

# CONFRONTING ECOLOGICAL CHANGE: WHAT WOULD A TRULY INTELLIGENT SPECIES DO?

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# Real-World Context: The (Worsening) Scientific Consensus

- —~~W~~ the undersigned, senior members of the world's scientific community, hereby warn all humanity... **A great change in our stewardship of the earth and the life on it is required if vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated.**

(UCS, *World Scientists' Warning to Humanity* 1992)

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

(MEA, *Living Beyond Our Means* 2005)

# In theory, *H. Sapiens* has unique potential to confront the crisis

- ❑ Four intellectual and emotional qualities distinguish humans from other advanced vertebrates:
  - ❑ unparalleled capacity for evidence-based reasoning and logical analysis;
  - ❑ unique ability for long-term forward planning;
  - ❑ the capacity to exercise moral judgment;
  - ❑ compassion for other individuals and other species.

# But other aspects of human nature (genes) and nurture (memes) intervene

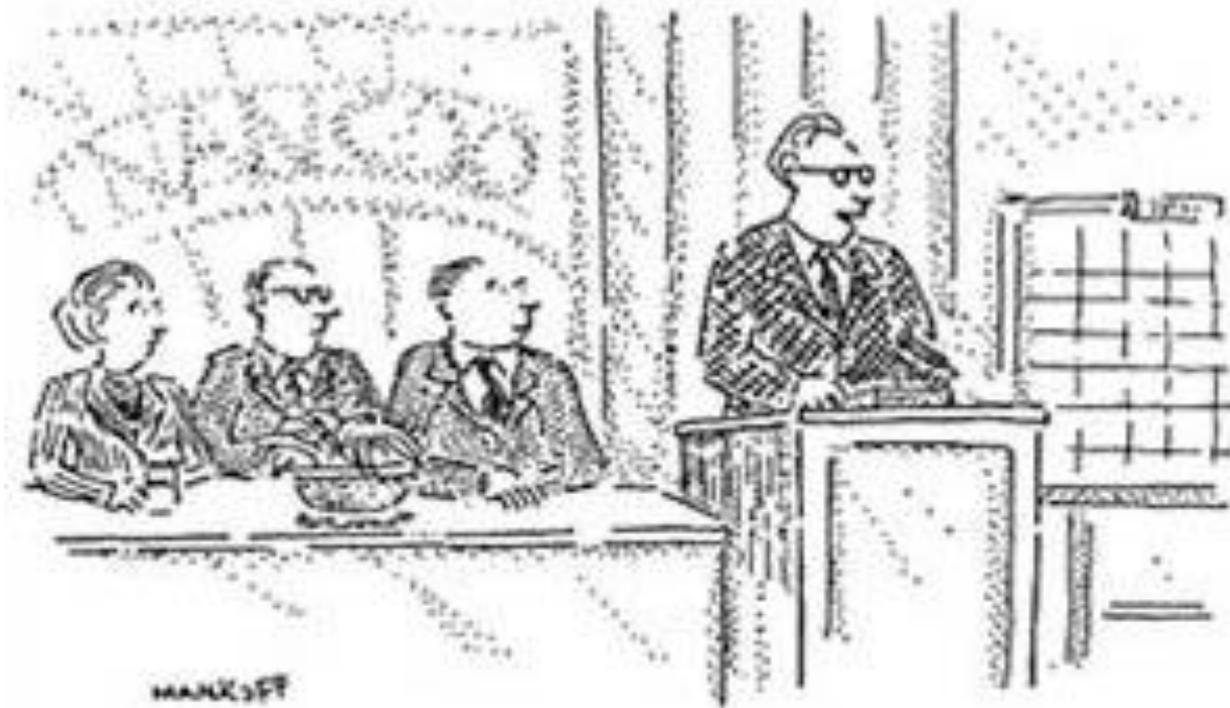
## Base nature (genetic predisposition)

- Unless or until constrained by negative feedback, all species populations tend to:
  - *expand to fill all the ecological space accessible to them and*
  - *use all available resources (in the case of humans, to the limits of contemporary technology)* (Rees 2006).

## Careless nurture (cultural predisposition)

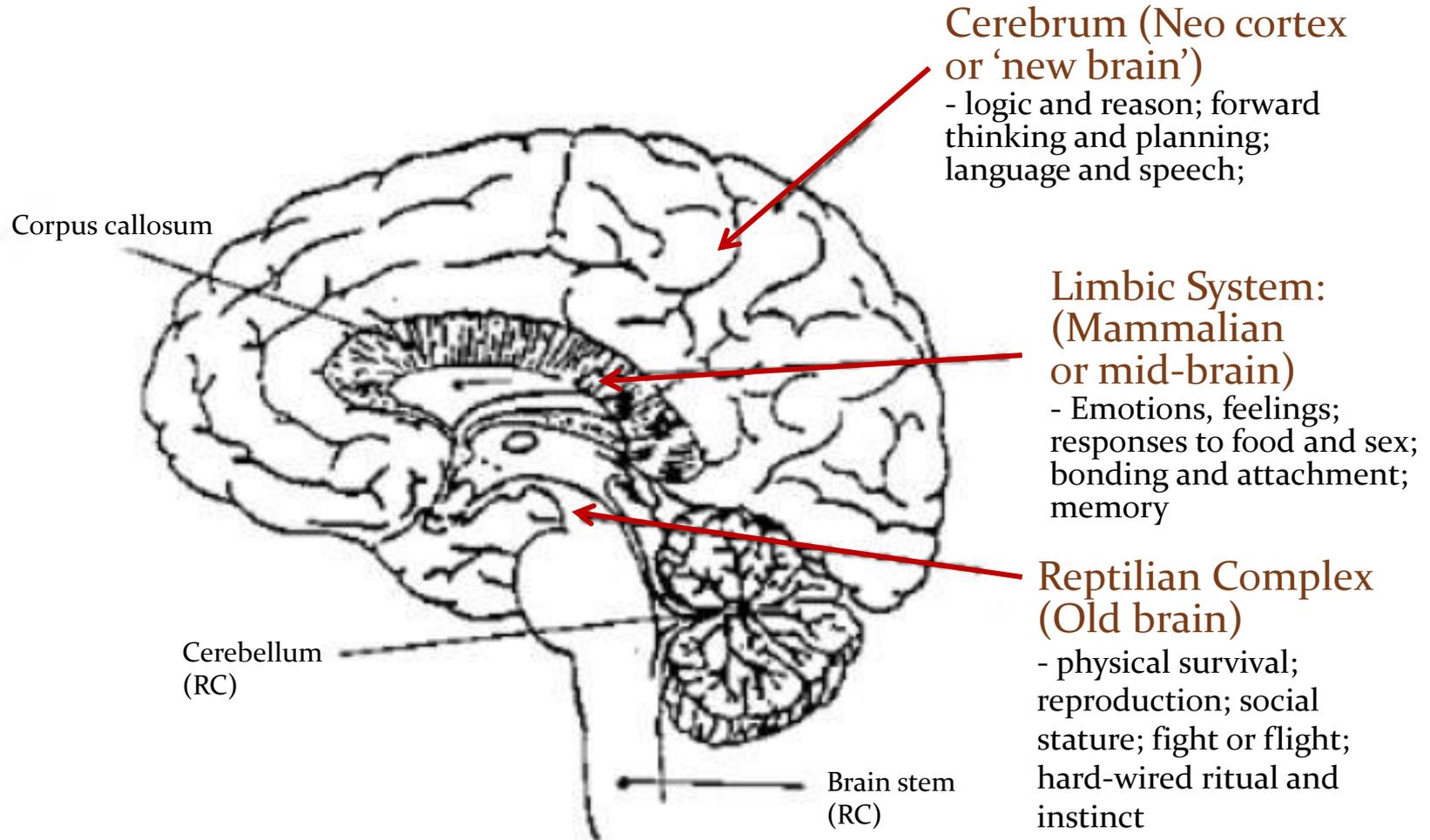
- Our socially-constructed cultural narrative of progress and continuous growth:
  - *“We have in our hands now... the technology to feed, clothe, and supply energy to an ever-growing population for the next seven billion years...”* (J. Simon 1995).
- The emergence of a new age of ‘unreason’
  - *E.g., politics dominated by neoliberal ideology, religious fundamentalism, climate-change denial, anti-intellectualism and other forms of „magical thinking”—the „faith-based” economy.*

