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Prepared by

*The Qualicum Institute*

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AGM**

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[www.qualicuminstitute.ca](http://www.qualicuminstitute.ca)

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***Qualicum Institute***

***Beyond growth: when  
science and politics  
don't mix***

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“If we don’t figure out some way of dealing with environmental sustainability, it’ll take care of all other problems, because we won’t be here to have them”

*Thomas Malone*

MIT Center for Collective Intelligence

<http://sloanreview.mit.edu/beyond-green/can-collective-intelligence-save-the-planet/>

## *Qualicum Institute*

*Tenet 1:*  
humanity is a part of—not  
separate from—Nature

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*Tenet 2:*  
humanity is completely  
dependent upon what Nature  
can provide



We're totally dependent on wild, natural ecosystems.

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### ***Human health and ecosystem services***

- Human health is strongly linked to the health of ecosystems
- Ecosystem services are absolutely vital to preventing disease and sustaining good health.

WHO MEA 2005

Our health is inextricably linked to the health of ecosystems.

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### *Ecosystems*



### *Regulate disturbance:*

*Buffer storm, flood, and drought events*



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### *Ecosystems*



*Move, store and purify water*



We're concerned about the loss of any species, not simply because it will reduce the biodiversity of an area but rather because each species, living out its daily life, is an integral component of the ecosystem enabling it to function and provide the free services that we--and all other life on Earth--need to survive.

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*Ecosystems are the **foundation** on  
which sustainability stands*

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*They are the **source** of our social  
well-being and our economy*

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*Tenet 3:*  
there are limits to what  
Nature can provide



This circular flow economic model is flawed in that it needs no input from the outside and expels no waste. However, the economic system is a dissipative system that requires continuous input of raw materials and expels a continuous output of wastes. This model goes against the first two laws of thermodynamics, the “supreme laws of the universe.” Neoclassical economics also suggests that there is near perfect substitutability between factors of production and therefore we don’t really need resources as we can substitute other factors of production for them. Also, since it is “the whole,” it is not bounded by anything and can grow forever. Reality, however, suggests that the economy is a subset of the environment, totally dependent on the environment for its economic throughput and health.

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### *Perfect substitutability*

“If it is very easy to substitute other factors for natural resources, then... the world can, in effect, get along without natural resources, so exhaustion is just an event, not a catastrophe.”

*Robert Solow*  
Nobel Economist

Lest you think I'm joking....

Neoclassical economics also suggests that market forces will allot resources efficiently and when the resource becomes scarce, human ingenuity will discover a substitute for the resource. But what is the substitute for clean air and abundant fresh water on a global scale?

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“Natural resources originate from the mind,  
not the ground, and therefore are not  
depletable.”

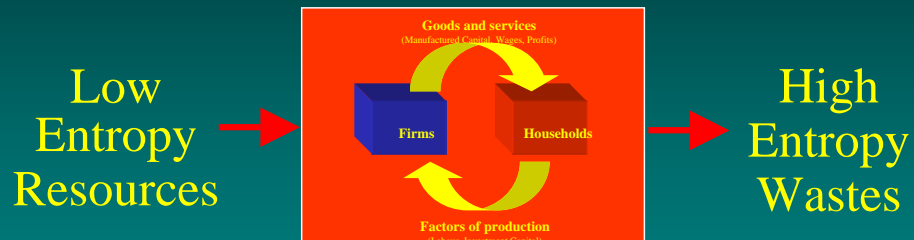
*Robert L. Bradley, Jr.*  
Economist, 2002



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*Ecological limits: resources and wastes*

The flow of economic throughput is not circular:



Requires continuous throughput of matter-energy according to thermodynamic laws

Daly and Farley, 2004. *Ecological Economics*.

The economic system is not a circular flow system. Since thermodynamics tells us you can't make something from nothing (first law), continuous input of low entropy resources are required to make the goods and services the economy provides. And also, since you can't make nothing from something, the economy expels a continuous output of high entropy wastes (second law) that have to be assimilated by the ecosystems.

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### ***Ecological limits: carrying capacity***

the maximum population size that can be supported indefinitely on an area  
[given technology and consumption levels]  
by the available resources without impairing the functions and productivity of the ecosystems of the area

## *Qualicum Institute*

### *Ecological limits: carrying capacity*

the maximum population size that can be supported indefinitely on an area [at a given technology and consumption level] by the available resources without impairing the functions and productivity of the ecosystems of the area

Fearnside, P.M., 1986. *Human carrying capacity of the Brazilian rainforest*. Columbia University Press, N.Y..

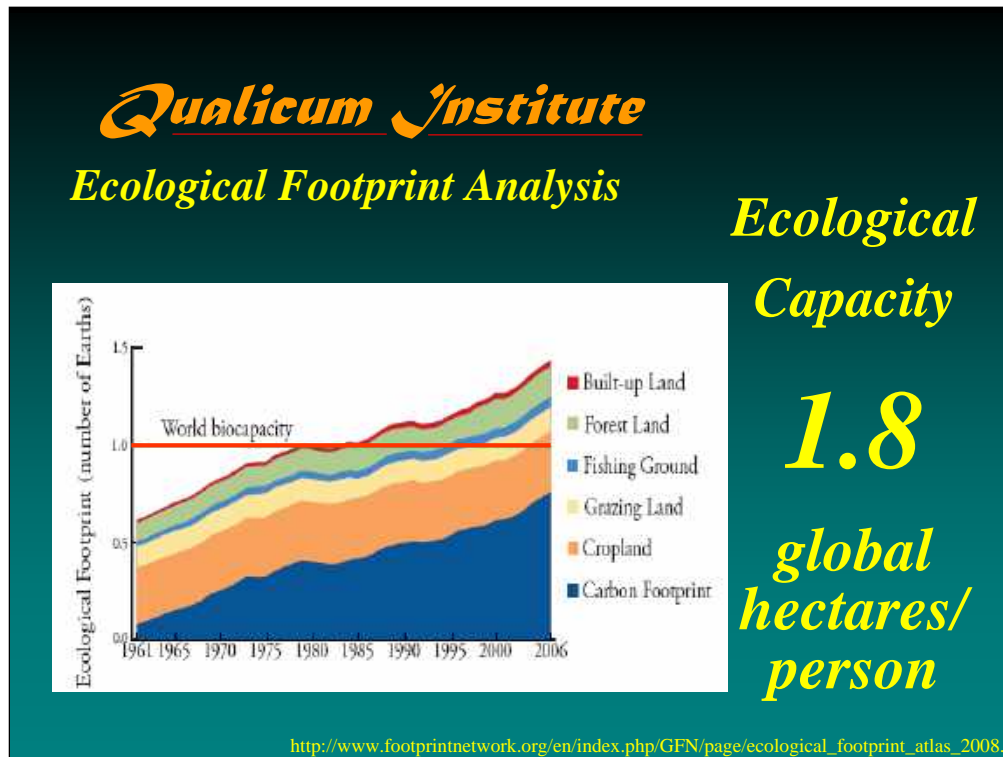
There are ecological laws that apply to every other organism on earth; however, neoclassical economics suggests we are exempt from them. For example...

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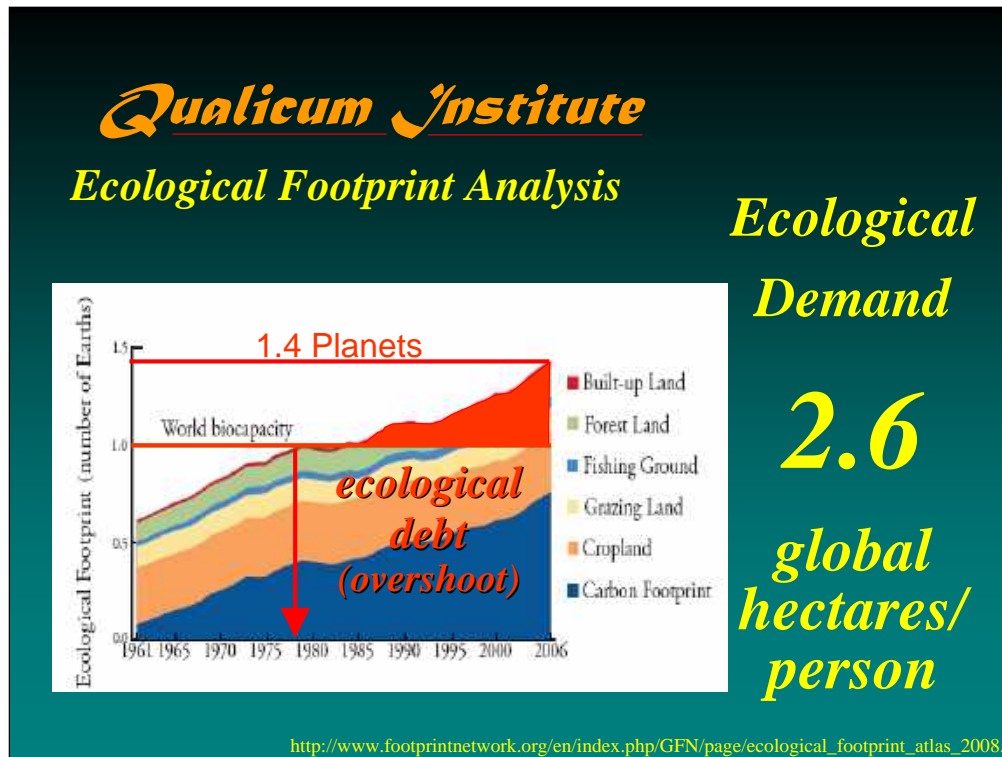
### *Ecological limits: carrying capacity*

Because of increases in knowledge, the earth's "carrying capacity" has been increasing to such an extent ... that the term "carrying capacity" has by now no useful meaning.

