

The Economics of Well-being of Water Reuse

Mark Anielski

CHO, Genuine Wealth Inc.

Author, *The Economics of Happiness*

June 26, 2014

19 : 4181 = 37 X 113
18 : 2584 = 23 X 17 X 19
17 : 1597
16 : 987 = 3 X 7 X 47
15 : 610 = 2 X 5 X 61
14 : 377 = 13 X 29
13 : 233
12 : 144 = 24 X 32
11 : 89
10 : 55 = 5 X 11
9 : 34 = 2 X 17
8 : 21 = 3 X 7
7 : 13
6 : 8 = 23
5 : 5
4 : 3
3 : 2
2 : 1
1 : 1
0 : 0

THE ECONOMICS of HAPPINESS

BUILDING Genuine
wealth

mark ANIELSKI



In the Economics of Happiness, Mark Anielski has visualized an arresting, and more importantly, a possible future, in which affluence will be measured in terms of more happiness and less stuff. That is a world to which all of us can aspire and for which we can work, for the sake of our grandchildren's futures and theirs. Read this and lift your expectations; a saner world is possible, and surely most desirable.

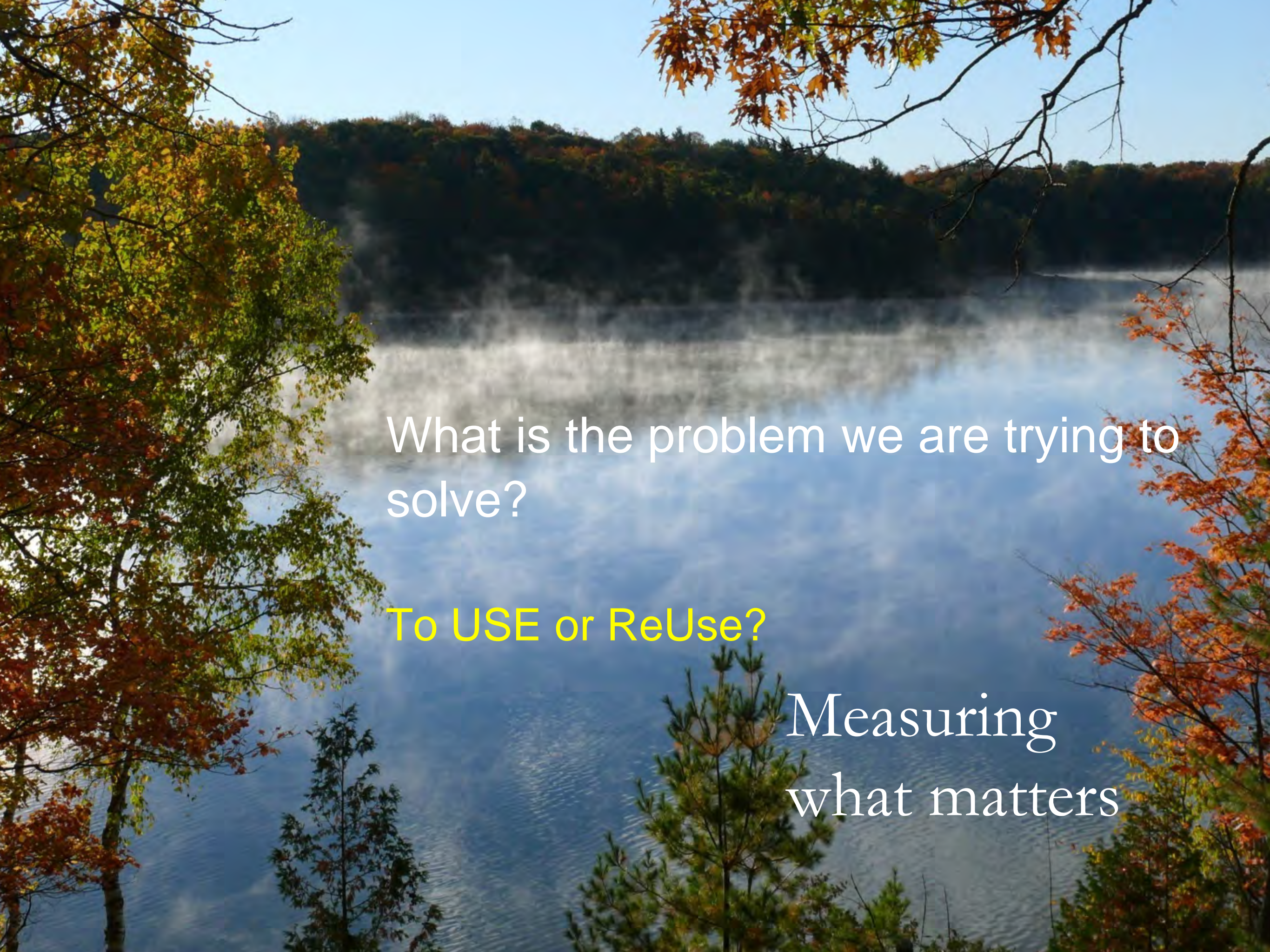
Ray Anderson, [Interface, Inc.](#)





GENUINE WEALTH

Measuring What Matters
to Well-Being.



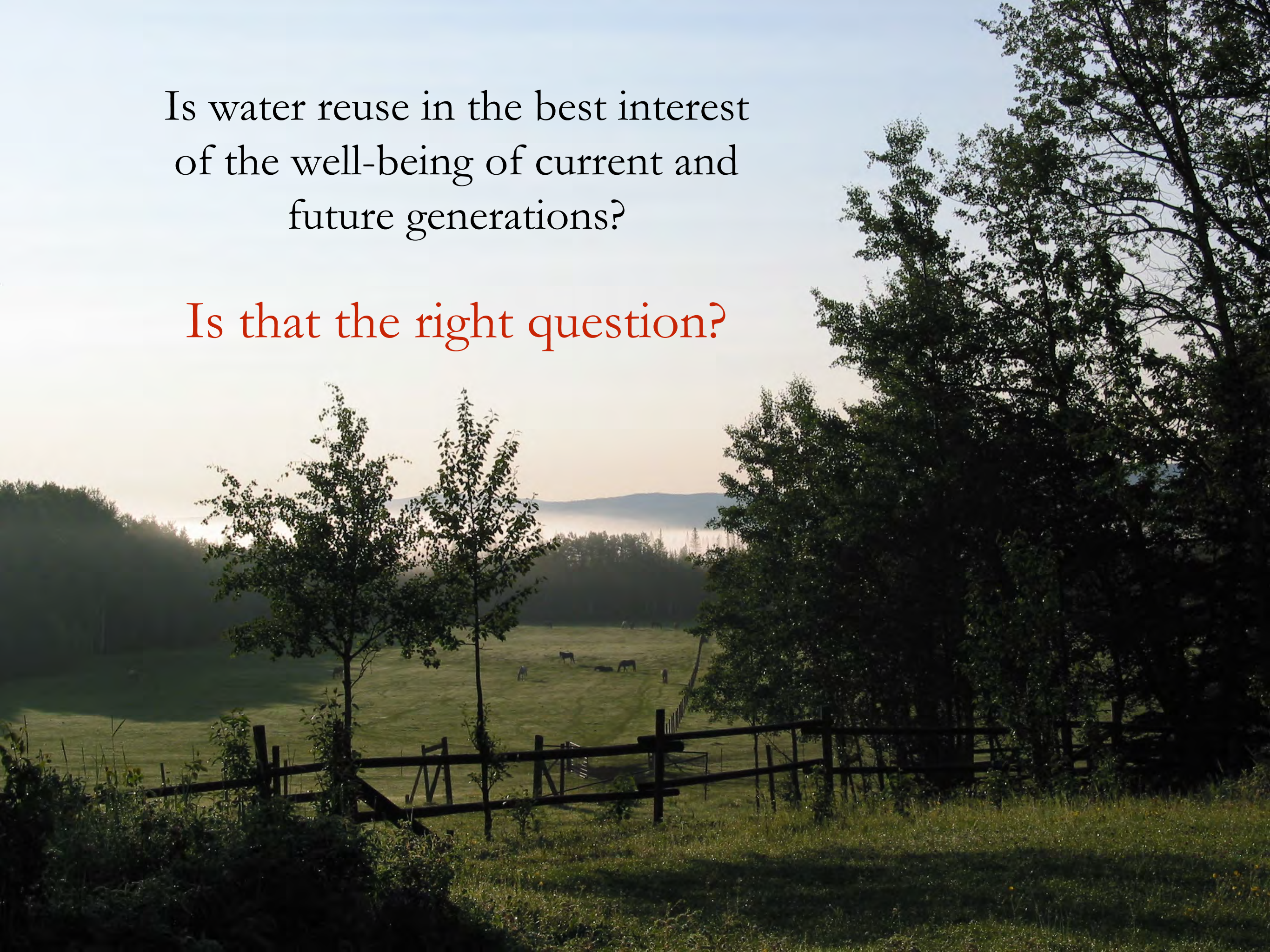
What is the problem we are trying to solve?

To USE or ReUse?

Measuring
what matters

Is water reuse in the best interest
of the well-being of current and
future generations?

Is that the right question?



