

The Climate Change Debates Phase II: What to Expect

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Outline

- Phase I:
 - Rise of 2 major institutions: IPCC & Kyoto
 - *Intent*: coordinate science and policy
 - *Effect*: prevented proper debate on each
 - *Outcome*: contentious and pointless policy
- Phase II:
 - Costs of Phase I policy to become apparent
 - Eventually the pointlessness will be too
 - But the problems won't be corrected any time soon

Rise of Kyoto Process



- 1992: UNFCCC (Rio)
- 1997: Kyoto Protocol
- Since then, Kyoto COP's have met regularly to reinforce international pressure for domestic action

The Power of Consensus

- *We must act now...*
 - Made it almost impossible for countries to hold out against Kyoto, even when it is known to be unworkable for them
 - The US is the exception that proves the rule (for now)

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Politics

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Environment Minister John Baird presented at a news conference in Ottawa on April 19, 2007 a scenario of what it would take to comply with the Kyoto Protocol. (CP / Fred Chartrand)

Baird accused of scare tactics on Kyoto

Updated Thu. Apr. 19 2007 10:30 PM ET
CTV.ca News Staff

Critics are accusing Environment Minister John Baird of using scare tactics, after he painted a grim picture of economic mayhem Canada were to comply with the Kyoto Protocol.

Baird told the Senate environmental committee that economists have warned against following the Kyoto targets, but critics disagreed with the findings.

"This is a rigged study," Liberal Sen. Grant Mitchell told Baird.



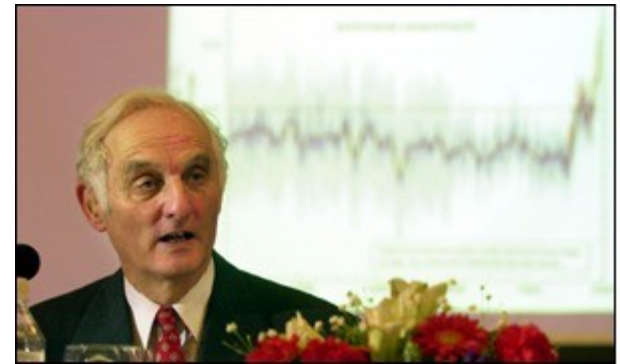
Federal Liberal environmental critic David

"The one thing that it demonstrates is how effective you are at spinning the media. And in fact, if we could just capture that spin, we'd have an alternative energy source."

During a news conference after he appeared before the committee, Baird said the government would instead bring forward a

Rise of IPCC

- IPCC produce reports every 5-6 years that reinforce popular idea of scientific consensus
- Assessment Reports
 - 1990
 - 1995
 - 2001
 - 2007



The Power of Consensus

- *The science is settled...*
 - Convenient basis for activists and journalists to claim consensus, dismiss questions about science
 - Obscured the depth of disagreement and uncertainty in science
 - Allowed marginalization of legitimate criticisms



Where it leaves us

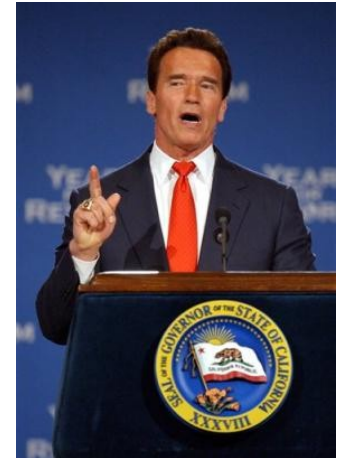
- Up until now, constraints on CO₂ emissions have been widely resisted due to costs
- The resistance is now collapsing in the face of inexorable institutional strength behind the global warming scare



North America: coming changes

- US:
 - California, NE States
 - SCOTUS decision
 - Next administration

- Canada:
 - BC, Alberta
 - Federal Government



By 2008:

- Some form of legal restrictions on CO₂ emissions will likely enter into force around the developed world
- The Consensus-Makers will feel vindication and will celebrate their victory
- Then what?



Phase II: 2 core ideas

- As a result of the message from the consensus machinery, the public believes:
 1. Global warming is a dangerous crisis with terrible effects coming soon.
 2. The solutions are readily available and trivially inexpensive.

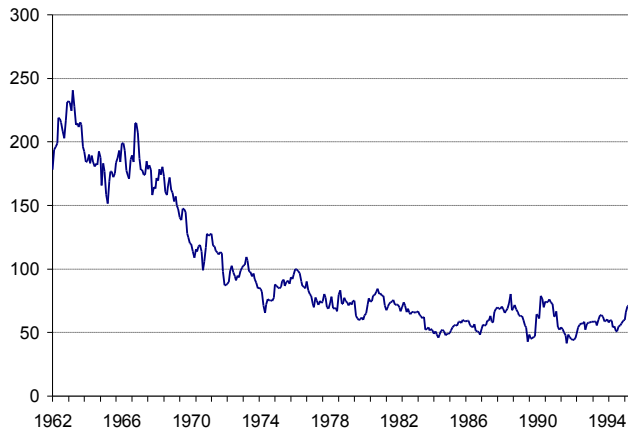


Phase II: 2008—2028

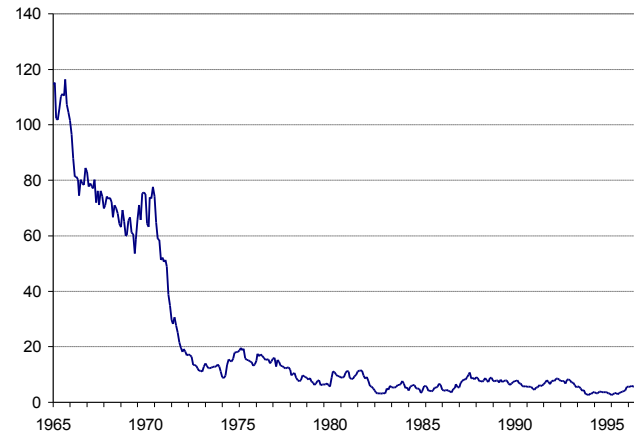
- We will find out the hard way that #2 is not true.
 - The solutions are not costless
 - CO₂ is not like air pollution
 - The scale of action is unprecedented
- This, and the lack of obvious disaster, will make people also question #1.