*Simon and Kahn*  
Economists



Ecological footprint analyses show that, there are only 1.8 gh/person of productive lands and waters to maintain our current average global standard of living. There is no just distribution of these resources. For example, Canadians use ~ 6 gh/pers., Americans about 9, Europeans about 4.5 and many Africans, less than 1. This is based on a global population of around 6.5 billion, we are now at 6.8 billion, and are heading towards 9 billion, which will reduce the 1.8 gh/pers. figure even more



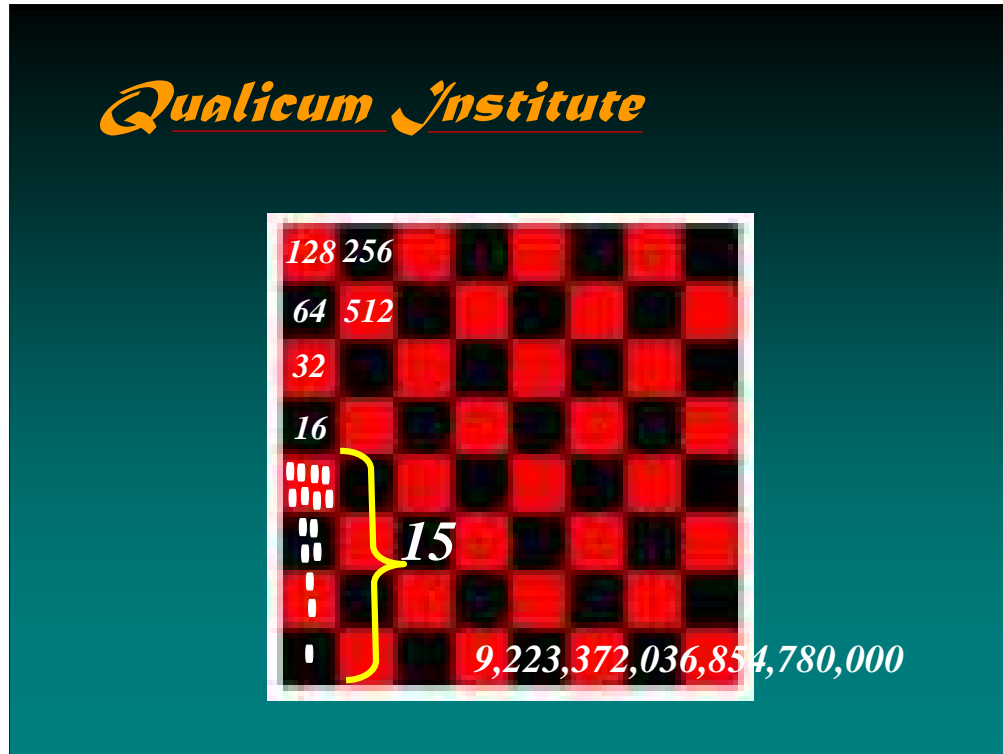
Ecological footprint analyses show that, in fact, we exceeded the carrying capacity of the biosphere back in the late 1970s and since then we have been amassing a significant ecological debt and gone into overshoot, a legacy we're leaving for our children. Also, as our population continues its increase this figure will also increase causing an even greater overshoot since the Earth's productive lands and waters are finite but are being continuously degraded.

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*Mathematical limits: exponential function*

“The greatest shortcoming of the human race is our inability to understand the exponential function.”

*Albert Bartlett  
Physicist*



Place a grain of rice on a chess board square and double it (2 on the next square, then 4, 8, 16,32, etc.) with each successive square. This is exponential growth, which demonstrates three of its characteristics. Exponential Growth 1) always involves a doubling period depending on the rate of growth, 2) choose any square and sum all the doublings below it and it will total one less than the square you chose. The next time you hear BC Hydro (e.g.) say “Over the next 10 years Vancouver Island will double its electricity use.” what they’re saying is that over the next 10 years more electricity will be used on VI than has ever been used in the past history of its electricity use on the island. 3) Large numbers are achieved in a relatively short time. That’s 9 quintillion grains of rice on the last square, double that on the entire board, which is greater than the earth’s entire rice production for a year.



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### ***Fatal flaws in conventional economics***

- *Ignores physical reality, such as the laws of thermodynamics*
- *Ignores ecological reality such as carrying capacity and the principle of competitive exclusion*
- *Ignores the exponential function*
- *Has no connectivity to the biosphere*
- *Assumes near-perfect substitutability*
- *Considers itself the whole; biosphere subset of it*

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### *Tenet 4:*

any organism that disregards  
Nature's limits threatens its  
own existence

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***Tenet 5:***  
humanity has been  
disregarding Nature's limits

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### ***Evidence:***

- about half world's temperate and tropical forests gone
- area larger than Canada suffers some desertification
- we're withdrawing over half the accessible freshwater
- we've increased atmospheric CO<sub>2</sub> by one-third
- we're fixing N at same rate nature fixes it resulting in  
over 200 dead zones in the ocean

Speth 2008. *The bridge at the edge of the world.*

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### ***Evidence:***

- 75% of marine fisheries at capacity or over-fished
- scores of persistent toxic chemicals in each of us;  
Canadians were tested for 88 harmful chemicals and  
on average 44 were found in each person
- biodiversity loss 100- to 1000-times normal rate

*Speth 2008. The bridge at the edge of the world.*

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### ***Millennium Assessment Findings:***

At the heart of this assessment is a stark warning. Human activity is putting such strain on the natural functions of Earth that **the ability of the planet's ecosystems to sustain future generations can no longer be taken for granted.**

<http://www.millenniumassessment.org/documents/document.429.aspx.pdf>. Section 2:5. 2005

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*This is despite:*

- More scientific and environmental information
- More environmental laws and regulations
- More environmental organizations
- More environmental awareness
- More protected areas
- More ecosystem restoration

Consider these points:

Despite the fact that we have more scientific and environmental information than ever before, more environmental regs than ever before ...

We have more environmental degradation than ever before.

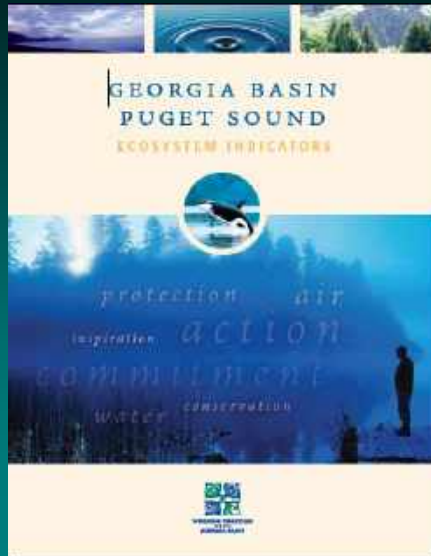
**What we're doing as conservationists (environmentalists, citizens) is *NOT* working!**

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What we're  
doing is *not*  
working!



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Findings show that some environmental conditions are improving ...but overall conditions have either worsened or there has not been significant change in seven of the nine indicator[s].

Georgia Basin - Puget Sound Ecosystem Indicators [http://www.pyr.ec.gc.ca/GeorgiaBasin/documents/2006GB-PSIndicators\\_eng.pdf](http://www.pyr.ec.gc.ca/GeorgiaBasin/documents/2006GB-PSIndicators_eng.pdf)

The document is titled "POPULATION HEALTH" and is part of the "GEORGIA BASIN - PUGET SOUND ECOSYSTEM INDICATORS". It contains several sections of text. A red circle highlights a paragraph in the "How does this affect you?" section. The highlighted text reads: "A large population in the region has a high dependency on tourism for their livelihoods. This dependency is a major concern for the region's future. The loss of tourism revenue would have a significant impact on the region's economy and the livelihoods of many people." The document also includes a small image of a globe and a photograph of a person.

Wildlife populations are also less able to survive, which in turn decreases biodiversity of the region. Losing species can mean losing tourism revenues for local communities.

Georgia Basin - Puget Sound Ecosystem Indicators [http://www.pyr.ec.gc.ca/GeorgiaBasin/documents/2006GB-PSindicators\\_eng.pdf](http://www.pyr.ec.gc.ca/GeorgiaBasin/documents/2006GB-PSindicators_eng.pdf)

We're not getting the message across to the public of the importance of biodiversity as the facilitator of ecosystem functions and the provision of the life-support ecosystems services. It's far more significant from that perspective than from a losing tourism revenues perspective, especially when you also consider the impacts to tourism that will result from Peak Oil. Tourism, as we know it, is NOT sustainable.

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The document page features several sections of text and a line graph. A red circle highlights a paragraph in the middle-left section. The line graph, titled 'Population Growth from 1975 to 2025', shows a steady upward trend. The x-axis represents years from 1975 to 2025, and the y-axis represents population in millions. The graph shows a consistent increase over the period.

**Agency initiatives and public policies aimed toward balancing social, ecological and economic values for managing population growth are found in all orders of government....**

Georgia Basin - Puget Sound Ecosystem Indicators [http://www.pyr.ec.gc.ca/GeorgiaBasin/documents/2006GB-PSindicators\\_eng.pdf](http://www.pyr.ec.gc.ca/GeorgiaBasin/documents/2006GB-PSindicators_eng.pdf)

This is the three-legged stool concept of sustainable development, a faulty model...



The theory goes, if you can just get into fine balance the three legs of the stool, social well-being, economy, and environment, that you will have a steady stool of sustainable development. But the environment cannot be a leg of the stool as it is the foundation on which the economy or sustainable development stands...



The environment **MUST** be considered at a much different level than the economy and our social well-being, since it is the source of those two factors.

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What are we doing about it?

What is the goal?

What is the strategy?

What is the timeline?

What is the goal?

What is the strategy?

What is the timeline?

Georgia Basin - Puget Sound Ecosystem Indicators [http://www.pyr.ec.gc.ca/GeorgiaBasin/documents/2006GB-PSindicators\\_eng.pdf](http://www.pyr.ec.gc.ca/GeorgiaBasin/documents/2006GB-PSindicators_eng.pdf)

Smart growth concepts are excellent livability concepts BUT they are NOT sustainability concepts!

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### ***Smart Growth***

**“When communities choose smart growth strategies, they can create new neighborhoods and maintain existing ones that are attractive, convenient, safe, and healthy. They can foster design that encourages social, civic, and physical activity. They can protect the environment while stimulating economic growth.”**

*This is Smart Growth Smart Growth Network [www.smartgrowth.org](http://www.smartgrowth.org)*

Protecting the environment and stimulating economic growth are diametrically opposed goals. Can't be done!

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### *Smart Growth*

“Smart growth is like buying a ticket on the *Titanic*. You can be “smart” and go first class or you can be “dumb” and go steerage.”

*Albert A. Bartlett  
Physicist*



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### ***RDN Regional Growth Strategy***

After 11 years, “overall, the region is not doing well in its efforts to become more sustainable.”

“Findings show the region is moving away from sustainability in several areas:

*Regional District of Nanaimo (2008)*



Any good sustainability policies are overwhelmed by the continuous growth.

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What we're  
doing is *not*  
working!

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*We have only dealt with*

**Symptoms**

*rather than the*

**Root Cause**

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Anything that is unrelated  
to elephants is irrelephant.

