Environmental Sustainability

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AFNS 416/516 – One Health
Week 9: March 6 and 8, 2012

Questions to ponder prior to the class

- **Are we as humans utterly dependent on the ecosystems in which we live (and, indeed, on the biosphere) for our survival?**

- **What do we mean by structural integrity? By moral integrity? Personal integrity? And, by ecological integrity?**

- **What do we mean by narratives and ideologies as constraints on objectivity?**

Two-lecture structure

- **Lecture 1:**
  The evidence about declines, the sciences supporting such studies, and the role of policy in influencing how and what we measure

- **Lecture 2:**
  Ethical principles and movements that provide hope

Epidemiology

The study of the distribution and determinants of disease in populations and its application to the control of health problems

- **Primordial *prevention*** *(policy intervention)*
- **Primary *prevention*** *(avoid exposure)*
- **Secondary *prevention*** *(early detection)*
- **Tertiary *prevention*** *(rehabilitation)*

Basic Epidemiology: Beaglehole, Bonita & Kjellström, WHO, Geneva 1993, 2006

Epidemiology

- **Our job is to inform policy with a view to reducing harms by preventing disease and premature mortality at the community level**

- ***How can we more effectively deliver on this obligation under global ecological change?***

Recommended readings *(1 of 2)*

- **Last JM, Soskolne CL. Human Health in a Changing World. Chapter 52. In Wallace/Maxcy-Rosenau-Last. Public Health & Preventive Medicine, 15th Edition, 2007. Edited by R.B. Wallace. McGraw-Hill Medical. New York, USA; pp. 925-937.**

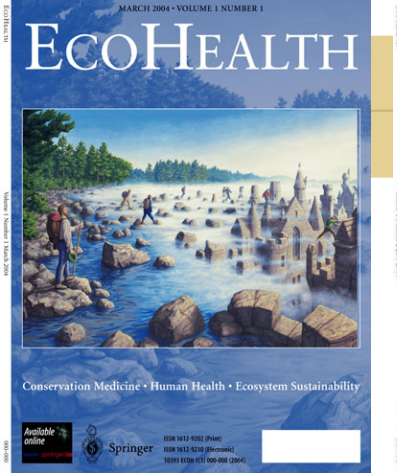
- **Soskolne CL. Eco-epidemiology: On the Need to Measure Health Effects from Global Change. Chapter 7. In: "Reconciling Human Existence with Ecological Integrity: Science, Ethics, Economics and Law." Edited by Laura Westra, Klaus Bosselmann and Richard Westra. Earthscan, London, UK; Sterling, VA, 2008; pp. 109-123. http://www.colinsoskolne.com/documents/024.pdf**

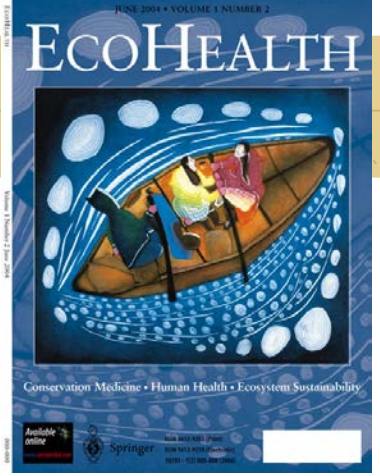
Recommended readings *(2 of 2)*

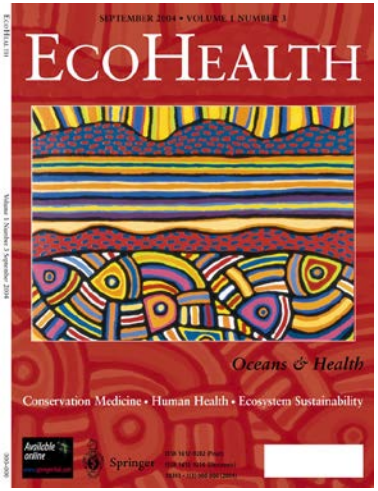
- **Soskolne CL et al (Editors). "Sustaining Life on Earth: Environmental and Human Health through Global Governance". Lexington Books, 2008 (459 pages). http://www.LexingtonBooks.com/ISBN/0739117297**

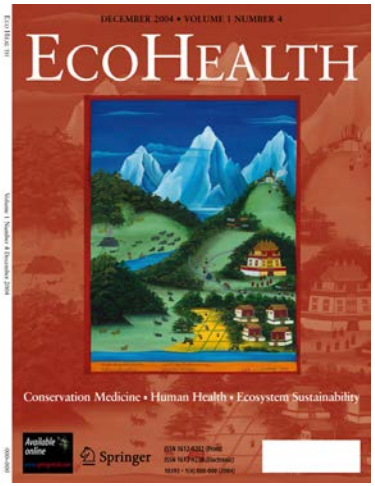
- **Millennium Ecosystem Assessment. Ecosystems and Human Well-Being. Volume 3: Policy Responses. (Eds. Kanchan Chopra, Rik Leemans, Pushpam Kumar, Henk Simons). Chapter 16: Consequences and Options for Human Health. Island Press, Washington DC, 2005:467-486. Also accessible at: www.maweb.org**

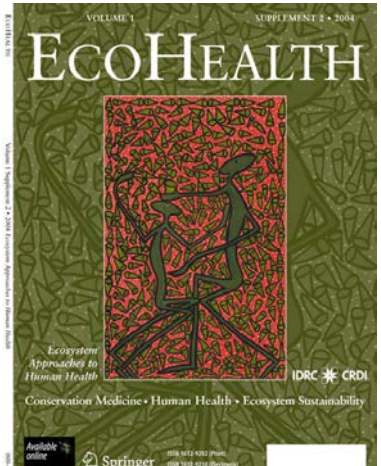
ECOHEALTH











International Association for Ecology & Health

www.ecohealth.net

Environmental Epidemiology

The Study of health effects on populations from exposures to *physical, chemical, and biological agents* external to the human body, *and* of immediate and remote *social, economic, and cultural factors* (e.g., urbanization, agricultural development, energy production/combustion) related to these physical, chemical, and biological agents. We try to clarify the relationships between exogenous factors and health.

Adapted from Porta, M. A Dictionary of Epidemiology, 5th Edition, 2008

Contemporary global-scale issues with major human health implications

- **Global geo-climatic system changes (e.g., global warming, sea level rise, ocean acidification); CO2 levels continue to rise**
- **Population growth with rapid urbanization and the development of mega-cities; Mass forced and voluntary migrations**
- **Expansion of consumption-intensive lifestyles (e.g., into China and India, each with 1B + populations)**
- **Increasing global and within-country disparities**
- **Fresh water declines everywhere**
- **Resurgence of old diseases and emergence of new (e.g., malaria and tuberculosis, HIV/AIDS, SARS)**
- **Species extinctions**
- **The growth-bound paradigm is entrenched**

Levels at which we operate

- **Micro lens** – ***e.g., physician-patient***
  - **On the ground …** **(advocate for patients)**
- **Meso lens** – ***e.g., community***
  - **From an elevation of about 100 meters**

    (advocate for communities)
- **Macro lens** – ***e.g., country/world***
  - **From an elevation of about 10,000 meters**

    (advocate for global health and well-being)

Courtesy of NASA…*Planet Earth*

- **Why should epidemiologists and public health researchers and practitioners be concerned with matters of a global nature?**

Traditional Public Health Domain

- **Sanitation**
- **Water Quality**
- **Food Safety**
- **Air Quality**

- **Vaccination programs**

New Concerns of Public Health

- **As we tamper with the very fabric of life through expansion of the human enterprise, Nature's Services are changed; these services we take for granted and assume free-of-charge in their support of life**

- **The effect is a net negative, with global impacts *such as* climate change, declines in air, water and soil quality, as well as food security issues**

Recent Newspaper Reports…

… anecdotal evidence?

Changing Landscapes

- **Expanding reach …**
- **Accelerating rates …**
- **Changing habitats …**
- **With this, shall we anticipate changes to public health practice?**
- **What, if any, is the role of Eco- and Environmental Epidemiology, and other specialists?**
- **And, Environmental/Bio-Ethics?**
- **And Law?**

EVIDENCE: Profound Declines in Ecological Integrity Demonstrated by ALL Markers of Biodiversity