Doing Well, Be Doing GOOD

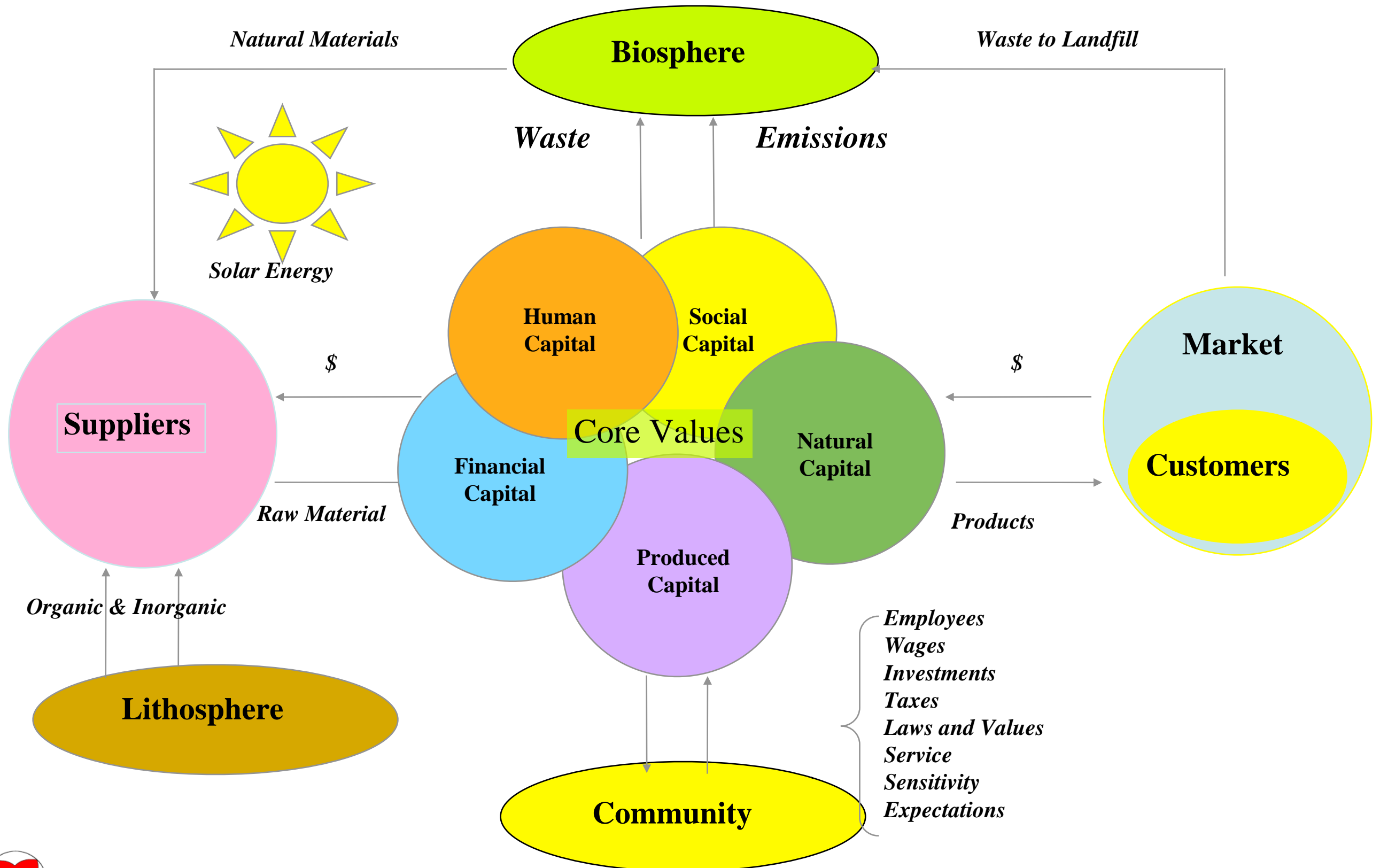
“We have a new vision: to become a leader in industrial ecology by first becoming a sustainable corporation and eventually a restorative enterprise.”



Ray Anderson
Founder
Interface Inc.

(1934-2011)

The 21st Century flourishing enterprise: Optimizing Relationships



Are we measuring what matters?



Florence, Italy



Luca Pacioli

1494

Summa de arithmetica, geometria, proportioni et proportionalita

All wealth belongs to the
Creator (God)

There is no such thing as a profit



Value

(Latin: valorum)

To be worthy or strong

Virtue

(Latin: valorum)

The moral excellence of a person
A trait valued as being good

A blue-tinted photograph of a herd of elephants in a savanna. The elephants are silhouetted against a bright, hazy background, likely a sunrise or sunset. The word "Wealth" is overlaid in a large, yellow, serif font in the center of the image.

Wealth

The conditions of well-being

What would Warren Buffet look for?

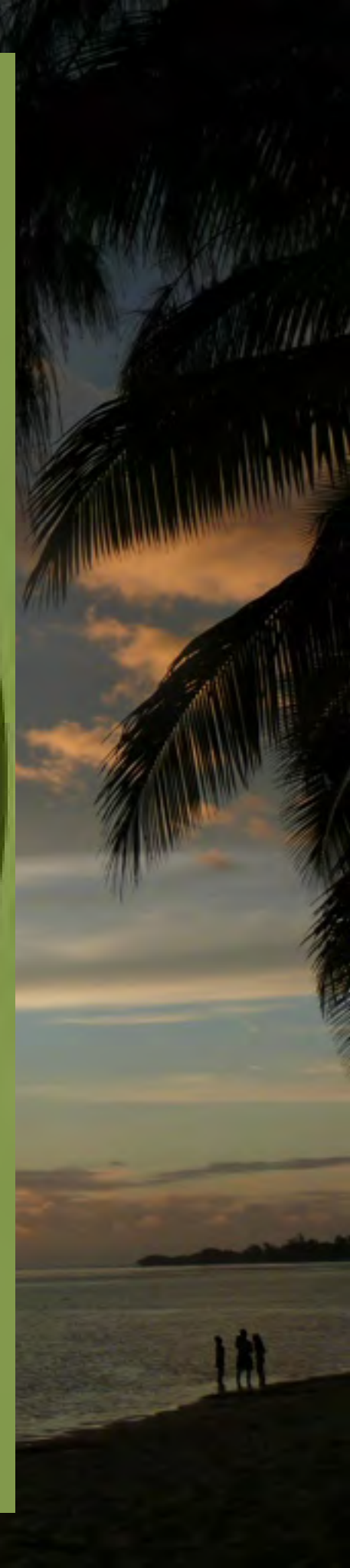
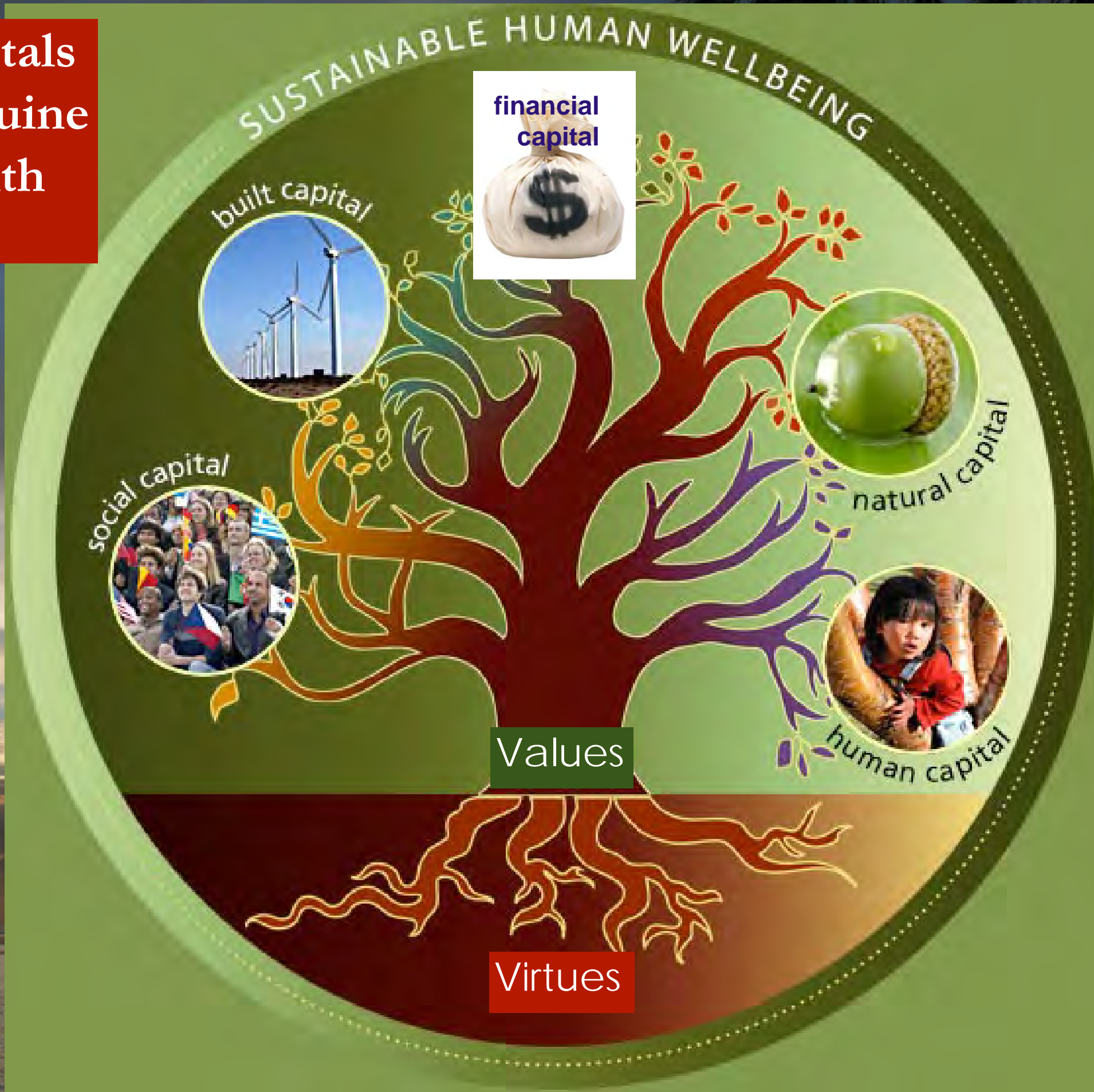


Warren loves health balance sheets

Where is the natural capital balance sheet for
Alberta's watersheds?



