

CHAPTER 15: ENVIRONMENTAL CHANGE AND CHALLENGES

GLOBAL PERSPECTIVES

Outline

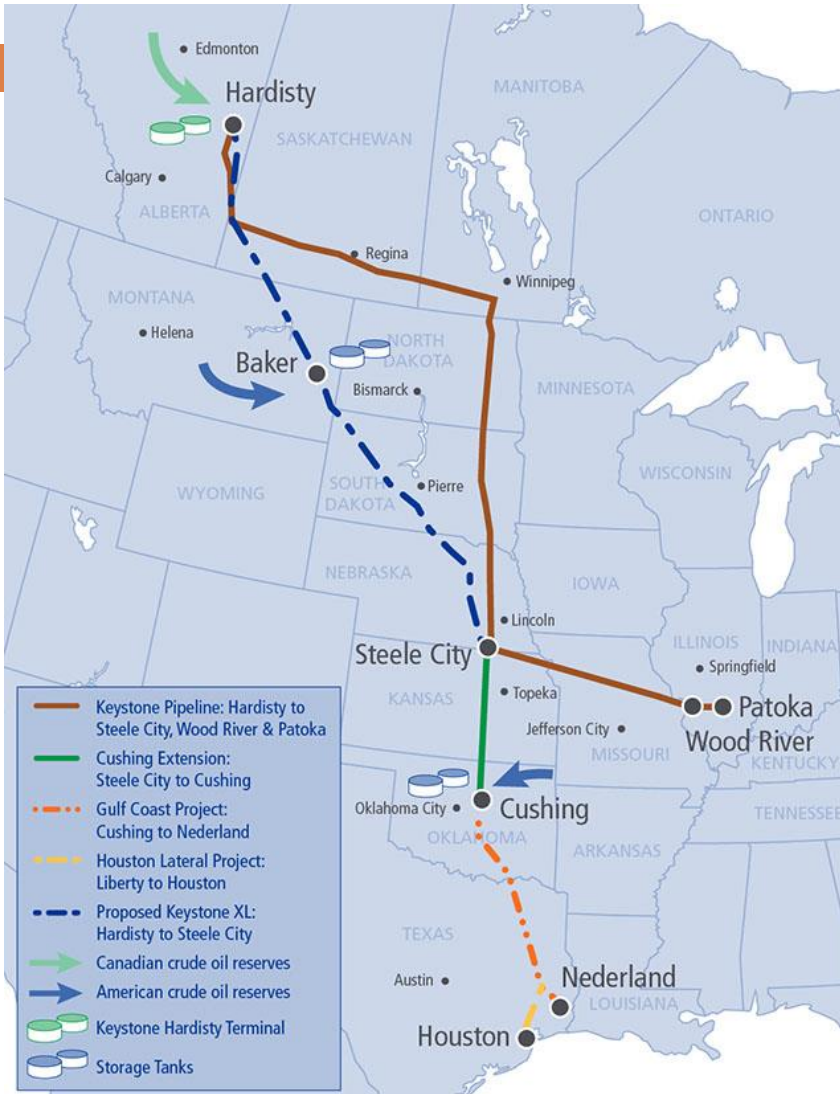
- Introductions – Winter term 2014 (Dr Randall)
- **Addendum to Course Outline** (see overhead and Dr Randall's teaching link on Department web site)
- Discussion of article from Toronto Star (published Jan 3, 2014)
- Lecture Topic: “Global Perspectives on Making IT Happen”
 - ▣ where IT = our responses to environmental degradation

“Five environmental issues to watch in 2014”

