Thinking Beyond Pipes & Pumps

Federation of Canadian Municipalities

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The POLIS Project on Ecological Governance

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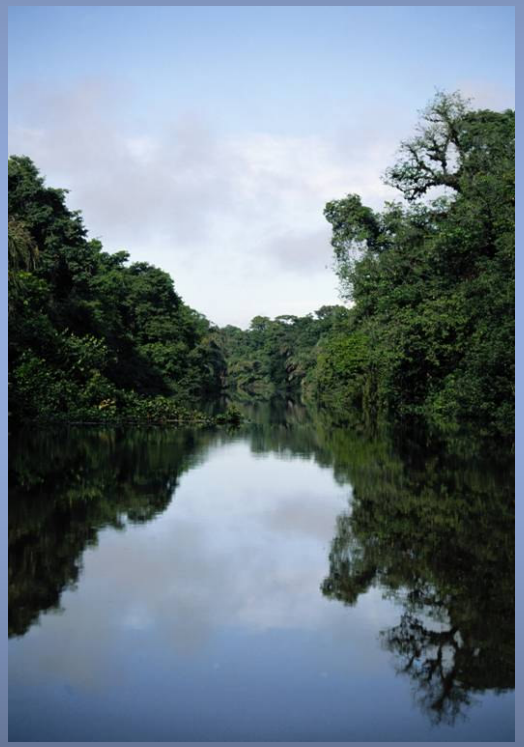
A prediction

The largest source of 'new' water for Canadians in coming decades will be from greater efficiency & conservation.

Just as we have come to think in terms of 'negawatts' (*Amory Lovins*) about electricity demand, we will also think in terms of 'negalitres' as new water demands are met through efficiency and conservation.



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Presentation overview

- About POLIS & Water Sustainability Project
- Research and publications
- The new water infrastructure = going beyond pipes & pumps
- Making the case for water conservation
- Research conclusions

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POLIS Project on Ecological Governance

- Research centre based at University of Victoria
- Established in 2000 by Eco-Research Chair of Environmental Law & Policy
- Where academic & policy research meets community action

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Ecological governance

- Embedding environment in all levels of decision making
- Environment not an 'add on' but central
- Asks how we might foster circular systems – reducing demand on distant and local ecosystems
- What does governance shaped by the principles of ecological sustainability look like?

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Water Sustainability Project

- Established in January 2003 at POLIS
- Examine urban water use and help reorient from supply to demand-side approaches
- Develop innovative governance options, decision-support tools and action plans
- Examine emerging water governance issues and leading examples
- Create a network of experts and raise public awareness

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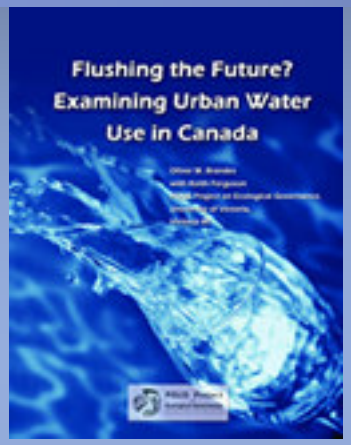
Project publications



- ***Flushing the Future?*** *Examining Urban Water Use in Canada (Aug 2003)*
- ***What the Experts Think****: Understanding Urban Water Demand Management in Canada (Dec 2003)*
- ***The Future in Every Drop****: The Benefits, Barriers and Practice of Urban Water Demand Management in Canada (May 2004)*

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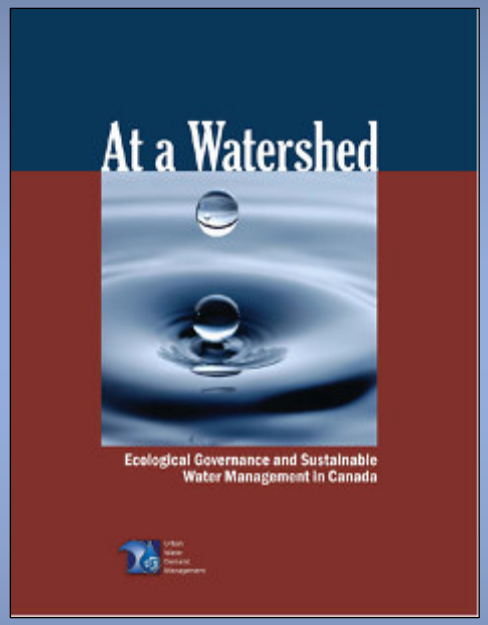
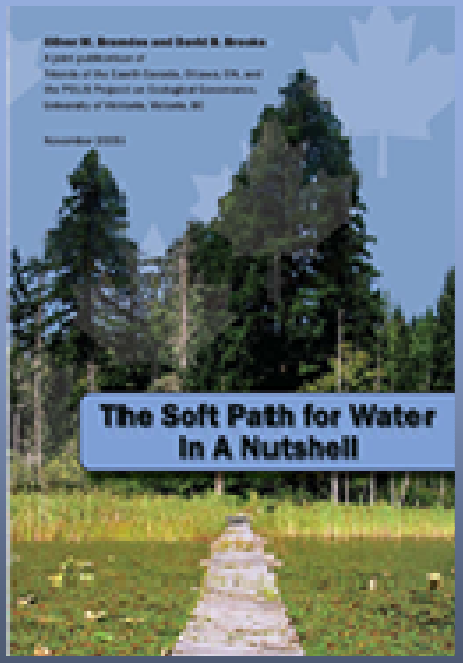
Project publications



