

These policies provide the opportunities to incorporate natural assets into asset management plans.

Similar to Asset Management BC's framework, MNAI's framework for natural asset management:

- Focuses on the desired outcomes, rather than prescribing specific methodologies. This allows local governments to develop and implement an approach that can be adapted to their unique local conditions.
- Tailors the framework to meet communities where they are now.
- Uses methodologies based on current international best practices as well as best practices that local government practitioners have developed and endorsed.
- Describes asset management as a process, providing a guide to the what and why of asset management, with a high-level review of the how. It is a principal resource for local governments looking for strategic direction or guidance on asset management.

The important take-away from all my asset management presentations is the emphasis on sustainable service delivery, as opposed to the underlying asset that delivers those services. This means natural capital can form a core element of municipal asset management strategies since this natural capital may provide, or could be restored to provide, ecosystem services that communities rely on. From the lens of a local government, this natural capital forms a class of natural assets that deliver municipal services just like engineered assets.



RESTORE THE BALANCE IN THE WATER BALANCE

*Kim Stephens and Robert Hicks,
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Climate Change is another variable when planning for sustainable service delivery, dealing with uncertainty, and managing risk

The authors have observed that, for all the talk over a long period of time about climate change and what it means, many local government practitioners still lack a full understanding of some foundational concepts and how to translate such concepts into resilient solutions and actions that would benefit their communities.

*Too often, in our experience, there is a tendency to add layers of complexity and lose sight of the nature of a problem as well as the obvious solution. The purpose of this article, then, is introduce the Asset Management BC readership to a foundational concept, namely **Water OUT=Water IN**, and open minds to spark conversations within local governments about what this deceptively simple equation means from the operational perspective.*

Droughts Affect All of Us

The key message in this article is that climate change is not a driver; rather, it is another variable. Climate change is only one factor to consider when we talk about sustainable infrastructure and sustainable water supply. The real issues are uncertainty and risk, more specifically how we deal with the first and manage the latter.

A constant challenge for planning is not to prevent past events, but instead is to use past experiences to inform and create flexible strategies for the present and the future. Furthermore, this need for flexibility is not restricted to the immediate scope of the problem at hand; but must also consider the broader juggling of evolving local government priorities and service demands.

This leads to the challenge of assessing problems with sufficient complexity to arrive at flexible and resilient solutions, while at the same time not being overwhelmed and paralyzed by over-analysis.

Climate change impacts are risks which can be addressed by aligning asset lifecycles to performance or change thresholds which consider how levels-of-service are likely to deteriorate in response to climate change impacts. Lifecycles must therefore be considered and re-aligned with the new changing “normal” conditions.

A Shrinking Safety Factor

Climate change has aggravated an existing vulnerability related to seasonal supply of water in BC. Over time, the safety factor has been shrinking. While it rains a lot in BC, we do not have an abundance of supply when demand is greatest. In addition, the mountainous nature of BC's geography means that BC communities are typically storage-constrained, and what storage they do have is measured in weeks to months.

As of 2015, we clearly crossed an invisible threshold into a different hydrometeorological regime in Western North America. Winters are warmer and wetter. Summers are longer and drier. This new reality has huge consequences for water security, sustainability, and resiliency.

A generation ago, water supply managers could reasonably anticipate that three months of water storage would be sufficient to maintain supply during a dry summer.

Today, however, a 6-month drought is a very real likelihood, and on a repeating basis. In the meantime, populations have also grown in the major centres.

When the water resource is large and water demand is small, variability is not that noticeable. But when the demand (Water OUT) is large relative to the available resource, a variation on the supply side (Water IN) magnifies the perception of impact. In many cases, BC communities have long been operating on narrow margins.

A Picture is Worth a Thousand Words

Context is everything. 2003 was a teachable year. When every possible natural disaster happened and Kelowna was burning (Image 1), climate change finally caught the attention of the public. Year-end opinion polls for the top news story of 2003 showed that “more people than ever became convinced that climate change is real.”



Image 1

The 2003 “teachable year” set in motion a series of outcomes that have rippled through time. First came the **Water Sustainability Action Plan**, released in February 2004. Then came release of **British Columbia’s Drought Response Plan** in June 2004. This was followed by the inter-ministry **Provincial Drought Forum** held in July 2004 in Penticton. The **2005 Achieving Water Balance Workshop**, also held in Penticton, was a Forum action item for peer-based sharing and learning.

Restore the Balance in the Water Balance:

“The science is ahead of the policy,” stated Jim Mattison, Assistant Deputy Minister of Environment, in a 2005 interview about the implications of a changing climate. He approved the program concept for the Penticton Workshop which pointed the way forward to the next paradigm-shift in water supply management. It introduced the **Water OUT = Water IN** way-of-thinking (Image 2).



Image 2

In 2005, BC was early in the second decade of water conservation to reduce demand on supply systems. Due to recurring droughts, the emphasis had been on “water use efficiency”. By 2005, however, the impacts and implications of a changing climate were top-of-mind.

The Penticton Workshop was the first milestone in a multi-year process to raise awareness among water decision-makers that: Ensuring a safe and adequate water supply depends on understanding the science behind the **Water OUT = Water IN equation** (Image 3), as well as what this means at the operational level.

