the partnership
for water sustainability in bc

Waterbucket eNews on January 26, 2021
https://waterbucket.ca/wscblog/

Living Water Smart in British Columbia:

Communicating with Plain Language is a Guiding Principle

Note to Reader:

Waterbucket eNews[1] celebrates the leadership of individuals and organizations who are guided by the vision for Living Water Smart in British Columbia[2].

The edition published on January 26, 2021 featured the story of Charles Axelsson and his doctoral research at the University of Venice. His PhD thesis is Adaptation through Policy: Climate Change induced Heavy Rainfall Events and Flash Flooding. By focusing on Metro Vancouver, New York City, Auckland, Sydney, Copenhagen, and Amsterdam he plans to capture a global picture of rainwater management and green infrastructure policy.

The umbrella for Partnership initiatives and programs is the Water Sustainability Action Plan for British Columbia[3]. In turn, the Action Plan is nested within Living Water Smart, British Columbia's Water Plan.

Cover Photo: Venice sunset, taken by Charles Axelsson

[1] https://waterbucket.ca/wscblog/
[2] https://waterbucket.ca/wcp/wp-content/uploads/sites/6/2017/11/livingwatersmart_book.pdf
[3] https://www.waterbucket.ca/cfa/sites/wbccfa/documents/media/81.pdf

Editor's Perspective

In mid-December 2020, Charles Axelsson reached out to me with a request for input to his global survey on stormwater management policy. This started a conversation that resulted in me connecting Charles with various local government leaders in the Metro Vancouver region. What aspect would make your research compelling for a BC audience, and what is your story behind the story, I queried Charles during a Zoom session.

As we talked, a 3-part storyline emerged: the childhood experience that motivates his research, the inherent weakness in science communication, and his perception of the BC scene. While all six cities recognize that green infrastructure is a foundation piece for climate change adaptation, what makes BC stand out is the underlying stewardship ethic. **This drives a science-based approach to 'designing with nature'**.

The aspect that caught my attention is that Charles began his PhD program with a narrow technical focus on macro-plastics in the marine environment. He then shifted his focus inland and became interested in the rainfall events themselves. His research led him to look at drainage-related issues through a social science lens.

Charles is examining the policies and infrastructure developed cities utilize to adapt their drainage conveyance systems, as well as the criteria used in making their decisions. He is investigating these topics through the lenses of research, government and advocacy. In December, Charles asked individuals in each of the six cities to complete an online survey. Detailed in scope, the survey has generated a database for analysis and comparison.

When Charles stated that what matters most is being able to present science-based knowledge in a way that is readily understood by any audience, the thought resonated with me. **Communicating with plain language is a guiding principle** for those involved with the Partnership for Water Sustainability. Viewed in a social context, his global research in understanding the approaches to communication in six regions is potentially quite powerful. And that is the value in sharing his story with you the reader.

Kim A. Stephens, MEng, PEng,
Executive Director
Partnership for Water Sustainability in BC
September 2021

Adaptation through Policy:
Climate Change induced Heavy Rainfall Events and Flash Flooding

In November 2020, the first set of findings from the doctoral work by Charles Axelsson were published in the Journal of Environmental Planning and Management[4]. In the journal paper, Charles and his co-authors looked at the foundations of stormwater and rainwater policy in six case cities – New York City, Auckland, Sydney, Copenhagen, and Amsterdam.

They present the state of urban adaptation to climate change induced pluvial flooding through cloudburst and rainfall events in the six cities. They discuss the management narrative of each case-study city in combating flooding events within the context of climate adaptation using their guiding policy documents.