Solutions costless?

- CO₂ is not like air pollution



Toronto: TSP at Bay and Wellesley

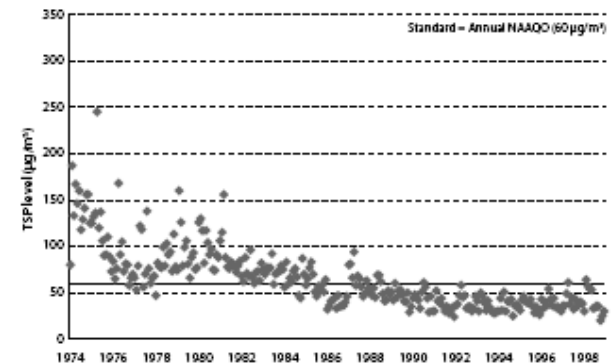


SO₂ at Bay and Wellesley

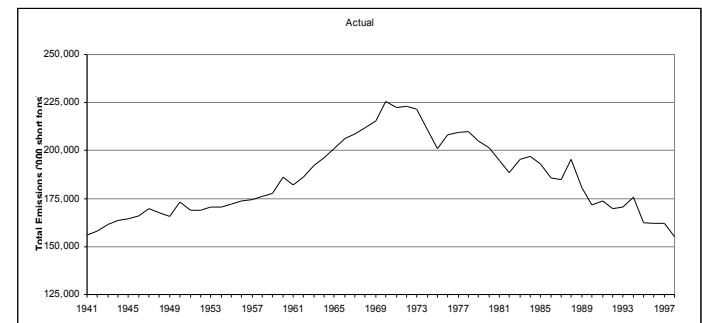
Solutions costless?

- Particulates, SO₂, CO and VOC's in Canada have all fallen dramatically since the 1970s
- NOx has also fallen, but not as much
- US: Total air pollution emissions today less than at end of WWII

Figure 2a: Trend in ambient levels of TSP in Montreal, 1974-1998



Source: Environment Canada, National Air Pollution Surveillance network,
<<http://www.ec.gc.ca/nc/napsdata/default.aspx>>.



Solutions costless?

- So why not CO₂?
 - Air pollution can be controlled by
 - Scrubbers
 - More efficient burning
 - Switch to low-sulphur coal
 - Can yield >90% emission reduction

Solutions costless?

- Not applicable to CO₂
 - There is no CO₂ scrubber
 - Heat efficiency doesn't affect CO₂ production, only volume consumed
 - There is no such thing as low-carbon coal
- Abatement requires
 - Use less fuel or
 - Capture and store CO₂
 - Some as-yet unknown technological fix

Solutions costless?

- Federal studies all the way along pointed to heavy costs of Kyoto compliance
 - McKittrick – Env Can (1996):
 - real GDP down 4.4% ,
 - real wages down 10.2%
 - Analysis and Modeling Group (2000):
 - “Sustained, long-term, negative economic impacts.”
 - Long run GDP loss of up to 3%,
 - Costs of ~\$3,000 per household
 - Federal Options Paper (2002)
 - Reaching only 10% of Kyoto target domestically and buying rest through permits: Real GDP down 1.7%
 - Etc. – there were lots of these from mid-90s to last week

Solutions costless?

- Bill C288, reaction to Baird's study last week – indicates extent of misinformation



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Critics assail Ottawa's dire Kyoto predictions

ALEX DOBROTA
From Friday's Globe and Mail

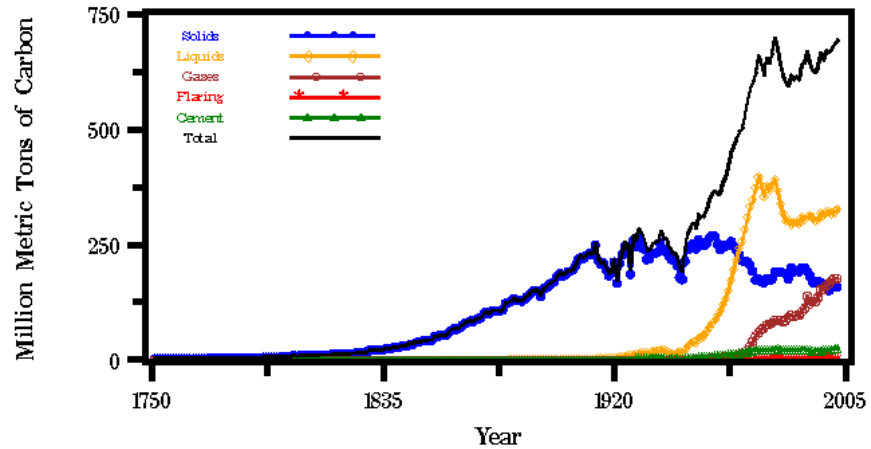
OTTAWA — Opposition parties and environmentalists Thursday accused the Conservative government of willfully overlooking the economic benefits of green technology to inflate the costs of reducing greenhouse gases.