<http://therryfichick.tumblr.com/post/365191182/via-flickflickflicker-lol>

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# *Economic Growth*

is not  
irrelephant!



And the root cause is... Economic growth, which is the elephant in the room. Environmentalists don't seem to want to deal with it and the business community and governments don't want to admit that it isn't working, even though taxes keep increasing and services keep getting cut.

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### *What is Economic growth?*

- An increase in the production and consumption of goods and services in the aggregate (increase in GDP)
- An increase in throughput, or flow of natural resources from ecosystems through the economy and back to the environment
- Facilitated by:
  - increasing population
  - increasing per capita consumption

Daly and Farley *Ecological Economics* 2004

Note that in order for economic growth to continue there must be an ever-growing *increase* in the production (use of more and more resources) and consumption (more and more consumers) of goods and services.

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### ***A perennial goal of governments***

“[Budget 2008] completely overturns the outdated notion that you have to choose either a healthy environment or a strong economy. That is simply not the case. That either/or thinking belongs to the past.”

Hon. Carole Taylor, Minister of Finance, British Columbia  
Budget Speech, 19 February 2008

Minister Taylor is correct, you don't have to choose between the environment and a strong economy but you do have to choose between the environment and a strong, growing economy...



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### ***A perennial goal of governments***

***“This budget ... includes a series of initiatives  
to keep our economy strong and growing.”***

*Hon. Carole Taylor, Minister of Finance, British Columbia  
Budget Speech, 19 February 2008*

...and she means a strong, growing economy.

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*“Political reality must be grounded in physical  
reality or it's completely useless.”*

*John Schellnhuber*

Director of the Potsdam Institute for Climate Impact Research, 2009

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### *A perennial goal of conventional economists*

“It is really agriculture that is affected [by climate change]. But even if agricultural productivity declined by a third over the next half century, the per capita GNP we might have achieved by 2050 we would achieve only in 2051.”

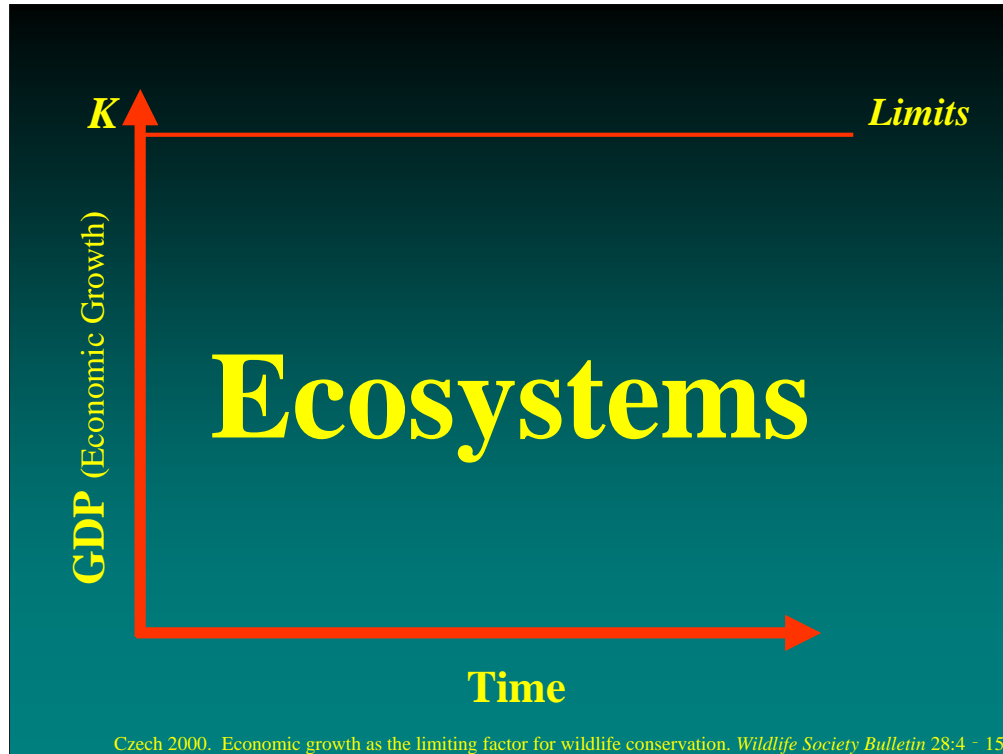
— Thomas Schelling,  
Nobel Laureate Economist  
Some Economics of Global Warming (1992)

There were 923 million hungry people in the world in 2007, an increase of 80 million since 1990. On average, a child dies every 5 seconds as a result of hunger - 6 million each year (2002-2008 UN estimates).

What he's saying is that we needn't be concerned about climate change because our per-capita GDP would only be slowed down by one year. Oh, by the way, we'd also lose one-third of our food production! This economic model cares not a whit about people or communities ... only the allocation of resources through market forces and economic growth.

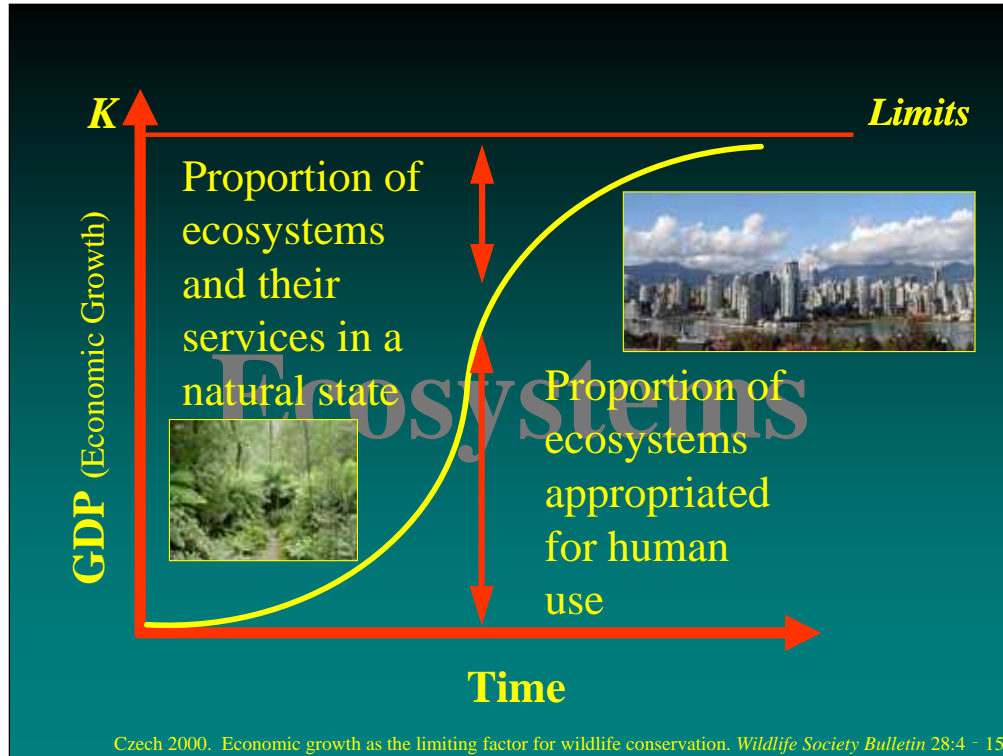
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There is a fundamental conflict  
between economic growth and  
biodiversity conservation and  
sustainability.

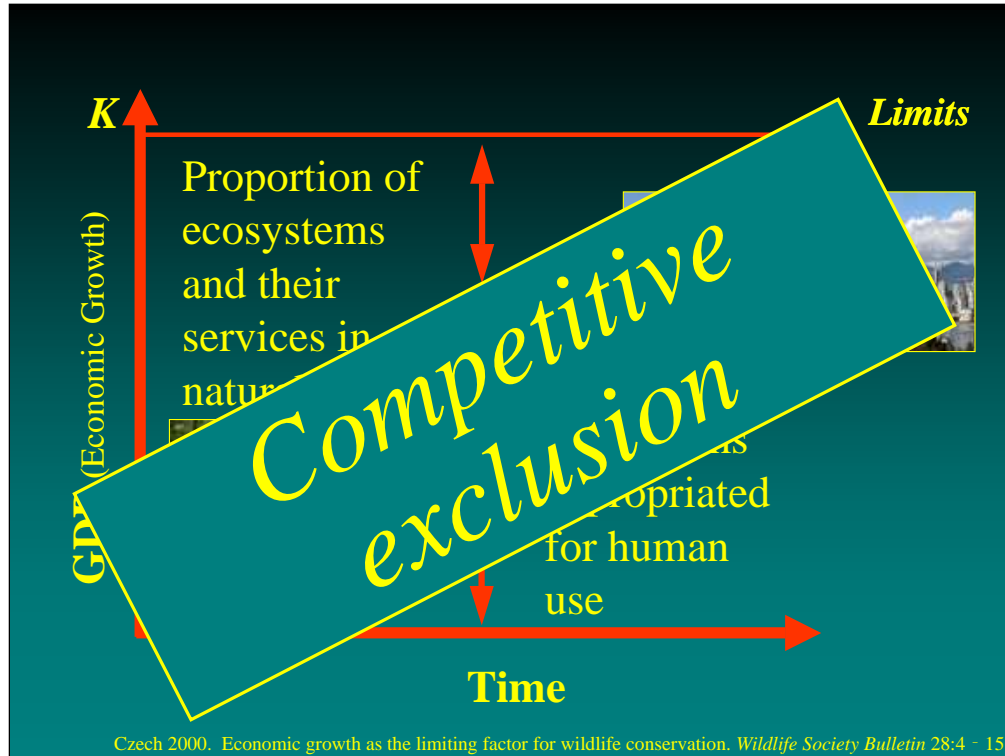


Here's where the conflict lies: We have ecosystems that provide us with important, life-giving services but they have limits, they are finite.

If you look at economic growth (an *increase* in the production and consumption of goods and services or an increase in flow of natural resources through the economy and back to the environment as waste) over time...



...you get a sigmoid curve where on the left side of the curve is the proportion of ecosystems (natural capital) in a natural state which declines as the economy grows. On the right side of the curve is the proportion of the ecosystems appropriated for human use, and that proportion increases as the economy grows. . Because of the significant breadth of the human niche we exclude those organisms that cannot live under the conditions we set.



This is the ecological principle of competitive exclusion: when two species vie for a limited resources, one always wins and the other is excluded from that resource. Hence the extinction rate being 100- to 1000-times the normal rate.