[4] https://www.tandfonline.com/doi/abs/10.1080/09640568.2020.1823346

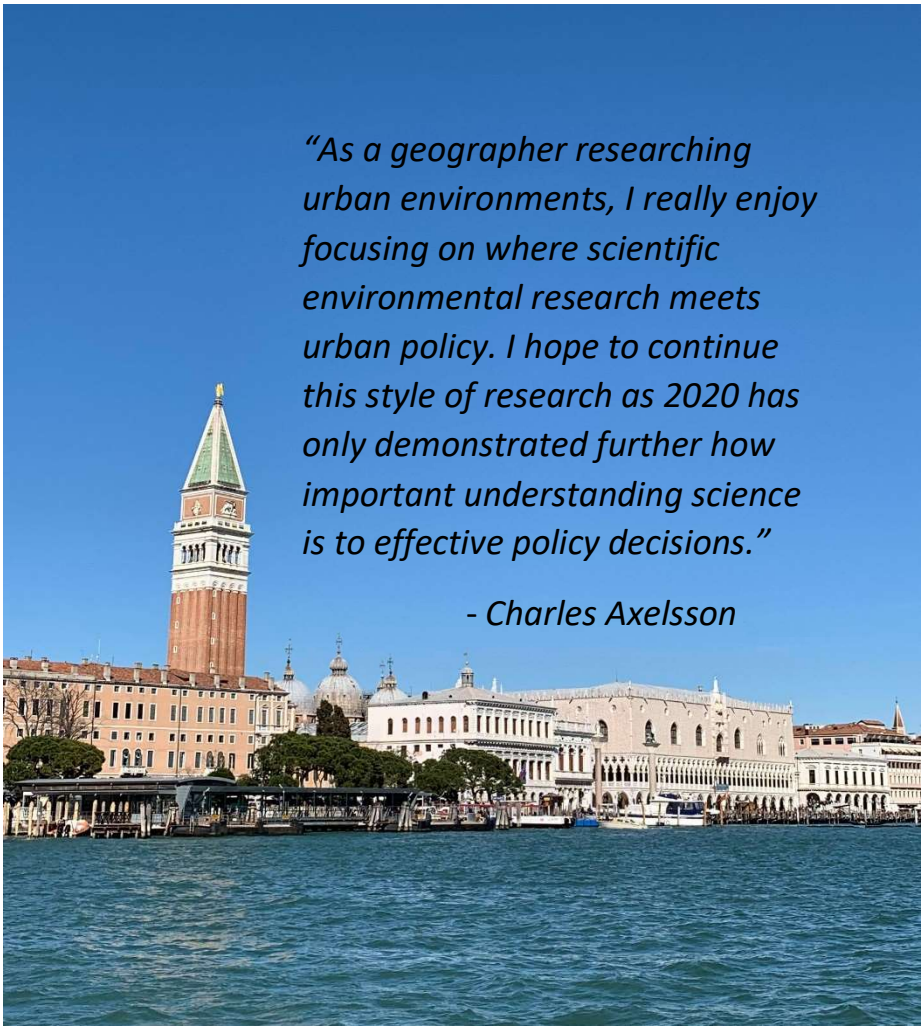
Climate Adaptation / Use Plain Language

"My discussions with Kim Stephens on the terms of management have helped me to re-evaluate how I discuss my own research," says Charles Axelsson.

"I was taking some of the terminology for granted as it is repeated in the literature time and time again but words like 'stormwater', 'rainwater' and 'drainage' can have such powerful unconscious effects on how you interpret the discussions and they can mean different things to different stakeholders in the system."

"These terminology choices ultimately have a large effect in science communication and the message you intend to convey. I find these differences interesting and yet more proof that I love science communication!

Charles Axelsson is a final year PhD candidate at Ca' Foscari University of Venice studying the Science and Management of Climate Change. Originally from Iceland, he grew up in NYC and Washington, D.C. before pursuing his undergraduate degree in Geography (BSc) at University College London. He continued with his masters in London in Environmental Technology (MSc) at Imperial College London.



Part 1- Cloudbursts ahead!

“On the East River in New York City, there is a small rocky beach no more than a few square meters when exposed in low tide, that I used to play on as a child. Only when I got older, and with an apparently strong immune system, did I realize that this was the location of a combined sewage overflow,” recalls Charles Axelsson.

Where it all began for Charles Axelsson. NYC combined sewer overflow (CSO) to the East River

(photo credit: Charles Axelsson)

“This is just one of the hundreds of CSO sites across the city that from the land, most people will never notice. Water infrastructure completely surrounds us in cities and has surrounded my research as well. From researching river pollutant loading and later, oceanic plastic, I now focus my PhD on urban stormwater and rainwater management in the face of increasing disruptions from climate change.”

