



**HEALTH LESSONS**  
from  
**CLIMATE CHANGE**  
**RESEARCH**

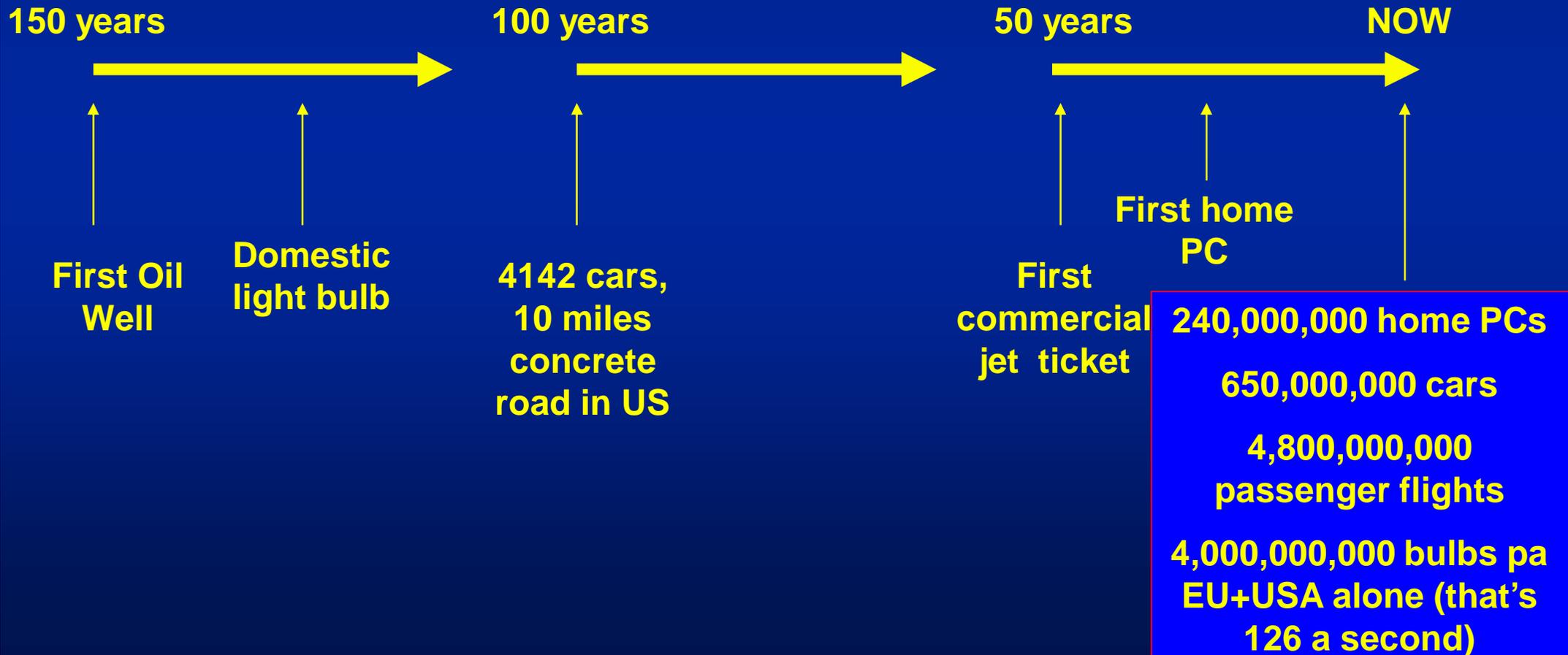
**Hugh Montgomery**

If plants and animals are crushed and don't rot, the CO<sub>2</sub> is stored



354-290m years ago = Carboniferous  
**Total of 350m years-worth....**

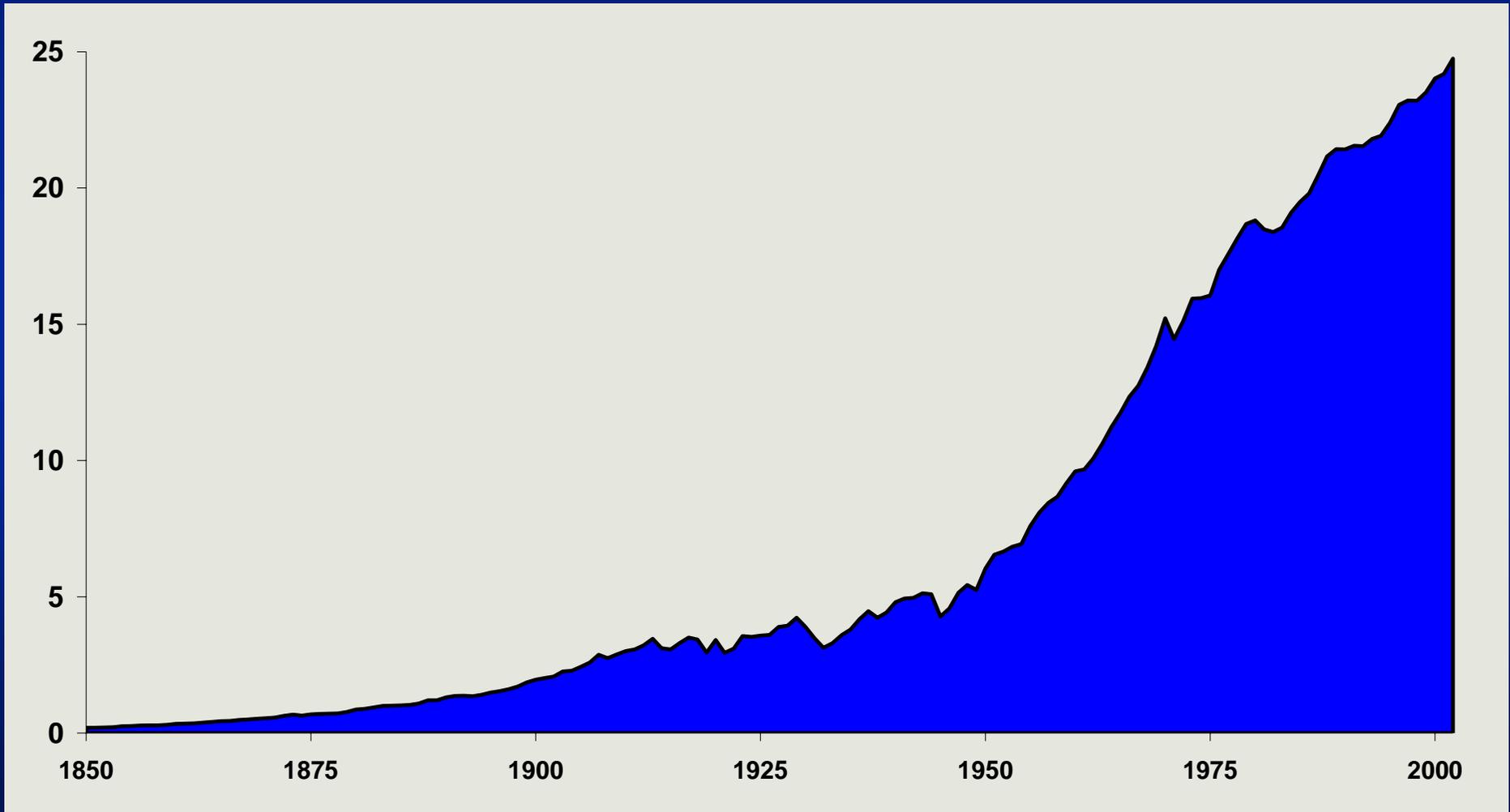
# ...which we are burning VERY fast



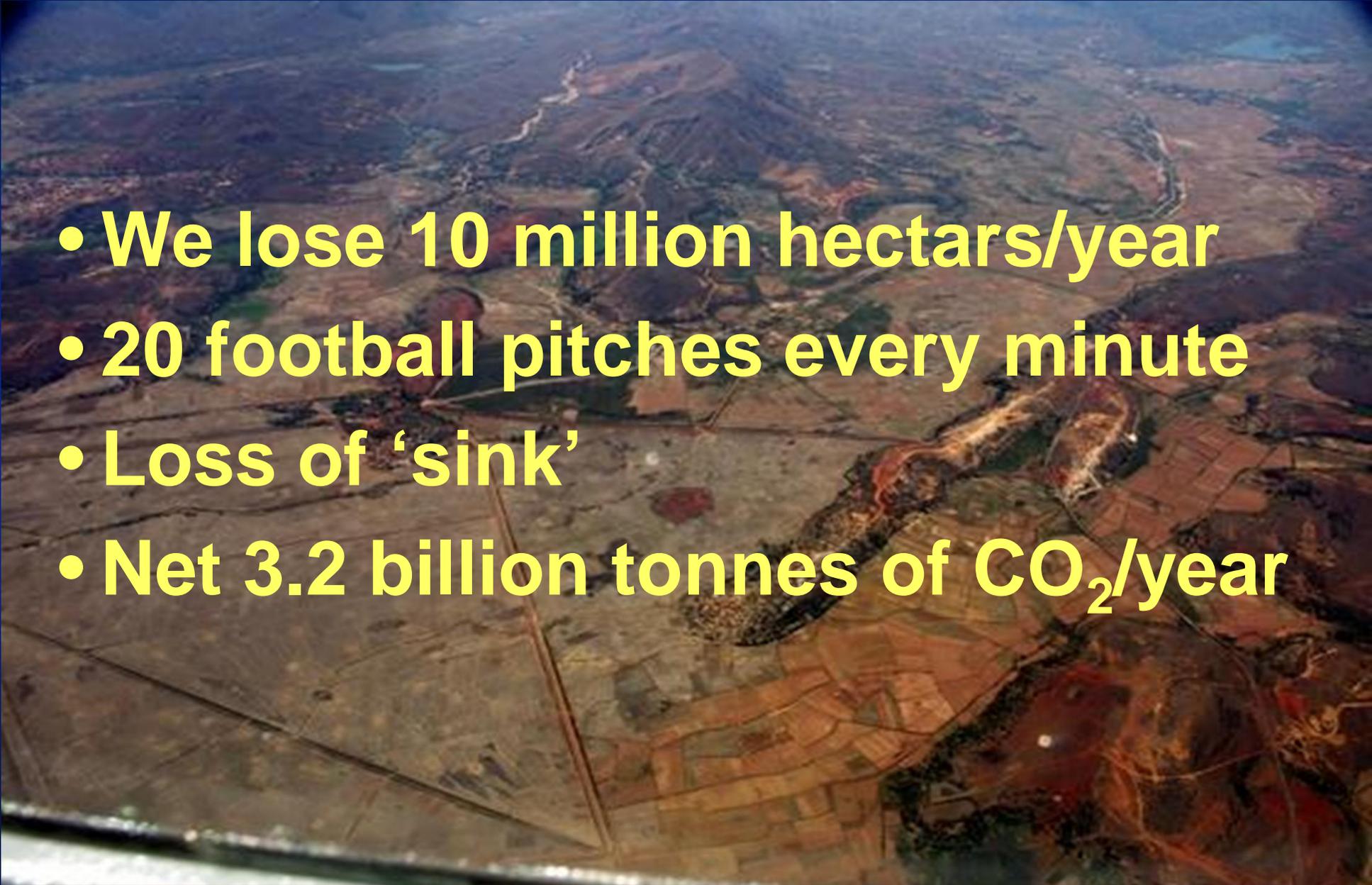
- **196,442 kg of coal.....**
- **103,881,279 litres of gas.....**
- **150, 179 litres of oil.....**
- **..... *A SECOND***

