

Climate Change and Christian Responsibility

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Introduction

Some quotes relating to climate change:

Extinction is forever.

Anon

This is the most serious problem facing humanity in the 21st century ... this is the problem that if we don't address it will undermine and perhaps destroy civilization ... Don't be under 40 ... if we fail to solve this problem, my advice to people is not to be under 40.

Professor Tom Burke, Imperial College London (BBC interview, 2006)

Introduction

1. Climate change is one of the defining issues of our time – with multiple dimensions: ethical, political, environmental, economic, scientific, international relations, food security, etc.
2. The subject is highly complex and controversial, where there is *deep uncertainty* and where there is a risk of humanity inflicting large-scale, irreversible damage to key biophysical systems, destroying countless species, submerging numerous coastal settlements and making the planet much less agreeable for human life
3. How should Christians handle an issue of this kind? What is a responsible approach? Have we done a good job thus far?

Christian responsibility and challenging issues

1. We are constantly confronted with complex, controversial and challenging issues – ethical, social, economic, political, environmental (or all combined)
2. In addressing such issues we should, as Christians:
 - become well informed about the issues and what is at stake
 - take the relevant scientific theories and evidence seriously
 - draw upon, and apply appropriately, the great doctrines, themes and insights of the Christian faith
 - assess the benefits and costs, and consider the risks (if any)
 - take appropriate precautionary action (when required)
 - accept the possibility of being wrong (humility)

Scientific theories and evidence

1. We need to take scientific theories and evidence seriously, but also recognize that science deals with testable and falsifiable propositions; new theories, hypotheses and conjectures are often found wanting, and are revised or discarded
2. The proposition that increasing CO₂ concentrations in the atmosphere will increase the global mean surface temperature (other things being equal) is well established, and has been taught in universities for well over 60 years; the initial detailed calculations regarding the impact of doubling CO₂ concentrations were undertaken by the Swedish chemist, Svante Arrhenius, in the 1890s (Nobel prize, 1903)

Scientific theories and evidence

3. In order to assess the scientific evidence on climate change, the UNEP and WMO established the Intergovernmental Panel on Climate Change (IPCC) in 1988. The IPCC has completed 4 major assessments, the most recent in 2007. These assessments involve hundreds of scientists and policy experts from around the world; each report goes through two lengthy and demanding peer review processes involving thousands of scientists and policy experts.
4. The 4AR Synthesis Report, Summary for Policy Makers, was approved in November 2007 by virtually every government in the world

Scientific theories and evidence

5. The major findings of 4AR include:

- “Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.” (1906-2005 about 0.75°C increase)
- “Most of the observed increase in globally-averaged temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic GHG concentrations.” (‘very likely’ means 90%+ probability)
- “Continued GHG emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would *very likely* be larger than those observed during the 20th century.”

Scientific theories and evidence

5. The major findings of 4AR include:

- “Anthropogenic warming could lead to some impacts that are abrupt or irreversible, depending upon the rate and magnitude of the climate change.”
- “Responding to climate change involves an iterative risk management process that includes both adaptation and mitigation and takes into account climate change damages, co-benefits, sustainability, equity and attitudes to risk.”

Scientific theories and evidence

6. Dr Jim Hansen (head of NASA's Goddard Space Centre) et al (2008)

"Humanity today, collectively, must face the uncomfortable fact that industrial civilization itself has become the principal driver of global climate. If we stay our present course, using fossil fuels to feed a growing appetite for energy-intensive life styles, we will soon leave the climate of the Holocene, the world of human history. The eventual response to doubling pre-industrial atmospheric CO₂ likely would be a nearly ice-free planet."

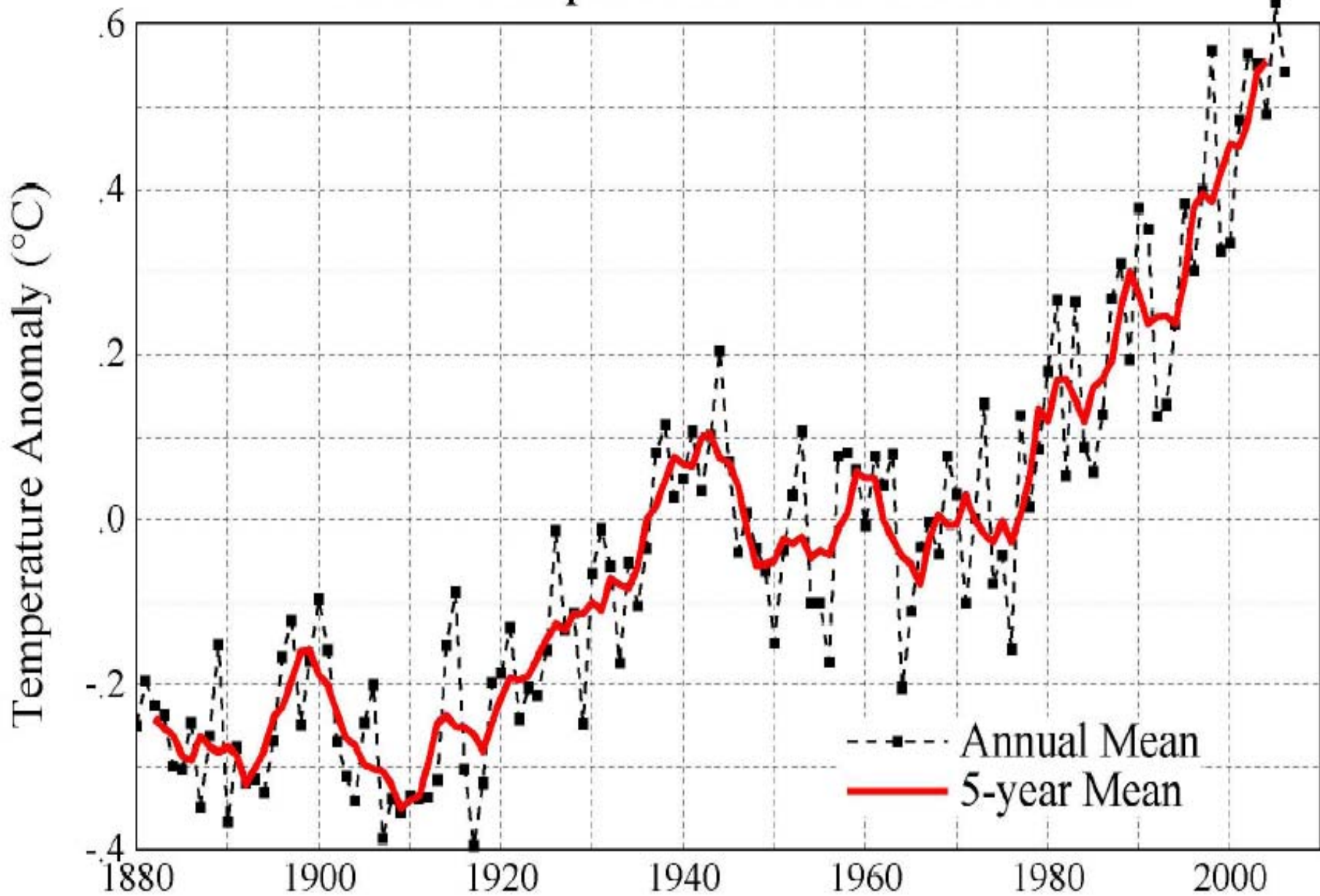
Scientific theories and evidence

Dr Jim Hansen et al (2008)

“Continued growth of greenhouse gas emissions, for just another decade, practically eliminates the possibility of near-term return of atmospheric composition beneath the tipping level for catastrophic effects.

