future, the WURC could be incorporated into government water resource rent collection and licence reporting management systems at a provincewide scale. The WURC software could meet certain needs of the new B.C. *Water Sustainability Act* related to the requirement for large water users (surface and ground) to report water use. Looking ahead, the WURC could be also linked to the provincial wastewater return online system.

#### "Unaccounted For" Water in the North Okanagan

Renee Clark of the Regional District of North Okanagan explained that the District's use of the WURC was critical to revealing that 30 per cent of the region's water is unaccounted for; this is water for which the regional district is getting no revenue. Currently the district is examining where this 30 per cent of water is being used (e.g. leaks, fire protection, water quality flushing).



## Making the Grade: Watershed Report Cards and Indicators

Concurrent Panel (Day Two): With Barbara Veale (Conservation Halton), Steve Litke (Fraser Basin Council), Margot Parkes (University of Northern B.C.) & Tom Rutherford (Department of Fisheries and Oceans Canada)

Watershed report cards (WRCs) and watershed indicators can be key tools for local and regional watershed stewardship initiatives (Figure 20). The WRC process isolates and studies important variables or areas of concern within a particular watershed, and then combines the results to construct a larger assessment of overall watershed health. Watershed reporting is increasingly being used in Canada as a tool to engage the broader public around watershed issues, especially as the challenges posed by climate change and other anthropogenic impacts to watershed health become increasingly evident.

### Using Watershed Report Cards

WRCs use a range of indicators to assess and describe existing watershed health conditions and trends over time. The process of selecting indicators enables watershed organizations to collect, organize, assess, and interpret relevant data. WRCs are valuable for informing watershed management and decision-making, policy creation, and stimulating action on sustainability initiatives. WRCs are also excellent tools for public engagement. Researchers should consult with the community when developing indicators. Consultation increases local awareness and dialogue around watershed issues, increases public education and support, and may even help attract funding. A wide range of marketing and outreach activities could be used to make the process interactive and engaging.

### Indicators of Watershed Health for Use in Watershed Report Cards

Distinct watersheds face unique challenges and there is no perfect set of indicators for any watershed. Rather, selection is context specific and should focus

## Case Study Watersheds



Figure 20: Watershed report cards in use in basins across Canada. Source: Veale, 2014.

on important local factors. As presenter Barbara Veale explained, watershed organizations should focus on issues of prime concern to residents and decision-makers as a way of mobilizing support. It is also important to limit the number of indicators used (more is not necessarily better), and planners must consider funding, availability of data, and time constraints. Ultimately, ideal indicators have four characteristics. They are affordable to study, easily measurable, relevant to the watershed and to local community values, and accessible to the public.


Early involvement of the public in indicator selection process helps focus time and resources in areas that will be most useful. For example, presenter Steve Litke of the Fraser Basin Council explained how his organization established an advisory committee to assist in polling constituents for their opinions on important watershed values. Many creative engagement options can be used, including surveys, public forums, workshops, and presentations.

### Indicators in the Cowichan

The watershed objectives and targets established in the Cowichan watershed (see *The Cowichan Experience: An Adventure in Governance Evolution*,

## Fish Target

- **We want healthy fish populations in the Watershed**
- **TARGET**- Steelhead pre-smolt abundance in the Cowichan should meet or exceed target densities
- **ACTIONS**
  - Conduct ongoing sampling at indexed sites
  - Report results incl. relationship with limit reference points
  - Include results of annual trout snorkel surveys
  - Develop intervention plan if monitoring indicates concerns



**Figure 21:** Healthy fish populations as a target can integrate other factors like water quality and riparian health. Source: Rutherford, 2014

p. 14) are seeing success largely because they are easily understood and are rooted in the community's interest in maintaining healthy aquatic systems to support fish habitat and recreation. Indicators and objectives in the Cowichan watershed focus on water quantity and quality, estuary health, riparian habitat, fish, and public health. Each watershed indicator has goals and tangible action items. For example, the public health target is to sustain safe recreational swimming conditions, and is supported by the action items of water quality sampling and an outreach program to engage the agricultural community around best practices for managing surface runoff.

In the Cowichan watershed, the selection of indicators and definition of goals and action items

### **The Fraser Basin Council's Work on Ecosystem Indicators to Assess Watershed Health**

While indicator selection must suit the ecological context of the watershed under investigation, the Fraser Basin Council and the B.C. Wildlife Federation are working on an initiative to identify a set of common watershed indicators to assist organizations in assessing, monitoring, and reporting on watershed health. The FBC will make the framework and associated report available online once it is finalized. Current FBC resources (including reports, guides, and toolkits) are available at: <http://www.fraserbasin.bc.ca/resources.html>

created a roadmap to help the Cowichan Watershed Board implement the *Cowichan Basin Water Management Plan*. The targets are science based and integrate multiple environmental health factors. For example, setting "healthy fish populations" as a goal compels planners to consider other connected factors, like water quality and riparian health, that are inherently correlated with fish health. The target then leads to clear actions (Figure 21).

In the Cowichan watershed, the selection process for targets recognized the relationships between ecosystem elements within watersheds, as well as connections between the watershed and local community. The Cowichan targets have been effective in raising public awareness, and engaging the entire community in action, sparked by a shared interest in the health of the watershed.

### **How should WRC data be presented?**

Once data has been collected, suggested Steve Litke, supplementing the raw numbers with other types of information, such as case studies, images, or narratives, is a great way to present information to a broader audience. Litke suggested that WRC creators should make the information available and use different representations to tell the data's story, such as graphs, maps, photographs, reports, presentations, launch events, media coverage, and online and/or interactive versions.

### **Pooling Our Water Knowledge: Assessing the Health of Canada's Water Wealth**

*Concurrent Workshop (Day Three):* With James Snider (WWF-Canada) & Simon Mitchell (WWF-Canada)

### **WWF's Canadian Freshwater Health Assessment**

WWF-Canada identified the need for a framework that provides a credible scientific basis for evaluating the health of water in Canada, and has thus developed a national program of freshwater health assessment, explained presenter James Snider. There have been several watershed "report card" initiatives undertaken in Canada, though these typically occur at local scales (e.g. through Ontario's Conservation Authorities). WWF-Canada's Freshwater Health Assessment<sup>35</sup>

is intended to be complementary to these past projects and, taken together, the data can inform decision-making at provincial and federal levels. The program goal is to assess the health of all freshwater systems in Canada by 2017. As of June of 2014, WWF-Canada will have completed assessments for seventeen watersheds. This Canada-wide assessment could provide a benchmark for tracking progress towards an aspirational goal of achieving healthy waters by 2025.

The assessment framework relies on four metrics: water quality, hydrology (flows), bugs (benthic macro-invertebrates), and fishes (Figure 22). Each of the four metrics consists of specific quantitative indicators, including statistical tests and accompanying thresholds for scoring. The metrics, based on their composite indicators, are then converted to an overall score that reflects the health of a watershed.

The metrics were developed based on an international scan of best practices, including existing programs in South Africa and Australia, and through consultation with Canadian experts. In order to define the metrics and contribute to evidence-based decision-making, the process has been peer-reviewed and driven by experts. In the future, community-based monitoring could be another valuable source of data. For now, however, the assessment draws mainly upon monitoring data from federal and provincial government agencies, which is uneven across the country. Data availability remains a key challenge.

### Assessment of the St. John River

In 2011, the Canadian Rivers Institute completed the report *The Saint John River: A State of the Environment Report*.<sup>36</sup> However, this report did not include a social analysis or name the actors responsible for point and nonpoint source pollution, water conservation, monitoring, or protection in the watershed – the “people side” of the equation. As a result, WWF-Canada’s effort on the St. John River began with a Social Ecological Inventory (SEI) across the watershed to better understand the actors and the roles they play in relation to a healthy river.

### Social Ecological Inventory of the St. John River

The SEI findings illustrated that there were gaps between the *State of the Environment Report* and what was happening on the ground, explained presenter

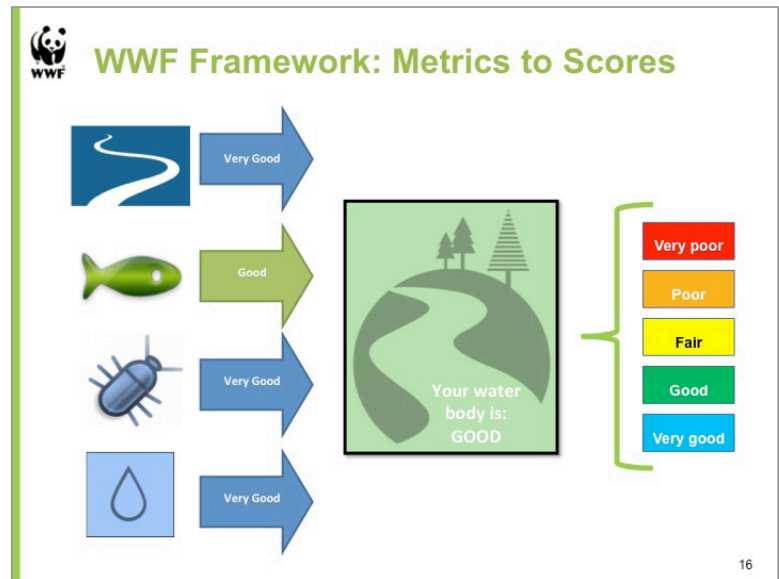


Figure 22: WWF-Canada’s Freshwater Health Assessment includes four metrics of freshwater health. Source: Snider, 2014.

Simon Mitchell of WWF-Canada. An SEI had never been done at the watershed scale before and the inventory revealed a number of interesting results. It identified 196 individuals in the watershed, who represented 160 different organizations, departments, and agencies. The most relevant result was that most of the actors in the watershed exhibited a number of the key principles of “governance,” yet participants of the SEI never used this language.

The research found that there is a keen interest in river health and healthy communities in the watershed. Many activities related to river health are occurring on the ground, but these are organized within a somewhat disconnected social system. The research revealed opportunities for collaboration at both local and regional levels to foster positive discussion and lead to the implementation of more actions that contribute to a healthy river. Subsequent community activities and events have included community meetings, partnerships with universities and non-governmental organizations, the St. John River Summit<sup>37</sup>, youth programs, and ongoing blogging and communications.

# Community Engagement

**E**ngaging community in water governance is key to garnering a broad base of support, building local legitimacy, and accessing the wealth of water knowledge that exists among locals. Transparent consultative processes that include the local community from the beginning will enhance community engagement over the long term. Three tools for engaging the public in watershed protection are presented in this section—constituent mapping, story mapping, and database management. It also includes tools bringing together a diversity of actors to produce reliable, relevant, community-level science to support decision-making processes at various levels of government.

---

## IN THIS SECTION:

### **A New Bag o’ Tricks: Engaging “the Public” in Watershed Governance**

*Concurrent Workshop (Day One):* With Susi Porter-Bopp (Canadian Freshwater Alliance), Kirsten Harma (Lake Windermere Ambassadors) & Sheila Muxlow (WaterWealth Project)

### **A Community Role in Decision-Making: Connecting Water Science and Policy**

*Concurrent Workshop (Day Three):* With Ryan van der Marel (Wildsight) & Heather Leschied (Wildsight)

---

## **A New Bag o’ Tricks: Engaging “the Public” in Watershed Governance**

*Concurrent Workshop (Day One):* With Susi Porter-Bopp (Canadian Freshwater Alliance), Kirsten Harma (Lake Windermere Ambassadors) & Sheila Muxlow (WaterWealth Project)

Every organization, no matter its mission or cause, likely has a specific target “public” (a group of people amenable to its work). Presenter Susi Porter-Bopp referred to this group as the “persuadables” and suggested that organizations should focus their limited resources on engaging these individuals. For example, there is a large percentage of Canadians who would likely be willing to protect water if water advocates or organizations directly engaged them in a meaningful way.

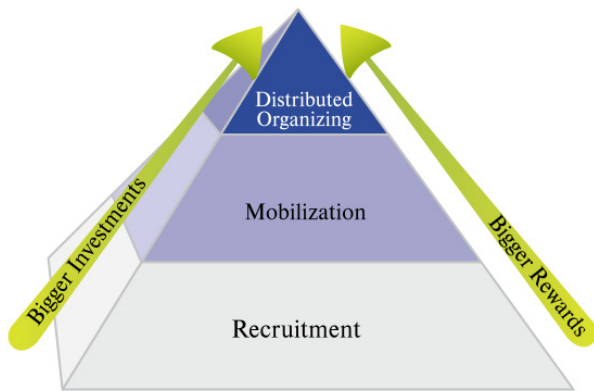
Three tools can be useful in the targeted engagement of specific groups: constituent mapping, story mapping, and a managed database of supporters. Once engaged, community members can then, for example, become part of the broad transition to local decision-making for watershed governance.

### **Tool 1: Constituent Mapping**

Constituent mapping (or “micro-targeting”) is a tool used by political parties, corporations, and community organizers to target specific publics. Constituent maps reveal information about the people who live in a particular region, and suggest which individuals might be recruited, mobilized within an organization, or engaged with its mission (Figure 23).