## Flows of emissions of CO<sub>2</sub> from burning fossil-fuels have risen rapidly since 1950

Billions of tonnes of CO<sub>2</sub>

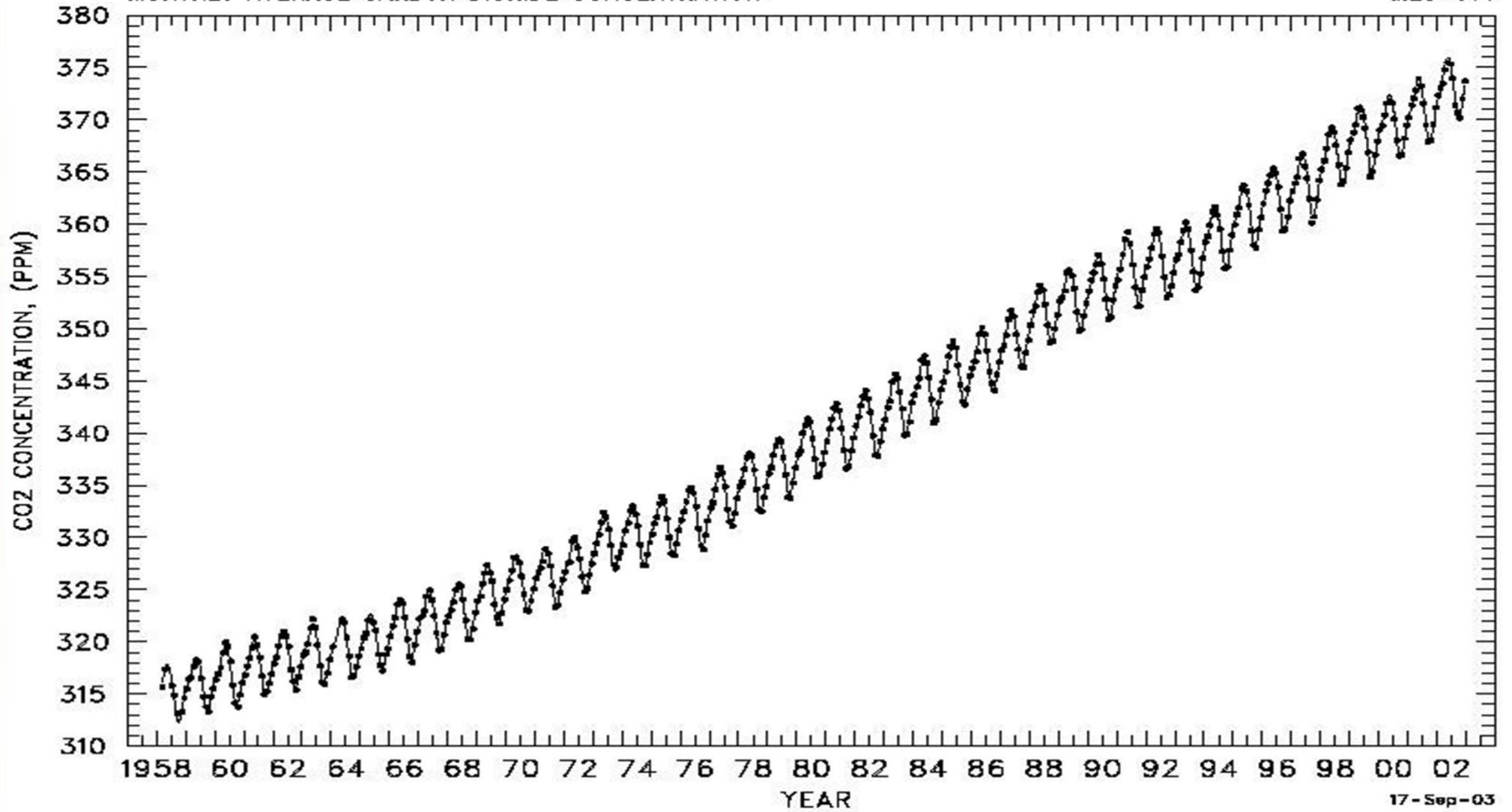




- 
- We lose 10 million hectares/year
  - 20 football pitches every minute
  - Loss of 'sink'
  - Net 3.2 billion tonnes of CO<sub>2</sub>/year