- ***At a Watershed****: Ecological Governance and Sustainable Water Management in Canada* (May 2005)



- ***The Soft Path for Water in a Nutshell*** (May 2006)

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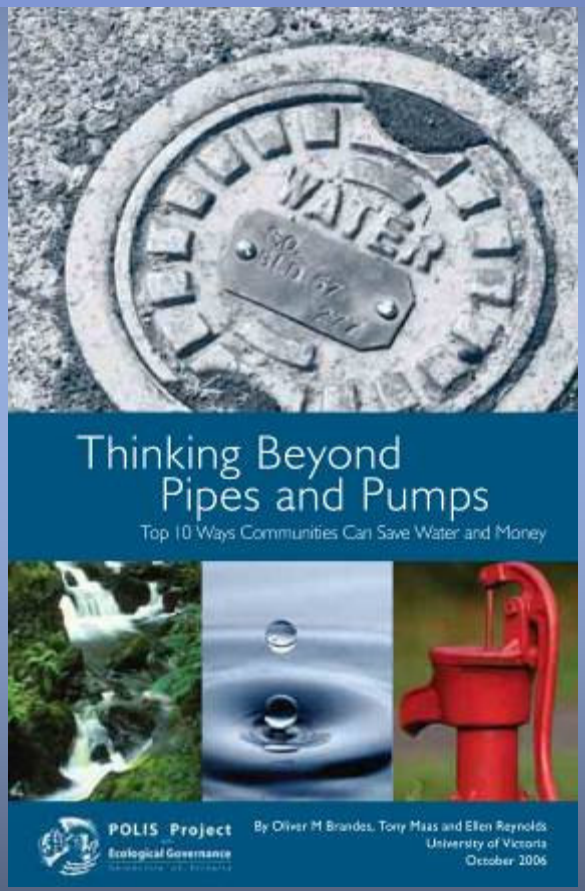

- Guide for water managers, communities
- Conservation as next best 'source' of water
- New water infrastructure includes 'social infrastructure'
- Decentralized technologies
- Local programs that change behaviour
- Alive with real world examples

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Why a 'new kind of infrastructure?'

Supply Limitations:

- A number of surface and ground water bodies have reached or are close to their limit for withdrawals
- Uncertainty and the WILD CARD of a changing global climate

Capital Costs:

- Water and wastewater infrastructure upgrades represent significant unmet capital costs – estimated at $23 to $49 billion Canada wide - just to catch up!!

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Environmental impacts

- Urban water withdrawals & wastewater returns are often geographically concentrated, amplifying impacts
- Development projects (dams, diversions) destroy aquatic & terrestrial habitat, introduce non-native species & block fish migration
- Ground & surface water withdrawals can permanently reduce surface water flows & availability, alter marine habitat & damage fish populations

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Paradigms of water management

Supply Development

VS

Managing Demand

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About the *POLIS Top 10*

Recognizes the local nature of the water management challenge -- that context is (almost) everything

The top 10 is an outcome of over 3 years of study with each meeting the following basic criteria:

- Technically feasible
- Broadly applicable
- Socially acceptable
- Cost effective compared to expansion
- Emphasizes decentralized technologies, lasting local programs that change behaviours & increase water productivity

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About the *POLIS Top 10*

Relies on building 'social infrastructure' (planning processes, education programs, and financial and human resources)

The key is the focus on a new kind of infrastructure that complements existing water supply:

- Innovative decentralized physical components;
- Water sensitive urban design to "hardwire" conservation into the landscape; and
- Conservation programs designed to engage community in solutions and change behaviour

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POLIS Top 10

10. Fix the leaks! Reduce waste
9. Stop flushing the future
8. Make managing demand part of daily business
7. Link conservation to development

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6. Price it right

QUESTION:

How can the cost of water increase – yet you end up paying less for it???