For example, the Canadian Freshwater Alliance has developed a tool called the Brew Creek Campaign Atlas that groups can use to specifically target various “publics” using adaptable messaging. Filters for the Campaign Atlas include age, gender, family size, language, and, perhaps in the future, freshwater fishery licence holders. These filters can be used to generate postal codes or census blocks that can be targeted for specific purposes (e.g. mail-outs, canvassing). In addition, it has been designed so that various filters can be created and added by specific organizations to customize the Campaign Atlas for their own purposes. The Campaign Atlas is currently only available in B.C., but expansion to other regions is planned for the future.





**Figure 23:** Constituent mapping is a strategic tool for advocacy organizations to find and map the “persuadables” when engaging in public outreach. Source: Porter-Bopp, 2014.

## Tool 2: Story Mapping

Story mapping is a new technology based on an old idea: emphasizing personal connection to place and land through stories. It is a way of reaching beyond “the choir” to “the congregation” (see *Taking the Pulse and Setting the Scene: Water Attitudes and the Emergence of Watershed Governance*, p. 3) and connecting with neighbours who also call a place home, explained presenter Sheila Muxlow of B.C.’s WaterWealth Project. Story mapping is a tool that identifies diversity as well as those things that bring us together.

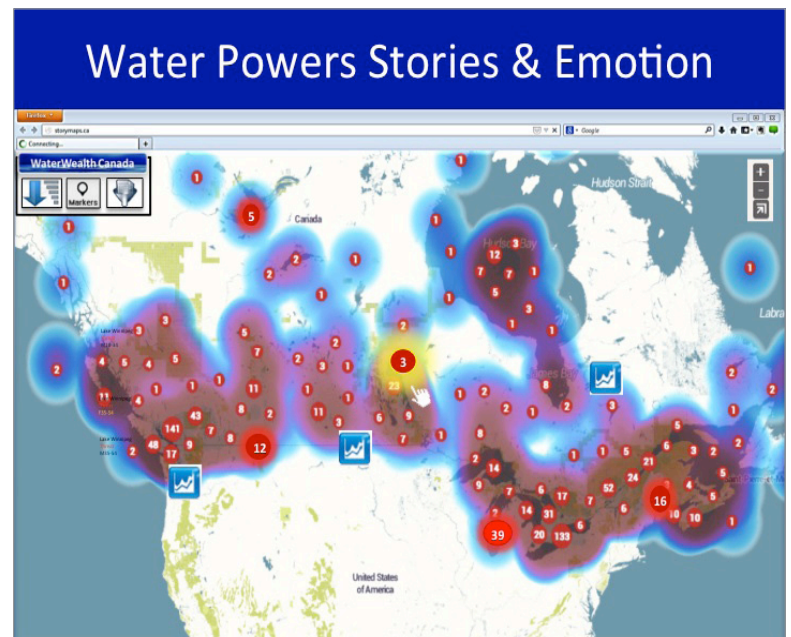
The WaterWealth Project has been piloting the approach using a web-based platform that can be brought into a community through different mediums, including smart phones and tablets, to ensure the tool can reach more people. Its goal is to build a crowd-sourced map of Canadian freshwater stories to amplify pride in our “home waters” (Figure 24). This approach focuses on what we have in common and what we have to be proud of, rather than on problems. Users can search for different watersheds on the interactive map to access personal stories (print or video) that people have shared about water.

The story-mapping approach asks people to engage on an issue they care about. It is easy to approach people and ask them to participate by inquiring if they have a water story to share or a freshwater place that’s important to them. The tool also has a number of benefits: it can be used to engage “the congregation” and neutralize opposition; it can reveal shared

areas of concern that we can all relate to; and, it can function as a list-building (database) tool by getting people to participate in campaign conversations in an unthreatening way.

WaterWealth’s story-mapping platform documents stories with the goal of leveraging decision-makers and eliciting a shared understanding of the fact that we cannot continue with harmful and exploitative practices if we want to ensure the safekeeping of the places that are special to us. It also represents an opportunity for an intergenerational connection between younger, tech-savvy youth and older individuals, since they can engage and share stories about places they both care about. Another outcome of the tool is getting face-to-face time with community members, which provides a chance to build new and authentic relationships, while also enabling opportunities for volunteer recruitment and a way of conveying information to people who might be looking for a way to get more engaged in water protection efforts in their community.

The tool is currently in the experimental phase, but results have been positive so far. The Baker Creek Enhancement Society (Alberta), Ecology Action Centre (Nova Scotia), and Watershed Watch Salmon Society (British Columbia) have all joined with the WaterWealth Project to test the story-mapping approach.



**Figure 25:** Values and concern mapping is a powerful way for individuals to visually share watershed knowledge while also fostering a sense of place. Source: Harma, 2014.



### Tool 3: Using A Database to Manage Supporters

Databases help build “people power.” Organizations that are leaders in community organizing use Contactor Relationship Management Systems (CRMS), which are databases that are used to house contact information. These databases are extremely efficient and sophisticated at keeping track of the specific ways in which people are supporting organizations and keeping track of relationships. Good databases help organizations:

- Get new people on contact lists;
- Segment and organize their lists by different “publics” or audiences;
- Keep supporters engaged;
- Assign values to every contact regarding how they contributed in the past; and
- Keep track of spending.

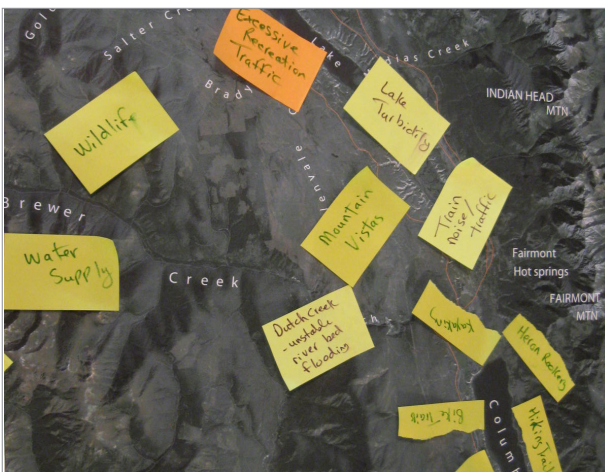
Databases can also track how users interact with a website and (sometimes) social media sites. This function can help segment communications and allows organizations to search for people, create mailing lists, and keep track of who is signing up for what.

### Case Study: The Lake Windermere Ambassadors

The Lake Windermere Ambassadors (LWA) of Invermere, B.C., made a five-year goal to create a governance group with delegated authority for the Lake Windermere watershed. In 2011, presenter Kirsten Harma explained, the LWA began to shift its

focus from the lake to the whole watershed, and the organization used community workshops to engage the public. For the first workshop, the LWA invited an expert to facilitate discussion and share information about water protection initiatives in other communities. A second workshop focused on sharing watershed knowledge, fostering a sense of place, and generating ideas for the future of the watershed. During this workshop, participants used sticky notes to label areas on watershed maps that were places of value or concern (Figure 25).

Harma explained that while the first two workshops were very effective at engaging people already interested in water and environmental issues, the LWA wanted to reach out to a broader public and bring new voices into the conversation. Thus, the LWA developed a third set of workshops to engage different groups based on their specific interests. A key lesson from organizing the third series of workshops was that the way in which invitations are offered affects participation. Participation was greatest among those people who had been invited directly by a member of the LWA. Furthermore, the LWA learned that to engage people outside of their own network, they needed to appeal to the values and concerns of individual stakeholders. For example, golf resorts are interested in water for irrigation and can be approached based on that interest, but they also have to be invited to participate during a time that fits with their specific needs (e.g. not during the busy summer season).



**Figure 25:** Values and concern mapping is a powerful way for individuals to visually share watershed knowledge while also fostering a sense of place. Source: Harma, 2014.

### A Community Role in Decision-Making: Connecting Water Science and Policy

*Concurrent Workshop (Day Three):* With Ryan van der Marel (Wildsight) & Heather Leschied (Wildsight)

A growing rift exists between good science and decision-making. The production of scientific knowledge is inherently subjective and can be affected by the source and purpose of the information. Furthermore, at the institutional level, scientific studies are influenced by political ideologies and motivations. Stories about the muzzling of scientists at the federal level undermine scientific validity, while governments seem to be moving away from science-based decision-making (Figure 26).

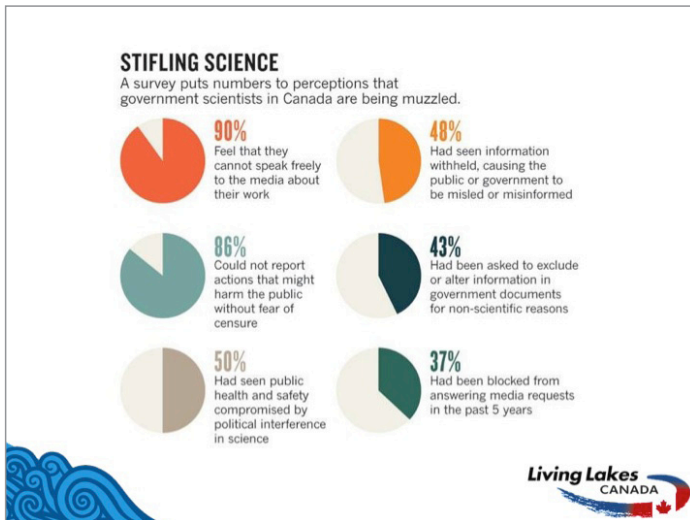


Figure 26: The issue of decreasing scientific capacity and problems with “stifled” science were described visually through this image in Ryan Van der Marel’s presentation. Source: PIPSC/ Environics, 2014.

Presenters Ryan van der Marel and Heather Leschied explained that Living Lakes Canada has a series of projects that aim to bring together local communities, government officials, and First Nations to produce reliable, relevant science at the community level. This information can then support and inform decision-making processes at the local, provincial, and federal levels. A key objective is to use citizen science initiatives to create databases of trusted information that can apply to decision-making at multiple scales, perhaps even scaling up to inform policy creation (Figure 27). At the same time, citizen engagement can mobilize communities to support environmental protection by identifying and keying in on existing community values.

**Tools and Approach: Sensitive Habitat Inventory Mapping**

Living Lakes Canada and its partners use Sensitive Habitat Inventory Mapping (SHIM) to map lakes in the Columbia Basin and elsewhere in Canada. SHIM is a scientifically defensible protocol that was developed by Fisheries and Oceans Canada. It gathers the data necessary for informed lake management planning. Eleven lakes in the Columbia Basin and the south basin of Lake Winnipeg have been mapped thus far. The Columbia Basin is undergoing rapid change, including changing climate and hydrology regimes, altered sediment properties of the river due to damming, the collapse of the Burbot fishery, and

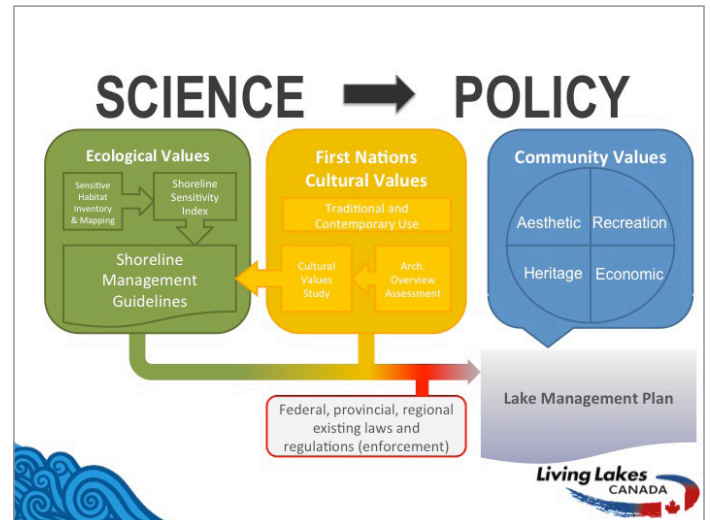


Figure 27: Bridging the gap between science and policy requires consideration of multiple values and the socio-economic and legal context in a basin. Source: van der Marel & Leschied, 2014.

the rapid expansion of vacation home properties. As a result of these changes and because of the concern of local environmental organizations, the Columbia Basin is an ideal testing ground for SHIM. SHIM breaks the lakefront into homogeneous zones (e.g. shoreline, sandy beach) to focus data collection and mapping (Figure 28). Next, field teams collect data. These teams are led by individuals from government agencies like the Department of Fisheries and Oceans or the Ministry of Forests, Lands and Natural Resource Operations, and are comprised of community people, First Nations, non-governmental organizations, and biologists and other scientists. Field teams work toward gathering data that reflects the current “level of impact” on the riparian zones. The opportunity to link science and decision-making helps decide what type and/or level of activity is appropriate for that particular shoreline type, given the current conditions and level of impact. In this way, van der Marel and Leschied explained, Living Lakes is essentially setting thresholds and targets based on the data and the desired future condition they would like to achieve. This output is then used by FrontCounter B.C. (a service for clients of provincial natural resource ministries and agencies) to assess the risk of new project proposals based on the data provided by the partner projects, representing a clear link between community-based science and provincial decision-making.<sup>38</sup>

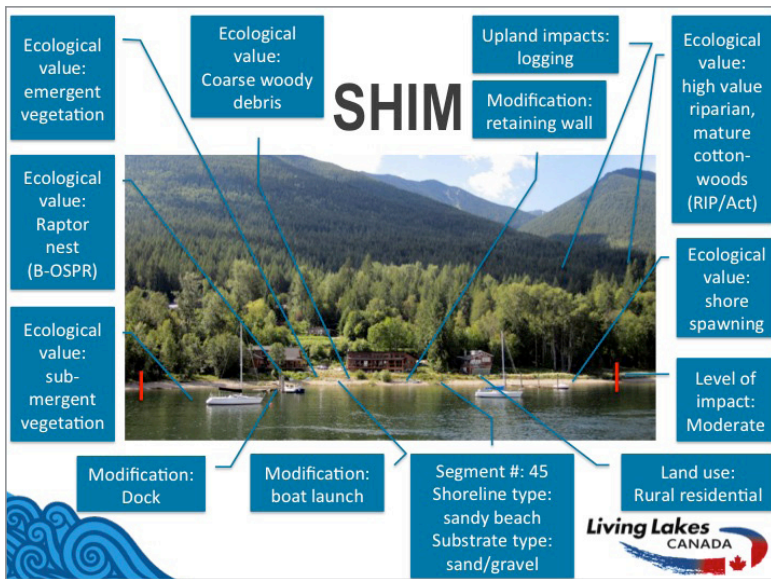


Figure 28: SHIM data collection and mapping zones. Source: van der Marel & Leschied 2014.