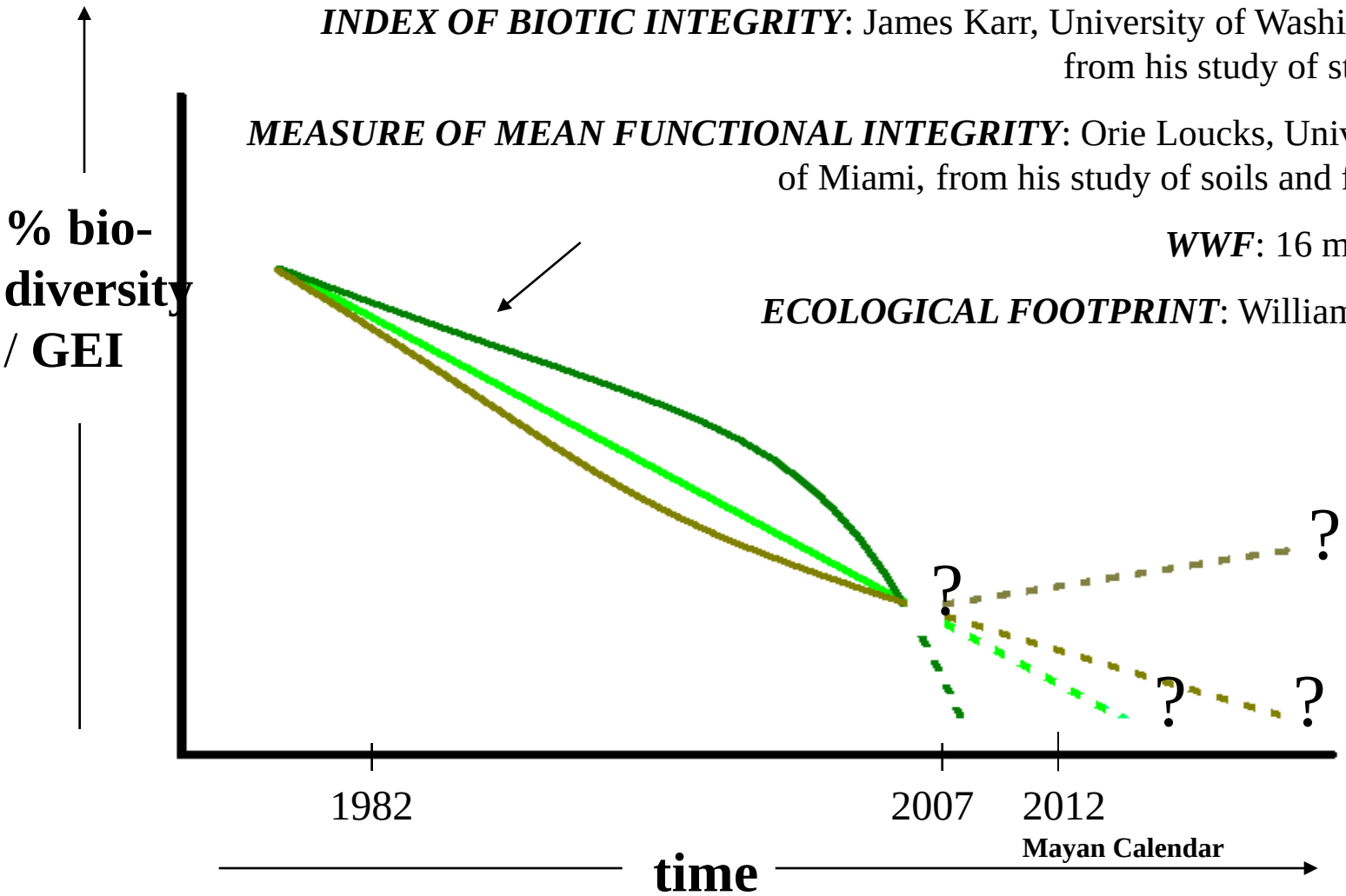
The past 25 years have seen an ~50% reduction in biodiversity as measured by INDEPENDENTLY-DERIVED indicators

INDEX OF BIOTIC INTEGRITY: James Karr, University of Washington, from his study of streams

MEASURE OF MEAN FUNCTIONAL INTEGRITY: Orie Loucks, University of Miami, from his study of soils and forests

WWF: 16 markers

ECOLOGICAL FOOTPRINT: William Rees



EDMONTON JOURNAL / edmontonjournal.com

IDEAS

TUESDAY, JANUARY 3, 2012 A11

Apocalypse? Not yet, according to Mayans

Ancient calendar doesn't predict the end of the world in 2012

KATHRYN REESE-TAYLOR
Ottawa Citizen

Our world is fascinated by prophecies of doom. Every day the media carry reports of predictions that the next year, decade, century or millennium will bring untold disasters. From a reading of current news headlines, this is difficult to argue against.

And now, we are bombarded by predictions of a disaster associated with what many say is the end of the Mayan calendar. But did the Mayans actually predict that the world as we know it will be destroyed by some unknown cataclysm on Dec. 21, 2012?

When the Mayans abandoned their great cities in southern Mexico, Guatemala, Belize, Honduras and El Salvador, they left behind large stone monuments with hieroglyphic writing. These inscriptions were very difficult to decipher as the writing system had not been used since the Spanish conquest when all but four of the books written by the Mayans were burned. However, based on the four remaining books, early scholars were able to identify some of the gods and goddesses, the numerical system and, most importantly, parts of the calendar. Therefore, while they could not decipher the events recorded on the stone monuments, scholars could read the dates on which these events occurred.

One date that stood out was the day the world was created according to the Mayans: Aug. 11, 3114 B.C. The actions leading up to the creation of the world involved the exploits of many gods and goddesses and took place over a long period, 13 baktuns (a baktun is equal to approximately 400 years, so 13 baktuns is roughly 5,200 years). On this last day of creation, the Maize Lord, one of the principal Mayan gods, reached his hand up into the sky and turned the heavens, which started time. After this act, "real time" started, and this is what is recorded as the first day in the Mayan calendar.

Because mythological time ended at the end of the 13th baktun, scholars and writers in the 1960s and '70s, who were keenly interested in the Mayans, assumed that the "real time" calendar would also end at the end of 13 baktuns, on Dec. 21, 2012. In 1966, Michael Coe, professor emeritus of anthropology at Yale University, first linked this presumed end of the Mayan calendar to a cataclysmic end of the world, as predicted by the Hopi and the Aztec.

This idea was later picked up and amplified in 1975 by Frank Waters in his book, *Mexico Mystique: The Coming Sixth World of Consciousness*. Waters, who also wrote the *Book of the Hopi*, argued that at the end of 13 baktuns, a catastrophe would completely destroy the old world and a new world would take its place. However, it is Jose Argüelles who is most closely associated with the 2012 phenomenon. Argüelles wrote a bestselling booking in 1987 called *The Mayann Factor*. In this book, he focused on the end of the 13 baktuns as a moment of transformation from one world order to another (guided by extraterrestrials from whom the Mayans are descended, but that is another article).

It is this concept of a new world rising from the ashes of the old that seems to resonate with people today. Books, articles, movies, documentaries and websites have tied an array of events, both fictional and factual, to 2012, including solar flares, shifting magnetic poles, astronomical alignments, recent political events, and, sadly, all-too-real natural disasters. Even the current economic crisis in Greece has been linked to 2012, although it is unclear what new world order will result from this calamity. Indeed, it seems clear from the reams that have been written about 2012 that we are unhappy with the world we have created and want a "do-over."

Yet, what did the ancient Mayans say about such a significant event in their future? Surely something as noteworthy as the end of the world or the coming of a new age of consciousness would have been recorded on many monuments. But in all of the thousands of texts left by the Mayans, only one includes any information at all about this momentous future event.

The single example comes from the site of Tortuguero in the state of Chiapas, Mexico. There, on Monument 6, the Mayans recorded the end to the 13th baktun. Interestingly, it was not even the main point of this inscription, but an addendum, comprising only eight glyph blocks at the end of a text that originally consisted of more than 156 glyph blocks. The focus of the text was the dedication of the building associated with the monument by the king of Tortuguero, Bahlam Ahaw (Jaguar Lord). This type of prediction into the future is fairly common in Mayan texts and serves to contextualize the main event in the inscription.

So what exactly was written in the final eight glyphs on Tortuguero Monument 6?

The Mayans recorded that on Dec. 21, 2012, the 13th baktun will end. Bolon Yokte', a god of transition associated with the ending of time periods, will witness the ceremonies conducted on this day and will be "invested," presumably by the descendants of the king, Bahlam Ahaw. Based upon the rituals of contemporary Mayans, scholars interpret this passage to mean that the future king of Tortuguero would have brought out an effigy of the god, Bolon Yokte', dressed it in ritual clothing and placed it on display to watch the ceremonies conducted in honour of the end of the 13th baktun.

Ironically, what is missing from this passage is any mention of the end of the world. There is no catastrophe predicted and no rise of a new world order foretold.

Further, the Mayans predict other events far into the future, well beyond 2012.

For instance, at the nearby site of Palenque, on the west panel in the Temple of the Inscriptions, the Mayans recorded the date of Oct. 23, 4772, in the future to contextualize the accession of the great king, K'inich Janaab' Pakal (Sun-Eyed Flower Shield) on July 26, 615. And at the magnificent city of Tikal, located in the heart of Guatemalan rainforest, the Mayan carved the date of Jan. 29, 5,039,131, on a stone monument commissioned in the sixth century by the king, Kalomte' Bahlam (Emperor Jaguar).

So, while the Mayans certainly envisioned the 13th baktun ending, just as we anticipate that the third millennium will end on Dec. 31, 2999, they in no way thought their world would end.

And this is what is so interesting about the 2012 prophecy. It is our culture that is captivated with apocalyptic predictions of all sorts, religious, political, economic and environmental, and we invented this doomsday scenario, not the ancient Mayans.

Kathryn Reese-Taylor is associate professor and graduate program director in the department of archeology at the University of Calgary.