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Economic growth is a  
*limiting factor*  
to conservation and  
sustainability.

Czech 2000. Economic growth as the limiting factor for wildlife conservation. *Wildlife Society Bulletin* 28:4 - 15

Conclusion:

Recall that a limiting factor is a factor that, if not addressed, makes reaching a goal virtually impossible **no matter what other wonderful things are done!**



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*Our  
solutions?*

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**Business as  
usual:  
just smarter  
and greener growth**



But they're still growth and a growing economy, using more and more resources is not sustainable, whether it's done smartly or greener or not.

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*What about  
Technological  
Solutions?*

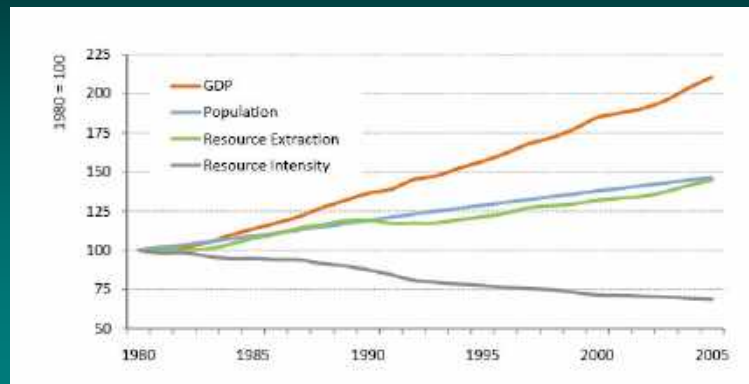
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# Empirical evidence

We have more technology than ever before in our history yet more environmental degradation than ever before; when is this technology going to kick in?

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### *Decoupling economic growth & resource use*



*Sustainable Europe Research Institute. 2009. OVERCONSUMPTION? Our use of the world's natural resources.*

In order for us to see a technological solution we would have to see resource extraction going down in line with technological progress (resource intensity). However, even though we are becoming more efficient with our resource use (intensity) our resource extraction still keeps climbing.

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### *Millennium Assessment Findings:*

“In the 200 years for which we have reliable data, overall growth of consumption has outpaced increased efficiencies in production processes...

... in practice, economic growth tends to increase consumption of energy and materials.”

WHO. 2005. <http://www.millenniumassessment.org/documents/document.357.aspx.pdf>. P 42.

WHO found that technological progress hasn't reduced the consumption of resources over the past 200 years!

Empirical evidence (just look around) also shows we have the most technology in our history and yet biodiversity continues its worldwide decline concurrent with economic growth and despite attendant and copious technological progress.

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*What about  
Conservation  
Solutions?*

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# Empirical evidence

More conservationist/environmentalist activities around the globe than ever before  
and still more environmental degradation than ever before.



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The past three decades have seen a 500% increase in land designated as protected areas for nature conservation globally.

IUCN–World Commission on Protected Areas (WCPA)/UNEP-WCMC, Washington, DC, 2003]; [www.unep-wcmc](http://www.unep-wcmc).

Setting aside land as protected areas is usually considered the best way to protect biodiversity...

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### *Declines in terrestrial amphibians*

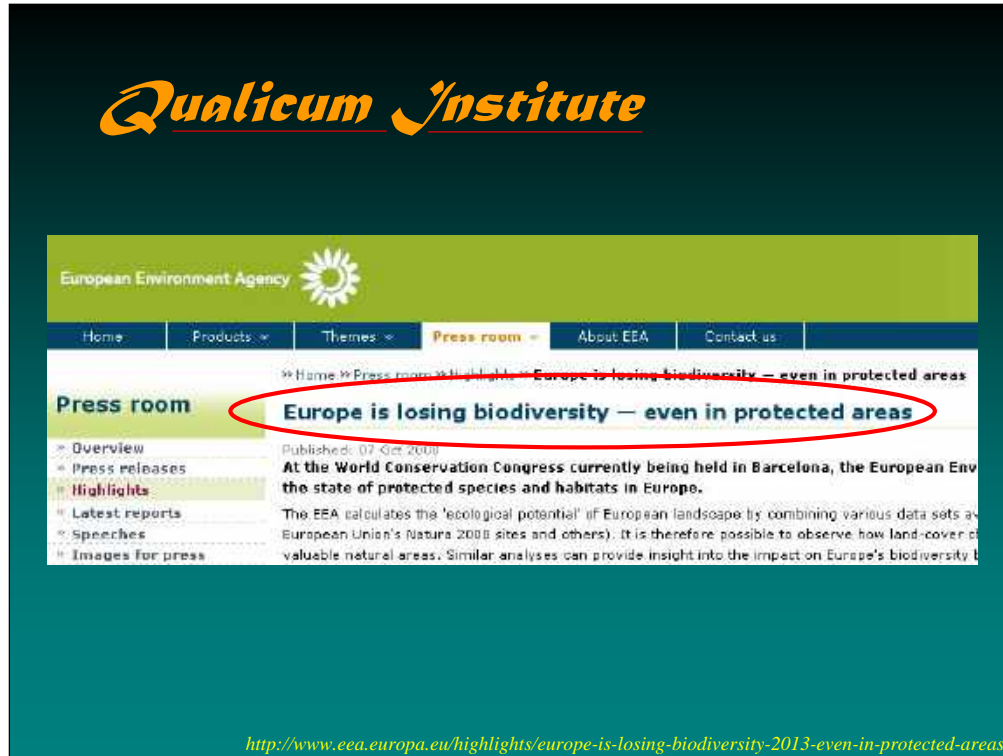
- population density of all species of terrestrial amphibians has declined by 75% since 1970; identical trends occurred for all species of common reptiles.
- declines are likely due to climate-driven reductions in the quantity of standing leaf litter, a critical microhabitat for amphibians and reptiles.

- La Selva Biological Station, a **protected** old-growth lowland rainforest in Costa Rica. (15 km<sup>2</sup>)



Whitfield et al. 2007. Amphibian and reptile declines over 35 years at La Selva, Costa Rica. *Proc. Nat. Academy Sc.*

This study took place on a 15 km<sup>2</sup> **protected area!** Even “protected areas” are suffering biodiversity loss and will likely continue to do so concurrent with global economic growth



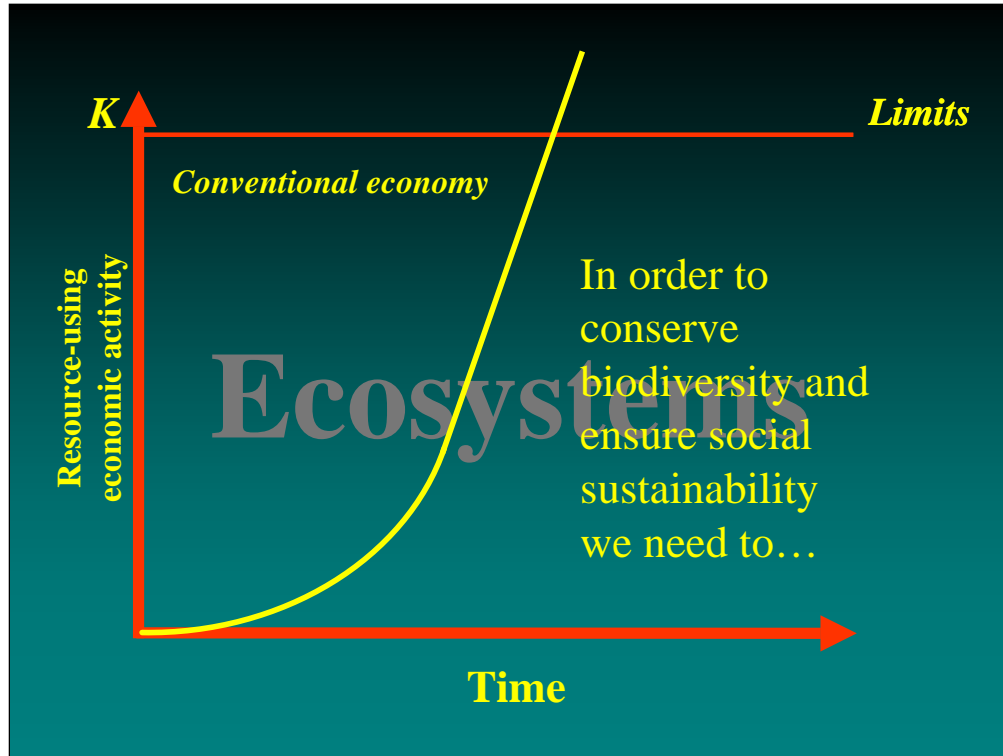
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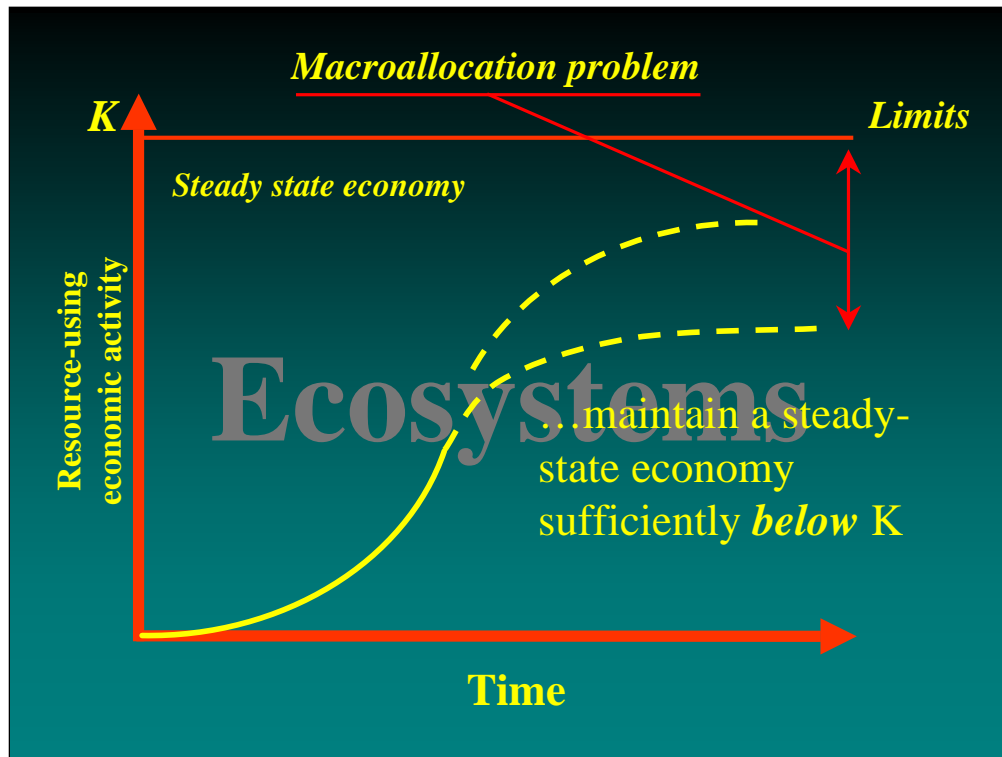
**The good news!**

**There is a solution!**

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# A Steady State Economy!





