The New Economy: Carbon and Ecosystem Values

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http://www.pacificsalmonforum.ca/final/BCPSFFinRptqSm.pdf

http://www.sfu.ca/act/documents/ACT_Biodiversity_Summary_Recommendations_final.pdf

Outline of Presentation

- Dialogue with government staff on new approaches to carbon management
- Outline ecosystem based approaches
- Value of ecosystem goods and services
- Identify barriers to ecosystem based management
- Short term and long term governance implications

Can we fix this?

Global Policy Context

- Increasing real cost of carbon based energy
- Need to reduce carbon emissions
- Need to increase carbon storage
- Recognize changing climate places stress on ecosystems
- Functioning ecosystems are more resilient to climate change

Lower Sampson Co., NC

Cimarron Co., OK

S. Lincoln Co., TN

Silicon Valley, CA

Provincial Policy Context

- Carbon emission reduction
- Carbon offset regulation
- Ecosystem based management on Central and North Coast
- Living water smart
- Future forest ecosystem initiative
- Conservation Framework

Ecological Goods and Services

- Provisioning services
  - Food
  - Fibre
  - Fresh water
  - Genetic resources
- Regulating services
  - Carbon sequestration
  - Water cleansing
  - Flood control
  - Drought protection
  - Temperature moderation

Valuating Goods and Services

- Northern boreal forest
  - Market value of forests $15 billion
  - Non-market value $150 billion
  - Wetlands and peatlands $ 80 billion
  - Water resources-hydro $20 billion
- Source: Pembina Institute
- Mountain pine beetle impacts
  - Loss of timber revenue $ 580 million
  - Loss of labour income $ 98 million
- Source: ACT Simon Fraser University

Ecosystem Services

- Sustaining ecological goods and services requires properly functioning ecosystems
- Changing climate impacting ecosystems faster than they can adapt
- Loss of ecosystem services will be costly
  - High replacement costs
- Emerging carbon market offers funding opportunities
- Retaining and restoring functioning ecosystems makes good business sense
- Wild Pacific salmon under threat in Southern watersheds

Carbon Cycle

- Clarify science on changes in land use affecting carbon emissions and storage
  - value of old growth forests
  - effects of silviculture
- Value of functioning riparian ecosystems for storing carbon
- Improvements to natural capital that can generate carbon offset credits
- Carbon budget should be included in TSR

Texas Cr. CO
Sept. 1976
Non-Functional

Texas Cr. CO
July 1987
PFC

Avoidance Strategies

- Maintain ecosystem functionality
  - Resilience to climate shifts
  - Sustain ecosystem goods and services
- Ecosystem based management
  - Design with nature
  - Whole systems approach
  - Business based valuation
  - Cost sharing by business and government
- Cost avoidance
  - Reduce costs of replacing services