1. The Keystone decision
2. The CO₂ conundrum
3. The insurance files
4. The algae blooms
5. The litigation question

Source: *Toronto Star*, Jan 03, 2014

The Keystone decision

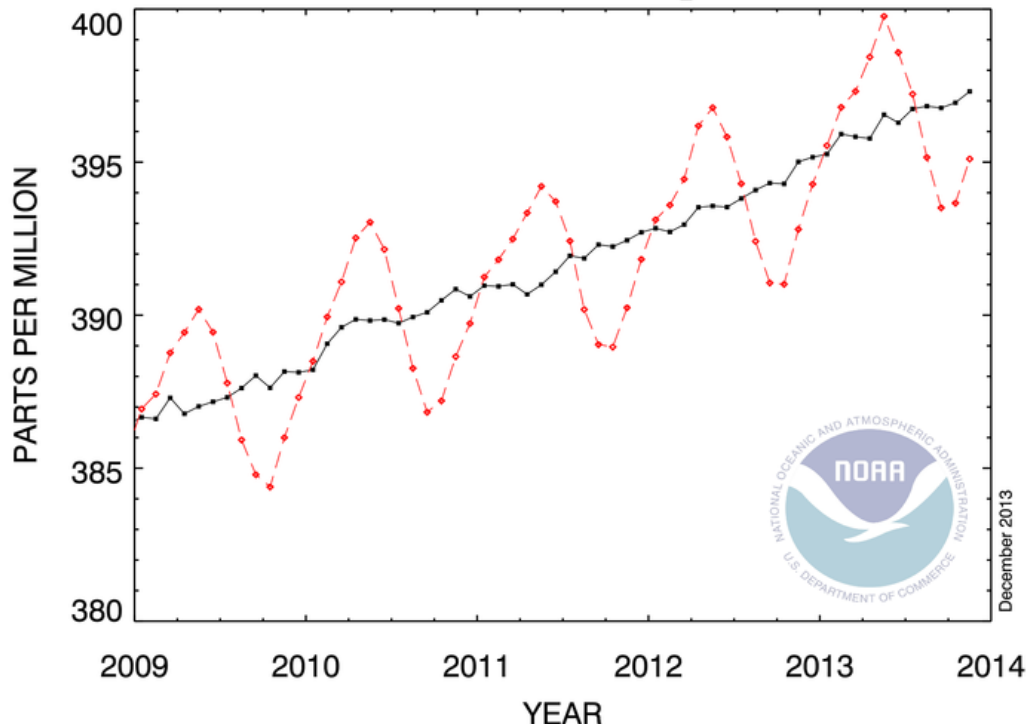


- In review for 6 years
- Traverses at least 6 US States
- Will facilitate release of 240 billions tonnes of carbon
- “The climate factor cannot be ignored” (quote of President Obama, in June 2013)

The CO₂ conundrum



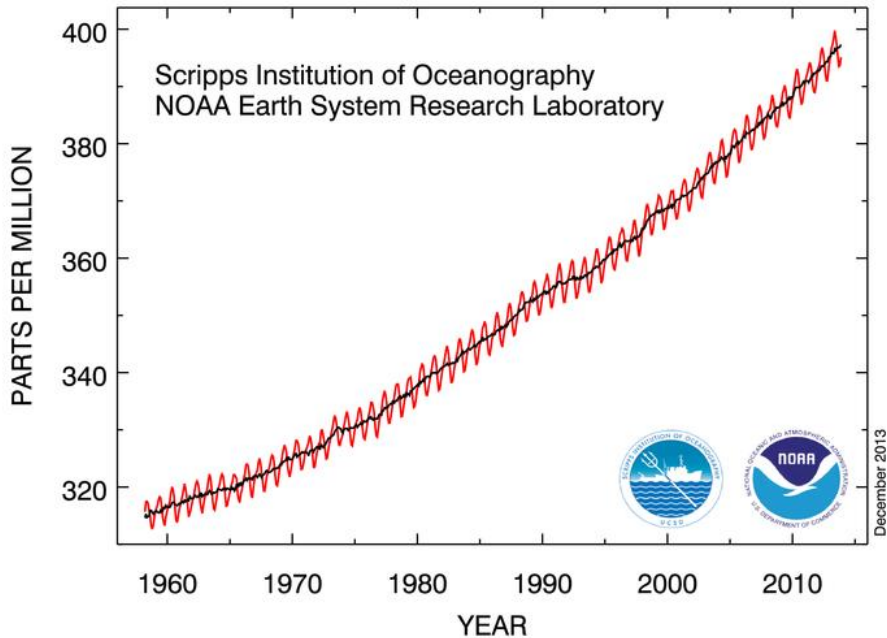
RECENT MONTHLY MEAN CO₂ AT MAUNA LOA



NOAA = National Oceanic and Atmospheric Administration

- This 'key driver' of climate change reached 400 ppm in May 2013
- Beyond levels seen in millions of years
- Rate of increase has been accelerating over past 5 decades