To conserve biodiversity we need to move to a **steady state economy** sufficiently below  $K$  that there is enough natural ecosystems to allow their normal functioning to provide the ecosystem services necessary for life. Ecological economists call the distance we need to move below the limits the macroallocation problem.



How much of the natural ecosystems do we have to leave intact for the provision of the life supporting ecosystem services, which will tell us...



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### *Macroallocation problem*



...how much of the ecosystem structure can we use for throughput to the steady state economy?

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### *Characteristics of a SSE*

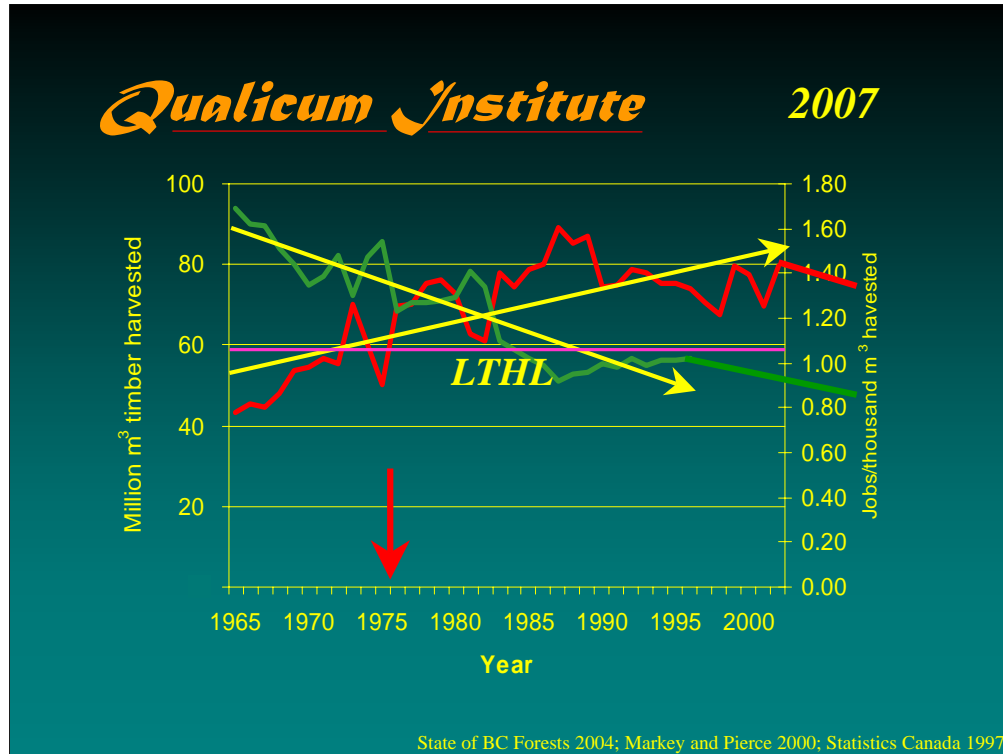
- Sustainable scale
- Just distribution
- Efficient allocation
- High quality of life



Energy and  
material flows  
within ecological  
limits

Daly and Farley *Ecological Economics* 2004

- Sustainable Scale
  - Energy and material flows within ecological limits
- Just Distribution
  - Limits to inequality
  - Need to ensure that the gap between the rich and poor is not too great
  - People who are too poor will not care about sustainability.
    - If daily life is struggle for basic needs, there's not much time or energy to consider the future
  - On the flipside, people who are excessively wealthy tend to consume unsustainably
- Efficient Allocation
  - Allocation of resources among competing interests is the focus of conventional economics
  - Efficient allocation is something that markets are good at, at least for certain types of goods and services
  - There is still a role for markets in a SSE
  - Need to recognise where markets work, and where they don't, and use markets only where they are appropriate
- High Quality of Life
  - Health, time, prosperity, and community



An example of non-sustainable scale: the BC forest industry.

Red line = annual harvest (1000000 m<sup>3</sup> timber harvested), increasing over time.

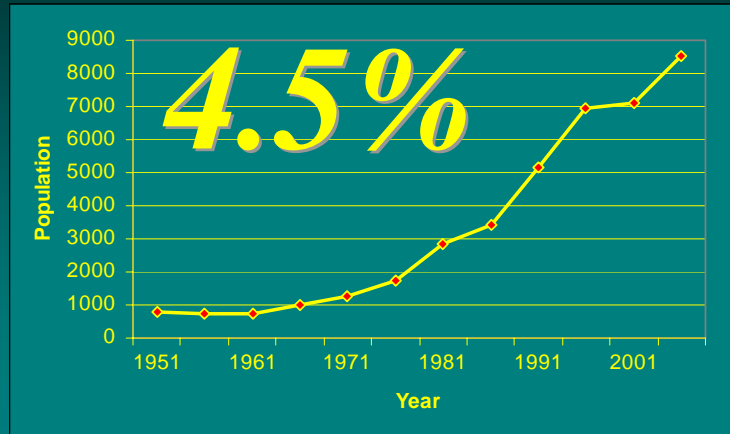
Green line = jobs/ 1000 m<sup>3</sup> timber harvested, decreasing over time.

Does it make any sense that corporate profits and economic efficiencies are more important than communities and the people dependent on forest jobs?

The scary line is the mauve line = estimated long term harvest level. Harvest below the line and you can harvest the forests sustainably forever. We've been harvesting above the line since the mid 1970s.

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### *Qualicum Beach Population Growth*



BC Stats 2005

Qualicum Beach has grown at an average rate of 4.5% since 1951.

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**Qualicum Beach population  
in 50 years?**

~~**65,000**~~  
**11,000**

If they continued at that rate they would reach 65,000 in 50 years. But they chose to set a limit to their population of 11,000 based on quality of life issues.

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### *Qualicum Beach OCP*

“Carefully managed growth and development based on a sustainable quality of life and a **maximum size** of community of approximately 11,000 population based on the build out under the goals and policies of this OCP.”

...and set their decision into their OCP. Note that they actually recognize limits by setting a maximum size of community.

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### *Characteristics of a SSE*

- Sustainable scale
- Just distribution
- Efficient allocation
- High quality of life



Limits to  
inequality

Daly and Farley *Ecological Economics* 2004

Currently, we tell the poor and destitute that, while they only have a tiny piece of the economic pie, with more economic growth their share of the pie will increase. So we haven't really had to **do** anything. In a SSE, we could no longer just tell them that since the economy wouldn't be growing; we'd actually have to do something.

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### *Economic growth & poverty reduction*

*“A healthy rapidly growing world economy is desirable for everyone ... Economic growth is the principal route to lasting poverty reduction.”*

*Anne Krueger*

*First Deputy Managing Director, IMF*

*Woodward & Simms. 2006. Growth isn't working. New Economics Foundation.*

This is the current belief by conventional economists. But it hasn't worked for the past 100 years, at least. And here's why ...



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### *Economic growth & poverty reduction*

- to achieve \$1 of poverty reduction requires \$166 of additional global production and consumption
- to get everyone onto an income of at least \$3 per day – the level around which income stops having an extreme effect on life expectancy – would require the resources of 15 planets to sustain the growth.

Woodward & Simms. 2006. *Growth isn't working*. New Economics Foundation.

Poverty reduction through economic growth is physically impossible...

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### *Economic growth & poverty reduction*

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Woodward & Simms. 2006. *Growth isn't working*. New Economics Foundation.

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### *Characteristics of a SSE*

- Sustainable scale
- Just distribution
- **Efficient allocation**
- High quality of life



Use markets  
only where  
appropriate

Daly and Farley *Ecological Economics* 2004

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### *Efficient allocation of resources*

**In order for markets to work effectively,  
resources have to be both**

- **excludable** (exclusive ownership is possible)
- **rival** (use of a unit by one prohibits the use of the same unit by another at the same time)

Daly and Farley *Ecological Economics* 2004

...something that ecosystem services are not, so markets don't work with them.

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### *Efficient allocation of resources*

**In order for markets to work effectively,  
resources have to be both**

- **excludable** (exclusive ownership is possible)
- **rival** (use of a unit by one prohibits the use of the same unit by another at the same time)

Daly and Farley *Ecological Economics* 2004

## *Qualicum Institute*

### *Characteristics of a SSE*

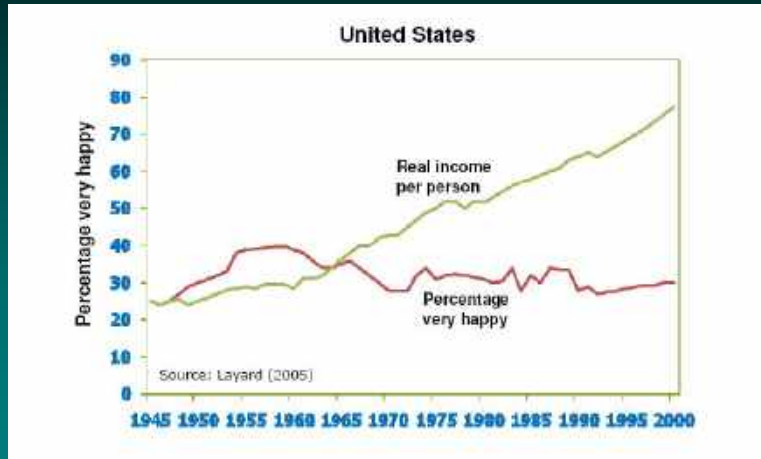
- Sustainable scale
- Just distribution
- Efficient allocation
- High quality of life



Health, time,  
prosperity,  
and community

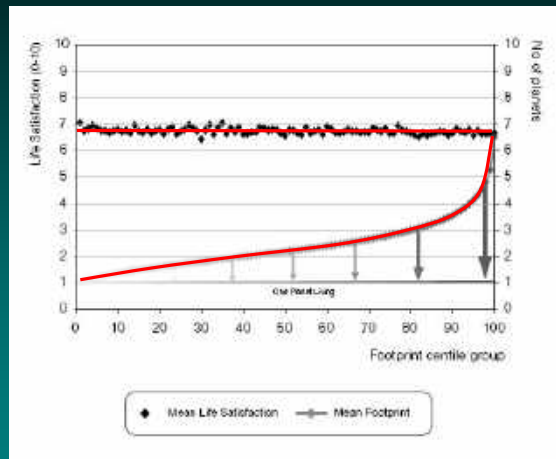
Daly and Farley *Ecological Economics* 2004

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Layard, R. 2005. *Happiness: Lessons from a new science*. Allen Lane, London, Great Britain.