The critics also heaped scorn on the sinister predictions of Environment Minister John Baird, that Canada will have a severe recession if it fulfills its obligations to cut carbon emissions under the Kyoto Protocol.

- *We will decrease megatonnes, Mr. Speaker, of CO2, and we would make megatonnes of money with it! Mr. Speaker*

Solutions costless?

- EU: Emissions rising despite policies



- UK has its doubts

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Blair signals shift over climate change

David Adam, environment correspondent
Wednesday November 2, 2005
[The Guardian](#)

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Tony Blair addresses the G8 climate change summit in London. Photograph: Jane Mingay/AP

Tony Blair appeared last night to undermine more than 15 years of climate change negotiations when he signalled a shift away from a target-based approach to cutting greenhouse emissions. Speaking at the end of the first day of a summit in London of environment and energy ministers, the prime minister said that legally binding targets to reduce pollution made people "very nervous and very worried".

Factors behind emissions growth

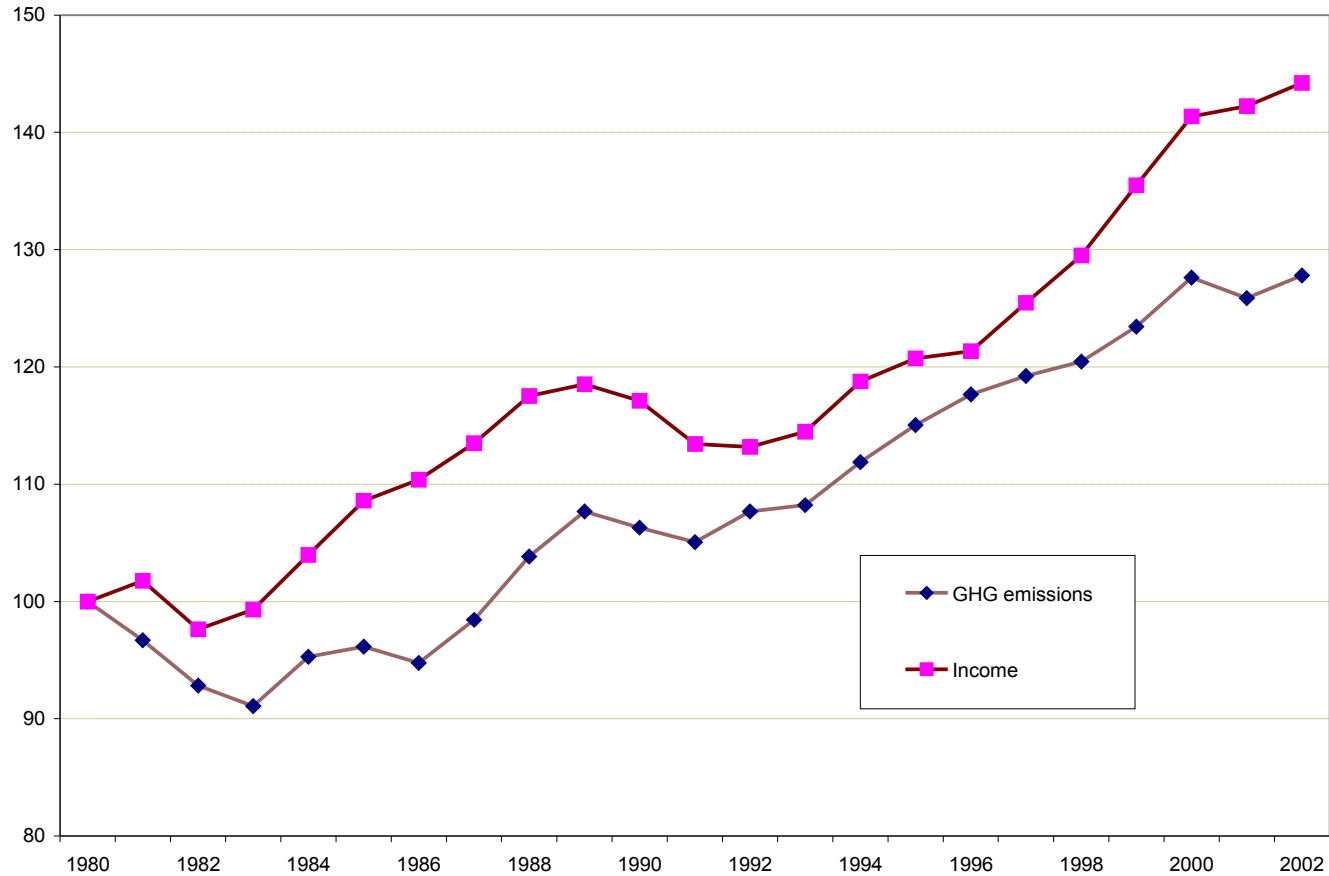
Change in Emissions/GDP
+Change in Population
+Change in Income (GDP per person)
=Change in Emissions

$$TOTAL\ GHG\ EMISSIONS = \left(\frac{Emissions}{GDP} \right) \times \left(\frac{GDP}{Population} \right) \times Population$$

Factors behind emissions growth

Change in Emissions/GDP (-1% p.a.)
+Change in Population (+1% p.a.)
+Change in Income (GDP per person)
=Change in Emissions

Factors behind emissions growth



Solutions costless?