MAUNA LOA OBSERVATORY, HAWAII  
MONTHLY AVERAGE CARBON DIOXIDE CONCENTRATION

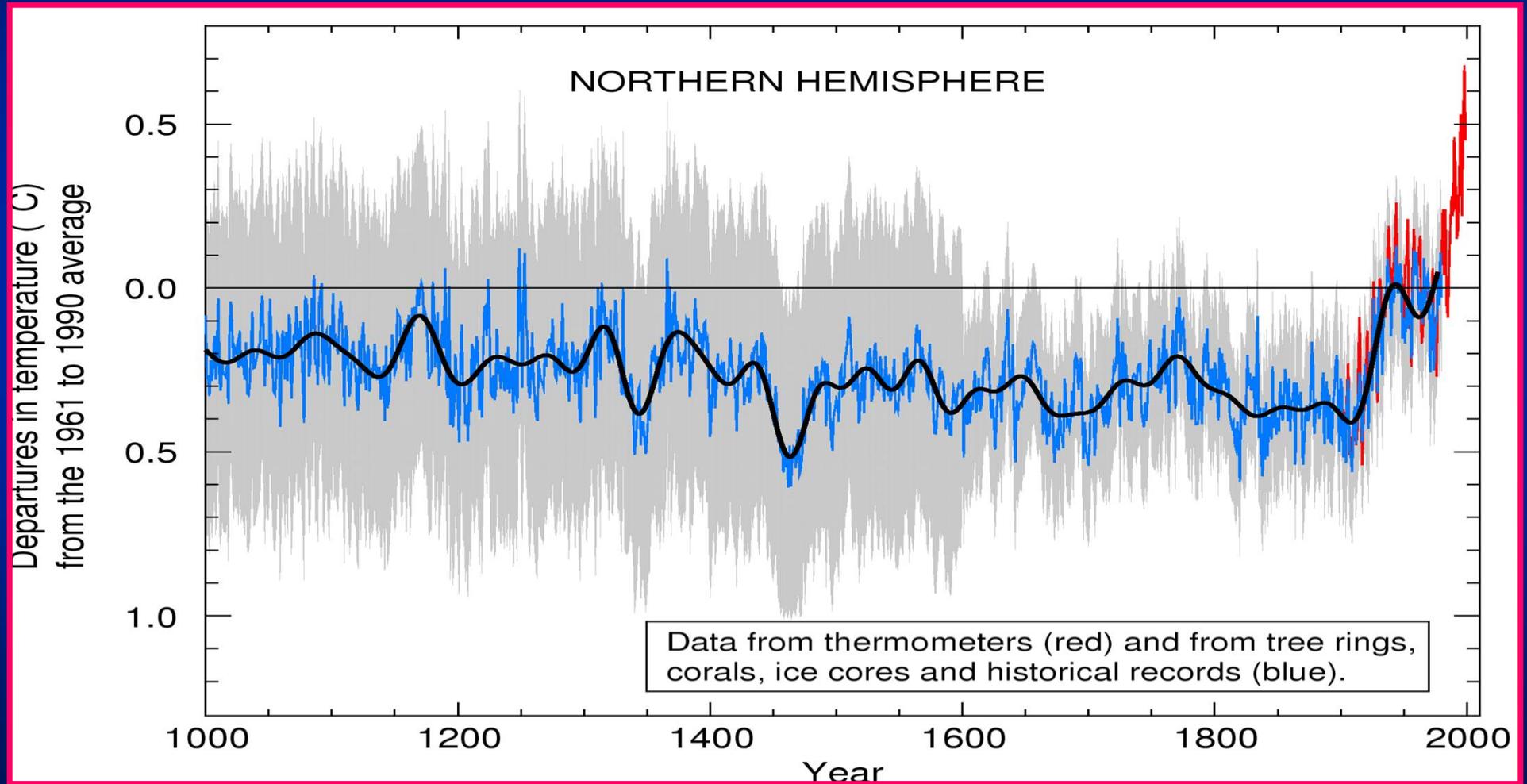
MLO-144



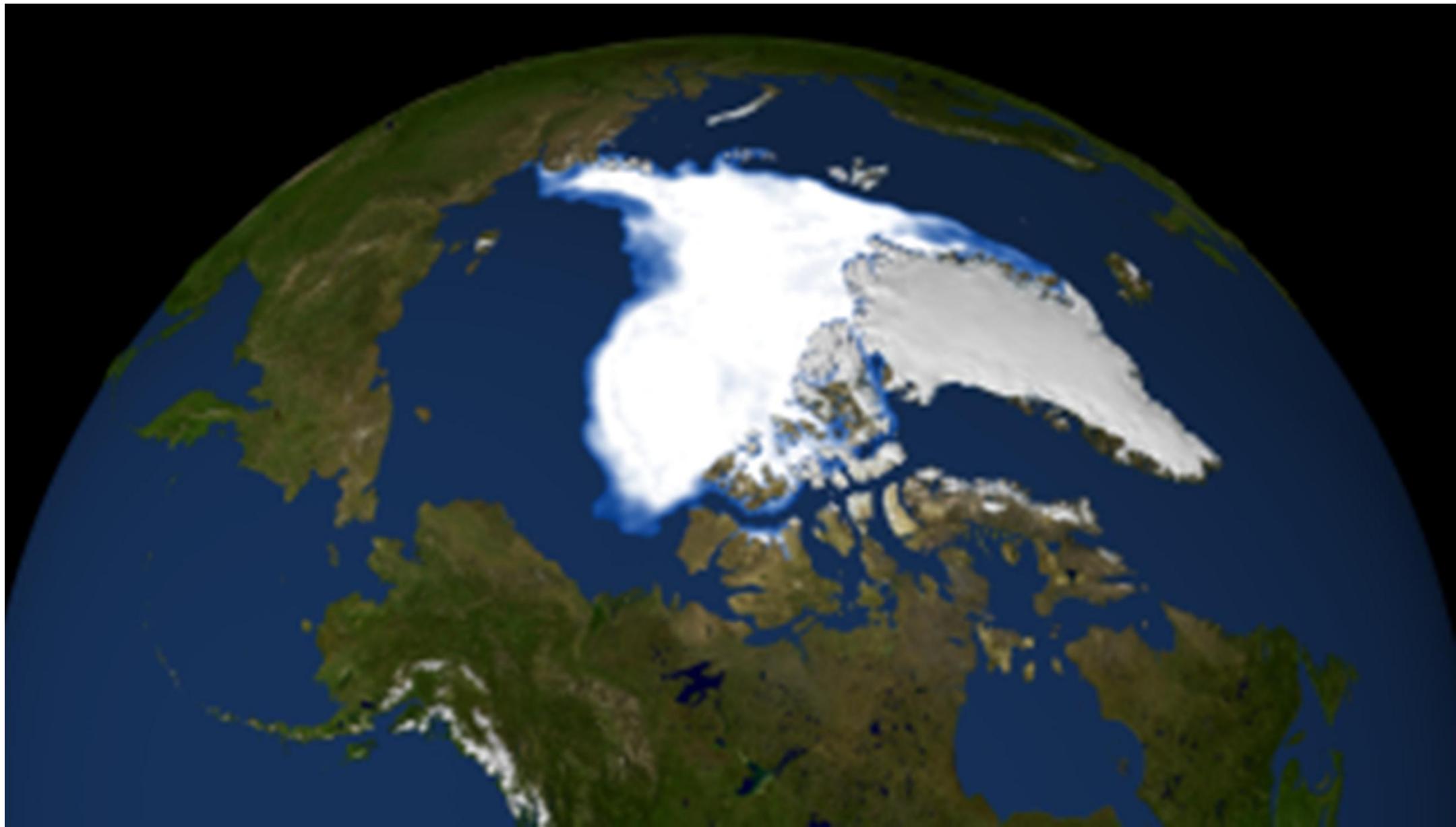
17-Sep-03

**The Earth has thus warmed...**

**And this is down to us**



*(Adapted from IPCC, 2001)*

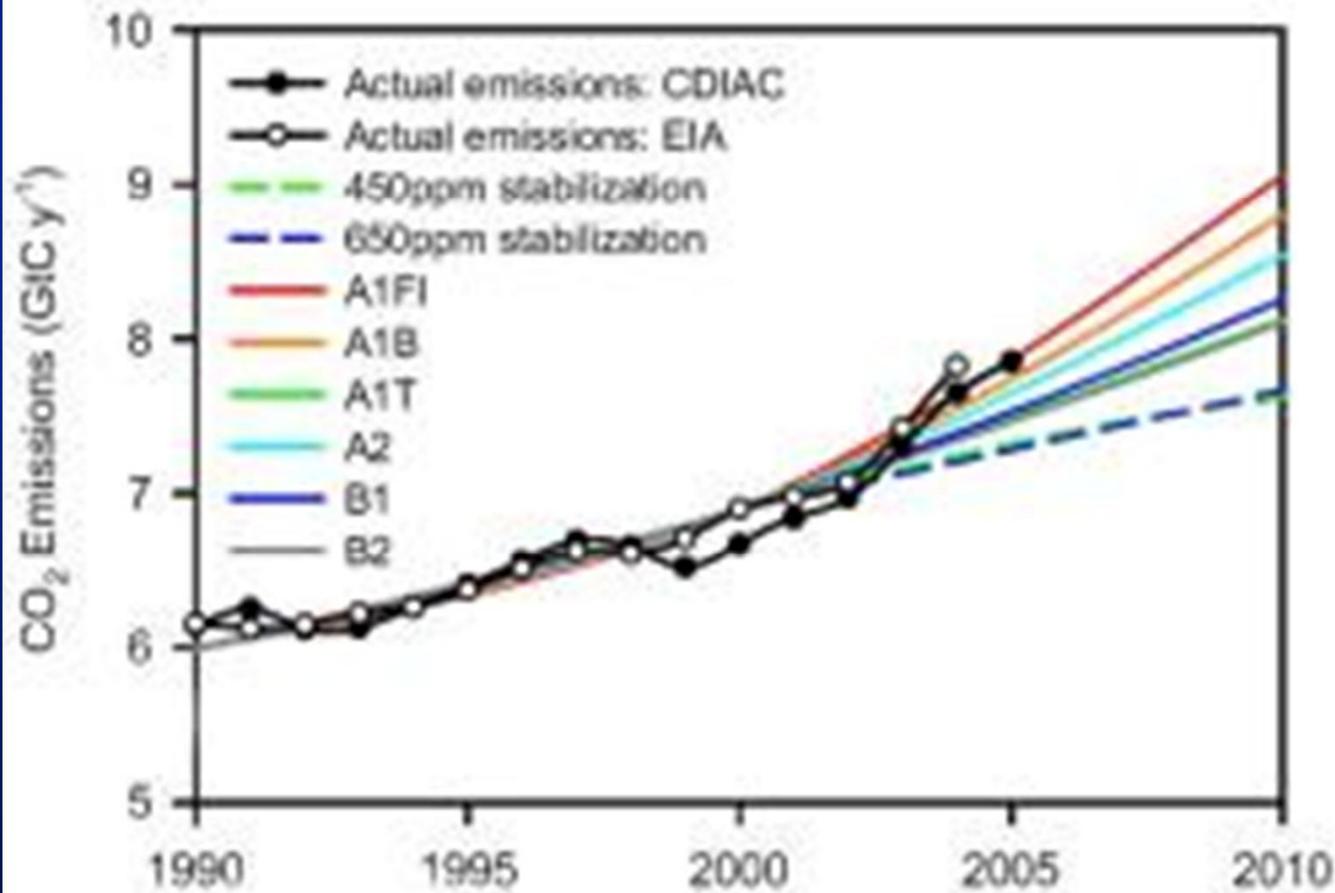


# WE ARE EXCEEDING WORSE CASE SCENARIOS

## Global and regional drivers of accelerating CO<sub>2</sub> emissions

Michael R. Raupach<sup>\*\*</sup>, Gregg Marland<sup>†</sup>, Philippe Ciais<sup>‡</sup>, Corinne Le Quéré<sup>§</sup>, Josep G. Canadell<sup>\*\*</sup>, Gerrit Klepper<sup>\*\*</sup>, and Christopher E. Field<sup>\*\*</sup>