## Qualicum Institute



Suggests our  
collective  
footprint could  
be reduced  
significantly  
without  
leading to  
widespread  
loss in well-  
being.

Thompson et al. 2007. *The European Happy Planet Index: An index of carbon efficiency and well-being in the EU*. New Economics Foundation.



## *Qualicum Institute*

### *Can we really do this?*

- *A SSE model for the Canadian economy*
- *Possible to have*
  - *Full employment*
  - *More leisure time*
  - *Eliminate poverty*
  - *Meet Kyoto commitments*
- *All without the need for economic growth!*

Victor, P.A., Rosenbluth, G., 2007. Managing without growth. *Ecological Economics* 61, 492-504.

## ***Qualicum Institute***

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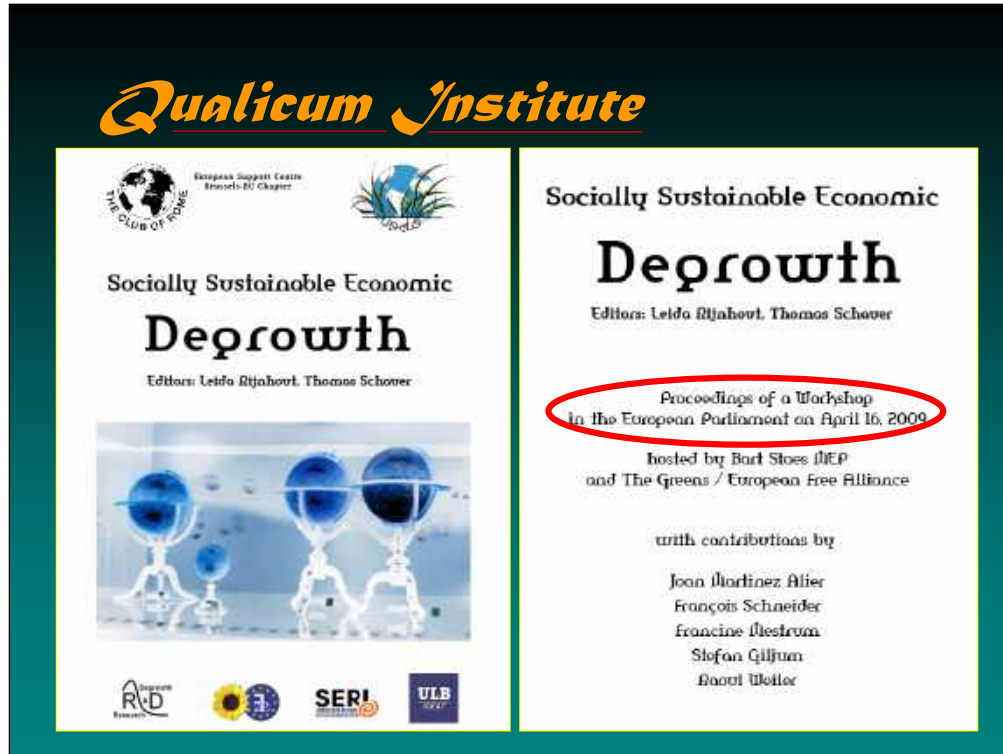
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## *Qualicum Institute*

*Can we really do this?*

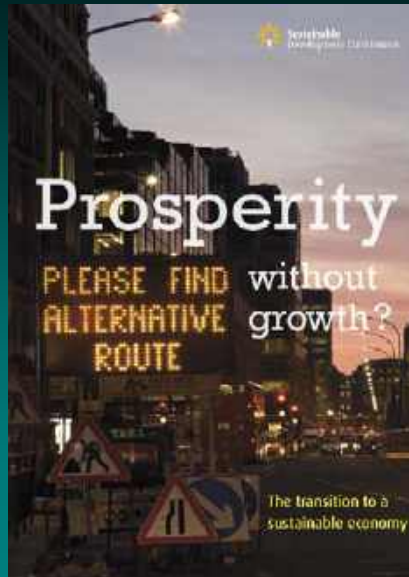
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  - Possible to have
    - Full
  - All without the need for economic growth!
- commitments

Victor, P.A., Rosenbluth, G., 2007. Managing without growth. *Ecological Economics* 61, 492-504.



Europe is far ahead of us in North America and is actively discussing issues such as degrowth and steady state economy

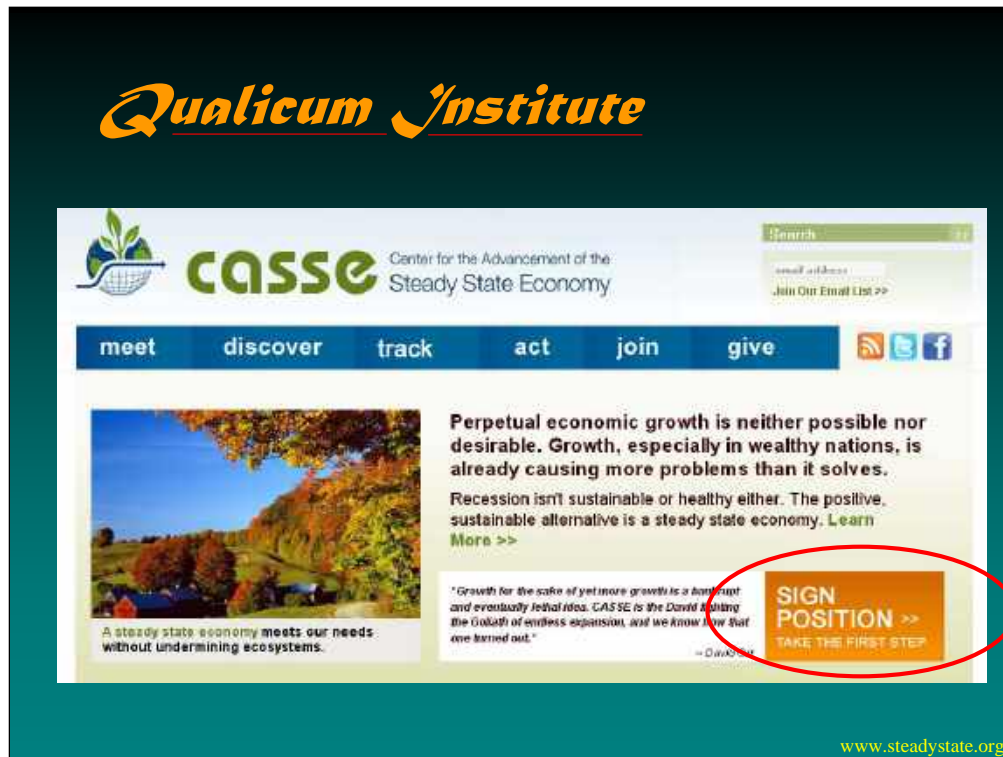
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Above all, there is an urgent need to develop a resilient and sustainable macro-economy that is no longer predicated on relentless consumption growth.

Sustainable Development Commission 2009

SDC advised the 4 top levels of government in the UK: Britain, Scotland Wales, Ireland



Here, in North America, we have the Center for the Advancement of the Steady State Economy, an organization that is trying to build a groundswell in favour of the Steady State Economy. They have a number of significant organizations and people that have signed their position statement on economic growth.

## ***Qualicum Institute***

### ***CASSE position statement:***

- **Fundamental conflict** between economic growth and biodiversity conservation
- **Fundamental conflict** between economic growth and ecosystem services
- Technological progress may not be depended upon to reconcile the conflict
- Steady state economy a viable option

The CASSE positions are basically... If you are in agreement you can help by signing on to the Center for the Advancement of the Steady State Economy position at <http://www.steadystate.org/CASSEPositionOnEG.html>

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Maude Barlow

Wendell Berry

Herman Daly

Gwynne Dyer

Paul Ehrlich

Paul Hawken

Richard Heinberg

C.S. "Buzz" Holling

Thomas Homer-Dixon

Helena Norberg-Hodge

William Rees

David Suzuki

Vandana Shiva

E. O. Wilson

Notable leaders in global sustainability, social, and conservation issues have signed the Center for the Advancement of the Steady State Economy's position statement.



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*Tenet 6:*  
humanity can choose to live  
within Nature's limits



The key word here is “choose.” Of course we don’t have to “choose” to do anything but, based on some pretty good science, we know we will likely suffer some fairly severe consequences.

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Being sustainable can be our  
choice or nature will make the  
choice for us.

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*Nature always bats last.*

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### *Social-Ecological Systems*

Three related attributes of social–  
ecological systems determine their  
future trajectories.

Walker, B., C. S. Holling, S. R. Carpenter, and A. Kinzig. 2004. Resilience, adaptability and transformability in social–  
ecological systems. *Ecology and Society* 9: 5.

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### *Resilience*

the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks.

Walker, B., C. S. Holling, S. R. Carpenter, and A. Kinzig. 2004. Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society* 9: 5.

## *Qualicum Institute*

### *Adaptability*

the capacity of actors in the system to influence resilience (in a SES, essentially to manage it).

Walker, B., C. S. Holling, S. R. Carpenter, and A. Kinzig. 2004. Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society* 9: 5.

An example here is that it is doubtful that our communities are resilient enough to deal with the projected impacts of both climate change and peak oil; however, we can adapt to those changes by increasing our community resilience, e.g., grow most of our food within the MABR, have a plan for projected sea level rise, have a plan for the increased summer temperatures and decreasing precipitation that's projected (e.g., cisterns to capture rainwater when the rains come. How will businesses dependent on tourism cope when oil hits \$150, \$200, \$300 a barrel and tourists no longer can afford to travel as often or at all?

## *Qualicum Institute*

### *Transformability*

the capacity to create a fundamentally new system when ecological, economic, or social structures make the existing system untenable.

