



Questions every journalist should ask about global warming


Ross McKittrick, Ph.D.
Associate Professor of Economics
University of Guelph

Manning Centre for Building Democracy
Calgary Alberta
August 27 2008



Questions every journalist should ask about global warming...

1. ...concerning the scientific consensus
2. ...concerning record-breaking events
3. ...concerning model predictions
4. ...concerning the need to act now
5. ...concerning the cost-effectiveness of policy
6. ...concerning the costs of a carbon tax
7. ...concerning the aims of international negotiators
8. ...concerning whether Canada is shirking
9. ...concerning the benefits of reducing emissions
10. ...concerning the next 10 years.



Questions concerning the scientific consensus



The 2007 IPCC Report represents the consensus view of “2500 of the world’s top scientists”



Questions concerning the scientific consensus

The 2007 IPCC Report represents the consensus view of “2500 of the world’s top scientists”

- Were those 2500 asked if they support the conclusions?
 - No.
 - How many were involved writing the summary conclusions?
 - About 30
 - How many worked on Vol. 1 Chapter 9 (the key chapter)?
 - Authors: 56
 - Independent Reviewers: 17
 - Government Reviewers: 8
 - Canadian government review comments: 0
 - Number of reviewers who specifically endorsed conclusions: 5
 - % Rejected Comments, Ch 9, 2nd draft: 58.1%
- http://mclean.ch/climate/IPCC_review_updated_analysis.pdf



Questions concerning the scientific consensus

The 2007 IPCC Report represents the consensus view of “2500 of the world’s top scientists”

- Was the report re-written after the close of scientific review?

YES, 3 times. None of these re-writes went through scientific review.

- Scientific review closed in June 2006
- Modified draft submitted to governments in October 2006
- New draft sent to governments in December 2006
- Summary for Policymakers written/published in February 2007
- Report draft re-written again between February and May 2007
- Published version: May 2007



Questions concerning the scientific consensus

The Royal Society/Meteorological Society/Academy of Science etc. has issued a statement supporting the idea of anthropogenic global warming





Questions concerning the scientific consensus

The Royal Society/Meteorological Society/Academy of Science etc. has issued a statement supporting the idea of anthropogenic global warming

- Was the statement put to a membership vote?
 - No. None of them have been voted on.



Questions concerning the scientific consensus

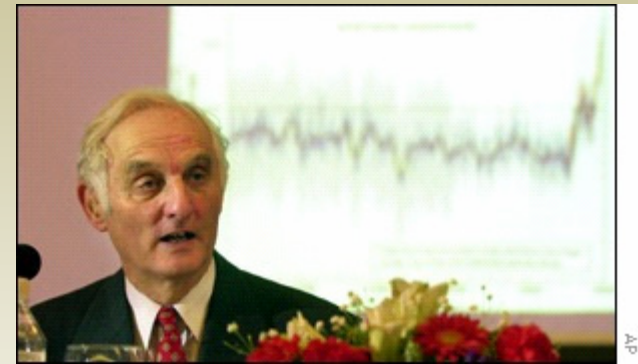
The Royal Society/Meteorological Society/Academy of Science etc. has issued a statement supporting the idea of anthropogenic global warming

- Was the statement put to a membership vote?
 - No. None of them have been voted on.
- How many members would support the statement if allowed to vote?
 - There's only one way to find out.



Questions concerning the scientific consensus

Only a handful of qualified scientists disagree with the IPCC





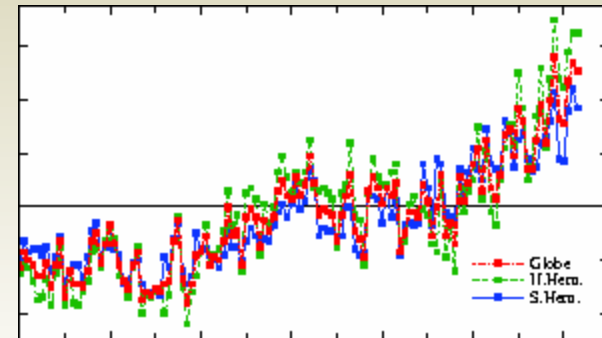
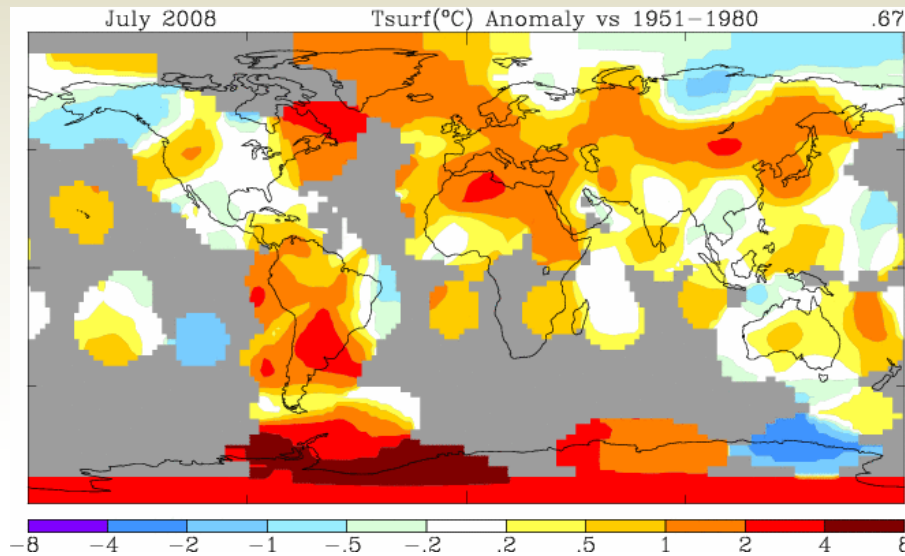
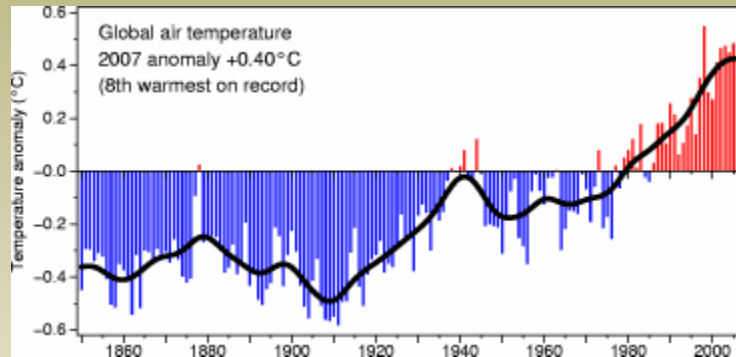
Questions concerning the scientific consensus

Only a handful of qualified scientists disagree with the IPCC

- Has anyone actually done a survey?
 - Yes: Bray and von Storch (2003) surveyed 530 climate modelers around the world
 - “To what extent is GW mostly caused by humans?”
 - On scale of 1 (strongly agree) to 7 (strongly disagree) mean response = **3.62**
 - Results “question [the claim] that the majority of scientists agree with the IPCC”
 - http://dvsun3.gkss.de/BERICHTE/GKSS_Berichte_2007/GKSS_2007_11.pdf
- Similar results found by OISM Petition Project
 - <http://www.petitionproject.org/>