“Most developed cities are able to handle their day-to-day rainfall. However, sometimes when it rains, it pours, and urban areas cannot process the surge in drainage runoff and must release it as fast as possible to the local environment. Despite fluctuations in overall rainfall totals, climate change is predicted to make these intensive rainfall events more frequent. With this comes the chance for more inland flooding and pollution loading to the natural environment.”

“In developed cities, decades and centuries of urban growth have led to a jigsaw puzzle of urban infrastructure. Storm drainage systems are ageing, built at different times to different standards, and often follow political boundaries not drainage basins. With climate change stressing these systems, it is all the more urgent to understand.”

Part 2- A doctoral project emerges

“What I am trying to discover in my thesis is what are the existing trends in urban stormwater policy within developed cities. By focusing on Vancouver, New York City, Auckland, Sydney, Copenhagen, and Amsterdam I plan to capture a global picture.”

“One area I am particularly interested in is communication, or the lack thereof. In the sciences, one of the largest challenges to research is science communication. A lot of fantastic studies are misinterpreted outside of scientific circles because the language, style and meaning of science writing is very different to non-specialists.”

“With climate change studies, this can lead to a serious disconnect between climate change policy and the supporting research. With other stakeholders also invested in management from advocates to business leaders, good policy is reliant of strong communication of everyone’s interests.”

“In this doctoral project I am trying to take these competing voices and understand how these groups’ visions of future stormwater management differ from each other. If we understand where we differ on urban climate adaptations, we can begin to build a bridge and effectively communicate our visions to one another.”

“The inclusion of six cities from around Europe, North America and Australasia also allow us to see if there are any regional variations in policy management. No one city can do everything, especially large cities with complex and competing interests. But by establishing the framework of what stormwater and rainwater management policy can be done and has been done, it allows cities to adapt and learn better from one another.”

“From researching river pollutant loading and later, oceanic plastic, I now focus my PhD on urban stormwater and rainwater management in the face of increasing disruptions from climate change.”

Macro-plastics entering the storm drain system in NYC (photo credit: Charles Axelsson)

Part 3- Observations from British Columbia

INITIAL FINDINGS:

"NYC, Vancouver, Sydney, Auckland, Copenhagen and Amsterdam present differing narratives toward pluvial flooding."

"The European cities craft a unique policy narrative of being innovators and pioneers in rainfall management. They take a very intensive approach to stormwater management."

"The North American cities do not present a unified vision of stormwater management. Alongside efforts to incorporate sustainable and environmental management into the stormwater management network, NYC remains a large city of competing interests."

"On the other hand, Vancouver has embraced an image of environmental friendliness and constructs a narrative of rainfall management full of 'green' improvements."

"In Australasia, the city management differences are reflected in the fundamental environmental problems; Sydney is too dry, and Auckland is too wet."

"The project is still ongoing yet my experience with British Columbia has so far been fantastic. While my focus is on the City of Vancouver, there is a consistent policy thread of integrated rain/stormwater management programs in the Metro Vancouver region today. Whether it is a case of branding forcing policy, or policy forming branding there is a clear focus in the province today on green technology, solutions, and environmental protections."

"While Vancouver may not have been the first municipality in the province to focus on green infrastructure policies, nor the recognized leader in rainwater management practices, the progress the city has made is nonetheless important and influential for British Columbia."

"On the global stage it is these large, alpha cities that gather and discuss the urban world. In this way Vancouver acts as a global ambassador for the province. All the time and investments made in throughout the larger Metro Vancouver region as allowed the city of Vancouver to be globally admired as an environmental urban success story and by extension, the larger area as a regional environmental success story creating a 'green' reputation the whole region benefits from."

"Through my readings and discussions with people in the Metro Vancouver region area, I have found that there is a sense of pragmatism among researchers, urban managers, and advocates. There is an openness and not only an admission but the acceptance that the existing green policies and practices they have now, particularly for replicating natural flow patterns in urban streams, may not hold all the answers. Even the natural world is sometimes overwhelmed by rainfall."

