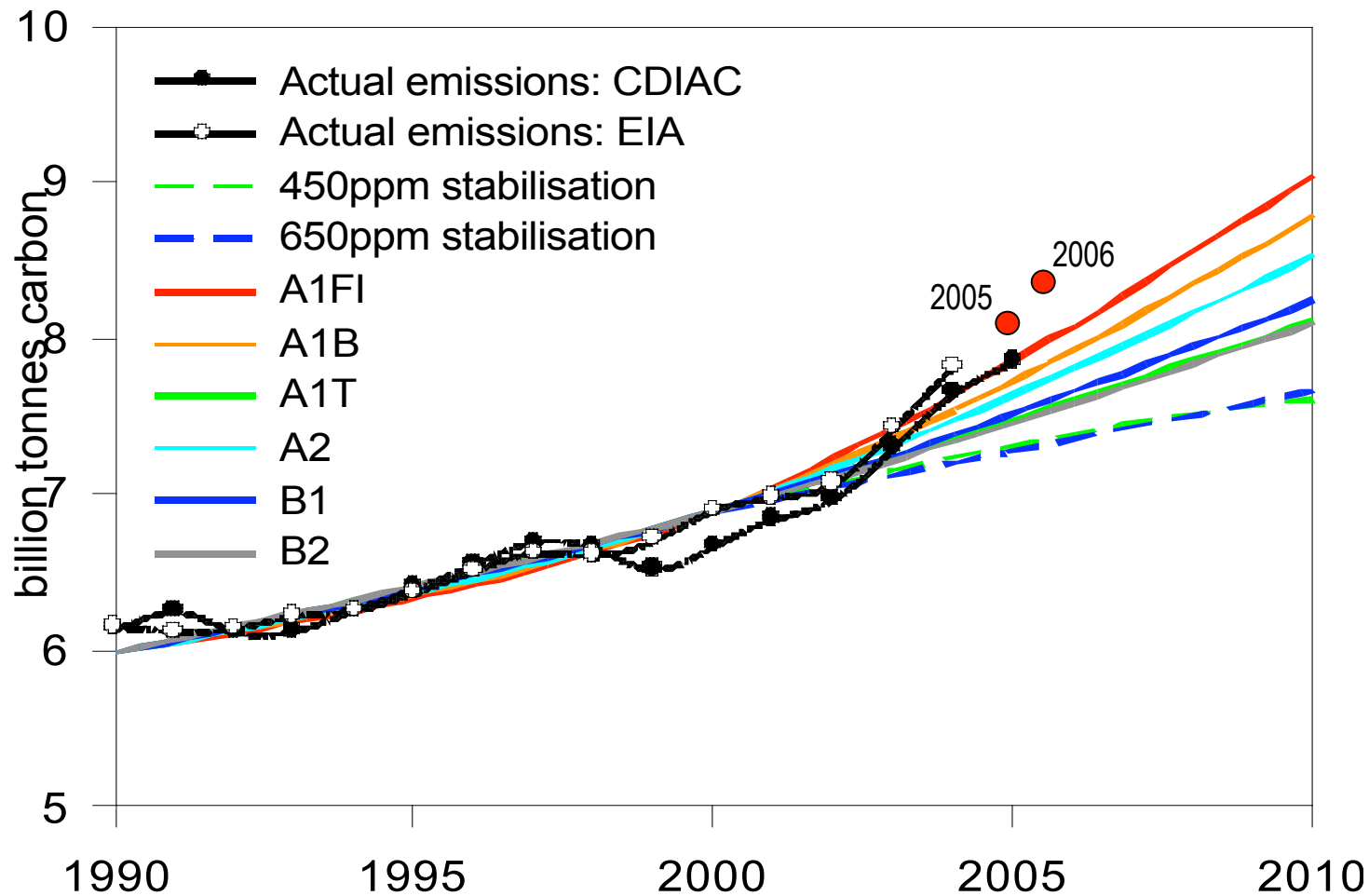


Why we must ration the future

David Spratt

September 2008

Emissions: rising more quickly than IPCC scenarios

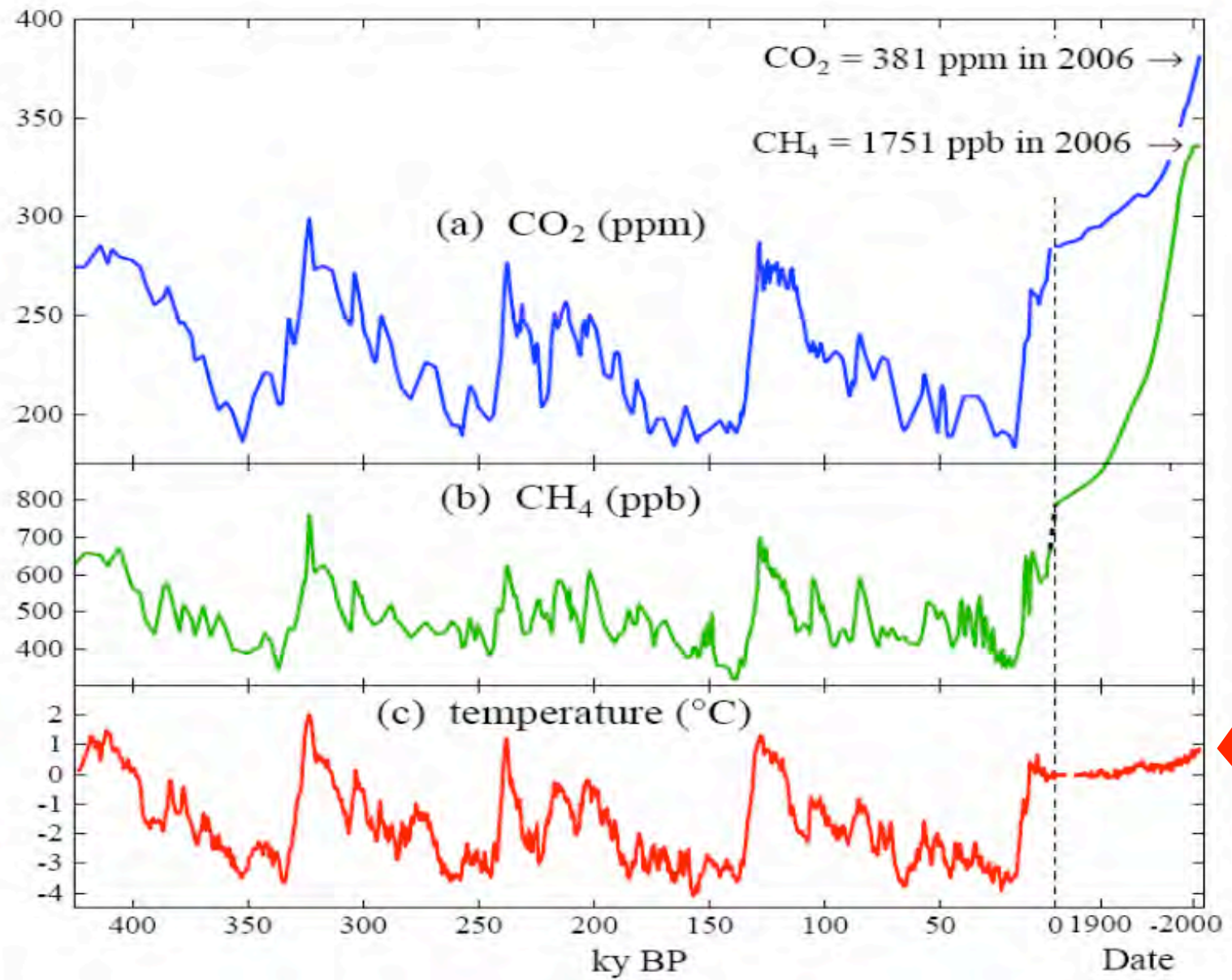


50-year
constant growth
rates
to 2050

- B1 1.1%,
- A1B 1.7%,
- A2 1.8%
- A1FI 2.4%

Observed
2000-2006
3.3%

