Drought on the West Coast: A New Reality?

Environmental Managers Association of British Columbia

What Happens on the Land Matters: Restore the Water Balance in Urban Areas!

Beyond the Guidebook 2015: Sustainable Watershed Systems

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Kim A Stephens, M.Eng., P.Eng., Executive Director





Have you heard of "Cathedral Thinking"?

The concept stretches back through the centuries to medieval times and is about the long-term!

The foundation for Cathedral Thinking:

a far-reaching vision, a well thought-out blueprint, and a shared commitment to long-term implementation



- The Partnership is a not-for-profit society
- The work of the Partnership supports and adds depth (working with practitioners) to the Living Water Smart vision,
 Green Communities initiative, and Climate Leadership Plan
- We share responsibility with government for delivering Projects and Tools under the umbrella of the Water Sustainability Action Plan for BC, released in 2004

Action Plan Road Map

- 1. Focus on Outcomes
- 2. Game-Changers Enable Action
- 3. Watersheds as Infrastructure Assets
- 4. One Rain Garden at a Time

"2015 was the year of the great drought, dwindling snow packs, melting glaciers, beleaguered salmon runs and a costly forest fire season, followed by windstorms and heavy rains."

from an editorial in the Vancouver Sun on December 31, 2015

Bare ski runs on Cypress Mountain as seen from CTV's Chopper 9 helicopter (Feb. 24, 2015)

2015 is a 'teachable year' for change, the first since 2003 when....

Okanagan Lake -

Drought

Forest Fires

Floods

Pine Beetle

"The year's top weather story wasn't one single event. Instead, it was a year-long parade of weather disasters that befouled British Columbia."

"Given what happened in 2003, more people than ever became convinced that climate change is real."

> Environment Canada website 2003 Top Ten Weather Stories

Kelowna

Active

Burning

Satellite imagery of forest fires in the Okanagan Basin

Under the umbrella of the Water Sustainability Action Plan, the Partnership is responsible for delivering the Georgia Basin Inter-Regional Educational Initiative (IREI)



Launched in 2012 with support from five regional districts, including Metro Van, that represent 75% of BC's population

In 2015, the five Regional Boards recommitted through 2017 to work as a team

The lands draining into the Salish Sea (Strait of Georgia & Puget Sound)

Key Message:

Local governments learn from each other and progress through sharing of case study experience



By telling the stories of those who are spearheading changes in practice, this helps other local governments eliminate the *"disconnect between*

information and implementation"

that may otherwise hold them back

waterbucket.ca website



Key Message:

Understanding leads to Action

This mind-map illustrates how the work of the Partnership fits within the provincial framework for Living Water Smart and Building Greener Communities

> In 2002, the Province embraced the Water Balance Methodology as the technical foundation for *Stormwater Planning: A Guidebook for BC*

The Guidebook was the outcome of inter-governmental collaboration, has stood the test of time, and underpins the IREI....

BC was the 1st jurisdiction in North America to adopt the 'Water Balance Methodology'

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Stormwater Planning

The Guidebook resulted in a set of "firsts" -

- Translated Science-Based Understanding
- Introduced the Rainfall Spectrum
- Introduced "Retain, Detain, Convey" Strategy
- Formalized Performance Target Approach
- Established Adaptive Management Precedent
- Initiated Paradigm-Shift to Rainwater Management

Local government is moving along a continuum. Knowledge is expanding and becoming clearer over time.



"Through sharing & learning, ensure that where we are going is indeed the right way"

Jody Watson Capital Regional District June 2013

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It has taken more than a decade to implement a policy, program and regulatory framework that makes possible 'Water-Resilient Communities

AN OVER-ARCHING THEME: What happens on the land matters!

2003 – The Teachable Year

2008 – Call to Action

2014 – Game-Changers Enable Action





What Happens on the Land Matters:

Of the three game-changers for action, the **BC Framework** is the lynch-pin because....