"Instead, there is a direct discussion on how to maximize greener solutions but support them with our existing infrastructure and knowledge base. This is vital for climate change adaptations as we need to plan for 50 to 100 years into the future while simultaneously solving the problems of tomorrow."

"Bound by geography, invested in salmon protection, and connected to the natural environment, the Metro Vancouver region has spent time fostering new green infrastructure for rainwater management. I look forward to continuing my research with City of Vancouver and the larger metro region to see how the policy framework of today develops in the future."

An article published by the Partnership in 2009 accompanied the Charles Axelsson feature story

Stormwater Management, Low Impact Development, Sustainable Drainage, Green Infrastructure, RAINwater Management.... what is an appropriate term to use?

What is an Appropriate Term to Use?

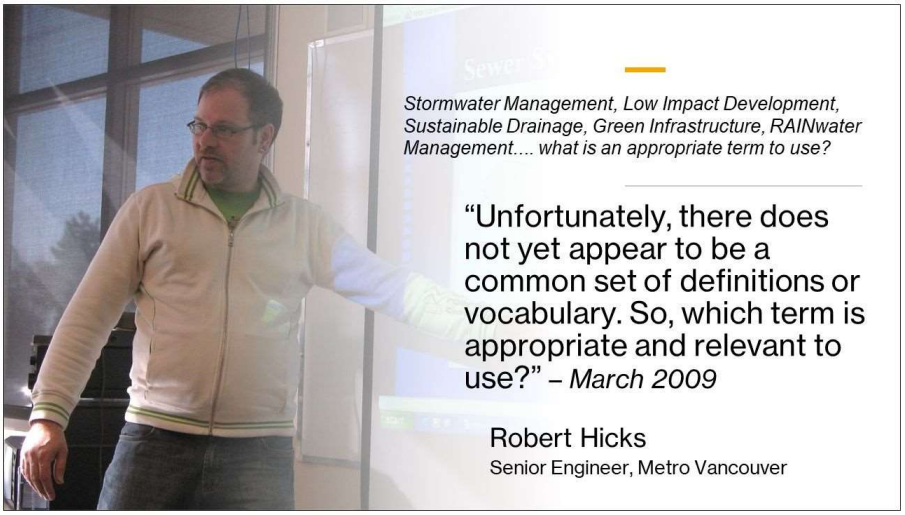
Stormwater Management, Low Impact Development, Sustainable Drainage, Green Infrastructure, RAINwater Management, Design with Nature, Water Sensitive Urban Design, Innovative Stormwater Management, Sustainable Urban Drainage Systems.... what is an appropriate term to use?

Context

For more than a decade (as of 2009), and as the list above shows, the language used by drainage practitioners around the world has been changing to reflect the evolving objectives in doing business differently.

"Unfortunately, there does not yet appear to be a common set of definitions or vocabulary, with each region of the English-speaking world using different terms," stated Robert Hicks. In 2009, he was a Senior Engineer with Metro Vancouver and an experienced water resource practitioner.

"So, which term is appropriate and relevant to use? In British Columbia, the Water Sustainability Action Plan is endeavouring to provide clarity of meaning so that there will be consistency of understanding province-wide."



Is Low Impact Development Relevant in British Columbia?

"While the term Low Impact Development is used in the United States for some types of at source rainwater/ stormwater management techniques, in British Columbia we have found that the usage of this term is often a barrier to uptake and implementation," observed Robert Hicks.

"From our BC perspective and experience, Low Impact Development is NOT exclusive to stormwater or rainwater management as it is a much broader classification of strategies that can include transportation, housing densities, etc. Regrettably, it seems to be associated with impressions of 'higher cost' and 'higher risk' in the development community. In BC, we have used 'Smart Growth' as an alternate to this, and even this term seems to be used less and less, in part because it is seen to be value-laden."

"Another point is that the Metro Vancouver region is primarily in renewal, retrofit, and redevelopment phases, with new development playing less of a role in affecting the long-term health of urban waterways. The term Low Impact Development does not intuitively reflect this."

How to Provide Clarity of Meaning?