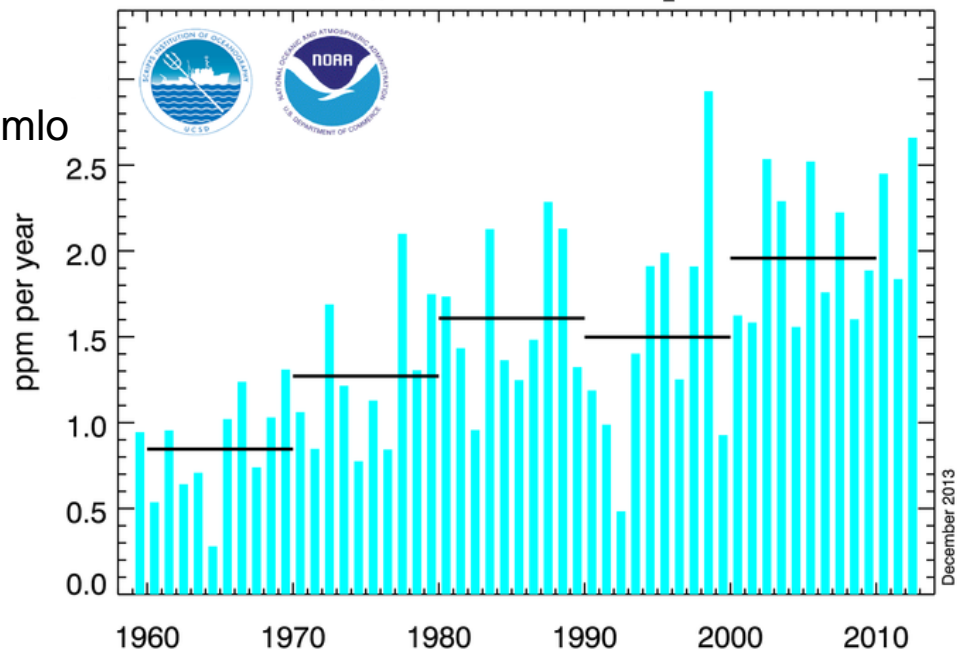
Atmospheric CO₂ at Mauna Loa Observatory