ANSWER:

Change the pricing structure

…and offer conservation improvements at the same time

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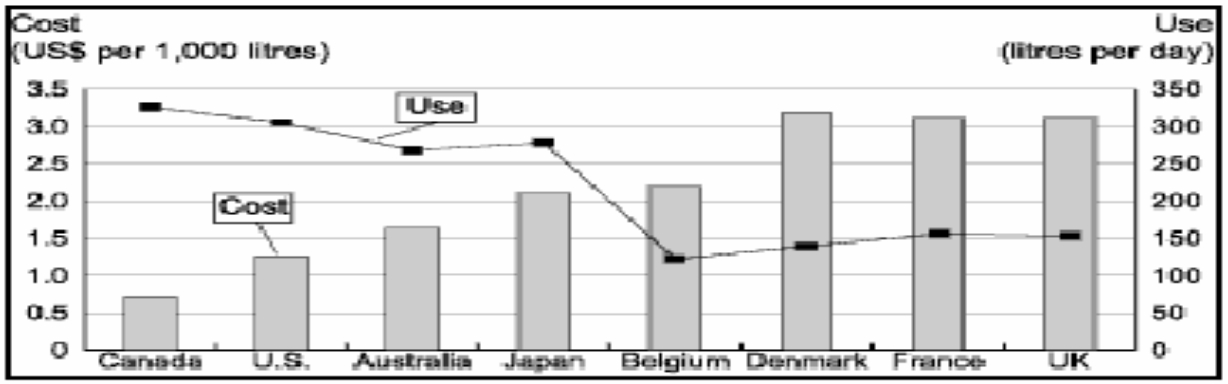
A picture says a thousand words



Source: OECD—All data are from 1994 to 1999 except data on U.S. use, which are from 1980.

Who has eaten at an all you can eat buffet??

…and what happens?

On average, Canadians paying flat or fixed rates use 74% more water than those under a volume-based structure

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5. Plan for sustainability

…by following the soft path and putting water conservation in an ecological context

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What is the Soft Path?

The soft path for water is an innovative, comprehensive planning approach based on 'soft energy paths' of the 1970s

Soft Path Principles

- Treat water as a service (e.g. sanitation, pleasant landscapes, agriculture) rather than an end in itself
- Match quality supplied to quality required by end use (less than 1/3 of current water use requires drinking quality water)
- Make ecological sustainability a fundamental criterion by emphasizing 'green infrastruture'

… and …

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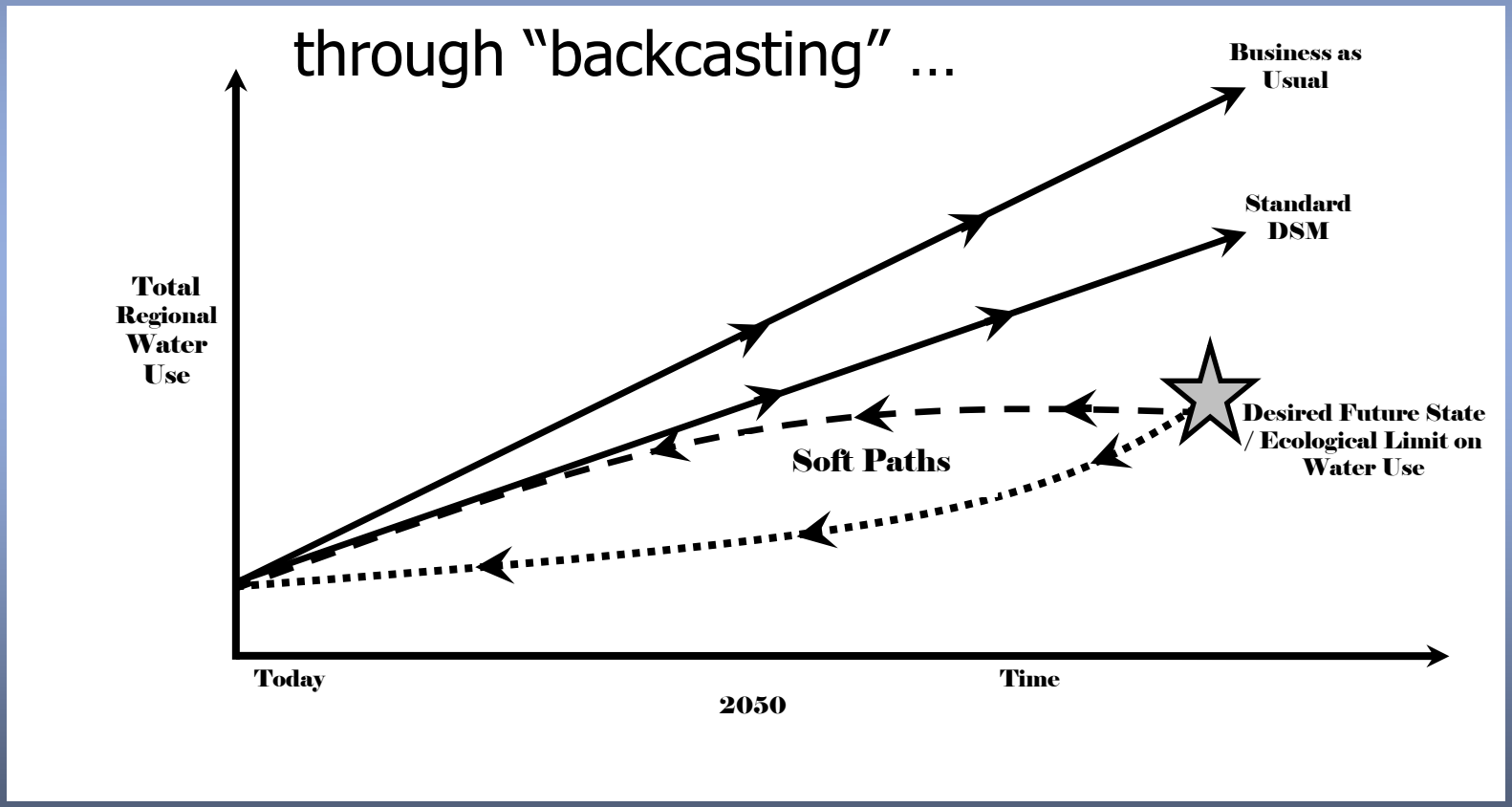
Plan backward - from future to present