"It is important to use descriptions which are linked more closely with the objectives and ideas - stormwater, sustainability, runoff, rainwater, infrastructure, etc.," continued Robert Hicks.

"Ideally, the right choice of wording will frame the concepts clearly and provide the terminology with some longevity. Clarity will help with uptake - jargon and anachronism needs to be avoided as they can obscure the objectives and ideas."

Focus on function and solution

"In Germany, it is Regenwasser (rainwater) and Nahenatur Entwaesserung (near natural drainage). In the UK, 'sustainable urban drainage systems' (SUDS) is used. The use of these terms have inspired many BC rainwater management professionals to focus on function and solution - site level, rainwater, green, integrated, infrastructure, etc. As a result, terms like 'on-site rainwater management', 'at source rainwater management', 'runoff source-control', 'site-level stormwater', and 'green infrastructure' are used in BC and are becoming part of the provincial government's vocabulary."

Link Terminology to Function and Purpose: "Another perspective is perhaps that stormwater is the contaminated, concentrated dirtied runoff, while rainwater is the pure resource. We have spent much effort dealing with problems created through a lack of integrated management, only to realise that the most effect management is at the source, and the resource level."

"There is not yet a single common term in use in BC, but there appears to be very positive acceptance of these terms by the various audiences. They more clearly link to the function and purpose. The term Low Impact Development does not provide the same meaning across Canada; and I believe it is likely to become outdated jargon," concluded Robert Hicks.

From Stormwater Management to RAINwater Management

"Choice of words is important; hence, changing the technical language is part of the process of advancing green infrastructure practices. We are weaning drainage practitioners away from a single-objective stormwater management way of thinking and designing.... to a way of doing business that is holistic, namely RAINwater management," stated Kim Stephens. In 2009, he was the Program Coordinator for the Water Sustainability Action Plan for British Columbia.

1980s Approach		Vision for 2000s
Drainage Systems	→	Water Balance Systems
Reactive (Solve Problems)	→	Proactive (Prevent Problems)
Engineer-Driven	→	Interdisciplinary Team-Driven
Protect Property	→	Protect Property ***and*** Habitat
Pipe and Convey	→	Mimic Natural Processes
Limited Consultation	→	Extensive Consultation
Local Government Ownership	→	Partnerships with Others
Extreme Storm Focus	→	Rainwater Integrated with Land Use
Peak Flow Thinking!	→	**Volume-Based Thinking!**

Drainage is the Function: "Increasingly, we have observed that the term RAINwater management resonates with non-engineers and the community at large. They intuitively get it. RAINwater management is about integration and an interdisciplinary approach that is landscape-based, and therefore goes well beyond the narrow engineering definition for conventional stormwater management."

"When I graduated from university in 1973, we called it drainage. Then in the mid-1970s the term stormwater management appeared in the literature. As far as I can determine, this terminology originated with the 'pipe guys' who were primarily concerned with making the distinction between sanitary and storm flows in combined sewer systems. Unfortunately, continued use of the term stormwater management only serves to perpetuate an outdated way of thinking."

"RAINwater management is at the heart of green infrastructure, The two go hand-in-hand, yet green infrastructure is not exclusively about RAINwater management," concluded Kim Stephens.

RAINwater Management is Landscape-Based

In November 2007, the Capital Regional District organized a Rainwater Management Workshop. Paul de Greeff, landscape planner, delivered a thought-provoking presentation that opened with this question: ***What is innovative rainwater management, and why should we pursue it as municipalities and developers?***

"If we view innovative rainwater management comprehensively, it starts with an understanding of site processes, systems and context," stated Paul de Greeff. "If we don't first understand the systems that we are designing within, and the full breadth of constraints and opportunities present on a site, fitting rainwater management systems into the landscape is a bit like making a medical diagnosis and prescription without first taking a patient history, lab tests or in any way trying to understand the patient."

"An appreciation that every site is different and has different needs or resiliencies is an essential first step for addressing innovative rainwater management."