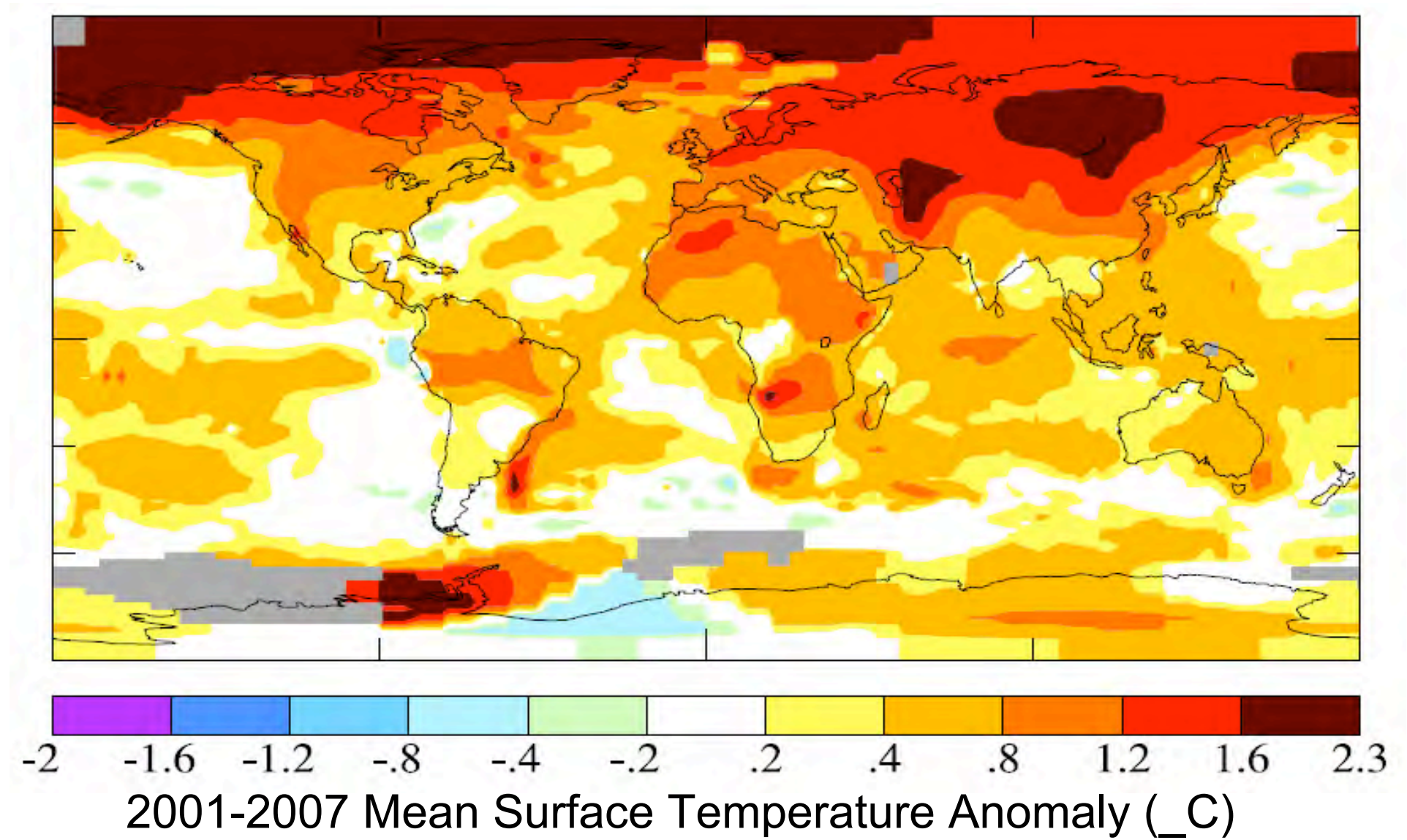
Temperature: big increases coming for present GHG levels



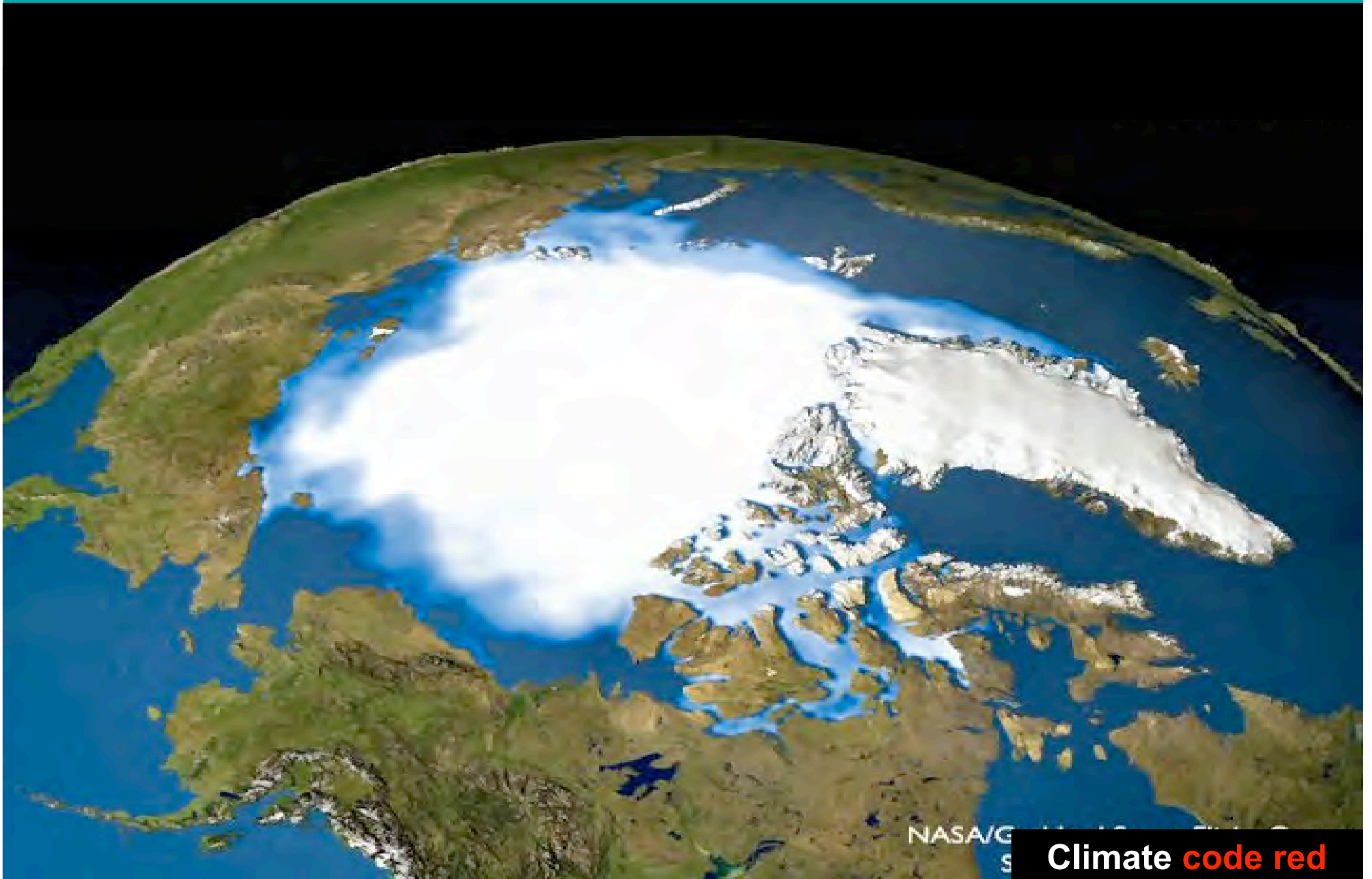
James Hansen / NASA

Climate code red

Warming is greatest in the polar north



Arctic summer: The way it used to be in summer



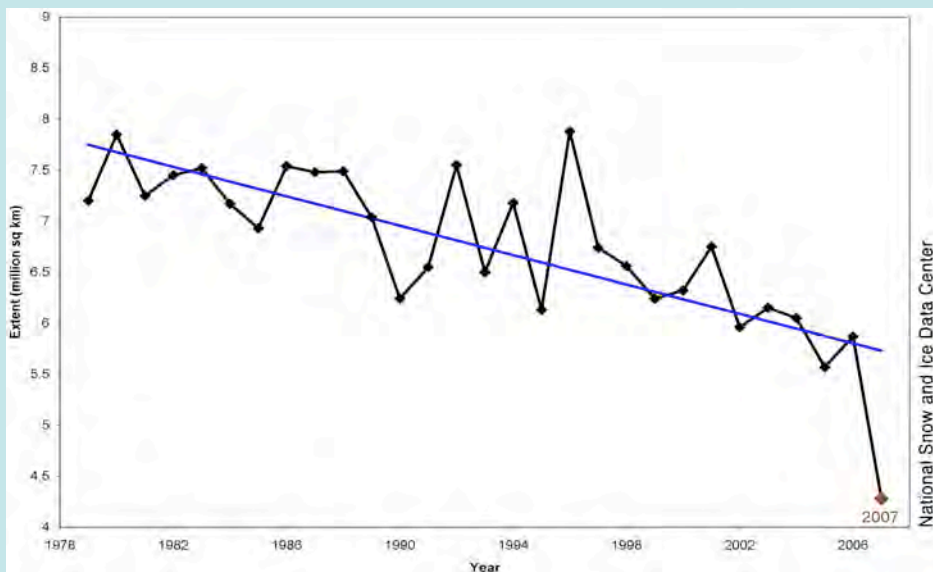
NASA/G...
S...