http://www.esrl.noaa.gov/gmd/ccgg/trends/#mlo_growth

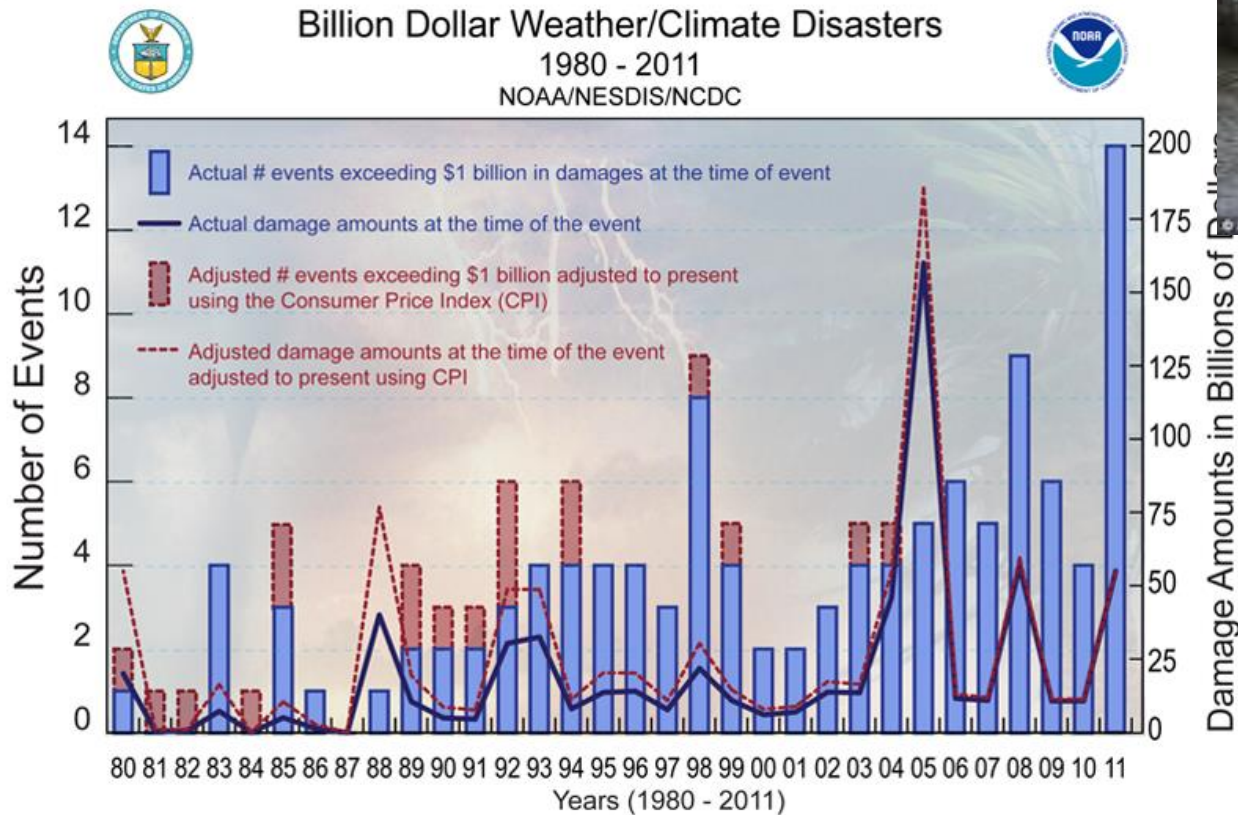
- Rate of increase has been accelerating over past 5 decades

annual mean growth rate of CO₂ at Mauna Loa



http://www.esrl.noaa.gov/gmd/ccgg/trends/#mlo_growth

The insurance files



- Increasing cost of extreme weather events

<http://www.21stcentech.com/climate-change-update-probability-not-certainty-is-the-cautionary-conclusions-of-european-climatologists-studying-recent-weather-history/>

The algae blooms



Algal blooms, Sept 2009 on Lake Erie



<http://www.noaanews.noaa.gov/stories2013/images/>

Above image from 2011 – the worst bloom in decades

- Swathes of blue-green algae (form due to high phosphorus inputs) ... big news in 2013 on Lake Erie
- Potential tourism and shipping impacts?

The litigation question



- “the year of court battles”
...
- Alberta oilsands
...contamination issues
- Northern Gateway pipeline
(to cross FN and other communities in BC)



Lecture Topic:

Global Perspectives on Making IT Happen

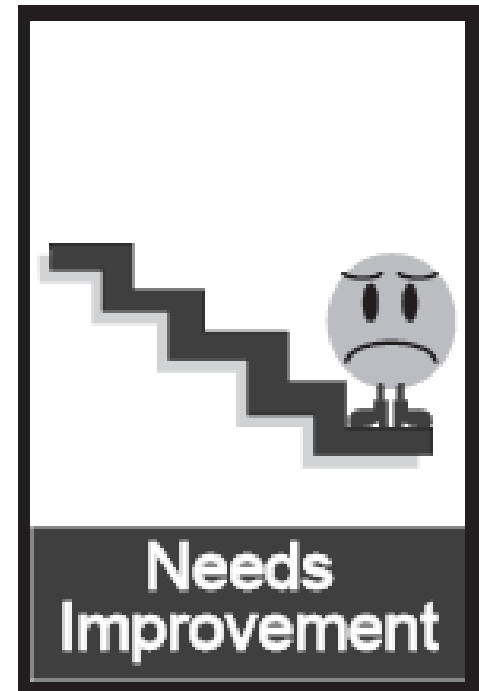
where IT = our responses to environmental degradation



From: Dearden and Mitchell (2012)

Environmental Issues for the 21st Century ...