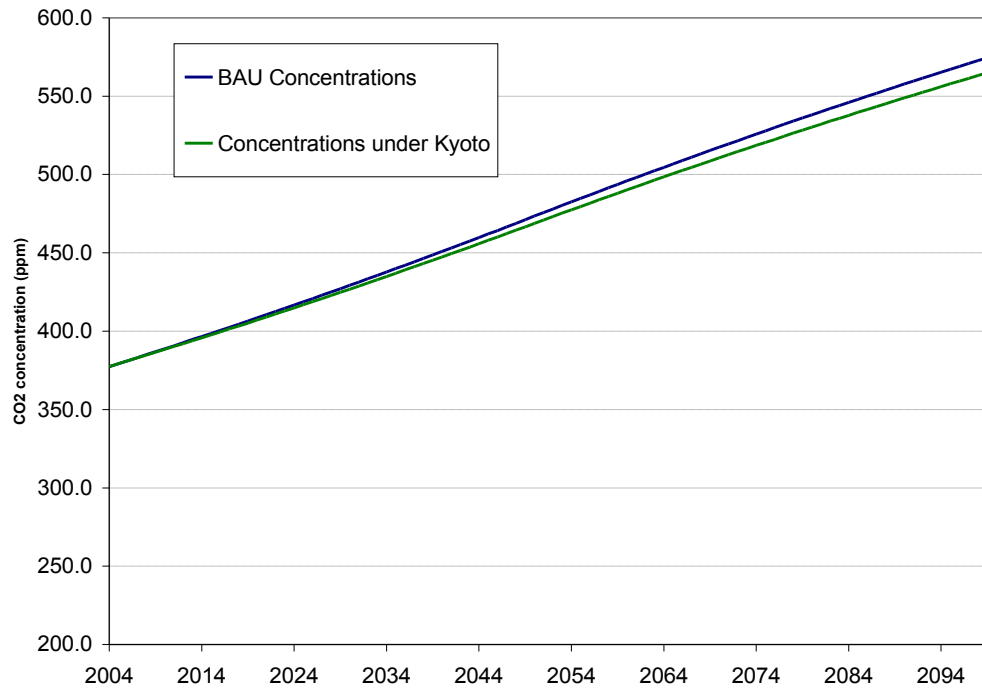
- For Canada (and US) under current economic/technological configuration
 - Cap on emissions = Cap on real income
 - Emissions cut = recession
- Many studies for federal government show this

Solutions costless?

- Why do so many people believe otherwise?
 - They have been told otherwise
 - It is not true
 - People will learn this in Phase II

Global scale of issue

- Envisioned cuts far beyond Kyoto



Economics of Phase II

- It will be impossible for nations to achieve commitments to major CO₂ cuts
 - But they will incur large costs trying
- No one will be happy
 - Activists will be angry at “lack of action”
 - Public will be unhappy at increasing costs
- Questions about the seriousness of GW will return
 - Atmospheric data
 - Emissions data
 - IPCC Process

How strong is belief in GW?

- New York, March 2007



Resolved: Global warming is not a crisis

Speaking for the motion: Michael Crichton, Richard S. Lindzen, Philip Stott

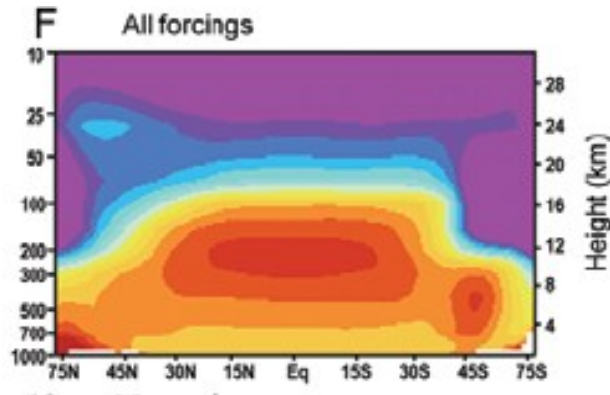
Speaking against the motion: Brenda Ekwurzel, Gavin Schmidt, Richard C.J. Somerville

Moderator: Brian Lehrer

	Date	3/14/2007		
Votes	Online Poll	Before Debate	After Debate	
For	54.76 %	29.88 %	46.22 %	
Against	41.94 %	57.32 %	42.22 %	
Don't Know	3.30 %	12.80 %	11.56 %	

Is the atmosphere warming?

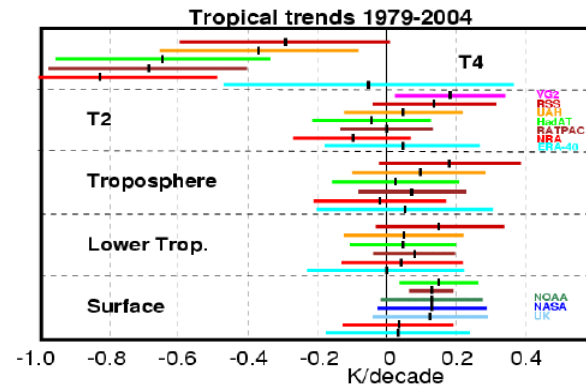
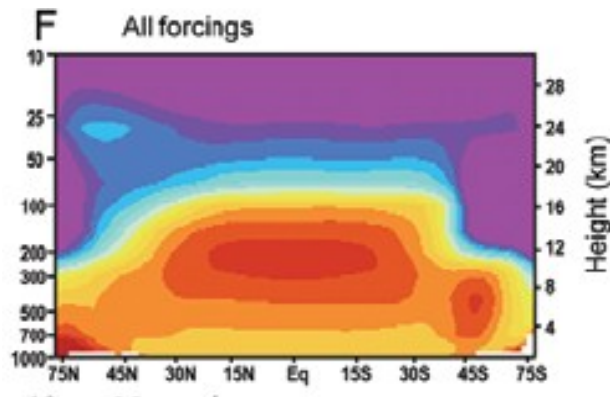
- Tropical troposphere region is key



- USCCSP (2006)

Is the atmosphere warming?