| PNAS | June 12, 2007 | vol. 104 | no. 24





**‘Climate change is the greatest global health threat of the 21st century’**

**UCL Lancet Commission**

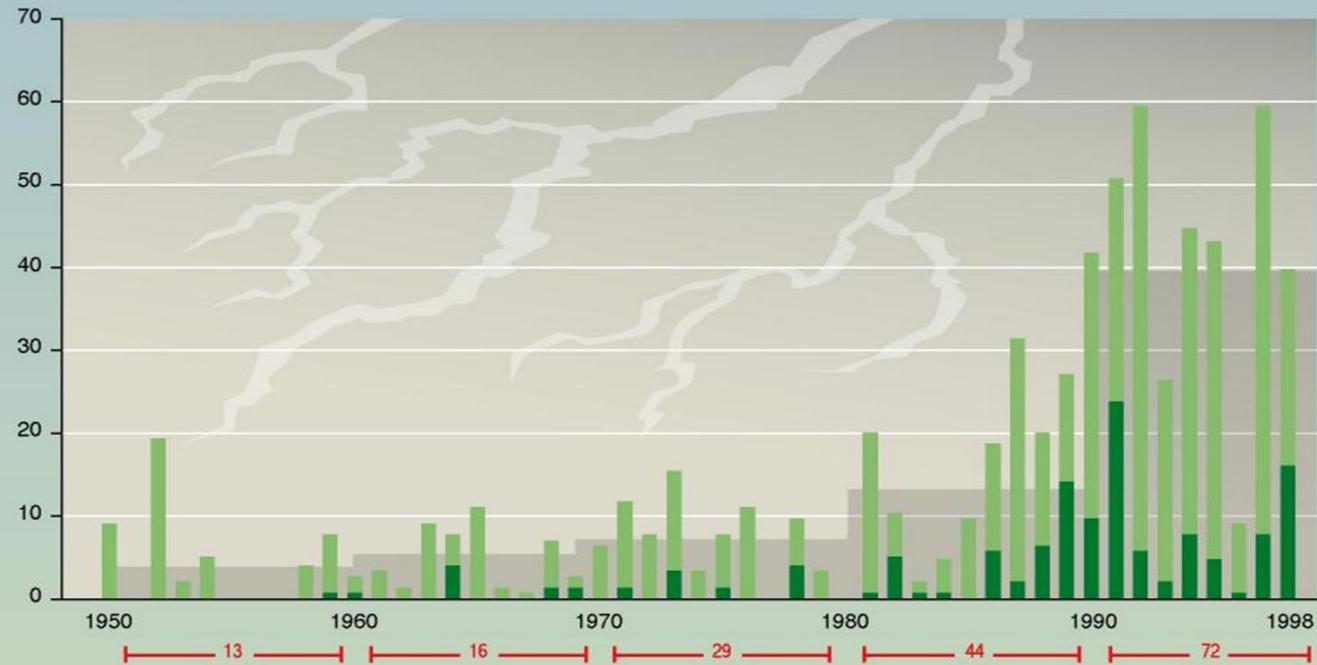
- **Deaths from heat**
- **Direct Injury**

**Health Effects of Climate Change in the  
UK**

**An update of the Department of Health  
report  
2001/2002**

## Global costs of extreme weather events (inflation-adjusted)

Annual losses, in thousand million U.S. dollars



SYR - FIGURE 2-7

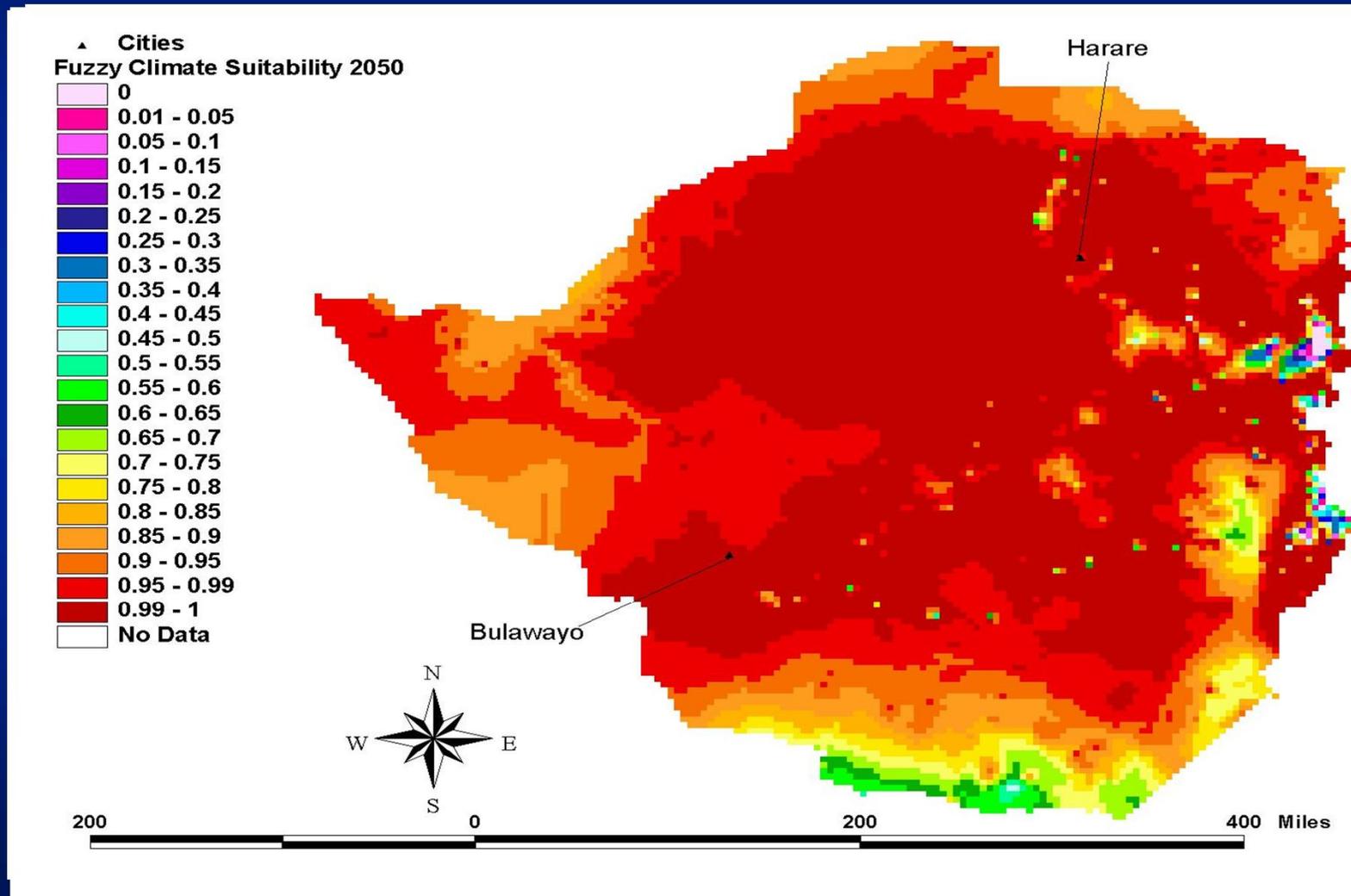
- **Deaths from heat**
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- **Pollution**
- **Food-related illness**
- **Altered disease vectors**

**Health Effects of Climate Change in the  
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# Modelling Malaria Transmissibility in Zimbabwe

2000-> 2025-> 2050



- **Deaths from heat**
- **Direct Injury**
- **Pollution**
- **Food-related illness**
- **Altered disease vectors**
- **Economic Collapse**
- **Crop Failure**
- **Water shortages**
- **Mass Migration**

# India builds a 2,500-mile barrier to rival the Great Wall of China

**TIMES**ONLINE

**Melting glaciers in the Himalayas are wreaking havoc in Bangladesh leading to a rise in illegal migration to India. This has prompted India to build an immense border fence in attempt to block newcomers.**

**THE**   
**INDEPENDENT**

28 February 2006

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- **Resource Wars**

# Pentagon study suggests potentially catastrophic consequences of climate change

## Executive Summary

There is substantial evidence to indicate that significant global warming will occur during the 21<sup>st</sup> century.