- ***But not limited to:***
 - ▣ Global climatic change
 - ▣ Water shortages
 - ▣ Biological impoverishment
 - ▣ Declining food yields per capita
 - ▣ Desertification
 - ▣ Pollution
 - ▣ Overpopulation



Causes of these issues

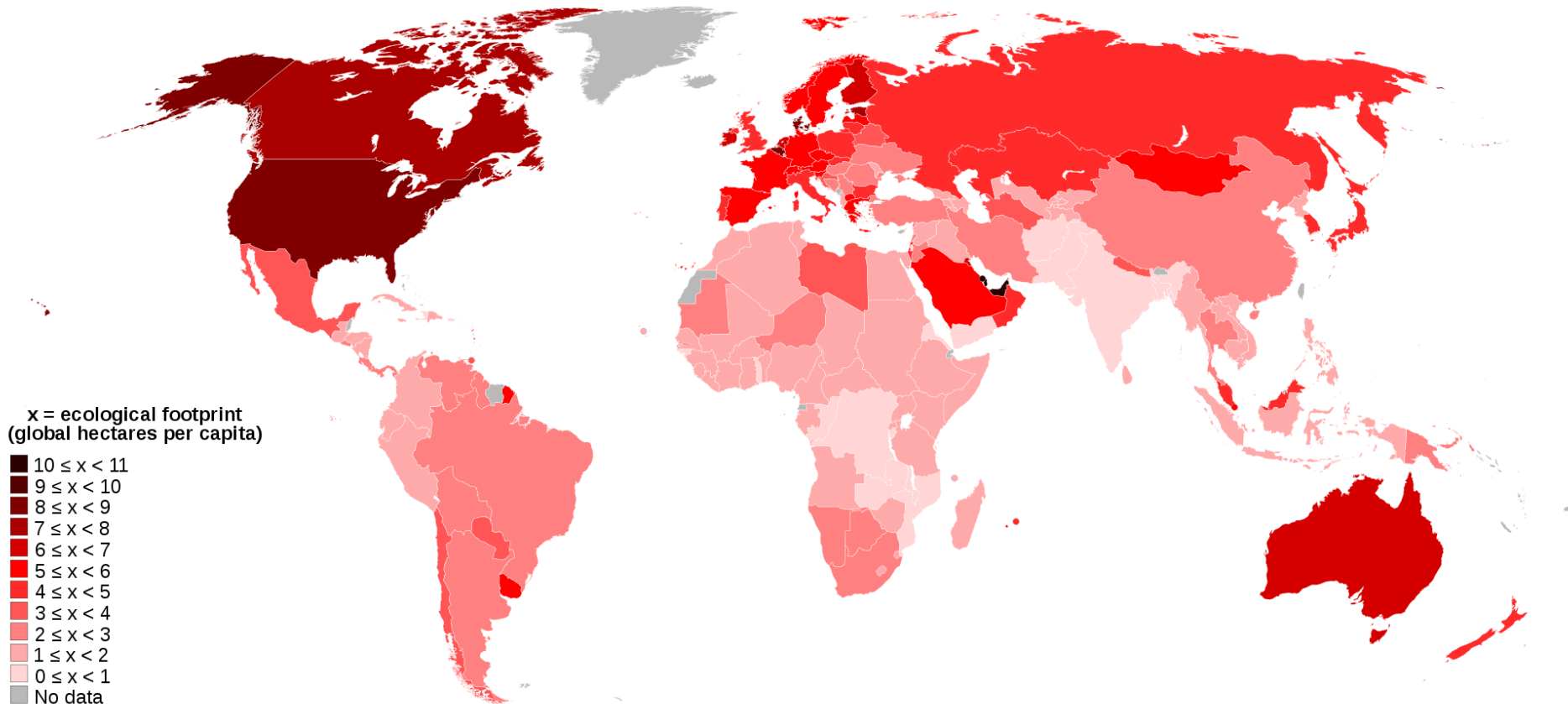


Image credit: Naturressourcer sustainable.dk (Feb 2013)

- Consumptive tendencies in the past/present (“developed countries” like Canada, UK, ...) – **unequal ‘ecological footprints’**

- Globalization of the 'consumer economy' will export these consumptive tendencies to developing countries ...