- Tropical troposphere region is key



- USCCSP (2006)

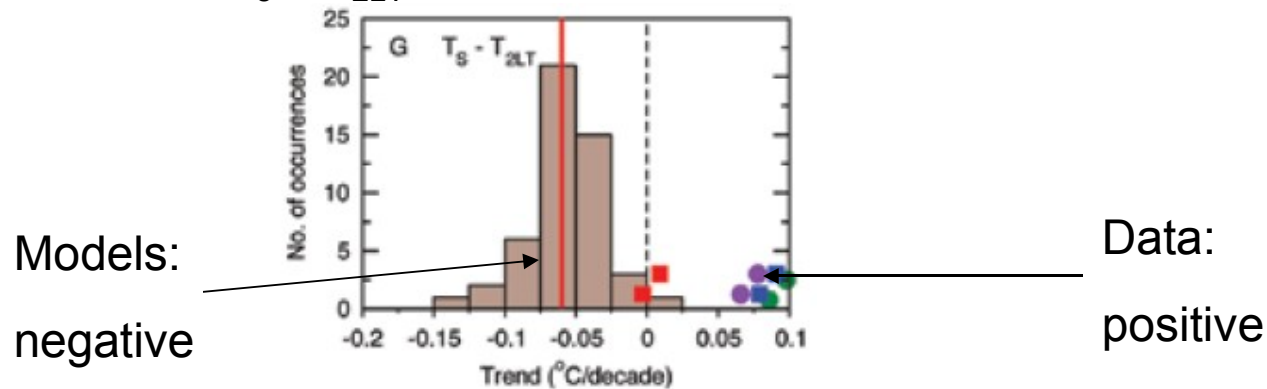
IPCC (2007)

Surface-satellite discrepancy

- Tropics: key profile of GHG-induced warming
 - Surface (T_s) trend less than Troposphere (T_{2LT}) trend
 - Models: $(T_s - T_{2LT}) < 0$: negative
 - Data: $(T_s - T_{2LT}) > 0$: positive

Surface-satellite discrepancy

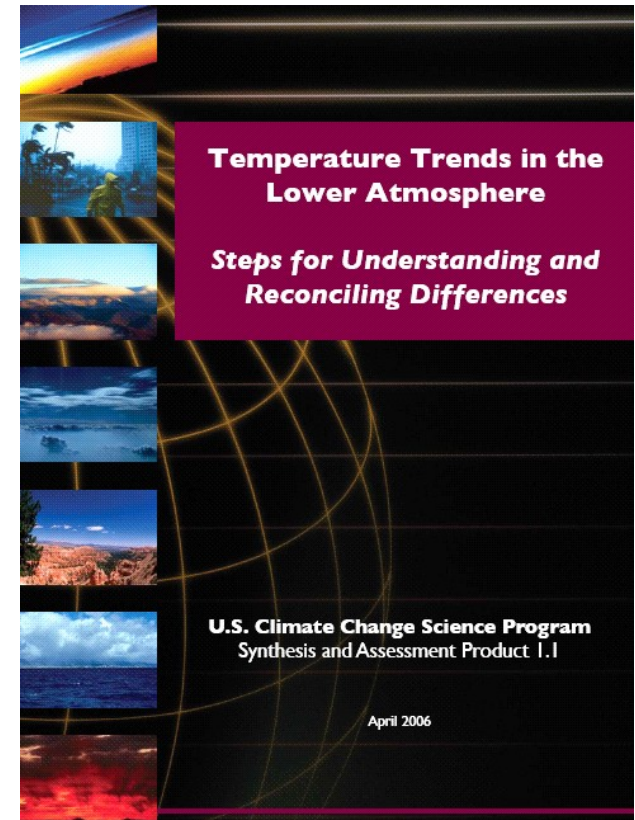
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- US CCSP Report p. 111

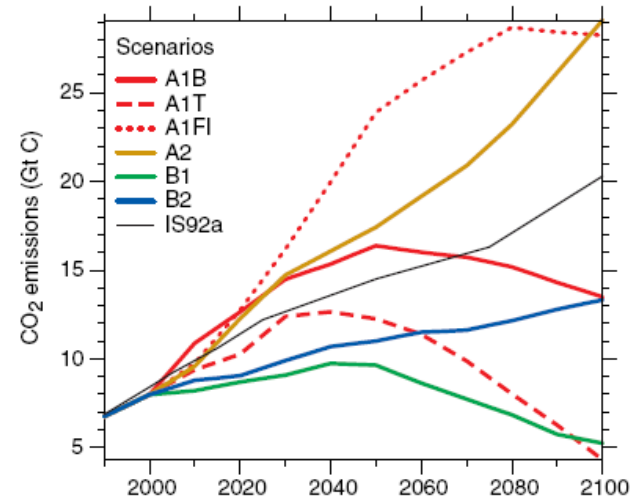
From the Executive Summary...

- Previously reported discrepancies between the amount of warming near the surface and higher in the atmosphere have been used to challenge the reliability of climate models and the reality of human-induced global warming. **Specifically, surface data showed substantial global-average warming, while early versions of satellite and radiosonde data showed little or no warming above the surface. This significant discrepancy no longer exists** because errors in the satellite and radiosonde data have been identified and corrected....
- For observations during the satellite era (1979 onwards), the most recent versions of all available data sets show that both the low and mid troposphere have warmed. **The majority of these data sets show warming at the surface that is greater than in the troposphere...**
- [In the tropics] Although **the majority of observational data sets show more warming at the surface than in the troposphere**, some observational data sets show the opposite behavior. **Almost all model simulations show more warming in the troposphere than at the surface**
- ... the issue is still open.