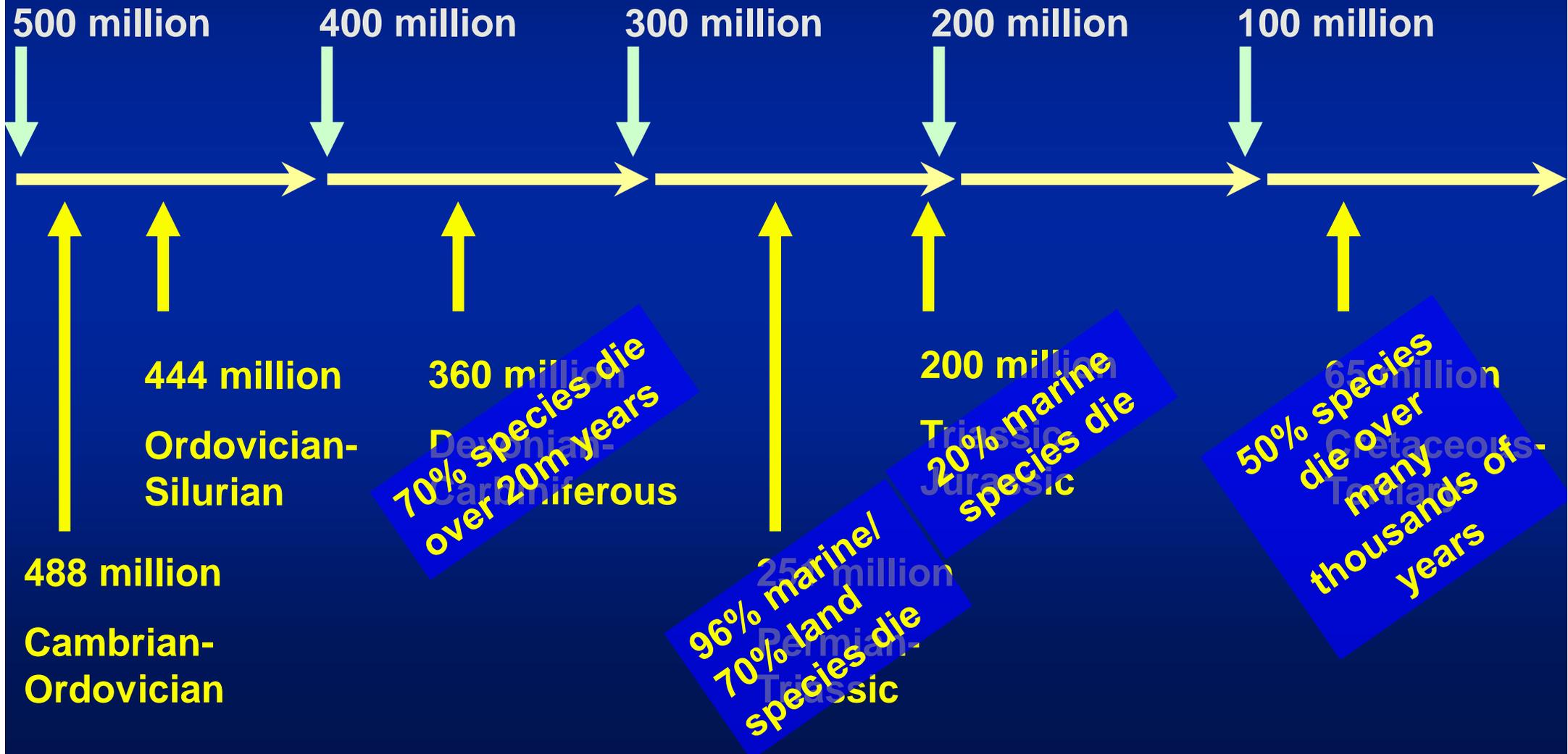
With inadequate preparation, the result could be a significant drop in the human carrying capacity of the Earth's environment.

October 2003

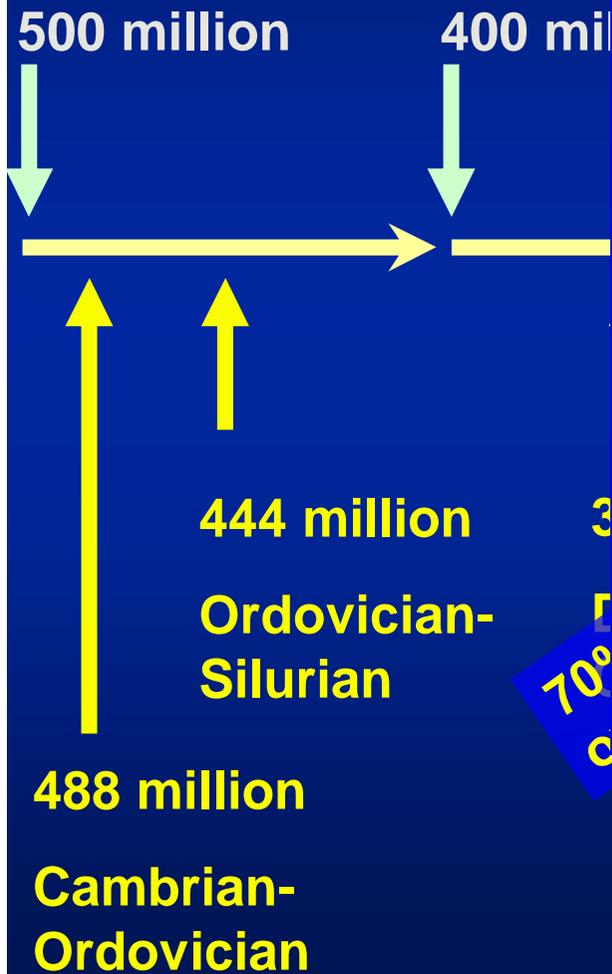
**'Disruption and conflict will be endemic features of life. Once again, warfare would define human life.'**

- **Deaths from heat**
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- **Resource Wars**
- **Ecosystem Collapse**