Questions concerning the *hottest year on record!*





Questions concerning the *hottest year on record!*

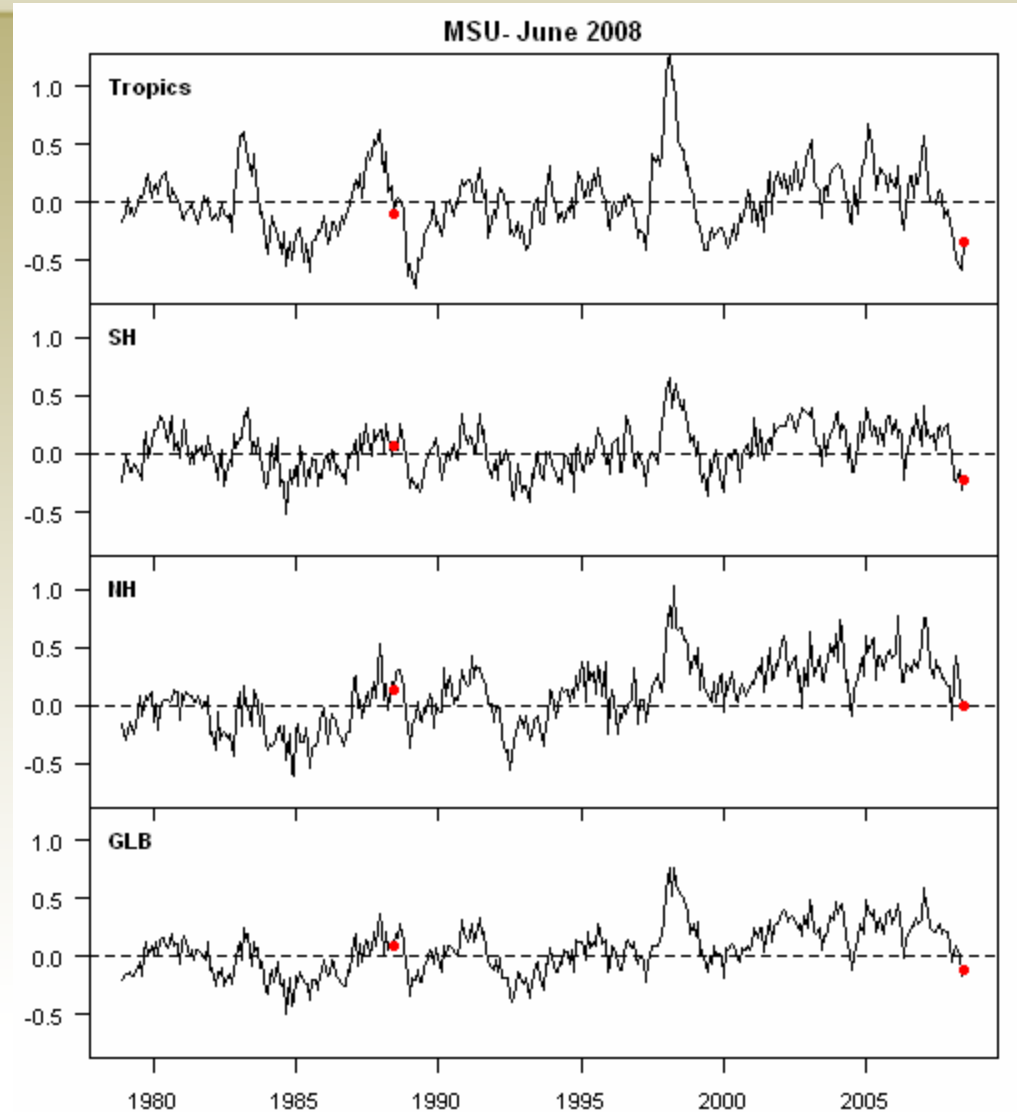
- How long is the record?
 - 1850 – CRU
 - 1880 – GISS, NOAA
 - 1948 – Canada
 - 1979 – NOAA Satellite temperatures/ice extent records
- Do all the data sets say the same thing?
 - Not usually
 - E.g. June 2008:
 - “8th Warmest on Record” – NOAA
 - “9th Coldest on Record” – NOAA Satellites (UAlabama)
 - http://icecap.us/index.php/go/joes-blog/latest_noaa_press_release_in_total_disagreement_with_nasa_satellite/



Questions concerning the *hottest year on record!*

- Satellite record is rarely reported

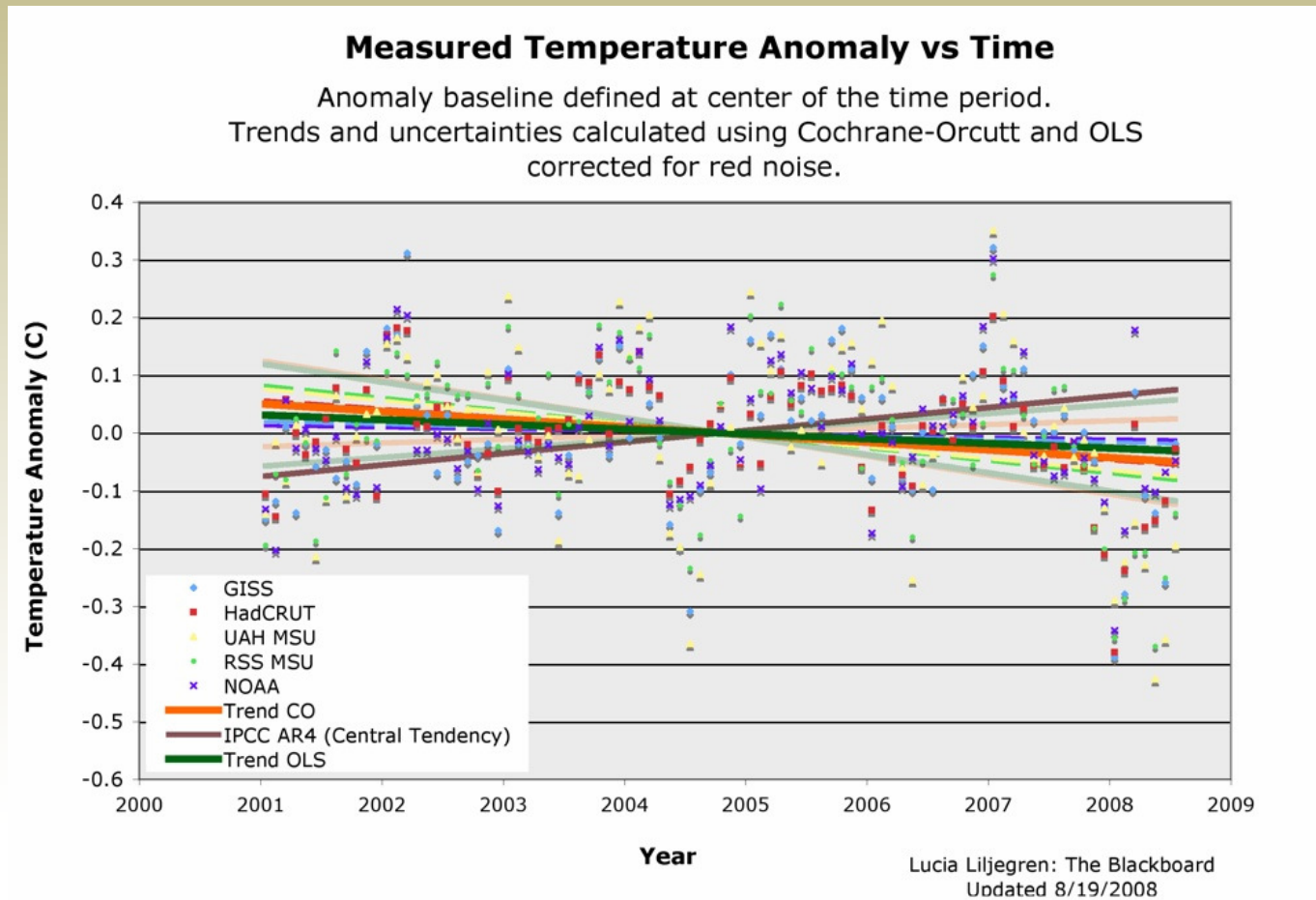
http://vortex.nsstc.uah.edu/data/msu/t2lt/ltglhmmam_5.2





