Watersheds, Health, Indicators & Governance: Towards Integration?

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(for the **Network for Ecosystem Sustainability & Health**)

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NESH

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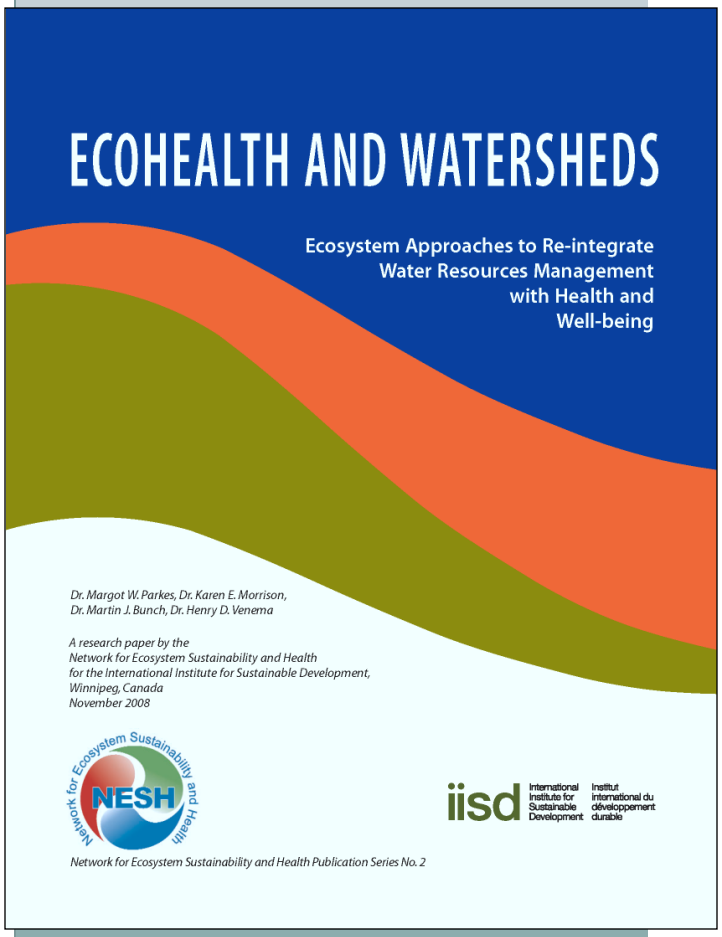
Water Innovation Centre

Overview

- *(Formatting here, clarify)*
- **Watersheds & Health**
  - Linking social & environmental determinants of health
- **Indicators**
- **Governance**
- **→ Towards Integration**

Where is health in this picture

Water, Social-Ecological Systems and Health



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Towards integrated governance for water, health and social–ecological systems: The watershed governance prism