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Why a "soft" path?

- Requires less steel and concrete
- Solves natural resource problems through ingenuity and innovation
- Asks "*Why*" rather than "*How*"
- Works with nature rather than against it

Bottom line: 2/3 water savings possible

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Soft Path research in Canada

Collaborative research effort led by David Brooks and Friends of the Earth Canada

Three focus Levels / Components

- Provincial (ON): University of Waterloo
- Watershed (NS): Acadia University
- Municipal (BC): POLIS Project (Univ. of Victoria)

Special Studies (for example)

Wastewater Diet and water Institutional barriers

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For more details see www.waterdsm.org or www.foecanada.org

4. Look to the sky – Rainwater as the source

For indoors…

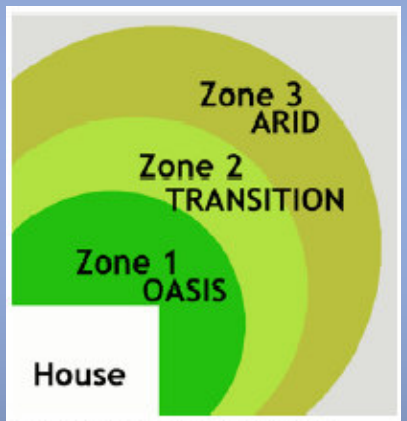

Figure 3: Xeriscaping recommends that plantings follow water-use zones, so that water-intensive areas are closer to the house.

…and all you need for outdoors

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Rainwater an 'alternate' source

Figtree Place, Australia

- Re-development of 27 residential units
- Rainwater stored to supply hot water and to flush toilets
- Water use down 45%
- BONUS: 2 year study demonstrated that Roof ⇨ tank ⇨ hot water system = treatment to Australian drinking water standards

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POLIS Top 10

3. Close the urban loop with Reuse and Recycling
2. Design communities FOR conservation
1. Educate, educate, educate

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Making the case for conservation

Benefits of DSM – financial & environmental

- Business case
  - Avoiding/deferring infrastructure costs and reducing operations
- Water/energy link
  - Saving water, saves energy
- Ecological case
  - Long-term benefits of maintaining ecosystems

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Making the case for conservation

Durham, ON

- $125 million for new infrastructure *vs* 10-year efficiency plan (and implementation) $17.2 million

California

- 19% of State's electricity from water-related use ⇨ diverted energy conservation funding for water conservation

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Five broad conclusions

Comprehensive programs take years (some times a decade to develop) - so START NOW!

Community engagement increases the effectiveness of programming - so make people part of the solution not just viewed as the problem

Attention to synergies (e.g. water-energy; social-technical; upstream-down-stream) maximizes productivity - so look at the whole picture

1/3 water savings are readily available in Canada and 2/3 savings are possible with a commitment to a comprehensive, integrated and long-term approach - so a new paradigm is possible

"Good" programs require a lasting commitment, vision, collaboration and leadership AND saves both water AND money

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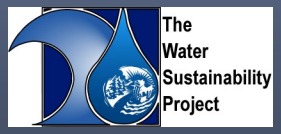
Thank you

To Tony Maas and Ellen Reynolds (co-authors)

and

The Water Sustainability Project team thanks the Walter and Duncan Gordon Foundation for their generous support of this research



Full project details available at www.waterdsm.org

Questions

"As we peer into the twenty-first century, water conservation is looking far more like an imperative than an option."

A. Vickers (2001)
Handbook of Water Use and Conservation

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