# *H. sapiens* is a deeply conflicted species



*"And so, while the end-of-the-world scenario will be rife with unimaginable horrors, we believe that the pre-end period will be filled with unprecedented opportunities for profit."*

# Where it's all Happening: The Triune Brain



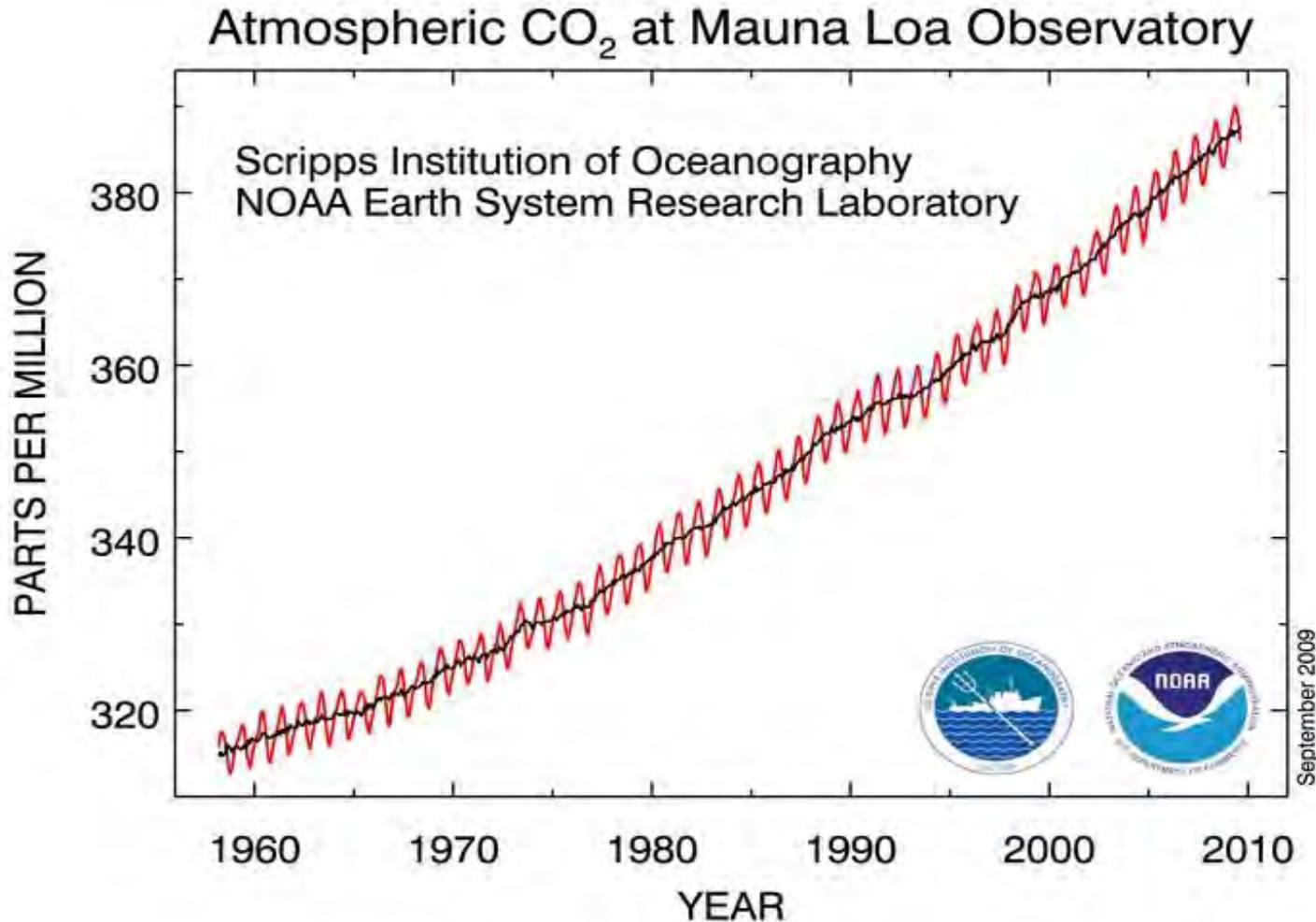
# Tension in the Integrated Mind

- ❑ Humans seem uniquely self-conscious and rational – we ‘live’ in **cerebral** consciousness. However:
- ❑ When safety or ‘survival’ (including personal prestige, socio-economic status) are threatened, innate behavioural propensities that operate *beneath consciousness* (e.g., in the **mid-brain** and **reptilian brain-stem**) override rational responses. That is:
- ❑ **Bottom line: short-term passions and instinctive predispositions often trump better judgment and logical reason.**

# Hypothesis: techno-Industrial society is *inherently* unsustainable

- Unsustainability is an inevitable emergent property of the systemic interaction between techno-industrial society, as presently conceived, and the ecosphere.