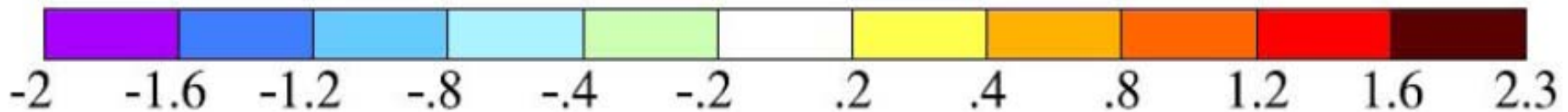
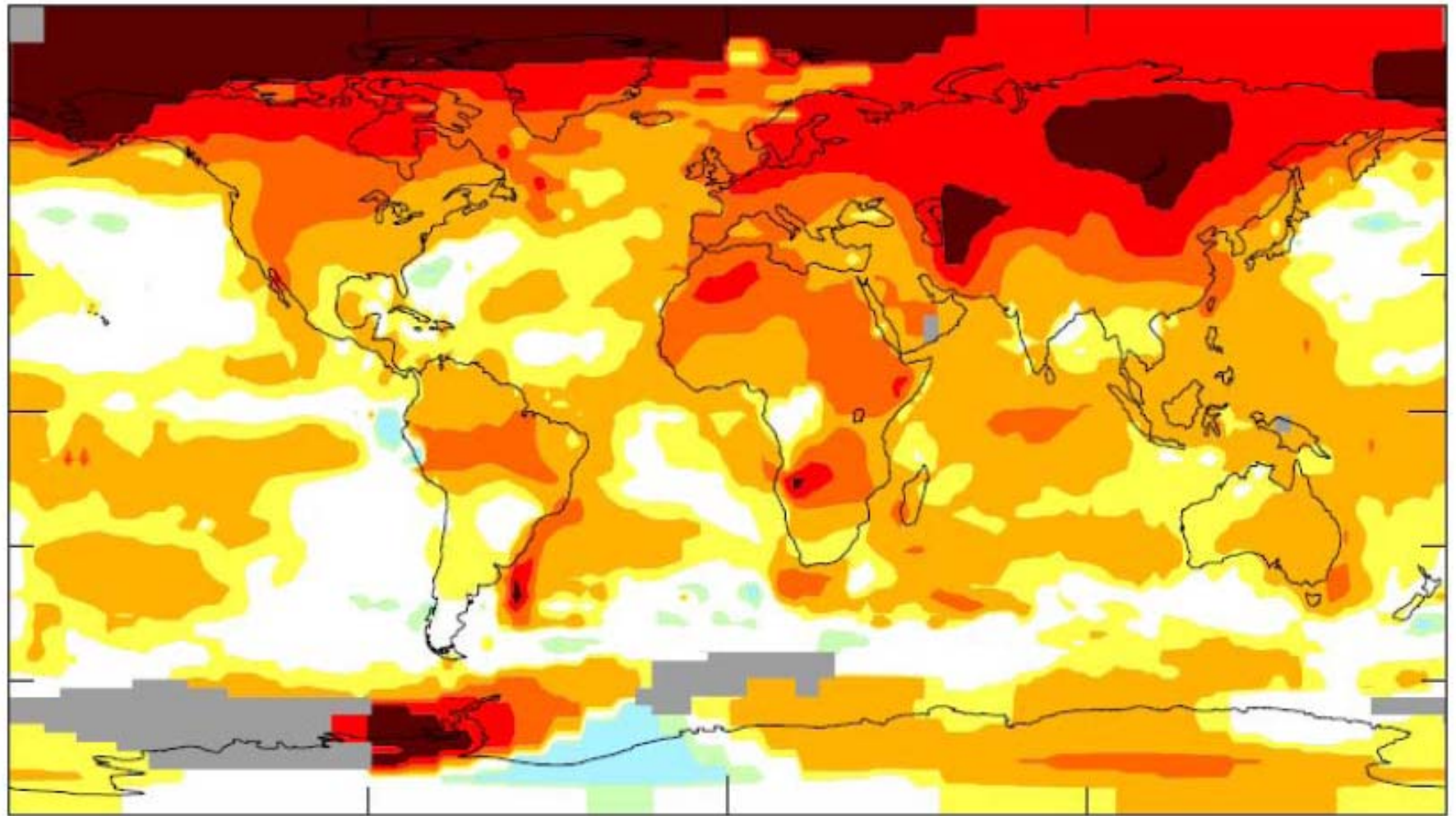
The most difficult task, phase-out over the next 20-25 years of coal use that does not capture CO₂, is herculean, yet feasible when compared with the efforts that went into World War II. The stakes, for all life on the planet, surpass those of any previous crisis. The greatest danger is continued ignorance and denial, which could make tragic consequences unavoidable.”

Global Temperature: Land-Ocean Index



2001-2007 Mean Surface Temperature Anomaly ($^{\circ}\text{C}$)

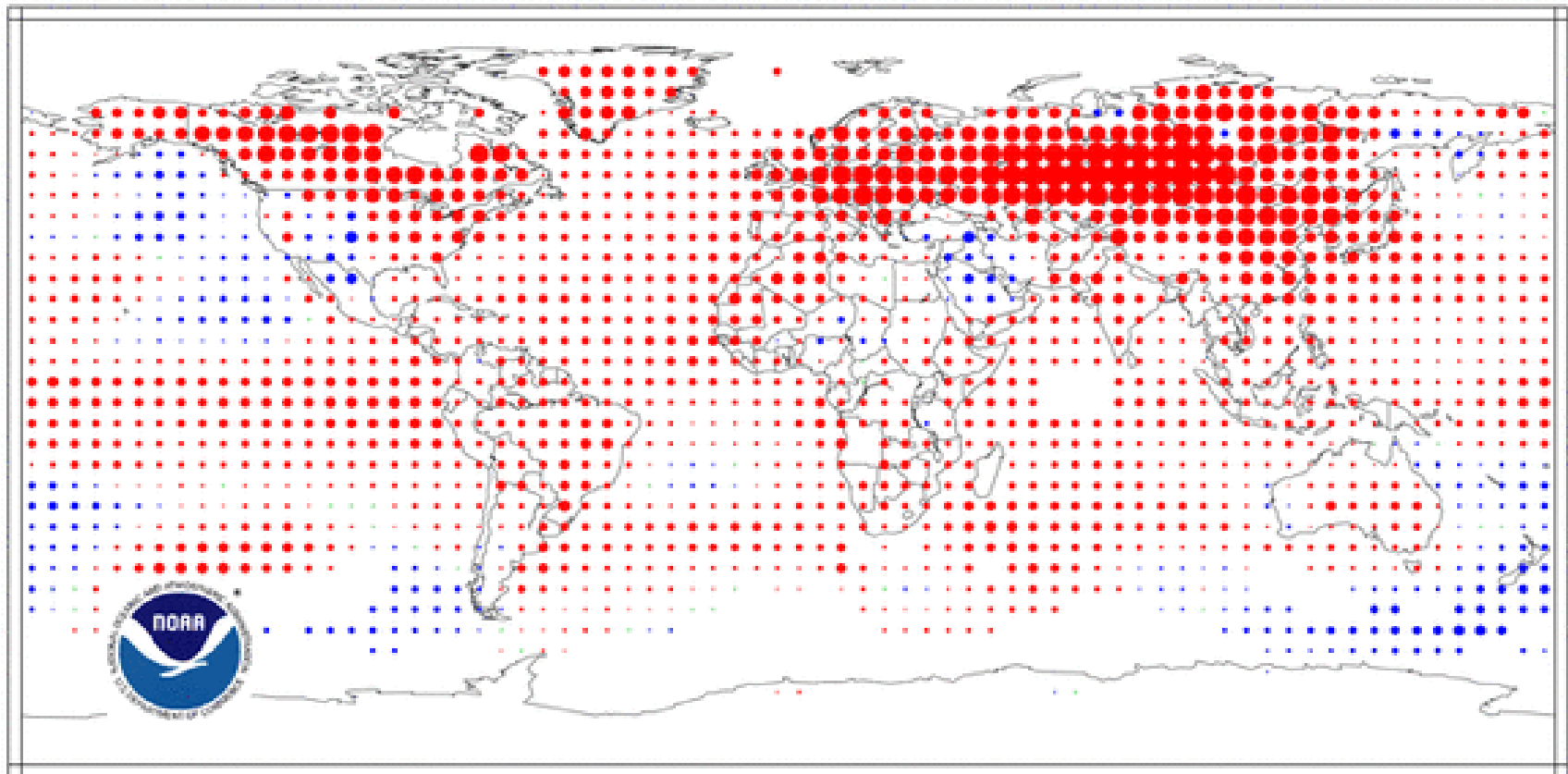
Base Period = 1951-80, Global Mean = 0.54



Temperature Anomalies Dec-Feb 2007

(with respect to a 1961-1990 base period)