Walker, B., C. S. Holling, S. R. Carpenter, and A. Kinzig. 2004. Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society* 9: 5.



## *Qualicum Institute*

So, if you want to make a real difference:

- Learn all you can about this fatally-flawed economic model that is threatening us all
- Add your name to the CASSE position [www.steadystate.org](http://www.steadystate.org)
- Get involved in community growth issues
- Address the *causes* of our environmental and many social problems, not just the *symptoms*

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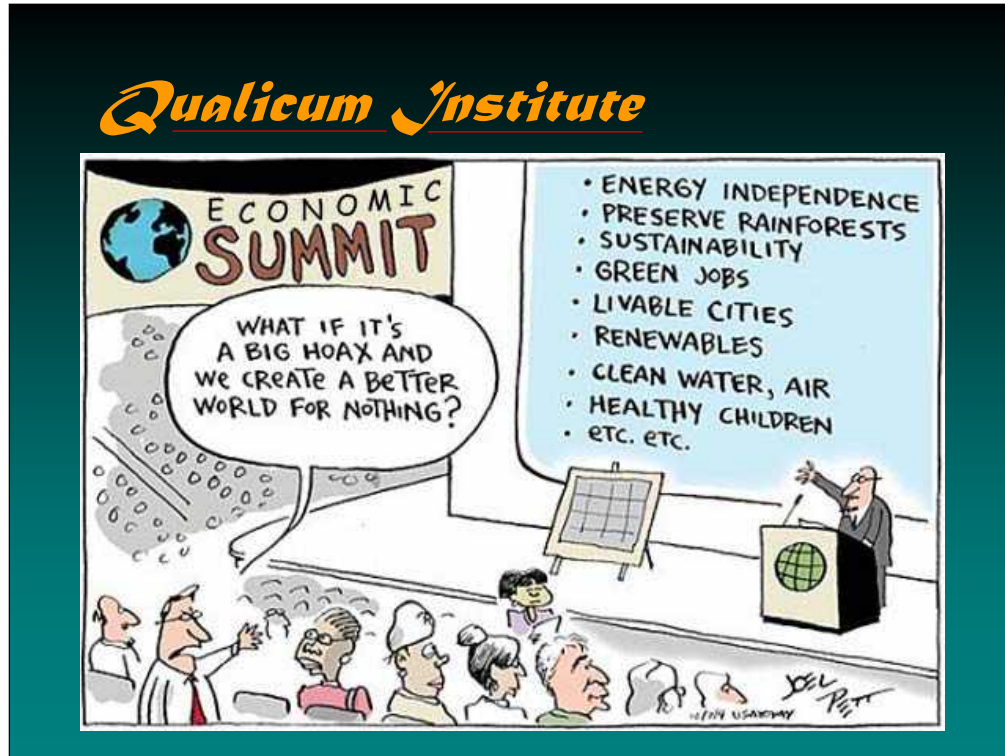
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*Simple precautionary test:*

**“What if I’m wrong?”**

If you don't believe that economic growth is a problem, and we do nothing about it, ask yourself one question...



And if we at the QI are wrong ...

*Presentation by Neil K. Dawe, President  
Qualicum Institute,  
Parksville, B.C.*

*Qualicum Institute*

*la fin*

*Presentation to  
Mount Arrowsmith Biosphere Foundation AGM  
Parksville, B.C.  
23 March 2010*

## *Qualicum Institute*

*“The only function of economic forecasting  
is to make astrology look respectable.”*

*K J Galbraith*

*Economist*



## ***Qualicum Institute***

***Roderick Haig-Brown***

“Any radical approach to conservation, to be successful, must include a radical redefinition of economic values.... Economic concepts have been short-term, wasteful, geared to maximum profit and further development.”

From Writings and Reflections, Chapter 19: Some Approaches to Conservation (1966)

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***Without a Change of Direction,  
We'll Get Where We're Going***

*“... current recovery efforts in California,  
Oregon, Idaho, Washington, and southern  
British Columbia will not sustain  
significant runs of wild salmon through  
2100 and beyond.”*

*Salmon 2100 project 2008.*

## *Qualicum Institute*

### *Pacific salmon*

To achieve long-term protection for salmon in the Pacific Northwest, two conditions must be met:

1. Protect genetic diversity
2. Take into account population growth and economic activity. In the absence of explicit choices to do otherwise, salmon will continue to decline.



*Upstream: Salmon and Society in the Pacific Northwest 1996*  
National Research Council; [http://www.nap.edu/openbook.php?record\\_id=4976&page=R1](http://www.nap.edu/openbook.php?record_id=4976&page=R1)

Salmon Symposium (1996), a US Congress initiative for answers to declining salmon stocks, concluded we have to address growth and economic activity or salmon will continue their decline.

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### *Pacific salmon recovery constraints*

1. most rules of commerce and economic growth;
2. increasing competition for key natural resources, especially for high quality water;
3. increasing number of humans and the requirement to meet their basic needs [wants].



Salmon 2100 project 2008.

Salmon 2100 Project: 36 salmon biologists and policy makers in Canada and the USA began this project in 2008 to look at what constraints were contributing to Pacific salmon recovery .

2. Competitive exclusion is driven by 1. Economic growth
3. Population growth and growth in per-capita consumption are what facilitate economic growth.

So really, these points *all* refer to economic growth

## ***Qualicum Institute***

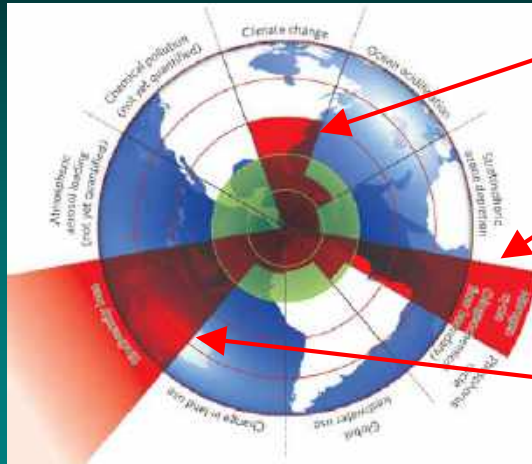
### ***Pacific salmon***

***“It is time to recognize the  
fundamental conflict between  
economic growth and salmon  
recovery.”***

Lackey, R.T. 2005. *Fisheries* 30:30-32

## *Qualicum Institute*

*Planetary boundaries (must not be transgressed)*



*Climate  
change*

*Nitrogen  
Cycle*

*Biodiversity  
loss*

Rockström et al. 2009. A safe operating space for humanity. *Nature* 461: 472-475

Study in 2009 further reinforces the MEA results that we've already transgressed some significant planetary boundaries.

## *Qualicum Institute*

### *Delusion*

An unshakable belief in something untrue. These irrational beliefs defy normal reasoning, and remain firm even when overwhelming proof is presented to dispute them.

Ford-Martin, P. 2006. *Gale Encyclopedia of Medicine*, 3rd Edition

Unfortunately, most of us believe in the delusion that economic growth is the solution to a healthy, sustainable economy and that being able to purchase more things will make us all happy despite the scientific evidence to the contrary.

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All we have to do to destroy the planet's climate and biota and leave a ruined world to our children and grandchildren is to keep doing exactly what we are doing today, with no growth in human population or the world economy.

*James Gustav Speth,*  
Dean of the School of Forestry & Environmental Studies,  
Yale University



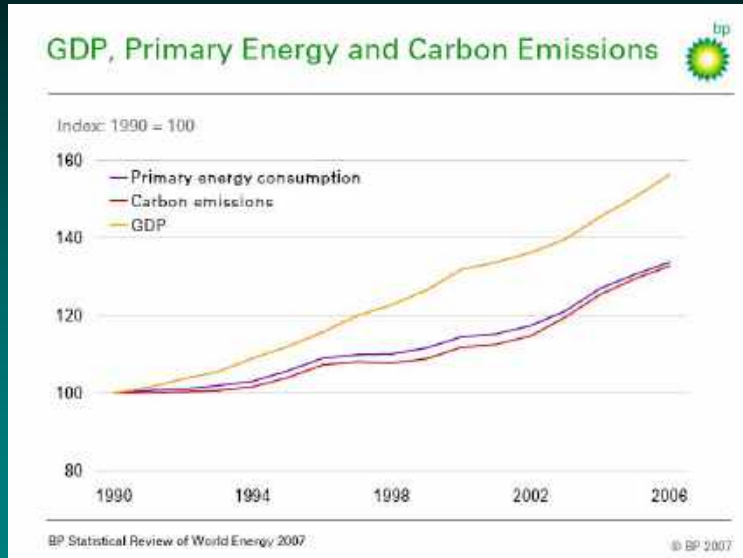
## ***Qualicum Institute***

### ***Carrying capacity: fossil fuels***

***Fossil fuels have artificially boosted the  
carrying capacity of earth for humans.***

*Mobus, G. 2009. *Bottleneck* by William Catton - A review.*

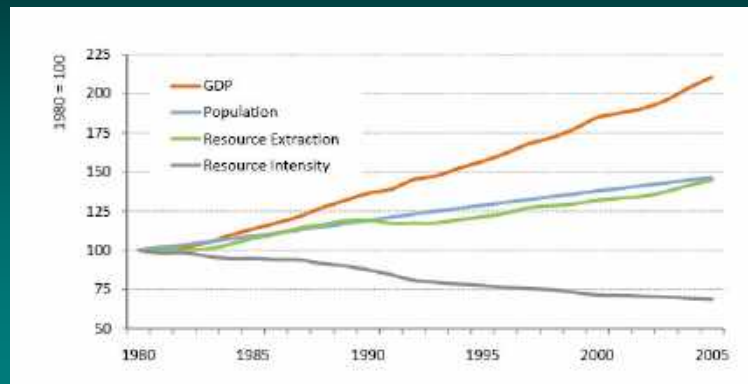
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Energy consumption is highly correlated with increasing GDP and carbon emissions. Note the graph was prepared by British Petroleum.

## *Qualicum Institute*

### *Resource extraction and population growth*



*Sustainable Europe Research Institute. 2009. OVERCONSUMPTION? Our use of the world's natural resources.*

Despite our resource intensity improving, i.e., the efficiencies by which we use resources have gotten better and better, resource extraction continues to rise concurrent with GDP (economic growth)

## ***Qualicum Institute***

### ***Carrying capacity: fossil fuels***

When the fossil fuels are effectively used up, what will replace them? ... there simply is no realistic or viable alternative energy source that could scale up to the level [we need].