# Some *facts*: 40% Increase in Anthropogenic CO<sub>2</sub> since 19th Century



**Current Level**

393 ppm

**Rate of increase (ppm/year)**

1970-79: 1.3

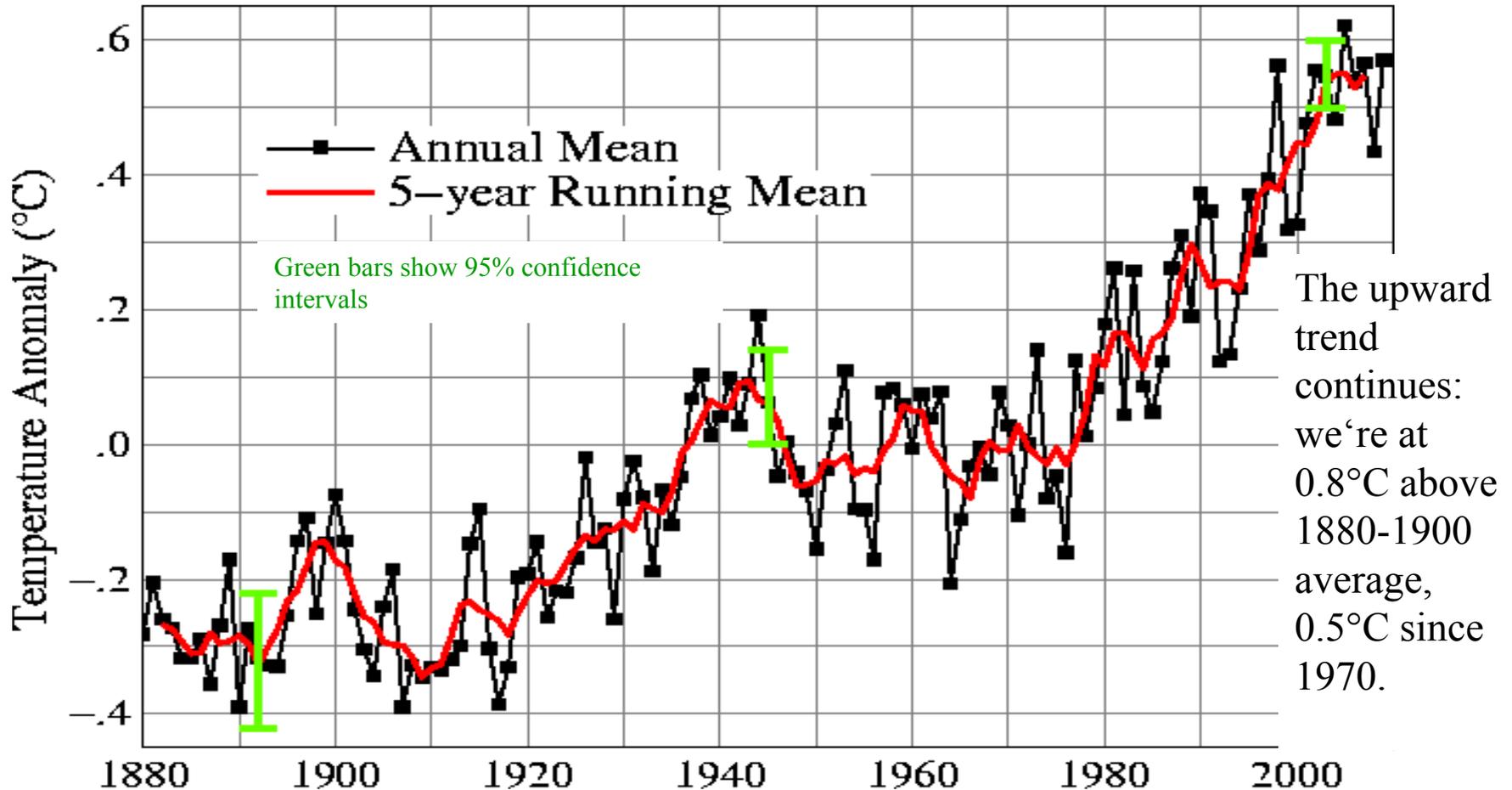
1990-99: 1.5

2000-07: 2.3

(accelerating!)

# Result? Mean global Temp Up 0.8 C° in 125 yrs

## Global Land–Ocean Temperature Index



# And the heat goes on

- ❑ 2010 was Canada's warmest year
- ❑ Globally, the first six months of 2010 were the warmest in the instrumental record.
- ❑ 2010 tied with 2005 for hottest year recorded.

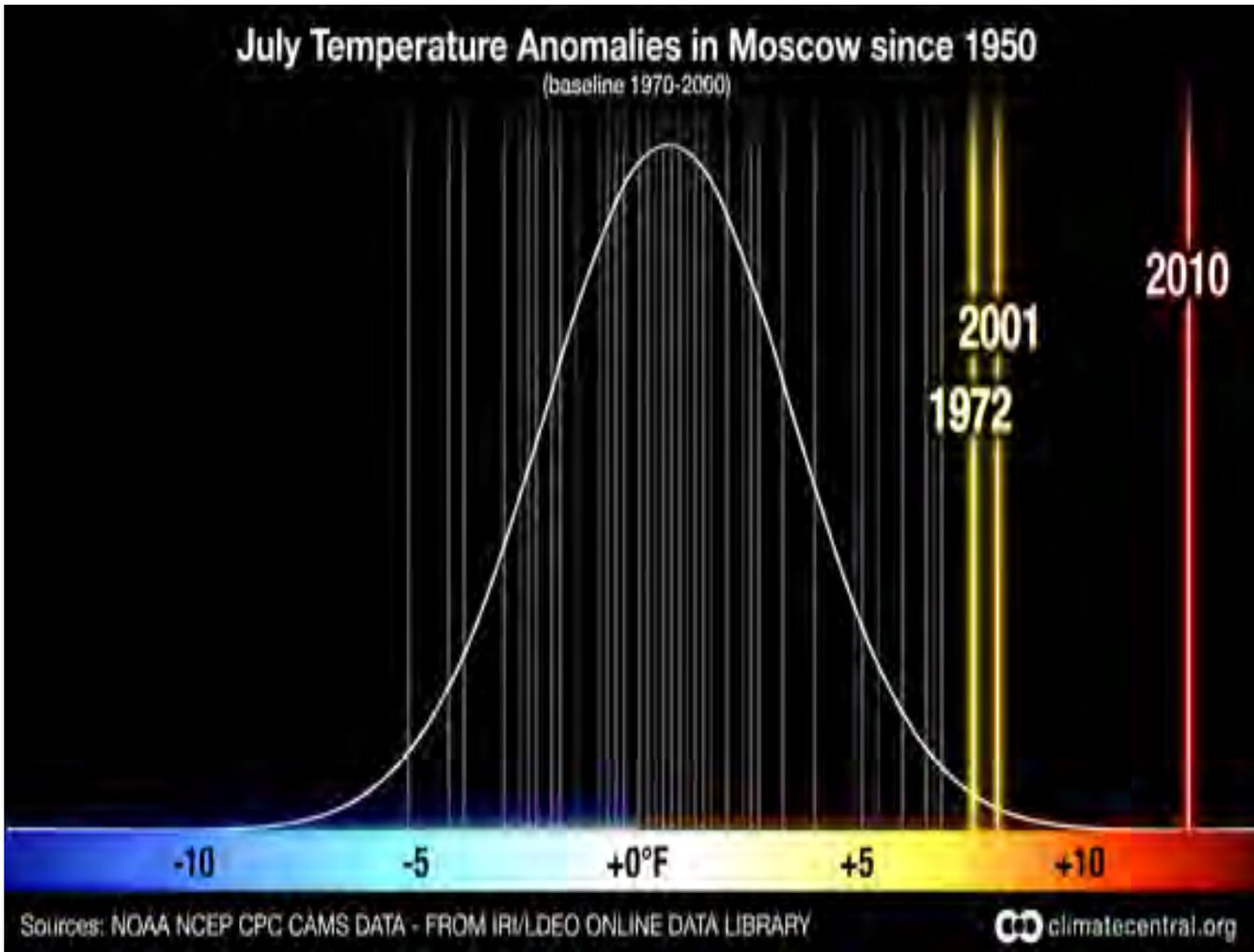
N.B. we should be experiencing modest cooling—we are in the midst of the longest solar minimum (few or no sunspots) in many decades.