National Climatic Data Center/NESDIS/NOAA

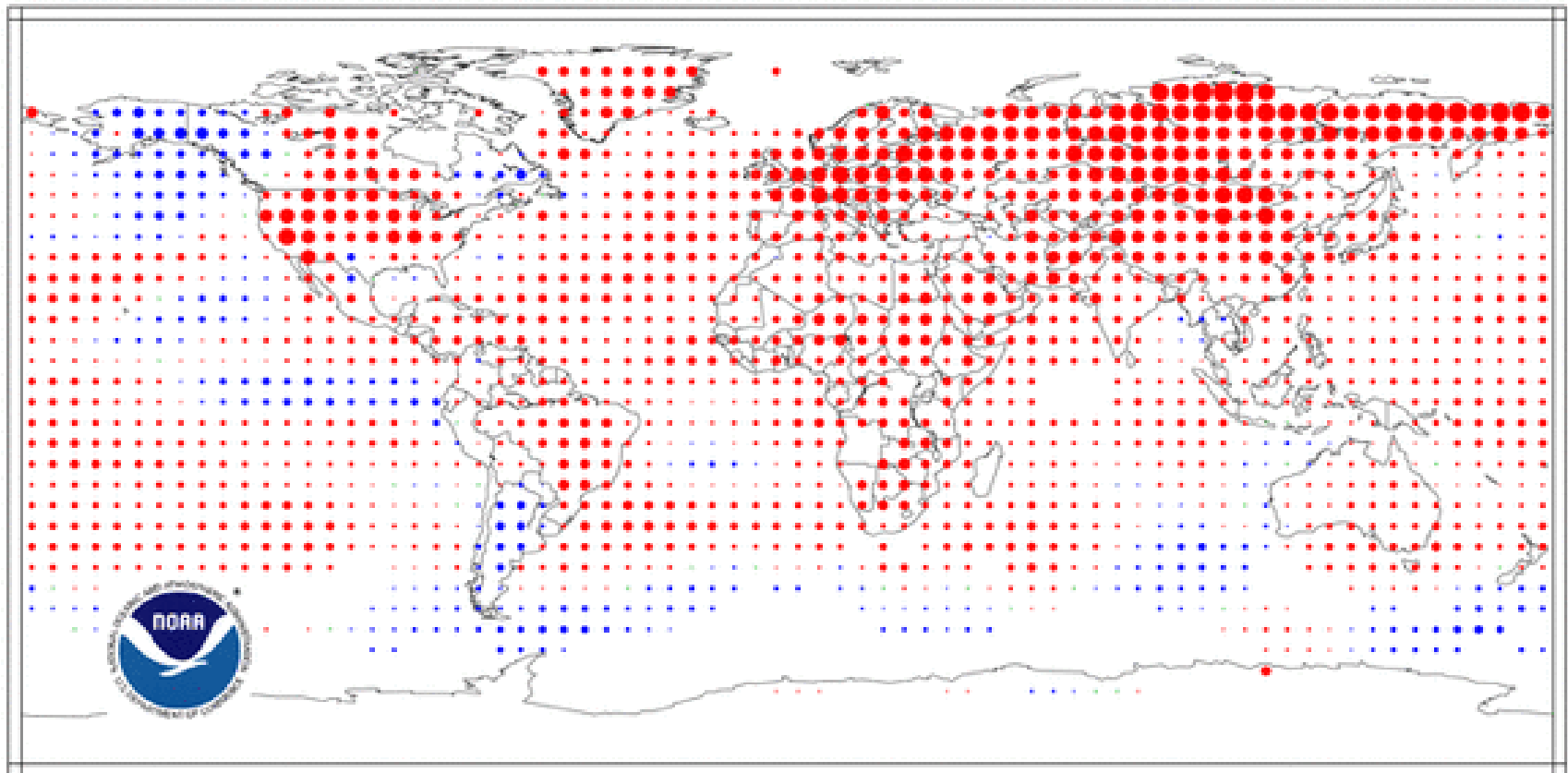


Degrees Celsius

Temperature Anomalies Mar-May 2007

(with respect to a 1961-1990 base period)

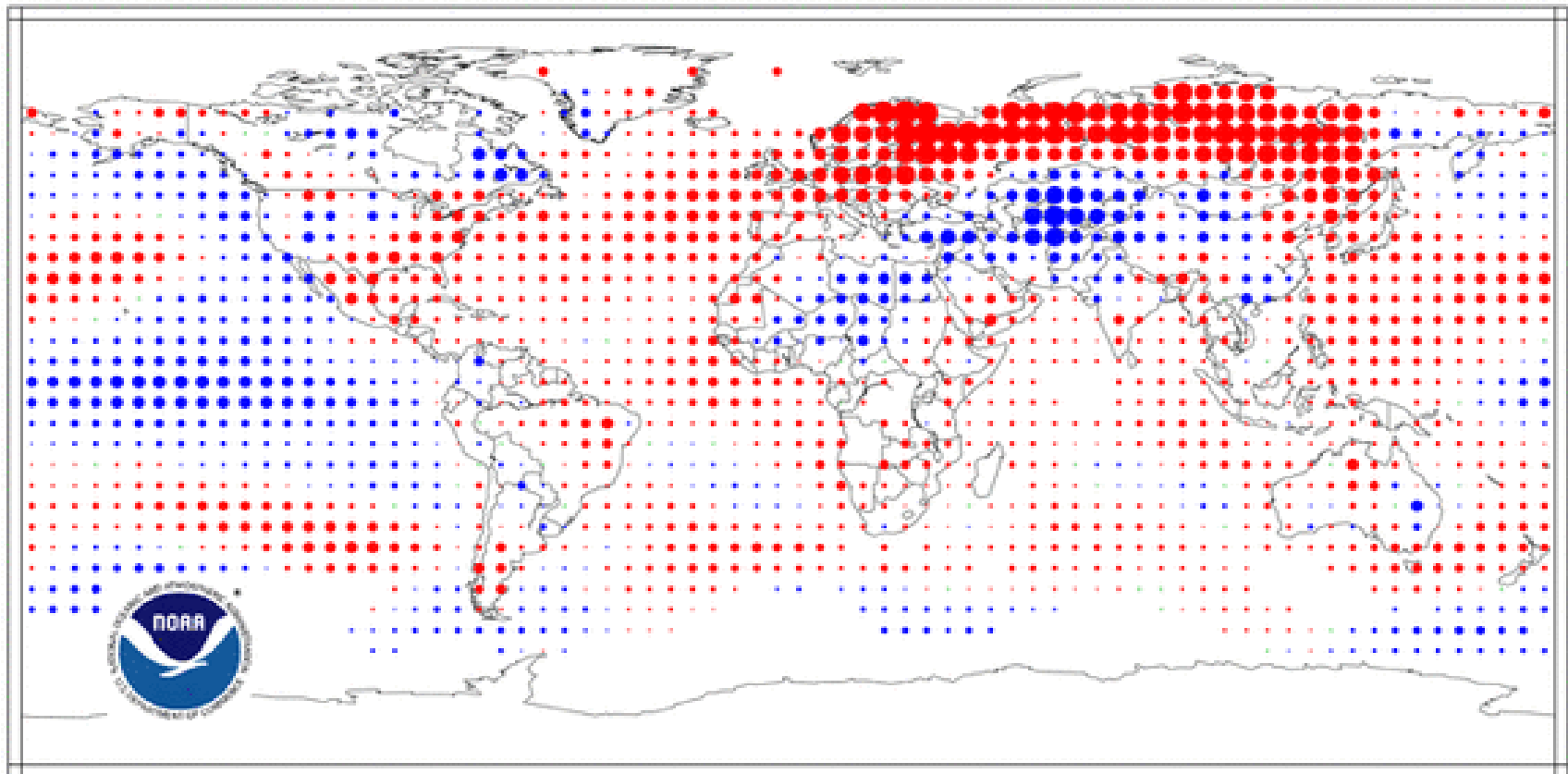
National Climatic Data Center/NESDIS/NOAA