#### First Nations' Sites

To protect First Nations' sites and information about these sites, Living Lakes Canada uses GIS techniques to mark the location of cultural significant or sacred sites, like traditional fishing spots or vision quest sites. These values are identified in the information output as protected areas, but no specific information is made available to the general public.

#### Field Experiences: The Lake Windermere Project

When community partners wanted to come together to collect data in order to communicate the issues they were seeing on the ground, Lake Windermere became the pilot project for the partners. Living Lakes Canada and the community identified fish, wildlife, and source water protection as the key "values at risk." In Lake Windermere, and in other successful projects, Living Lakes Canada has gone to great lengths to encourage community participation by employing a number of different strategies, including door-to-door advocacy, surveys, and pancake breakfasts. Active community engagement, the participation of local people in citizen science, and a communicative and transparent process were keys to the Lake Windermere project's success.

#### Field Experiences: The Tie Lake Project

In certain instances, the work of Living Lakes Canada has been met with resistance. In Tie Lake, van der Marel and Leschied explained, the planning and consultation process was rushed, so the community was sceptical of the partnership's intent. Local people did not want to lose autonomy over access to the shoreline, and viewed the project as a threat to their authority to decide how to manage the lakefront. However, a second attempt with more robust consultation and community engagement has helped change perspectives, and the community has become more involved and invested in the citizen science process.

Living Lakes Canada is amassing a large amount of data in participating watersheds. This data is being presented to the communities to allow them to engage with it, identify risks and priorities, and build their own goals and visions for lake management in an open process. The ultimate goal is to advance the overall objective of lake protection, which will only be accomplished through processes of community involvement. The community and data-sharing aspects of these projects are vital, as they improve collective intelligence in matters pertaining to the lake and watershed health.

# Social Financing

**N**on-profit and community-driven organizations that are working to improve conservation practices and water and land use face a key challenge: finding sufficient funds in a context of scarce resources and government cutbacks. However, several new funding tools may be available. Social financing is an approach to managing money to solve social problems that is “outside” of conventional financing arrangements. Collaboration and innovative partnerships are critical to accessing these resources.

---

## IN THIS SECTION:

### **Social Finance 101: Emerging Ideas to Support Community-Led Governance Initiatives**

*Big Ideas Keynote (Day Two):* Session introduction by Kelly Lerigny (Real Estate Foundation of British Columbia), with presentations from Ken Gauthier (Urban Matters), Tim Morris (Morris Consulting) & Paul Emerson (Vancity)

---

## **Social Finance 101: Emerging Ideas to Support Community-Led Governance Initiatives**

*Big Ideas Keynote (Day Two):* Session introduction by Kelly Lerigny (Real Estate Foundation of British Columbia), with presentations from Ken Gauthier (Urban Matters), Tim Morris (Morris Consulting) & Paul Emerson (Vancity)

British Columbia is undergoing a shift in how government projects, including water infrastructure and other water management activities, are financed. But there is also a fundamental shift in how non-governmental organizations, who often support various governance activities, are able to survive as organizations and conduct their work. Typically, these groups have relied on grants from governments, but increasingly, these funds are no longer available. Presenter Ken Gauthier of Urban Matters suggested that governments are increasingly interested in mobilizing private capital for public goods and are working toward removing barriers that inhibit that change. For watershed planning and the implementation of watershed plans and specific projects, a mix of funding is required from philanthropic sources, governments, and social finance, suggested Tim Morris of Morris Consulting.

### **Financing: Specific to The Organization and Its Needs**

Gauthier explained that the specific type of financing approach that an organization adopts will depend on its organizational structure; water groups in B.C. exist on a wide spectrum, ranging from largely commercial enterprises to charitable organizations. As well, said Gauthier, the type of funding an organization pursues will depend on its specific needs. The types and sources of funding for long-term, ongoing organizational support might be quite different than those for specific, short-term projects.

### **Long-Term Funds**

For long-term funds, organizations may benefit from considering how they themselves might generate revenue (e.g. from providing tourism services). Meanwhile, Morris suggested that watershed planning and implementation must be supported by sustainable funding through a local tax base or water licence fees over the long-term.



**Special Projects**

For short-term projects, special initiatives, or infrastructure, organizations may wish to pursue innovative tools such as community micro-lending, micro-financing, crowd-sourced funding, impact investing, or social impact bonds (for “intervention services”). According to Morris, Foundations may provide a valuable source of project-oriented funds; they have a niche in the world of water finance and are well suited to funding “proof of concept” pilot projects or catalyzing innovative projects. Foundations are good sources of front-end funds to pilot or test innovative projects to show that they work and can happen elsewhere or more broadly. Foundations are also able to take more risk than an entity that requires a return on an investment.

**The Canadian Philanthropic Sector**

The philanthropic sector in North America (especially in the United States) is more developed than in Europe, where there is a greater public expectation for governments to fund public projects. However, explained Morris, the total amount of resources available from the philanthropic sector is limited. Water issues receive a relatively small portion of resources, which underscores the need for strategic use of funds (Figure 29).

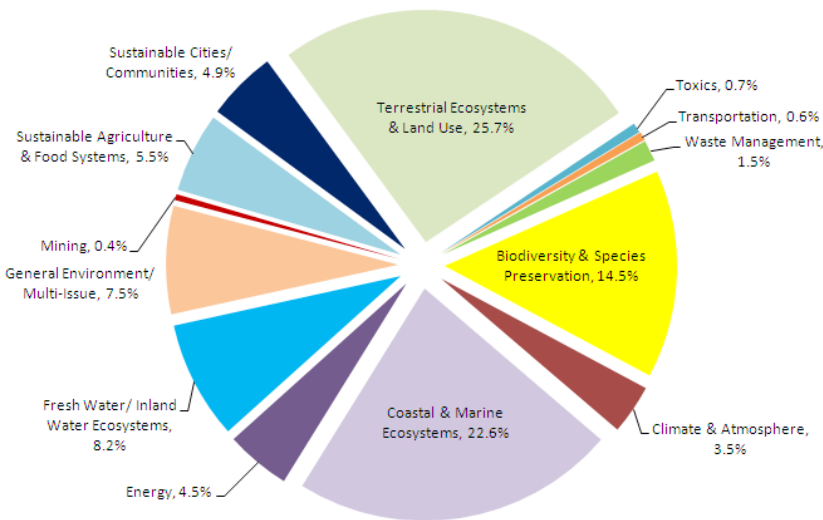
**Support For Watershed Organizations: Two Examples**

**The Real Estate Foundation of British Columbia (REFBC)**

Water sustainability is one of REFBC’s key theme areas. REFBC not only awards grants, but also connects organizations with common interests, shares results, and enhances networks. More information is available at [www.refbc.com](http://www.refbc.com).

**The Vancity Community Foundation**

Credit unions can be differentiated from regular banks in a number of ways, but presenter Paul Emerson stressed that a key distinction is that credit unions are collaborative (and competitive), but they don’t compete; they are not constrained by fixed returns. Vancity and local credit unions are more closely aligned with community values, and are invested in collaboration and building partnerships. Team members at the Vancity Community Foundation accept charitable donations and manage them based on sustainable and responsible investment practices, and distribute funds primarily through charities. More information is available at [vancitycommunityfoundation.ca](http://vancitycommunityfoundation.ca).



**Figure 29:** Fresh water and inland water ecosystems receive just 8.2 per cent of funds provided by the philanthropic sector. Source: CEGN – A Profile of Environmental Grantmaking in Canada, 2010.



# Where To Next and Final Thoughts

**T**he *Watersheds 2014* forum brought together a diverse group of water advocates to enhance their networks and contacts, learn from each others' experiences, and develop new skills and capacities. A key message coming out of the forum was that water advocates and the community of leaders and practitioners are not alone in their work; there is a large network of existing practitioners and, further, the possibility of mobilizing a broad constituency to work toward the shared purpose of water protection. *Watersheds 2014* was about creating a shared water culture, and engaging with the many complex and dynamic challenges faced by communities in British Columbia, Canada, and beyond.

---

## IN THIS SECTION:

### **Creating a Watershed Culture: Reflections from Beyond Canada**

*Big Ideas Dinner Keynote (Day One):* By Tim O'Riordan (University of East Anglia)

### **Where Do We Go from Here? The Future of Watershed Governance**

*Closing Panel (Day Three):* Moderated by Oliver M. Brandes (POLIS Project on Ecological Governance), with presentations by Tim Morris (Morris Consulting), Jon O'Riordan (POLIS Project on Ecological Governance), Susi Porter-Bopp (Canadian Freshwater Alliance) & Tim Kulchyski (Cowichan Tribes)

---

## **Creating a Water Culture: Reflections from Beyond Canada**

*Big Ideas Dinner Keynote (Day One):* By Tim O'Riordan (University of East Anglia)

Keynote presenter Tim O'Riordan spoke to three major ideas: the culture around water, creating a culture of stewardship, and the establishment of a parliament of B.C. watersheds.

### **The Culture around Water**

O'Riordan articulated that, to him, cultures are like a braiding river; they connect and diverge but ultimately come from a common source and have a common end. According to O'Riordan, creating a water culture includes, but is not limited to:

- A sense of bonding, connections, and bringing people together;
- A sense of understanding and appreciation that you can learn by reflecting and accepting;
- A sense of continuous learning; and
- A notion of common morals, and a collective understanding of the right thing to do.

Culture creates a sense of identity—a sense of what makes us special and what makes our views important. Yet, many young people feel they have no influence on the changing world around them. It is through culture that young people might come to create a sense of purposefulness, specialness, and influence. Through mentorship, youngsters can be the experts and, one day, even become the mentors of the old.

### **Creating a Culture of Stewardship**

Stewardship practices must be targeted and efficient, but also inspiring. At *Watersheds 2014*, people in the broader public who might be receptive to stewardship ideas were called, at different times, the “members of the congregation” and the “persuadables.” A key task of water advocates is engaging these people. Stewardship, then, becomes a broader social project: the shaping of a new water culture. For example, said O'Riordan, some of the best data in the current age comes through phone networks. People who are on the ground, daily, in

watersheds—perhaps fishing or walking dogs—are the ones that see changes in the waterways. A stewardship culture is lively and constantly being revitalized. As such, people who operate within this culture learn to be comfortable taking on the unfamiliar. The stronger a culture of stewardship, the harder it becomes for senior levels of government to ignore its values.

### A Parliament of B.C. Watersheds

O’Riordan concluded his keynote by suggesting the creation of a “parliament of B.C. watersheds.” Individual “water ambassadors” who would represent water interests in their region would come together and work collaboratively to address the different interests and challenges being faced provincially, learn from each other about what works in their home watersheds, and act as a way to bring a diversity of people together to discuss different challenges faced by B.C. watersheds as they arise. The role of a water ambassador, O’Riordan explained, would be to bond people together over a common concern, as well as to ensure that senior levels of government become engaged in a more substantial way with the “parliament.”

A parliament of B.C. watersheds would provide space for differing ideas and cultural revitalization, as well as act as a “social incubator” for the younger generation to feel connected to a culture of stewardship on water. O’Riordan urged delegates to not be worried about the direction we are taking, since the forum exemplified our conviction to creating a culture of water and stewardship.