Questions concerning the *hottest year on record!*

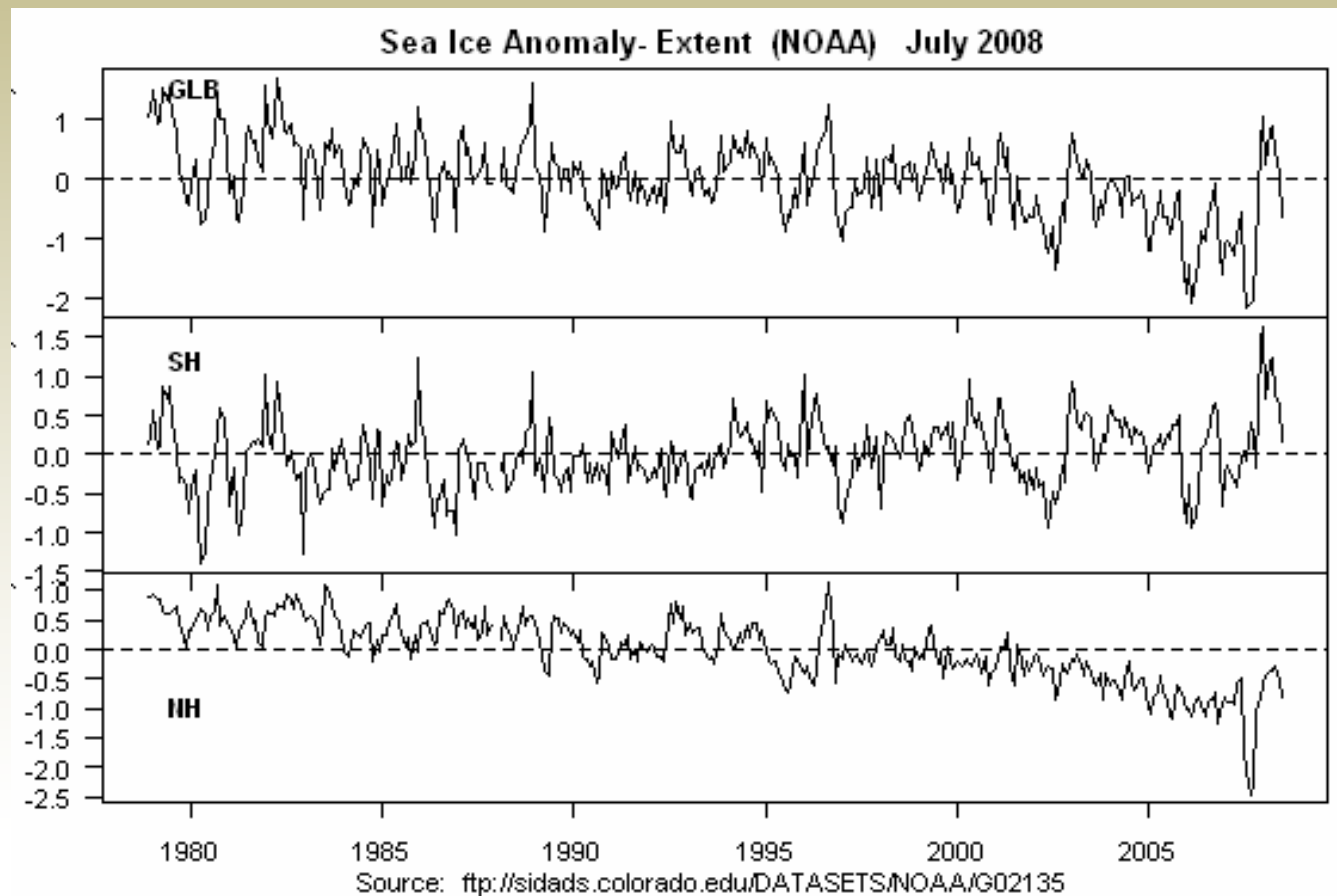
- Since 2001, Major data sets have trended down, while IPCC projections trend up





Questions concerning the *hottest year on record!*

- Sea ice records are likewise short (post-1979)





Questions concerning model predictions

“These changes are consistent with climate model predictions.”





Questions concerning model predictions

“These changes are consistent with climate model predictions.”

- Does that mean all models predict these changes, every time?
 - For regional events, no.
- Do other models predict the opposite?
 - For regional events, the models typically disagree.



Questions concerning model predictions

“These changes are consistent with climate model predictions.”

- “Since the late 1960s, much of the North Atlantic Ocean has become less salty, in part due to increases in fresh water runoff induced by global warming, scientists say.”

*-Michael Schirber, LiveScience
June 29, 2005*

- “The surface waters of the North Atlantic are getting saltier, suggests a new study of records spanning over 50 years. They found that during this time, the layer of water that makes up the top 400 metres has gradually become saltier. The seawater is probably becoming saltier due to global warming, Boyer says.”

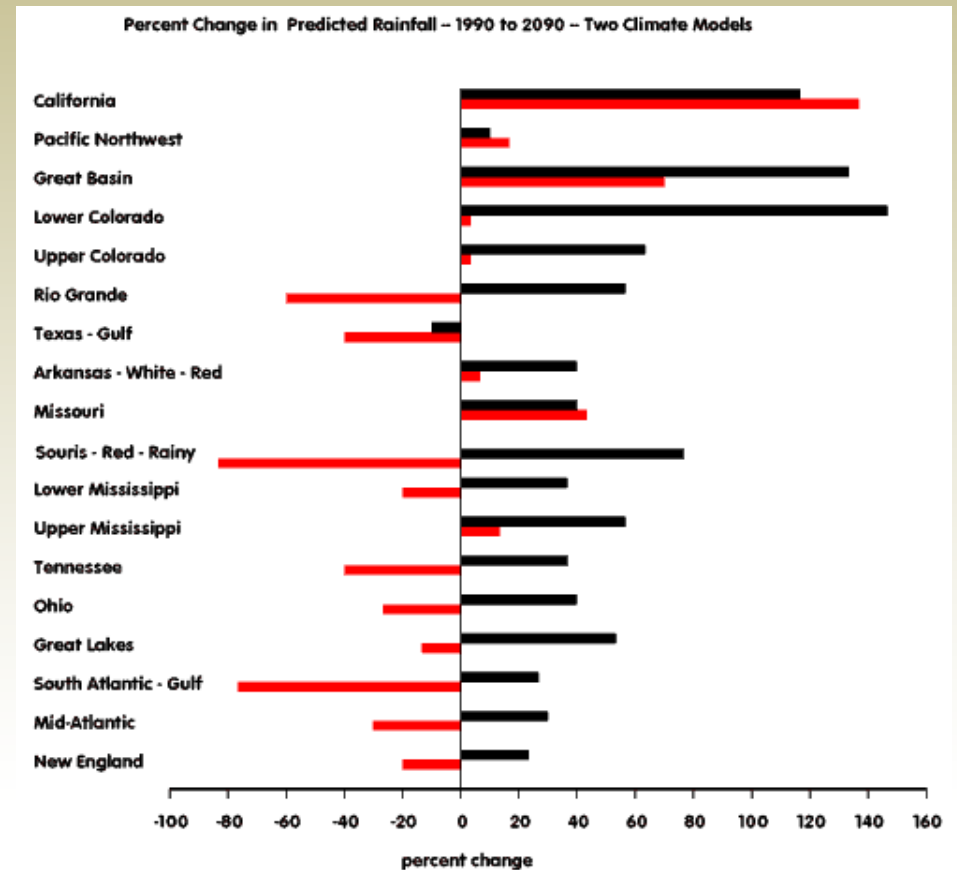
*-Catherine Brahic, New Scientist
August 23, 2007*



Questions concerning model predictions

“These changes are consistent with climate model predictions.”