Temperature Anomalies Dec-Feb 2008

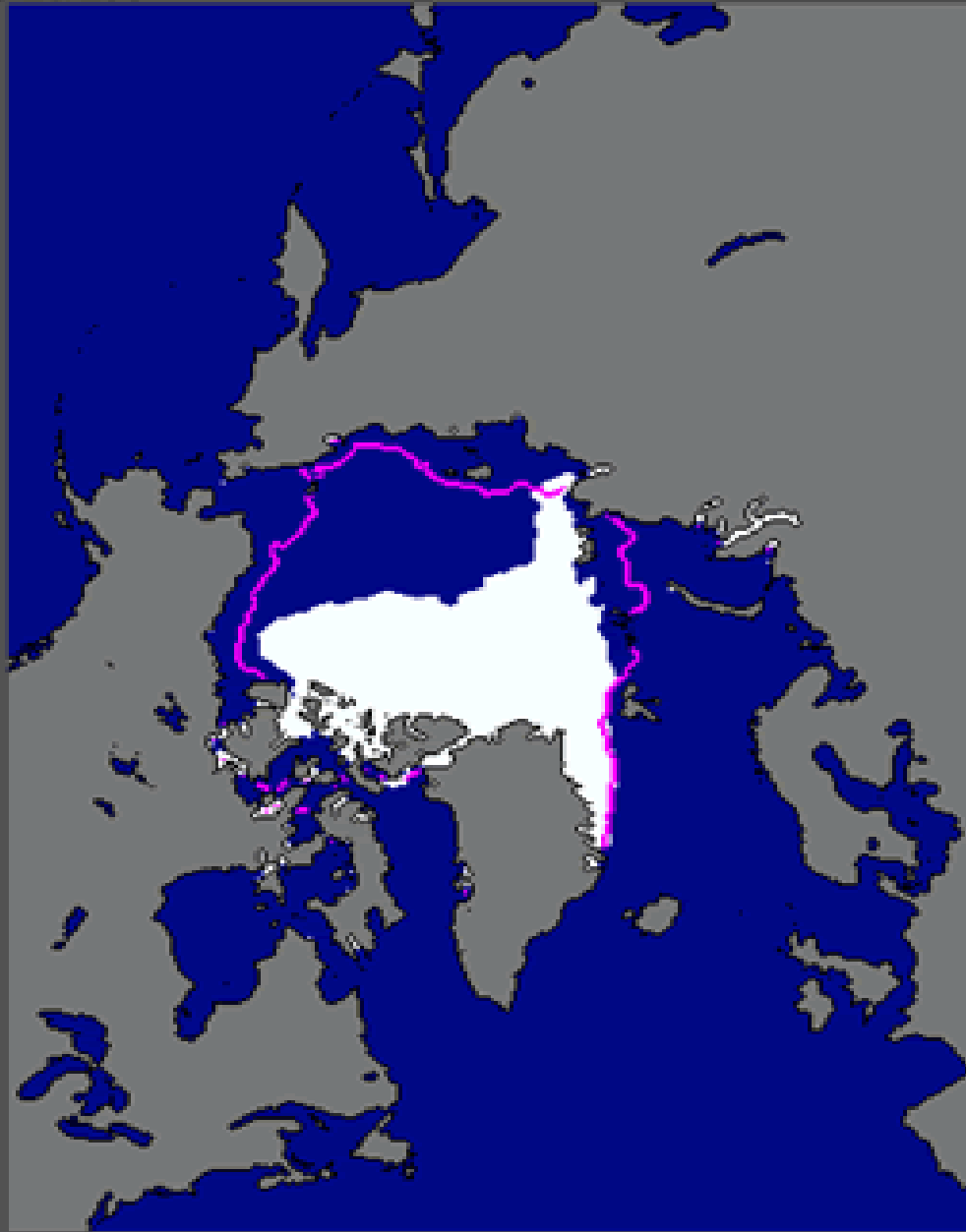
(with respect to a 1961-1990 base period)

National Climatic Data Center/NESDIS/NOAA



Degrees Celsius

Current Ice Extent
09/25/2007



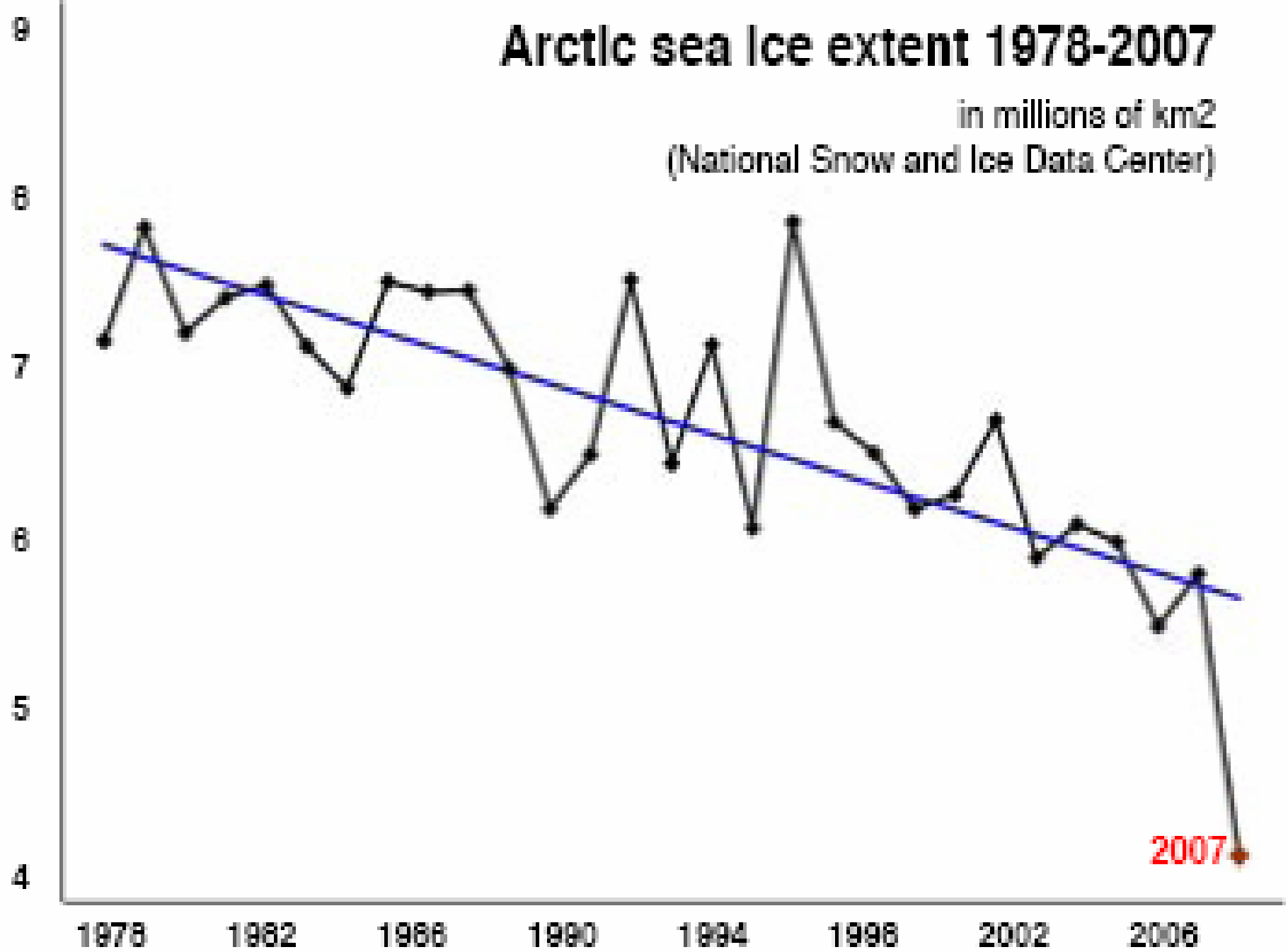
National Snow and Ice Data Center, Boulder, CO