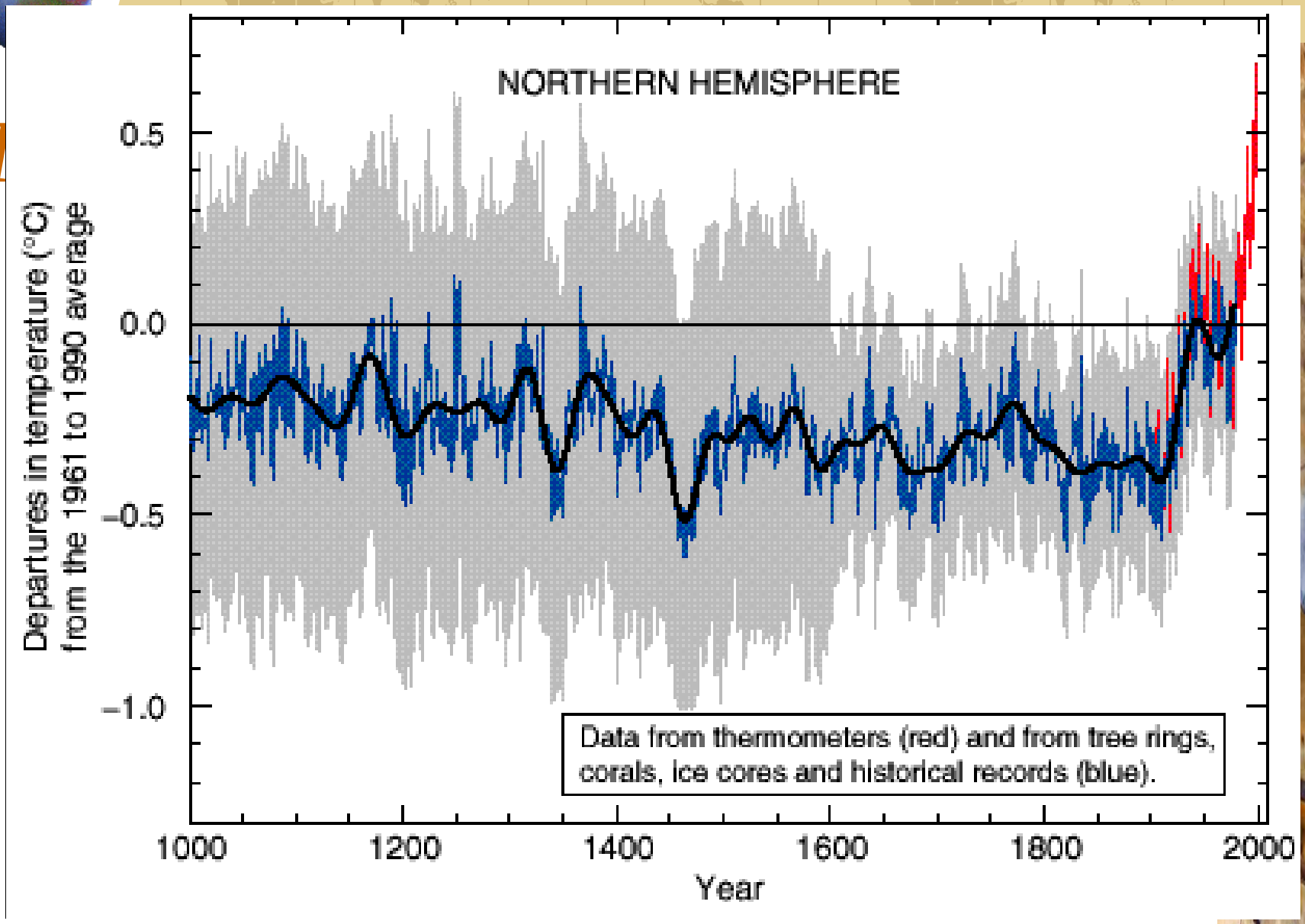
Postmedia News

Five Stages of Grief

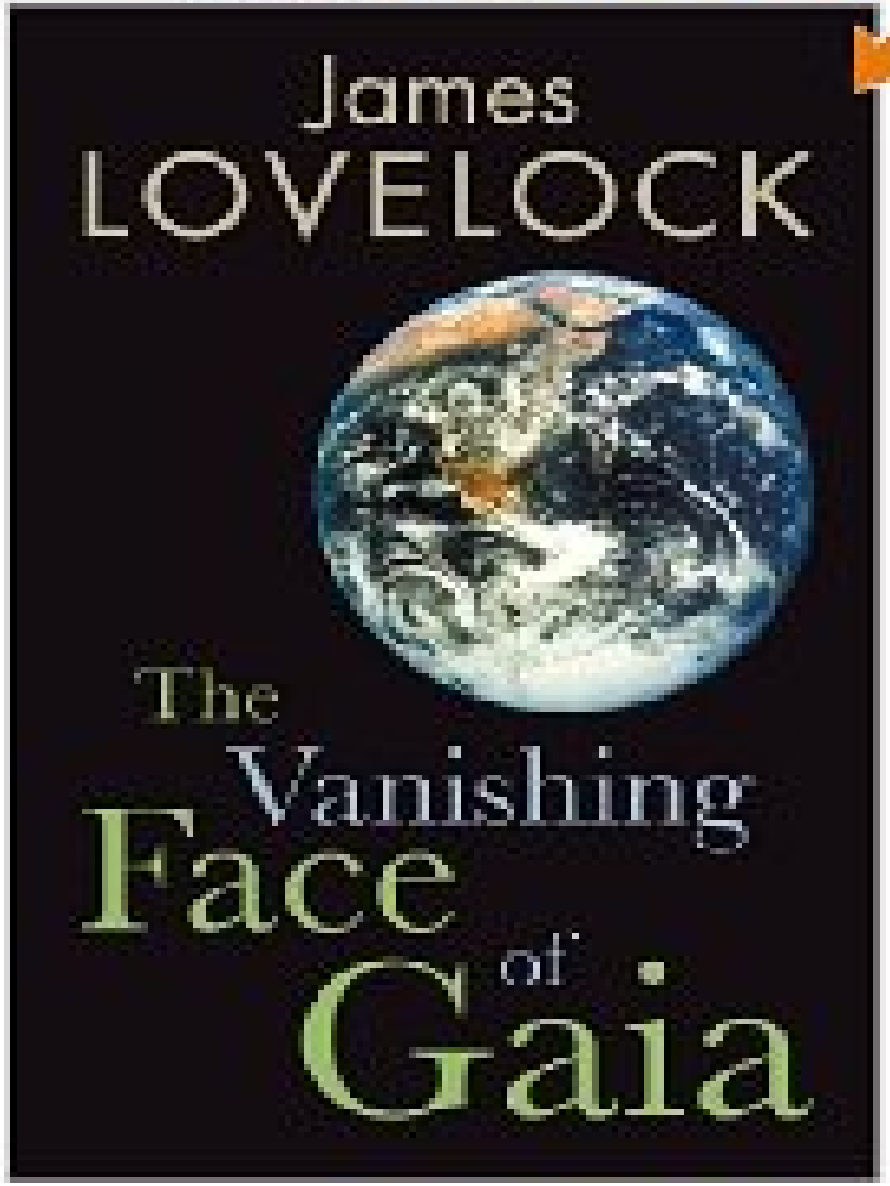
Elizabeth Kübler-Ross, 1969, "On Death and Dying"

- **Denial**: *It can't be happening!*
- **Anger**: *Why me? It's not fair!*
- **Bargaining**: *Just let me live to see my children graduate!*
- **Depression**: *I'm so sad, why bother with anything?*
- **Acceptance**: *It's going to be OK!*

- **Laying blame**: it's someone else's fault


NORTHERN HEMISPHERE
Departures in temperature (°C) from the 1961 to 1990 average
0.5
0.0
−0.5
−1.0
1000
1200
1400
1600
1800
2000
Year
Data from thermometers (red) and from tree rings, corals, ice cores and historical records (blue).

Click to LOOK INSIDE!



ECOLOGICAL FOOTPRINTS

- **The area beneath the heel of the foot represents the concentration of population (as in any city) that depends for its sustenance on the much greater land mass represented by the remainder of the foot**
- **The city <u>imports</u> resources (air, water, food, building materials, etc) and exports its wastes**

Comparing average consumption

- **Ecological Footprint (EF) (ha/person)**

	1991	2003
USA	= 5.1 /	= 9.5
Canada	= 4.3 /	= 6.5
India	= 0.4 /	= 0.8
World	= 1.8 /	= 2.2

Footprints are rising with rising energy and material consumption, even in the richest and most efficient countries, and fastest in the fastest growing countries, like China and India. The 2006 Living Planet Report shows the rising global EF since 1960, recognizing that the earlier years have wider margins of error.

Sources: **Wackernagel & Rees. *Our Ecological Footprint* 1996; and the 2006 Living Planet Report**

- **Why should epidemiologists and public health researchers and practitioners be concerned with matters of a global nature?**

→ The Right to Life for both present and future generations

ORTHODOX VS. UNORTHODOX APPROACHES

- ✓ ***"The significant problems we face today, from our current patterns of thinking, cannot be solved by the same pattern of thinking which created them."*** **– A. Einstein**
- ✓ ***"Inside the Box"*** **vs.** ***"Outside the Box"***
- ✓ ***"Linear Reductionism"*** **vs.** ***"Complexity"***
- ✓ **"*Uni*-disciplinary" vs. "*Inter*-disciplinary" vs. "*Multi*-disciplinary" vs. "*Trans*-disciplinary"**
- ✓ ***"Band-Aid Solutions"*** **vs.** ***"Systemic Solutions"***
- ✓ ***THE EARTH CHARTER*****: It is a vision, not an instruction manual – take it as such."**

$I = P * A * T$

- ***INTEGRITY EQUALS: "POPULATION" TIMES "AFFLUENCE" TIMES "TECHNOLOGY"***

- **GEI = f[Population, Consumption, Technology]**

*The "I = P *A * T" identity*

Impact (or "Integrity") = f(Population*Affluence*Technology)

Ehrlich& Holdren, 1971

Stresses the interdependence of forces which often are treated independently as needs for "population control," "reduced consumption," or "green technologies". Helps in making our values and assumptions transparent.

The interplay of all determinants is critical for their recognition, investigation, and in formulating policy.

*The "I = P * A * T" Identity*

"INTEGRITY" EQUALS "POPULATION" TIMES "AFFLUENCE" TIMES "TECHNOLOGY"

Ehrlich's & Holdren, 1971

- **Exposes bias and self-interest when "North" blames "South", and vice versa**
- **We must recognize our collective interest on this fragile planet and, whether we are "North" or "South", we all have to change our ways in rather profound ways if our goal is "sustainability"**
- **Else, it is like rearranging the deck chairs on the Titanic as we approach the iceberg that causes us to sink**

HEY, YOU UP AT THE FRONT!
STOP BREEDING!
Developing countries
USA
Canada
EU
© Steve Bell 1994
481·18·8·94

Climate Change only?

Or, Global Change more generally?

Is Global Change Really Occurring?