...it provides local government with the financial incentive for integration of 'watershed systems thinking' into

asset management



Passed in April 2014, and effective as of 2015, the Water Sustainability Act is.....



....the signature piece in a policy, program and regulatory framework that establishes expectations for adapting to a changing climate by:

- Striving to build greener communities
- Choosing to live water smart

These are drivers to restore the Water Balance in urban areas

- Protect stream health and aquatic environments
- Consider water in land use decisions
- 3. Regulate and protect groundwater
- 4. Regulate water use during times of scarcity

- 5. Improve security, water use efficiency and conservation
- 6. Measure and report large-scale water use
- 7. Provide for a range of governance approaches



The Water Sustainability Act has 7 goals

The Act embeds this guiding philosophy in the regulatory framework.....

Managing one water resource

- Surface water and groundwater managed under the same regulatory regime
- Hydraulic connection between surface water & groundwater considered
 - When licensing water use
 - When regulating water use during shortages
- Examining conditions for amending licences to change surface water source to groundwater source



The Act will have widespread impacts on how water and land practitioners conduct their work....



"The Water Sustainability Act results in a new opportunity and framework to collaborate."

Ted White Manager, Water Strategies & Conservation BC Ministry of Environment

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In 2002, the Province adopted the Water Balance Methodology because...

BC is primarily a mountainous region Headwater tributary streams are a predominant feature Watershed health is very much about protection of aquatic habitat The critical issue is aquatic habitat damage and loss caused by land development and erosion of streams

Watershed protection starts with an understanding of how water gets to a stream, and how long it takes...



Surface runoff from minutes to hours

Interflow (shallow horizontal) from days to seasons

Deep Groundwater from years to decades or more

Maintain the proportion of rainwater entering the stream via each pathway!

INTRODUCING THE NEW PARADIGM – *"Watersheds as Infrastructure Assets"*

The 3 pathways are:

- over the land surface
- shallow horizontal (interflow)
- deep vertical to groundwater

A watershed is an integrated system.

The **three pathways** by which rainfall reaches streams are 'infrastructure assets'.

The three pathways provide **'water balance services'**.



A UNIFYING THEME: What Happens on the Land Matters!



THROUGH RESTORATIVE DEVELOPMENT:

Influence form & function of Built Environment. Replicate a desired watershed (water balance) condition. AND Reverse the decline in the ecological baseline.

> This will take time, commitment and perseverance

Guidebook Premise:

"Land development & watershed protection can be compatible"

Policy, Program and Regulatory Framework

Science-Based Understanding of 'Changes in Hydrology' & Development Impacts

In 2002, the breakthrough was: Science-based understanding bridged the gap between "policy" and "practice"

> Infrastructure & Site Servicing Practices

> > 2002



Policy, Program and Regulatory Framework

Science-Based Methodologies & Tools to Mitigate Development Impacts

"Watersheds are Infrastructure Assets and provide Water Balance Services" In 201<mark>6, the ch</mark>allenge is to: Bridge the disconnect between *"understanding" and "implementation"*

> Infrastructure & Site Servicing Practices



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City of North Vancouver's Rain Garden Program is a foundation piece for a long-term vision for restoring the Water Balance in a fully urbanized city



"A single rain garden will not make a material difference. But 1000s of rain gardens would be a different story.

Restoring stream health requires a long-term commitment over decades by the community, successive Councils and City staff.

We can turn the situation around over time."

Mayor Darrell Mussatto City of North Vancouver September 2014

Key Message:

Design rain gardens to restore hydrologic function!

Maintain the proportion of rainwater entering the stream via each of three pathways



Key Message:

To manage watersheds as infrastructure assets, apply Water Balance targets to design rain gardens



In Closing:

To protect or restore the Water Balance, the process starts with Rain Gardens

"Everyone in the process, students, designers, managers and contractors must *understand and care about* the bigpicture goal. This requires an ongoing educational process that instils an ethic.

Creating a lasting change does require constant reminders to staff."



Hugh Fraser, P.Eng. Deputy Director of Engineering Delta Municipality