Climate code red

Arctic summer sea-ice loss



Minimum ice extent 2005



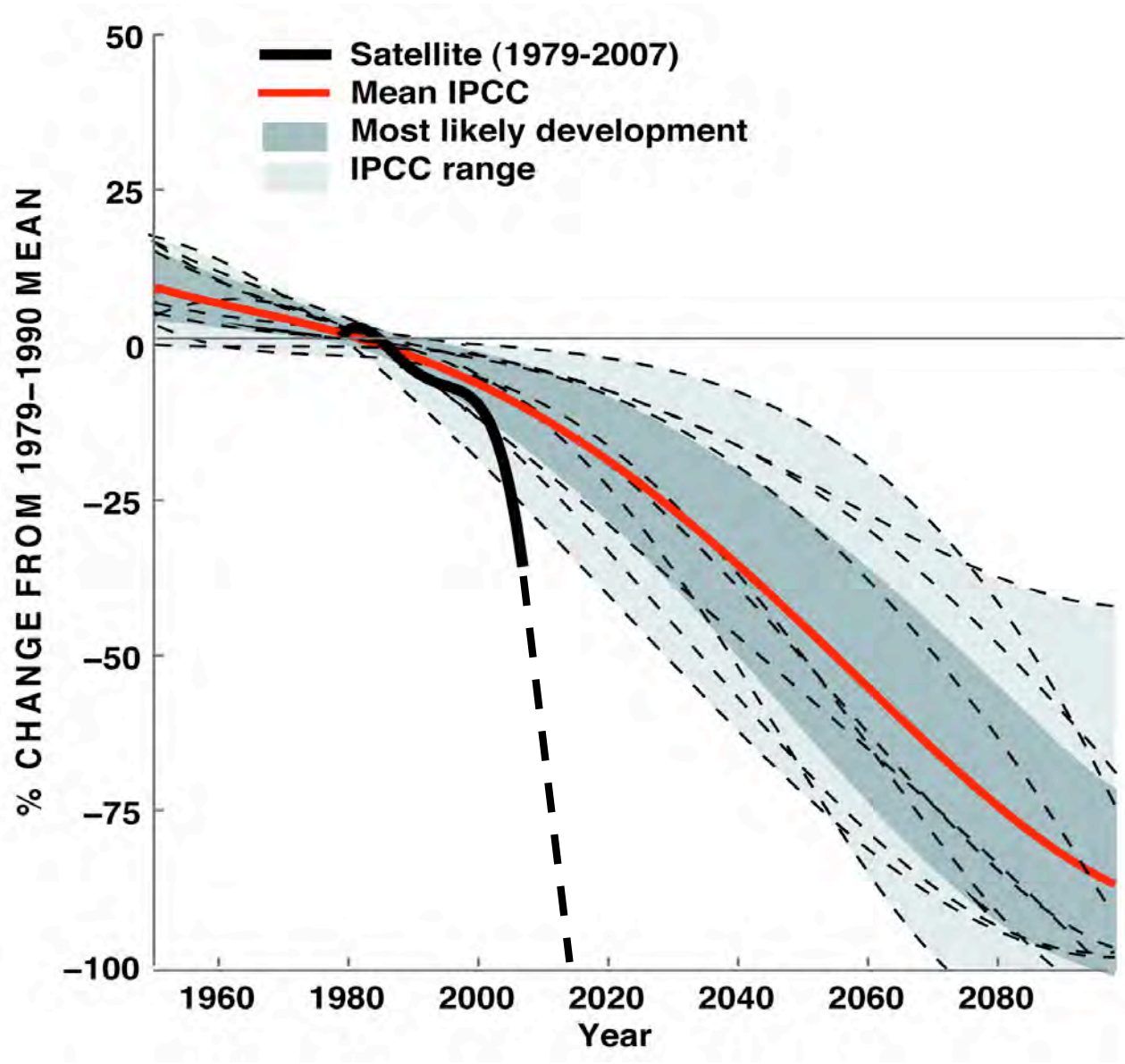
Minimum ice extent 2007



NSIDC

Climate **code red**

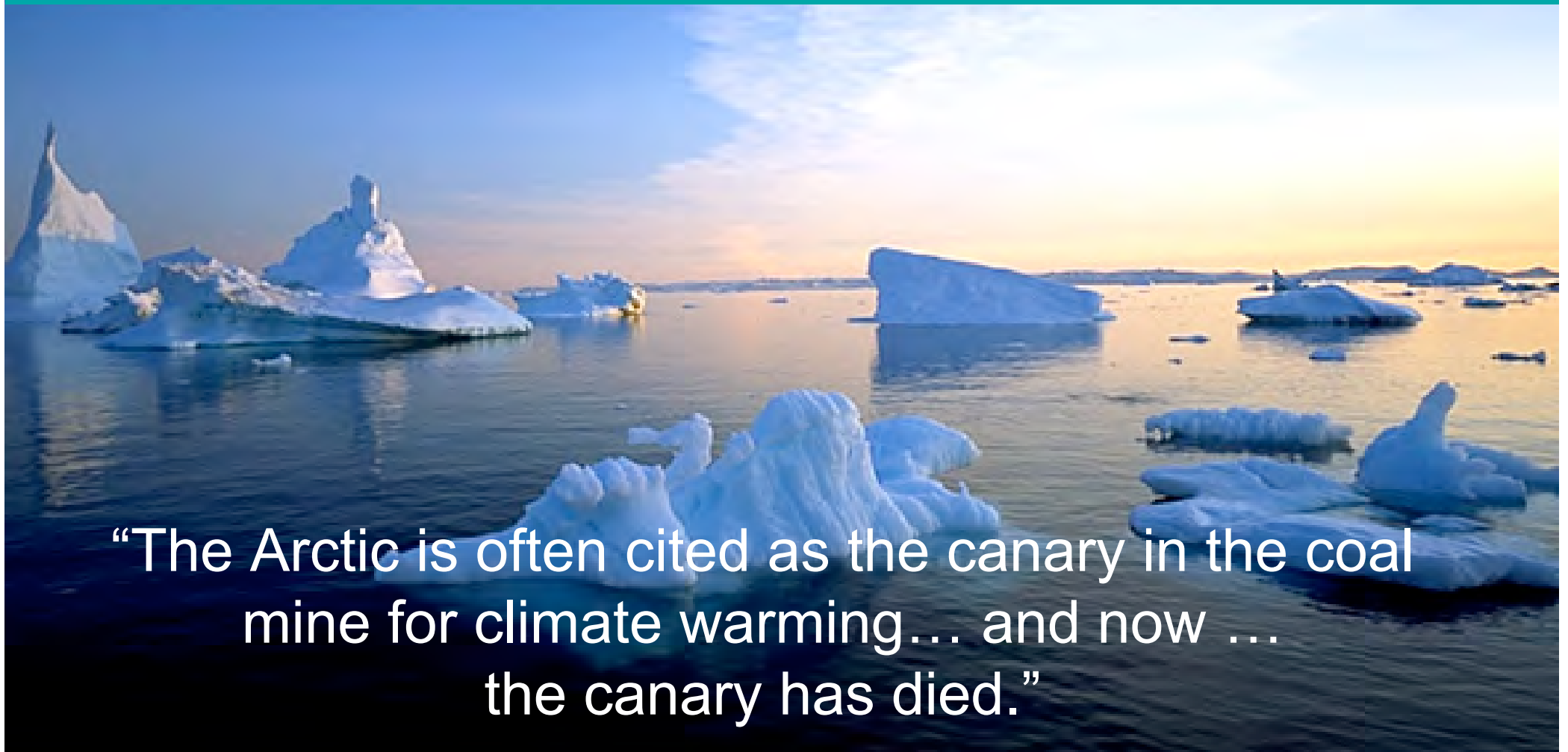
Arctic summer sea-ice loss predictions



Asgeir Sorteberg

Climate code red

The Arctic ecosystem is changing very quickly



Dr Jay Zwally, Glaciologist, NASA, December 2007

Disintegration of Greenland ice-sheet



“We are close to being committed to a collapse of the Greenland ice sheet”.

Tim Lenton, Univ.
of East Anglia

Antarctica

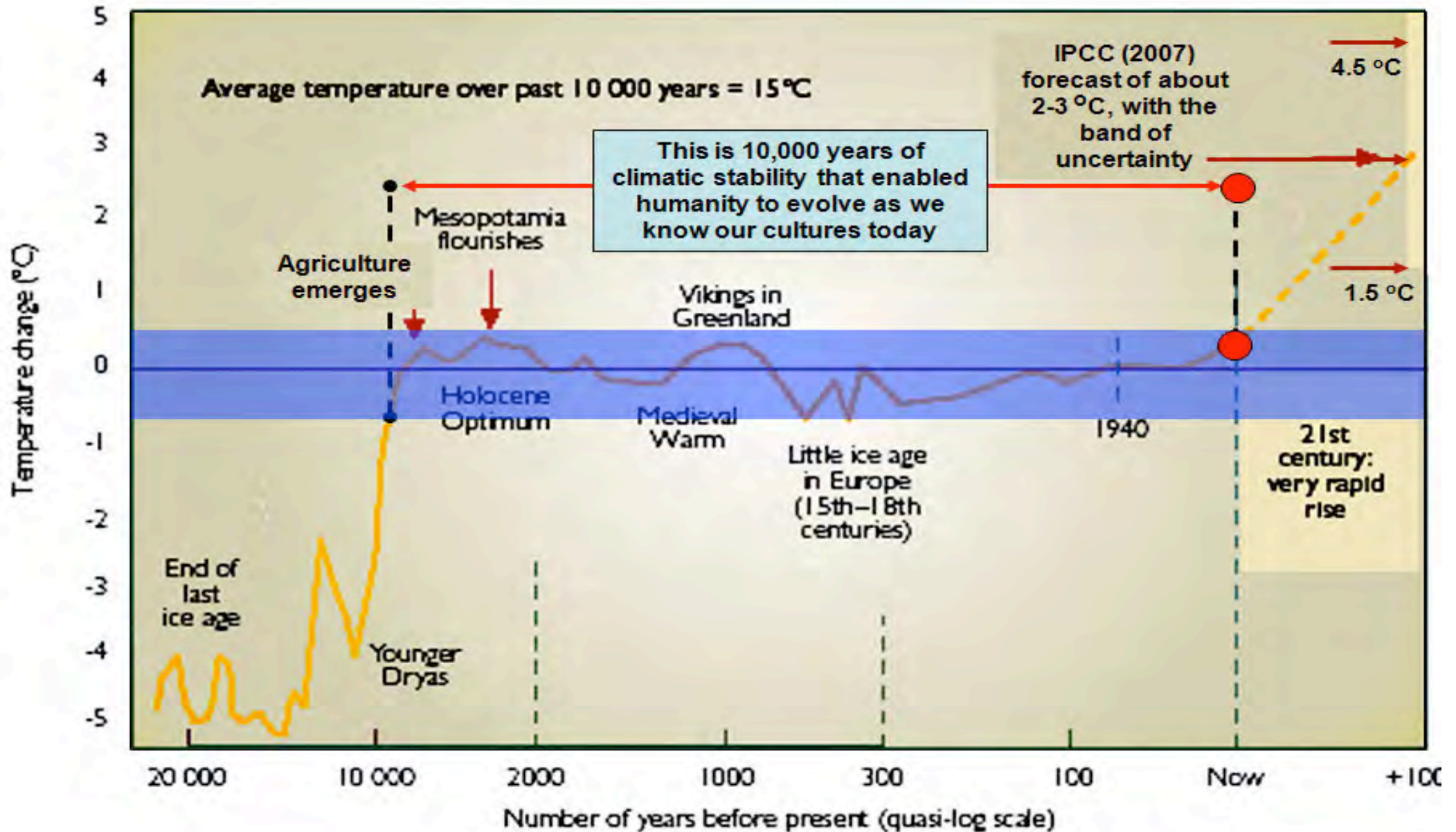
**'Things are on more of a hair trigger
than we thought.'**

— Ted Scambos, glaciologist, Univ. of Colorado.