'Site Adaptive Planning' *is a term coined by Will Marsh, Professor Emeritus, University of Michigan. It is the practice of investigating and analysing landscape processes and attributes to understand how they function and where they are more sensitive or more resilient, and then planning how we might begin to fit development into landscapes in a manner that responds to how a site functions.*

City of Portland Coins RAIN Acronym

At the Water in the City Conference held in Victoria, British Columbia in September 2006, Tom Liptan informed his Canadian audience that the City Portland coined the acronym RAIN to contrast contemporary 'rainwater management' with traditional 'stormwater management'. A landscape architect with the City's Bureau of Environmental Services, he was the driving force behind the research and development of new urban techniques, codes and policies in the City of Portland.

"Designing with and re-introducing natural elements such as soil, water, and vegetation on rooftops, streets, sidewalks, and parking lots is showing promise in Portland, Oregon."

When he began his 90-minute presentation, Tom Liptan commented that "It is great to see that the Province of British Columbia is proactively encouraging the drainage community to start using the all-encompassing Rainwater Management as an alternative to single-objective Stormwater Management."

"The language-shift that you have initiated in British Columbia is what we would like to see happen in Portland. This is one reason why the Bureau of Environmental Services has coined the RAIN acronym. We believe this will help promote changes in thinking and practice so that we achieve beneficial outcomes."

"Traditional stormwater management has a narrow scope, is event-based, and only considers a handful of runoff events that might occur in a given year. Rainwater management, on other hand, accounts for all the rainfall-days that occur each year."

"Rainwater management is all about developing in a way that restores the function and value of trees, soil and open space in our communities. If we develop today with long-term sustainability in mind, future generations can enjoy a vibrant city and clean and healthy rivers, instead of bearing the burden of our actions", concluded Liptan.

What We Are Trying to Achieve in British Columbia

In February 2009, the British Columbia Ministry of Community Development sent out a circular to all Municipal and Regional District Chief Administrative Officers, Engineers and Planners to draw attention to **Beyond the Guidebook: Context for Rainwater Management and Green Infrastructure in British Columbia**. (A copy is included on the next page)

Released in June 2007, Beyond the Guidebook focuses on desired outcomes. RAINwater management is a means to an end to change the way land is developed...so that we can create liveable communities and protect stream health.

The Beyond the Guidebook framework and direction for rainwater management and green infrastructure reflects a 'design with nature' approach to climate change adaptation and managing risk.

"Over time, sustained application of the water balance methodology can help local governments protect and/or restore stream health."

How We Develop Land: "We really have to look at how we develop land. Ultimately this requires leadership and champions on the ground. The message is that the Province of British Columbia is rewarding good behaviour," stated Glen Brown. In 2009, he was Executive Director, Local Government Infrastructure and Finance Division of the Ministry of Community Development.

"Beyond the Guidebook is an on-the-ground application of Living Water Smart. It helps focus the attention of local governments and the development community on what is an achievable outcome that makes sense, and results in net environmental benefits at a watershed scale."

Ministry Circular on Context for Rainwater Management and Green Infrastructure in British Columbia

"The *Beyond the Guidebook* framework and direction for rainwater management and green infrastructure reflects a 'design with nature' approach to climate change adaptation and managing risk." – February 2009

Glen Brown,
Executive Director
Ministry of Community Development

BRITISH COLUMBIA
The Best Place on Earth

Ministry of Community Development

Local Government Infrastructure and Finance
PO Box 9838 Stn Prov Govt
(4th Floor - 800 Johnson Street)
Victoria BC V8W 9T1

CIRCULAR

Circular No. 09:03
ARCS File #: 195-20

February 10, 2009

To: All Municipal and Regional District Chief Administrative Officers, Engineers and Planners

Re: *Beyond the Guidebook* - Context for Rainwater Management and Green Infrastructure in British Columbia

Beyond the Guidebook reflects a 'design with nature' approach to climate change adaptation. *Beyond the Guidebook* was released in June 2007 as a guidance document to introduce a methodology for correlating green infrastructure effectiveness in protecting stream health through using a pragmatic approach to achieve performance targets based upon rain water balance.

