

APPENDIX 2: DEALING WITH UNCERTAINTY AND MANAGING RISK IN WATER SUPPLY

In a lunch hour presentation, Kim Stephens, Program Coordinator for the Water Sustainability Action Plan in BC, looked at how we can adapt to climate change in managing water, and dealing with risk and uncertainty in water supply more generally, using the example of Convening for Action on Vancouver Island. Themes from Mr. Stevens' presentation are summarized below.

Some ideas to keep in mind from a “blue ecology” perspective on climate change include:

“Climate change is about water and its transformation from one state to another.”

“From a water-first perspective, we need to think about how and where the rhythms of water are changing and, most importantly, how we can mitigate the impacts from an interdisciplinary and ecosystems management approach.”

“Water needs to be acknowledged by Western science for its central functional and spiritual roles in our world.”

An imperative for achieving sustainability is to “design with nature” – a term coined by Ian McHarg that calls on us to mimic the natural environment. The focus is sustainability with respect to terrestrial and aquatic habitat. Design with nature helps us remember that where and how land is developed determines how water is used – i.e., the sustainability of supply and how water runs off the land. Even soils can be severely affected by urbanization. For example, construction equipment significantly reduces the infiltration and groundwater recharge capabilities of soils. Thus, after a few months, a newly graded and sodded lawn can develop a hard “pan,” or layer, on or just beneath the topsoil that prevents water from filtering through. The result is that the soils can become almost impervious and have runoff characteristics similar to pavement. Some other consequences of compacted soils are that lawns require more watering and fertilizers and poor soil conditions develop so that there is loss of plant vigor. Since 38% of water use is outdoor, processes like this are important.

As climate change and urban growth and densification processes progress, water risks increase. But we can adapt, or change direction, by improving the built environment and protecting the natural environment. Cumulative benefits accruing over time include sustainable community living. A designing with nature approach is key to climate change adaptation and includes the following measures:

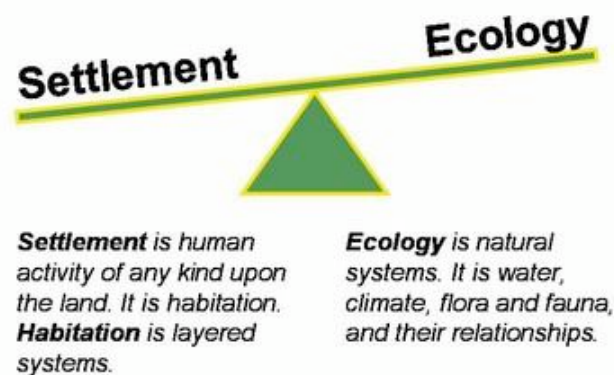
- Develop compact, complete communities.
- Increase transportation options.
- Reduce the loads on water, waste and energy systems.
- Protect and restore urban ‘green’ space.
- Strive for a lighter ‘hydrologic footprint’.
- Achieve higher levels of receiving water protection.

Densification is part of this picture, and workshop participants emphasized the need to consider optimum levels of densification for particular areas. They also noted that that function is relevant as well as structure – how dwelling units are shaped and how the space is used. Equity is another important consideration. Climate change affects some people more than others in terms of how

the impacts are distributed, with the most vulnerable being the elderly and the poor. We may be able to draw lessons from large cities outside of Canada.

Mr. Stephens went on to describe an initiative called Convening for Action on Vancouver Island (CAVI), as a bridge to new forms of water governance. Characterized as “The New Business As Usual,” CAVI aims to provide leadership in water sustainability. The initiative has visualized what we want Vancouver Island to look like in 50 years. It promotes water-centric planning and a design with nature way of thinking and acting to create livable communities in balance with ecology. CAVI makes it easy for people to connect, bringing together those who plan and regulate (local government), those who build (developers) and those who provide the legislative framework (the Province). In addition to seeking a common vision, CAVI creates learning and networking opportunities, focuses on the relationship between land and water, and promotes sharing of ideas and experience.

CAVI promotes taking actions on-the-ground that add up to a positive settlement strategy...so that benefits exceed liabilities.