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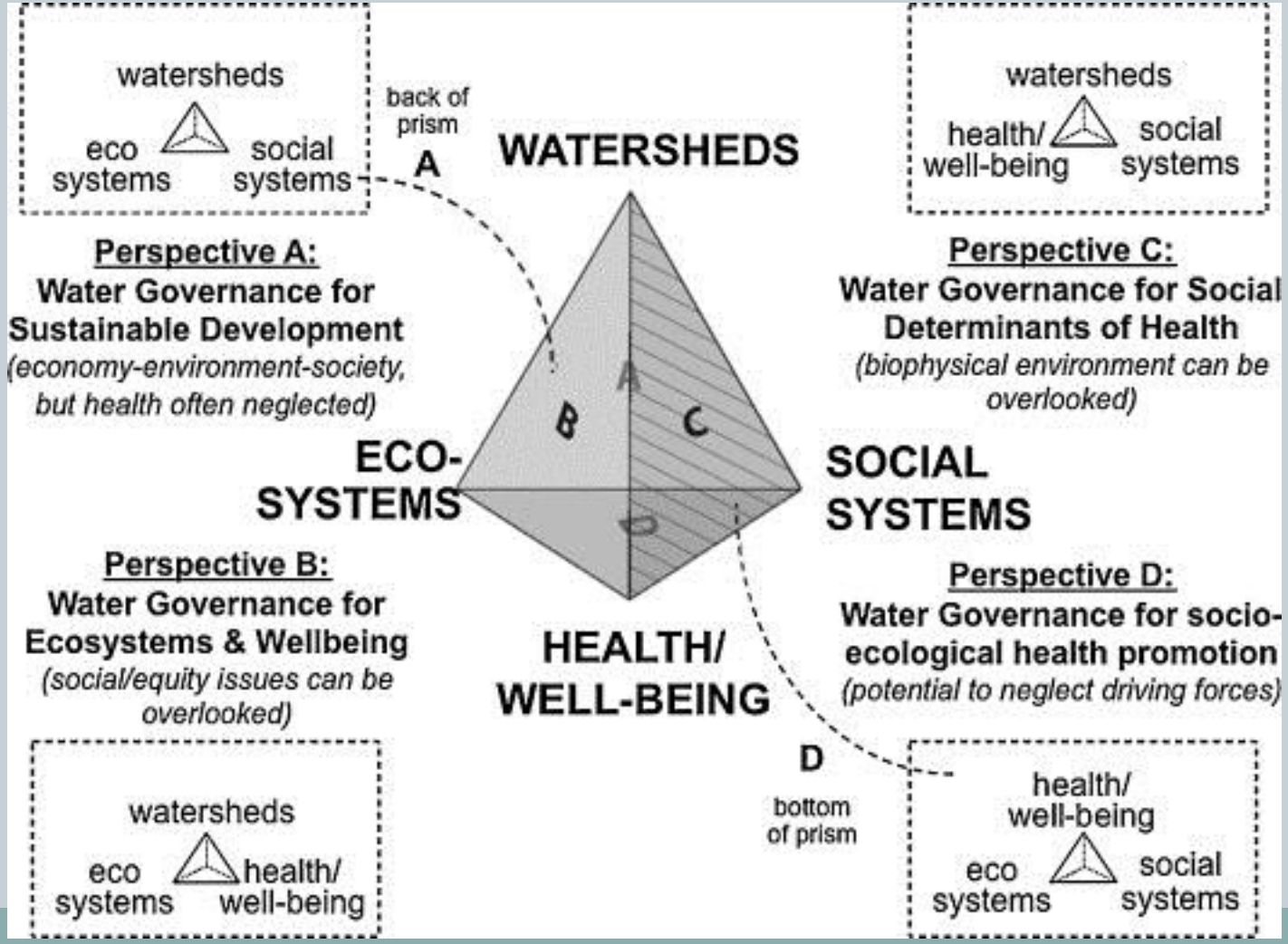
ABSTRACT

This article proposes a shift toward the integrated governance of watersheds as a basis for fostering health, sustainability and social–ecological resilience. The authors suggest that integrated watershed governance is more likely when different perspectives, including health and well-being, are explicitly understood, communicated, and sought as co-benefits of watershed management. A new conceptual device – the watershed governance prism – is introduced in relation to the multiple facets of governance that characterize contemporary water resources management and examined as an integrative framework to link social and environmental concerns with the determinants of health in the watershed context. The authors assess the diagnostic and communicative potential of such a framework, discussing its utility as a concise depiction of multiple, interacting policy priorities and as a guide to integrate different research and policy domains into the governance of water, health and social–ecological systems.

The Watershed Governance Prism



(PAST & PRESENT)

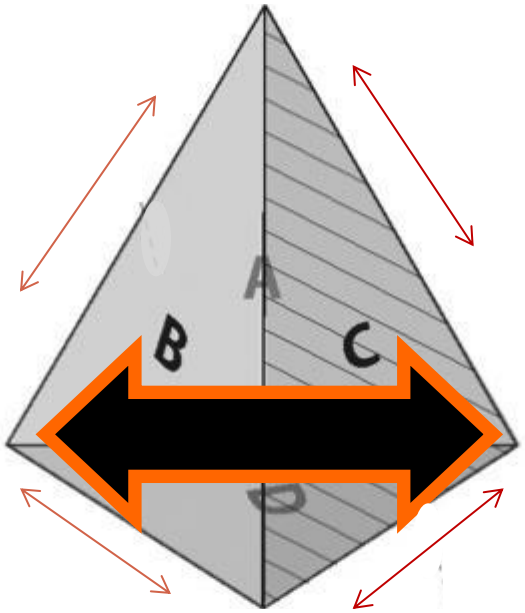
Driving forces of change in

WATERSHEDS

"Hazards"??

"Home"??