5 Capitals of Genuine Wealth



Human Capital



(People): The life capabilities or capacities of people in an organization or community including their level of education (knowledge, skills, competencies), experience, motivation, health, happiness, available time (life-energy) and spiritual well-being that facilitates the creation of personal, social and economic well-being.

Social Capital

The relationships, networks and norms amongst family, friends and colleagues that facilitates collective action; doing things together and for each other, usually without financial compensation [reciprocity]. This includes friendships, clubs, associations, community leagues, neighbourhood socials, churches, email chat groups, workplace climate, and family outings.



Natural Capital

Nature is the model of abundance



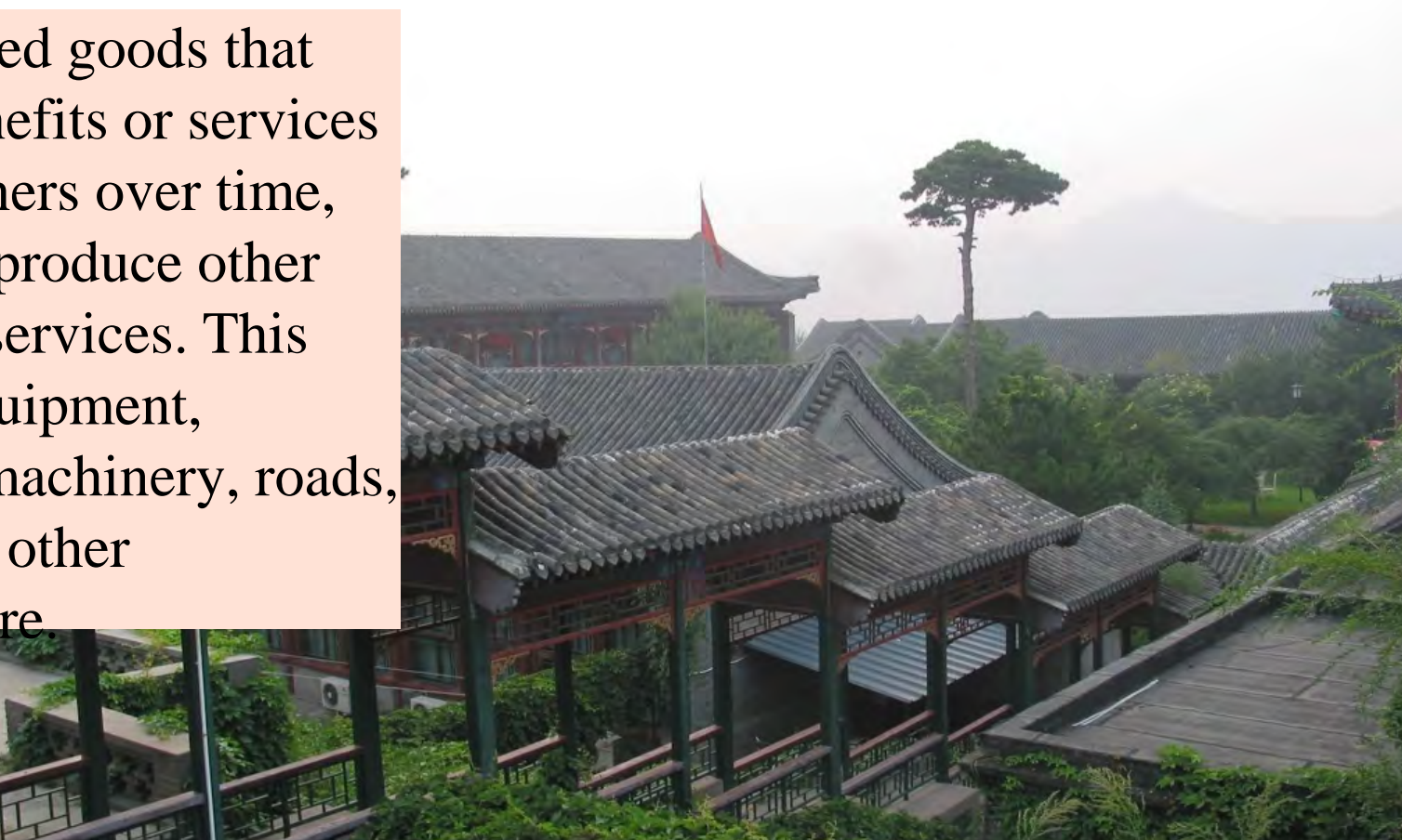
The environmental stocks and systems that provide us with the many natural materials and services upon which we rely to sustain economic activity. This includes natural resources, land, and ecosystems.





Built Capital

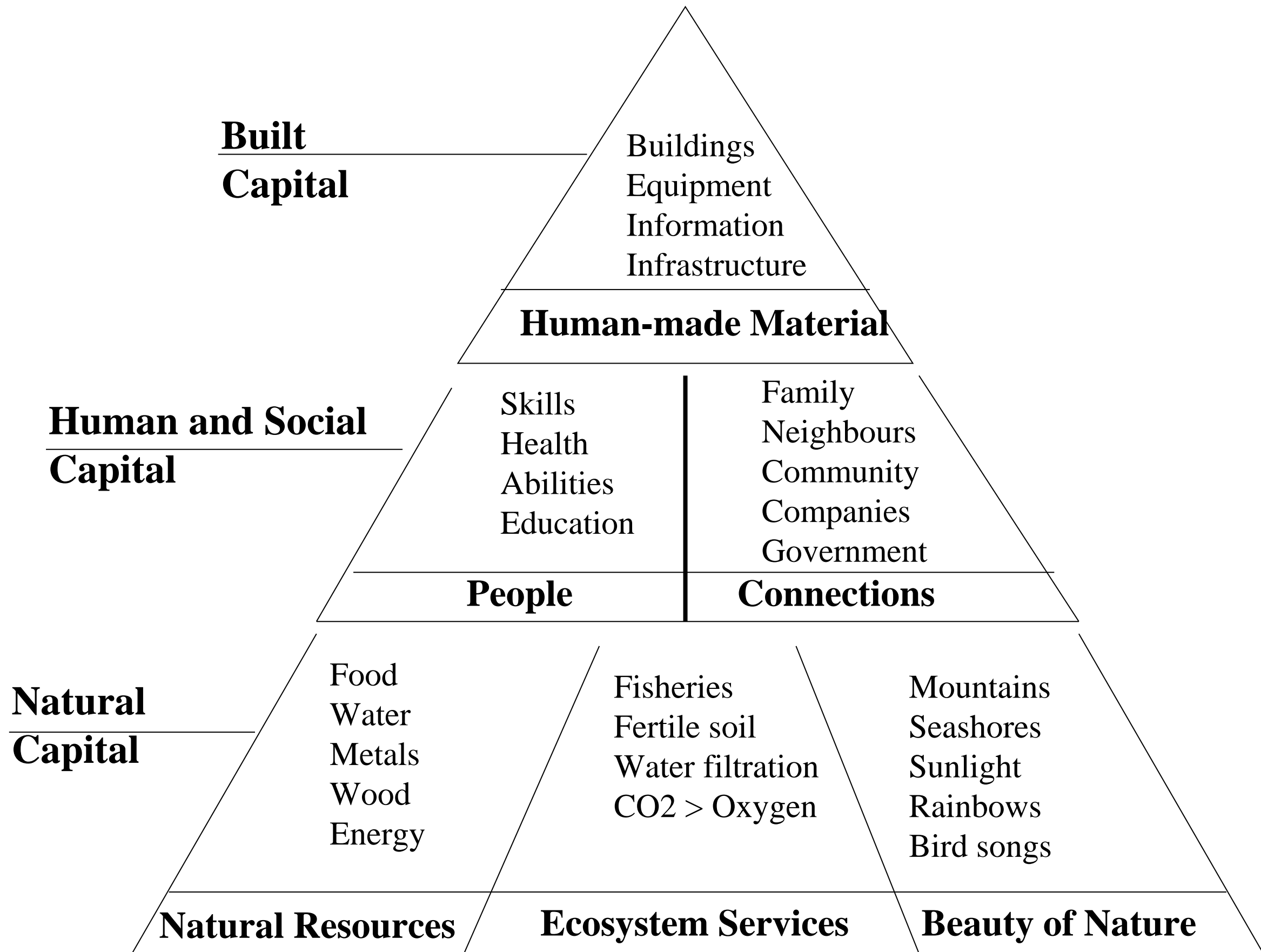
The produced goods that provide benefits or services to their owners over time, by helping produce other goods and services. This includes equipment, buildings, machinery, roads, patents and other infrastructure.



Financial Capital

The financial or monetary assets of an organization, including cash and other financial instruments.