Minimal uncertainty about global change, and pretty much certainty, for population growth, the rate of species' extinctions, technological impacts, etc.

Neoliberal Globalization

A major force in the world that works against longevity and for widening disparities:

1. Neoliberal Globalization: Is There an Alternative to Plundering the Earth? - by Prof. Claudia von Werlhof http://www.globalresearch.ca/index.php?context=va&aid=24403

2. *Encirclement*: A 2 hr and 40 minute-long docu-drama about neo-liberalism, 2008. Learn about accessing the DVD at http://encirclement.info/index2.html The production arm is at: www.filmsdupasseur.com In French with some English (interviews with Noam Chomsky), but with excellent English sub-titles throughout.

Definitions and concepts to "open our minds"

- **BRAIN-WASHED:** *Indoctrination by propaganda*
- **DOGMA:** *Something held as authoritative without substantiation*
- **ENTITLEMENT:** *A right to benefits*
- **HUMILITY** vs. ARROGANCE
- **HYPOCRITE:** *Putting on a false appearance of virtue or religion,* or ***Not*** **WALKING THE TALK:** ***Not*** *Doing what you preach*
- **LIVE, SPEND, AND CONSUME AS IF THERE IS NO TOMORROW:** *A self-fulfilling prophesy?*
- **MANIPULATION:** *To control for one's own advantage*

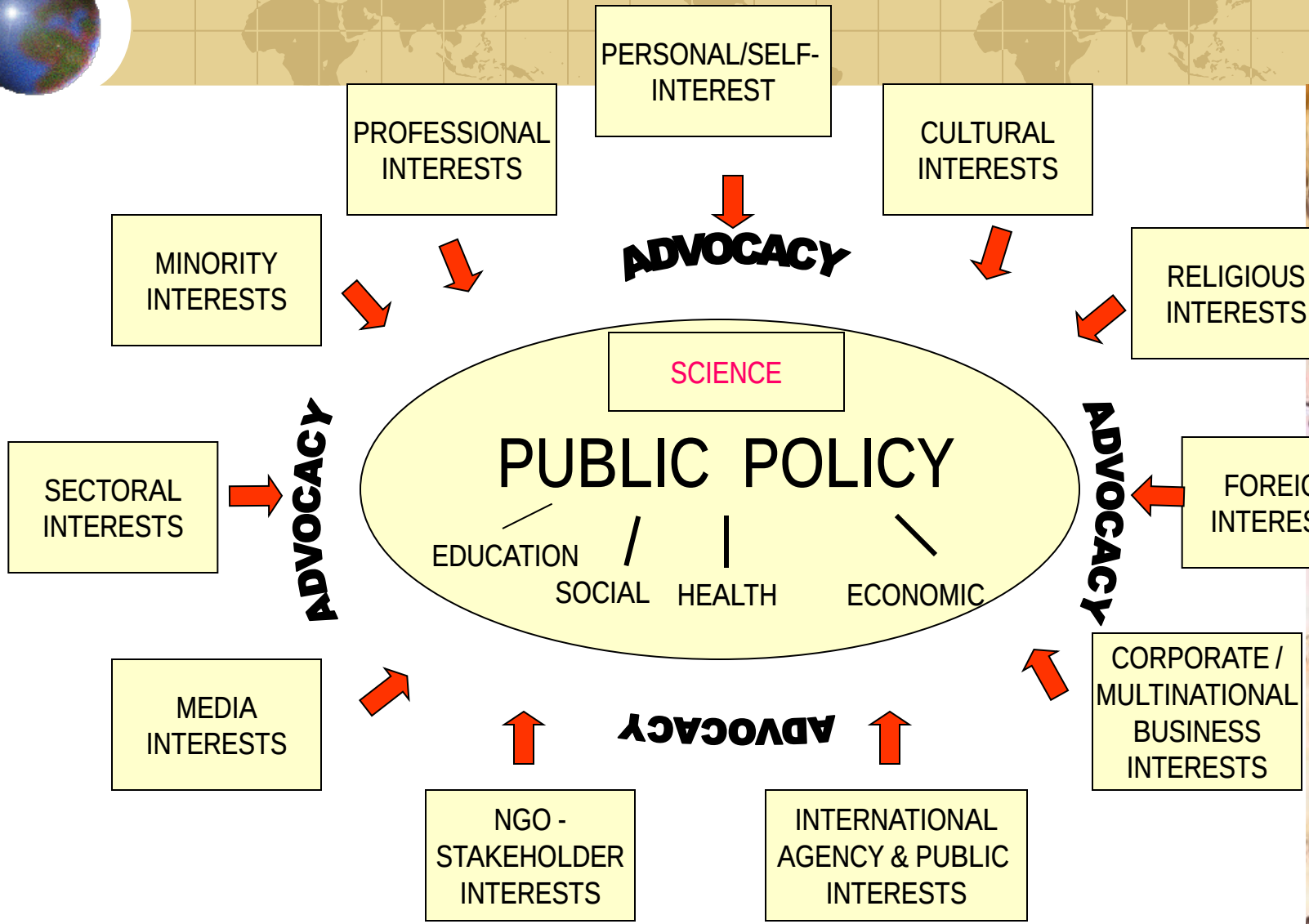
- ✓ **The MILITARY-INDUSTRIAL-ACADEMIC COMPLEX:** *An alliance to influence government policy*
- ✓ **MYTH:** *An unfounded or false notion*
- ✓ **PARADIGM:** *A framework used to describe reality*
- ✓ **SELF-INTEREST:** *Concern for one's own advantage*
- ✓ **SOCIOPATHS:** *Con artists who sway the exploitable with no regard to their rights in pursuit of power (psychopaths)*
- ✓ **SOLIDARITY:** *Unity based on community of interests*

POLICY RELEVANCE

- **Epidemiology is the science that is basic to rational public health policy formulation**
  - **Infectious Diseases – *proximate***
  - **Chronic Diseases – *distal determinants: complex interactions, industrial activities, pollution, synergies***
- **Uncertainty is inherent to science**

and interplays with

- **The policy-maker's conundrum**


PERSONAL/SELF-INTEREST
PROFESSIONAL INTERESTS
CULTURAL INTERESTS
ADVOCACY
MINORITY INTERESTS
RELIGIOUS INTERESTS
SCIENCE
PUBLIC POLICY
EDUCATION
SOCIAL
HEALTH
ECONOMIC
SECTORAL INTERESTS
ADVOCACY
ADVOCACY
FOREIGN INTERESTS
MEDIA INTERESTS
ADVOCACY
CORPORATE / MULTINATIONAL BUSINESS INTERESTS
NGO - STAKEHOLDER INTERESTS
INTERNATIONAL AGENCY & PUBLIC INTERESTS

Science is but one such pressure

--- HUMILITY AND EMPATHY FOR THE POLICY-MAKER

So, what can the public health sciences contribute to this discussion ?

Prevent **major harms to human health, well-being, and function; and the possible extinctions of sizeable communities**

QUESTIONS THAT EMERGE

For how long can human health be sustained

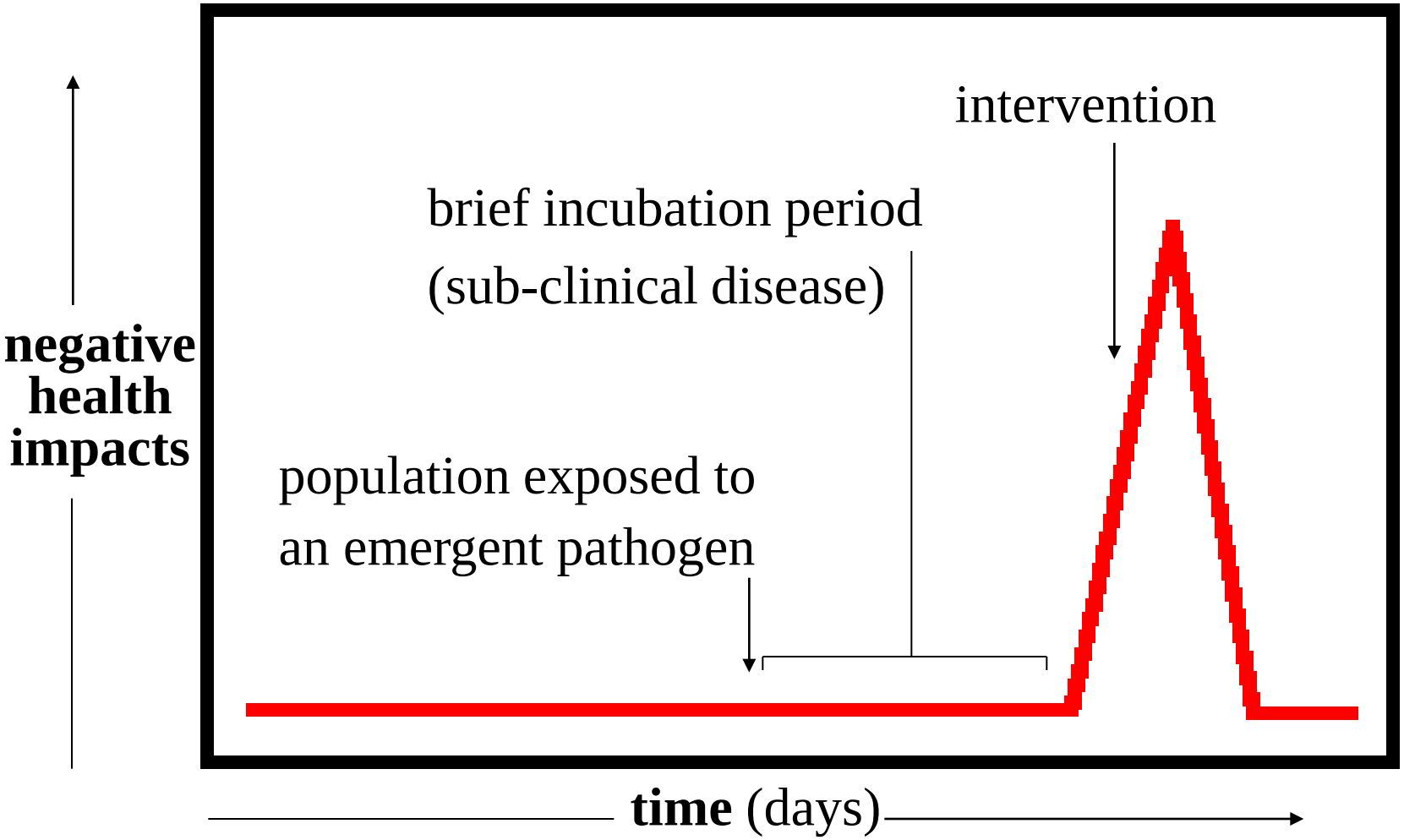
- **while continuing to draw down ecological capital?**
- **while declines in ecological integrity accelerate?**