- From 2000 US National Assessment:





Questions concerning model predictions

- Newman and Mika, *Global Change Biology* 2008
 - The two researchers used projections from both a Canadian climate model and a British model. The impact predictions for the swede midge should have been roughly the same regardless of which model was used to generate the future climate, said Newman. But when the two researchers compared the results, they found they were completely different. http://www.uoguelph.ca/news/2008/08/accuracy_of_cli_1.html
 - *"We basically got opposite answers when we should have gotten the same answer," said Newman. "This shows that the work being done around predicting the biological impacts of climate change can vary depending on which particular climate model is being used. It's concerning because a vast majority of the impact research conducted is based on the projections of these models."*



Questions concerning model predictions

- Are there changes that all models predict?
 - YES:
 - Tropic: tropospheric warming amplified relative to surface
 - Arctic: surface warming amplified relative to troposphere
 - The consistency reflects the fact that these changes are essential parts of the AGW mechanism

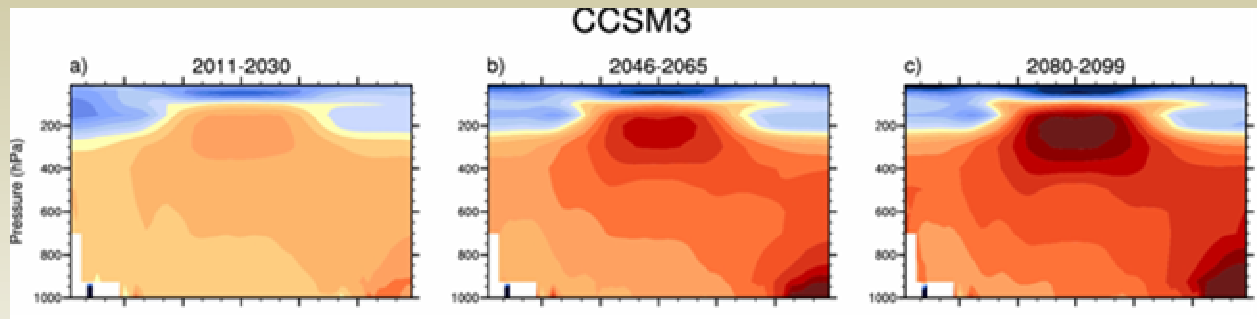


Questions concerning model predictions

- Are there changes that all models predict?
 - YES:
 - Tropic: tropospheric warming amplified relative to surface
 - Arctic: surface warming amplified relative to troposphere
 - The consistency reflects the fact that these changes are essential parts of the AGW mechanism
- Do *these* predictions match the data?
 - NO

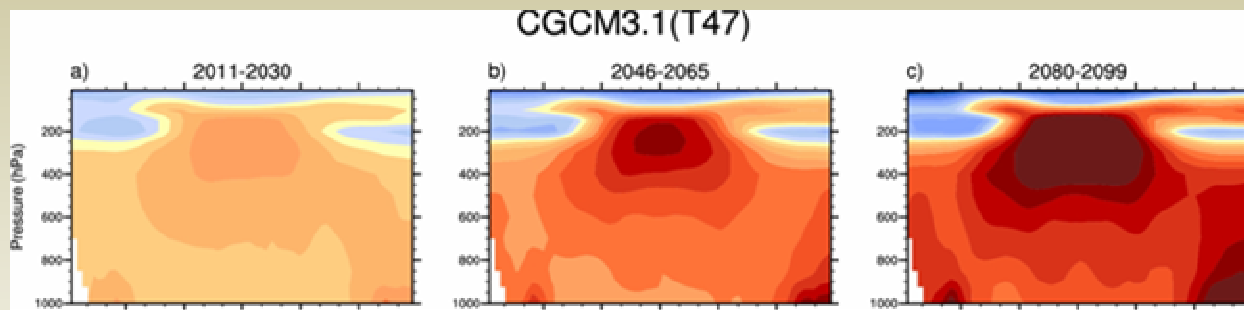


Future projections in IPCC AR4 (Figure 10.7)



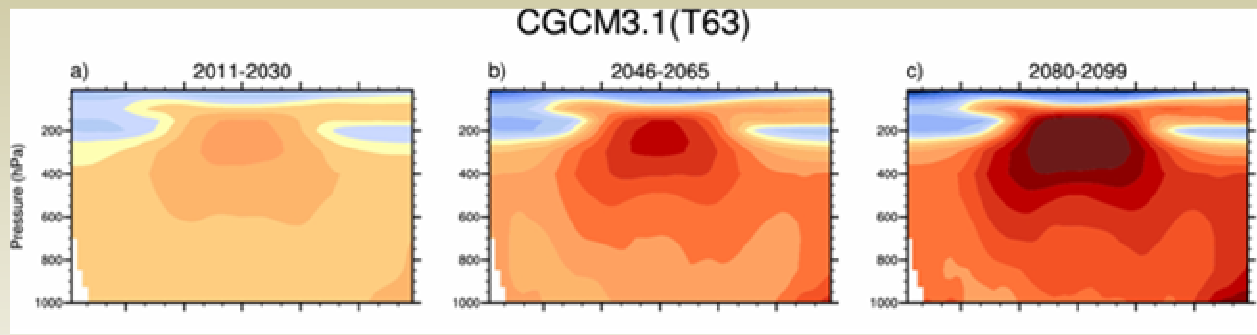


Future projections in IPCC AR4 (Figure 10.7)



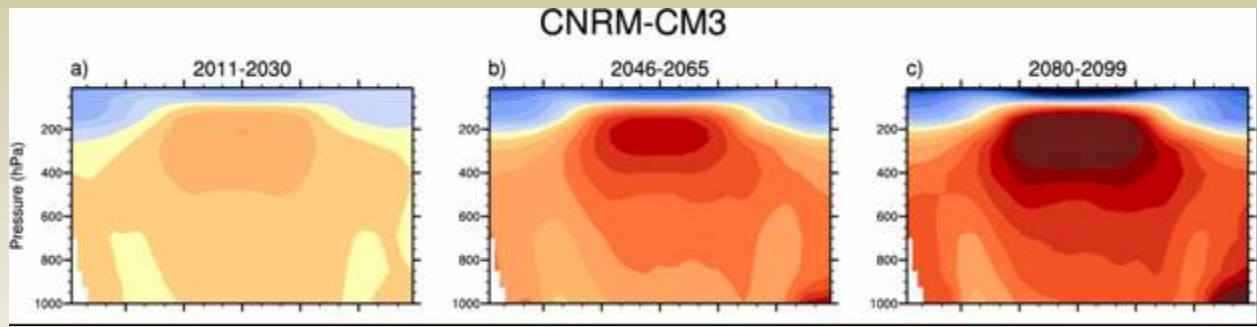


Future projections in IPCC AR4 (Figure 10.7)