**Financial
Capital**

**Human
Capital**

Five Capitals of Genuine Wealth

*The Conditions of Well-being
The things that make life
worthwhile*



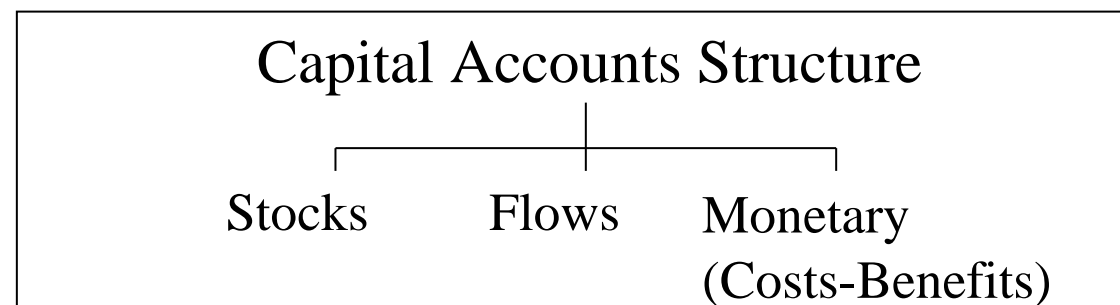
**Built
Capital**

**Social
Capital**

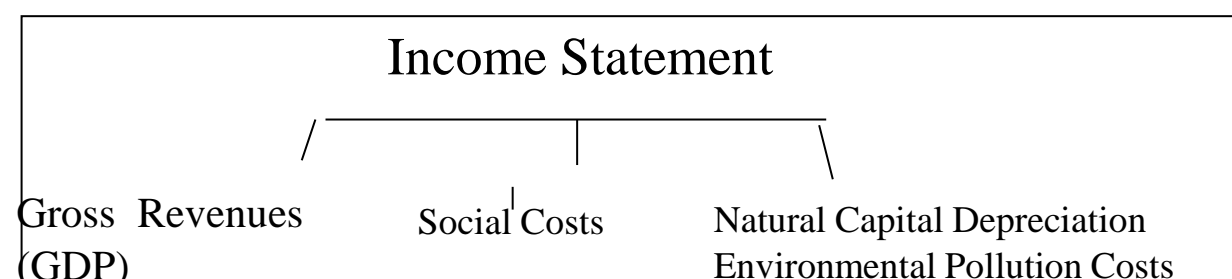
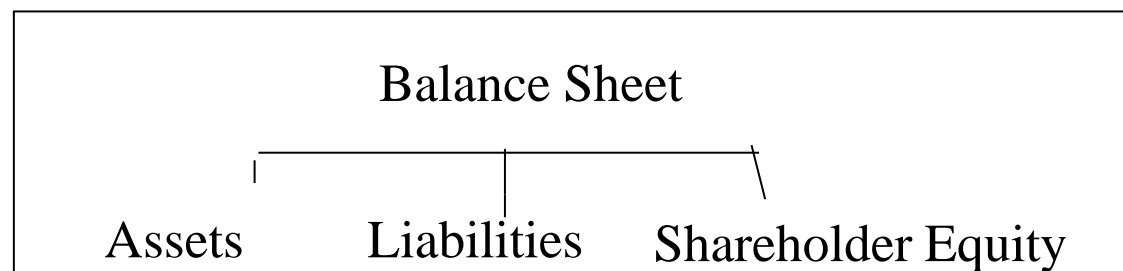
**Natural
Capital**

**Sustainability
Indicators**

Inventory



Objective
Subjective
Monetary



It's time that governments put natural assets on their balance sheets

Natural Capital Account Balance Sheet

Assets

Liabilities

Land Arable Land Grassland Forest Land Wetlands Other Lands	Greenhouse gas emissions Industrial, Household
Water resources Surface water Ground water Water quality	Solid wastes
Energy Crude oil Crude bitumen Natural gas Coal Renewable energy capacity	Toxic wastes
Minerals (gold, copper, other minerals)	Loss of Ecological Integrity
Timber	Cost of pollution
Ecological Goods and Services 17 services	Unsustainable renewable resource use
	Depreciation of non-renewable energy resources
	Shareholder's Equity
	Returns on natural capital economic rents
	Distribution of natural capital (domestic/export)

Canadian Sustainability Accounting System

Sustainability Accounting System

Current Sustainability Accounting Initiatives (some examples)

Scale

National Capital Accounts

National

- StatsCan Econnections/National Capital Accounts
- Env. Can. CISE
- CPRN Quality of Life Indicators

Provincial Capital Accounts

Provincial

- Yukon CEE “Sustainable Progress Indicators”
- B.C. Environmental Trends
- Alberta Round Table on E&E – SD indicators
- Manitoba SOE (1997)

Eco-system (e.g. drainage basin)

Community

- Fraser Basin Sustainability Indicators
- Georgia Basin (QUEST)
- StatsCan “Trends in Cities” project (drainage basin scale)
- NRCAN QofL mapping

Community Capital Accounts Quality of Life Indicators

Corporate

- Federation of Canadian Municipalities (FCM) Quality of Life Indicators
- Sustainable Calgary
- Hamilton Vision 202

Global Reporting Initiative (GRI) economic, social and environmental sustainability indicators

Companies using GRI guidelines:

- BC Hydro
- Suncor Energy
- TransAlta
- Van City Savings Credit Union

Corporate Sustainability Reporting:

57 Canadian companies prepare environmental, social or sustainability reports; 22 prepare “triple bottom line” sustainability reports. (Stratos Report *Stepping Forwar: Corporate Sustainability*)

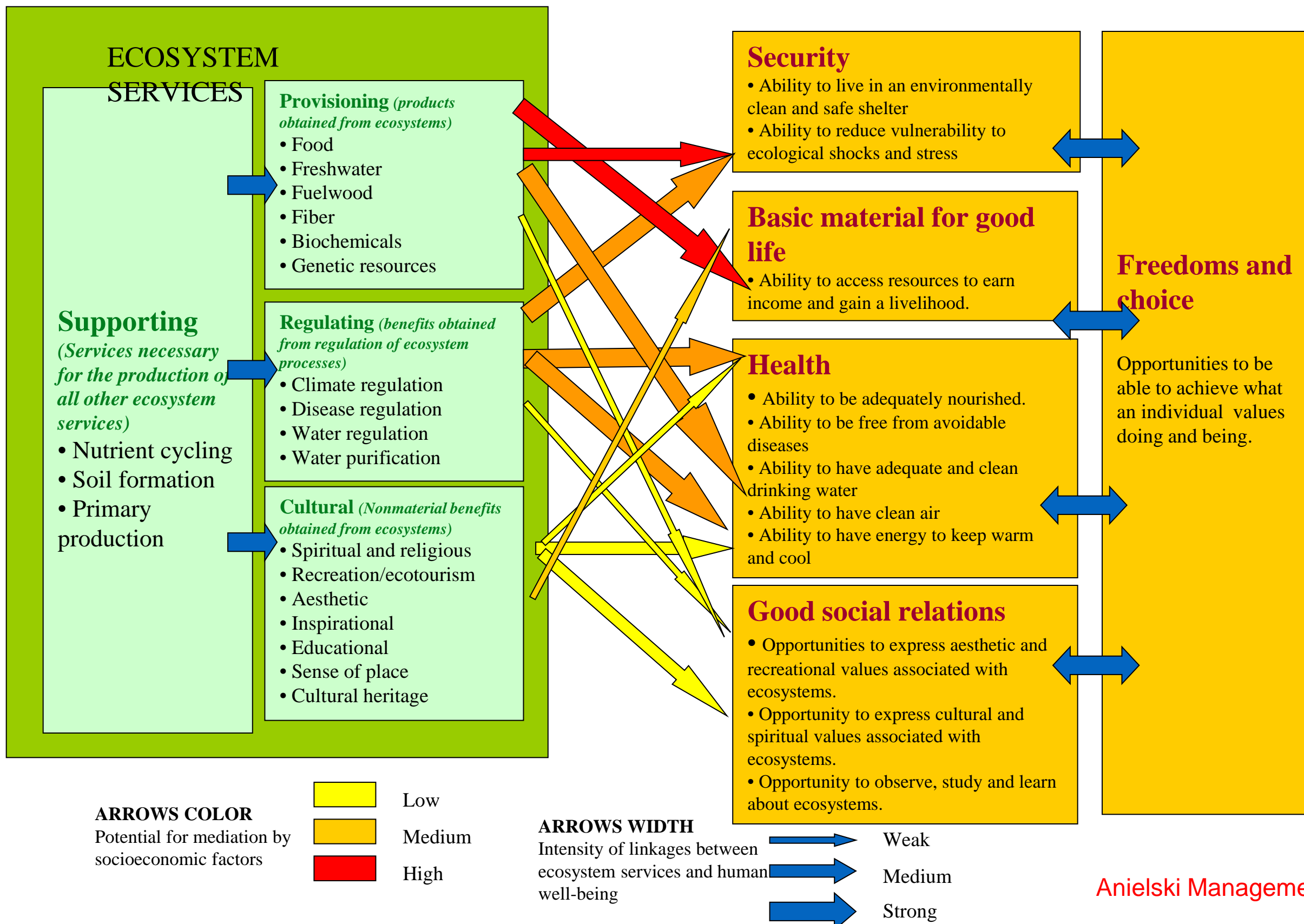
Reporting in Canada:

You are here

Linkages between Ecosystem Services and Human Well-being

GENUINE WEALTH

Determinants and Constituents of Well-being



Genuine Wealth Assessment tied to the 'science' of happiness and wellbeing

Genuine Wealth Hierarchy of Needs



Phase 4: Well-being Optimization

Being Genuine – The Operating Model

new classes of
wealth and utility

New effective decision
making



The question:
What is the highest-and-best
use of our natural assets?