ECO-SYSTEMS **(PLACE)**



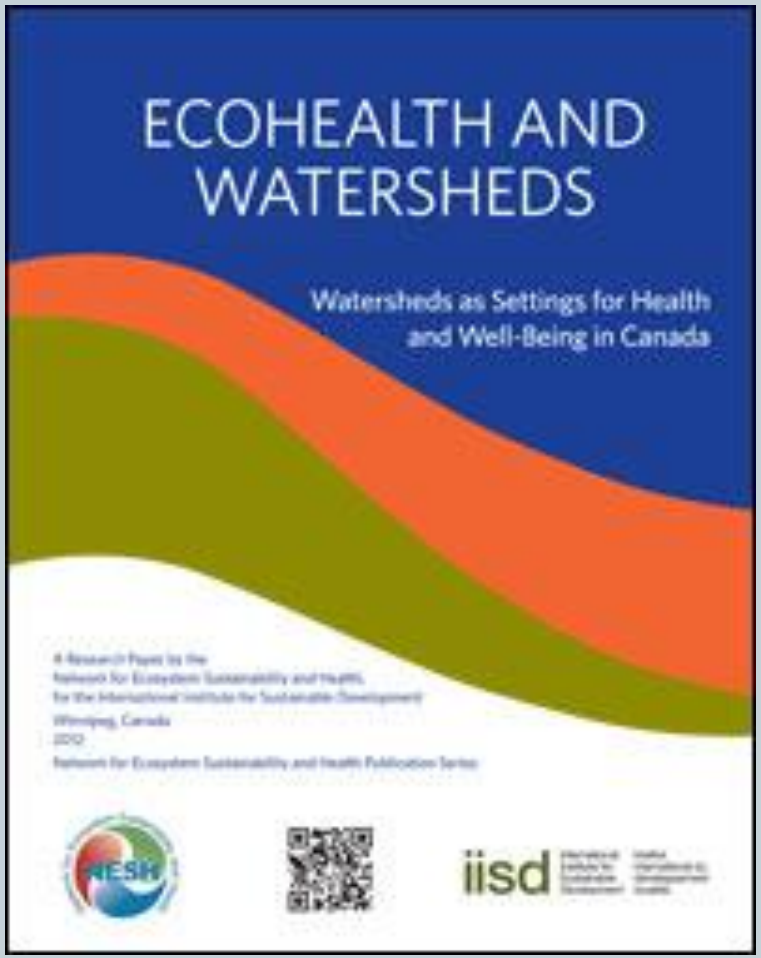
SOCIAL SYSTEMS **(PEOPLE)**

HEALTH & WELLBEING

→ When, how & where do we connect **health**, **ecosystems** & **society?**

Adapted from Parkes et al 2003 ; Parkes et al 2010

Watersheds as Settings for Health & Wellbeing



Morrison, K., Parkes, M., Hallstrom, L., Neudoerffer, C., Bunch, M., & Venema, H. (2012). *Ecohealth and watersheds: Watersheds as settings for health and well-being in Canada.*

(mention pamphlet too)

Why Indicators AND Governance
(wither integration??)

- An expressed need from Watershed Partners
  - *Example watershed partners….*
- An point of connection with Health Agencies
  - Northern Health
  - From 'that can be done' to designing new approaches
- Indicators as a tool FOR governance
  - "The processes whereby societies and organizations make important decisions, determine whom they involve in the process, and hold decision-makers to account" (Graham et al 2003
- The need for Integration….