# Among the extreme weather events of 2010

During summer 2010 we saw:

- ❑ Severe drought in sub-Saharan Africa and the Amazon basin.
- ❑ The calving of the largest iceberg in nearly 50 years in Greenland.
- ❑ Rain-induced landslides and the worst floods in decades in China.
- ❑ The worst monsoonal flooding in Pakistan's history.
- ❑ A millennium-record heat wave and massive wildfire in Russia.

# Summer in Moscow (2010)

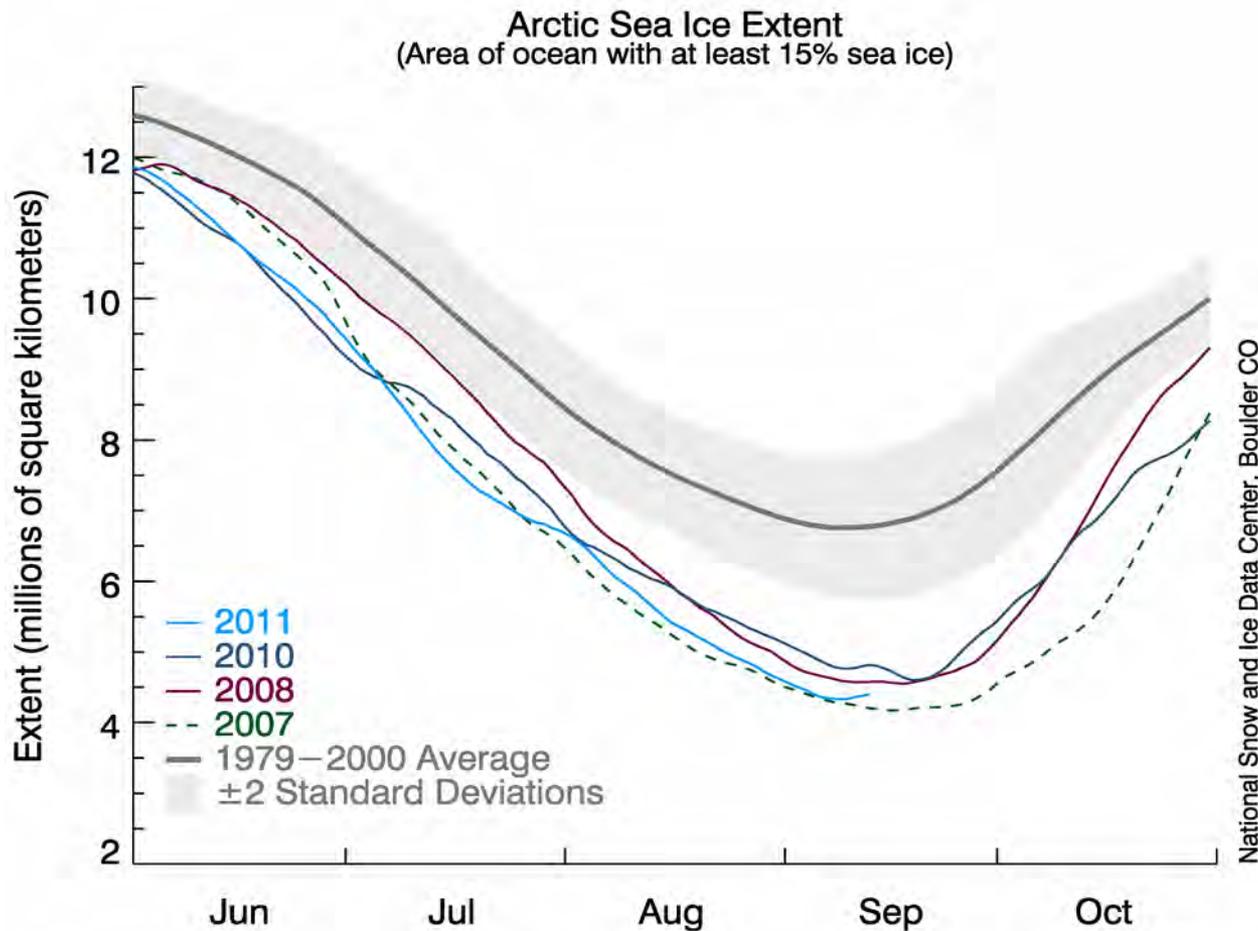


- The July 2010 average temperature in Moscow was four standard deviations above the 1970-present mean for the month .  
(baseline: 1970-2000)
- The statistical probability of this occurring is only 1 in 66,000.

# Summer 2011 in the US

- ❑ In July almost 9,000 daily heat records were broken or tied across the country. (2,755 highest maximum temperatures and 6,171 highest minimum temperatures).
- ❑ Large parts of the Southwest and the Southern Plains had more than 30 days with daytime highs more than 100 degrees Fahrenheit.
- ❑ Texas, Oklahoma, New Mexico, and Louisiana all had their warmest summers on record. Texas and Oklahoma were hotter this summer than any state has ever been since records began in the late 1800s.

# September 2011: Arctic Sea Ice Extent (Second?) Lowest on Record



13 Sep 2011

- On September 9, 2011 sea ice extent dropped to 4.33 million square km (1.67 million square miles).
- The last five years (2007 to 2011) have been the five lowest extents in the continuous satellite record (since 1979).