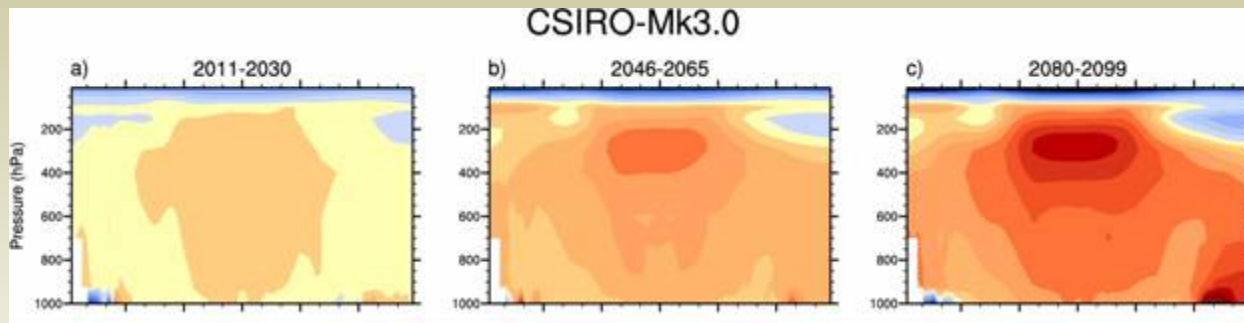


Future projections in IPCC AR4 (Figure 10.7)



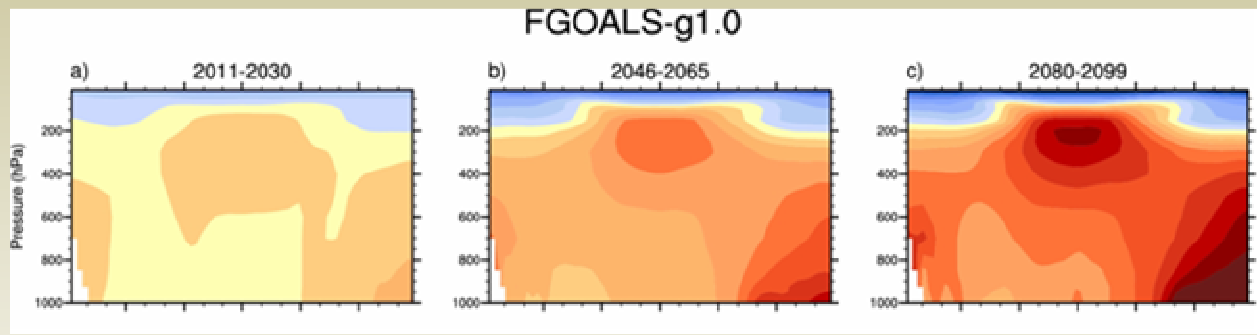


Future projections in IPCC AR4 (Figure 10.7)



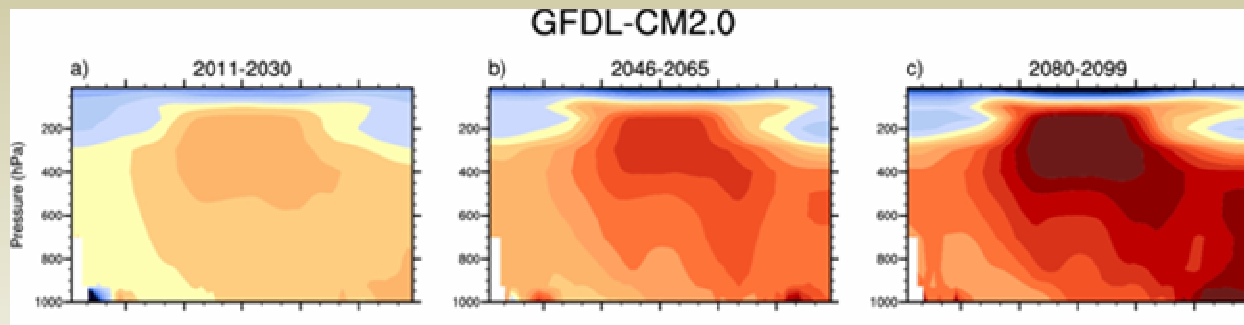


Future projections in IPCC AR4 (Figure 10.7)



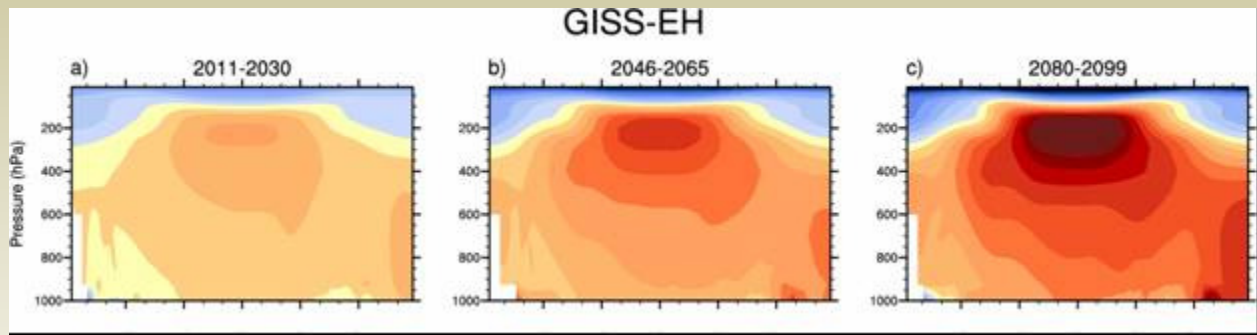


Future projections in IPCC AR4 (Figure 10.7)



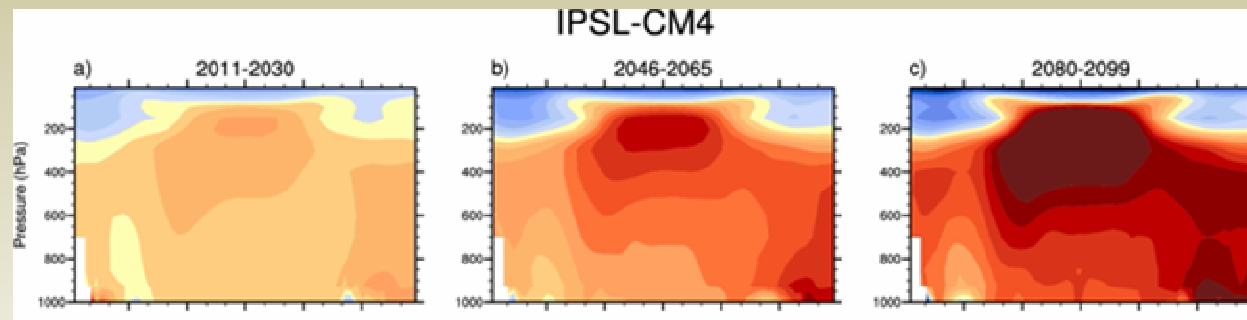


Future projections in IPCC AR4 (Figure 10.7)



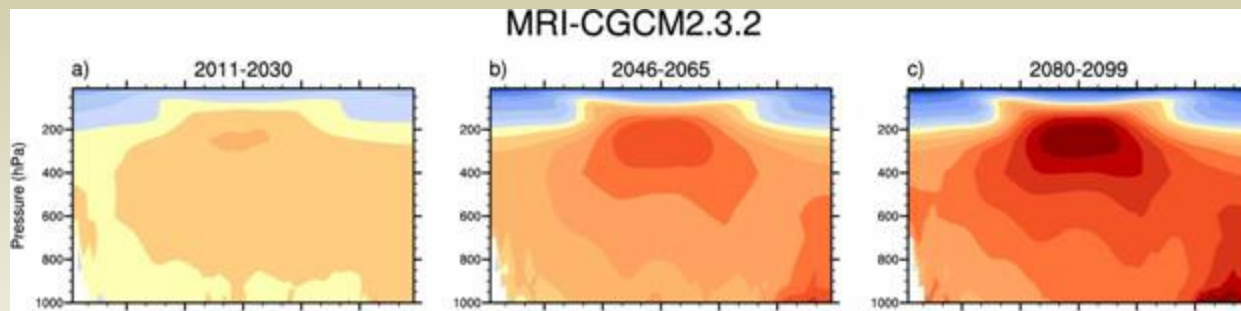


Future projections in IPCC AR4 (Figure 10.7)