Canadian Sustainability Indicators Network

April 3, 2013

Measuring Watershed Health and Human Well-being: The Quest for Indicators

Mike Puddister,
Director, Restoration and Stewardship

Tatiana Koveshnikova
Project Coordinator, Ecological Goods and Services

Presentation Outline

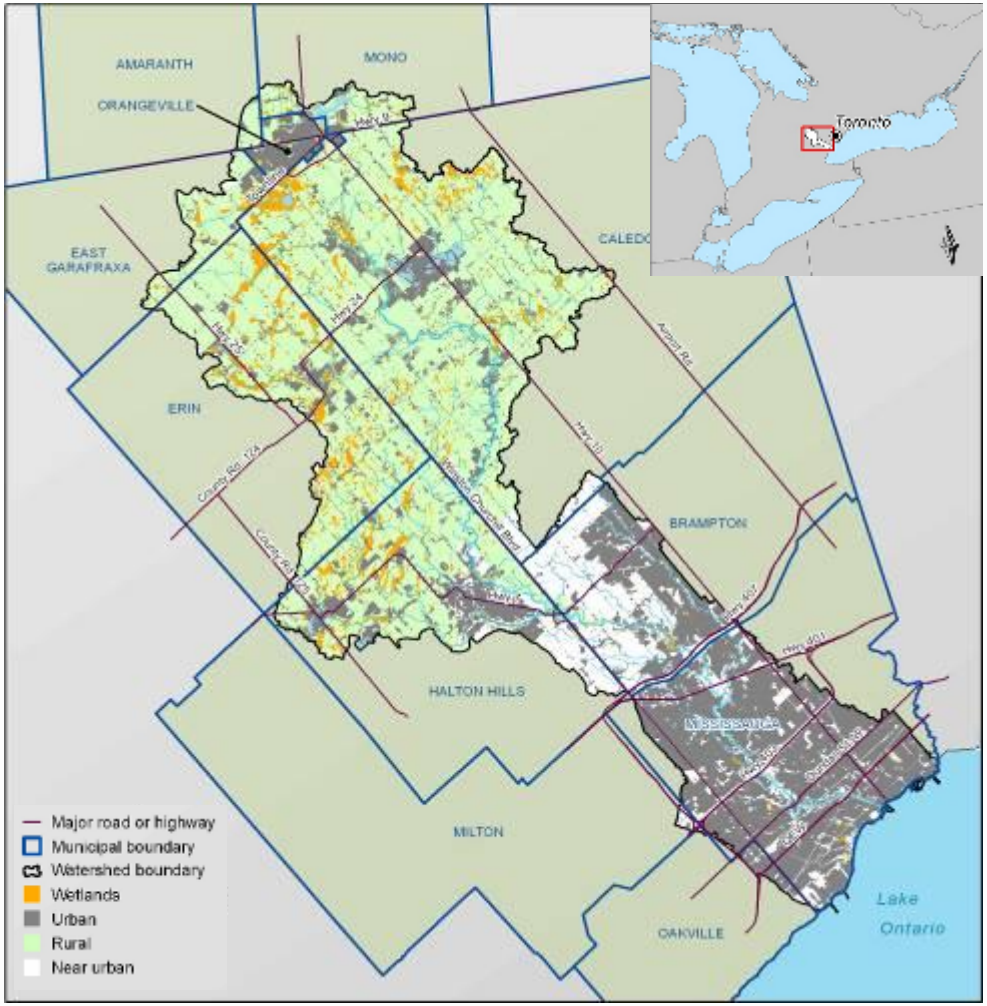
- Credit Valley Conservation
- Integrated Watershed Monitoring Program: Biophysical Indicators
- Ecosystem Services and Human Well-being:
  - Phase I: key findings
  - Phase II: next steps

CVC Mandate

- One of the 36 Conservation Authorities in Ontario
- Management on a watershed basis as per CAA
- Works in partnership with municipal governments, schools, businesses and community organizations
- Key programs include:
  - Water resources
  - Land management and acquisition
  - Environmental advisory services (Planning)
  - Conservation area management
  - Stewardship and education
  - Natural heritage
- CVC's core operating principles:
  - "*We recognize the inextricable link between human health and the natural environment*."
  - "*We recognize that healthy communities require a sustainable balance between economic, social and environmental priorities, interests and uses."*