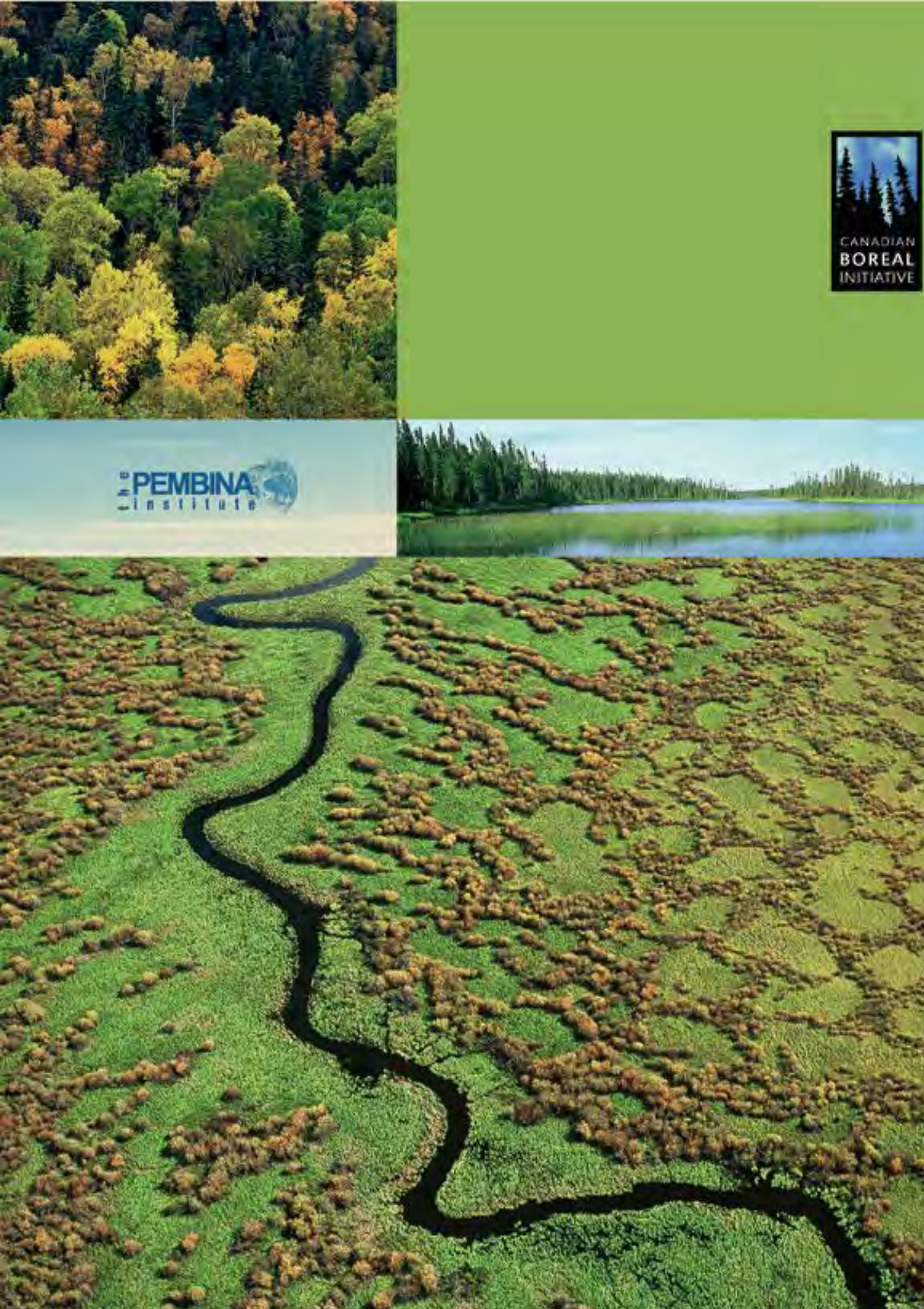
What
contributes to
or impairs our
well-being?



Counting Canada's Natural Capital:

Assessing the Real Value of Canada's Boreal Ecosystems

Mark Anielski
&
Sara Wilson



PEMBINA
INSTITUTE



The Real Wealth of the Mackenzie Region



ASSESSING THE NATURAL CAPITAL VALUES OF A NORTHERN BOREAL ECOSYSTEM




The Real Value of New York's Watershed¹²

The Catskill watershed covers roughly 80,000 acres (32,389 hectares) in the Catskill Mountains located northwest of New York City. The forested watershed is a natural filtration system that provides over 9 million New York City residents with 1.1 billion gallons of clean drinking water every day. The U.S. Environmental Protection Agency estimates that throughout the U.S., over 3,400 public water systems serving 60 million people obtain their water from forested watersheds, which must be in relatively integral condition to provide sustained services of potable water.

The value of protecting and conserving forested watersheds came to the forefront in 1997 with New York City's progressive decision to invest US\$1.5 billion to protect the Catskill watershed instead of building yet another water filtration plant. The plant would have cost \$6–8 billion to build, plus \$300–500 million to maintain.

While it's difficult to draw a direct parallel between New York and the Mackenzie watershed, it is interesting to compare water values. If we adjust New York watershed values from 1997 to 2006 values, and apply them to the Mackenzie watershed (170 million hectares), the fresh water from the Mackenzie watershed would be worth over \$1 trillion a year!

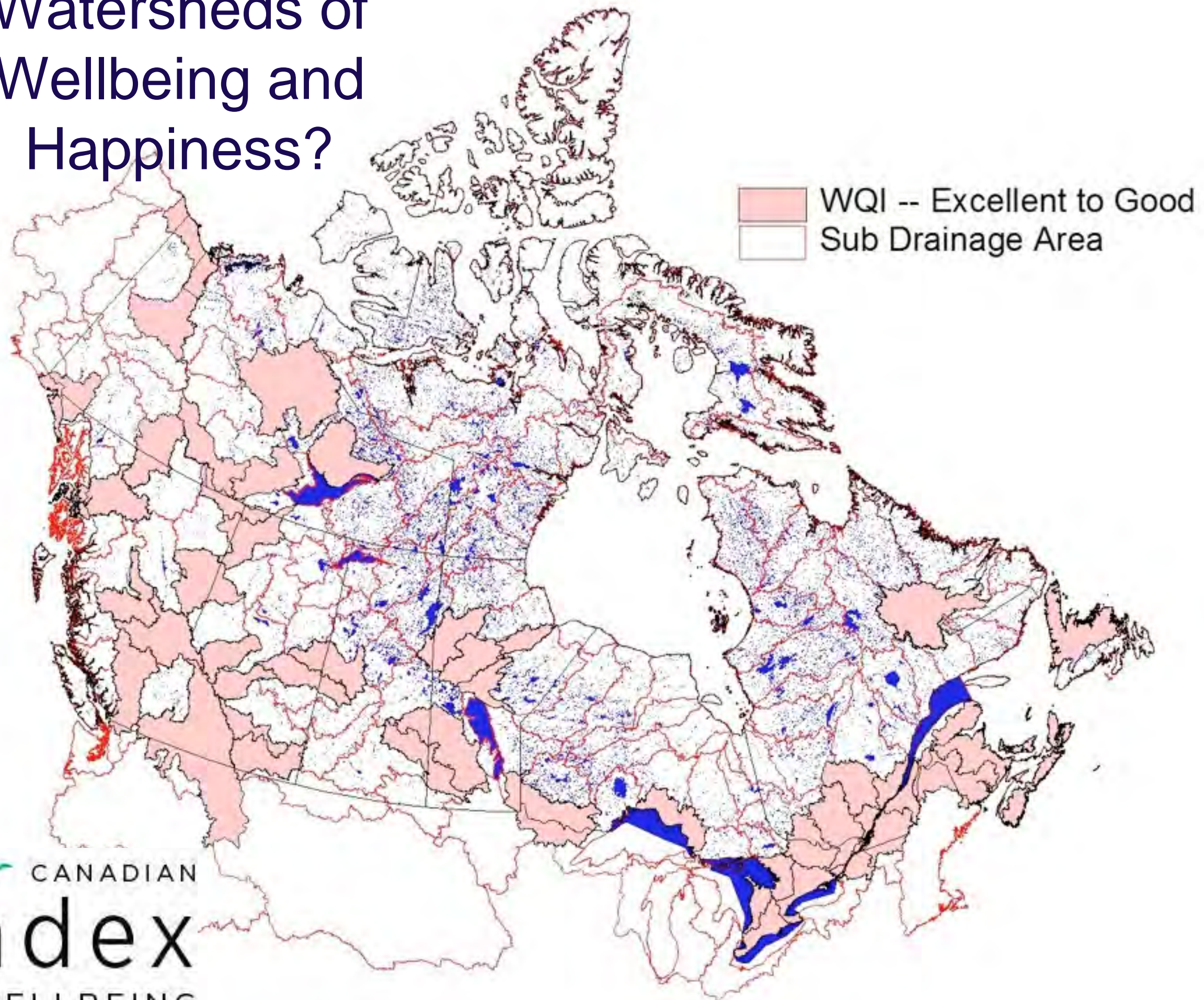


Tree cover in a watershed contributes to reduced water treatment costs.