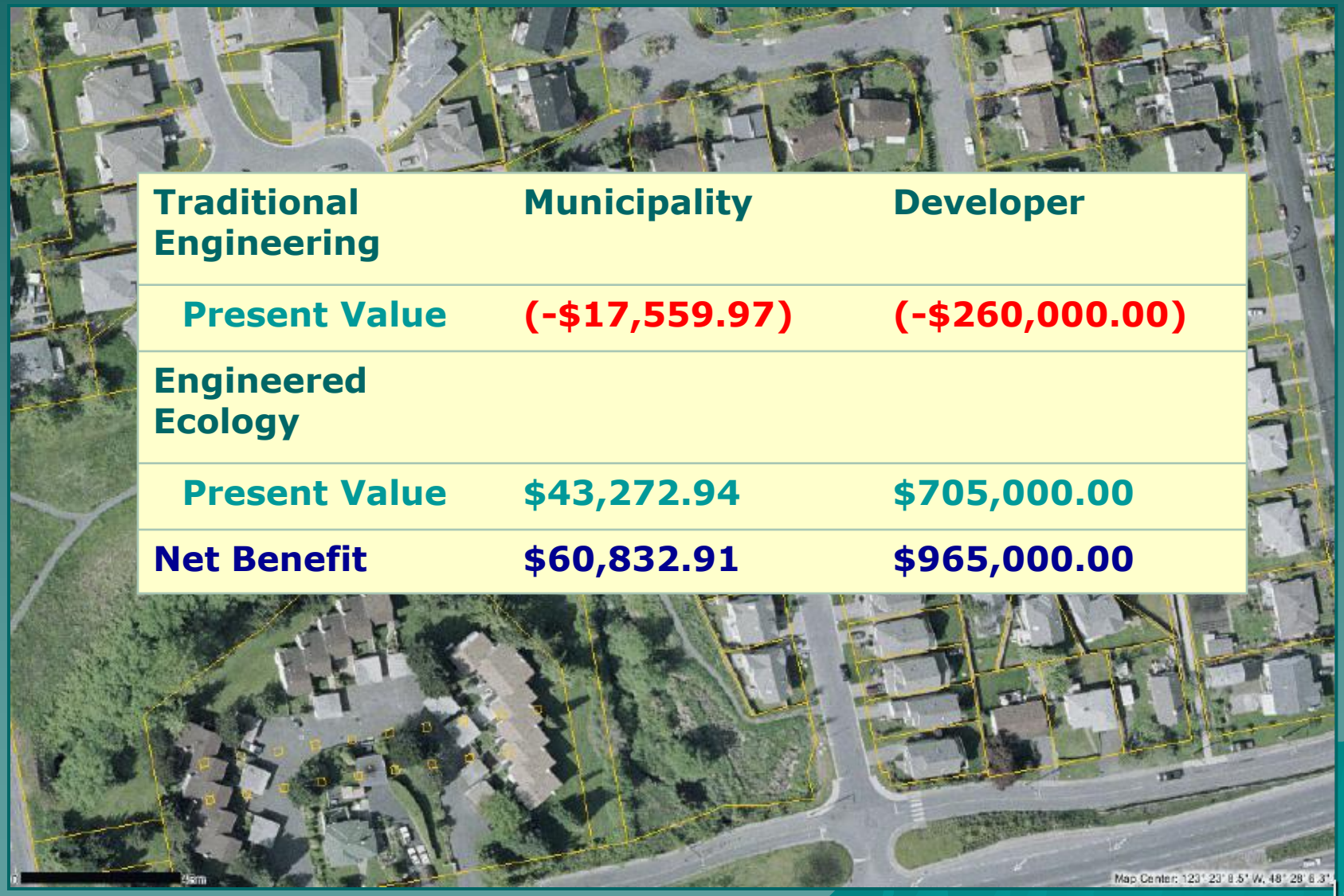
Swan Creek Restoration

1999

May 2004

May 2006

Financial Benefit (Value)



Traditional Engineering	Municipality	Developer
Present Value	(-$17,559.97)	(-$260,000.00)
Engineered Ecology		
Present Value	$43,272.94	$705,000.00
Net Benefit	$60,832.91	$965,000.00

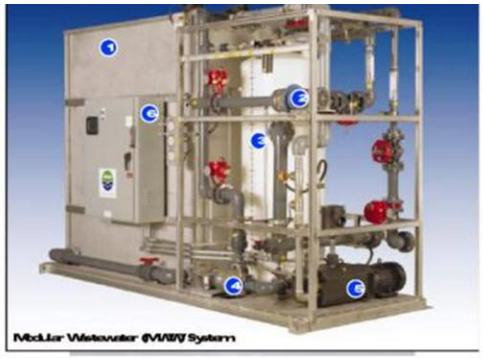
Glacier National Park (Courtesy Dave Polster, Polster Environmental Services)

Governance Barriers

- No single agency responsible for whole system management
- Lack of established ecosystem indicators to measure ecosystem limits
- Land and resource decisions not integrated on an ecosystem basis
- Restrictions on reuse of treated water and waste
- Draw down of natural capital and ecosystem functionality resulting in increasing risk in a climate changing world