---

### Where Do We Go from Here? The Future of Watershed Governance

*Closing Panel (Day Three):* Moderated by Oliver M. Brandes (POLIS Project on Ecological Governance), with presentations by Tim Morris (Morris Consulting), Jon O’Riordan (POLIS Project on Ecological Governance), Susi Porter-Bopp (Canadian Freshwater Alliance) & Tim Kulchyski (Cowichan Tribes)

Throughout the forum, presenters repeatedly returned to the idea that we are entering the “age of adaptation.” Rapid change and uncertainty are the new normal—a fact that some presenters referred

to as the “end of stationarity.” Many of the water challenges participants and delegates spoke about witnessing in their home waters, such as droughts, floods, and impacts on fish and aquatic environments, are a result of changes in our climate and hydrological cycle. Such changes and eroding ecological health underscore the need for sustainable water use, and innovative forms of watershed governance that incorporate a diversity of worldviews, knowledge, participants, and approaches.

Watershed governance is emerging as a viable approach to achieving long-term ecological and economic sustainability and better engagement of local communities, including both rights holders and stakeholders, in critical decisions that affect us all. Moderator Oliver M. Brandes noted that to adequately address many of the current and emerging water challenges, water governance needs to change more in the next ten years than it has over the last one hundred years. A key factor for success in moving towards watershed governance is improved collaboration and connections between citizens and decision-makers at the watershed scale.

Several “winning conditions” for watershed governance that were raised by both presenters and delegates at *Watersheds 2014* include:

- Watershed boards, with First Nations co-governance and local government support;
- Delegated powers that enable a functional government framework;
- Governance processes that are transparent and accountable;
- Continuous capacity building and peer-to-peer learning; and
- Sustainable funding sources.

*Watersheds 2014* brought together many committed water advocates who have been working to put these winning conditions into practice to protect watersheds and freshwater resources. These people remind us what is possible in water governance, and that we must continue to be the architects of our water future.

## Concluding Remarks

**W***atersheds 2014* was an opportunity to build on an evolving conversation that has been gathering momentum across British Columbia—and, indeed, across the country—amongst a number of communities, organizations, and individuals. To date, this dialogue has been grounded in real-life learning from experiences of trying to put better stewardship and innovative governance in place from the bottom up. This conversation has focused on the watershed as the critical scale for governance and also as a “space” for building common interest and for aligning efforts around water stewardship, awareness, connectivity, and the diversity of perspectives about and traditions around land and water. Across B.C., there is a strong network of individuals who are passionate about the protection and conservation of the province’s water, and this is coupled with increasing awareness of the integral and historical role that First Nations have in stewarding water for current and future generations. These future generations will be faced with similar, but also many new challenges regarding fresh water.

In B.C., watershed governance will fundamentally require a large shift to effectively reflect the needs, expertise, and experience of local communities, and to integrate First Nations into decision-making and embed more holistic perspectives that view water as something much more than a resource to be managed. Collaboration and cooperation at all levels of government, including firm recognition of First Nations’ rights and title as they pertain to traditional lands and water, will be critical to ensure the sustainable use of our most precious resource.

It is important to note that watershed governance need not be another layer of government or bureaucracy. Rather, the overarching goal is to provide an alternative to current systems of governance and planning that focus too narrowly on single sectors, thereby isolating water from its broader interactions across communities and within ecosystems. Coming out of the *Watersheds 2014* forum, the message was loud and clear: Local communities and First Nations want to see their knowledge and interests reflected in decisions that affect their watersheds. They are ready to be leaders in freshwater stewardship and create positive change in their watersheds for generations to come.

# Appendices

## APPENDIX 1: WATERSHEDS 2014 PRESENTER BIOGRAPHIES



### Jason Alexandra

Jason Alexandra has 30 years of experience working at intersection of research, policy, and practice in conservation, natural resources management, and sustainable land-use. Jason has published widely and run innovative horticultural, revegetation, forestry, and farming businesses. Jason has held senior roles including Executive Director of the Earthwatch Institute and Director of Land & Water Australia and the Port Phillip CMA. Between 2008 and 2013 Jason was a senior executive at the Murray Darling Basin Authority (MDBA) where he had responsibilities for a range of water policy, research, and ecosystem management programs. He is the managing director of Alexandra and Associates Pty Ltd, a specialist consulting company, and an honorary fellow at Charles Darwin University.



### David Anderson

David Anderson's experiences include an Olympic silver medal (rowing), foreign service, environmental consultant, professor, Member of the BC Legislature, and Member of Parliament. David was elected as a Member of Parliament six times and held four Cabinet portfolios including Transport, Fisheries and Oceans, and Revenue. In addition, he was Canada's longest standing Environment Minister. A fisherman, David is an active outdoors enthusiast and has a special fondness for the Cowichan region. In the 1990s, he was instrumental in the Cowichan River being designated as a Canadian Heritage River. David has received numerous awards and two honorary degrees for his support for the environment.



### Cheri Ayers

Cheri has worked for First Nations as a biologist and as a consultant since 1998. She has been involved in watershed and habitat restoration, marine inventories, stewardship initiatives, technical advisory boards, fishery initiatives, and drafting of the fisheries chapter for the Hul'q'umi'num Treaty. She has worked throughout her career to better understand traditional practices of First Nations related to caring for the environment, and completed a Masters of Science on Hul'q'umi'num perspectives on marine conservation.



### Jesse Baltutis

Jesse Baltutis joined the POLIS Water Sustainability Project in November 2011 as its Water Policy and Governance Project Coordinator. In September 2013 he started his Ph.D. in the University of Victoria's Department of Geography, and now works at POLIS in a limited researcher role. From 2011 to 2013, Jesse's work focused on policy development and stakeholder engagement around the Water Act modernization process in B.C. network development, and issue identification regarding the water-energy nexus in B.C., as well as developing POLIS' transboundary water management research. He has also worked with the United Nations Environment Programme in Kenya and Friends of the Earth Middle East in Palestine. In 2009, he completed his Masters of Science in Environment and Development, where his research focused on fairness and equity in transboundary water management in the Jordan River basin.



### Kelly Bannister

Dr. Kelly Bannister is Co-Director of the POLIS Project on Ecological Governance, a Research Associate at the Centre for Global Studies, and an Adjunct Associate Professor in the Faculty of Human and Social Development at the University of Victoria. Kelly applies her background in ethnobiology to policy-relevant research and collaborative education on biocultural diversity. Her focus is on ethical and legal issues in research involving biodiversity and Indigenous cultural knowledge, and the role of collaborative methods, ethical guidance, and governance tools to address power relations and facilitate equitable research design. Kelly is currently a Steering Committee member of the Intellectual Property Issues in Cultural Heritage project, based at SFU and funded by the MCRI program of SSHRC, and Co-chair of the Ethics Program for the International Society of Ethnobiology (ISE).



### Margaret Birch

Margaret Birch is a Registered Professional Biologist and joined the City of Coquitlam as their Environmental Services Coordinator in 2007. She has worked in the environmental and fisheries field for more than thirty years and brings work experience from Federal

Fisheries Canada, the provincial government, and the private sector to the position. Currently based in the City's Environmental Services Division, Engineering and Public Works, Margaret oversees environmental assessment reviews of development and infrastructure projects, and serves as the City representative on several local and regional watershed, fisheries, wildlife, vector-related environmental planning and advisory committees. In late 2007, the City of Coquitlam formed a partnership with the Kwikwetlem First Nation, and embarked on bringing the diverse watershed sectors of interests together to develop a Coquitlam River watershed governance framework. Margaret was directly involved over the ensuing years of community visioning and engagement, which led to the formation of the Coquitlam River Watershed Roundtable early in 2011.



#### **Oliver M. Brandes**

Oliver M. Brandes is an economist and lawyer by training and a trans-disciplinarian by design. He serves as co-director of the POLIS Project on Ecological Governance at the University of Victoria's Centre for Global Studies and leads the POLIS Water Sustainability Project, where his work focuses on water sustainability, sound resource management, public policy development, and ecologically based legal and institutional reform. Oliver is an adjunct professor at the University of Victoria Faculty of Law and School of Public Administration. He is a founding member of the Forum for Leadership on Water (FLOW), which he currently co-chairs, and B.C.'s Convening for Action on Vancouver Island (CAVI) Leadership Team. In 2009, he helped lead the writing of the book *Making the Most of the Water We Have: The Soft Path Approach to Water Management*, which brought together the results of the first-ever international water soft path study in a comprehensive edited book.



#### **Albie Joe Charlie (Whulquletse)**

Albie Joseph Charlie is an elected official for Cowichan Tribes. He enjoys the outdoors, including fishing, and hunting, and enjoys assisting in the kitchen cooking for Longhouse ceremonies. Albie is a retired Social Worker, and he spends majority of his time assisting families in the area of culture.



#### **Renee Clark**

Renee Clark is the Water Quality Manager for the Regional District of North Okanagan (RDNO), with over 25 years in the Water Quality and Stewardship field. Her role has included

the development and implementation of the Water Quality Program for Greater Vernon Water, Source Assessments and Response Plans, Emergency Response, and Drought Management and Response plans. Ongoing drinking water communications and reports to the public, stakeholders, elected officials, health authority, and the province is challenging, but has been very rewarding.



#### **Deborah Curran**

Deborah is the Hakai Professor in Environmental Law and Sustainability at University of Victoria Law. Focusing primarily on land use law, Deborah has significant experience in analyzing and making recommendations on how local governments approach regulation and planning for environmental protection, particularly in the context of smart growth and ecosystem integrity.



#### **Lauren Dobell**

Lauren joined Vancity's community investment team in 2011 as Director of Partnerships. The role draws on an array of previous episodes in international development (Southern African reconciliation and reconstruction strategies in particular), government relations, public policy-shaping at all levels, journalism, and academia, as well as the Canadian Councils (for international cooperation, unity, learning) that are an oddly recurring theme in her resume. During her bi-hemisphere, tri-continent years, she once enjoyed seven consecutive summers, and carelessly misplaced much luggage (both literal and metaphorical), countless pairs of sunglasses, and occasionally her sense of perspective. These days, the real economy-focused, wealth-redefining good work going on in and around Vancity fuels an overriding optimism.



#### **Mike Donnelly**

Mike Donnelly is the manager of water and utility services for the Regional District of Nanaimo. He manages the region's eight water systems and the Drinking Water and Watershed Protection program. The Drinking Water and Watershed Protection program is relatively new to the region and was put in place to develop plans and strategies aimed at protecting the region's water resources. Combining the typical duties of a public works manager with the watershed protection planning function has been an interesting challenge for Mike. He hopes that today's discussions will help him move that program forward and perhaps provide some insight for others struggling with this important topic.





### **Eli Enns**

Eli is a Nuu-chah-nulth Canadian political scientist who has focused in Constitutional Law, International Dispute Resolution, and Ecological Governance. He is the co-founder of the Ha'uukmin Tribal Park in Clayoquot Sound on the west coast of Vancouver Island. Eli is the great grandson of Nah-wah-sum - public speaker and historian for Wickaninnish, Tyee Ha'wiih of Tla-o qui-aht. A proud father of five, Eli holds himself accountable to Future Ancestors and invests his time in several related capacities: Committee Member - Canadian Commission for UNESCO Man and the Biosphere National Committee; Director - Plenty Canada; Business Development Liaison - Ecotrust Canada; and as the North American Regional Coordinator for the Indigenous Peoples' and Community Conserved Territories and Areas Consortium (ICCAs). Eli has developed an Indigenous Watershed Management Area Program which aims to compliment an Ecological Governance approach with a well thought out Ecological Economics component.



### **Mike Fox**

Mike Fox has been working in Municipal Government for over 12 years. Mike's current responsibilities as Manager of Operations and Environmental Services for the City of Kimberley include overseeing engineering, capital works, public works operations, roads, sidewalks, water, sewer collection, wastewater treatment, solid waste collection, electrical, fleet, and equipment. While working in Nova Scotia, Mike helped designate a community drinking watershed. Since then, he has been a strong advocate for clean drinking water and protecting watersheds. Mike sits on Mark Creek and Matthew Creek Watershed Advisory for the City of Kimberley.



### **Ken Gauthier**

Ken is a Social Intrapreneur at Urban Systems ([www.urbansystems.ca](http://www.urbansystems.ca)), a 40 year old consultancy that specializes in community development across Western Canada. After a decade working as a market based engineering consultant, then another 5 years as a Managing Partner and now as a Co-Leader of both Urban Systems and the Urban Systems Foundation, Ken has more recently been focused on bringing the spirit of social innovation to and through the company. Continuously inspired to find the better path for Urban Systems and socially-minded for-profit companies, Ken is actively engaged in building momentum, championing causes, and developing business opportunities that positively impact community and the business bottom line.



### **Deborah Harford**

As executive director of the Adaptation to Climate Change Team (ACT), Deborah Harford is responsible for development of the initiative's pioneering vision and its partnerships with the public and private sectors, as well as overall coordination and management of the program. She directs and produces ACT's policy recommendations for effective adaptation strategies at all levels of government, as well as communication and promotion of the program's outcomes. Through Deborah's efforts, ACT has created networks between local, national, and international climate change research practitioners, NGOs, industry representatives, all levels of government, First Nations groups, and local communities. Deborah's work with ACT has gained her national recognition as a resource for those seeking information on climate change adaptation and practical coping strategies.