Climate **code red**

Out of the comfort zone



Climate code red

Sea-level rise

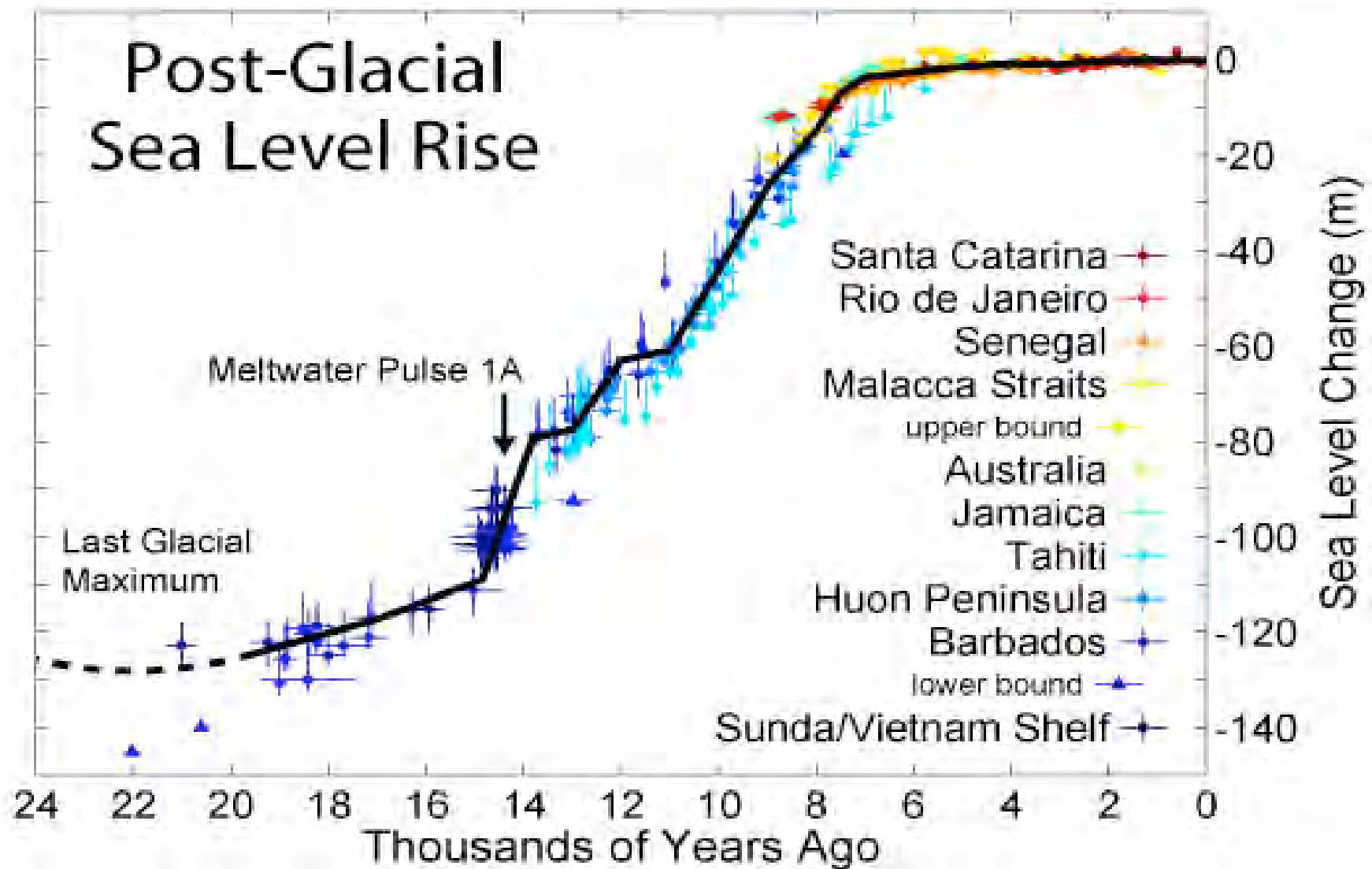
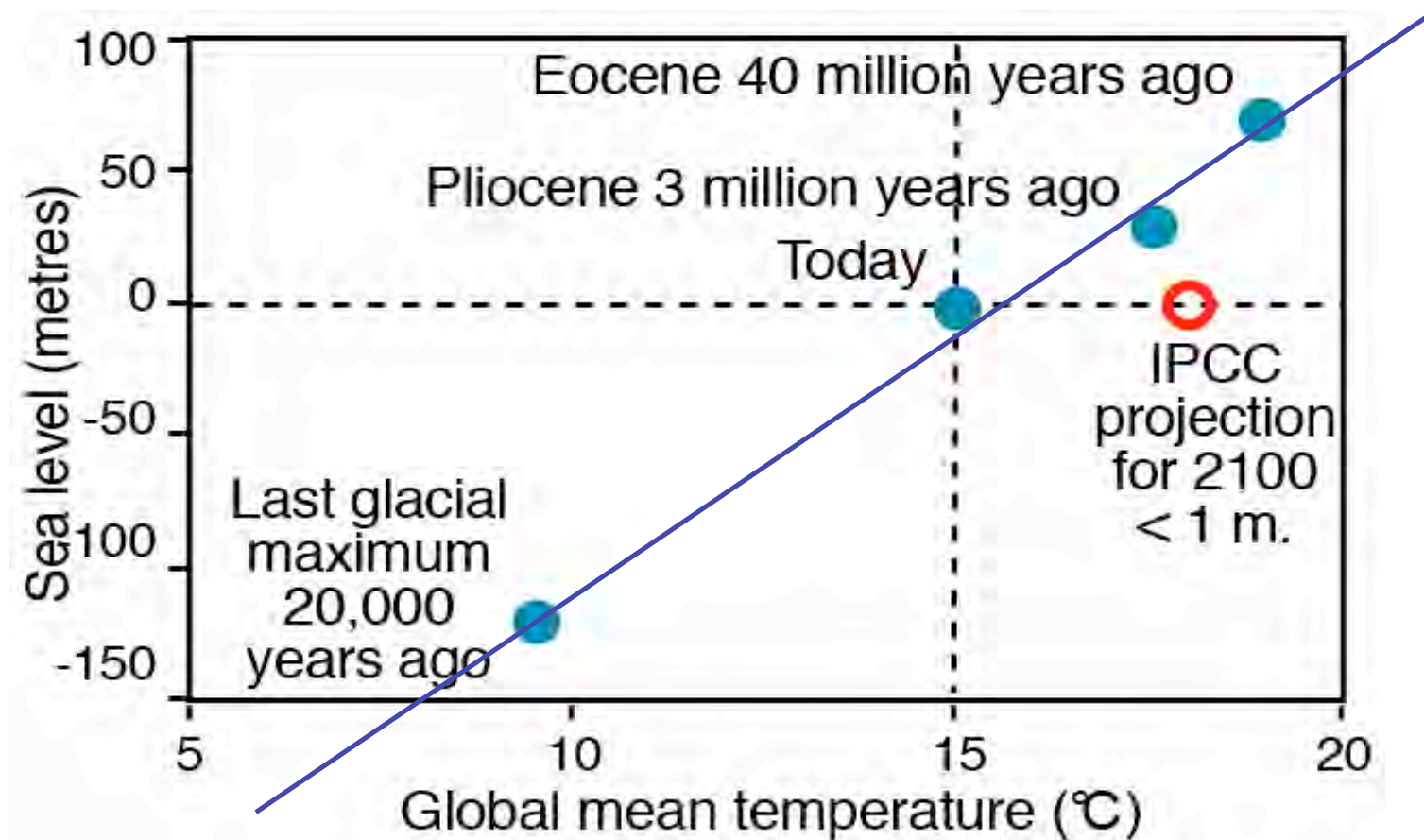