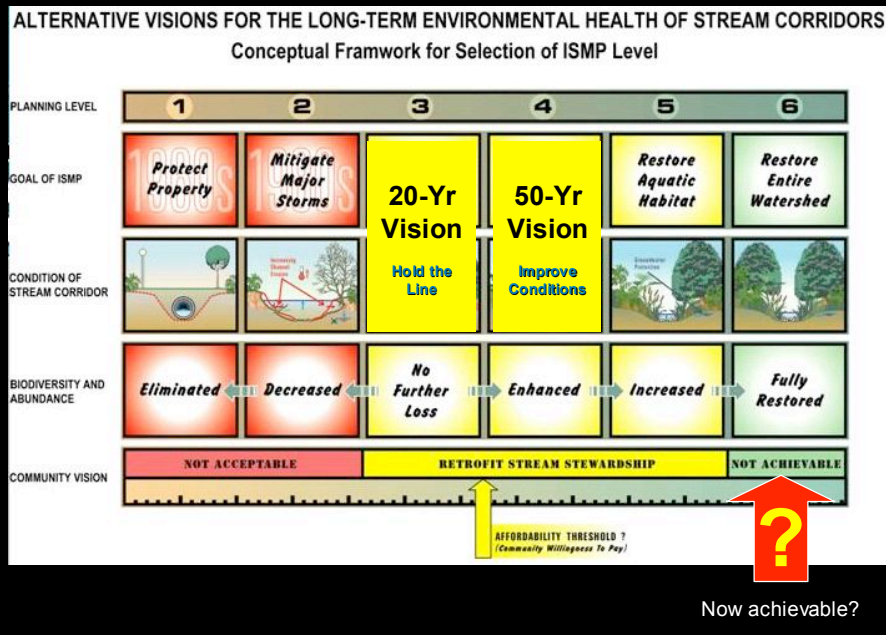


We can create our future in the face of climate change if we keep in mind that getting to the big picture requires starting with the smallest pieces. The essence of effective project management is to operate on two tracks: one track is the big picture, which is the destination; the other track is comprised of the details, because if you don't take care of the details you can be easily derailed. And to deal with uncertainty and manage risk we need to build resiliency incrementally.

There is no silver bullet; we need to do many small things because the flip side of a problem is an opportunity; hence, the flip side of a cumulative impact is a cumulative benefit – over time the benefits accumulate.

Ten years ago we might have believed that the best we can do with regard to sustainable water management would be to “hold the line.” According to the thinking outlined above, there may now be grounds for believing that what once felt unachievable is now within our grasp. The following slide illustrates this prospect.

What we believed to be 'unachievable' in 1998 may in fact now be within our grasp

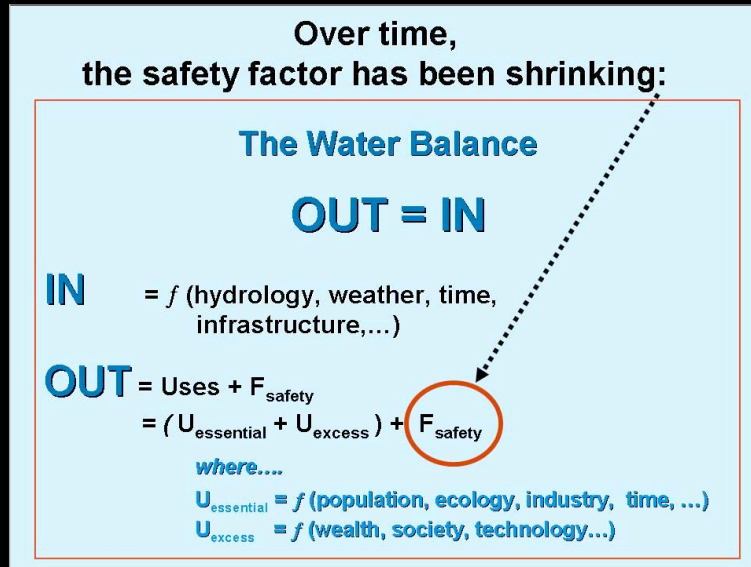


Yet, over time, the safety factor with regard to our water management calculations has been getting smaller. Considering that a simple version of water balance assumes that out = in, inherent variability on both sides of the equation creates uncertainty which in turn creates risk. There are multiple WHAT IF combinations and permutations.

Looking at BC in particular, while it rains a lot, we do not have an abundance of supply when demand is greatest. Most communities in BC have been vulnerable for decades because we typically tap small creeks and we have few major groundwater aquifers. The nature of the BC geography / topography is that we are typically storage-constrained, and the storage we do have is measured in weeks to months. In short, the issue already is one of “under supply.” We already have an efficiency issue, and climate change is aggravating an existing vulnerability. So, if we are vulnerable on the IN side of the equation, then we have to build in resiliency on the OUT side. But where will we do that, keeping in mind that everything is in flux? We look for the little things that will yield cumulative benefits – for example, requiring a foot of soil for all development sites so that there is a sponge that reduces water need and prevents water runoff.

Some of the factors in the logic of this deceptively simple “in-out” equation are illustrated in the following slide.

This deceptively simple equation embodies the basic principles and concepts for dealing with uncertainty and managing risk



This quote is offered in conclusion:

“And finally, we still need to remember that it is not solely wisely developed or green urban infrastructure but human behaviour which ultimately determines our sustainability”
(Peter Andzans, Manager, Community Sustainability City of Abbotsford, January 2008)