median
ice edge

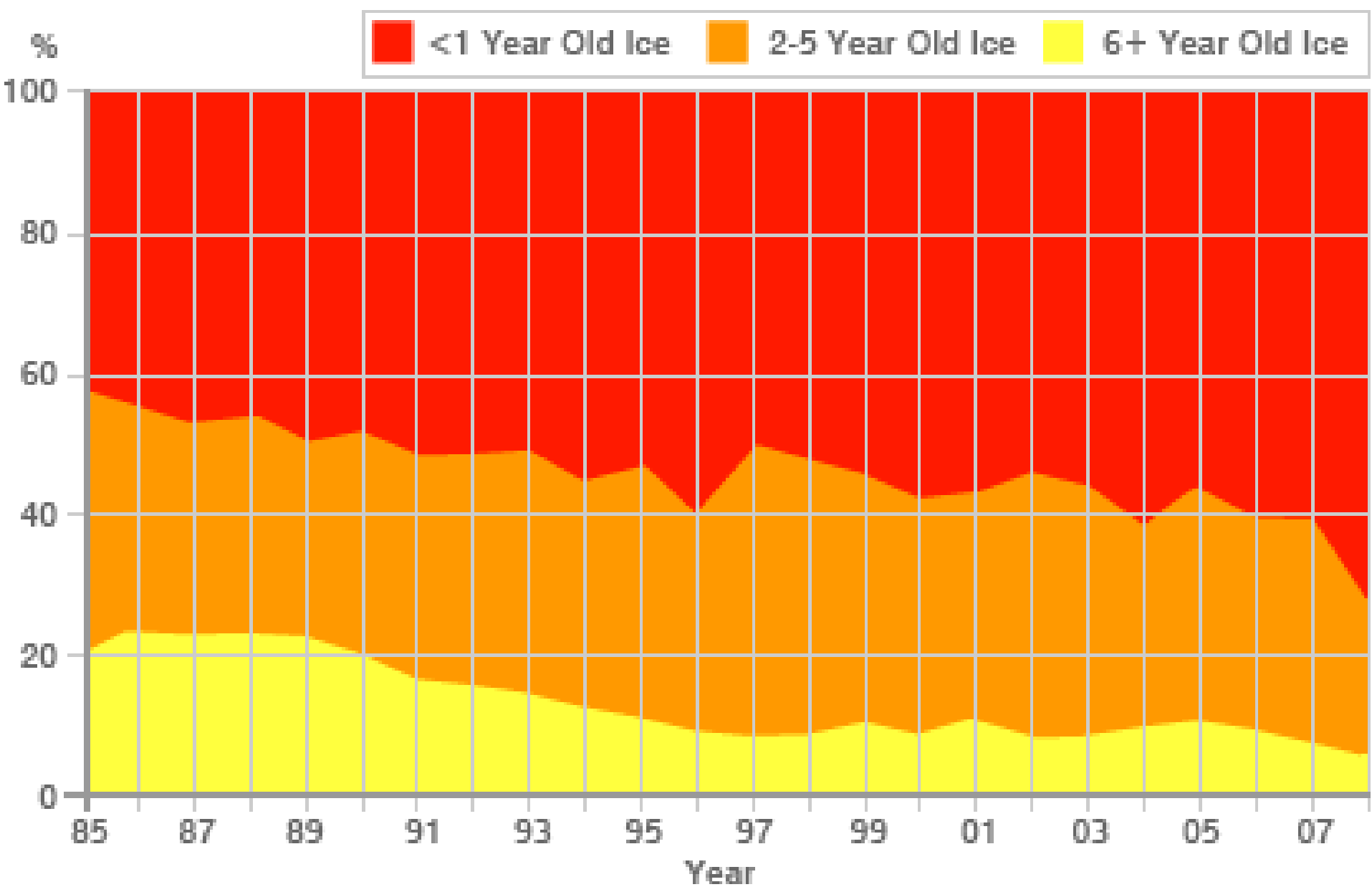
Total extent = 4.2 million sq km

Arctic sea ice extent 1978-2007

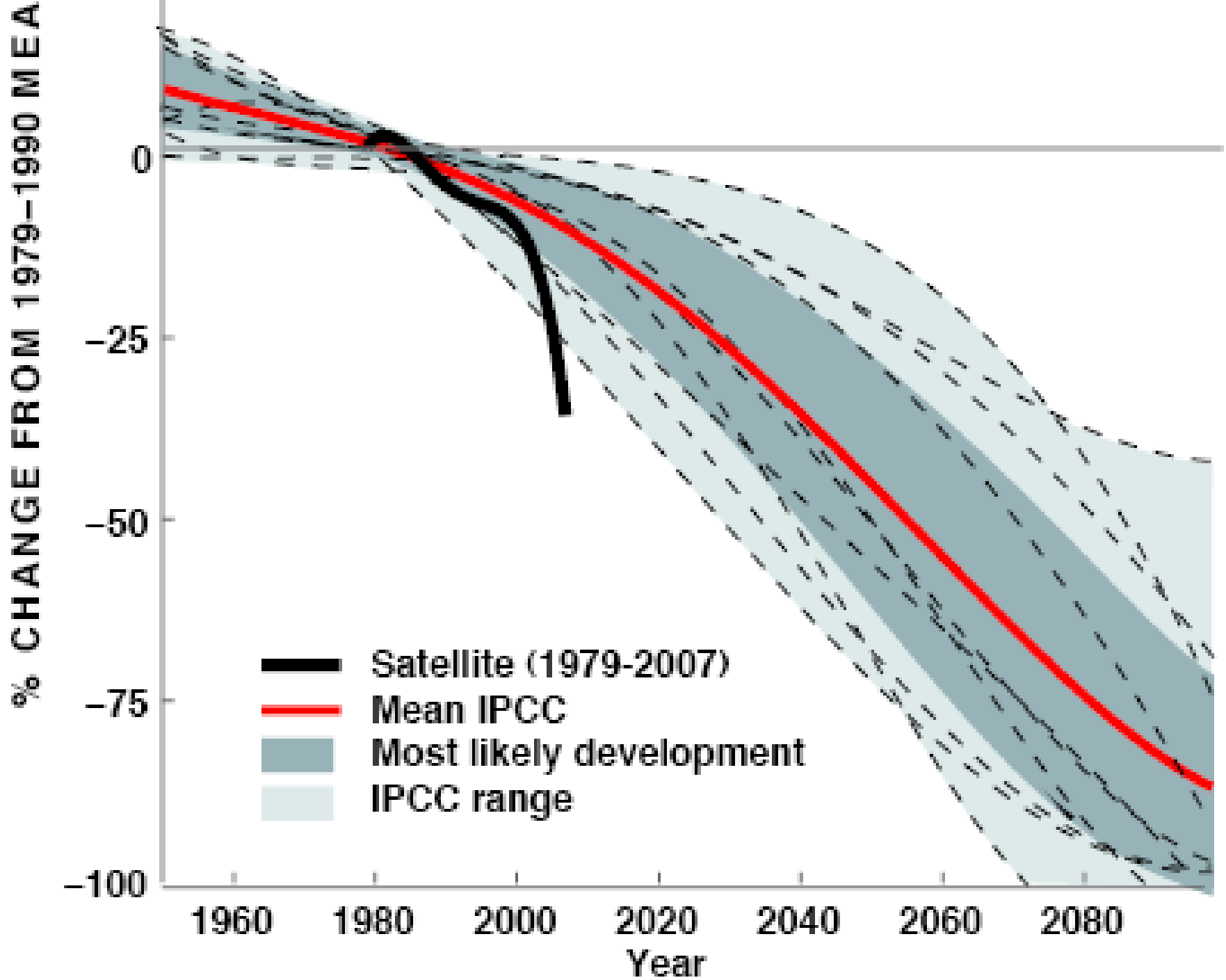
in millions of km²
(National Snow and Ice Data Center)



ICE AGE - THE ARCTIC IN FEBRUARY



SOURCE: NSIDC



Jakobshavn Ice Stream in Greenland

Discharge from major Greenland ice streams is accelerating markedly.



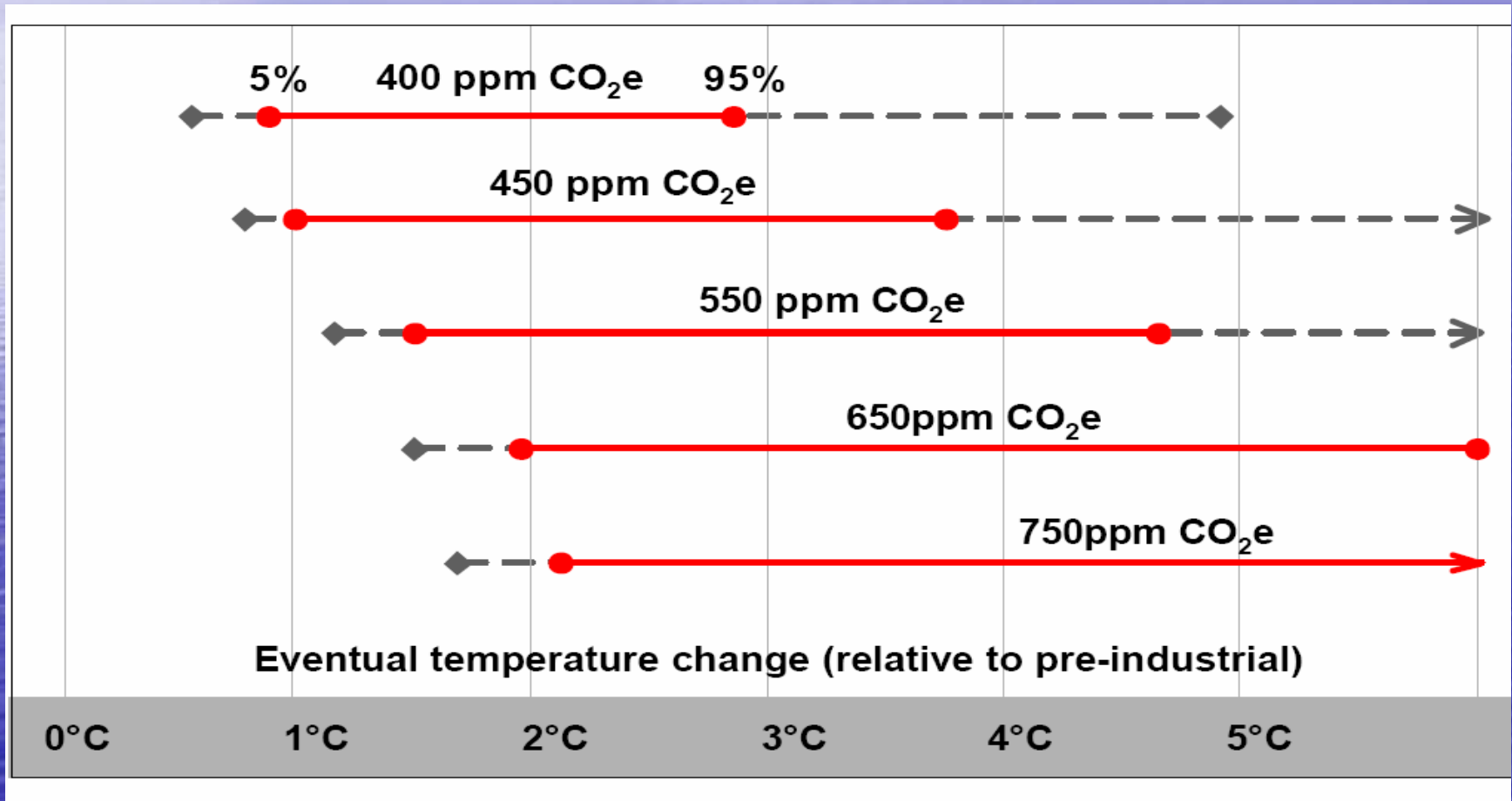
*Source: Prof. Konrad Steffen,
Univ. of Colorado*



What needs to be done?