### **Kirsten Harma**

Kirsten has worked to help people understand their connection with freshwater ecosystems in a diversity of cultural and geographic contexts. She has researched the social and political drivers of water pollution in Mexico, worked with community volunteers on a stream biomonitoring program in Costa Rica, and help developed wetland protection policies in northwest Washington. She currently coordinates the water monitoring, community education, and watershed governance initiatives for the Lake Windermere Ambassadors, a lake stewardship NGO based in the East Kootenays, BC. Kirsten has a Master of Science degree in Resource Management and Environmental Studies from the University of British Columbia (2011), and a Bachelor of Science in Environmental Science from Western Washington University (2001).



### **Martin Hoffman**

Martin is in his second year of law school at the University of Victoria. He has a particular interest in the areas of environmental and Indigenous law. As part of his work with the Environmental Law Centre, he has done research on the purpose and function of the Water Act, as well as examining other legal tools for watershed management. Martin prefers to spend his spare time out on the ocean in his kayak.



### **Rodger Hunter**

Since 2005, Rodger has worked as a management consultant with Vis-a-Vis Management Resources Inc. His areas of specialty include strategic and business planning, business/program reviews, governance, project management, and sustainable watershed management. Prior to becoming a management consultant, Rodger worked in a variety of positions with the B.C. provincial government, including Coastal and Wetland Specialist, Manager of the Habitat Conservation Fund, Manager of Economic Development Policy at Treasury Board Staff, Treaty Negotiator, Executive Director of Environmental Protection, and Assistant Deputy Minister. In July 2009, he was invited to work with the partners responsible for developing the Cowichan Basin Water Management Plan to establish the Cowichan Watershed Board to implement that plan. Since 2010, Rodger has served as the part-time coordinator of the Cowichan Watershed Board. He has a M.Sc. in Biological Sciences from Brock University and an MPA from the University of Victoria.



### **Brian Huntington**

Brian Huntington is Associate Director of the Skeena Watershed Conservation Coalition, based in northwest BC. Brian graduated from the University of Montana with a BSc in Resource Conservation and Wildlife Biology. Since 2004, Brian has been organizing baseline inventory research for selected fish, wildlife, and cultural resources in the upper Skeena watershed. In 2007, he was adopted into Wilp Gwininitxw, a Gitksan House group with territories in the upper Skeena. Cultural heritage and ecological research on Gwininitxw territory has inspired Wilp Gwininitxw to begin a land use planning process aimed at protecting and enhancing cultural and ecological values in the territory and watershed.



### **Rob Hutchins**

Rob Hutchins recently retired from a career as a classroom teacher and school counsellor. He is presently serving his seventh term as mayor of the Town of Ladysmith. Rob also serves as Chair of Cowichan Valley Regional District, Co-Chair of the Cowichan Watershed Board, Co-Chair of the Cowichan Community Health Network and a Director of the Island Coastal Economic Trust. Rob lives in Ladysmith with his wife Susan. They have five adult children and four grandchildren. Rob's family owns and operates The Old Town Bakery and the Wild Poppy on 1st Avenue, Ladysmith.



### **Lydia Hwitsum**

Lydia Hwitsum served as Chief Councillor of Cowichan Tribes for three terms between 1997 and 2011. Lydia is currently the Chair of BC's First Nation Health Authority. She has also worked as a Political Executive with the First Nations Summit and a Principle with Hwitsum Consulting. Lydia has volunteered with the Minerva Foundation, the International Centre for Human Rights and Democratic Development, the Valley Native Friendship Centre, and the Indian Home Makers Association. Lydia was one of the founding Co-Chairs of the Cowichan Watershed Board and was instrumental to its early successes.



### **Nelson Jatel**

Nelson is the Water Stewardship Director at the Okanagan Basin Water Board. He works with the Okanagan Water Stewardship Council to develop practical solutions that reflect the best available science, innovative policy, and consensus approaches. Nelson has a background in freshwater science and was previously the Executive Director of the Okanagan Partnership. In his spare time, Nelson enjoys spending time at his family vineyard in Naramata.



### **Amanda Karst**

Amanda is a Research Associate at the Centre for Indigenous Environmental Resources (CIER). For the last decade, she has worked with First Nations and Métis communities across Canada on environmental initiatives. Her work at CIER has involved watershed planning, youth engagement, traditional foods and medicines, climate change, and environmental monitoring. She has worked on CIER water projects such as the First Nations Watershed Planning Guidebooks, Youth Water Leaders program, and First Nations Water Security project. She obtained her M.Sc. in Biology (ethnobotany/plant ecology) from the University of Victoria in 2005. Amanda is Métis, originally from Saskatchewan.



### **Tim Kulchyski**

Tim has worked with a variety of clients, assessing upland, freshwater, and marine ecosystems for 15 years. His work often involves examining the impacts of development on cultural values. Recently, he participated in a program to control invasive plants in the watershed, fisheries and aquatic plant and shellfish inventory, and monitoring activities. Tim has travelled extensively, studying the interaction between resource issues and cultural heritage. Over the past several years he was involved in a major

Hul'qumi'num language revitalization initiative. Tim has been a member of the Cowichan Watershed Board since its inception in 2010.



#### **Kelly Lerigny**

Kelly Lerigny is the current chair of the Real Estate Foundation of BC and a residential REALTOR® with 25 years of experience in the Chilliwack area. The BC Real Estate Association appointed Kelly to the Foundation board in 2010,

where she shares the responsibilities of the Foundation's governance with the other board members. In her previous role as past president of the BC Real Estate Association, Kelly was the Quality of Life champion for the province and across Canada.



#### **Heather Leschied**

As Wildsight's Water Program Manager, Heather saw the award-winning and federally recognized "Lake Windermere Project" through to completion. She has been an active participant in water

stewardship efforts in the Columbia Basin for the past decade. She sits on the Columbia Basin Watershed Network Steering Committee, Lake Windermere Ambassadors Board, Friends of Kootenay Lake Steering Committee, and has been involved in the East Kootenay Integrated Lake Management Partnership since its inception in 2006. She is a certified Streamkeepers and CABIN (Canadian Aquatic Biomonitoring Network) trainer and delivers workshops for groups from across Canada. Heather received a degree in Environmental Studies and Geography from Lakehead University in Thunder Bay, Ontario, on the North Shore of Lake Superior.



#### **Steve Litke**

Steve graduated from Simon Fraser University in 1995 with a Master's Degree in Resource and Environmental Management. Steve has worked with the Fraser Basin Council since 1998

and is the Senior Manager responsible for the Council's Watersheds and Water Resources Program. He has overseen the development of guidance documents on watershed planning and collaborative watershed governance. He and the FBC team have designed and facilitated numerous workshops throughout BC on water issues, stewardship, planning, governance, and exploring opportunities for collaborative action. He also has extensive experience with the use of sustainability indicators to measure and report on the health of the Fraser River Basin and its regions.



#### **Lana Lowe**

Lana Lowe is the Director of the Fort Nelson First Nation Lands Department. She holds an undergraduate degree in Geography and a Master's degree in Indigenous Governance from the

University of Victoria. Lana has worked with Indigenous organizations in North and Central America, including the Union of BC Indian Chiefs and the Nahual Foundation in Guatemala, CA. Lana is a proud member of the Fort Nelson First Nation.



#### **Luschiim (Arvid Charlie)**

Luschiim (Arvid Charlie) is a Cowichan Elder who holds an honorary doctorate from Vancouver Island University for his extensive knowledge of the land, its resources, and traditional practices.

He is the son of Violet Charlie and late Simon Charlie. Luschiim has spent decades on the waters of the traditional territory of Cowichan Tribes First Nation. Initially a canoe racer, he became a skipper in both canoe races and Tribal Journeys. Luschiim knows many marine and terrestrial plant and animal resources, their uses, and sustainable harvesting practices. He is greatly concerned about impending pipeline expansion and increased tanker traffic both due to impacts on the environment such as increased erosion and spills that will affect salmon and impact the lives and the safety of canoeist and kayakers who are exposed to more frequent tanker wakes. Luschiim has served as an elected member of Cowichan Tribes' Council for over 40 years.



#### **Tony Maas**

Tony Maas has spent the last 10 years thinking and writing about water policy and governance and advocating for the health of Canada's lakes and rivers. He is a founding member and former chair

of the Forum for Leadership on Water and currently serves as chair of the External Advisory Board for the Water Institute at the University of Waterloo and the Steering Committee of the Canadian Freshwater Alliance. Tony recently stepped down from his position as national Freshwater Program Director for WWF-Canada and is currently working as an independent consultant providing policy research and strategic guidance to organizations in the not-for-profit sector. He lives in Kitchener, Ontario and holds a Master of Environmental Studies from the University of Waterloo where he studied water policy and governance.





### Ryan van der Marel

Ryan's passion for freshwater systems has taken him from the Okavango's "Every River has its People" project in sub-Saharan Africa to guiding canoe trips across Canada. After moving back to the West Kootenays, Ryan began consulting on species-at-risk projects and lake management planning for Kootenay Lake. Using the template set by the East Kootenay Integrated Lake Management Partnership, he chairs the multi-agency Kootenay Lake Partnership to develop sound science on which to base shoreline guidance documents. Ryan is also an active steering committee member of the Friends of Kootenay Lake and a youth outdoor leadership and experiential education instructor. Ryan received an Honours Bachelor of Global Development Studies and Geography from Queen's University in Kingston, Ontario, and a Masters of Resource and Environmental Management from Dalhousie University in Halifax, Nova Scotia.



### Madelaine Martin

Madelaine works as an Infrastructure Resource Officer for the Ministry of Community, Sport, and Cultural Development's Local Government Division, and was committee chair for revision of the BC-specific Water Conservation Planning Guide. She has firsthand experience with water systems, having carried out planning and decision making for new works at the municipal level. With a background in asset management, environmental science, and economics, she supports sustainable and well-planned infrastructure development.



### Angus McAllister

Angus McAllister is President of McAllister Opinion Research. McAllister uses an array of qualitative and quantitative interview, data capture, and analytical tools help clients understand what works and what doesn't in engaging and moving the constituencies that matter to them. In the past decade, McAllister Opinion Research has interviewed over 350,000 thought leaders and citizens in over a dozen nations. McAllister clients include major universities in Canada and the United States, governments in four provinces, seven federal government agencies, and several NGOs. Prior to founding McAllister in 2001, Angus served as Vice President, Global Research with Ipsos-Reid, and prior to that was Vice President with Environics International in Toronto. He also enjoyed five years with the Ontario Ministry of the Environment and Energy in the early 1990s. Angus studied sociology and statistics to earn his Master's degree from Carleton University in 1989. Angus is also co-founder and owner of the online social media platform [www.sayzu.com](http://www.sayzu.com).



### Lorna Medd

Dr Lorna Medd began her career as a general practitioner and later added population health at the University of Manitoba Northern Medical Unit. Her focus there was on innovative community health practices in Primary Health Care and remote fly-in First Nation communities. After completing specialty training in Community Medicine, she worked in Public Health as a Medical Health Officer (MHO). From 1994–2007, she was the MHO for the Central Interior based in Prince George, and she was MHO for Island Health based in Nanaimo until 2010, when she retired. Her areas of focus include food security and ecosystem health. Her personal interests include animal welfare, alternative energy, and organic gardening.



### Simon Mitchell

Simon J. Mitchell leads WWF's effort on the St. John River and advocates for a healthy river for humans and nature. He joined WWF in August 2012 after spending over a decade working in a variety of capacities for community-based watershed groups along the St. John River as part of a varied career in the forest and now water conservation fields. While working with the grassroots to protect some of the most unique landscapes in the region he has pursued opportunities for residents and visitors to learn about and experience our rich living heritage. Simon is an Associate with Waterlution and the Canadian Rivers Institute.



### Michele-Lee Moore

Michele-Lee Moore is an Assistant Professor in the University of Victoria's Department of Geography. With a passion for creating positive transformative change and a belief that public policy and institutional structures and processes are the areas where she can best contribute to that change, Michele-Lee's research focuses on global and local water governance, networks, social innovation, and resilience. Her current research program is examining how innovation in water governance is generated, supported, adopted, or institutionalized by Canada's water-related activities at the global level. Michele-Lee is also part of the Resilience Alliance Young Scholars (RAYS) research collective. Previously she worked with the Waterloo Institute for Social Innovation and Resilience, and at the B.C. Ministry of Environment. Michele-Lee holds a BSc in Ecology, an MSc in Geography, and a PhD in Global Governance.