Human Welfare and Ecological Footprints compared

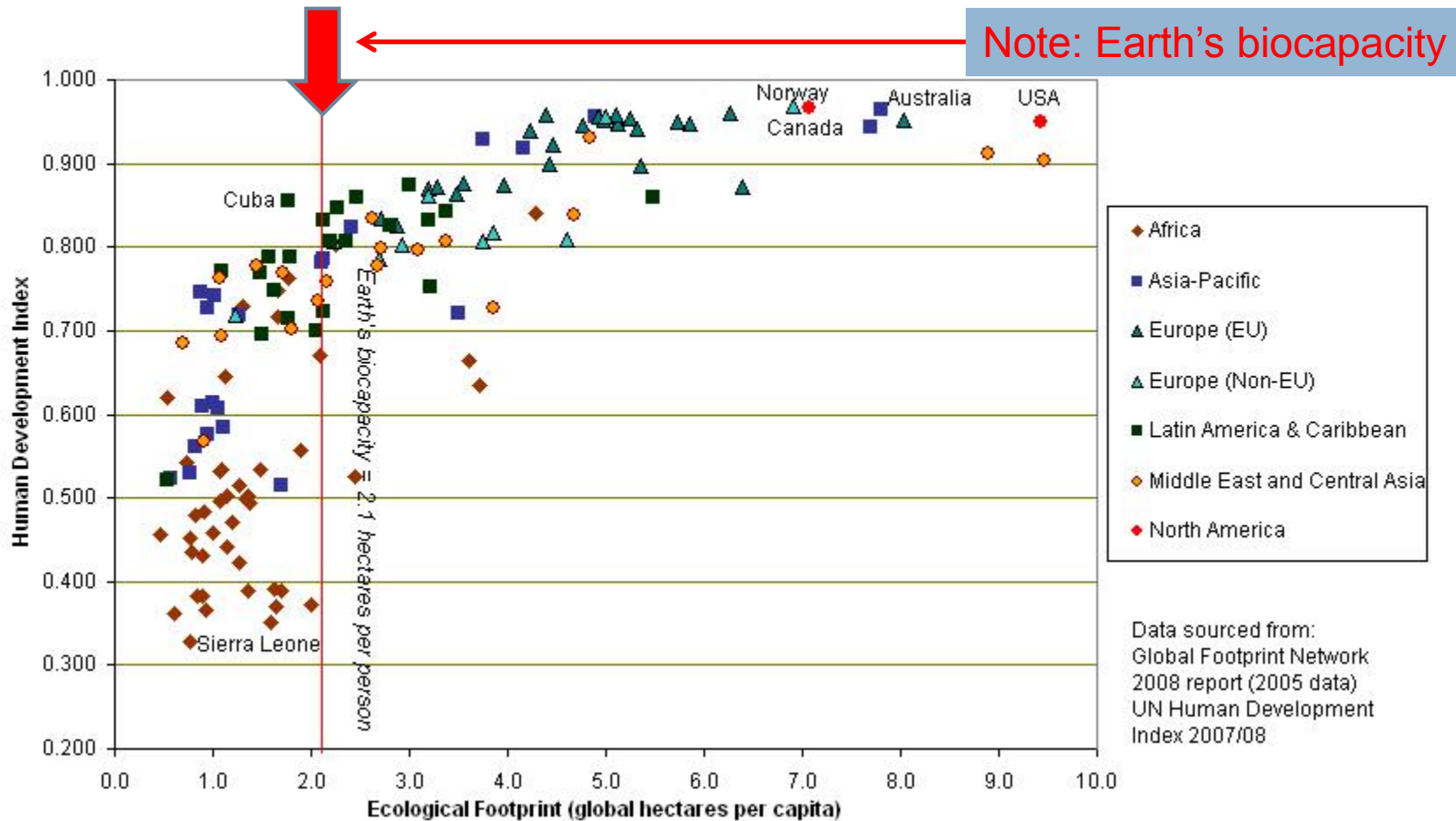


Image credit: Crisis Energética www.crisisenergetica.org (Feb 2013)

Millennium Ecosystem Assessment (2005)

- A 'state of the planet' review ... concluding that 15 of the 24 major planetary ecosystem services *"have been pushed beyond their limits and are in a degraded state"* (D&M, 2012, p541)
- Clearly, action is needed to stem and reverse these trends ...