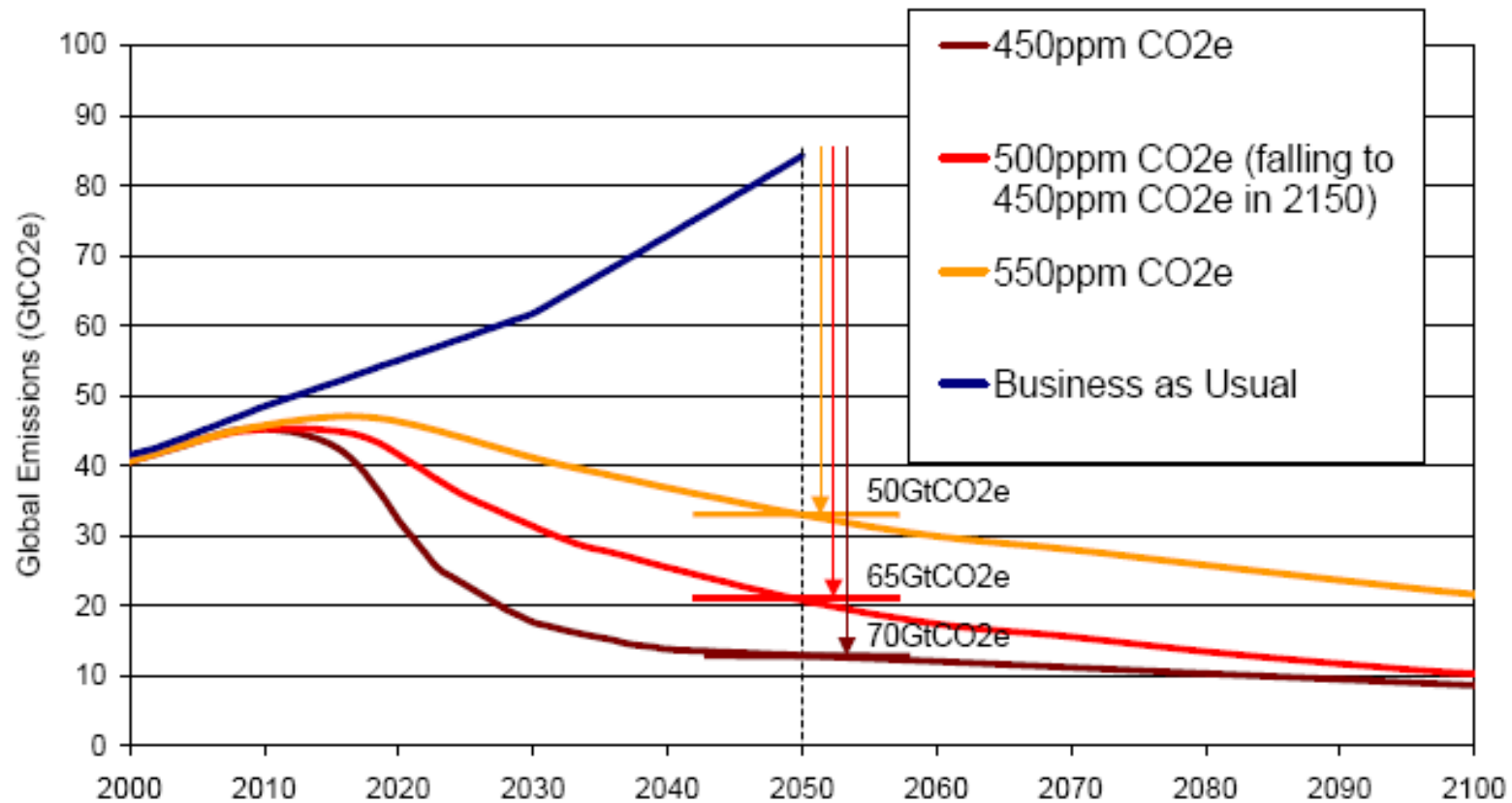
1. The global mean surface temperature has increased about 0.75°C above pre-industrial levels, and there is another 0.5°C in the pipeline (due to lags)
2. To prevent an increase of much over 2°C (above pre-industrial), CO_2 equivalent concentrations need to be stabilized at under 500ppm (currently about 430ppm and rising at 2ppm p.a.)
3. To achieve this target, *global* GHG emissions need to be reduced by 50-85% by 2050, and even further beyond this date. This implies much larger cuts by developed countries like NZ (e.g. up to 90%)
4. Put differently, current global GHG emissions need to be reduced from about 6-7 tons per capita to about 2 tons per capita (NZ emissions are currently about 20 tons per capita)

Stabilization targets and temperature implications (from Stern Review)



Emission paths to stabilization

(from Stern Review)



Theology and climate change

1. Key theological doctrines of relevance to Christian ecological ethics include:

- Creation – human beings have a two-fold responsibility in relation to God's creation, as stewards and priests
- The Fall/sin – human responsibility for damaging and distorting the Creation
- Incarnation – God, in Christ, affirms the value of the material world and humanity
- Resurrection, redemption and the New Creation
- Other key values (including justice) and virtues (such as love and hope)

Theology and climate change

1. The Doctrine of Creation – human beings have a two-fold responsibility in relation to God's creation
 - First, as 'priests' of creation – made only 'a little lower than Angels' and 'crowned with honour and glory' (Ps 8), humans are called to give voice to creation's praise of its Creator. Our calling, as those made in the image of God, is to continue God's blessing of the Creation – preserving its beauty, nurturing its fruitfulness and offering back to God what was originally supplied
 - Second, as 'stewards' of creation, humans have 'dominion'; but this does not mean *domination*; stewardship must be defined by the Lordship of Christ, which is characterized by servanthood, humble obedience, reconciliation and restoration

Theology and climate change

2. The New Creation

The Apostle Paul talks about the creation waiting in eager longing for the glory of God to be revealed (Rom 8) and the creation groaning in labour pains. The image here is not merely that of pain associated with *suffering*, but also the pain associated with *birth*. But what is coming to life? For Paul, it is a *new creation*, based on the Resurrection, the advent of which is equally, if not more, significant than the original creation. For the author of Revelation, it is a *new heaven and a new earth*. Whatever the terminology, the emphasis is on a new reality emerging from the old – related to the old yet distinct and transformed. This does not imply that we should welcome the destruction of the old, whether via human-induced climate change or any other means; on the contrary.

Theology and climate change

3. Considerations of justice:

- Christian ethics (both OT and NT) places a strong emphasis on the addressing the needs of the poor and disadvantaged
- There is strong evidence that human-induced climate change is already affecting the poor and disadvantaged in a disproportionate manner (e.g. via severe droughts, floods, food price increases, civil conflicts, etc.) and that much worse is to come (especially in Africa, Asia and small island states)

Some problematic approaches

Many Christians continue to argue that the prevailing scientific theories, evidence and conclusions about the causes and consequences of climate change, as reflected in the assessment of the IPCC, are seriously flawed or simply wrong.