### Joan Morris

Joan Morris, Sellemah, is an elder from the Songhees Nation. She lived in the first 10 years of her life at Tl'ches (Chatham Island) off of Oak Bay, Victoria. From her grandparents and her great grandmother, Ch'emíyekw, she learned quickly about the lands and waters of her home place and how to care for them and to live a safe and healthy lifestyle. She was taken to the Kuper Island residential school but also travelled seasonally with her family as a girl to pick fruit on the islands in Puget Sound and at Yakima. She has been a caregiver at hospitals and an advisor in many initiatives around culture, environment, and health. She has had a deep interest in plants, animals, and water, as well as in social justice issues, especially around truth and reconciliation in connection with the residential schools. She has also given a voice to those who suffered injustices in the Nanaimo Indian Hospital, where her mother was hospitalized for many years.



### Tim Morris

Tim Morris is a consultant specializing in strategic and policy advice related to fresh water protection. Over the last decade, Tim has worked to protect Canada's lakes and rivers as an academic, advocate, and grant-maker. For five years, Tim managed the fresh water program at the Walter and Duncan Gordon Foundation, a national independent Foundation dedicated to the development of sound and innovative public policy. He has a Masters of Laws focused on water law and policy in the Great Lakes region, and has authored numerous articles and reports on water policy. Tim has also served on the advisory committee to the former water program of the National Roundtable on the Environment and Economy and as a member of the Board of the Canadian Environmental Grantmakers Network. Tim was recognized as one of Water's Next: Best and Brightest in Water 2011 by *Water Canada Magazine*.



### Sheila Muxlow

Sheila is the Director with the Water-Wealth Project based out of her hometown of Chilliwack, B.C. She comes to water advocacy after nearly a decade of working on social and environmental justice issues. Sheila is grounded in a respect for the rights and responsibilities of people who call a place home, and believes that long-term solutions to water problems need to come from a local level of planning, monitoring and enforcement. Sheila has a Liberal Arts diploma from the University of the Fraser Valley and a degree in International Development and Globalization studies from the University of Ottawa. She spent several years living and working in Australia, China and Ethiopia.



### Linda Nowlan

Linda Nowlan is the Interim Regional Director, British Columbia and Pacific for WWF-Canada in Vancouver. She was a member of the Canadian Council of Academies' Expert Panel on Groundwater, the BC government's Technical Advisory Committee on the Water Act, the BC Independent Drinking Water Review Panel, and Vancouver's Greenest City Action Team. A Fraser Basin Council director since 2010, she currently chairs the Watersheds and Water Resources Committee. Linda is an environmental lawyer, the former Executive Director of West Coast Environmental Law, and a member of the IUCN Commission on Environmental Law. She has written and published widely on water and biodiversity protection.



### Jon O'Riordan

Dr. Jon O'Riordan is a former Deputy Minister of the Ministry of Sustainable Resource Management in the British Columbia Provincial Government. He has completed 35 years in the public service, mainly with the Provincial Government, in environmental management and land and resource planning. In his most recent position at the Ministry of Sustainable Resource Management, he was responsible for completing six regional land and resource management plans. Dr. O'Riordan joined the Water Sustainability Project as a strategic water policy advisor in 2007, where he focuses on provincial water policy reform and the ecological governance of water management.



### Tim O'Riordan

Professor O'Riordan is Emeritus Professor of Environmental Sciences at the University of East Anglia, U.K. He has edited a number of books on the institutional aspects of global environmental change, policy, and practice, and led two international research projects on the transition to sustainability in the European Union (1995–2002). He is actively involved in research addressing the themes associated with better governance for sustainability. He is also active in the evolution of sustainability science partnerships. His direct work relates to designing future coastlines in East Anglia in England and in Portugal, to ensure they are ready for sea level rise and the creation of sound economies and societies for a sustainable future. His other research interests cover interdisciplinary approaches to pursuing the transition to sustainability, risk perception and communication, business, and social virtue.





### Natasha Overduin

Natasha Overduin joined the POLIS Water Sustainability Project in September 2013, bringing with her a keen interest in watershed management and integrated environmental assessment. Her work primarily focuses on supporting the Canadian Water Network-funded project “Building Capacity for Success: Towards Watershed Governance in British Columbia and Beyond.” In 2012, she completed her Bachelor of Public Affairs and Policy Management at Carleton University. Her honours thesis examined the application of the collaborative watershed governance model in two B.C. watersheds—the Okanagan and Fraser basins. Natasha is beginning her MA in Geography at the University of Victoria. Working primarily in the Water, Innovation, and Global Governance (WIGG) Lab with Dr. Michele-Lee Moore, Natasha’s research will focus on water management issues in the Mackenzie River basin.



### Margot Parkes

Dr. Margot Parkes is a Canada Research Chair in Health, Ecosystems, and Society and an Associate Professor in the School of Health Sciences at the University of Northern British Columbia (UNBC).

Margot’s work probes our understanding of the environment as a context for health, and seeks to integrate social and ecological determinants of health. Her work brings together organizations, communities, and researchers to focus on watersheds as settings for health, and to design education, research and governance options that foreground the relationships among health, social equity, and ecosystem sustainability. Margot’s past work as a medical doctor and subsequent training in human ecology and public health have also fuelled innovative teaching and leadership roles in the field of ecohealth. Dr. Parkes moved to Northern BC in 2009, where she has had the opportunity to work with a variety of groups who share the converging goals of “healthy people, living in healthy communities and healthy environments.”



### Ryan Plummer

Ryan Plummer is Director of the Brock Environmental Sustainability Research Centre (ESRC) and Professor in the Department of Tourism and Environment at Brock University (Canada). He is also a Senior Research Fellow with the Stockholm Resilience Centre (Sweden) and a Scientific Director of the Canadian Rivers Institute. His multi-faceted program of research broadly concerns the governance of social-ecological systems. Water resources are the context in which his research mainly occurs and he is a Faculty Investigator in the Water Policy and Governance Group at the

University of Waterloo. Findings from his research have been published in leading international journals such as *Ecological Economics*, *Ecology and Society*, *Environmental Management*, *Frontiers in Ecology and Society*, *Global Environmental Change*, *Journal of Environmental Management*, *Society and Natural Resources* and the UN journal *Natural Resources Forum*.



### Susi Porter-Bopp

Susi is the BC Organizer with the Canadian Freshwater Alliance. She works with grassroots and First Nations organizations and groups active on freshwater issues across the province that are seeking to enhance their public engagement and outreach.



### Tom Rutherford

Tom Rutherford has been a fisheries biologist for over 33 years, living and working on Haida Gwaii and in the Cowichan Valley. For most of that time Tom has focused his efforts on supporting community watershed stewardship. He is currently acting Sector Head for Fisheries and Oceans Canada’s resource restoration and community involvement programming on B.C.’s South Coast.



### Wayne Salewski

Wayne Salewski lives in Vanderhoof, BC and loves it. He has been retired since 2009 and has taken this opportunity to work for his community, region, and province by working to adapt water stewardship values into our economic fabric, and to restore the many streams that flow into the Nechako River. He has had the opportunity to be involved with many individuals and organizations over the last 40 years but believes that this has been the best of times and looks forward to making a difference. Foremost on his agenda has been working on conservation issues that bring a wider understanding of the importance of a balanced resource extraction and acknowledgement of cumulative effects. He has been recognized by Earth Day Canada in 2011 and recently by the Fraser Basin Council/Department of Fisheries and Oceans with the BC Interior Stewardship Award for Ecosystems Excellence.



### Marlowe Sam

Dr. Marlowe Sam is member of the Colville Confederated Tribes (CCT) of Washington. The primary focus of his research deals with indigenous/aboriginal water rights of the Okanagan (Syilx) peoples. Currently, he is a sessional instructor at the University of British Columbia’s Okanagan campus and The En’owkin Centre.



### Calvin Sandborn

Calvin is one of BC's most experienced public interest environmental lawyers. He is former counsel to West Coast Environmental Law Association and the Forest Practices Board, and was Associate to the historic Commission on Resources and Environment. He has successfully litigated many high profile cases (particularly in the areas of forestry and endangered species) and instigated broad law reform. In 2011, Calvin was named an Honourary Citizen of the City of Victoria and received the Andrew Thompson Award, BC's top prize for Environmental Advocacy.



### Anna Warwick Sears

Anna is the Executive Director of the Okanagan Basin Water Board. She leads the Board's programs for sustainable water management in the Okanagan Basin, environmental grants, and aquatic weed management. She is a strong advocate for progressive water policy in BC, and is a passionate communicator, building bridges between science, policy, communities, and all parts of the water sector. Anna has a background in population biology and watershed planning, and was previously the Research Director for an environmental organization in Sonoma County, California.



### Chip Seymour

Chief William C. (Chip) Seymour served as a Cowichan Tribes Councillor from 2005 to 2013. In 2013, he was elected Chief. He grew up exploring the Cowichan watershed, the river, and its tributaries. As Chief, his primary focuses are education, employment, training, culture, housing, and working to re-establish a sense of hope among young people. In his role of Co-Chair of the Cowichan Watershed Board, he intends to reinforce the importance of whole watershed thinking and collaborative approaches to achieving the Watershed Board's targets. He is particularly concerned about the impacts of forest practices on water quality, fisheries, and other resources. Chip has coached sports for over thirty years, initially coaching lacrosse and then soccer.



### Dan Smith

Dan Smith is a member of the Wei Wai Kum First Nation (Campbell River) of the Laich-Kwil-Tach First Nations. He has an extensive history of working with First Nations, Aboriginal organizations, and the federal government. He was elected to the three-member political executive of the First Nations Summit for two consecutive terms between June 2008 and 2013,

and he was appointed to the BC Treaty Commission in 2013. Dan has also served as Vice President of the Native Council of Canada, President of the United Native Nations, and member of the BC Human Rights Commission, as well as numerous other boards and committees. He has worked in senior positions with the Department of Fisheries and Oceans, Indian and Northern Affairs Canada, Heritage Canada, and Canada Employment and Immigration.



### James Snider

James has provided spatial analysis and conservation planning expertise to the WWF-Canada team since 2007. Building on his background in landscape ecology and conservation biology at McGill University and environmental impact assessment and statistics at Concordia University, he provides landscape analysis and mapping support for WWF's freshwater, arctic, and climate programs.



### Carrie Terbasket

Carrie Terbasket is a member of the Lower Similkameen Indian Band of the Okanagan Nation located in the Southern Interior of British Columbia. Carrie is an active spokeswoman for the preservation of the natural world. She believes that women have a strong connection to the land and the water and as such should have a place in the forefront of land based discussions and decision-making. She is currently in her second term on the National Aboriginal Council on Species at Risk (NACOSAR), a council responsible to advise the federal Minister of Environment on the administration of the Species at Risk Act (SARA). She is Chair and co-founder of the South Okanagan-Similkameen Syilx Environmental Committee (SOSSEC), a group who strive for meaningful First Nations participation in the conservation arena throughout the Okanagan Nation and beyond. Carrie is also the proud mother of Madison, Liam, and Abigail.



### Andrew Thomson

Andy grew up in Nanaimo, earned his degree in Marine Biology from UBC, and worked on diverse projects with a primary focus on the effects of escaped Atlantic salmon from fish farms. From 2005 to early 2012, he was the Director of Aquaculture Management with the Regional Aquaculture Coordination Office of the Department of Fisheries and Oceans. Andy is now DFO's Area Director for South Coast BC. He lives with his wife and her three children in beautiful Ladysmith.



### **Nancy Turner**

Nancy Turner is an ethnobotanist, Distinguished Professor and Hakai Professor in Ethnoecology in the School of Environmental Studies at the University of Victoria. She has worked with First Nations elders and cultural specialists in northwestern North America for over 40 years, documenting and promoting their traditional knowledge of plants and habitats. She has authored and co-authored over 20 books and over 125 book chapters and papers. Her awards include membership in the Order of British Columbia (1999) and the Order of Canada (2009).



### **Stephen Tyler**

Dr. Stephen Tyler is the founder and president of Adaptive Resource Management Ltd in Victoria B.C., an interdisciplinary consulting practice specializing in community-oriented climate adaptation and natural resource management. He develops practical tools and concepts for climate adaptation and sustainable land and resource management through applied collaborative research, capacity building, and synthesis of effective policy and practice. His areas of expertise include: climate change and adaptation; institutional and socio-economic issues in natural resource management; research management and utilization; and applications of interdisciplinary methods. Dr. Tyler has worked as a policy analyst, consultant, and researcher on environment and development issues in Canada, the U.S. and Asia. He is the recipient of a national-level Friendship Prize from the government of the People's Republic of China for his collaborative work on water resource management. He holds a PhD in urban and regional planning from the University of California, Berkeley.



### **Barbara Veale**

Barbara Veale is the Manager of Planning and Regulation Services for the Halton Region Conservation Authority based in Burlington, Ontario. Prior to accepting this position, Barb was a long-term employee of the Grand River Conservation Authority where she led several planning initiatives including the designation of the Grand River as a Canadian Heritage River. Barb has a particular interest in integrated watershed management. In 2004, she was part of a Canadian delegation from the University of Waterloo to China, providing advice on participatory approaches for managing water resources. Barb completed her doctoral studies at the University of Waterloo in 2010. Her research focused on watershed governance and explored the use of watershed report cards and other indicator reports as decision tools for watershed management in Canada.



