

Capture Rain Where It Falls: Application of the Water Balance Model to 'Design with Nature'

The Water Balance Model for British Columbia

A provincial tool developed under the umbrella of the Water Sustainability Action Plan for British Columbia

By

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Guest column published online by the Communities in Transition Newsletter in March 2009

Context

The Water Balance Model (WBM), as an approach to managing rainwater, was first introduced in 2003. It was an impressive step towards applying a 'design with nature' solution to a growing problem for many municipalities. A 'new' Water Balance Model was launched at the end of 2008 to considerable acclaim. It garnered the **Premier's Award for Innovation & Excellence** in February 2009 and considerable attention as an important 'decision support tool' to help improve the way we develop land in British Columbia.

The response of local governments has been very encouraging. Since the beginning of the year, over 300 individuals and organizations have taken out Trial Subscriptions. The majority of major municipalities in Metro Vancouver and Fraser Valley are now members of the Water Balance Model Partnership; and membership on Vancouver Island is growing too.



Premier Gordon Campbell with the award-winning Water Balance Model Team
Standing (L to R): Richard Boase, Ed von Euw, Premier Campbell, Tim Pringle and Jim Dumont
Sitting (L to R): Ted van der Gulik (Chair), Kim Stephens, Laura Maclean, Adrian Irwin,
Chris Jensen, and Ben Kangasniemi
Missing from photo: Dr. Charles Rowney, Remi Dubé, Jay Bradley, Corino Salomi,
Mark Wellman, David Hislop, John McMahon, Glen Brown and Doug Backhouse

The Need

The drought, forest fires and floods that British Columbia experienced in 2003 created a teachable moment in terms of how governments at every level view water. The drought resulted in many streams being at or below historical flow conditions; the public water supply was in jeopardy; and a survey showed that over 2 million people were impacted, 84 water systems were under stress, and 43 more systems suffered in some degree.

"The 2003 situation highlighted the need to integrate 'green' development practices with water resource management. But how [were we to do that]? A user-friendly tool was needed to evaluate the hydrologic effectiveness of site development practices that capture rain where it falls. The web-based Water Balance Model is that tool," states **Ted van der Gulik, Chair** of the Inter-Governmental Partnership that developed and maintains the Water Balance Model (WBM).

Objectives

The Inter-Governmental Partnership (IGP) includes three provincial Ministries – Agriculture and Lands, Environment, and Community Development - numerous local governments from four regions within BC; and three federal agencies. The IGP developed the WBM to support and/or help achieve these community planning objectives:

1. promote a design with nature way-of-thinking,
2. adapt to climate change,
3. reduce our hydrologic footprint,
4. create liveable communities,
5. reduce outdoor water use,
6. reduce rainwater runoff,
7. reduce flooding of agricultural land, and
8. protect and/or restore stream health.

Project contributors also include the British Columbia Water and Waste Association and the Real Estate Foundation of British Columbia.

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Climate Change Adaptation

The WBM is unique, bridges engineering and planning, links development sites to the stream and watershed, and enables science-based runoff performance targets to be established.

The 'design with nature' paradigm captures the essence of climate change adaptation. "Adaptation is about responding to the changes that will inevitably occur. Adaptation is at the community level and is therefore about collaboration. If we can show how to get the water part right, then other parts are more likely to follow," states **Lynn Kriwoken, Director**, Innovation and Planning in the Watershed Stewardship Division of the Ministry of Environment.

Lynn Kriwoken is the Province's lead person for delivering **Living Water Smart, BC's Water Plan**. An over-arching goal is to encourage land and water managers to do business differently. The WBM adds depth to Living Water Smart.

A 'Design with Nature' approach and re-use of resources are key to climate change adaptation

- Develop compact, complete communities
- Increase transportation options
- Re-use and recycle water, energy and nutrients from liquid 'wastes'
- Protect and restore urban 'green' space
- Strive for a lighter 'hydrologic footprint'
- Achieve higher levels of stream, wetland and receiving water protection

About the Water Balance Model

The WBM is an easy-to-use tool. It is able to calculate in minutes or hours what previously took days or weeks, the WBM enables urban planners, drainage engineers, developers and stewardship groups to:

- quantify the impact of development on rainwater runoff at a site,
- assess how rainwater leaving the site affects adjacent areas such as agriculture and urban/rural developments, fish streams or water for human use, and
- select on-site source controls so that, ideally, rainwater that leaves the site would be the same after the development as before.

Since 2003, the total investment to develop and enhance the WBM exceeds \$1.0 million, including in-kind contributions for outreach and practitioner education. But no monetary value can be attached to the real benefits to society of an improved environment through reduced erosion of streams, increased carrying capacity of watercourses for fish spawning, increased storage capacity of topsoil to capture rainfall or reducing irrigation water demands during hot summer growing periods.

Subscribers, who contribute annual fees, consist mainly of local governments, but also include universities and consultants. Universities are key because they are training the next generation of planners (who prepare development plans) and local government engineers (who prepare the physical drainage and infrastructure plans). In addition, and thanks to funding from Canada Mortgage and Housing, WBM is now available to all provinces across Canada.

In summary, this tool is the professional computational and communication backbone that will help local governments achieve the sustainable reality of implementing best practices the greening of the man-made environment.