Only One World >> Planet Earth

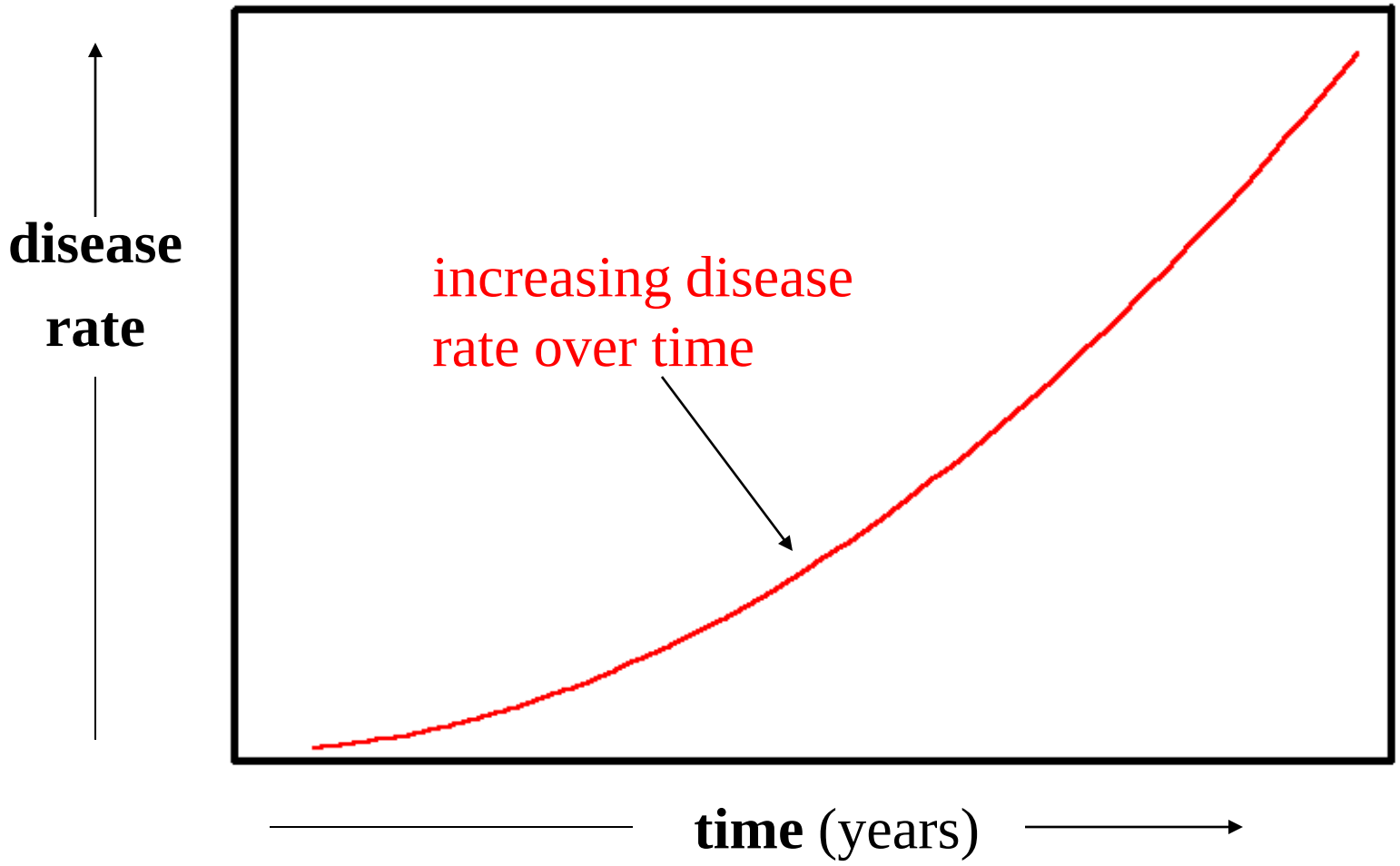
Eco-epidemiology

Eco-epidemiology is a sub-specialty of epidemiology, focusing on the relationships between human health and the dynamics of global ecological change.

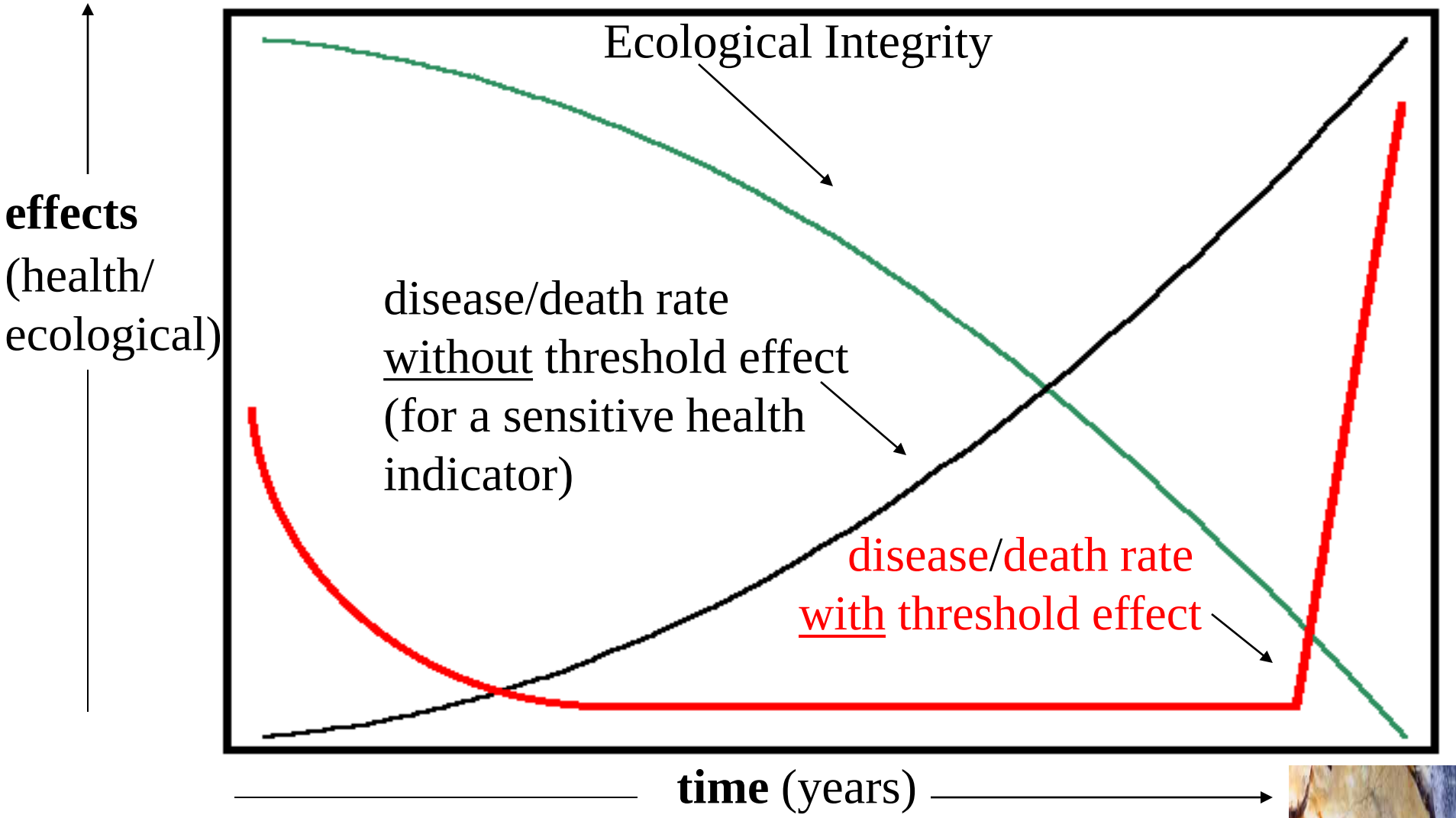
Threshold health effect in a hypothetical time-trend study of a communicable disease



Non-threshold health effect in a hypothetical time-trend study of a chronic disease



Threshold health effect in a hypothetical time-trend study, superimposed on an idealized relationship between ecological disintegrity and a sensitive health indicator

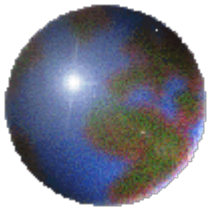


Traditional Health Indicators

- **Life Expectancy**
- **Percent Low Birth Weight Babies**
- **Infant Mortality**
  - ***Intuitively linkable to measures of ecological degradation****, but no association was found* *(Sieswerda et al., 2001)*
  - ***Wealth is the buffer***

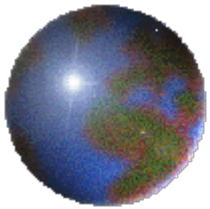
    So, what happens to those who live in poverty without the buffer of wealth?