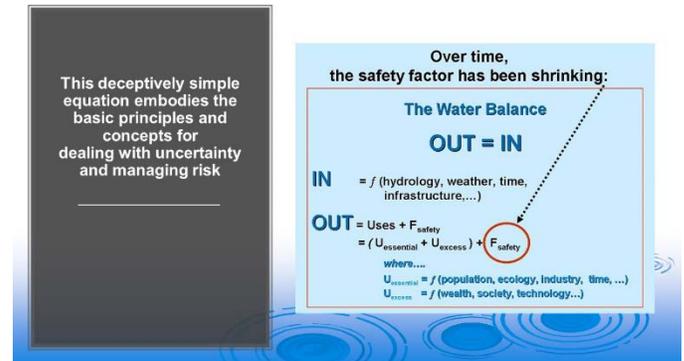


Image 3

Variability > Uncertainty > Risk:

How do you solve the **OUT = IN** equation when both sides are variable? After all, it is mathematically not possible to solve for two or more unknowns when one has a single equation.

The inherent variability creates uncertainty which in turn creates risk. There are multiple ‘what if’ combinations and permutations to consider in the **OUT = IN** equation.

Thus, a key observation is that both sides of the equation can be managed, albeit to different degrees and with different risks.

Climate Change Impacts are Not Optional

If we look at the variability in climate change impact scenarios that may occur within many asset lifecycles, we may get distracted by the uncertainty and statistical variance of the magnitude among the anticipated changes for key parameters that inform levels-of-service.

Another way to consider this variance and uncertainty is to not look at the variation of key parameters for a given future year, but rather consider the time-range that a key performance threshold might be reached. For example, climate models could indicate a change in a water supply in 2050 decreasing by 15% to 25% depending upon underlying assumptions.

Framing climate change impacts this way does not clearly align the changes to asset performance. But what if the

scenarios are reframed with the uncertainty being the timeframe that a threshold is reached and not the uncertainty of change for a future date? Then asset performance can be better assessed. For example, what if the data now said the water supply will decrease by 25% as early as 2050 and as late as 2080? This reframes reaching the threshold as unavoidable and results in a window of impacts which can be considered as part of an asset's lifecycle and risk.

For asset management, the consideration is how and when assets might be compromised in their lifecycle by climate change and certainly that new assets need to consider what climate change impacts will affect their lifecycle and levels-of-service.

Consideration of the Water/Energy Nexus:

The other key point is that local government initiatives focussed on the climate emergency require the transitioning from fossil energy to renewable energy within the next 20 to 30 years. This means reducing carbon emissions by 80% to avoid the very worst emission scenarios and impacts!

This also means that assets' lifecycles need to consider this transformation and how alternate forms of energy can either be accessed or applied. For example, recovering heat from sewers for district and space heating, biogas from sewerage sludge, micro-hydro, and avoided energy needs through better water resource use and infrastructure planning.

Looking back, the Achieving Water Balance Workshop in 2005 also anticipated this paradigm-shift and introduced the **Water/Energy Nexus**. In 2021, this is another idea whose time has come!

Where to Focus Resiliency Efforts

Because many factors are in play within the $OUT = IN$ equation, an over-arching goal for sustainable water supply management would be to build in resiliency that addresses risk. If communities are vulnerable on the *IN side* of the equation, then it would make sense to build in resiliency on the *OUT side*. There is no silver bullet.

Communities need to do many little things. Over time the cumulative benefits of doing many things do add up.

With respect to water, natural assets have traditionally been underrecognized, underappreciated, and undervalued by local governments. That is now changing because a program such as the Partnership's **Ecological Accounting Process (EAP)** provides local governments with a methodology and metrics to put maintenance and management (M&M) of stream corridor systems on an equal footing with constructed assets (municipal infrastructure).

This is a game-changer. It provides environmental planners with a starting point for a balanced conversation with engineers and accountants about the services that natural and constructed assets both provide.

Conclusion

Given the variability of the factors behind **Water OUT = Water IN**, this relationship always will represent a snapshot in time as its' inputs shift, evolve and change over time.

About the Authors:

Kim Stephens is the Executive Director for Partnership for Water Sustainability in BC. Kim has played a leadership role in a series of provincial initiatives over the past three decades.

Robert Hicks has over 25 years of utility policy and planning experience in regional and municipal government and holds a Certificate in Local Government Service Delivery issued through UBCM and the Ministry of Municipal Affairs. He was part of the team that conceived the partnership and collaboration framework for the Water Sustainability Action Plan for BC.

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Thanks to our followers, AMBC comes to you through social media keeping you informed and providing you the opportunity to comment and inform us of your asset management story or challenge. What we tell people comes mostly from you, so keep the comments, ideas, barriers and commentary coming and help spread the word about sustainable service delivery using the asset management process to improve decision making.

Twitter and LinkedIn have been invaluable platforms in sharing information about several important events including the first ever **Asset Management Day** on May 19 (#AMDay2021), **Local Government Awareness Week** (#LGAW2021), and AMBC's free* **Advancing Your Asset Management Practices** training programs, which are currently underway.

On LinkedIn, AMBC's post impressions have grown almost threefold from **1,625** in June 2020 to **4,595** in May 2021. Shares, comments, clicks, and followers have also increased over the past year. Be one of them.

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