# What real climate scientists say

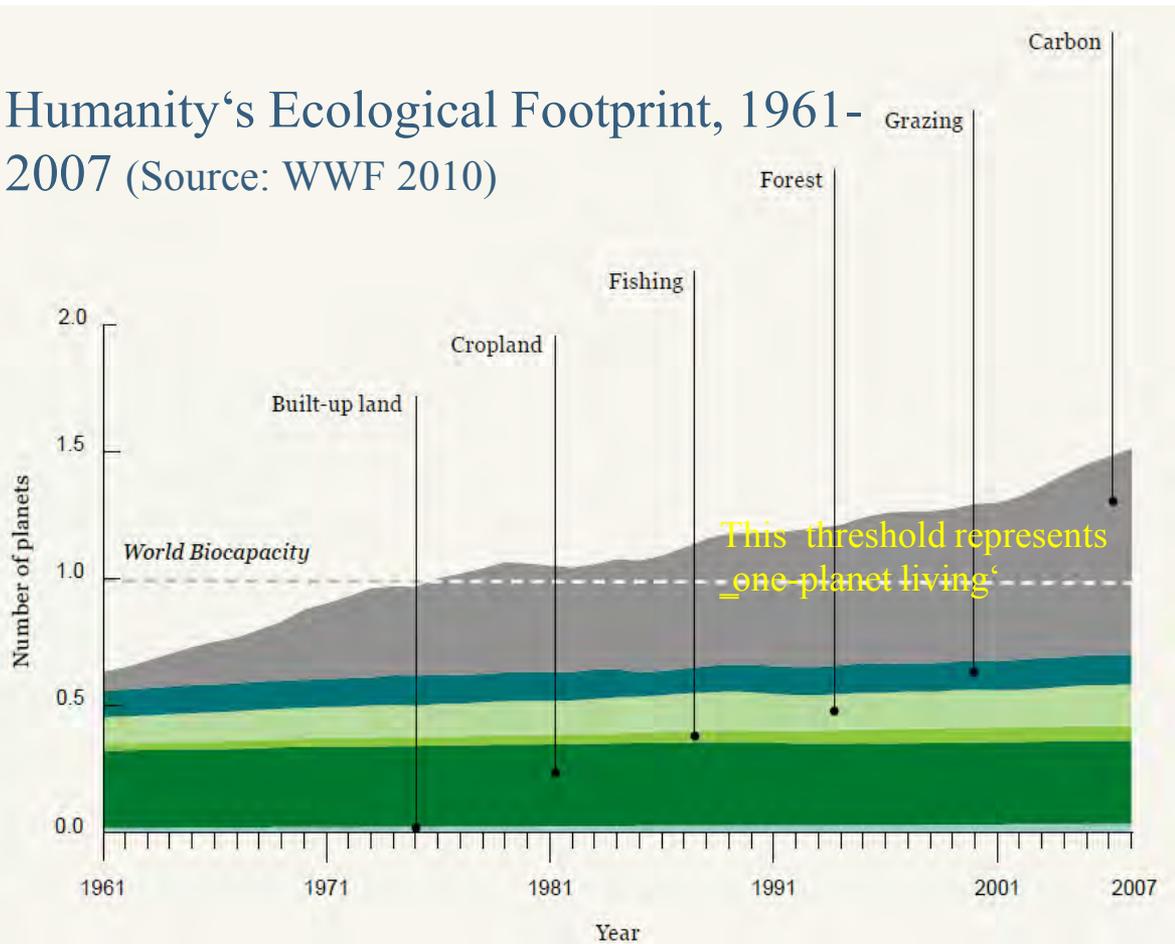
(Anderson and Bows. 2008. *Phil. Trans. R. Soc. A* doi:10.1098/rsta.2008.0138)

- ❑ To stabilize GHGs at even 650 ppmv CO<sub>2</sub>e, **the majority of OECD nations must begin to make draconian emission reductions soon (by 2015).**
- ❑ Unless we can reconcile economic growth with unprecedented rates of decarbonization (in excess of 6% per year), **avoiding this increase will require a planned economic recession.**
- ❑ NOTE: 650 ppmv CO<sub>2</sub>e implies a *catastrophic* four degree C mean global temperature increase.



# The data tell us this is a world in ecological overshoot

Humanity's Ecological Footprint, 1961-2007 (Source: WWF 2010)

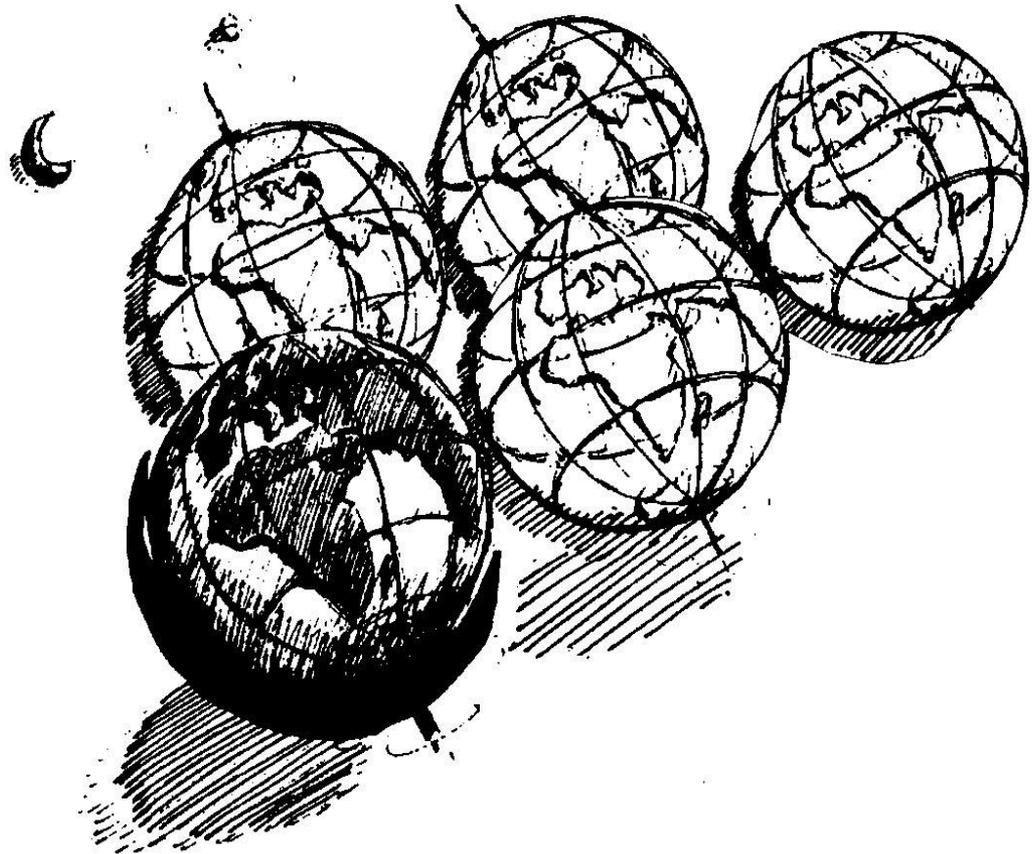


- Productive ecosystem area/capita 1.8 gha; current demand: 2.7 gha/capita. I.e.:
- The human enterprise already exceeds global carrying capacity by about 50%.
- In late August we reached overshoot day for the year.
- For the rest 2011 humanity will live by depleting natural capital and over-filling sinks.