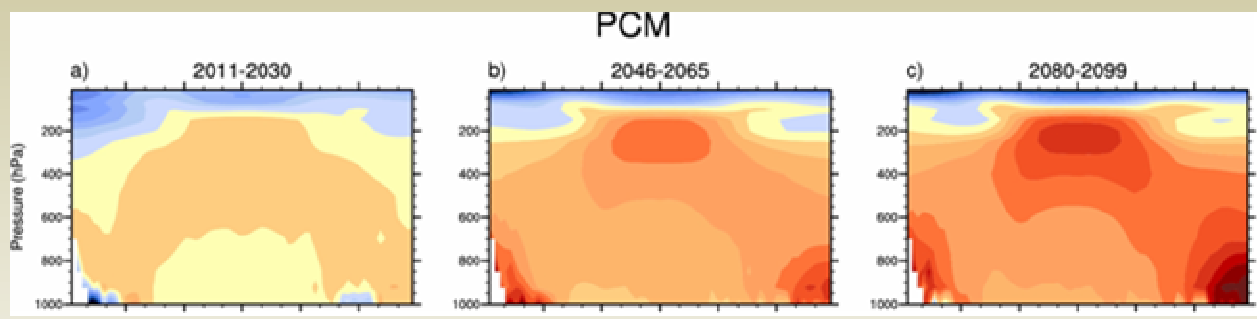


Future projections in IPCC AR4 (Figure 10.7)



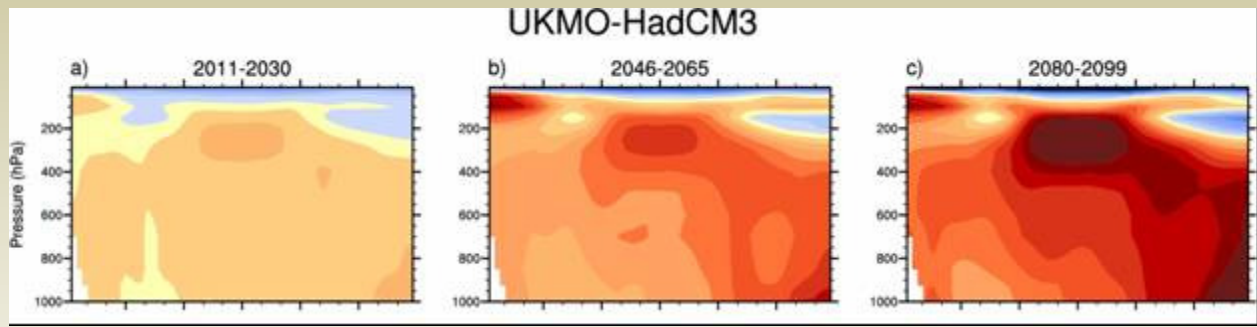


Future projections in IPCC AR4 (Figure 10.7)



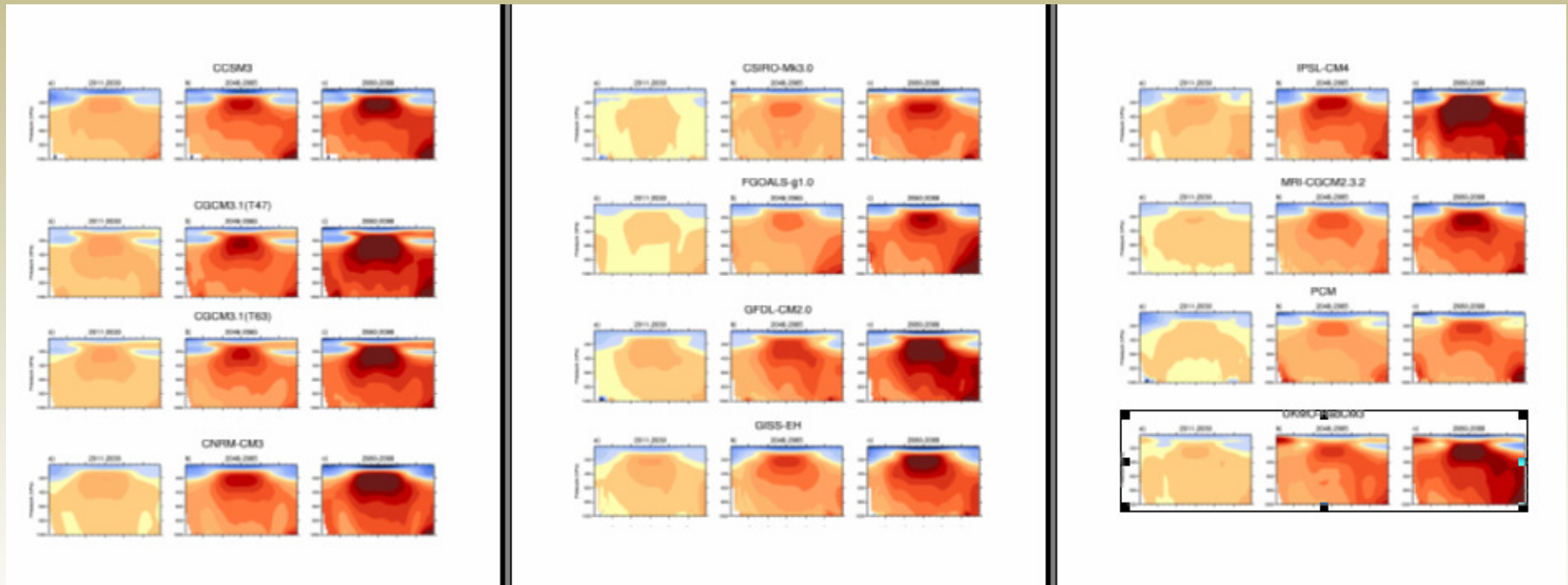


Future projections in IPCC AR4 (Figure 10.7)





Future projections in IPCC AR4 (Figure 10.7)

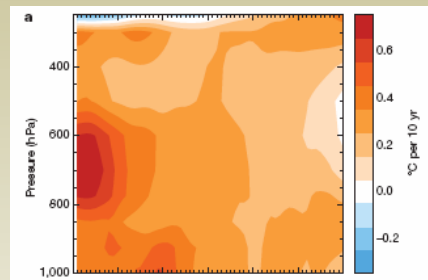


http://ipcc-wg1.ucar.edu/wg1/Report/suppl/Ch10/Ch10_indiv-maps.html



Questions concerning model predictions

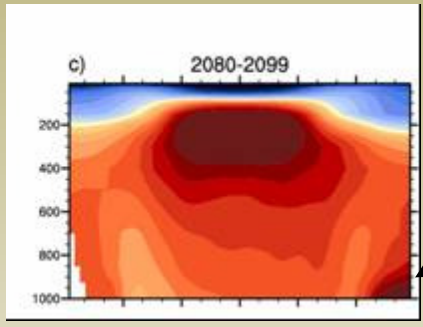
- Amplified surface Arctic warming



- “Our results do not imply that studies based on models forced by anticipated future CO₂ levels are misleading when they point to the importance of the snow and ice feedbacks. It is likely that a further substantial reduction of the summer ice-cover would strengthen these feedbacks and they could become the dominant mechanism underlying a future Arctic temperature amplification. **Much of the present warming, however, appears to be linked to other processes, such as atmospheric energy transports.**”