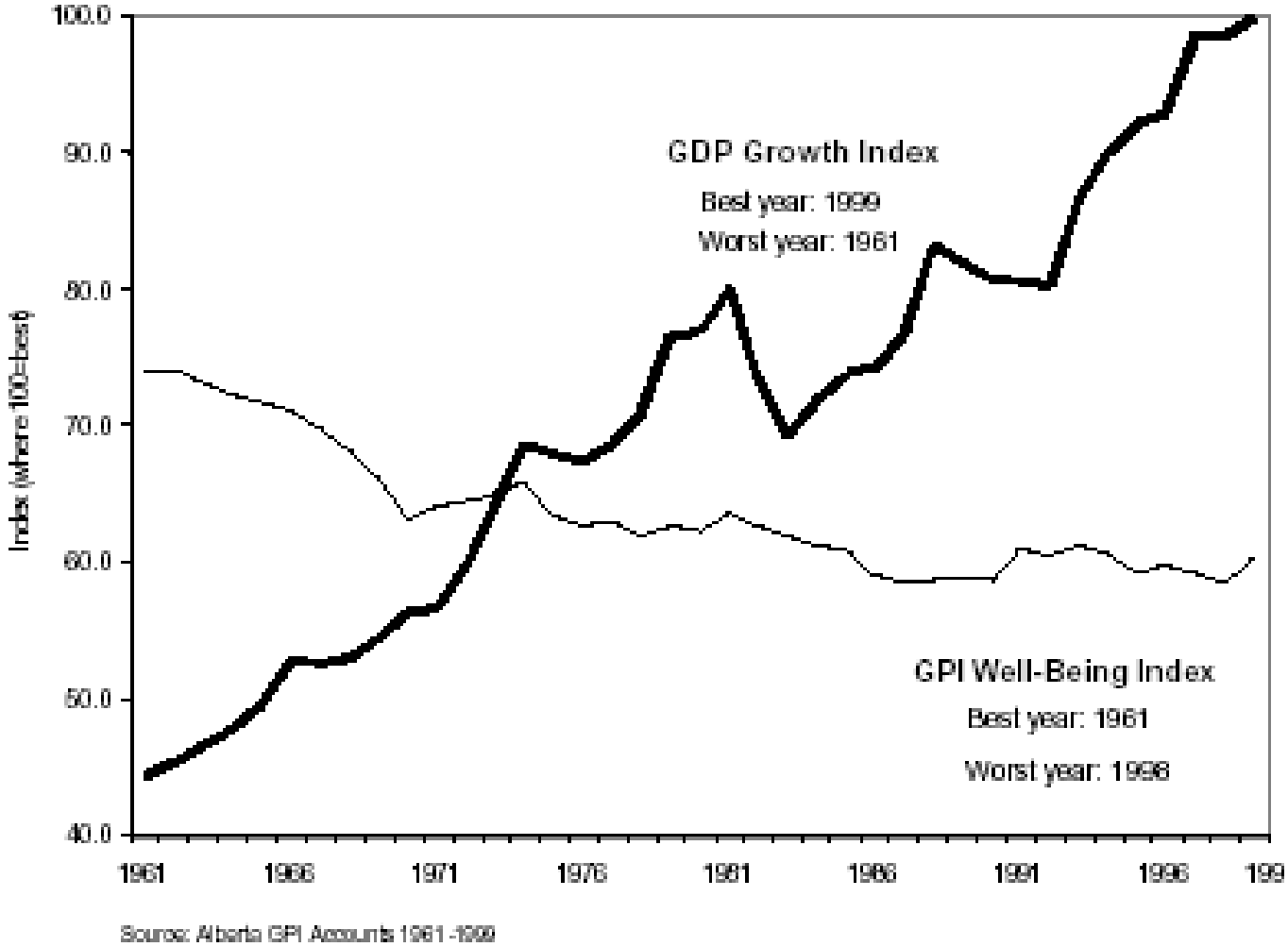
The Alberta GPI Indicators for Economic, Personal-Societal and Environmental Well-being - *Redefining Progress, San Francisco; Mark Anielski, Edmonton*



Economic	Personal-Societal	Environmental
• Economic growth • Economic diversity • Trade • Disposable income • Weekly wage rate • Personal expenditures • Transportation expenditures • Taxes • Savings rate • Household debt • Public infrastructure • Household infrastructure	• Poverty • Income distribution • Unemployment • Underemployment • Paid work time • Household work • Parenting and eldercare • Free time • Volunteerism • Commuting time • Life expectancy • Premature mortality • Infant mortality • Obesity • Suicide • Drug use (youth) • Auto crashes • Divorce (family breakdown) • Crime • Problem gambling • Voter participation • Educational attainment	• Oil and gas reserve life • Oilsands reserve life • Energy use intensity • Agricultural sustainability • Timber sustainability • Forest fragmentation • Parks and wilderness • Fish and wildlife • Wetlands • Peatlands • Water quality • Air quality-related emissions • Greenhouse gas emissions • Carbon budget deficit • Hazardous waste • Landfill waste • Ecological footprint

The Alberta GPI Well-being Index versus Alberta GDP Index, 1961 to 1999





- **End of lecture - Part I**

Equity and fairness …

Ethical dimensions of global climate change

*November 6, 2007 (*Courtesy J. Patz*) -- Cartograms*

Millennium Development Goals

HEALTH, POVERTY & CONSERVATION

1. **Eradicate extreme poverty and hunger**
2. **Achieve universal primary education**
3. **Promote gender equality and empower women**
4. **Reduce child mortality**
5. **Improve maternal health**
6. **Combat HIV/AIDS, malaria, and other diseases**
7. **Ensure environmental sustainability**
8. **Develop a global partnership for development**

Principles (from bioethics)

- **Respect personal autonomy**
  - *Fidelity and veracity*
- **Do good (Beneficence)**
- **Do no harm (Non-Maleficence)**
- **Social and distributive justice**
  - *Equity in the distribution of benefits and risks of research and policy*
- **Integrity in research**

Primary Principles in Public Health

- **Protect the most vulnerable in society** (e.g., unborn, children, Inuit, frail elderly)
- **Involve communities in our research** (ensure community relevance of our work)
- **Integrity in Public Health**
  - **Serve the public health interest above any other interest**

The principle of SOLIDARITY

- **What goes around, comes around in our world that, environmentally, is a seamless web**

- **"*Made in Canada*", "*Made in Alberta*" and "*Voluntary compliance*" are counter to this principle**

- **Too much self-interest …**
  - **The fox guarding the hen house …**

The FUNDAMENTAL PRINCIPLES of BIOETHICS include (under Non-maleficence and Respect for Autonomy)

- **PRECAUTIONARY PRINCIPLE**
  - ***where there is a risk from a certain agent, the presence of uncertainty shall not be used as a reason for postponing cost-effective measures to prevent such exposure***
- **POST-CAUTIONARY PRINCIPLE**
  - ***When we have missed the opportunity for precautionary action - as with climate change, we must plan for adaptation to prevent inevitable harms consequent to climate change*** *(Lisa Heinzerling, Georgetown University, 2007)*

The FUNDAMENTAL PRINCIPLES of BIOETHICS include (under Justice):

- **ENVIRONMENTAL JUSTICE**
  - ***Who is taking the risks?***
  - ***Who is deriving the benefits?***

- **THE POLLUTER PAYS**
  - ***incentive to internalize costs***

The FUNDAMENTAL PRINCIPLES of BIOETHICS include (under Justice and Non-maleficence):

- **THE SEVENTH GENERATION PRINCIPLE**
  - **Consider consequences seven generations hence**

In whose interests?

- **Only Canada as a nation?**
- **Only the USA as a nation?**
- **Only North America as a region?**
- **Only the present wealthy?**
- **Only the present generation?**
- **Future generations – locally/globally?**

Be aware of forces at play that influence both science and policy.

… Great vigilance and personal integrity are required to change course

Manufacture of doubt 61

In whose best interests?

- **David Michaels' work**
  - **OUP 2008: "Doubt is their product: How industry's assault on science threatens your health"**
- **The policy-maker's conundrum**
  - ***The greater the uncertainty, the more unlikely it is that policy will be set***

The Four D's applied to scientists studying that which does not support the status quo

- Deny
- Delay
- Divide
- Discredit
  - [Dismiss] [Death – Meryl Streep in the movie Silkwood, 1983?]

Climate change questioned in schools mailout

U.S. think-tank says it's trying to inject 'balance' by sending out 11,000 brochures and DVDs

MIKE DE SOUZA
Canwest News Service
OTTAWA

An American think-tank has sent out more than 11,000 brochures and DVDs to Canadian schools urging them to teach their students that scientists are exaggerating how human activity is the driving force behind global warming.

The Chicago-based Heartland Institute said its goal is to ensure that students are provided with a "balanced" education about "an important and controversial issue," but critics, including a leading climate scientist, described it as a campaign of misinformation.

The mailout, sent in February, included results from international surveys of climate scientists conducted in 1996 and 2003, along with a 10-minute DVD called *Unstoppable Solar Cycles, The Real Story of Greenland*.

"It took me a while to figure out what they were up to," said Eric Betteridge, who teaches at Hillcrest High School in Ottawa.

The Heartland Institute says that it purchased a database list of addresses of 11,250 schools from across the country, including about 10,000 private or faith-based schools, for a massive mail campaign aimed at Canadian children in all provinces.

"All the kids in our schools are being taught that climate change is a serious crisis and that we've got to reduce our CO_2 and they're being taught (that) quite falsely," said Jay Lehr, the science director at the Heartland Institute who sent the package.

"We would like to educate people and basically give them the other side of the issue, so we send out materials only in hope of a little balance."

The Sierra Club of Canada said that the Heartland Institute's information was far from being balanced.