"We're in a giant car heading towards a brick wall and everyone's arguing over where they're going to sit."

- David Suzuki



Sustainable Development



“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987, p.8)

- How do we achieve this?

Millennium Development Goals (MDGs)

- Recall from chapter 1, these are:
 1. Eradicate extreme poverty and hunger;
 2. Achieve universal primary education;
 3. Promote greater 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

- These were set at a UN summit in 2000 by world leaders, with agreed targets to be met by 2015

MDGs targets and indicators

Table 1.1 | Ensuring Environmental Sustainability: MDG Targets and Indicators

Targets

Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources

Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss

Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation

By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers

Indicators

- Proportion of land area covered by forest
- Carbon dioxide emissions, total, per capita and per \$1 GDP (PPP)
- Consumption of ozone-depleting substances
- Proportion of fish stocks within safe biological limits
- Proportion of total water resources used
- Proportion of terrestrial and marine areas protected
- Proportion of species threatened with extinction
- Proportion of population using an improved drinking water source
- Proportion of population using an improved sanitation facility
- Proportion of urban population living in slums

Source: UNs Millennium Development Goals.

From: Dearden and Mitchell (2012)

MDGs ... progress on ?? (some examples)

- Poverty rates decreased from 1/3 to 1/5 of global population (1990 to 2004) – ***on track to meet***



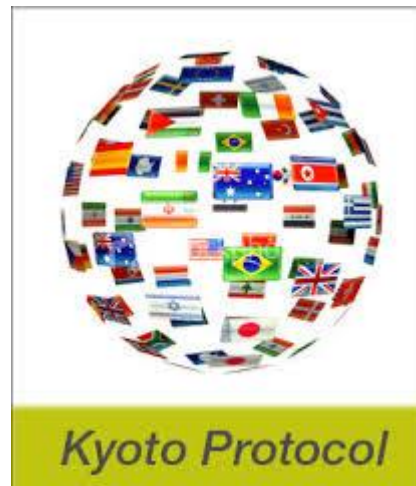
- Some improvements to extreme poverty in sub-Saharan Africa but not enough – ***NOT on track to meet***