Chart by Robert A. Rohde from published data

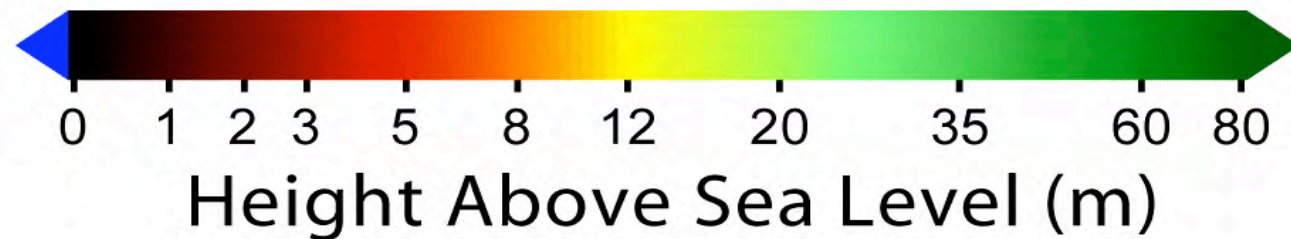
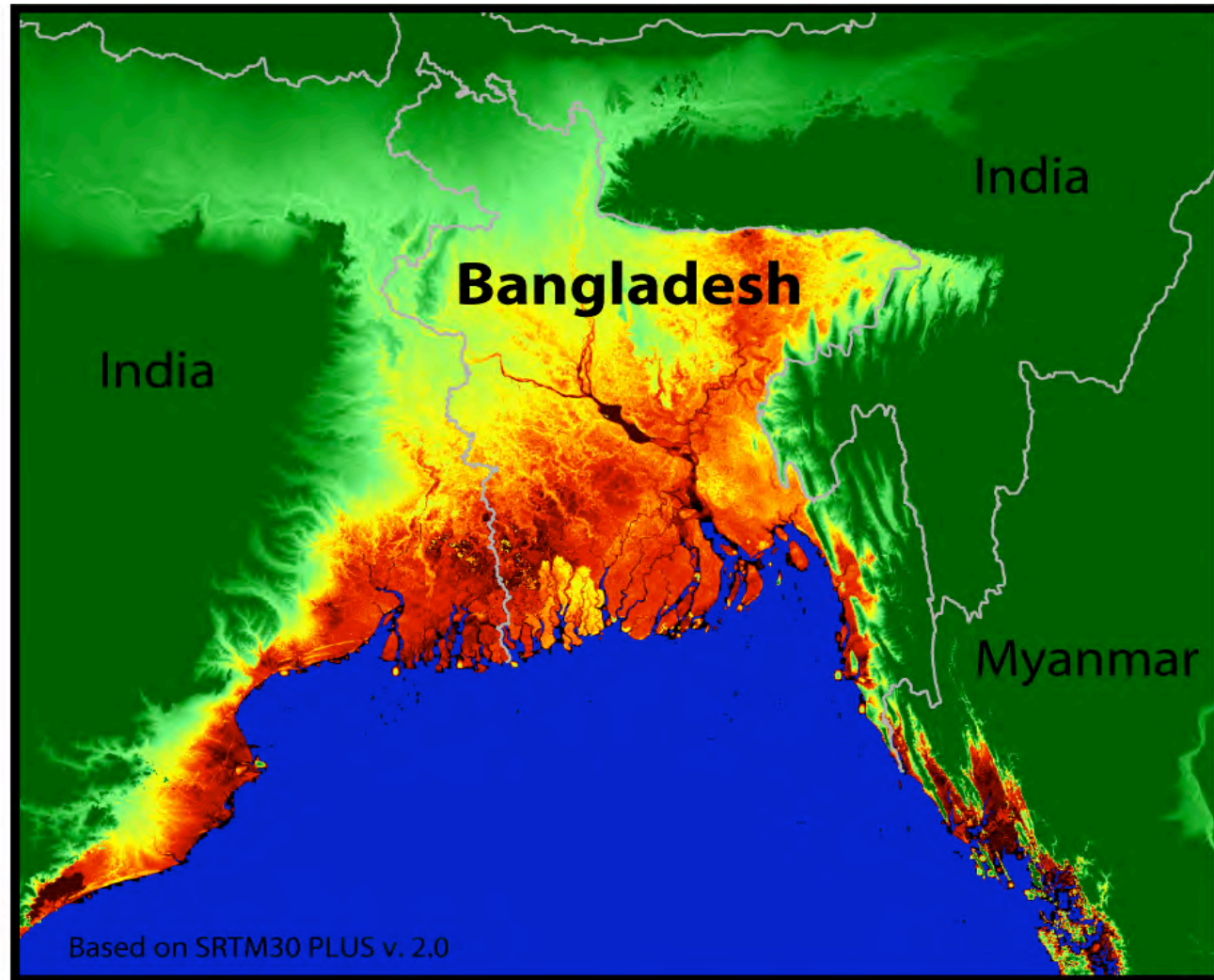
Climate code red

Sea-levels in paleoclimate record

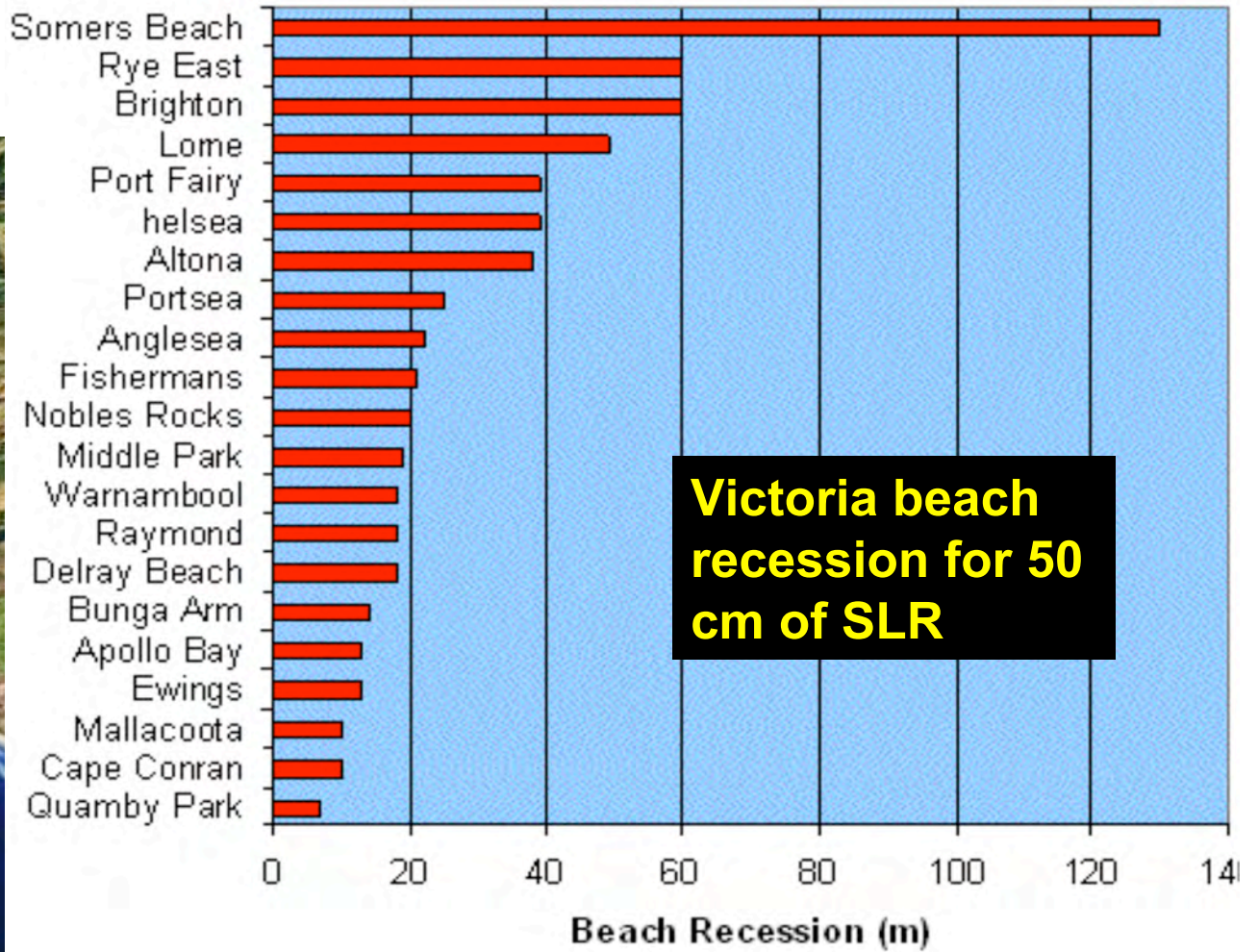


The last time temperatures were 2-3C higher (three million years ago) sea levels were 25 metres higher