Conservation ONTARIO
Natural Champions

Credit River Watershed

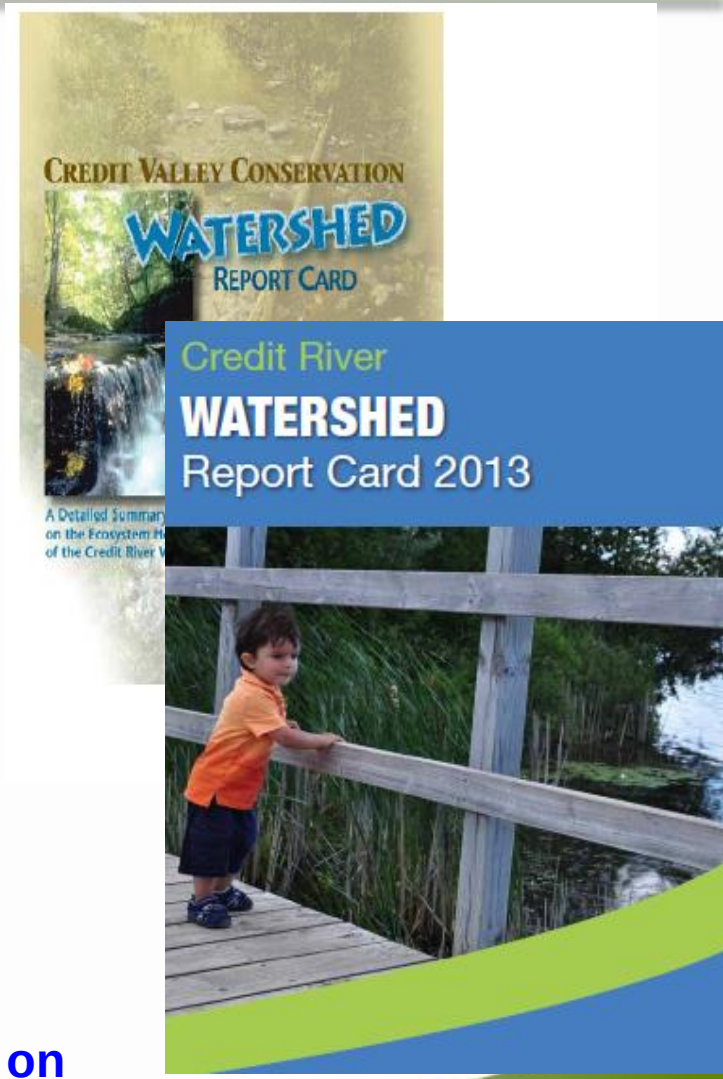


- Just west of Toronto in GTA
- Population ~ 750,000
- Area ~ 1,000 km^2
- Land use in the watershed:
  - 33% urban
  - 29% agriculture
  - 23% natural (wetlands and forest)

Integrated Watershed Monitoring Program: Biophysical Indicators

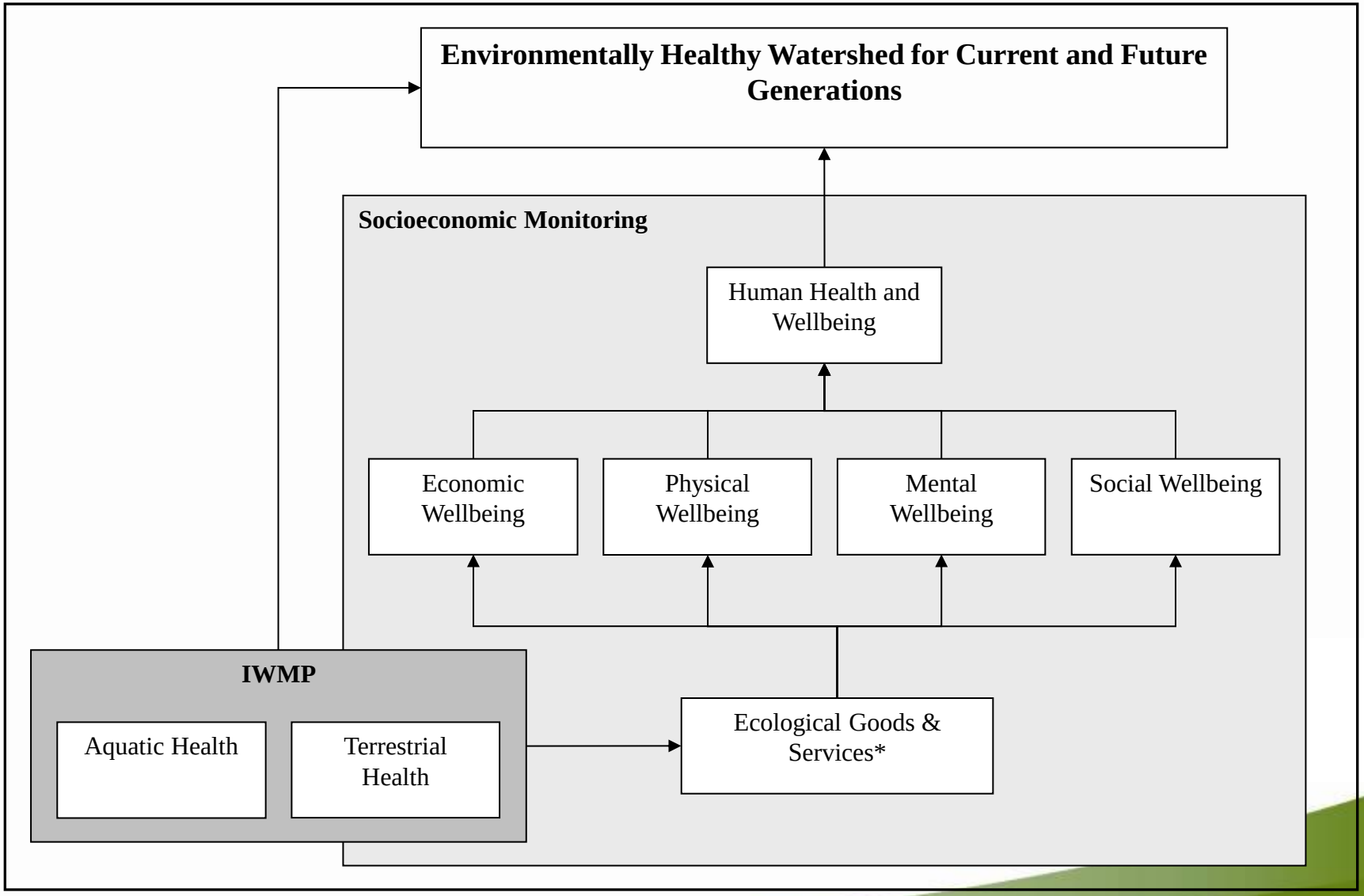
- Started in 1999
- Goal: "*ensuring an environmentally healthy river for economically and socially healthy communities*"
- Watershed wide program: 175 monitoring sites
- 2013 Watershed Health Report and Watershed Report Card:

✓ Key threats: Climate change and land use change;
✓ Groundwater levels and quality;
✓ Streamflow;
✓ Fluvial geomorphology;
✓ Forest integrity;
✓ Wetland integrity;
✓ Riparian integrity;
✓ Water chemistry and temperature;
✓ Sediment chemistry;
✓ Benthic macroinvertebrates;
✓ Fish



Need for indicators measuring impact on human health and well-being

Conceptual Map of the Watershed and Human Health and Well-being



Ecosystem Services and Human Well-being
Phase I: Research Objectives

- **To understand the linkages between ecosystem health and human well-being in the Watershed**
- **Examine perceived importance of ecosystem elements for the residents' well-being;**
- **Capture the current level of satisfaction with various ecosystem elements and functions;**
- **Provide recommendations for designing a set of indicators to monitor changes in well-being over time**

Over 1,000 respondents completed the survey

Phase I Results: Importance of Natural Areas

68% of respondents rated natural areas as an important contributor to their well-being

Ecosystem benefits most strongly linked to well-being:

- Trees for cleaning the air (91%)
- Clean water (89%)
- Scenic beauty (85%)
- Protection from flood and erosion (81%)
- Community belonging/sense of place (72%)

Nature contribution to health:

- Importance for relieving stress (79%)
- Aiding physical fitness (76%)
- Restoring productivity and concentration (67%)
- Recovery from illness (67%)

Importance of access to natural areas:

- Having an access to natural areas inclines an individual to derive benefits from those areas
- Natural areas within walking distance are the most important

Phase I Results: Some Potential Indicators

Well-being Mechanism	Scale Considerations	Domains	Example Indicators
Ecosystem services	• Provincial • Watershed • Local community	Good social relations	• Social equity (e.g., canopy distribution)
		Freedom of choice and action	
		Security	• Flood risk index
		Good health	• Water quality index
		Basic material for a good life	
Contact with nature	• Watershed • Local community	Good social relations	• Use of green space for social functions
		Freedom of choice and action	
		Security	• Index relating green space to measures of safety • Perceptions of safety
		Good health	• Availability and accessibility of natural areas • Use of natural areas for relieving stress • Use of natural areas for improving physical fitness • Urban canopy cover
		Basic material for a good life	

Phase II: Research Objectives

Goal: to explore and report on the relationship between watershed ecosystem health and human health and well-being

Objectives:

- Design conceptual framework to connect *ecosystem health, ecosystem services*, *watershed management* and *human well-being*
- Develop a set of indicators that relate changes in ecosystem conditions to changes in human health and well-being
- Run a pilot for one neighbourhood/subwatershed
- Produce watershed-wide GIS tool/map to report on the well-being indicators and the value of natural cover at different scales (subwatershed, neighbourhood, household)
- Develop a set of scenarios to demonstrate how watershed management practices affect well-being of local residents;
- To evaluate and monitor management/restoration strategies as they relate to the well-being of local residents

Exploring Indicators of Watershed & Community Health

Webinar Co-Sponsored by CSIN and NESH

April 3, 2013

Presented by:

Steve Litke, Fraser Basin Council

Fraser Basin Council

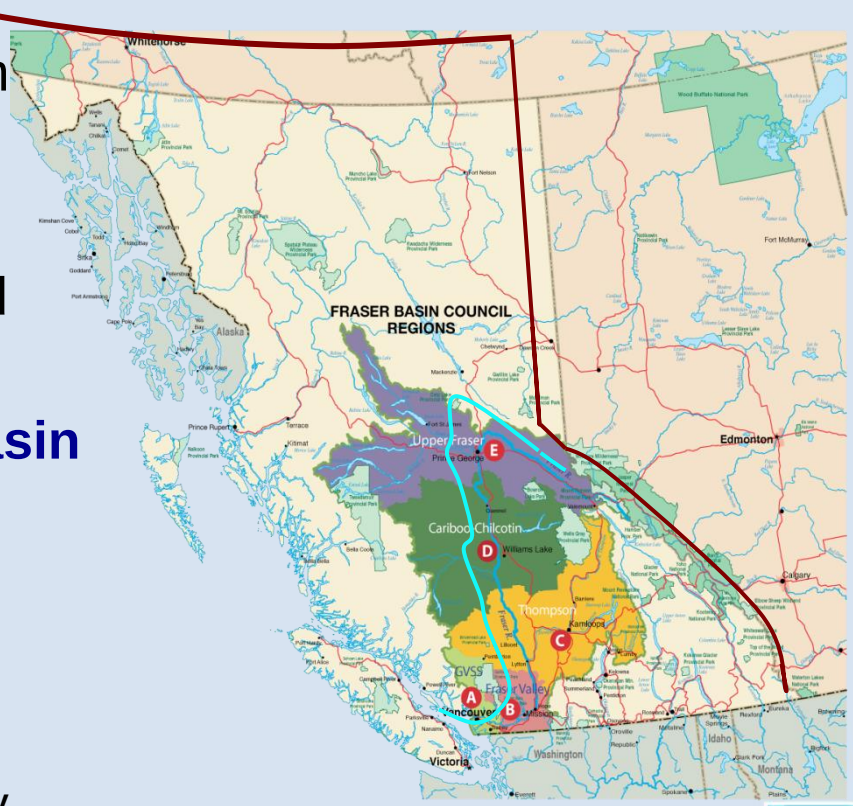
SUSTAINABILITY SNAPSHOT 4

Outline

- Introduction to Fraser Basin Council (FBC)
- Overview of FBC Sustainability Reporting
- Examples of FBC Indicator Themes and Metrics
- Connecting Watersheds and Community Health
  – Some Challenges and Reflections

Fraser River Basin - Geography

- Fraser River flows ~1400km Mt Robson to Vancouver
- Area is about 220,000km^2
- Population is 2.7 million and growing
- **Five regions within the Basin**
  - Upper Fraser
  - Cariboo-Chilcotin
  - Thompson
  - Fraser Valley
  - Greater Vancouver-Sea to Sky



Fraser Basin Council

- Not-for-profit NGO to advance sustainability in the Basin
- Board of Directors (37) includes four orders of Canadian government, private sector and civil society interests
- **Mandate to advance sustainability - especially in complex, inter-jurisdictional issues**
- Mandate to educate on the need for sustainability
- **Role to measure and report on progress towards sustainability in the Fraser Basin**

Snapshot 4 - Indicator Themes

Three to five measures per theme plus stories

1. **Aboriginal & Non-Aboriginal Relations**
2. **Agriculture & Food**
3. Air Quality
4. **Biodiversity (Wildlife & Habitat)**
5. Business & Sustainability
6. **Climate Change**
7. **Community Engagement**
8. **Consumption & Waste**
9. Economy

Snapshot 4 - Indicator Themes

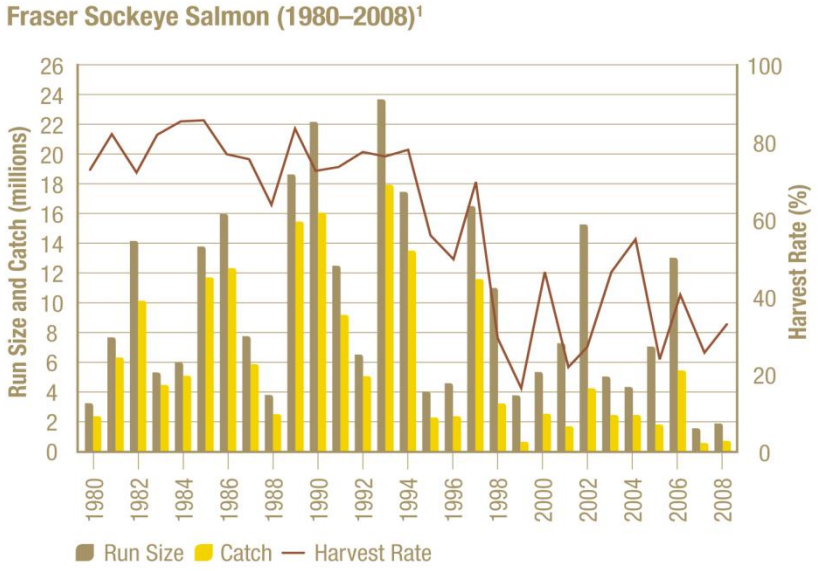
10. Education
11. Energy
12. **Fish & Fisheries**
13. **Forests & Forestry**
14. **Health**
15. Housing
16. **Income & Employment**
17. Population & Demographics
18. **Water Quality & Quantity**