Global Leadership

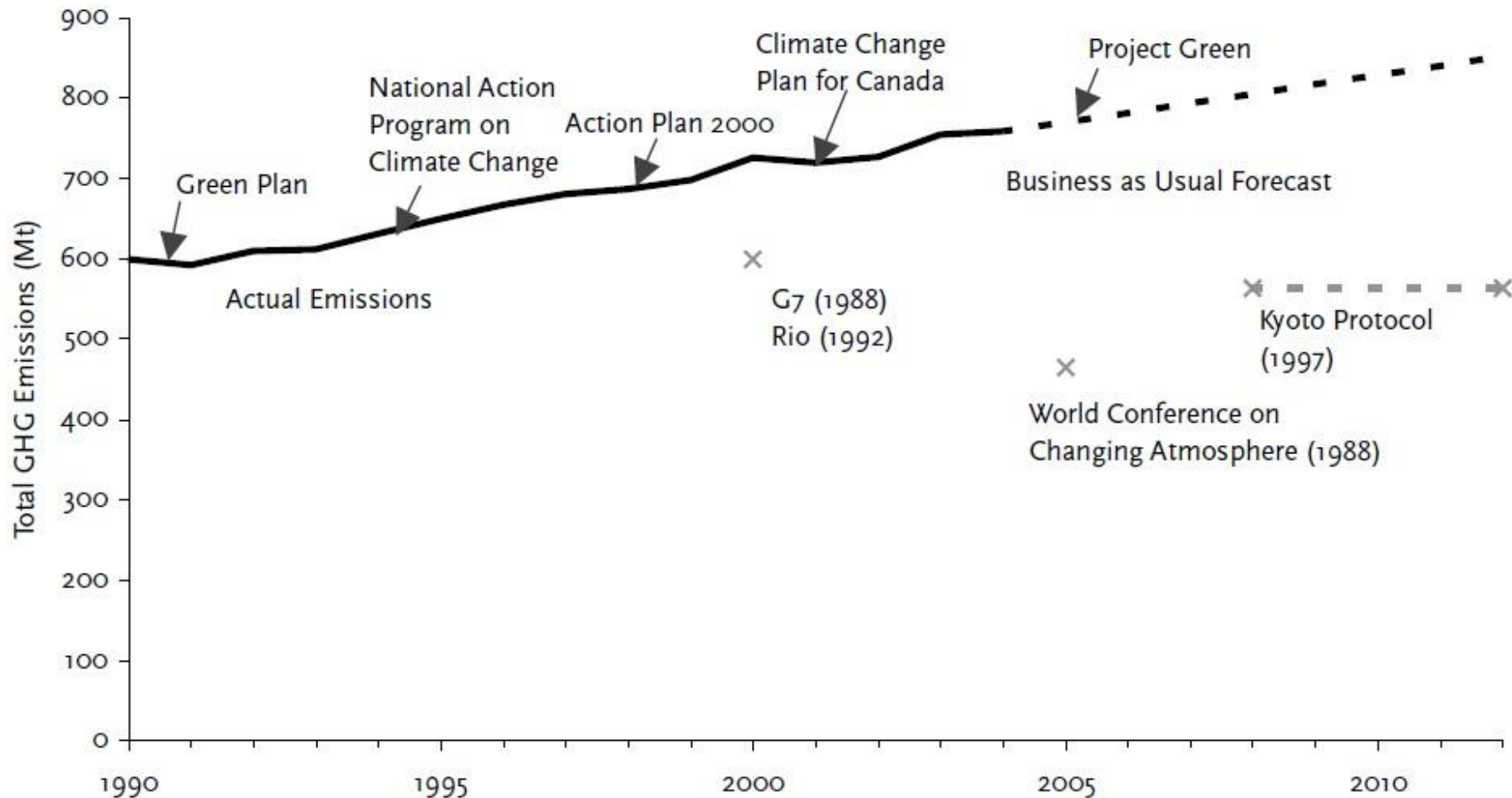
- Responses to sustainable development (Rio UN Summits 1992 and 2012)
- Responses to climate change (Montreal Protocol on CFCs, Kyoto Protocol on greenhouse gas emissions, IPCC: Intergovernmental Panel on Climate Change...)
- Regarding conservation ... Stockholm Convention on Persistent Organic Pesticides; Convention on Biodiversity



Global Responses needed

- ***Developing countries*** to improve 'quality of life', health and wealth etc
- ***Developed countries*** to reduce consumption to more sustainable levels?
- Have these occurred?
- Canada used to have a reputation of an environmental leader ... that has been lost in the past decade

Greenhouse Gas Emissions in Canada, 1990–2004, and International Commitments to Reduce Greenhouse Gas Emissions



From an essay by : Mark Jaccard, circa 2007. **Canada's Kyoto Delusion: the evidence is finally forcing us to admit we have done nothing.** (M.J. is Professor of Resource and Environmental Management at Simon Fraser University)

Suggestion of “Millennium *Consumption* Goals”

- Examples:
 - ▣ Halve total **energy use** by 2025
 - ▣ Halve use of fossil fuels by 2020
 - ▣ Halve household energy use by 2020
 - ▣ Cut military spending by 75% by 2025
 - ▣ Replace GNP with a **better indicator on societal well-being**
 - ▣ Halve **obesity/overweight rates** by 2020
 - ▣ Produce one-half of food organically by 2020
 - ▣ Reduce consumption of animal products by 50% by 2020
 - ▣ Increase **local resilience of food supply**
 - ▣ Better distribute wealth – raise taxes on wealthiest
 - ▣ Double rate of **non-motorized transport**
 - ▣ Increase density of suburban housing by 50% by 2020
 - ▣ Guarantee access to health care for all

(p.543 in D&M 2012)

References

- Dearden, P and Mitchell, B. 2012. *Environmental Change and Challenge*, Fourth Edition, Don Mills, Ontario: Oxford University Press {chapter 15}
- Toronto Star, Jan 3, 2014. Five Environmental Issues to Watch in 2014.