Well-being Accounts for Canada's Watersheds

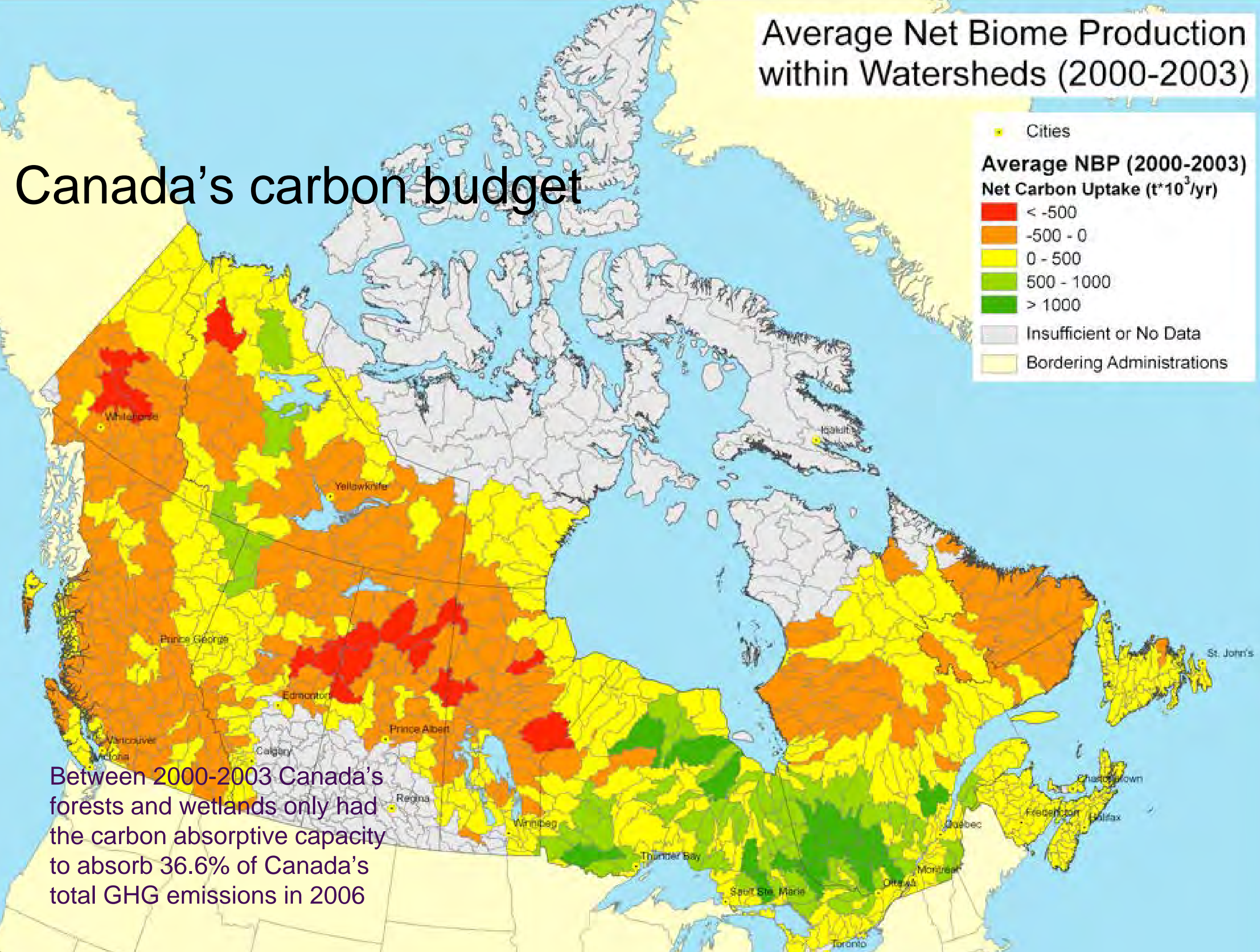


Watersheds of Wellbeing and Happiness?



Average Net Biome Production within Watersheds (2000-2003)

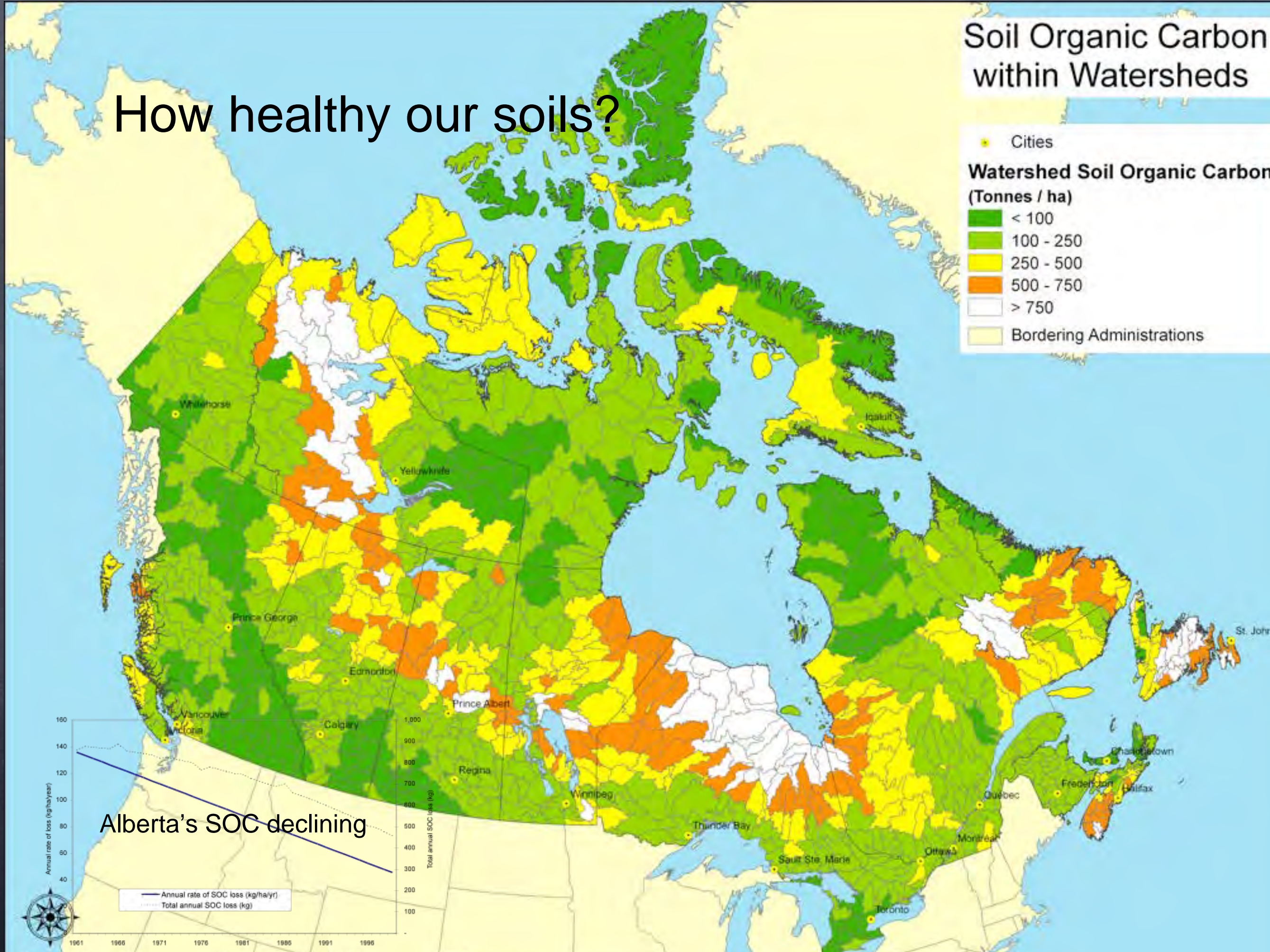
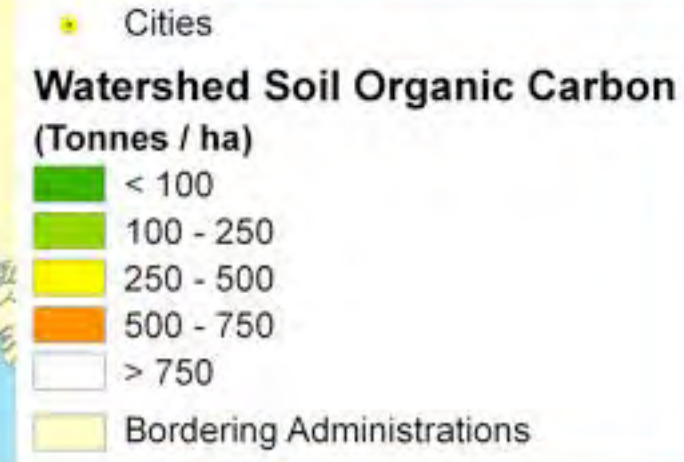
Canada's carbon budget



Between 2000-2003 Canada's forests and wetlands only had the carbon absorptive capacity to absorb 36.6% of Canada's total GHG emissions in 2006

How healthy our soils?