"It's alarming that an American think-tank is distributing misinformation on the most important issue of our time in Canadian schools, to actually create an illusion that there is a scientific debate," said Emilie Moorhouse, a spokeswoman for the environmental group.

The Heartland Institute describes itself as a national non-profit research and education organization whose mission is "to discover, develop, and promote free-market solutions to social and economic problems."

The brochure and DVD said that scientists were "deeply divided" about "the notion that climate change is mostly the result of human activities." It also suggested that the sun was the main factor behind recent warming recorded on the planet.

The package does not make reference to the conclusions reached by governments and scientists from around the world in their 2007 assessment of the latest peer-reviewed research on climate change.

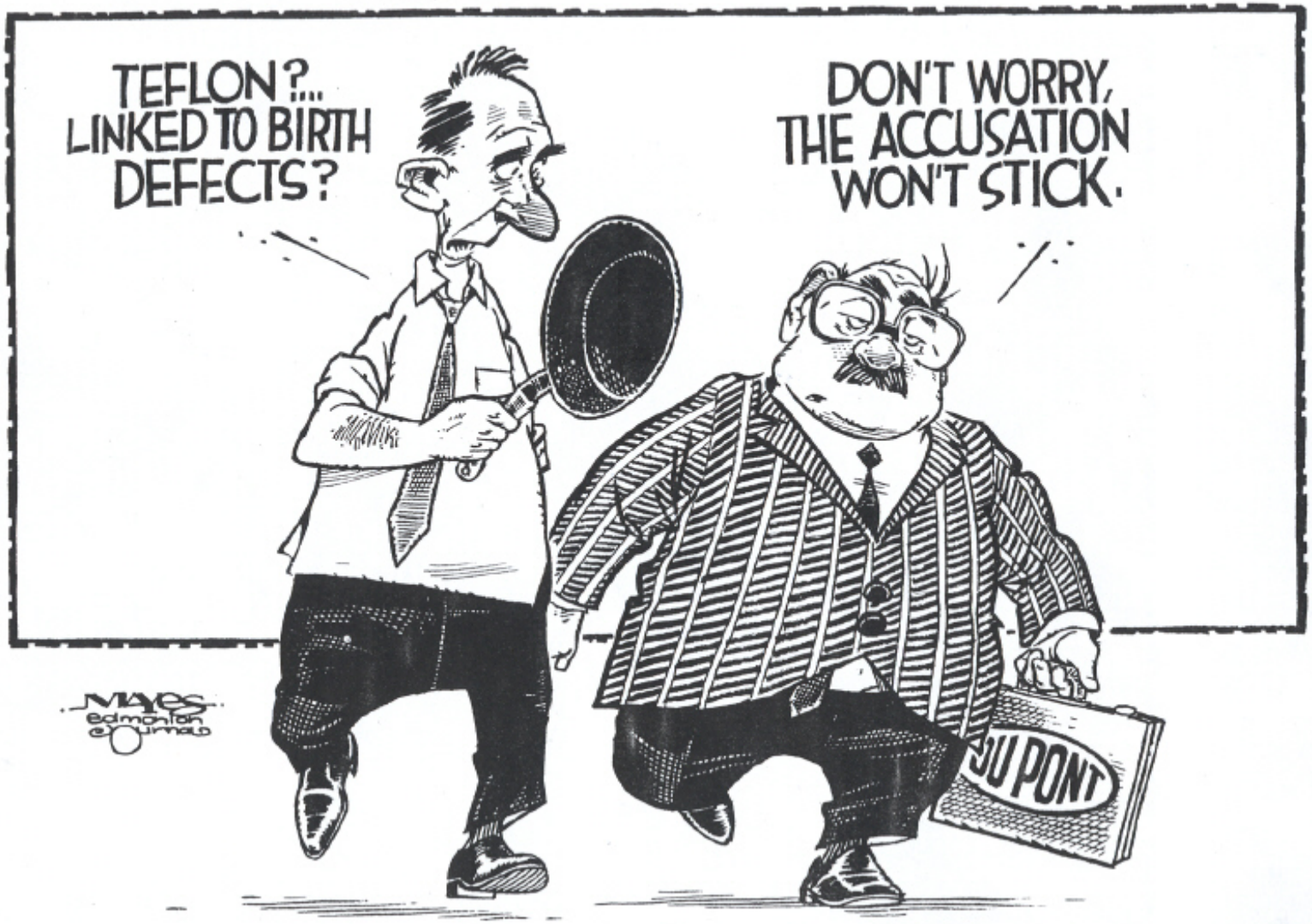
The Intergovernmental Panel on Climate Change wrote that global warming is unequivocal and that there is a 90-per-cent chance it is being caused by humans.

After reviewing the Heartland Institute package, Betteridge said he was left feeling both amused and distressed that someone would try to promote this material to children in the classroom.

"I think I would be concerned because it was well written," he said.

The Heartland Institute has received $791,000 in funding from Exxon-Mobil since 1998, according to a recent analysis by Greenpeace USA.

• A10 WEDNESDAY, AUGUST 11, 2004 / EDMONTON JOURNAL



Being able to discern fact from fiction

- **Hone your "bullshit" detection skills**
  - *Or, said differently:*
- **Hone your "crap" detection skills**

- **From any vested interest, conspiracy theorist, and even scientist whose findings you should be poised to refute**

- **What are the most promising solutions to these problems?**

Anthropocentrism and eco/biocentrism

- **Reconnecting humans to their complete dependence on the ecosystems in which they live …**

- **New approaches are needed to move us from our silo-based and compartmentalized approaches**

Reductionist vs. Systems Approaches

- **Reductionism:** Pursuit of single causes along linear paths to explain a phenomenon

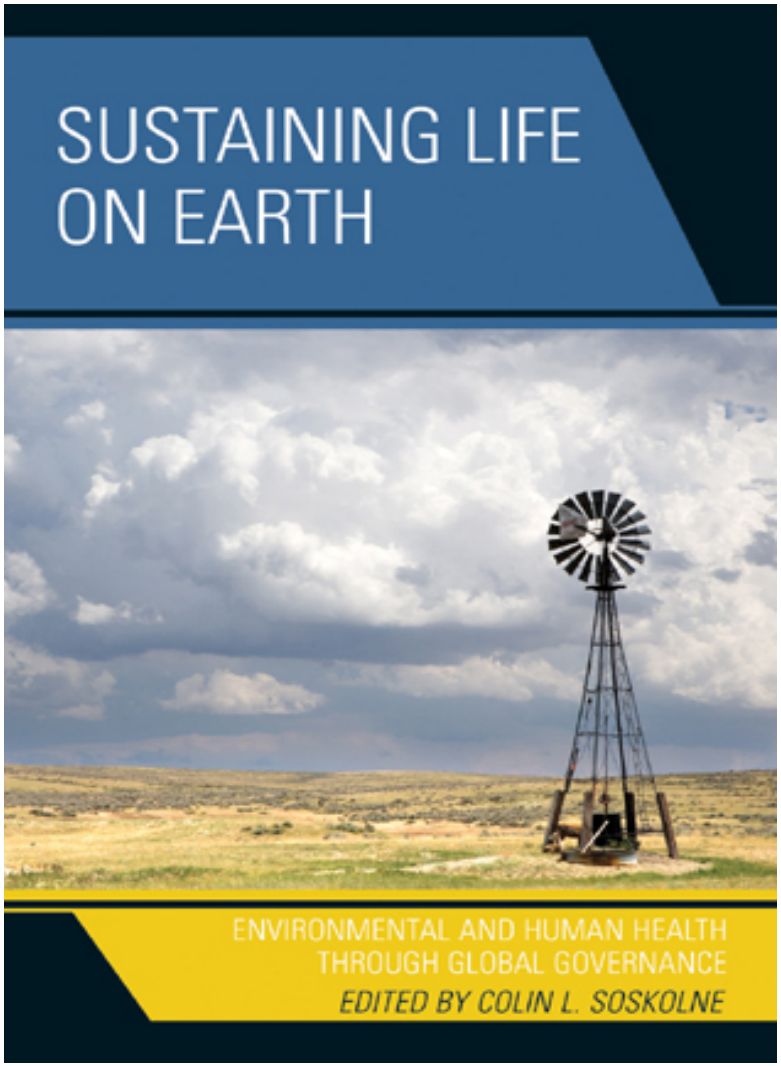
- or -

- **Systems Approaches/Wholism:** Integrative, multi-, inter- and transdisciplinary approaches to explaining a phenomenon; embraces complexity

Transdisciplinarity

- ***Transdisciplinary approaches to <u>Human Health</u> are approaches that integrate the natural, social and health sciences in a humanities context, and in so doing transcend each of their traditional boundaries. Emergent concepts and methods are the hallmark of the transdisciplinary effort.***

2008: Lexington Books



How have we reached this critical stage?

- **From the book's PREFACE …**

- **What jurisdictions are at the forefront in addressing large-scale environmental health problems?**

Grave Challenges

Individually & Collectively

<u>OPPORTUNITY and HOPE</u>:

1. **The Earth Charter**
2. **Constitution and Bill of Rights**
3. **Teaching about Sustainability**
4. **Local Land Ethic (*Indiana Dunes*)**
5. **Websites that are global**
6. **Conventions and Treaties**

The Earth Charter

A soft law instrument … to save us from ourselves

Preamble

- ***Respect and care for the community of life***
- ***Ecological integrity***
- ***Social and economic justice***
- ***Democracy, non-violence, and peace***

The Way Forward

http://www.earthcharter.org/

Accessible in 35 different languages

I. Respect and care for the community of life

- 1. Respect Earth and life in all its diversity.
- 2. Care for the community of life with understanding, compassion, and love.
- 3. Build democratic societies that are just, participatory, sustainable, and peaceful.
- 4. Secure Earth's bounty and beauty for present and future generations.