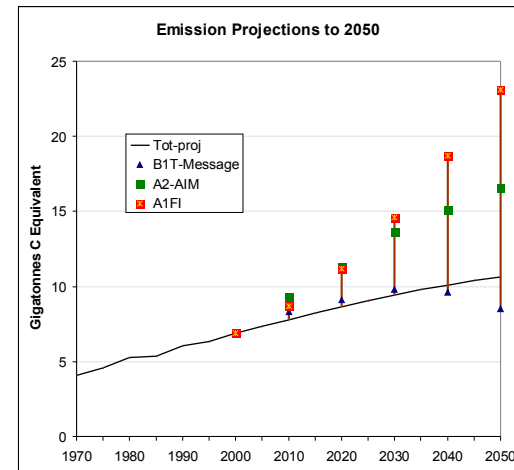
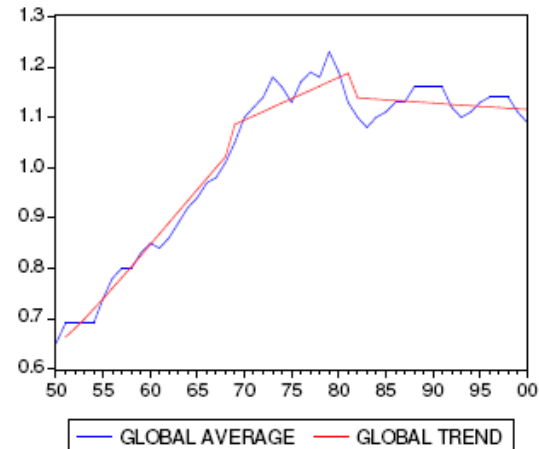
Emission Scenarios

- IPCC Scenarios yield wide spread of warming forecasts
- Half based on assumption global per capita emissions will rise from current rate (1.14 tonnes/ capita) to over 1.5 tonnes/ capita or more by 2050



Emission Scenarios

- Historical data provides no support for this
- Extremely unlikely per capita emissions will get over 1.5 tonnes/capita
- Implies lowest end of global emission scenarios



Global scale of issue

- Current world real average income: ~\$4,000
- IPCC Scenarios: as of 2100

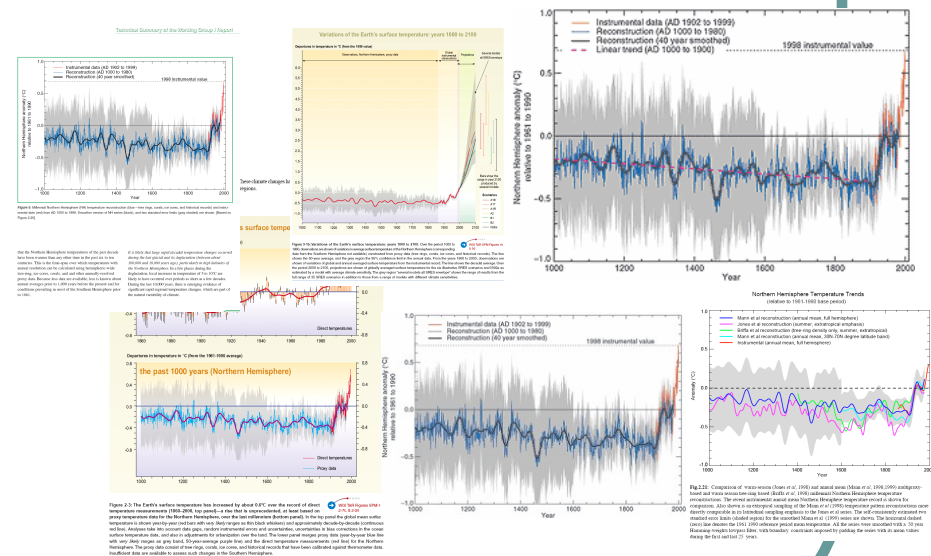
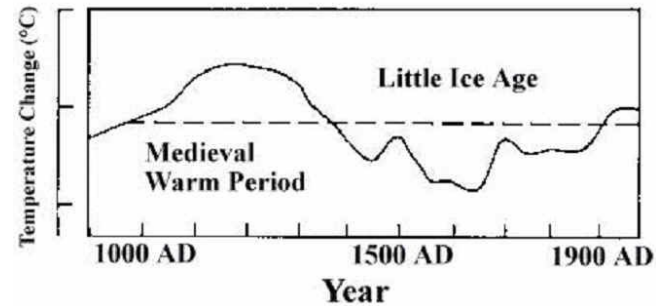
	<u>Baseline</u>	<u>+4C Warming</u>
A1:	\$74,900	\$71,200
B1:	\$46,600	\$44,300
B2:	\$22,600	\$21,500

Looking back at science questions:

- Is there a conflict of interest in the IPCC process?
 - Sections covering controversial topics are always written by one party to the controversy
 - It always turns out to be the side that produces results favourable to the global warming story
 - Developers of major data sets get to review the quality of their own data

Hockey stick example

- Paleoclimate graph in 1990 IPCC Report
- Hockey stick graph in 2001 IPCC Report
- Review section written by hockey stick author