### **Jennifer Vigano**

Jennifer Vigano is a policy advisor with the Water Strategies and Conservation group of the Water Protection and Sustainability Branch within the Ministry of Environment. Jennifer has worked with the Ministry of Environment on water and intergovernmental issues since 2008. Prior to this, Jennifer worked nationally on the development of water and wastewater policy, internationally in forest conservation, and as a professional forester in north central BC. Jennifer has been working on Living Water Smart and the Water Sustainability Act since 2010.



### **Graham Watt**

Graham Watt is a geographer and environmental planner with a love for mountains and rivers. Graham has worked in a number of watersheds in B.C. and Alberta, including the North Saskatchewan Watershed, and is currently the coordinator for the Kettle River Watershed Management Plan for the Regional District of Kootenay Boundary.



### **Ted White**

Ted White is the Manager of Water Strategies and Conservation for the Water Protection and Sustainability Branch in the Ministry of Environment. Ted has been working with the Ministry on different Water files, including water use planning, forestry and water quality, and water policy since 1994. Ted was part of the team that developed Living Water Smart: BC's Water Plan and has been part of the Water Act Modernization Project since its inception.



### **Reg Whiten**

Reg Whiten is a resource stewardship agrologist, planner, and adult educator based at Moberly Lake in north-east BC. He has operated a consulting practice, InterraPlan Inc., for the past twenty years, serving aboriginal communities, industry, government, and non-profit organizations. Through work overseas and across northern Canada, Reg has developed a specialization in integrated rural development and resource stewardship planning with a focus on rural watersheds. His consulting work includes negotiation of forest resource-access agreements, preparation of regional and local land-use plans, and development of training and community resource management programs. Milestones in Reg's advocacy work include formation of the Peace River Watershed Council, and the Boreal Centre for Conservation Enterprise. In late 2010, Reg contracted with the City of Dawson Creek as Watershed Steward and coordinator of its Watershed Stewardship program. Last year, this work was nominated for the British Columbia Excellence in Water Stewardship Award.





**Brian Wilkes**

Brian is a Victoria, BC based biologist and environmental consultant. He has worked on numerous water and watershed related projects in Canada and in several international settings.

Brian has a special interest in governance arrangements to improve water and watershed management. He played a key role in organizing initial activities in BC on collaborative watershed governance, and has been a long-time friend and supporter of the POLIS project's efforts in this regard. Since 2010, he has served as the volunteer chair of the Water Advisory Committee to the Capital Region's Water Supply Commission.



**Jody Wilson-Raybould**

Regional Chief Puglaas (Jody Wilson-Raybould) is a descendant of the Musgamagw Tsawataineuk and Laich-Kwil-Tach peoples. Jody was first elected Regional Chief of the BC

Assembly of First Nations in 2009 and re-elected in November 2012 by the 203 First Nations in BC. As Regional Chief, Jody has championed the advancement of First Nations' strong and appropriate governance, fair access to lands and resources, improved education and individual health. In addition to her responsibilities as Regional Chief, Jody is an elected member of Council in her home community of We Wai Kai, a role that she credits for strengthening her understanding and commitment to work at the provincial and national level advocating for strong and appropriate First Nations' governance. She is a member of the We Wai Kai Nation and lives with her husband, Tim Raybould, at Cape Mudge Village, Quadra Island, BC.



## APPENDIX 2: WATERSHEDS 2014 PARTICIPANT LIST

*Accurate as of January 16th, 2014*

Randy Alexander (Regional District of Nanaimo)	Georgia Collins (Shawnigan Basin Society; Shawnigan Watershed Roundtable)
Jason Alexandra (Alexandra and Associates Pty Ltd.)	Larry Commodore (The WaterWealth Project; Sto:lo Nation)
David Anderson (Former Canadian Minister of the Environment)	Jimmy Cook (Nanoose First Nation)
Tom Anderson (Cowichan Valley Regional District)	Wendy Cooper (Tides Canada Foundation)
Jennifer Archer (Archer Consulting; Rivers Without Borders)	Simon Courtenay (Canadian Water Network)
Heather Armstrong (Royal Roads University; BC Hydro)	Shannon Cowan (Salt Spring Island Watershed Protection Authority)
Steve Arnett (Town of Ladysmith)	Keith Crow (Lower Similkameen Indian Band)
Mary-Jean Atkinson (Cowichan Lake and River Stewardship Society)	Deborah Curran (Faculty of Law, University of Victoria)
Cheri Ayers (BioAyer Consultants)	Celine Davis (Ministry of Environment)
Lina Azeez (Fraser River Watershed)	Rita Dawson-Willott (Vancouver Island Water Watch Coalition)
Elizabeth Bailey (Somenos Marsh Wildlife Society)	David DeWit (Tides Canada Foundation)
James Baker (District of Lake Country)	Brett Dimond (School of Community and Regional Planning, University of British Columbia)
Jesse Baltutis (POLIS Project on Ecological Governance, University of Victoria)	Rod Dobell (Centre for Global Studies)
Natalie Bandringa (Capital Regional District)	Lauren Dobell (Vancity)
Kelly Bannister (POLIS Project on Ecological Governance & Centre for Global Studies, University of Victoria)	Mike Donnelly (Regional District of Nanaimo)
Antonio Barroso (GW Solutions Inc.)	Karina Dracott (University of Victoria)
Manfred Bauer (Regional District of Okanagan-Similkameen)	Rana El-Sabaawi (University of Victoria)
Margaret Birch (City of Coquitlam)	Eli Enns (North American ICCA Consortium; POLIS Project on Ecological Governance, University of Victoria)
John Blythe (Fort Smith Group)	Ken Epps (Island Timberlands)
Tracy Bond (Baker Creek Enhancement Society)	Lauren Fegan (Regional District of Nanaimo)
Laura Brandes (POLIS Project on Ecological Governance, University of Victoria)	John Finnie (Convening for Action on Vancouver Island)
Oliver Brandes (POLIS Project on Ecological Governance, University of Victoria)	Kelly Forbes (University of Victoria)
Jessie Braun (Centre for Indigenous Environmental Resources)	Ross Forrest (Town of Lake Cowichan)
Rosanna Breiddal (Water, Innovation and Global Governance Lab, University of Victoria)	Mike Fox (City of Kimberley)
Gwen Bridge (Lower Similkameen Indian Band)	Bruce Fraser (Cowichan Valley Regional District)
Coral Brown (Lower Nipit Improvement District)	Theresa Fresco (Fraser Basin Council)
Arnd Burgert (GW Solutions Inc.)	Ken Gauthier (Urban Systems)
Katie Burles (Columbia Basin Watershed Network)	Larry George (Cowichan Tribes)
Albie Charlie (Cowichan Tribes)	Gerry Giles (Cowichan Valley Regional District)
Renee Clark (Regional District of North Okanagan)	Nicole Gordon (Taku River Tlingit First Nation)
Chris Cole (TimberWest Forest Corp)	Ian Graeme (Ministry of Environment)
	Dale Green (Capital Regional District)
	Jennifer Greenwood (North Columbia Environmental Society)
	Kim Hardy (Tides Canada Foundation)



Deborah Harford (Adaptation to Climate Change Team; Simon Fraser University)	Luschiim (Aavid Charlie) (Cowichan Tribes)
Kirsten Harma (Lake Windermere Ambassadors; East Kootenay Integrated Lakes Management Partnership; Living Lakes Canada)	Tony Maas (FLOW – Forum for Leadership on Water)
Kat Hartwig (Living Lakes Canada)	Emanuel Machado (Town of Gibsons)
David Hendrickson (Real Estate Foundation of BC)	Deana Machin (First Nations Fisheries Council)
Spencer Chandra Herbert (MLA, Vancouver-West End)	Terry MacRitchie (Upper Columbia Valley)
Tim Hicks (Columbia Basin Trust)	Madelaine Martin (Ministry of Community, Sport, and Cultural Development)
Martin Hoffman (Faculty of Law, University of Victoria)	Kim Maynard (Town of Princeton)
Brad Hope (Regional District of Okanagan-Similkameen)	Angus McAllister (McAllister Opinion Research; SayZu Analytics)
Rodger Hunter (Cowichan Watershed Board; Vis-a-Vis Management Resources Inc.)	Dana McDonald (Evergreen)
Brian Huntington (Skeena Watershed Conservation Coalition)	Catherine McEwen (McEwen & Associates; Salt Spring Island Water Preservation Society )
Robert Hutchins (Cowichan Watershed Board; Cowichan Valley Regional District; Town of Ladysmith)	Meghan McKee (North Salt Spring Waterworks District)
Lydia Hwitsum (Cowichan Watershed Board)	Lorna Medd (Vancouver Island Health Authority (Retired))
Domenico Iannidinardo (TimberWest Forest Corp)	Natalya Melnychuk (University of Waterloo)
Nelson Jatel (Okanagan Basin Water Board)	Jack Minard (Comox Valley Land Trust; Tsolum River Restoration Society; Salmon Enhancement and Habitat Advisory Board)
Parker Jefferson (One Cowichan; Cowichan Lake and River Stewardship Society)	Simon Mitchell (St. John River; Living Rivers Initiative; WWF Canada)
Joshua Jodoin (Franz Environmental Inc.)	Michele-Lee Moore (Department of Geography, University of Victoria)
Amanda Karst (Centre for Indigenous Environmental Resources)	Doug Morgan (Constituency Assistant for Bill Routley)
Dawn Keim (Regional District of Nanaimo)	Joan Morris (Songhees Nation)
Morgan Kennah (Sustainable Timberlands and Community Affairs)	Tim Morris (Morris Consulting)
Jane Kilthei (One Cowichan)	Ian Morrison (Cowichan Valley Regional District)
Graham Kissack (Catalyst Paper Corp)	Pat Moss (Skeena Watershed)
Greg Knox (SkeenaWild Conservation Trust)	Brenden Mulligan (Yukon River Inter-Tribal Watershed Association)
Lynn Kriwoken (Ministry of Environment)	Verna Mumby (Greater Twin Lakes Stewardship Society)
Tim Kulchyski (Watershed Board; Cowichan Tribes)	Matt Murray (University of Victoria)
Tracy Lawlor (Lower Similkameen Indian Band)	Sheila Muxlow (The Fraser/Sto:lo Valley)
Keith Lawrence (Cowichan Valley Regional District)	Dave Newman (Town of Gibsons)
Jon Lefebure (Municipality of North Cowichan)	Adam Norris (Mighty Peace Watershed Alliance)
Kelly Lerigny (Real Estate Foundation of BC)	Melissa Nottingham (Shawnigan Watershed Roundtable)
Heather Leschied (Columbia Basin Watershed; Lake Windermere Ambassadors Board; Friends of Kootenay Lake)	Linda Nowlan (Pacific Conservation)
Ellen Leslie (Hornby Water Stewardship Project; Heron Rocks Friendship Society)	Jonathan O’Riordan (POLIS Project on Ecological Governance, University of Victoria)
Steve Litke (Fraser Basin Council)	Tim O’Riordan (University of East Anglia)
Francesca Loro (Peninsula Streams Society)	Craig Orr (Watershed Watch)
Lana Lowe (Fort Nelson First Nation)	Natasha Overduin (POLIS Project on Ecological Governance, University of Victoria)