# MASS EXTINCTION EVENTS



# MASS EXTINCTION EVENTS



**“A 1998 survey by the American Museum of Natural History found that 70% of biologists view the present era as part of a mass extinction event, the fastest to have ever occurred. Some.. predict the extinction of one-half of all species in the coming decades”**

25 million years ago  
96% marine species die  
70% land species die  
Permian-Triassic

thou  
year

## **WWF/ IoZ/ ZSL May 2008 LIVING PLANET INDEX**

**“Ground-living vertebrates have declined by 25%, with most of the slump occurring since 1980. Marine species held fairly steady until the late 1990s before falling sharply to give an overall drop of 28%. Freshwater species have decreased by 25%, primarily since the late 1980s.”**

# Extinction risk from climate change

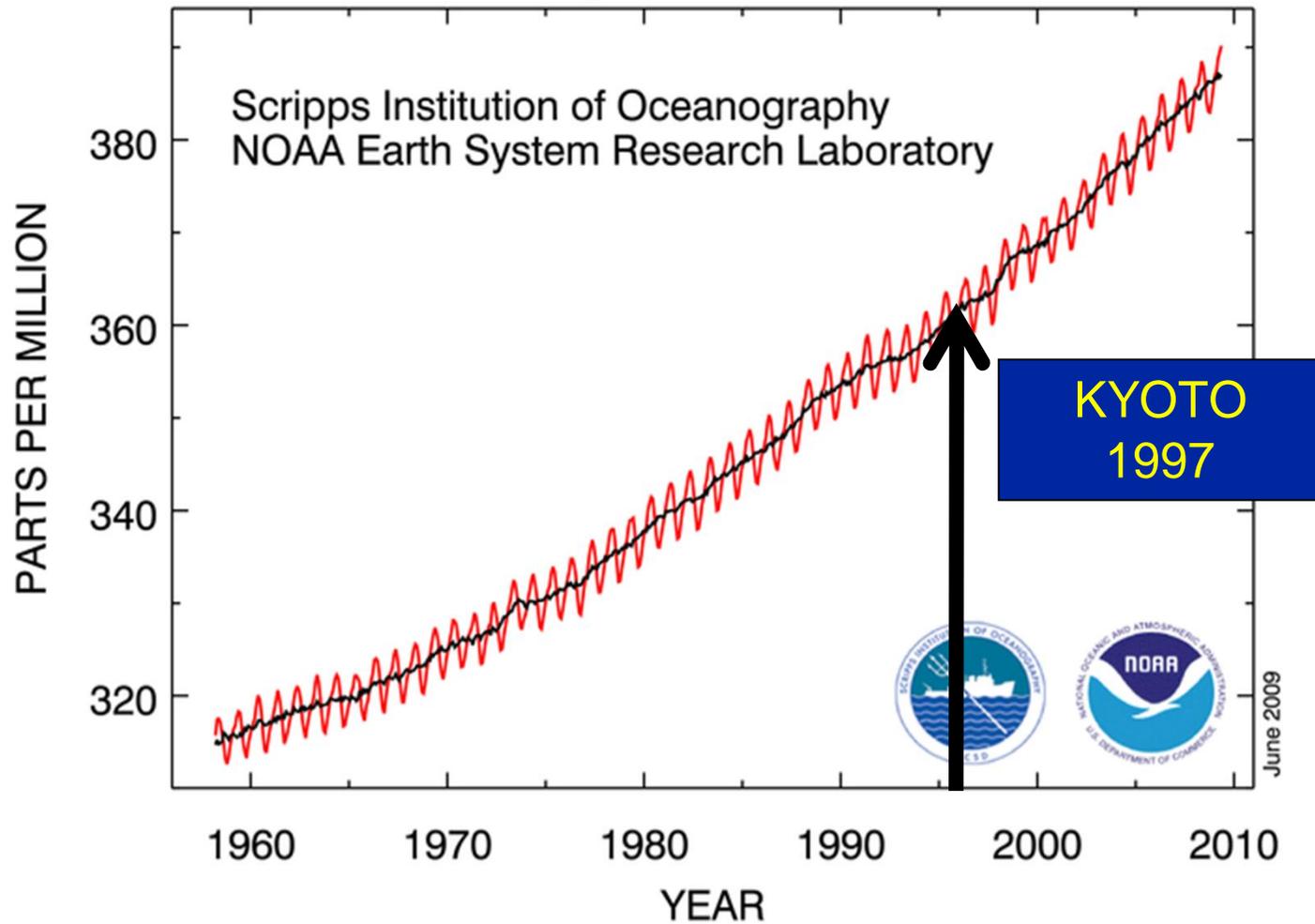
letters to nature

we predict, on the basis of mid-range climate-warming scenarios for 2050, that 15–37% of species in our sample of regions and taxa will be ‘committed to extinction’.

**58% for upper-range**

**ARE WE TAKING  
ACTION?**

# Atmospheric CO<sub>2</sub> at Mauna Loa Observatory



**SO HIGH CARBON  
IS POSITIVELY  
HARMFUL.**

**BUT LOW CARBON  
IS POSITIVELY  
HEALTHY!**

# **UK TRANSPORT EMISSIONS**

**Road transport accounts for  
22% of UK greenhouse gas  
emissions**

## **Fewer cars means less pollution**

**“Air pollution and mortality benefits of the London Congestion Charge”**

Predicted benefits in the charging zone wards were 183 years of life per 100,000 population.

In London overall, 1888 years of life were gained

Occup Environ Med. 2008 Sep;65(9):620-7.

## **Fewer cars means fewer accidents**

2,598 personal injury RTAs inside the zone in the year before the scheme.

Fall by 40 and 70 annually because of the charging zone

Further fall by 130-160 by changes favouring walking/cycling

TfL Impacts Monitoring 4th Report, 2006.

## **Walking and Cycling are Feasible**

- **Average UK car speed (all journeys) only 14.5 mph (2008 Dept Transport data)**
- **61% of all car journeys are under 2 miles**

## **More exercise-> less**

- **Depression**
- **Stroke**
- **Heart attack**
- **Cancers**
- **Osteoporosis**
- **Falls**
- **Muscle weakness**
- **Obesity**
- **Diabetes**

# **LOW CARBON SAVES MONEY**

**“The European Union has a 20 per cent target. The current predictions by the EU suggest savings of €51 billion, but the report shows that raising the target to 30 per cent could increase the savings to as much as €76 billion per year.”**