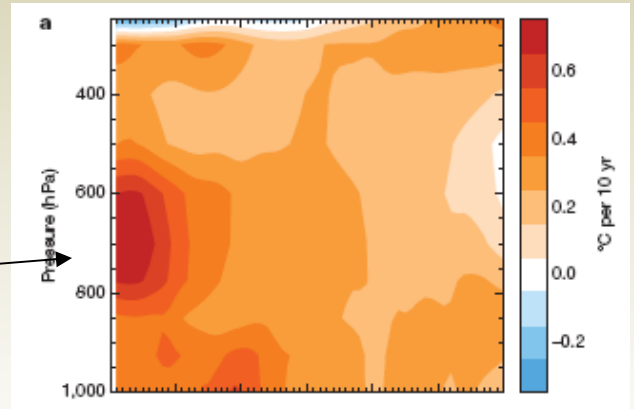


Questions concerning model predictions



Models predict Arctic amplification near surface

But observations place it in troposphere





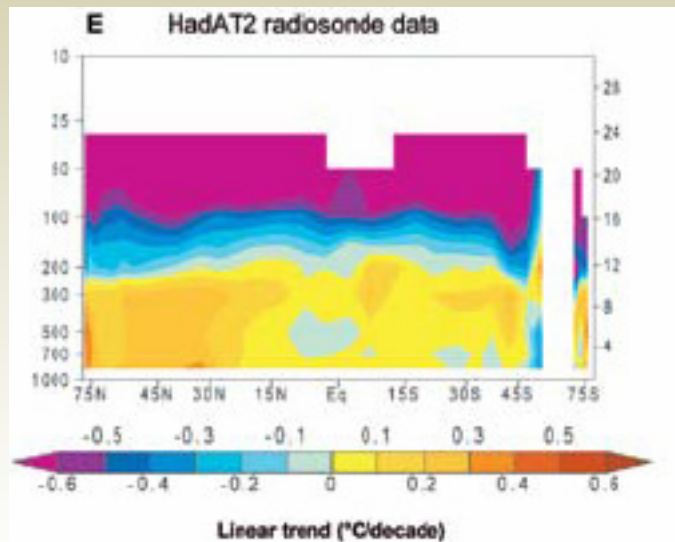
Questions concerning model predictions

- Balloon record

<http://www.climate-science.gov/Library/sap/sap1-1/finalreport/default.htm>

“Another noticeable difference is that the HadAT2 data show a relative lack of warming in the tropical troposphere where all four models simulate maximum warming.”

(CCSP p. 116)



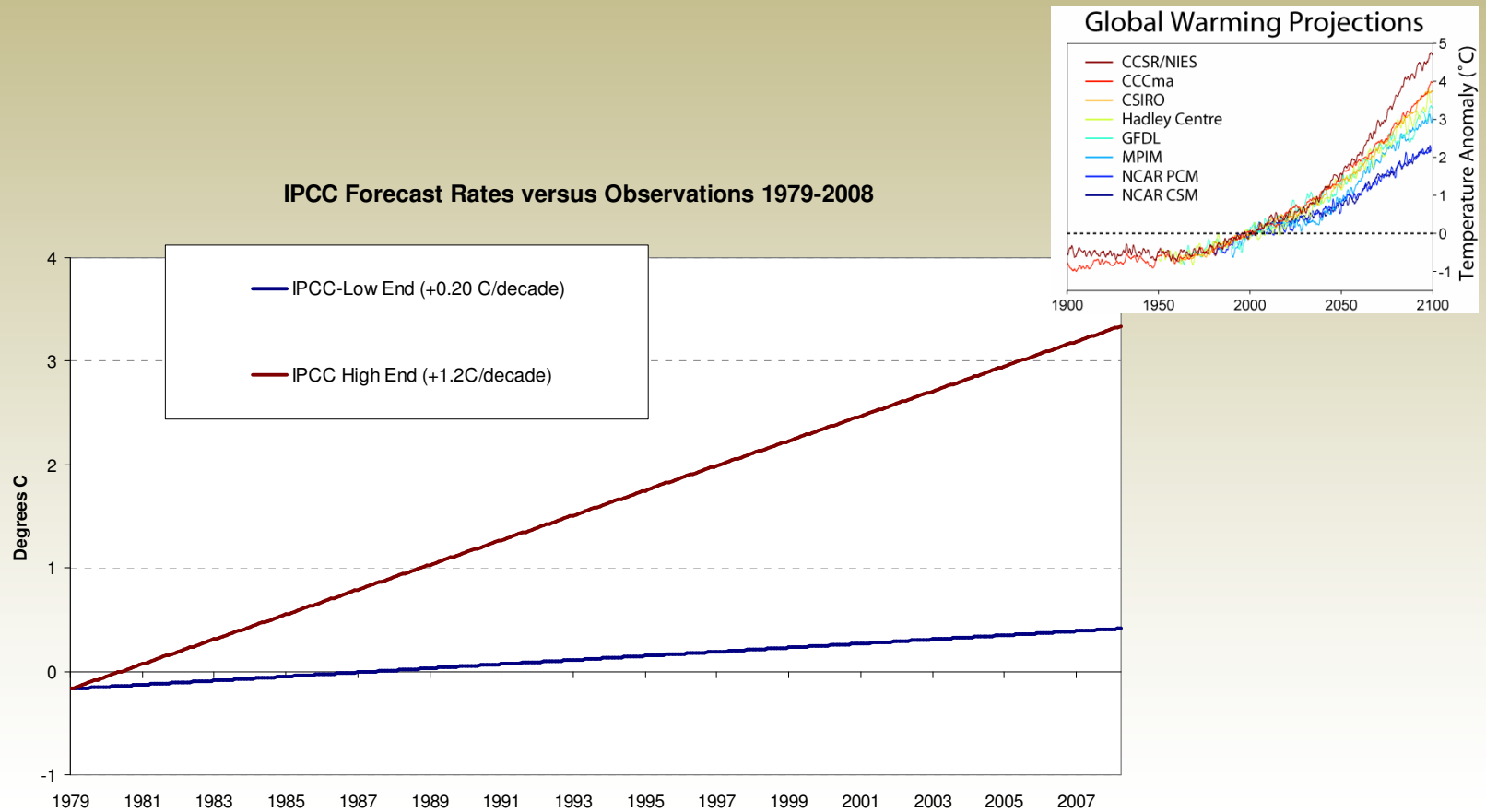
“...the lower troposphere warms more rapidly than the surface in almost all model simulations, while, in the majority of observed data sets, the surface has warmed more rapidly than the lower troposphere. In fact, the nature of this discrepancy is not fully captured in Fig. 4G as **the models that show best agreement with the observations are those that have the lowest (and probably unrealistic) amounts of warming.**”

(p. 11, emphasis added)