Sea-level risk: Bangladesh



Coastal erosion threat: Victoria



CSIRO

Image © 2005 DigitalGlobe

© 2005 Google

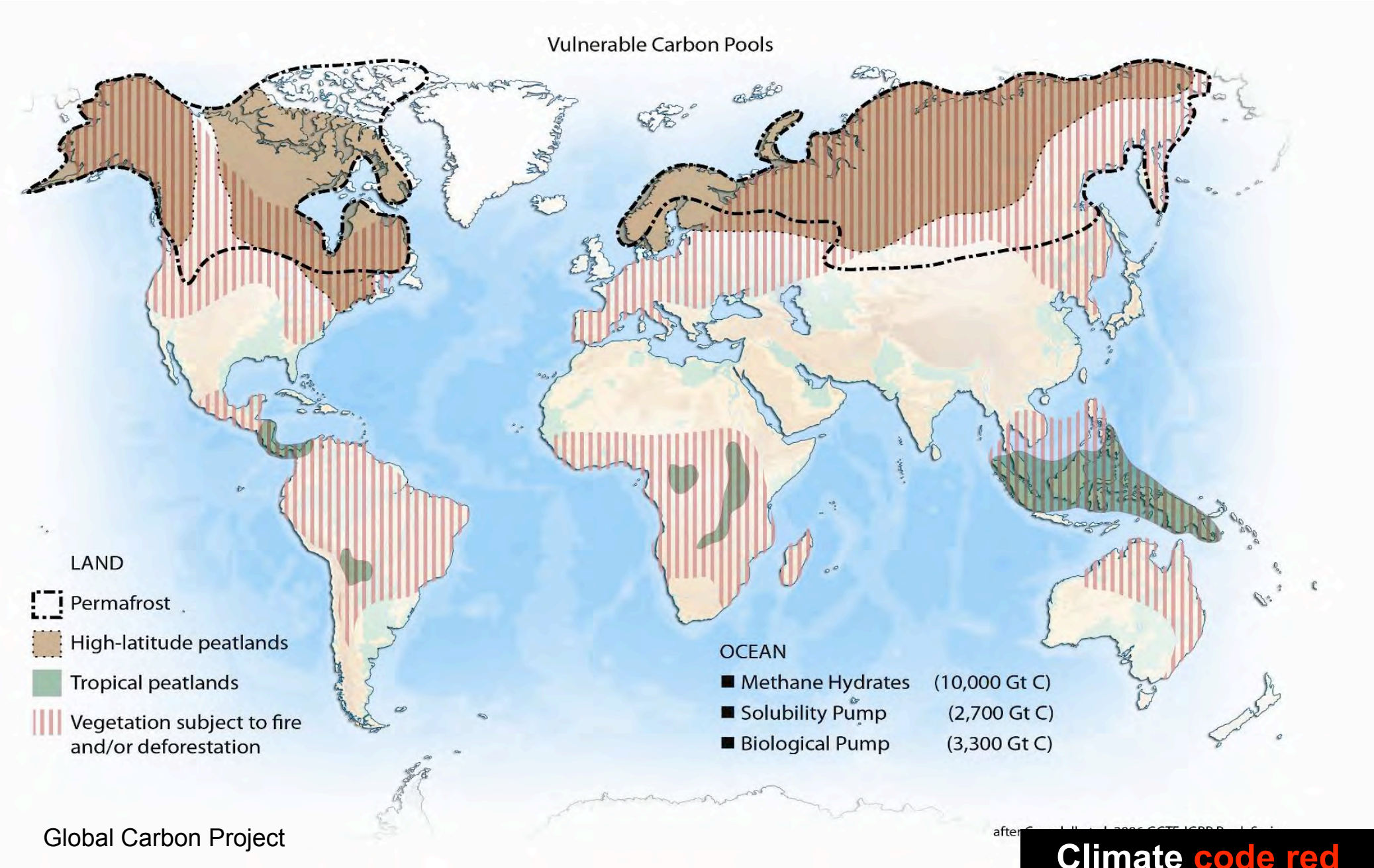
Pointer 38°44'44.90" S 143°40'12.96" E elev 83 ft

Streaming ||||| 100%

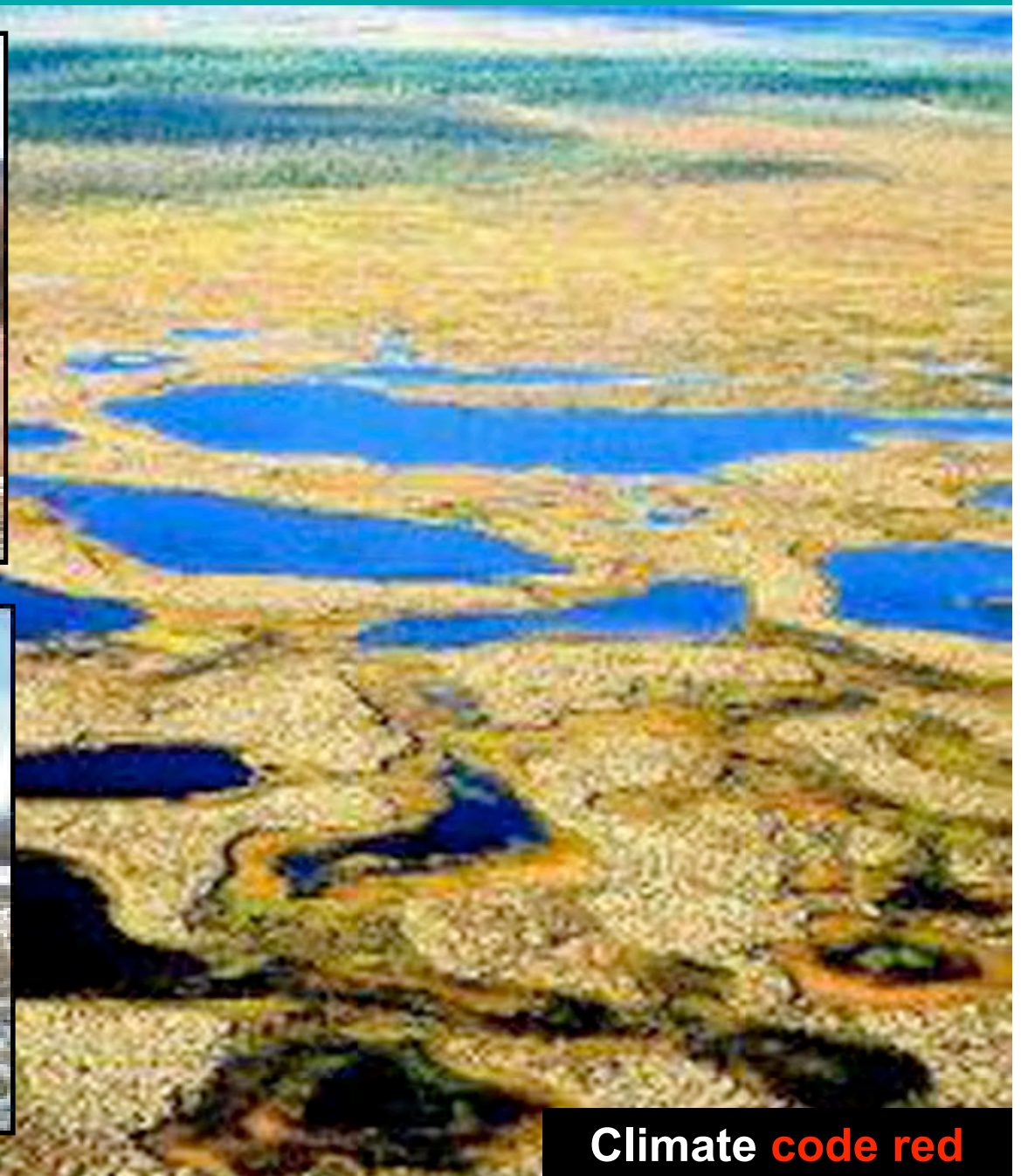
Eye alt 13550

Climate code red

Vulnerable carbon pools in the 21st century

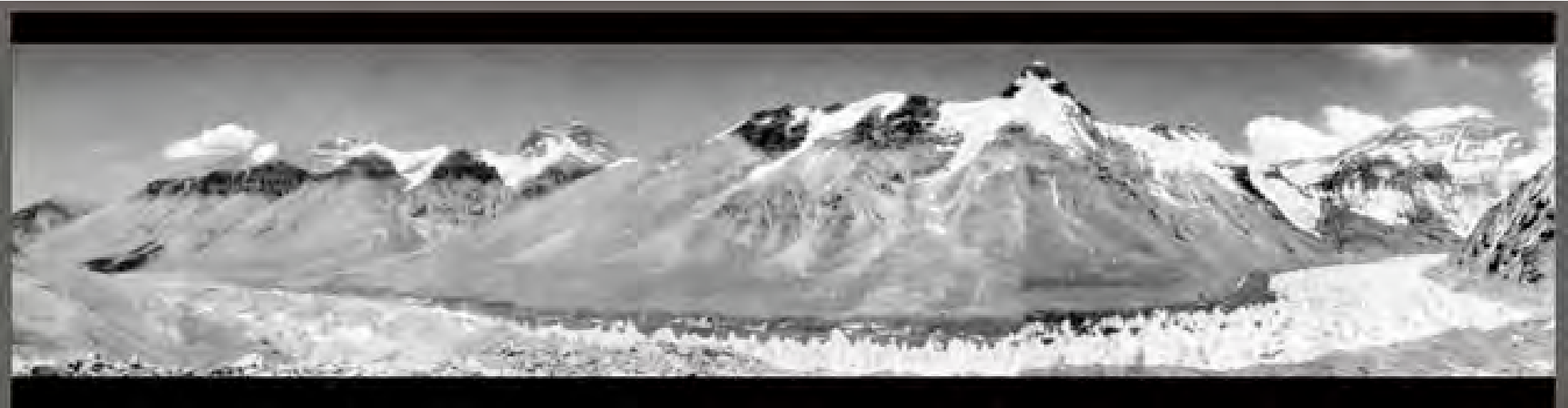


Melting permafrost



Climate **code red**

Himalayan ice-sheet and glacier loss



The massive ice flow of the Rongbuk Glacier north of Mt Everest in 1968 (top) has since declined dramatically (2007 below). Source: Science Press, China/Greenpeace/John Novis

Himalayan ice-sheet loss: consequences for Indus valley



Climate code red

Assessment of CO₂ target by James Hansen (now 387 ppm)

Phenomenon

Target CO₂ (ppm)

- | | |
|------------------------------|---------|
| 1. Arctic Sea Ice | 300-325 |
| 2. Ice Sheets/Sea Level | 300-350 |
| 3. Shifting Climatic Zones | 300-350 |
| 4. Alpine Water Supplies | 300-350 |
| 5. Avoid Ocean Acidification | 300-350 |

→ Initial Target CO₂ = 350* ppm

*assumes CH₄, O₃, Black Soot decrease

Rapid transition to post-carbon economy

1. The **only reasonable target** is 325ppm or less.
Anything more means no Arctic sea-ice, irretrievable loss of Greenland ice-sheet and large-scale permafrost carbon release.
2. We must reduce emissions to zero **as quickly as is safely possible** because the climate system is already too hot, there is more to come and we have already passed dangerous tipping points.
3. We must **cool the earth** -0.3C compared to present.