Evolution of Design Process

Engineered Ecology
Closed loop
Design based on **value**



Examples of Regulatory Changes Recommended

- Need to review conservation caps under FRPA
- Coordinate or share provincial decision-making based on an ecosystem basis
- Manage ecosystems based on natural boundaries- not administrative ones
- Maintain landscape level planning to manage cumulative effects as a business case
- Encourage reuse of water under municipal sewage regulation
- Amend RAR to encourage functioning riparian zones
- Provide incentives to encourage early adopters

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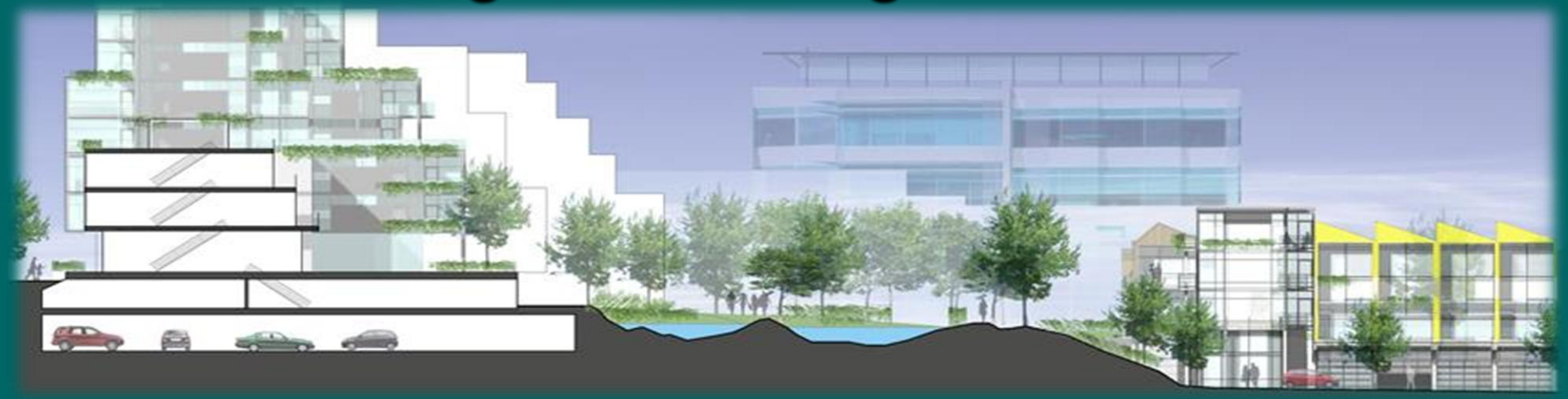
Dockside Green: Before (Brownfield)

Dockside Green: After (Concept)

LEED™ platinum

Water + Energy

Integrated Design = Value



Financial Implications

- Efficiencies in service delivery across ministries through shared decision making
- Short term challenge to ministry budgets for research
- Partnerships with conservation groups, US agencies, private sector
- Stress importance of business case and economic stimulus
- Creative use of infrastructure funds under the new green economy

Policy Recommendations

- Value ecological goods and services
- Apply carbon budgets to ecosystem management
- Economic assessment of climate change on regional economies
- Public Land Trust encouraged to acquire key connectivity corridors
- Align budgets across governments and conservation foundations to support ecosystem resiliency

Longer Term Issues

- Water is becoming the most critical resource in a changing climate world
- Water is undervalued by users and poorly managed by all levels of governments
- Education at schools and universities on ecosystem values and functions will be key
- Need for a ministry responsible for protecting ecosystem goods and services
- Include carbon and ecosystem values in all resource assessments

Summary

- In a healthy society, economy follows ecology and education precedes them both

- Ken Carey, 'Starseed—The Third Millennium, Living in the Prehistoric World, Harper, San Francisco, 1991