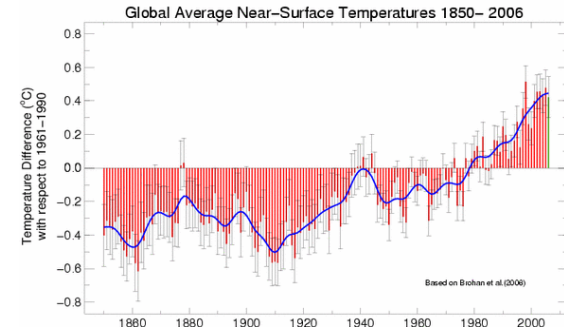


Hockey stick example

- Never independently checked until Canadian businessman Steve McIntyre requested to see data in 2003
- Over next 2 years we discovered fundamental mathematical errors that invalidated the result
- Led to
 - Corrigendum in *Nature* (2004)
 - Front page coverage in WSJ (2005)
 - US National Academy of Sciences Expert Panel (2006)
 - Wegman Committee Report (2006)
 - Congressional Hearings (2006)
- Current view: no one can say how today's climate compares to that of 1,000 years ago
- Yet new IPCC Report claims it is likely the warmest in 1300 years

Surface weather data

- Global warming graph based on data collected at surface
- Collected in fragmented network around the world supplemented with sea water measurements



Met Office Hadley Centre for Climate Change and CRU, University of East Anglia

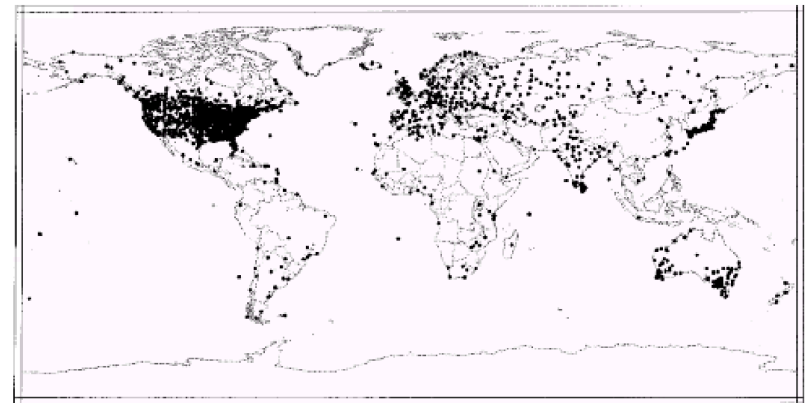


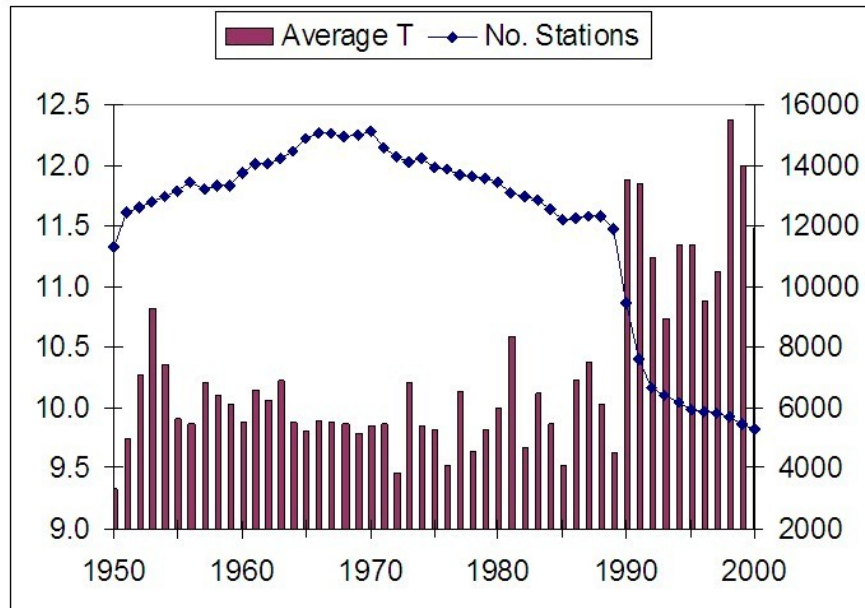
FIG. 3. Maps of GHCN mean temperature station locations: (a) all GHCN mean temperature stations and (b) mean temperature stations with data in 1900. Approximately 1000 GHCN stations have a century or more of mean temperature data. Work is under way to fill in some of the large data-sparse regions shown in (b) by digitizing selected station data from Colonial Era Archives (Peterson and Griffiths 1996).

Surface weather data

- IPCC: adamant that less than one-tenth of trend is due to contamination: At most 0.006 °C/decade
- Yet the cited literature does not show this
 - Jones et al. (1990) is the multi-region-scale study they cite most often
 - Parker (2004) only looks at narrow category of data contamination
 - They ignore several global-scale studies since then that found the opposite, or that critiqued Parker's method
 - deLaat and Maurellis (2004, 2006)
 - McKittrick and Michaels (2004)
 - Pielke and Matsui (2005)