Rapid transition to post-carbon economy

The obstacles are political and social in character, rather than technological or economic



Climate **code red**

Rapid transition to post-carbon economy

Today I challenge our nation to commit to **producing 100% of our electricity from renewable energy and truly clean carbon-free sources within 10 years**... This goal is achievable, affordable and transformative.

To those who argue that we do not yet have the technology ... I've seen what they [entrepreneurs who will drive this revolution] are doing and I have no doubt that we can meet this challenge.

A photograph of Al Gore speaking at a podium. He is wearing a dark suit jacket over a light blue shirt. He has his hands raised in a gesture while speaking. The background is slightly blurred, showing what appears to be a map or a large screen.

Al Gore

18 July 2008

Rapid transition to post-carbon economy



"Solar thermal can be the big gorilla on the grid. As long as it has storage, and storage is the key, we can supply over 90 per cent of Australia's generation from this source on a continuing basis with no fuel." Prof. David Mills

Rapid transition to post-carbon economy



After Pearl Harbour, the US economy was transformed from the world's largest producer of consumer goods to world's largest producer of military goods within a year.

Fast economic transition is possible if it is planned and we really want to do it.

Climate **code red**

NESS

Rapid transition to post-carbon economy

How much is reasonable to spend to save the planet from catastrophic global warming?

Table 4 *Military burden 1939-1944 (military outlays as % of national income)*

	1939	1940	1941	1942	1943	1944
USA	1	2	11	31	42	42
UK	15	44	53	52	55	53
Germany	23	40	52	64	70	–
Japan	22	22	27	33	43	76

Source: Harrison, M. (2000) “The Economics of World War II: Six Great Powers in International Comparison”, Cambridge University Press

**Fast economic transition to a
zero-carbon world and a safe climate
is possible if it is planned and
we really want to do it.**

We can imagine transformative action.

**We can solve the global warming
crisis and re-make the way we live.**

Reducing greenhouse emissions

1. Prohibition e.g. efficiency standards, water
2. Price on greenhouse emissions i.e. carbon tax
3. Limit the quantity of emissions by licence

Cap and auction/trade (a form of rationing)

4. Innovation and research

leading to ...

5. Technological substitution

e.g. building energy efficiency programme

Limit the quantity of emissions by licence

Auction of emission permits to business

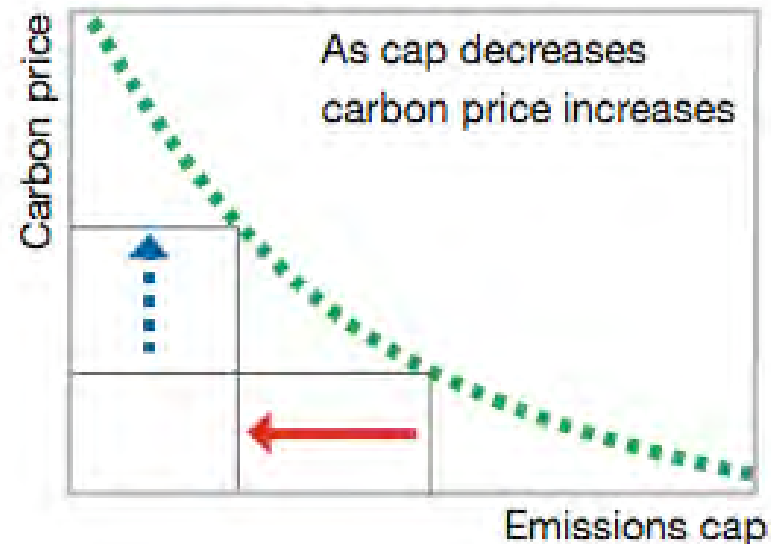
Business bid periodically in ascending auction for emission permits

Price rises as cap decreases

Permits can be traded

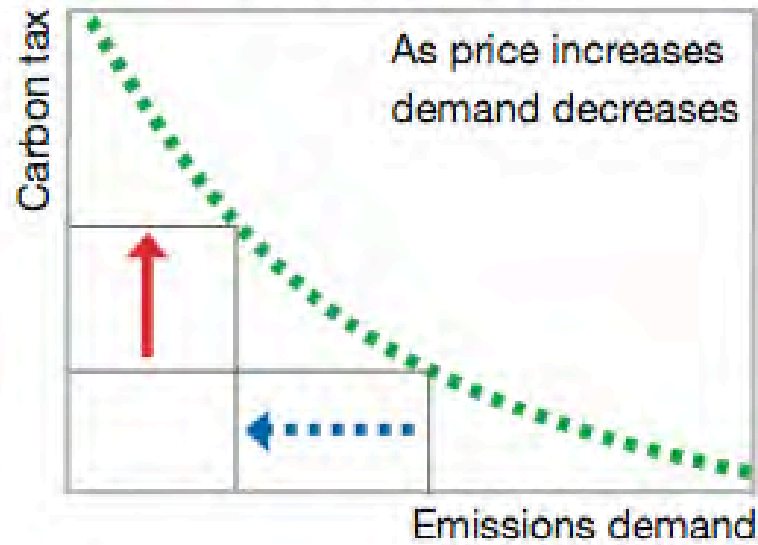
Price of goods rise with carbon intensity

Cap & trade



Put a direct price on emissions

Carbon tax



Do price / quantity mechanisms work?

Are cap and trade schemes effective?

Does cap fit the scientific imperatives?

Breadth of coverage

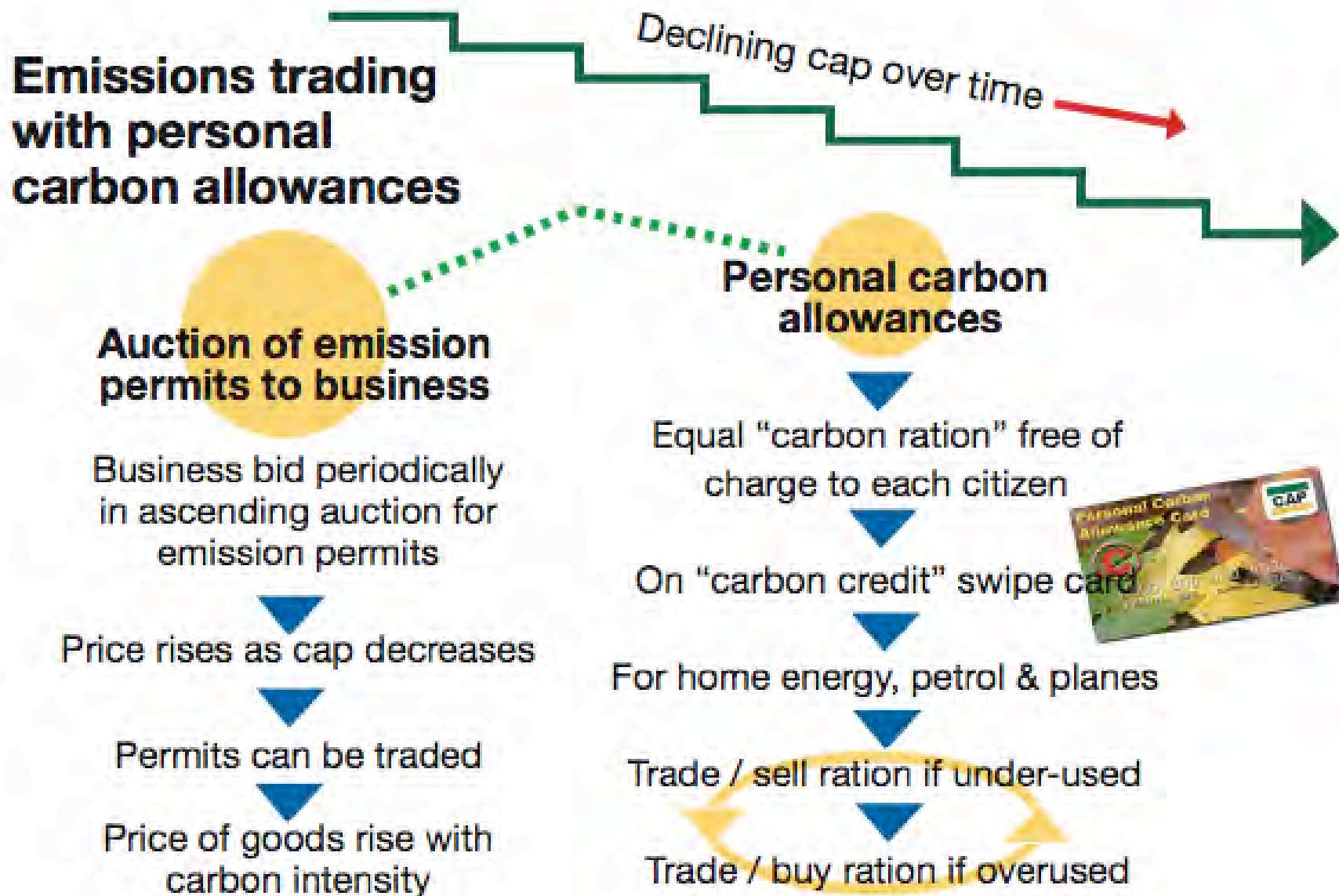
Exemptions and free permits

Border control

Price elasticity and demand reduction

Equity considerations

Personal carbon allowances



Key issues

Effectiveness

Acceptability

War rationing “fair and necessary”

Transaction costs

Capacity for people to track their ration

Political support

Equity

Personal carbon allowances and equity

Table 12: Effect of DTQs including aviation with a quota for each adult and half a quota for each child

Deciles	average net change £/year	per cent losers	per cent gainers	per cent losing £1pw
1	36.31	18	82	3
2	23.55	17	73	2
3	23.10	17	73	4
4	14.48	34	66	7
5	7.32	43	57	8
6	-3.58	47	53	10
7	-7.32	54	46	13
8	-10.23	68	32	21
9	-19.60	75	25	27
10	-42.95	78	22	31
All	0.00	48	52	13
Households with children	+11.14	41	59	13
Households with pensioners	+12.33	32	68	2

Carbon allowances would be more progressive than a carbon tax even if the tax revenues were recycled as effectively as possible

Dresner & Ekins "The distributional impacts of economic instruments to limit greenhouse gas emissions from transport" 2004 Policy Studies Institute. Table for tax of P10/tCO2

Personal carbon allowances

BOB CARR: “Individual carbon rationing with penalties for those who exceeded their quotas was one of a number of radical measures that might be needed to tackle climate change...”