II. Ecological Integrity

- **5. Protect and restore the integrity of Earth's ecological systems, with special concern for biological diversity and the natural processes that sustain life.**
- **6. Prevent harm as the best method of environmental protection and, when knowledge is limited, apply a precautionary approach.**
- **7. Adopt patterns of production, consumption, and reproduction that safeguard Earth's regenerative capacities, human rights, and community well-being.**
- **8. Advance the study of ecological sustainability and promote the open exchange and wide application of the knowledge acquired.**

III. Social and Economic Justice

- **9. Eradicate poverty as an ethical, social, and environmental imperative.**
- **10. Ensure that economic activities and institutions at all levels promote human development in an equitable and sustainable manner.**
- **11. Affirm gender equality and equity as prerequisites to sustainable development and ensure universal access to education, health care, and economic opportunity.**
- **12. Uphold the right of all, without discrimination, to a natural and social environment supportive of human dignity, bodily health, and spiritual well-being, with special attention to the rights of indigenous peoples and minorities.**

IV. Democracy, Non-Violence and Peace

- **13. Strengthen democratic institutions at all levels, and provide transparency and accountability in governance, inclusive participation in decision making, and access to justice.**
- **14. Integrate into formal education and life-long learning the knowledge, values, and skills needed for a sustainable way of life.**
- **15. Treat all living beings with respect and consideration.**
- **16. Promote a culture of tolerance, nonviolence, and peace.**

The Earth Charter

- Enabling of MDG attainment
- Linkages among health, poverty, and conservation
- Inter-dependencies are recognized

Rights-Based Arguments in Support of The Earth Charter

- **The Earth Charter is the only document that:**
  - ***Supports Ecological Integrity rights***
  - ***Has Biocentrism at its core***
  - ***Integrates the dependence of human health on Ecological Integrity, and hence "the right to life" for present and future generations***
  - ***Extends a right to precaution in policy-making (benefits to whom? risks to whom?)***
  - ***Explicitly defends future generations***

Fully addresses Buddhist and other religions' concerns too

The Earth Charter

- **Encourages interdisciplinary and transdisciplinary approaches to addressing complex social policy questions that also integrate health**

- http://www.earthcharter.org/files/charter/charter.pdf

- **Prevention in focus –**

  for the support of *all* life and its inter-dependence

South Africa 1996 Bill of Rights

24. Environment

Everyone has the right

(a)To an environment that is not harmful to their health and well-being; and

(b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that

(i) prevent pollution and ecological degradation;

(ii) promote conservation; and

(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable social and economic development.

And more countries since mid-1990s

- **Brazil, Columbia, Ecuador, Cuba, Andorra, Ukraine, France, India, China, Philippines, Papua New Guinea, Montenegro, Iraq, Kenya, Bhutan …**

- **David R. Boyd: *The Environmental Rights Revolution: A Global Study of Constitutions, Human Rights, and the Environment***
  UBC Press, December 2011

VALUES, ETHICS, AND SUSTAINABILITY

This course was first taught in the Fall term, 2008, and was rated highly. In this revamped course for 2010, students will, once more, gain an appreciation for how values and ethics impinge on decisions that are needed to reconnect humans to the ecosystems upon which we depend for a sustainable future. The topic is considered in relation to social, economic, and biophysical vibrancy the world over. Because the integrity of life-supporting ecosystems is essential to human health and well-being, the concept of sustainability is examined in various contexts: individually, collectively, regionally and internationally. While mechanisms are explored for integrating sustainability into the individual disciplines, students will emerge better able to engage in the broader social discourse on what changes are needed and how to achieve them for a sustainable world.

Class Times: Thursdays, 18:00-21:00 (January 7-April 8, 2010) **Location:** UT 1-38

Instructor: Colin L. Soskolne, School of Public Health

Pre-requisites: At least one relevant course in any of the sciences, humanities, or engineering disciplines AND written permission of the course coordinator (at colin.soskolne@ualberta.ca) which will be based on a brief explanation of why you are motivated enough to take this course. The course coordinator MAY waive the course requirement component for those students who can justify a waiver based on work or life experience.

Structure: This highly interdisciplinary course will reveal the extent to which “the system” is broken, how we have come to the point of systems collapse, and how a major overhaul of “the system” might be managed. It will frame the issues and equip new generations of graduates with the means for changing course, from a world destined to collapse under current business-as-usual approaches, to a sustainable world for both present and future generations.

For more information, please visit
www.see.ualberta.ca

Local Land Ethic

- ***Indiana Dunes***
  - http://www.humansandnature.org/
  - http://indianadunesethic.wikispaces.com/
- ***Camrose, Alberta***

  (Augustana) next ?

Websites

- **Edmonton and Area Land Trust**
  - *http://www.ealt.ca/culture-connection/*
- **V1 Newsletter: Promoting Spatial Design for a Sustainable Tomorrow**
  - *http://www.vector1media.com/*
- **Global Footprint Network (1.2 to 1.5 earths – overshoot)**
  - *http://www.footprintnetwork.org/en/index.php/GFN/*

Convention on Biological Diversity

A two-week meeting of over 190 countries' governments in Nagoya, Japan, October 2010.

At the opening session, the very last sentence of Achim Steiner (the head of the United Nations Environment Program) was that

"*we must approach biodiversity conservation from an ethical point of view*" …

Countries Join Forces to Save Life on Earth

An historic deal to halt the mass extinction of species was finally agreed last night in what conservationists see as the most important international treaty aimed at preventing the collapse of the world's wildlife. *London Independent, United Kingdom*

http://www.independent.co.uk/environment/nature/countries-join-forces-to-save-life-on-earth-2120487.html

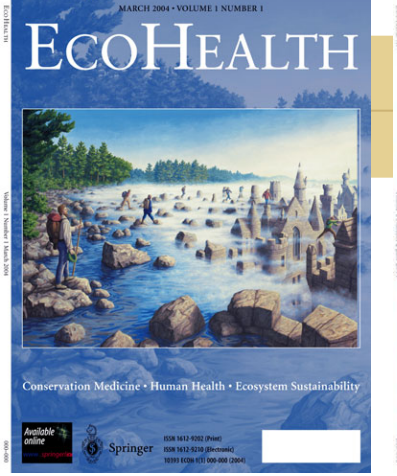
October, 2010

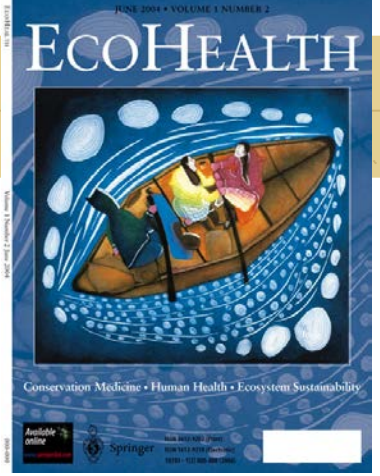
Public Education - Movies

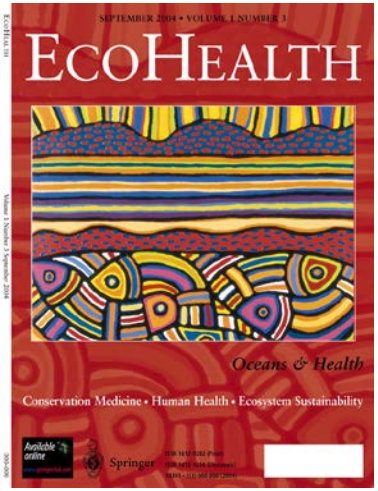
- Home (1 hour and 33 minutes)
  http://www.youtube.com/watch?v=jqxENMKaeCU

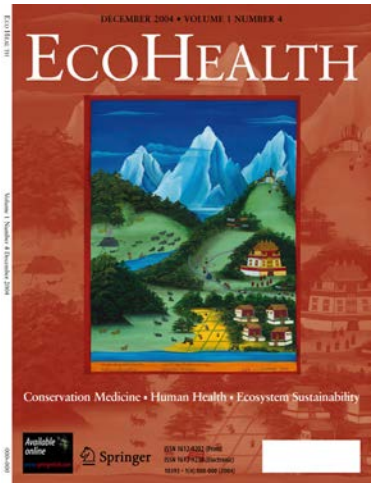
- Journey of the Universe (56 minutes)
  www.JourneyoftheUniverse.org

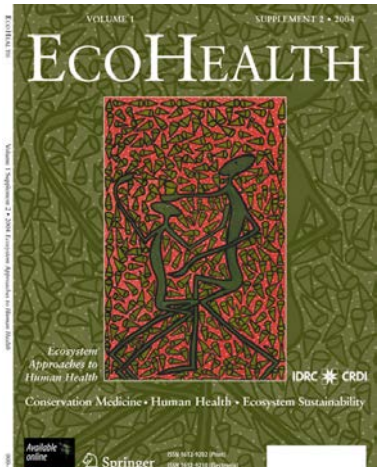
ECOHEALTH











International Association for Ecology & Health

www.ecohealth.net

Can we prevent severe effects?

- **Primordial *prevention***
- **Primary *prevention***
- **Secondary *prevention***
- **Tertiary *prevention***

Primordial Prevention: Eco-epidemiology's domain …

Policy shifts for:

- **Health Benefits; co-benefits**
- **Present and Future Generations**

HOW BEST TO INFORM SUCH POLICIES?

The Challenges are to

- ***Influence values for sustainability***
- ***Instill new ethical norms for sustainable behavior in:***
  - **Individuals**
  - **Organizations (NGOs, professional societies, etc)**
  - **Institutions (financial, schools, universities, etc)**
  - **Corporations**
  - **Governments (local, national, supranational)**
- ***Influence law and its enforcement***
- ***Reduce scientific uncertainties***

Questions?