# This means that

- ❑ To sustain just the present world population at the material standards enjoyed by North Americans, would require three-four additional Earth-like planets!

**Regrettably**  
—Good planets are hard to find.”



# Unresponsive 'intelligence'

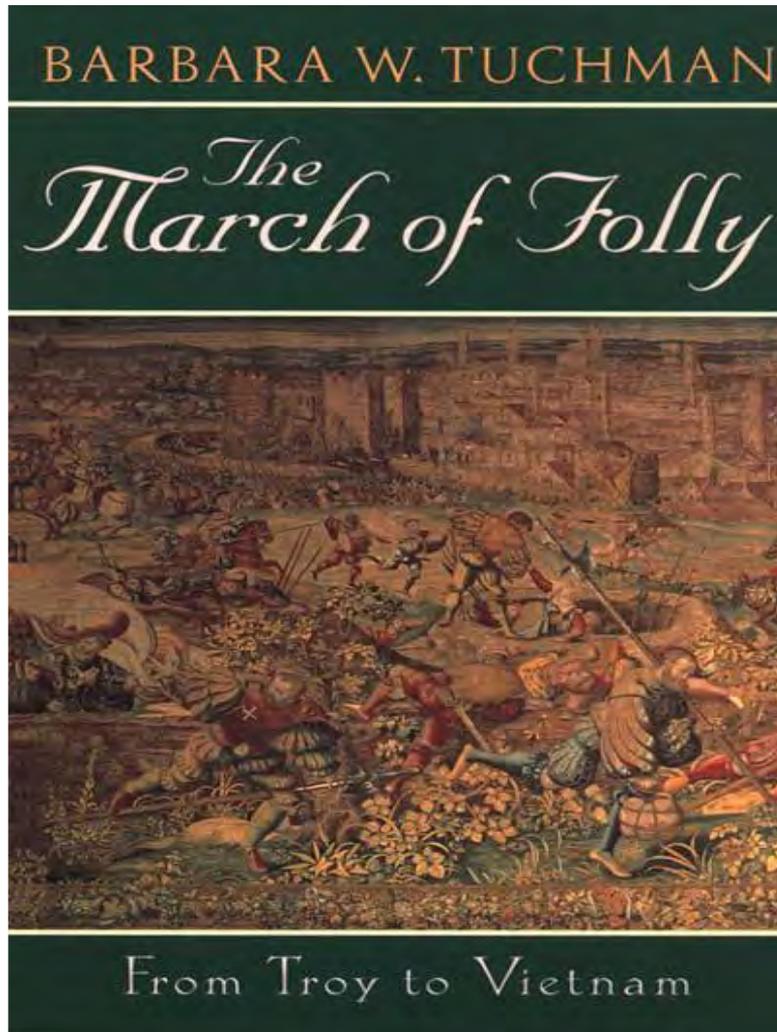
- —A man with conviction is a hard man to change. Tell him you disagree and he turns away. Show him facts or figures and he questions your sources. Appeal to logic and fails to see your point.”

(Festinger et al. 1956. *When Prophecy Fails*)

# Intransigence in science itself

- —... new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it” (Max Planck, 1949)

# Politics: No domain of reason



- — “Why do holders of high office so often act contrary to...reason? Why does intelligent mental process so often seem not to function?”
- — “Woden-headedness... plays a remarkably large role in government. It consists in assessing a situation in terms of preconceived fixed notions [i.e., ideology] while ignoring any contrary signs. It is acting according to wish while not allowing oneself to be deflected by the facts” (Tuchman 1984).

# We live in deep denial (and there is now an explanatory mechanism in cognitive neurology)



- During individual development, sensory experiences, repeated teachings and cultural norms literally shape the human brain's synaptic circuitry in patterns that reflect and embed those experiences.
- Subsequently, people seek out *compatible* experiences and, **—when faced with information that does not agree with their [preformed] internal structures, they deny, discredit, reinterpret or forget that information”** (Wexler, 2006).

# SO, THE QUESTION OF THE DAY

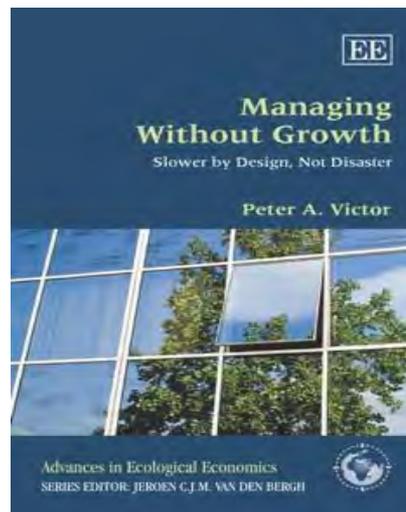
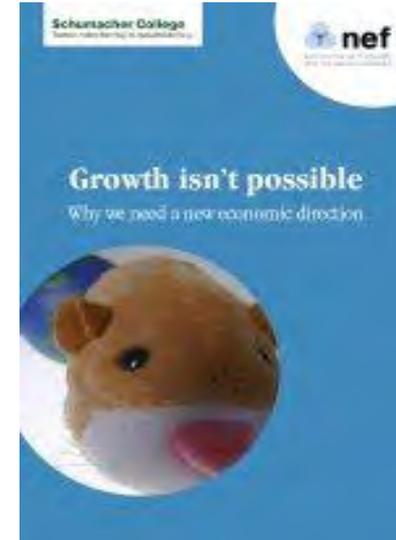
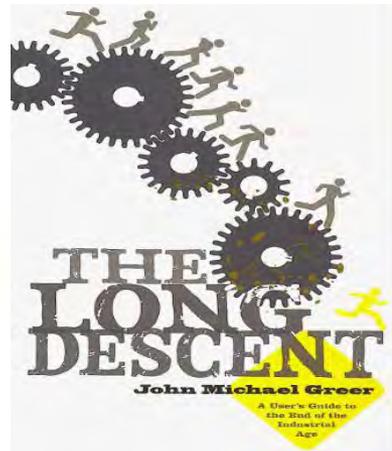
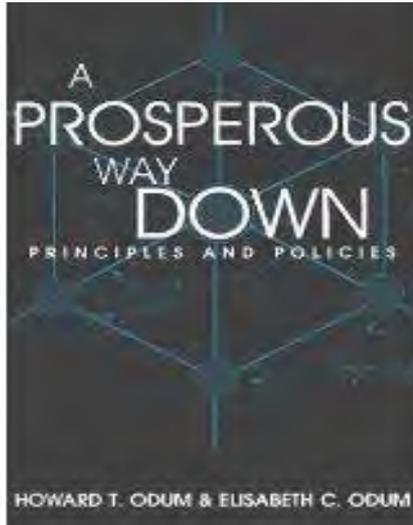
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What would a truly intelligent, forward-thinking, compassionate species plan to do in response to available data, the historical record and ongoing trends?