IAN DUNLOP “The schemes so far discussed at State and National level are not sufficiently comprehensive for the task we now face. The simplest, most practical variant, which overcomes their flaws, is a system of Tradeable Energy Quotas... an electronic system for rationing energy.”

DAVID MILIBAND “The challenge we face is not about the science or the economic ... it is about politics”... carbon rationing “limit the carbon emissions by end users based on the science, and then use financial incentives to drive efficiency and innovation”.

Reports

www.defra.gov.uk


A Rough Guide to Individual Carbon Trading

The ideas, the issues and the next steps

Report to Defra

Simon Roberts and Joshua Thumim
Centre for Sustainable Energy

November 2006



CENTRE FOR SUSTAINABLE ENERGY

Domestic Tradable Quotas


A policy instrument for greenhouse gas emissions

Richard Starkey & Kevin Anderson

December 2005

Tyndall Centre for Climate Change Research Technical Report 39

AEA Energy & Environment
From the AEA group




Cap and Share: Phase 1; policy options for reducing greenhouse gas emissions

Interim Final Report

Report to Comhar Sustainable Development Council, Ireland

ED43215
Issue Number 4
28th May 2008



connecting you

feasta
The Foundation for the Economics of Sustainability

Cap & Share



A fair way to cut greenhouse emissions

May, 2008

€5/£4

Conclusions

Not a silver bullet

More equitable

Egalitarian

Encourages behavioural change

Communicates sense of emergency

Encourages community engagement

Encourages community education

Carbon Rationing Actions Groups (CRAGS)


A group of people who have decided to act together to reduce their individual and collective carbon footprints and reach a higher level of domestic sustainability.

1. Understand **current domestic energy use** and greenhouse gas emissions.
2. Set a **reduction target or an annual emissions target** or "carbon ration".
3. **Learn and work together** how to reduce energy use and emissions.
4. **Keep a record** of household energy use and private car and plane travel over the year and compare at year's end.
5. Optionally, at the end of the year, **be responsible** for any "carbon debt" (i.e. emissions over and above their ration or target).

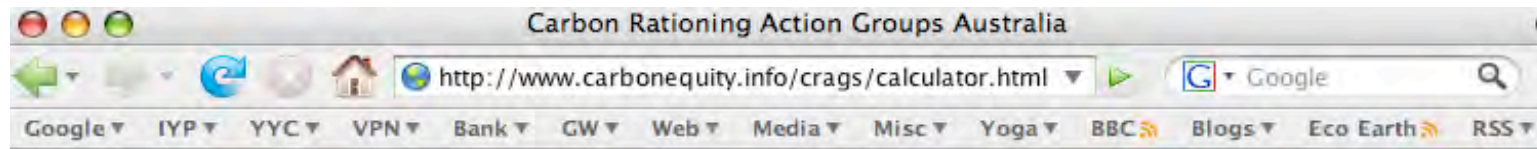
Carbon Rationing Actions Groups (CRAGS)

	Birmingham FOE
Glasgow	4500kgCO ₂ for home, car, plane and long distance bus and train; over-emissions pay and under-emissions receive at 7p per kgCO ₂ .
Hereford	targetting 4000 kg CO ₂ with a 0p penalty for 2007-8
Islington	targetting 4050Kg, started on Dec 1st 2006, 10 members, 5p per Kg CO ₂ penalty for high emitters, 5p per Kg CO ₂ reward for low emitters.
Langport	Target of 8,400kg as a group average, with a penalty of 2p per kg over and a cap of Â£100
Leeds	Each of us is setting our own reduction targets and penalties.



 Active: CRAGs which have set their rules and started their carbon years.

Carbon Rationing Actions Groups (CRAGS)






Carbon Rationing Action Groups

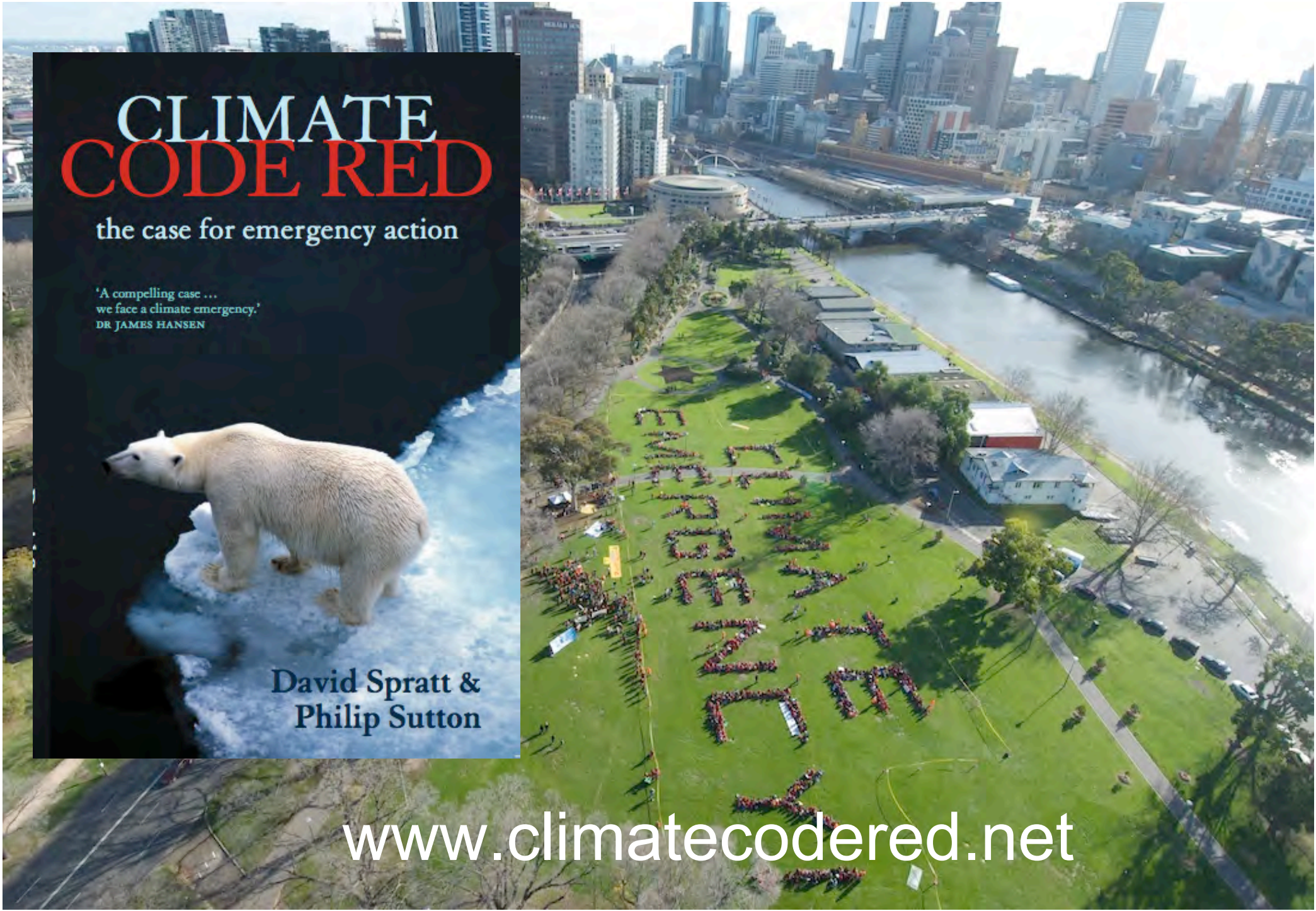
What | Why | How | Calculator | Groups | Forum | Contact

Carbon calculator

Calculate your household energy and private transport carbon dioxide (CO₂) emissions **for one year**

	Victoria	Your usage	Emissions CO ₂ tonnes
 Electricity	Kilowatt hours (kWh) / year	<input type="text"/>	0
	% green electricity	0% <input type="text"/>	
 Gas	Megajoules (MJ) / year	<input type="text"/>	0
 Motor vehicles	1st vehicle Fuel type	Petrol <input type="text"/>	
	OPTION 1: litres / week	<input type="text"/>	
	OPTION 2: Kilometres / year	<input type="text"/>	
	Vehicle size	Compact <input type="text"/>	0


www.carbonequity.info/crags



**CLIMATE
CODE RED**

the case for emergency action

'A compelling case ...
we face a climate emergency.'
DR JAMES HANSEN



David Spratt &
Philip Sutton

www.climatecodered.net