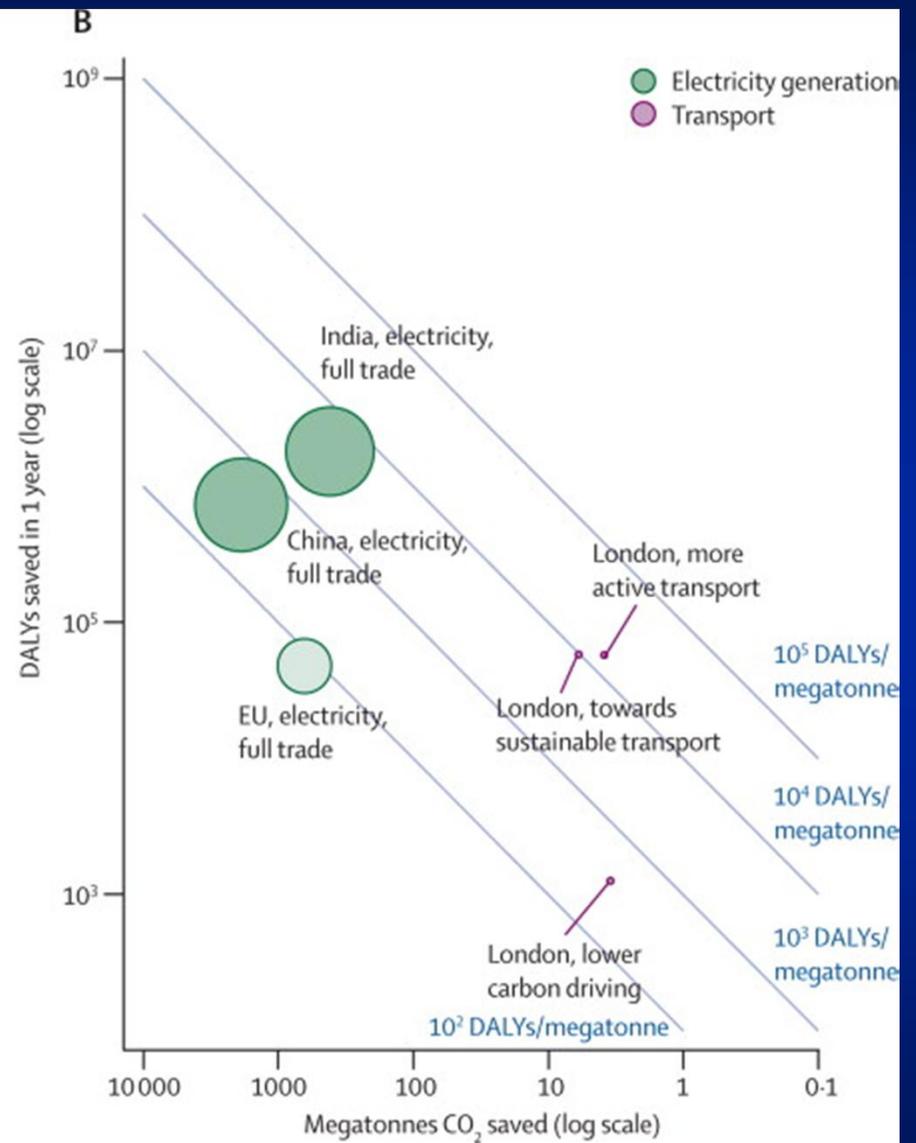
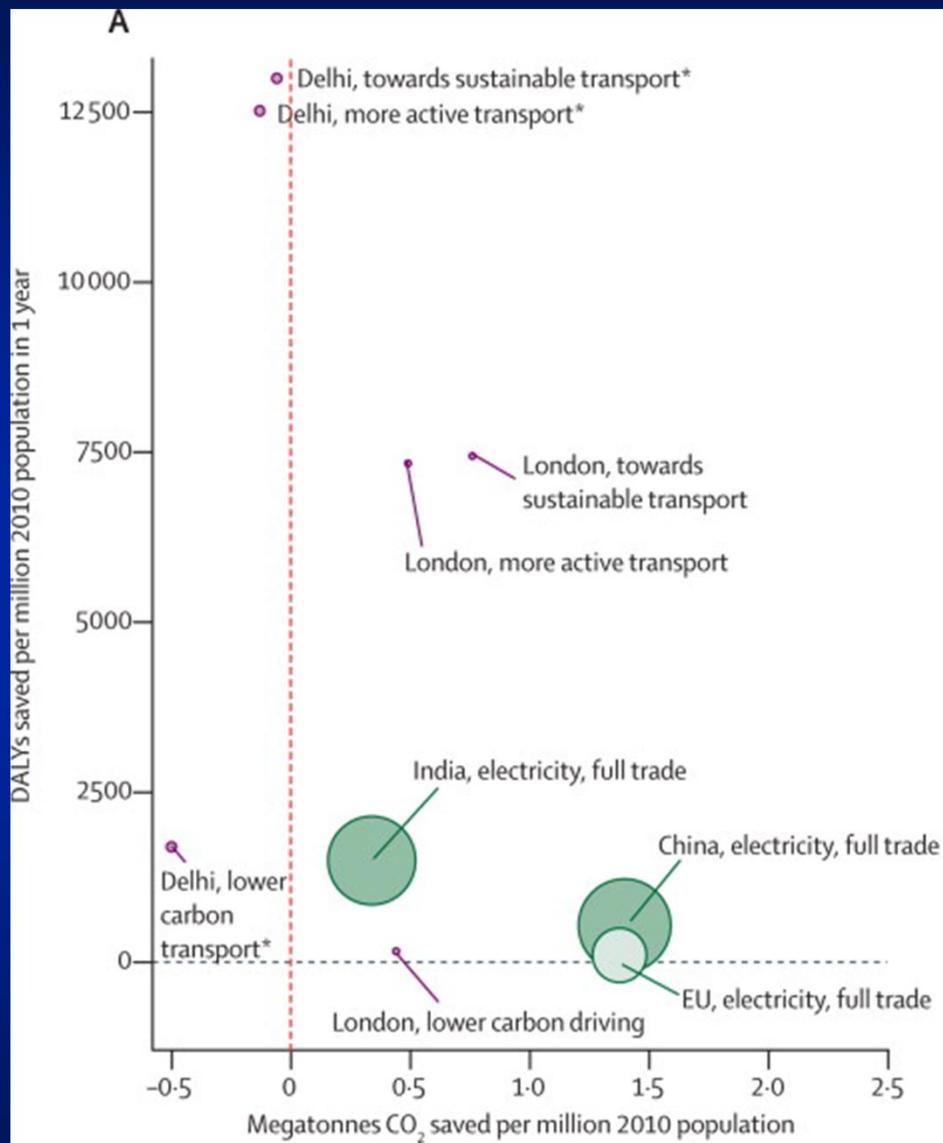
**Health and Environment Alliance (HEAL), Climate Action Network Europe (CAN-E)  
and WWF**

# Public health benefits of strategies to reduce greenhouse-gas emissions: overview and implications for policy makers

*Andy Haines, Anthony J McMichael, Kirk R Smith, Ian Roberts, James Woodcock, Anil Markandya, Ben G Armstrong, Diarmid Campbell-Lendrum, Alan D Dangour, Michael Davies, Nigel Bruce, Cathryn Tonne, Mark Barrett, Paul Wilkinson\**

**THE LANCET**

Vol 374, Dec 2009- Jan 2010, p 2104-2114



**"Al Gore described climate change as 'An Inconvenient Truth', but the findings of this study offer a very convenient truth. Reducing greenhouse gas emissions is not only essential to help tackle climate change, it is also an important way to improve public health'.**

**Sir Mark Walport, Director of the Wellcome Trust**

**OUR WATCH.  
OUR RESPONSIBILITY.**