Soil Organic Carbon within Watersheds



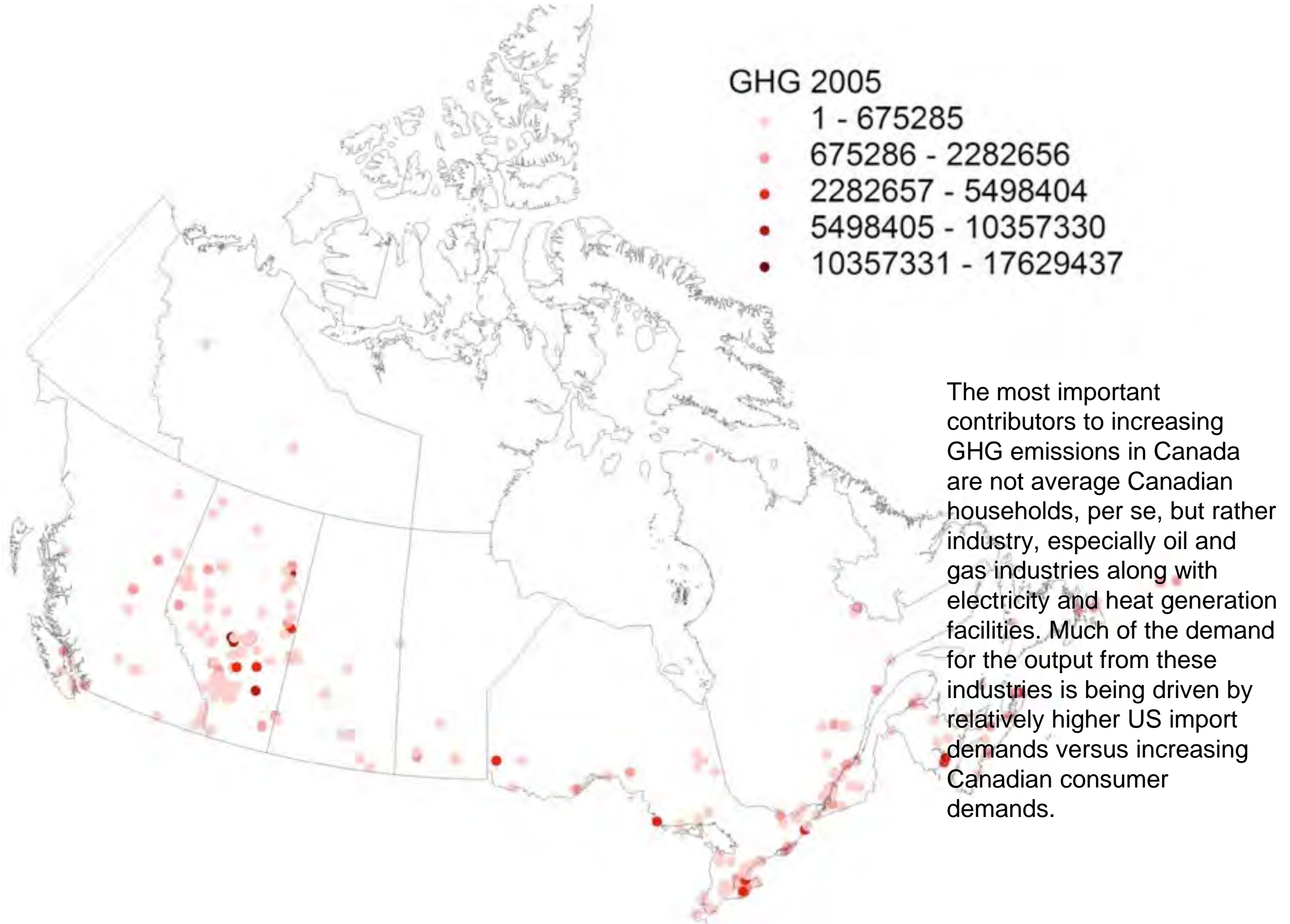
Alberta's SOC declining



— Annual rate of SOC loss (kg/ha/yr)
- - - Total annual SOC loss (kg)

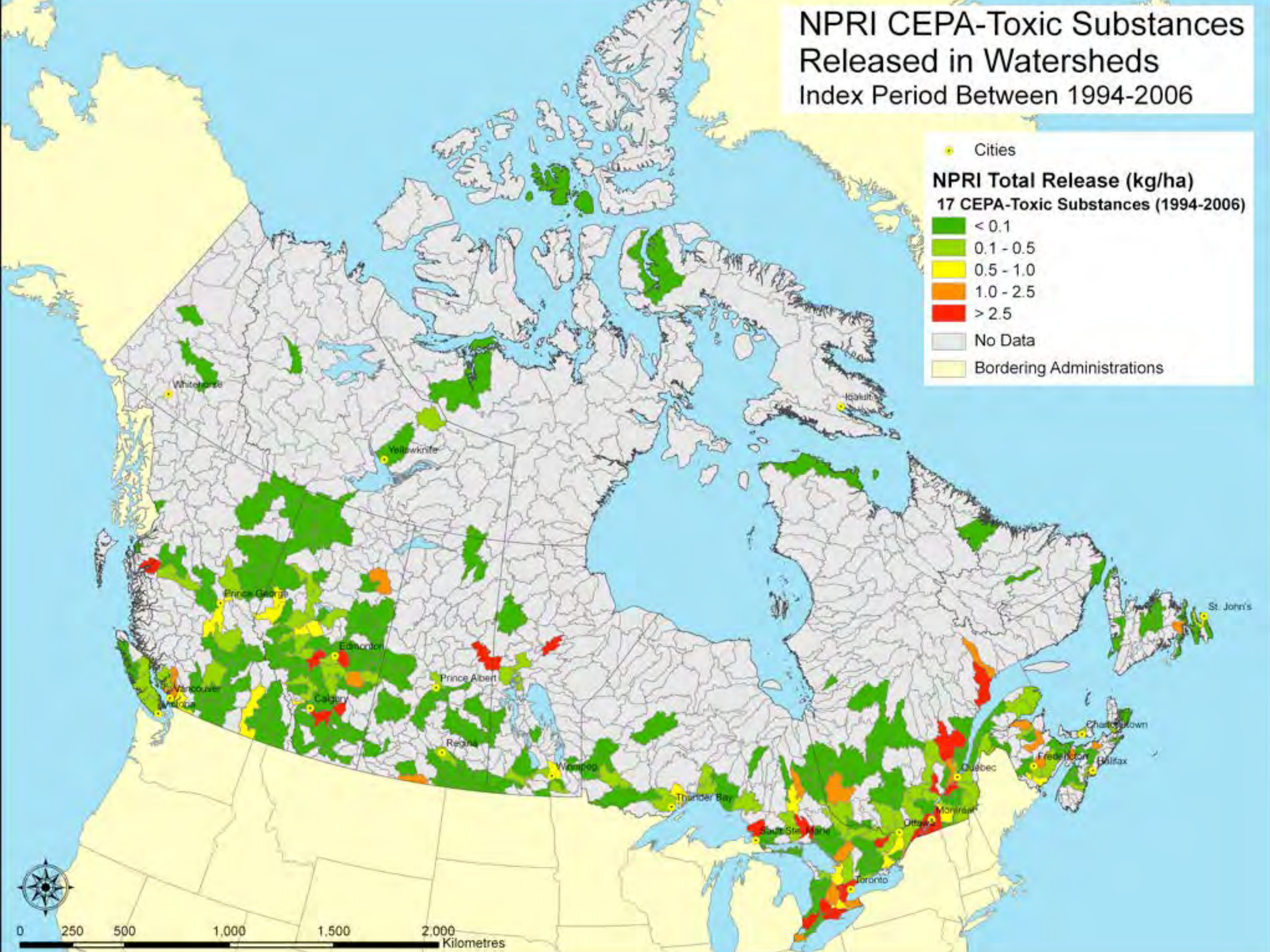
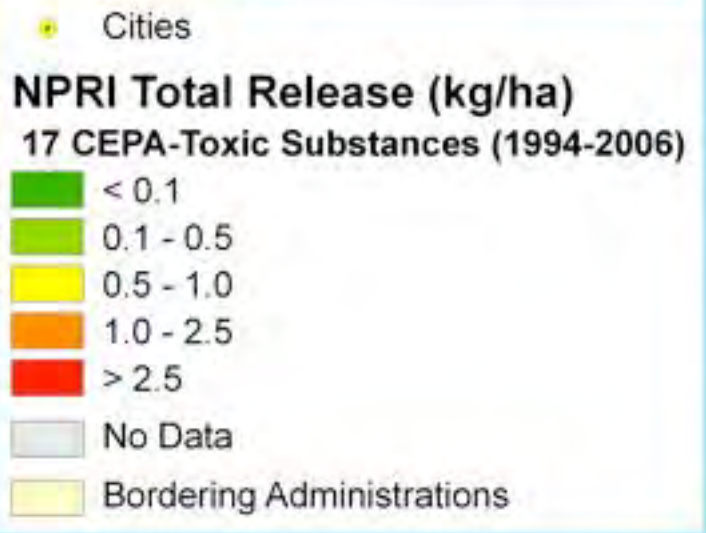
Source: Original data from Agriculture and Agri-Food Canada. Calculations by authors. Data from 1961 to 1970.