Surface weather data

- Loss of data points at 1990 coincides with change in raw mean

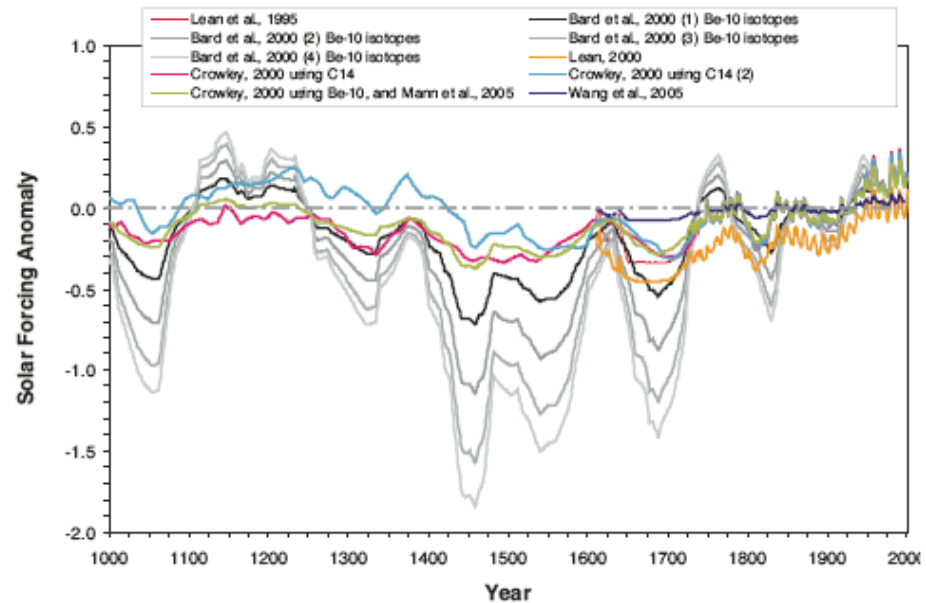
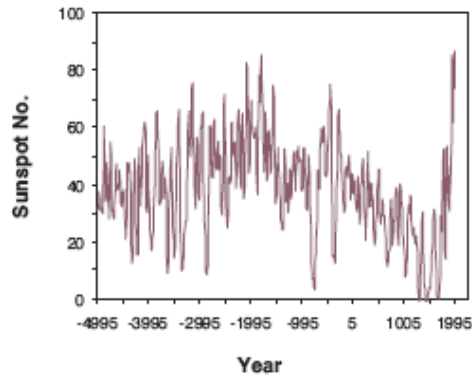


Surface weather data

- Jones et al. (1990): Bedrock of IPCC case
 - Steve McIntyre, FOI Request for location of stations used in study
 - April 2007, University FOI Officer:
 - I have been in conversation with Dr. Jones and have been advised that, in fact, we are unable to answer (B) as we do not have a copy of the station data as we had it in 1990. The station database has evolved since that time and CRU was not able to keep versions of it as stations were added, amended and deleted. This was a consequence of a lack of data storage comparable to what we have at our disposal currently.

Treatment of solar data

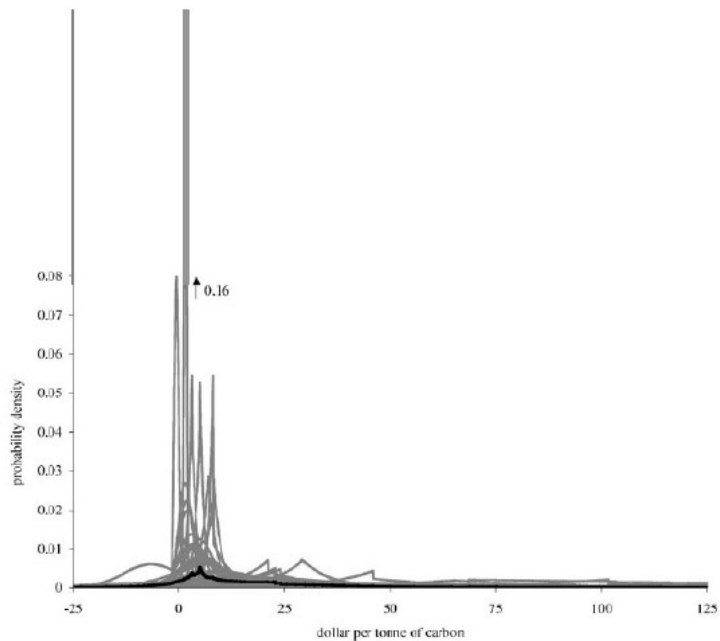
- Solar data



- IPCC: Changes in solar irradiance since 1750 are estimated to cause a radiative forcing of $+0.12$ [$+0.06$ to $+0.30$] W/m^2 , which is less than half the estimate given in the TAR.

Inevitable question: is global warming a bad thing?

- Tol (2005): reviewed over 100 studies of damage costs, estimated median cost of \$2-\$10/tonne
- Stern (2006): looked at one model, estimated up to 20% of world GDP would disappear



Inevitable question: is global warming a bad thing?

- Only one of those studies is ever discussed in House of Commons, in media
- David Suzuki, April 20 2007:
 - "First of all, let's stop listening to the goddamn economists," he said. "Twenty per cent of the economy will disappear. It will cost more than World War I and World War II put together. We'll go into a kind of depression we've never, ever had in all of history."
 - Suzuki says he's heard different numbers from economists, including some who have estimated the cost of meeting Kyoto as one per cent of gross national product.

The Phase I consensus

- Rapid, unprecedented atmospheric warming is underway, which will cause major ecological catastrophe and human misery unless it is stopped
- Stopping it is cheap and easy

Neither one is true

- It will be apparent over the next 20 years:
 - The best quality data do not find evidence of much, if any, atmospheric warming
 - The dire predictions will fail to materialize
 - CO₂ abatement will prove to be very difficult and very costly
- As this all sinks in, the Phase I consensus will unravel.
 - It will also unravel the basis for the costly policy framework
 - But it won't happen soon.

Between now and then

- A lot of costly and pointless policy now appears unavoidable
- Costly enough to hurt, but not costly enough to inspire backlash
- A few lucky rent-seekers will prosper, everyone else will be worse off



Phase II: concluding thoughts

- I am pessimistic about the chance of avoiding a lot of pointless, expensive global warming policy
- I hope Phase II is over soon, but I think it will take 10-20 years