Examples of Metrics

1. Retention of agricultural land; # of Environmental Farm Plans; **use of beneficial management practices**
2. Extent & ecological diversity of Protected Areas; species & ecosystems at risk; fish & wildlife populations; status of habitat
3. Rates of volunteerism
4. Rates of household environmental activities
5. Employment by sector
6. Area of forest affected by Mountain Pine Beetle and associated community vulnerability; forest area disturbed versus restocked
7. Life expectancy, leading causes of death, waterborne illnesses
8. Water Quality Index ratings; **attainment of water quality objectives**; boil water advisories; population served by degrees of wastewater treatment

Fraser Sockeye Salmon

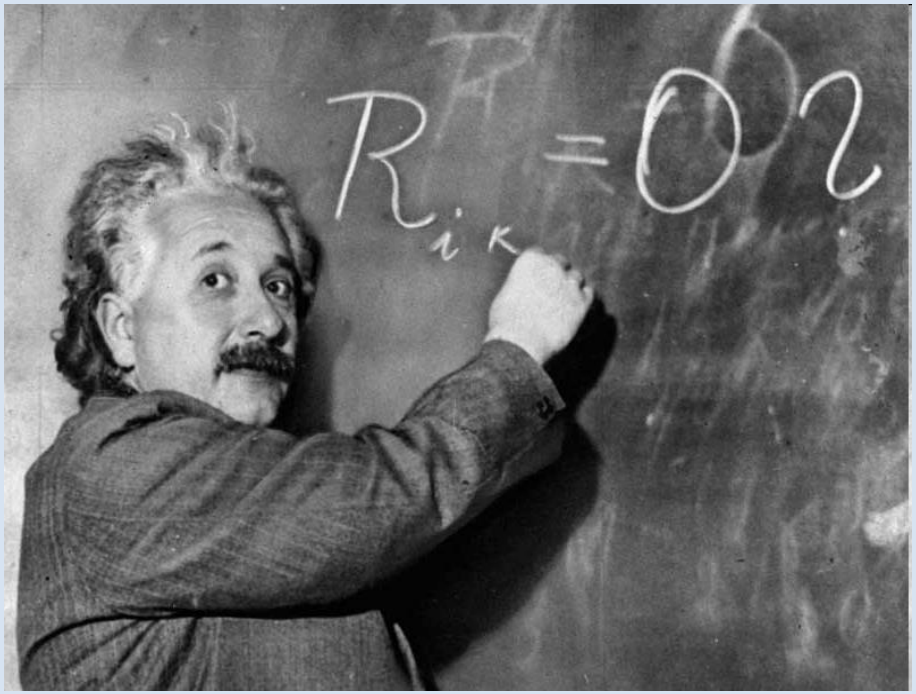
- An indicator of watershed health (among other factors)
- Connections to human health:
  - Aboriginal food, social and ceremonial fishery
  - Recreational and commercial fisheries



Connecting Watersheds and Community Health - Some Challenges

- Few indicators (that are supported by available data) truly integrate watersheds and community health
- **Indicators are simple proxies for a complex world**
- Watersheds, health, sustainability and ecohealth are complex and are influenced by numerous factors
- These issues are not conducive to identifying clear causal links – correlation is not necessarily causation
- Significant effort to convert administrative boundaries (of data sources) to watershed boundaries

Connecting Watersheds and Community Health - Some Challenges



"Not everything that counts can be measured.

Not everything that can be measured counts."

Connecting Watersheds and Community Health – Some Reflections

- Watershed-based reporting can help foster thinking like a watershed and understanding health connections
- Consider appropriate scales for watershed reporting
- **Supplement indicator data with story-telling:**
  - Case studies of watershed and health connections
  - Analysis to co-relate watersheds and community health
- **Pilot innovative metrics to advance the field:**
  - Physical activity from voluntary watershed stewardship
  - Access to watershed-based recreational opportunities
  - Survey data on public values associated with watersheds

Thank You

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www.fraserbasin.bc.ca

http://www.fraserbasin.bc.ca/resources_indicators.html