Numerous examples, let me note two:

Some problematic approaches

Thomas Sierger Derr ' The Politics of Global Warming', *First Things*, August/Sept. 2007 (Emeritus Professor of Religion and Ethics)

- Rejects virtually all the scientific evidence as presented by the IPCC
- Constantly refers to the 'mainstream' scientists and their supporters as promoters of 'alarmism'
- Concedes, however, that "atmospheric emissions can affect climate ... so perhaps there is something to the greenhouse gas theory"!!
- Claims that "economies would be wrecked by adoption of the Kyoto targets."
- Claims that "Environmental alarmism is part of a systematic rejection of industrial civilization, of technology, consumerism, globalization, and what most of us think of as growth and progress ..."
- Says nothing about the ethical issues at stake or how Christian should respond to uncertainty and risk; no mention whatsoever of the precautionary principle; a profoundly disappointing article, especially for a former Professor of Religion and Ethics

Some problematic approaches

An open letter "A Call for Truth, Prudence, and Protection of the Poor: An Evangelical Response to Global Warming" from the Interfaith Stewardship Alliance (US); signed by over a hundred leading theologians, church leaders and some scientists

- Rejects the proposition that global warming could have catastrophic consequences for humanity
- Rejects the IPCC assessment that human beings are responsible for most of the warming of the past century or so, claiming that "a large part, perhaps the majority" is due to natural causes
- Claims that reducing carbon dioxide emissions will have only an "insignificant impact" on global warming
- Claims that government action to address global warming will do more harm than good

Some problematic approaches

- It quotes the theologian Wayne Grudem: "It does not seem likely to me that God would set up the world to work in such a way that human beings would eventually destroy the earth by doing such ordinary and morally good things and necessary things as breathing, building a fire to cook or keep warm, burning fuel to travel, or using energy for a refrigerator to preserve food".

Some problematic approaches

- It appears that Dr Grudem and his co-signatories have not heard of the ozone hole or the reasons for the loss of stratospheric ozone – i.e. human generated chlorofluorocarbons (CFC), etc. used for refrigeration, air conditioning, aerosol propellants, etc. – or the efforts to stop the destruction of ozone via the Vienna Treaty and Montreal Protocol; nor do they seem to be aware of the damage being done by the burning and felling of tropical forests (all for perfectly ‘good’ economic reasons); but how could they be unaware of the Christian doctrine of the Fall and human sinfulness?

Some problematic approaches

- “Whether or not global warming is largely natural, (1) human efforts to stop it are largely futile ...”
- There is a very basic flaw in this statement
- Cf the destruction of ozone by humans and the relatively successful human efforts to stop it

The Policy Challenge

1. The Earth's atmosphere is a 'natural global commons' or a 'global public good', and thus is subject to the free-rider problem: without clear and enforceable property rights, every country has an incentive to use it as a dumping ground for greenhouse gases and other pollutants. Further, if enough nations refuse to cooperate, or refuse to take sufficient action, any collective endeavours to mitigate the problem by the remainder of the global community will be put at risk and rendered less effective. In these circumstances, there will be an increased likelihood of a 'tragedy of the commons' (i.e. dangerous global warming).

The Policy Challenge

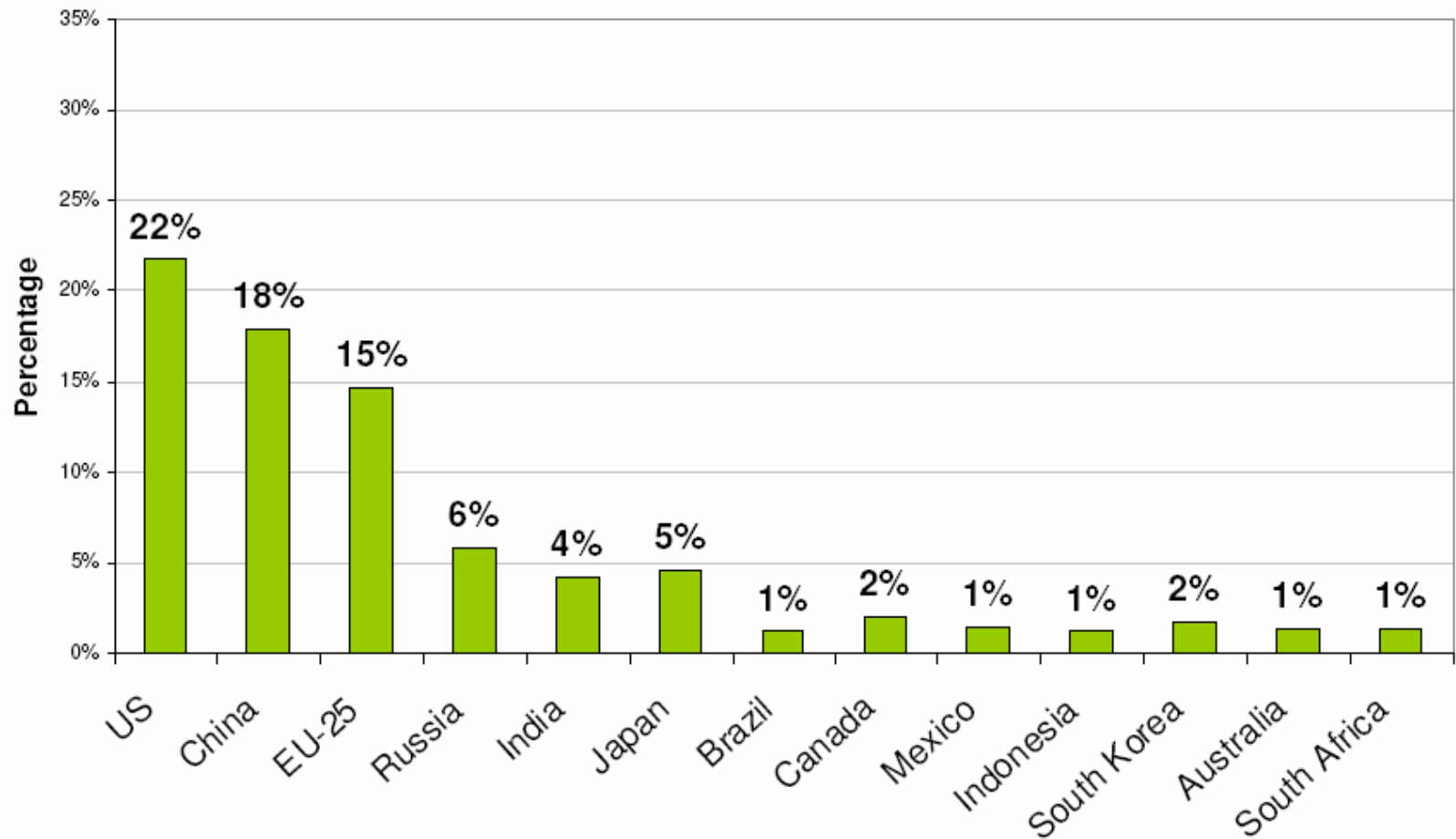
2. The quest for global cooperation must overcome many obstacles:

- National self-interest and incentives for each country to free-ride
- Conflicts between the developed and developing world (and within each block) over how the burden of mitigation and adaptation should be shared
- The power of vested interests (especially the fossil fuel industry)
- The sheer complexity of the policy issues
- The short-term economic and political costs of taking action, with the gains not being evident for decades (although the aggregate economic costs are likely to be very modest)
- Weak international institutions
- Ignorance, a lack of will and skepticism

Burden Sharing – Effort Sharing

1. UNFCCC embraces the principle of “common but differentiated responsibilities and respective capabilities”; but on what basis should we differentiate between countries? Is there a case for equal per capita emission allowances and, if not now, then when?
2. Possible principles:
 - Equal sharing of the burden (objections)
 - Historical contribution/responsibility (based on total accumulated emissions – but from when?)
 - Current contribution/responsibility (e.g. as measured by emissions per capita)
 - Capability (e.g. as measured by per capita income)
 - Mitigation potential
 - Need (note distinction between ‘survival’ and ‘luxury’ emissions)
 - Comparable effort (but what is comparable? equal?)