The ongoing *Beyond the Guidebook* provincial initiative builds on the guidance provided in the original *Stormwater Planning: A Guidebook for British Columbia*. In 2008, Vancouver Island was home of the pilot region for a regional team approach to rainwater management and green infrastructure implementation. Partnerships and the Vancouver Island Learning Lunch Seminar Series enabled capacity building for stakeholders, local municipal staff, developers and consultants.

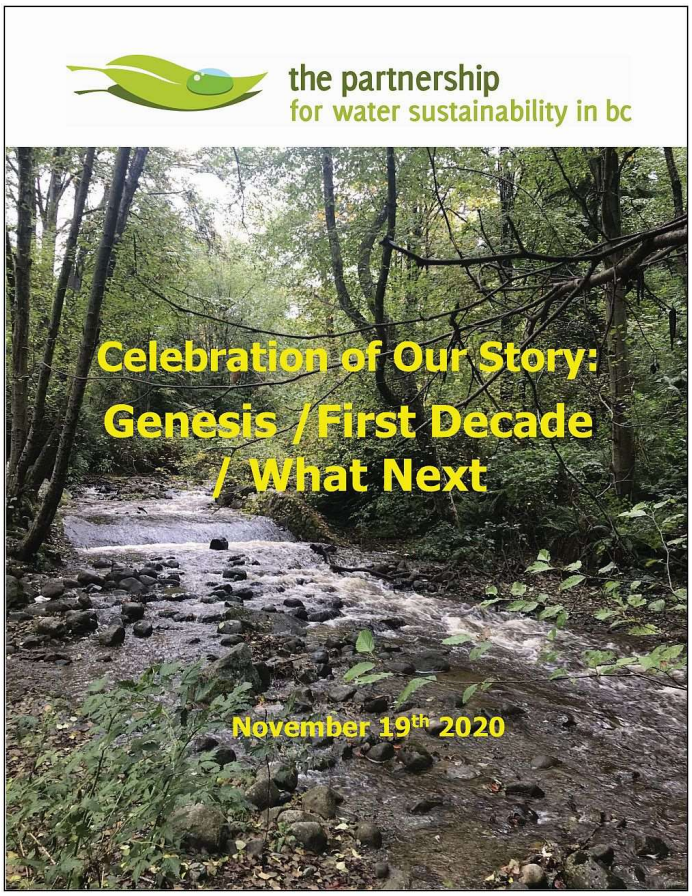
The Water Balance Model for British Columbia is a web-based decision support tool that provides easy access to the *Beyond the Guidebook* approach and is available at http://bc.waterbalance.ca/. This tool bridges engineering and planning and links the site to the stream and watershed. The Ministry of Community Development is a member of the inter-governmental partnership that develops and maintains the Water Balance Model. The Guidebook and supplementary guidance documents are downloadable from the website.

Over time, sustained application of the water balance methodology can help local governments protect and/or restore stream health.

Beyond the Guidebook supports and/or complements other provincial initiatives, notably: Living Water Smart, the Green Communities Project and A Guide to Green Choices. Collectively, these initiatives establish expectations that, in turn, will influence the form and function of the built environment in general and green infrastructure on the ground in particular.

For more information regarding the *Beyond the Guidebook* initiative and infrastructure grant programs, please contact the Local Government Infrastructure and Finance Division at 250 387-4060.

Glen Brown
Executive Director
Local Government Infrastructure and Finance



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https://waterbucket.ca/about-us/

About the Partnership for Water Sustainability in British Columbia

Incorporation of the Partnership for Water Sustainability in British Columbia as a not-for-profit society on November 19, 2010 was a milestone moment. Incorporation signified a bold leap forward.

Over two decades, the Partnership had evolved from a technical committee in the 1990s, to a "water roundtable" in the first decade of the 2000s, and then to a legal entity. The Partnership has its roots in government – local, provincial, federal.

The Partnership has a primary goal, to **build bridges of understanding** and pass the baton from the past to the present and future. To achieve the goal, the Partnership is growing a network in the local government setting. This network embraces collaborative leadership and **inter-generational collaboration**.

The Partnership believes that when each generation is receptive to accepting the inter-generational baton and embracing the wisdom that goes with it, the decisions of successive generations will benefit from and build upon the experience of those who went before them.

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