Canada's carbon liability



NPRI CEPA-Toxic Substances Released in Watersheds

Index Period Between 1994-2006

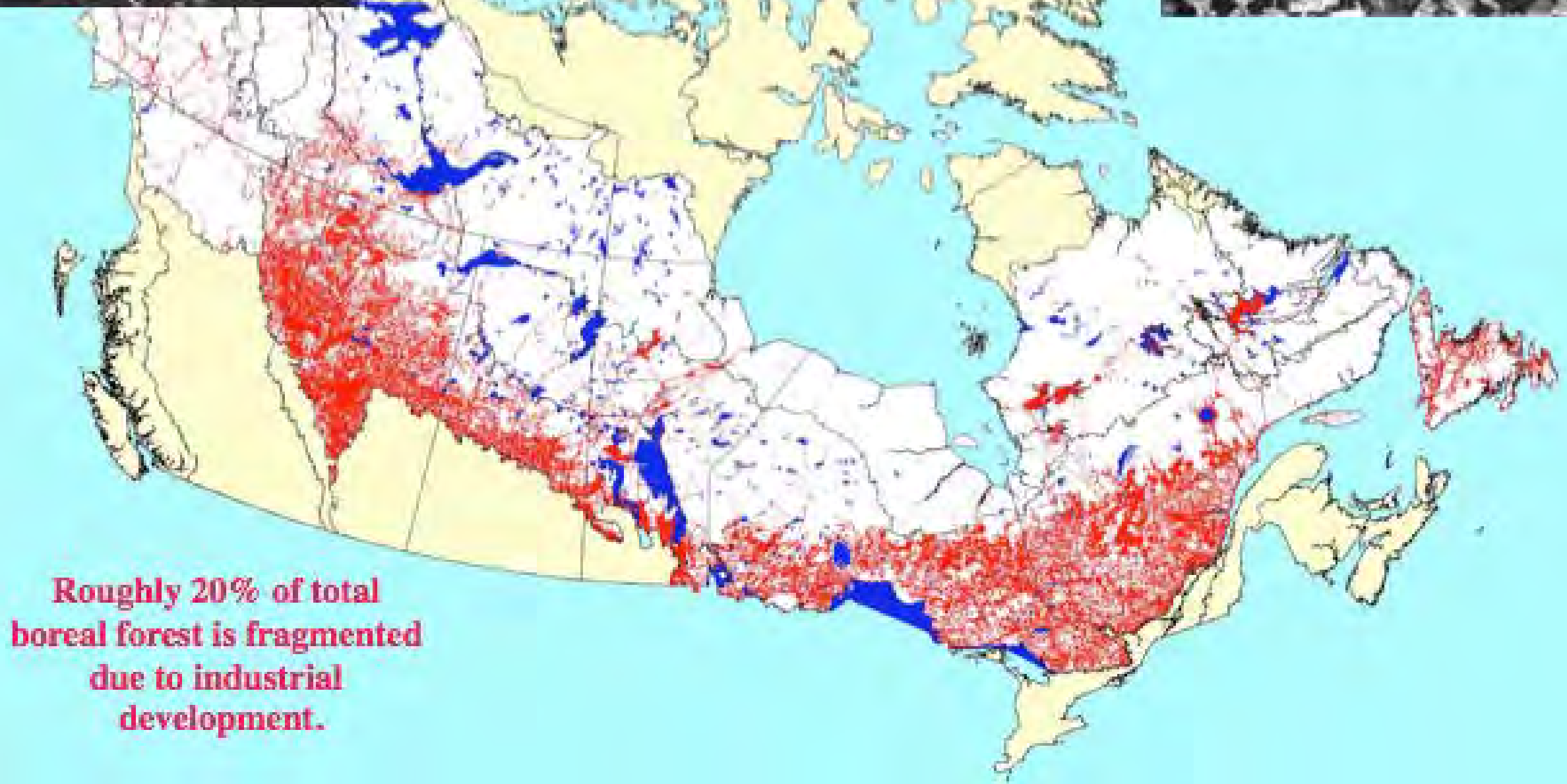
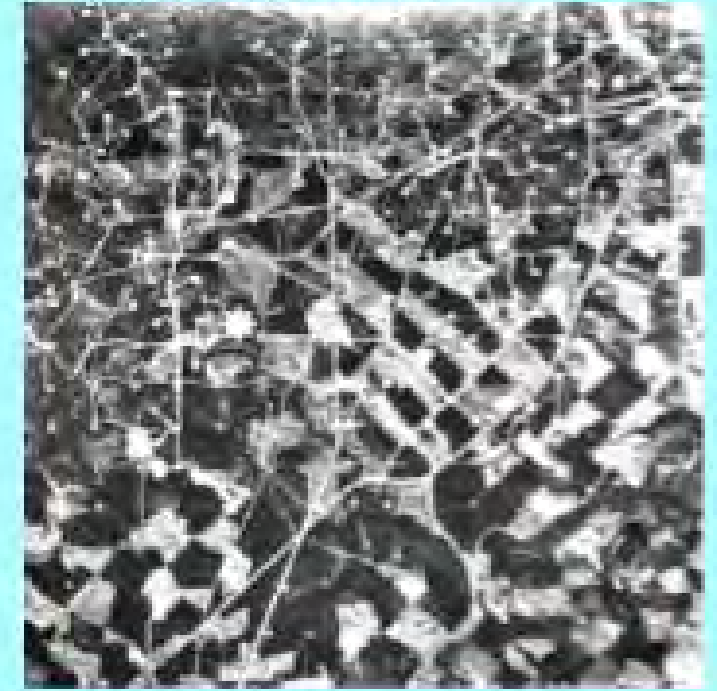


Measuring Ecological Integrity

Swan Hills, Alberta 1949



Swan Hills, Alberta 1991



Roughly 20% of total boreal forest is fragmented due to industrial development.

Land cover in the North Saskatchewan River Watershed



Economic Activity and Ecosystem Services in the North Saskatchewan River Basin

Scale 1 cm = 12 km
0 20 40 80 120 160 Kilometers



- Legend**
- Sub-Watersheds
 - Rivers
 - Expressway
 - Major Road
- AAFC 30m Landcover**
- Agriculture - Annual Croplands
 - Agriculture - Perennial Hay & Pasture
 - Grasslands
 - Shrubs
 - Trees - Deciduous
 - Trees - Coniferous
 - Trees - Mixed
 - Wetlands
 - Water Bodies
 - Exposed Land or Rock
 - Urban Development



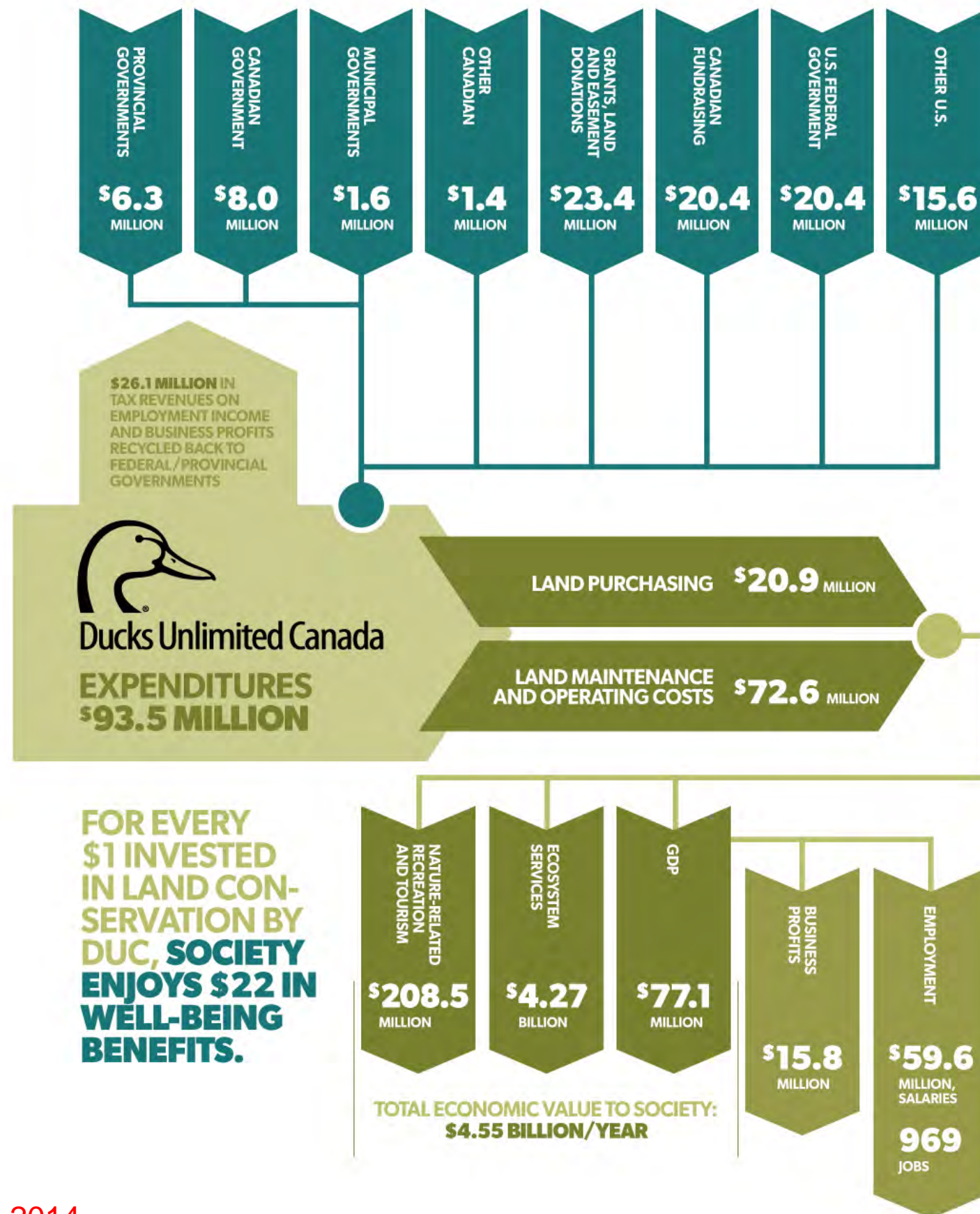
A Genuine Return on Investment: The Economic and Societal Well-being Value of Land Conservation in Canada

Prepared by Mark Anielski, John Thompson and Sara Wilson | MARCH 2013



Ducks Unlimited Canada
Conserving Canada's Wetlands

AVERAGE ANNUAL SOCIETAL RETURN ON INVESTMENT FROM DUCKS UNLIMITED CANADA'S CONSERVATION WORK



How will human development contribute to net-positive (or negative) well-being in our watersheds?



*There is no **wealth** but life;
Life, including all its powers of love,
of joy, and of admiration.*

-- John Ruskin

What is the optimum balance of **positive**
and **negative** impacts on well-being?



Nunavut, Canada

Are you realizing the **highest-and-best USE**
from our watershed?





The State of Well-being of
Canada's Watersheds in 2014

I see a future where economic growth, GDP
and profit maximization will be replaced by
well-being optimization

What will you do on Monday for your watershed?





GENUINE WEALTH

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