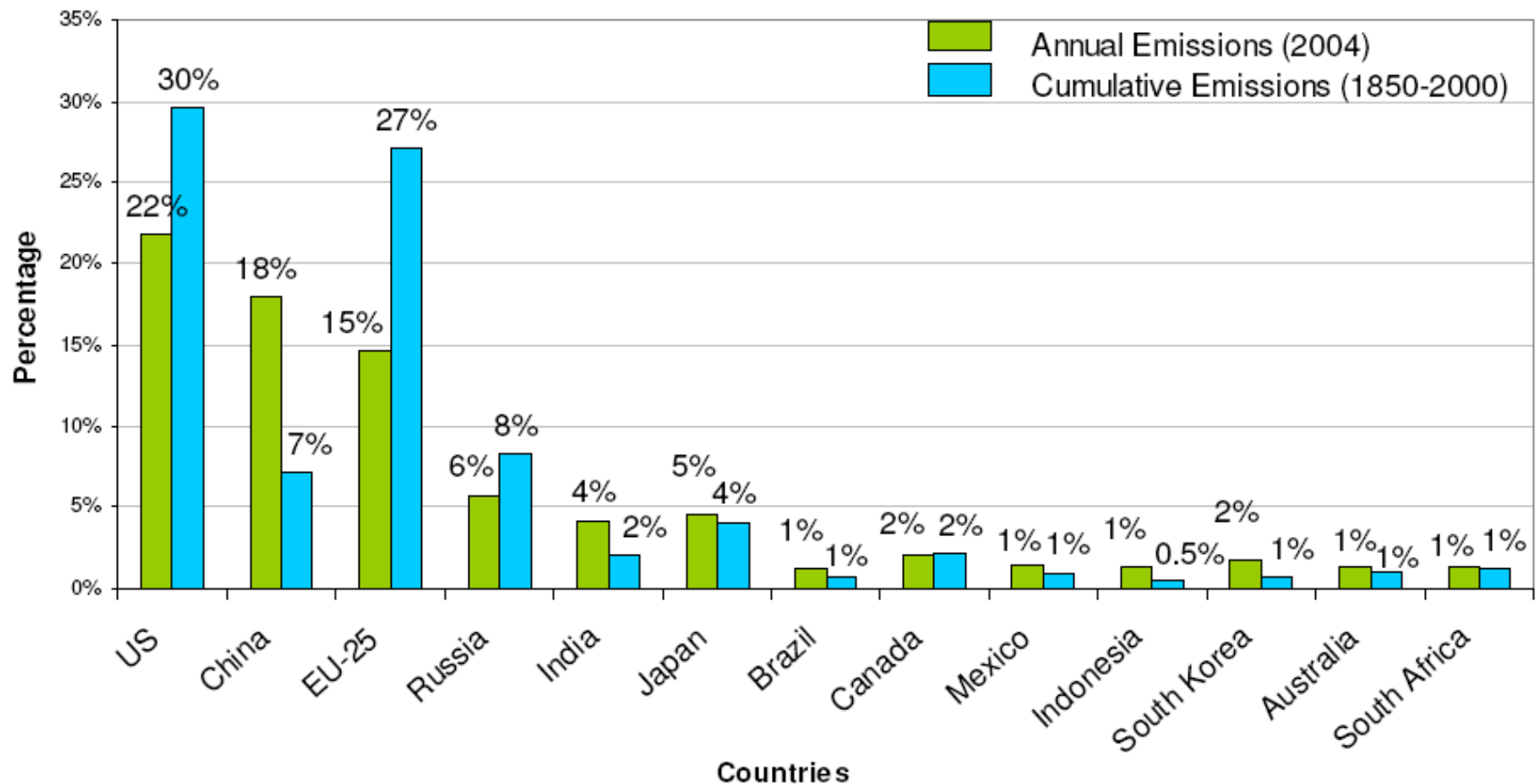
Annual CO₂ Emissions* (2004)



*Energy-related CO₂ gases only

Source: IEA (2006) CO₂ Emissions from Fossil Fuel Combustion .

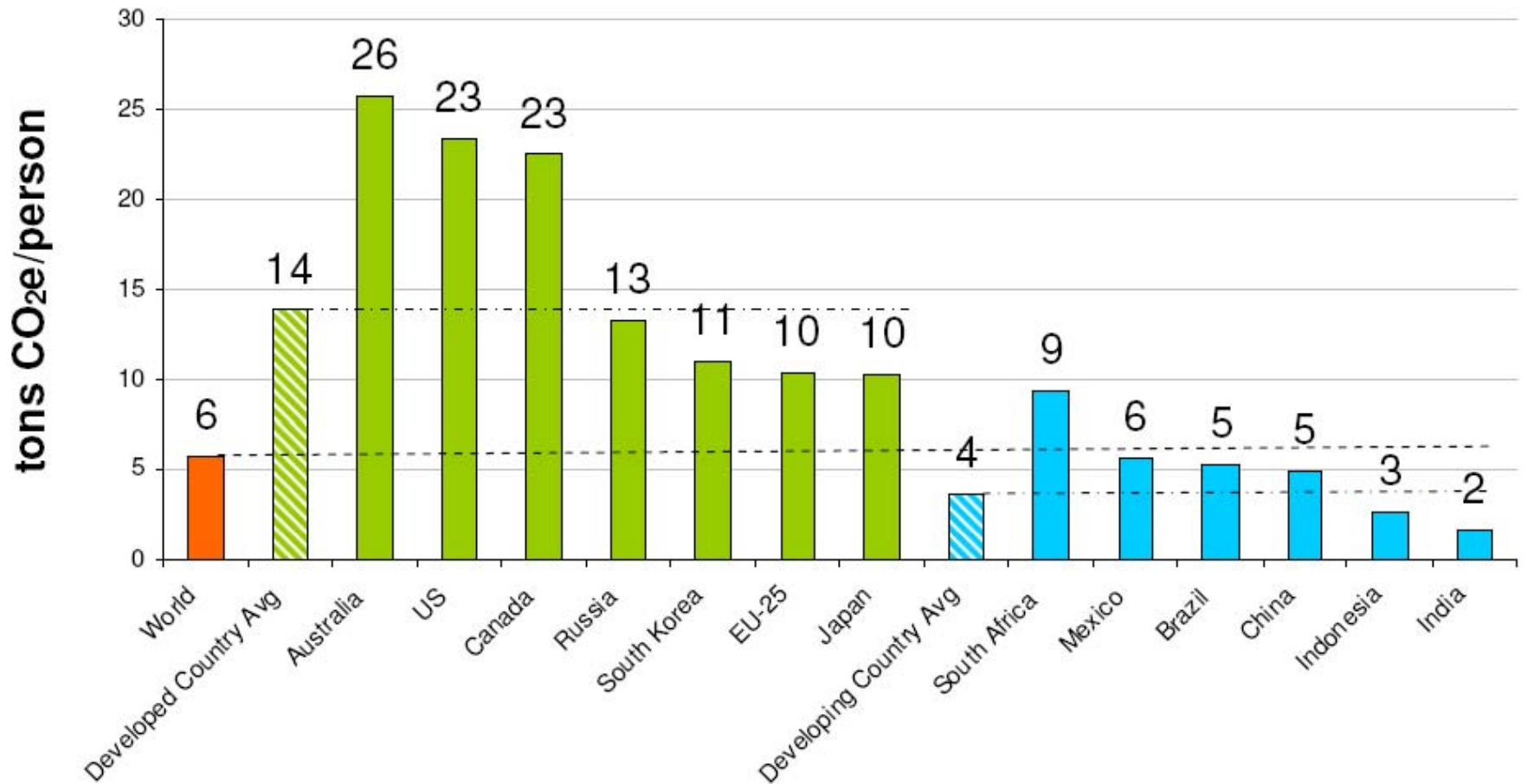
Comparison: Annual* & Cumulative** CO₂ Emissions



Source: * Annual Emissions for the year 2004 from IEA (2006) CO₂ Emissions from Fossil Fuel Combustion

** Cumulative Emissions from 1850-2000, CAIT WRI

Per Capita GHG Emissions (2004)



Source: IEA (2006) CO₂ Emissions from Fossil Fuel Combustion and EPA (2006) Global Anthropogenic Non-CO₂; Greenhouse Gas Emissions: 1990 – 2020

The Challenges for Christians

1. Need to become better informed about the scientific evidence and policy issues
2. Need for sound theology and ethics
3. Need to speak on behalf of the voiceless – including endangered species and those yet to be born
4. Need for integrity – congruence of word and deed; this will entail life style changes – leading by example

The Challenges for Christians

5. Need to reduce our personal, organizational and national carbon footprints
6. Need for political action, including support for NZ taking a lead in the international quest for solutions
7. Importance of hope (based on the resurrection) in the face of sobering predictions

Conclusions

1. The most recent, reliable scientific evidence suggests that the risks of inaction are potentially huge in scope, scale and duration
2. There is a strong ethical case for taking a precautionary approach – especially given the potential for catastrophic and irreversible impacts on major planetary systems (insurance principle)
3. Global GHG emissions need to be cut by well over 50% by 2050; for rich countries, probably as much as 90%
4. Overall, the costs of mitigation are likely to be modest relative to the costs of inaction
5. We need concerted and effective action at multiple levels of government – international, national and sub-national – and by businesses, community organizations, churches and individuals

Concluding thought:

“No one made a greater mistake than the person who did nothing because they could do so little”

Acknowledgements

1. National Climatic Data Centre (NOAA)
2. National Snow and Ice Data Center
3. Dr Jim Hansen's blog
4. The Pew Center
5. Rev Dr Graham Redding – sermon notes

Some references

1. Intergovernmental Panel on Climate Change (2007) *Fourth Assessment Report* (Summaries for Policy Makers from WG1, WG2 and WG3)
2. www.climateark.org
3. www.realclimate.org
4. Jonathan Boston (ed) *Towards a New Global Climate Treaty: Looking Beyond 2012* (Wellington, Institute of Policy Studies, 2007)
5. Michael Northcott, *A Moral Climate: The Ethics of Global Warming* (New York, Orbis Books, 2007)