# Accept the *really* 'inconvenient truth'

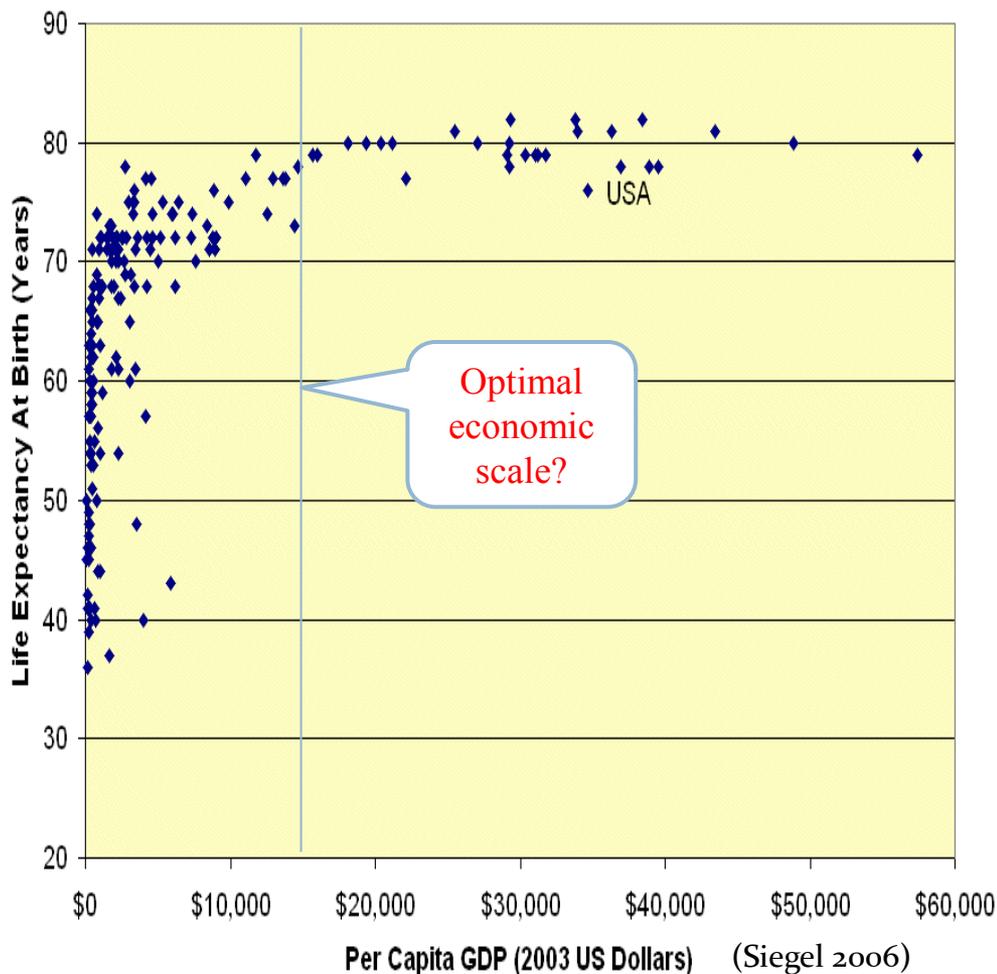
- ❑ Sustainability means contemplating planned economic contraction (giving up material growth) in wealthy countries.
- ❑ —Industrialized world reductions in material consumption, energy use, and environmental degradation of over 90% will be required by 2040 to meet the needs of a growing world population fairly within the planet's ecological means" (BCSD 1993; *'Getting Eco-Efficient'*).
- ❑ North Americans should be taking steps to reduce their ecological footprints by 80% from about 9 global average ha to an equitable Earth-share (1.8 gha) (Rees 2006).

# Contraction is no longer a taboo subject



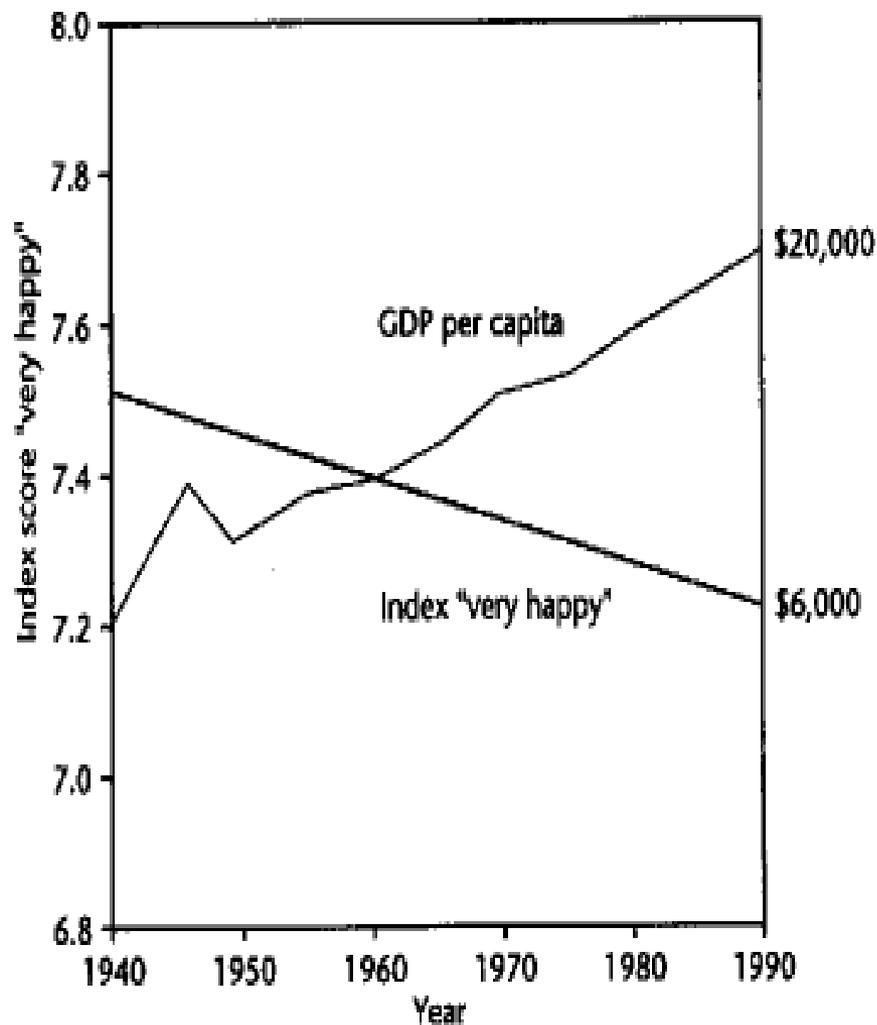
Books providing both a detailed rational and policy prescriptions for economic contraction are proliferating.

