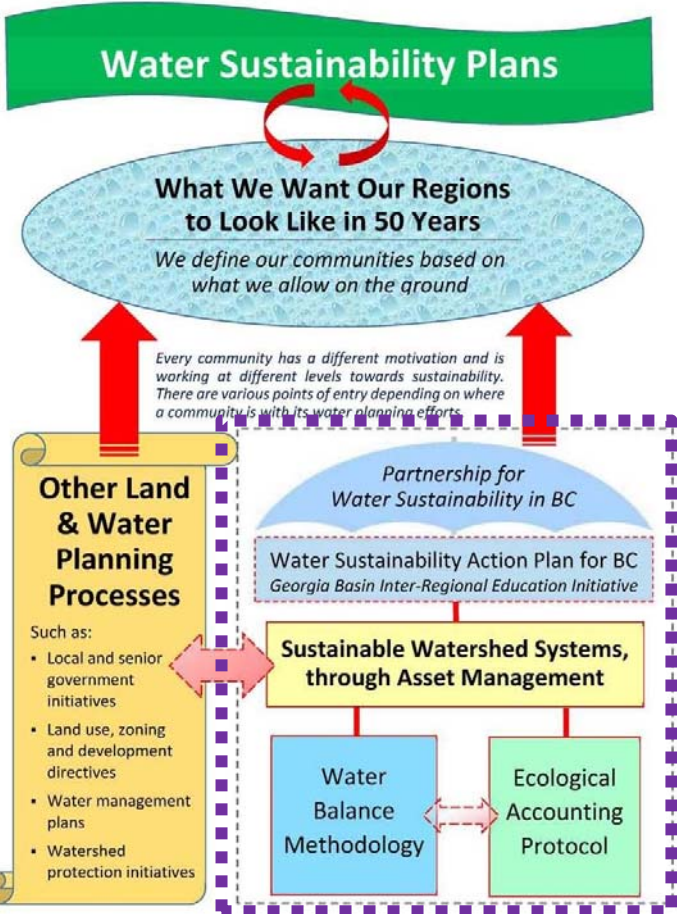




A GOAL: **Build Greener Communities**

LIVING WATER SMART  
 CASCADING OBJECTIVES: Deal with Uncertainty  
 Manage the Water Balance  
 Adapt to a Changing Climate

AN OUTCOME: **Settlement, Economy and Ecology in Balance**



# Ecological Accounting Protocol: An Idea Whose Time has Come



Tim Pringle, Chair  
 Ecological Accounting Protocol Initiative  
 Partnership for Water Sustainability in BC

# Optimum Choice

- ❑ Supports local government asset management strategy
- ❑ Lowest life-cycle costs
- ❑ Watershed health (hydrological functioning)
- ❑ Social benefits
- ❑ Solutions from natural and engineered systems

# Reality Check

DESIGN ENGINEERED SYSTEMS TO  
FIT INTO NATURAL SYSTEMS.....

NOT THE OTHER WAY AROUND

# Why Ecological Accounting?

- Determine the optimum blend of engineered measures and services drawn from natural assets.
- Communities want greater commitment to watershed health and water sustainability
- **Sustainable Watershed Systems Through Asset Management**

# Eco-System-Based Management

- Protect watershed health
- Achieve water sustainability
- Support climate change mitigation measures
- Support sustainable human settlements

Convening for Action to Do Business Differently:

*Changing the Land Ethic*

**Settlement Change** *in balance with* **Ecology**



- Ecology can exist without human habitation
- Human habitation cannot exist without ecology!

# Green Infrastructure in OCPs

## City of Kelowna (2012 OCP)

- “To be sustainable, infrastructure must be efficient and durable while creating minimal impacts on the environment.” (Chapter 7)
- Natural Environment Development Permit Guidelines (Chapter 12)...  
.....with emphasis on “environmentally sensitive areas and groundwater resources....”

# Green Infrastructure in OCPs

City of Surrey, B.C.

- *Sustainability Charter 2008*
- “A City-Wide Biodiversity Conservation Strategy based on the EMS (Ecosystem Management Study) inventory and the associated Green Infrastructure Network (GIN) Management Strategies” 2011



# 15 to 20 years ago

Real Estate Foundation's early involvement:

- Use and conservation of land are equal values
- Funds for Mapping of Environmentally Sensitive Areas
- Working with the James Taylor Chair in Landscape and Livable Environments, UBC

# Headwaters Project

East Clayton, Surrey, B.C. 1999-2002

“A real-life demonstration of sustainable development principles and performance standards in a community neighbourhood environment.”

# Other Early Innovative Projects



**UniverCity at Simon Fraser University, 2002**  
**City of Chilliwack, B.C. 2002**

# Design With Nature & GI Strategies

## 2002 - 2016

- 2000 – *Green Municipal Fund* established by FCM
- 2002 – Water Balance Model Inter-Governmental partnership
- 2003 – Web-based Water Balance Model (First Version)
- 2003 – Water Sustainability Committee (WSC) of BCWWA formed: now the Partnership for Water Sustainability in BC (since 2010)
- 2003 - Green Infrastructure Partnership formed (WSC, GVRD, WCEL and MMCD)
- 2005 – Ministerial announcement to launch the [Waterbucket.ca](http://Waterbucket.ca) website.
- 2007 – Publication of the *Green Bylaws Toolkit* by the environmental Law Clinic at University of Victoria

# Wetlands Provide Green Infrastructure Services



# Ecological Accounting Protocol

## Four Analytical Approaches

- Substitution
- Cost Avoidance
- Environmental Benefits
- Attributed Values

# SUBSTITUTION

- Rain water interception, infiltration, retention and conveyance
- Conveyance is surface flow, sub-surface flow, inter-flows, ground water recharge

# Cost Avoidance

- ❑ Developers, owners rely on previous, proven experience
- ❑ Drawing services from natural assets infrequently occurs
- ❑ Negative impacts on hydrological conditions often occur.



DISASTER





# Environmental Benefits

- Flora and fauna benefit
- Healthy watersheds (functioning hydrology) can help mitigate climate change.
- Intrinsic values estimated in research by Nancy Olewiler (SFU), Suzuki Foundation, and others.
- Area of focus for the current Municipal Natural Capital Initiative.

# Attributed Values

- Commonly shared services
  - > potable water, clean air, flood prevention, green space, etc.
- Enterprises relying on services from natural assets; examples include resorts, agriculture
- Natural values capitalized into real estate

# Analytical Steps

- Apply Water Balance Model
- Watershed Characteristics and Profile Reports
- Identify civil services for drainage that the natural assets might supply
- Review the existing infrastructure design and identify substitution options
- Run opportunity cost analysis
- Proxy report