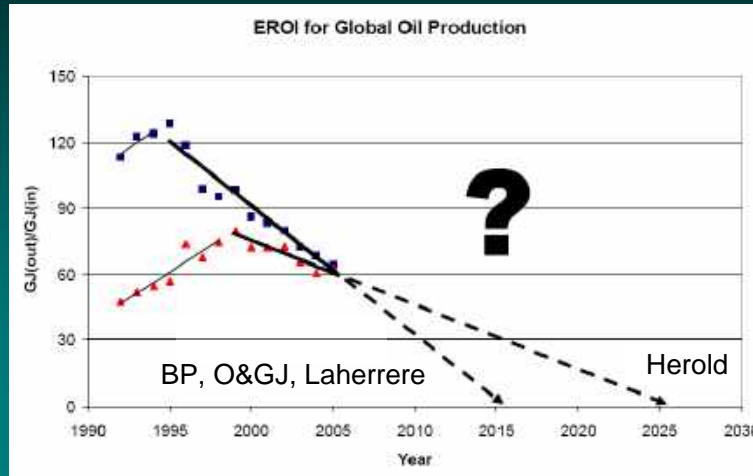
... it's the rate of change that gets us.

Mobus, G. 2009. *Bottleneck by William Catton - A review.*

If we had a hundred years to prepare we, perhaps, could solve this problem. But we don't because of the rate of change...

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### EROI for global oil and gas



Hall et al. 2006. *EROI: The Key Variable in Assessing Alternative Energy Futures?* [http://sef.umd.edu/files/Hall\\_SEF06.pdf](http://sef.umd.edu/files/Hall_SEF06.pdf)

This graph shows that the energy return on investment (EROI; energy out/energy in) has been declining since about 1995 or 1999, depending on the source, and if the trend continues it will be uneconomic to look for more oil because the energy required to search for the oil will not be replaced by the energy in the new oil discoveries.

## *Qualicum Institute*

### *Remember exponential growth?*

“Each successive doubling period consumes as much resource as all the previous doubling periods combined. This little appreciated fact lies at the heart of why our current economic model is unsustainable.”

Professor Roderick Smith FEng. *Carpe diem: the dangers of risk aversion* 2007

## *Qualicum Institute*

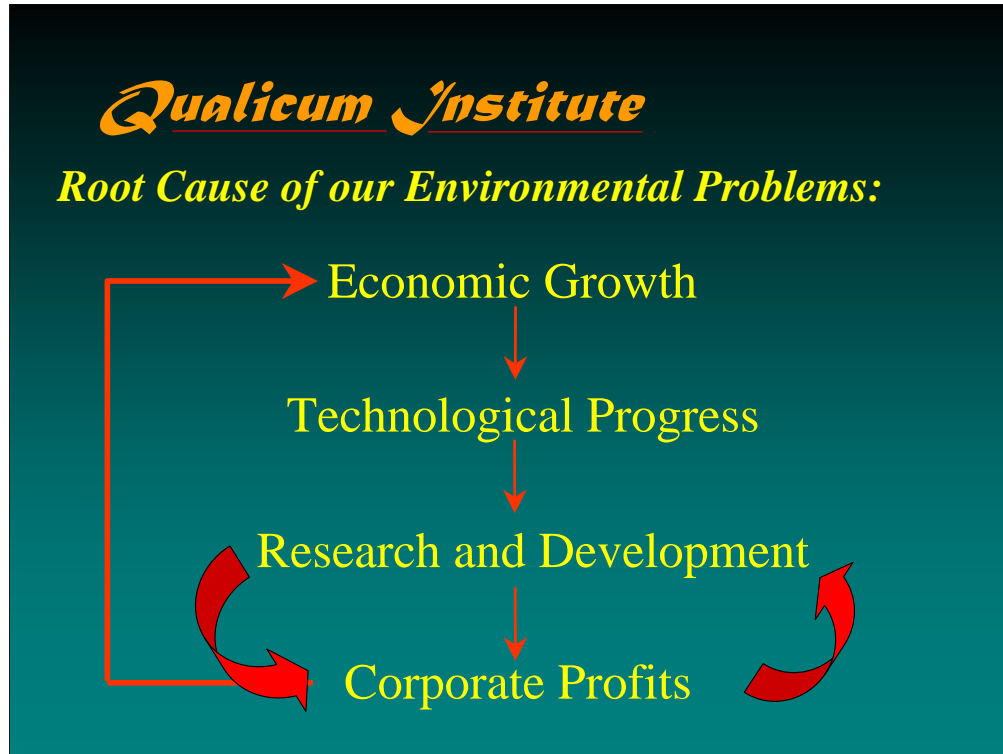
As the economy grows it

1. Removes structural elements of ecosystems
2. Depletes non-renewable resources
3. Displaces healthy ecosystems & services
4. Degrades remaining ecosystems with waste

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Due to the tremendous breadth of the human niche, which further expands via new technologies, the human economy grows at the competitive exclusion of biodiversity.





If economic growth is the root cause of our environmental problems and technological progress will solve the problem you get a circular argument because technology is facilitated by R&D and R&D only takes place if corporations make profits, and corporate profits are dependent on economic growth!

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“Creative thinking may mean simply the realization that there's no particular virtue in doing things the way they have always been done.”

*Rudolf Flesch*

Writing teacher, plain-English consultant, and author

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Our environmental organizations have grown in strength and sophistication, but the environment has continued to go downhill, to the point that the prospect of a ruined planet is now very real. How could this have happened?

*James Gustav Speth*

Dean of the School of Forestry & Environmental Studies,  
Yale University

## ***Qualicum Institute***

### ***Millennium Assessment Findings:***

*Over 60% of the 24 ecosystem services  
evaluated were being degraded or used  
unsustainably.*

United Nations (March 2005)

## ***Qualicum Institute***

### ***US National Wildlife Refuges***

New research: refuges are increasingly isolated and squeezed by sprawl, improper development, and some types of agriculture.

The growth is caving in the political boundaries of these “secured” habitats or polluting them from the outside.

National Wildlife Refuge Association 2005. *State of the system: beyond the boundaries.*

## *Qualicum Institute*

### *US National Wildlife Refuges*



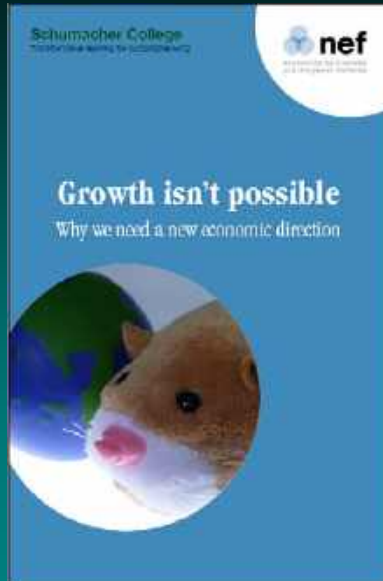
*Sacramento NWR  
Complex*

*Stone Lakes NWR*



*National Wildlife Refuge Association 2005. State of the system: beyond the boundaries.*

## *Qualicum Institute*

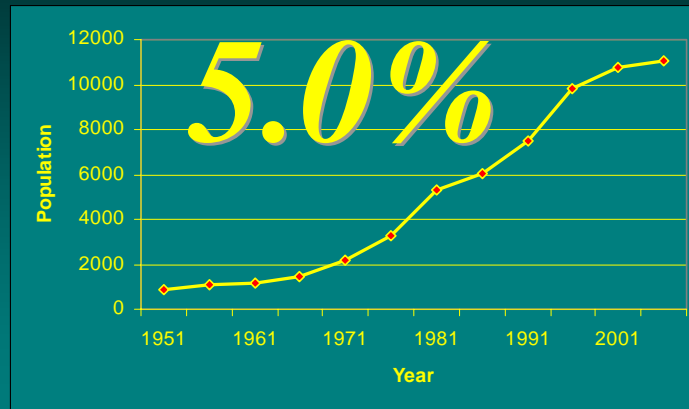


A new macro economic model is needed, one that allows the human population as a whole to thrive without having to rely on ultimately impossible, endless increases in consumption.

Simms and Johnson 2010

## *Qualicum Institute*

### *Parksville Population Growth*



*Source: BC Stats*



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**Parksville population  
in 50 years?**

**130,000**

At the average growth rate over the past 50 years. Even if Parksville only grew at an average rate of 2.5% it would reach about 40,000 people in 50 years.

## ***Qualicum Institute***

### ***Parksville faces \$3 million deficit (2008)***

Parksville council: “ever-increasing development was placing the city’s infrastructure and financial resources at risk.” Mayor: “our [financial] carrying capacity has reached its max.”

This, despite skyrocketing taxes imposed on the community—5% for each of the next 5 years

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### ***Increasing the tax base or the taxes?***

- Study after study has consistently shown increased population provides less revenue than infrastructure costs needed to accommodate additional residential growth.
- Cost ratios of servicing residential developments: between \$1.15 and \$1.50, a 15% to 50% shortfall.
- Servicing costs for farm, forest land or open space: \$0.36 to \$0.46 for every dollar received in taxes.

na.fs.fed.us/ss/07/forests\_cost\_less.pdf; American Farmland Trust

## *Qualicum Institute*

### *West Greenwich, RI*



- Population around 5,000
- proposed 168 unit housing development
- fully informed by the cost-benefit analysis of growth, the community voted 53:1 in favour of \$8 million bond issue to help purchase the 660 ha of forest and farmland.

Gedan, B.N. 2006. Voters OK \$8-million open-space bond issue. *Providence Journal*. [www.projo.com](http://www.projo.com)

Instead of opting for development the community floated an \$8 million bond issue to buy the development lands at current market value...

## *Qualicum Insti*

### *West Greenwich, RI*



- average increase in taxes: \$150, considerably less than ongoing and increasing costs if proposed development went ahead.
- today, 47% of the town lands are conserved as natural ecosystems, providing ecosystem services and maintaining rural character and quality of life.

Gedan, B.N. 2006. Voters OK \$8-million open-space bond issue. *Providence Journal*. [www.projo.com](http://www.projo.com)

...which resulted in .... Another way some communities are dealing with excessive growth.

## ***Qualicum Institute***

***Roderick Haig-Brown***

“Communities still struggle in ridiculous competition for growth ...blind to the fact that in doing so they welcome destruction of the very factors that made their living places desirable.”

From Writings and Reflections, Chapter 19: Some Approaches to Conservation (1966)