Margot Parkes (University of Northern British Columbia)	Justine Starke (Salt Spring Island Watershed Protection Authority; Islands Trust)
Pravin Pillay (University of Victoria)	Ron Stepaniuk (North Salt Spring Waterworks District)
Carys Pinches (Department of Geography, University of Victoria)	Jennifer Swift (Centre for Global Studies, University of Victoria)
Ryan Plummer (Environmental Sustainability Research Centre, Brock University; Stockholm Resilience Centre; Canadian Rivers Institute)	Terry Tebb (Pacific Salmon Foundation)
Susi Porter-Bopp (Canadian Freshwater Alliance)	Carrie Terbasket (South Okanagan-Similkameen Syilx Environmental Committee; Lower Similkameen Indian Band)
Michael Recalma (Qualicum First Nation)	Tessa Terbasket (Similkameen Valley Watershed)
Helen Reid (Cowichan Tribes)	Andrew Thomson (Department of Fisheries and Oceans)
Clay Reitsma (Municipality of North Cowichan)	Neil Todd (Nicola Tribal Association)
Dawn Remington (Bulkley Watershed; Skeena Watershed)	Katherine Trajan (GW Solutions Inc.)
Lucy Rodina (Institute for Resources, Environment and Sustainability, University of British Columbia)	Nancy Turner (School of Environmental Studies, University of Victoria)
June Ross (Vancouver Island Water Watch Coalition)	Christine Twerdoclib (School of Environmental Studies, University of Victoria)
Bill Routley (MLA, Cowichan Valley)	Stephen Tyler (POLIS Project on Ecological Governance, University of Victoria; Adaptive Resource Management Ltd)
Geneen Russo (Ministry of Environment)	Ryan van der Marel (Living Lakes Canada)
Tom Rutherford (Department of Fisheries and Oceans)	Barbara Veale (Conservation Halton)
Wayne Salewski (Nechako Environment and Water Stewardship Society)	Nathalie Viau (City of Campbell River)
Marlowe Sam (University of British Columbia – Okanagan; En'owkin Centre)	Ernie Victor (Sto:lo Nation Fisheries)
Calvin Sandborn (Environmental Law Centre, University of Victoria)	Jennifer Vigano (Ministry of Environment)
Taoya Schaefer (Lake Windermere/Upper Columbia Valley)	Suzanne von der Porten (University of Victoria)
Anna Sears (Okanagan Basin Water Board)	Jodie Walsh (Centre for Global Studies, University of Victoria)
Leanne Sexsmith (Real Estate Foundation of BC)	Jason Walters (Department of Geography, University of Victoria)
Rosie Simms (Institute for Resources, Environment and Sustainability, University of British Columbia)	Graham Watt (Regional District of Kootenay Boundary)
Rick Simpson (BC Wildlife Federation Region 8; BC Wildlife Federation Inland Fisheries Committee)	Gilles Wendling (GW Solutions Inc.)
Genevieve Singleton (Natural History Interpreter)	Ted White (Ministry of Environment)
David Slade (Cowichan Watershed Board)	Reg Whiten (Dawson Creek Watershed Society)
Faye Smith (Mid Vancouver Island Habitat Enhancement Society)	Roger Wiles (One Cowichan)
Dan Smith (Wei Wai Kum First Nation)	Brian Wilkes (Independent Consultant)
James Snider (World Wildlife Fund)	Taylor Wilkes (University of Waterloo)
Pamela Spalding (School of Environmental Studies, University of Victoria)	Nicole Wilson (Institute for Resources, Environment and Sustainability, University of British Columbia)
Chief William C. Seymour (Cowichan Tribes)	Jody Wilson-Raybould (Puglaas) (BC Assembly of First Nations)
Margaret Squires (Salt Spring Island Watershed Protection Authority)	Jack Wong (Real Estate Foundation of BC)
Michelle Staples (City of Duncan)	Angelique Wood (Regional District of Okanagan-Similkameen)

## APPENDIX 3: SOURCES AND CITATIONS

- <sup>1</sup> *The Governance for Watershed-Based Source Water Protection* project was a collaborative research initiative that ran from 2008 to 2012. It was supported by the Canadian Water Network and leveraged a variety of additional partner resources, expert support, and complementary grants. The project was led by the Water Policy and Governance Group ([www.wpgg.ca](http://www.wpgg.ca)) at the University of Waterloo and involved numerous researchers and graduate students, as well as partners from academia, government, non-governmental organizations, First Nations, and watershed and community groups. It produced a number of detailed reports, academic articles, workshops, and presentations. This project revealed important insights about challenges and solutions for source water protection governance in Canada.
- <sup>2</sup> *A Water Gathering: Collaborative Watershed Governance in B.C. and Beyond* was held on January 26th and 27th, 2012 in Vancouver, B.C. For more information, please see: <http://www.pbli.com/programs/overview?itemid=40>
- <sup>3</sup> Morris, T. & Brandes, O.M. (2013). *The State of the Water Movement in British Columbia: A Waterscape Scan & Needs Assessment of B.C. Watershed-Based Groups*. Victoria, Canada: POLIS Project on Ecological Governance at the University of Victoria, and the Real Estate Foundation of British Columbia. Retrieved from [http://poliswaterproject.org/sites/default/files/StateOfWaterMovement\\_HigRes.pdf](http://poliswaterproject.org/sites/default/files/StateOfWaterMovement_HigRes.pdf)
- <sup>4</sup> Brandes, O.M. & O’Riordan, J. (2014). *A Blueprint for Watershed Governance in British Columbia*. Victoria, Canada: POLIS Project on Ecological Governance at the University of Victoria. Retrieved from <http://poliswaterproject.org/sites/default/files/POLIS-Blueprint-web.pdf>
- <sup>5</sup> Rapport, D. (2014, January 22). *Freshwater Priorities: Where We are and Where We’re Heading* [Video file]. Retrieved from <http://poliswaterproject.org/webinar/609>
- <sup>6</sup> (2014, January). *Watersheds 2014 Readings and Research Package*. Victoria, Canada: POLIS Project on Ecological Governance at the University of Victoria. Retrieved from <http://poliswaterproject.org/publication/610>
- <sup>7</sup> McAllister, A. (2012). *Life Cycle: Sustaining the Story of Water in British Columbia*. A Focus Group Research Report. Retrieved from Canadian Freshwater Alliance website: [https://www.freshwateralliance.ca/sites/default/files/resources/bc\\_freshwater\\_focus\\_groups\\_report.pdf](https://www.freshwateralliance.ca/sites/default/files/resources/bc_freshwater_focus_groups_report.pdf)
- <sup>8</sup> Ibid
- <sup>9</sup> McAllister, A. (2013). *Freshwater Insights B.C. 2013. A Survey of British Columbian Attitudes on Fresh Water*. Retrieved from Real Estate Foundation of British Columbia website: <http://www.refbc.com/sites/default/files/V1.02-PUBLIC-RELEASE-BC-WATER-POLL-2013-Final-Topline-Findings.pdf>
- <sup>10</sup> See Ermine, W. (2007). *The Ethical Space of Engagement*. *The Indigenous Law Journal*, 6:1, 193-203. Retrieved from <https://tspace.library.utoronto.ca/bitstream/1807/17129/1/ILJ-6.1-Ermine.pdf>
- <sup>11</sup> For more information on this proposed framework, please see FLOW’s *Shared Water, One Framework*: [http://www.flowcanada.org/sites/default/files/documents/SharedWater\\_OneFramework\\_email\\_0.pdf](http://www.flowcanada.org/sites/default/files/documents/SharedWater_OneFramework_email_0.pdf)
- <sup>12</sup> Freshwater Alliance Website. (2013.) Retrieved August 20, 2014, from <https://www.freshwateralliance.ca/>
- <sup>13</sup> For more information on the Okanagan Basin Watershed Board’s Water Supply and Demand Project, please see: <http://www.obwb.ca/wsd/>
- <sup>14</sup> Westland Resource Group Inc. (2007). *Cowichan Basin Water Management Plan*. Retrieved from <http://www.cowichanwatershedboard.ca/sites/default/files/CowichanBasinWaterManagementPlan-March2007.pdf>
- <sup>15</sup> B.C. Ministry of Energy and Mines. *Liquefied Natural Gas: A Strategy for B.C.’s Newest Industry*. Retrieved from [http://www.gov.bc.ca/ener/popt/down/liquefied\\_natural\\_gas\\_strategy.pdf](http://www.gov.bc.ca/ener/popt/down/liquefied_natural_gas_strategy.pdf)
- <sup>16</sup> For more detailed information on the Cowichan Watershed Board’s approach, see Hunter, R., Brandes, O.M., Moore, M-L., & Brandes, L. (2014, August). *The Cowichan Watershed Board: An Evolution of Collaborative Watershed Governance*. Victoria, Canada: POLIS Project on Ecological Governance, University of Victoria. Retrieved from <http://poliswaterproject.org/publication/761>
- <sup>17</sup> For more information on the Van der Peet case, see: <http://indigenousfoundations.arts.ubc.ca/home/land-rights/van-der-peat-case.html>
- <sup>18</sup> Casselman, A. (2013, 25 November). *Changes to Canada’s fisheries law alarm biologists*. *Nature*. Retrieved from <http://www.nature.com/news/changes-to-canada-s-fisheries-law-alarm-biologists-1.14234>
- <sup>19</sup> The June 2014 Supreme Court of Canada decision in the *Tsilqot’in Nation v. British Columbia* case further challenges the notion of Crown ownership and legally establishes aboriginal title lands as a new form of collective aboriginal ownership and control of land.
- <sup>20</sup> A report on professional reliance is forthcoming from the Environmental Law Centre. Visit [www.elc.uvic.ca](http://www.elc.uvic.ca)
- <sup>21</sup> Initially set as a property tax of \$10 per household per year in 2000, the rate has increased beginning in 2010 by \$2 per year and will level off in 2014 and remain at \$20 per year until 2019, when future rates will be determined. The fund currently hovers around \$1.7 million per year, and is administered as a partnership with various community land trusts. For further information, see the Capital Regional District website: <https://www.crd.bc.ca/about/news/2010/01/14/board-approves-rp-land-acquisition-fund>
- <sup>22</sup> For more information on New Zealand’s *Resource Management Act*, see New Zealand Ministry of Environment’s “An Everyday Guide to the Resource Management Act Series”, available at <http://www.mfe.govt.nz/publications/rma/everyday/>.
- <sup>23</sup> Baltutis, J. et al. (May 2012). *Cross-Canada Checkup: A Canadian Perspective on Our Water Future*. Victoria, Canada: POLIS Project on Ecological Governance at the University of Victoria. Retrieved from [http://poliswaterproject.org/sites/default/files/CrossCanada\\_LowQualityOnline.pdf](http://poliswaterproject.org/sites/default/files/CrossCanada_LowQualityOnline.pdf)
- <sup>24</sup> For more information on resilience thinking and practice, see: <http://poliswaterproject.org/webinar/743>
- <sup>25</sup> Belzile, J., Martin, M., Edwards, L., Brown, G., Brandes, L., & Warwick Sears, S. (2013, December). *Water Conservation Guide for British Columbia*. Victoria, Canada: B.C. Ministry of Community, Sport & Cultural Development. Retrieved from <http://poliswaterproject.org/publication/603>

- <sup>26</sup> The water calculator is available online: <http://www.waterconservationcalculator.ca/>
- <sup>27</sup> The Fraser Basin Council's document *Rethinking Our Water Ways* is a guide to watershed planning, and it includes practical advice for local groups. It is available on their website, at [http://www.fraserbasin.bc.ca/\\_Library/Water/guide\\_rethinking\\_water\\_2011.pdf](http://www.fraserbasin.bc.ca/_Library/Water/guide_rethinking_water_2011.pdf)
- <sup>28</sup> For more information or to order CIER's First Nations integrated watershed planning guidebooks visit <http://www.yourcier.org/first-nations-integrated-watershed-planning-guidebooks-2011.html>
- <sup>29</sup> For further information on the Open Standards for the Practice of Conservation, please see: <http://www.conservationmeasures.org/initiatives/standards-for-project-management>
- <sup>30</sup> Coquitlam River Watershed. (2014). *Watershed Plan*. Retrieved from <http://www.coquitlamriverwatershed.ca/content/watershed-plan>
- <sup>31</sup> For more information, see [http://ecohealthkta.net/digital\\_stories/](http://ecohealthkta.net/digital_stories/)
- <sup>32</sup> Report available online: [https://www.northernhealth.ca/Portals/0/About/PositionPapers/documents/EnvironmentContext%20Health\\_V2\\_20120725\\_WEB.pdf](https://www.northernhealth.ca/Portals/0/About/PositionPapers/documents/EnvironmentContext%20Health_V2_20120725_WEB.pdf)
- <sup>33</sup> Further information on this project can be found online: <http://www.unbc.ca/parkes/knowledge-action-project-improving-social-and-environmental-determinants-health-through-integrated-health-governance>
- <sup>34</sup> For more information on the California Department of Water Resources Data Exchange Center, see: <http://www.water.ca.gov/floodmgmt/hafoo/hb/cdecs/>
- <sup>35</sup> WWF-Canada's freshwater health assessments can be accessed online. The website encourages users to take action by suggesting methods of getting involved. For more information see <http://www.wwf.ca/conservation/freshwater/freshwaterhealth/>
- <sup>36</sup> Kidd, S.D., Curry, R.A., & Munkittrick, K.R. (Eds). (2011). *The Saint John River: A State of the Environment Report*. Fredericton, Canada: Canadian Rivers Institute. Retrieved from [http://www.unb.ca/research/institutes/cri/\\_resources/pdfs/criday2011/cri\\_sjr\\_soe\\_final.pdf](http://www.unb.ca/research/institutes/cri/_resources/pdfs/criday2011/cri_sjr_soe_final.pdf)
- <sup>37</sup> For more information see [http://www.wwf.ca/conservation/freshwater/st\\_john\\_river\\_summit.cfm](http://www.wwf.ca/conservation/freshwater/st_john_river_summit.cfm)
- <sup>38</sup> More on SHIM can be found at [http://www.cmnbc.ca/atlas\\_gallery/sensitive-habitat-inventory-and-mapping-shim](http://www.cmnbc.ca/atlas_gallery/sensitive-habitat-inventory-and-mapping-shim)





**POLIS Project**  
on  
**Ecological Governance**  
University of Victoria



**POLIS Project on Ecological Governance**  
Centre for Global Studies, University of Victoria  
PO Box 1700 STN CSC  
Victoria, BC V8W 2Y2 Canada  
Tel: 250-721-8800  
Email: [polis@uvic.ca](mailto:polis@uvic.ca)