# A convenient truth: GDP Growth in rich countries is futile



- ❑ Since 1976, the Canadian economy has grown by 130%. GDP per capita is 70% per cent higher.
- ❑ There has been no change in the percentage of the population in poverty or in the unemployment rate.
- ❑ The absolute numbers of impoverished and unemployed has increased.
- ❑ Subjective well-being is constant or declining.

# Inequitable growth reduces well-being



- In many rich countries neither objective nor felt well-being are *still* associated with rising GDP/income per capita.
- On the contrary, ~~here~~ we see US data showing ~~—~~ the strange, seemingly contradictory pattern ... of rising real income and a falling index of subjective well-being” (Lane 2000).

# Conceptual steps on the way forward

## **The world community must recognize that:**

- ❑ for the first time in history, individual and national interests are converging with humanity's collective interests;
- ❑ we can no longer implement economic policy, without ecological policy, without social policy.
- ❑ no country can become sustainable on its own—**sustainability is a collective problem that demands collective solutions.**

# Re-socialize for Sustainability

## **Governments must act for the common good:**

- ❑ Initiate a national public education campaign on the severity of the crisis and the need for decisive action.
- ❑ Promote a cultural shift from private to public capital accumulation and to human development.
- ❑ Implement job-training and job-placement programs to equip people for employment in sunrise industries.
- ❑ Recognize the advantages of job-sharing in the context of improved work-life balance (self-actualization).
- ❑ Design and implement new forms of social safety nets to enable peoples' transition to the post-carbon economy (there will be sunset as well as sunrise industries).

# Intervene to create a more efficient market economy – let prices tell the truth

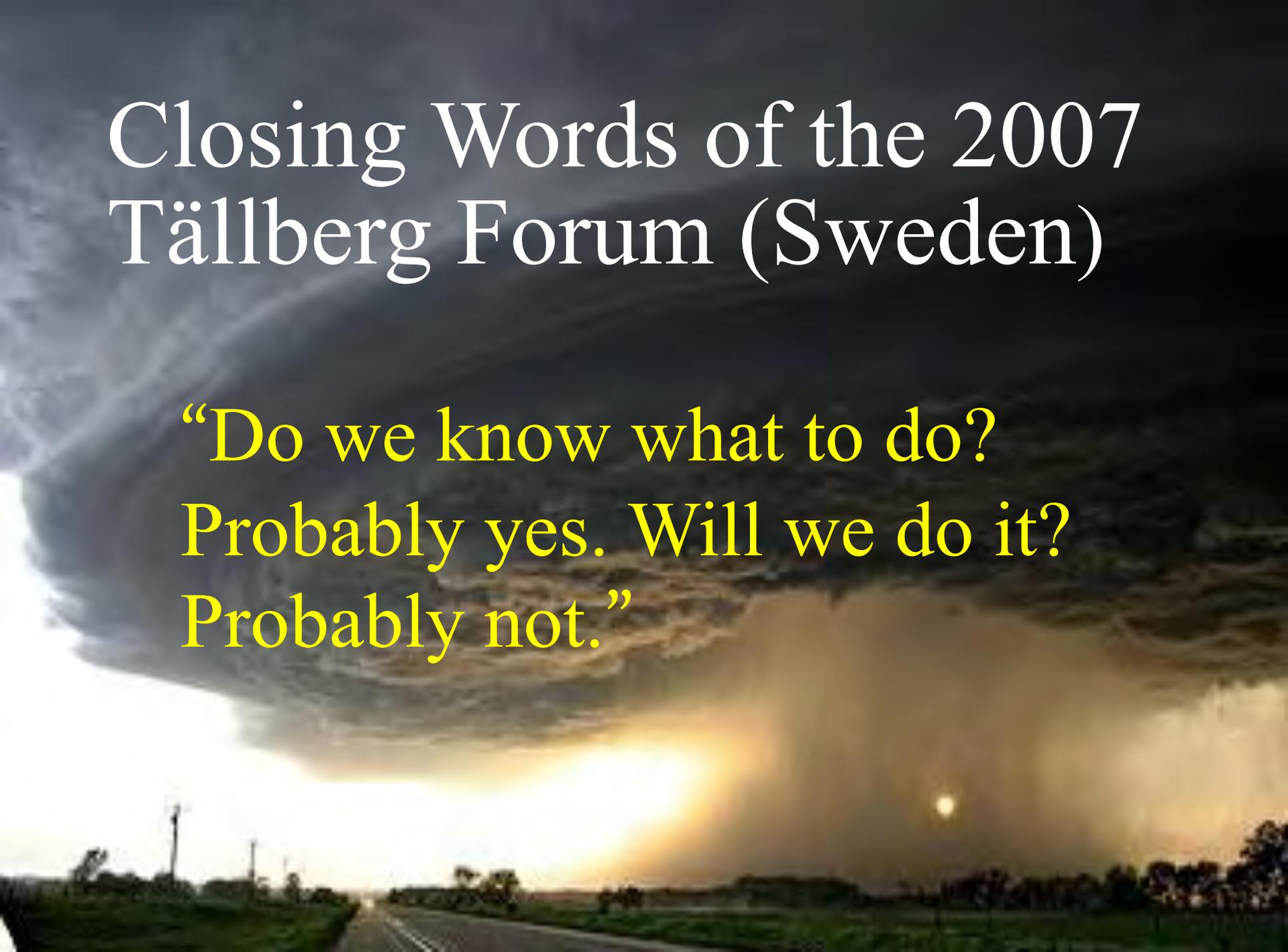
- ❑ Recognize that government intervention to correct for gross market failure (e.g., climate change) is necessary and legitimate.
- ❑ To improve market efficiency, internalize ecological and social externalities, i.e., insist on full-cost pricing.
- ❑ End perverse subsidies (e.g., to the fossil fuel sector).
- ❑ Initiate ecological fiscal reform—tax the bads, not the goods.
- ❑ Implement a combination of pollution charges/taxes (e.g., carbon tax) and import tariffs. (Support WTO reform.)
- ❑ Return to progressive income taxation (including negative income taxes if necessary to assist low-income families through the transition).

# Encourage emergence of the post-carbon economy (promote costless investment)

- ❑ Rethink transportation: de-emphasize private autos; invest in rail, public transit and related infrastructure, and the necessary capacity to manufacture domestically.
- ❑ In the building sector, emphasize retrofits but insist that both renovation and new construction meet at least Passivhaus or LBC standards (i.e., set firm targets).
- ❑ Support development of the insulation, glass and window, and building systems industries in every province.
- ❑ Implement state-of-the-art standards for household appliances, including space and water heaters.
- ❑ Encourage the development of sustainable alternative energy systems that might actually work in Canada.

# Closing Words of the 2007 Tällberg Forum (Sweden)

“Do we know what to do?  
Probably yes. Will we do it?  
Probably not.”



An aerial photograph showing a coastline with green hills on the left and blue water on the right. The text is overlaid on the image.

The challenge for us is  
to prove them wrong!

Thank You  
(and good luck!)