Questions concerning model predictions

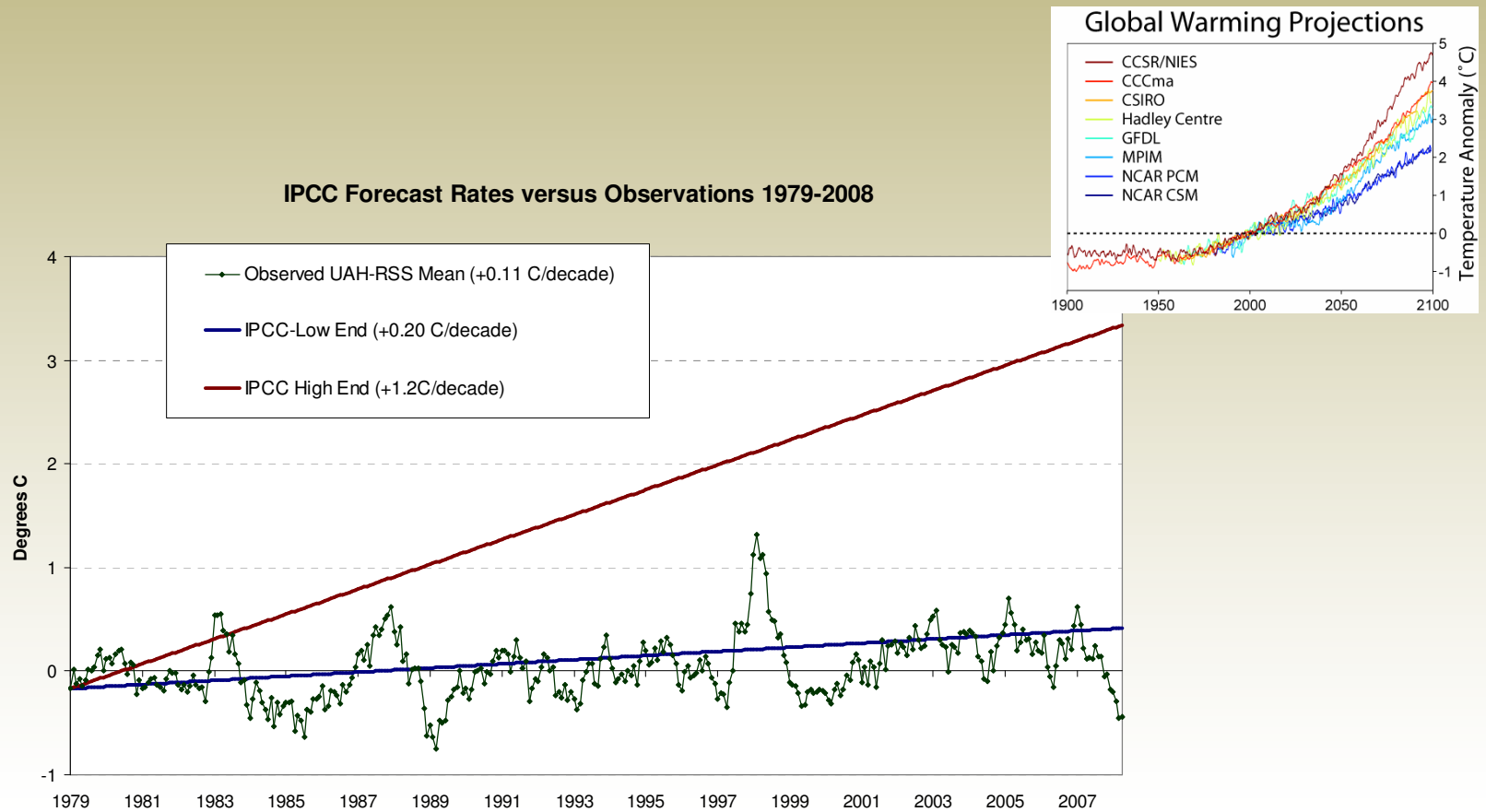
- Using RSS & UAH satellite data for tropical troposphere





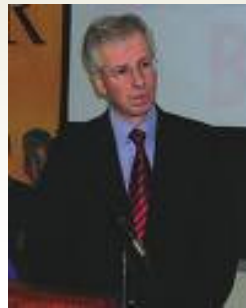
Questions concerning model predictions

- Using RSS & UAH satellite data for tropical troposphere





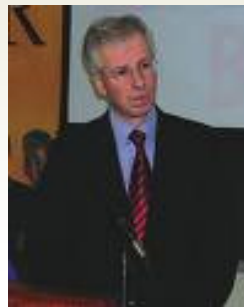
Questions concerning the need to act now





Questions concerning the need to act now

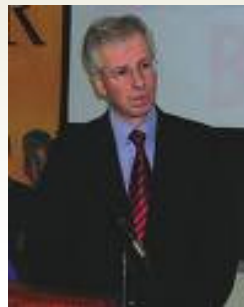
- What *specific* piece of evidence convinces you of this?





Questions concerning the need to act now

- What *specific* piece of evidence convinces you of this?
- Have you personally checked whether it is true or not?





Questions concerning cost-effectiveness of policy

- “This policy will reduce our greenhouse gas emissions by 32.5 Megatonnes”



Project Green

Moving Forward on Climate Change

**A Plan for Honouring
our Kyoto Commitment**

**Canada's Contribution
to Addressing Climate Change**



Questions concerning cost-effectiveness of policy

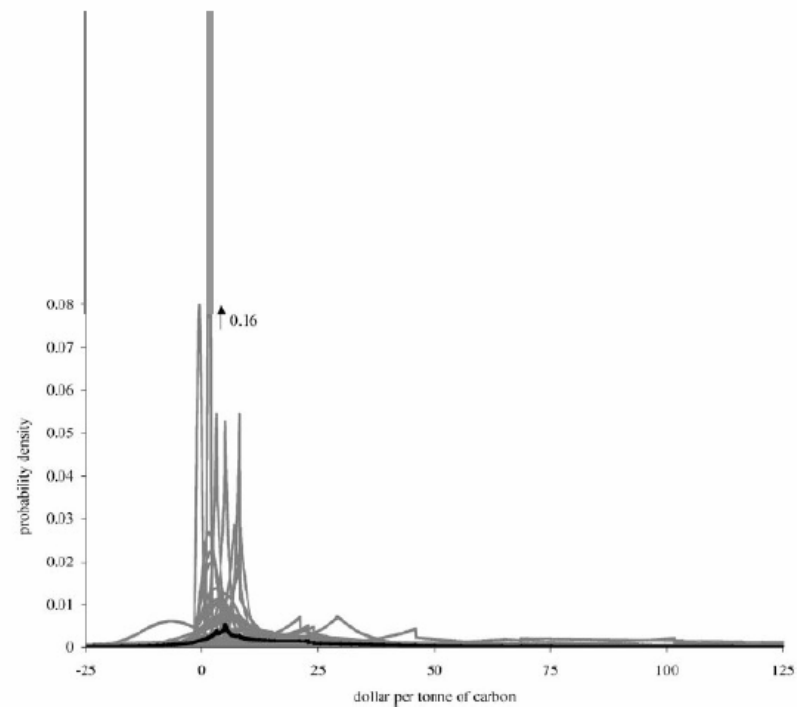
- “This policy will reduce our greenhouse gas emissions by 32.5 Megatonnes”
- How much will it cost per tonne?
- How much should we spend per tonne?



Questions concerning cost-effectiveness of policy

- Economic analysis of global costs if climate models are true:
 - ~\$10-20 per tonne

Tol, Richard S.J. (2005) "The marginal damage costs of carbon dioxide emissions: an assessment of the uncertainties." *Energy Policy* 33 (2005) 2064–2074.





Questions concerning cost-effectiveness of policy

- Liberal gov't promise to oil&gas sector, 2002:

\$15/per tonne

Letter from Minister Dhaliwal to CAPP,
December 18 2002



On the price of carbon credits, the Government will ensure that, during the first commitment period, Canadian companies will be able to meet their emission reduction responsibilities at a price no greater than \$15 a tonne. The Government will work with industry and others to develop appropriate mechanisms to meet this commitment in a manner that is affordable to industry and responsible for all Canadians.



Questions concerning cost-effectiveness of policy

- “This policy will reduce our greenhouse gas emissions by 32.5 Megatonnes”
- How much will it cost per tonne?
- How much should we spend per tonne?
- If the cost is 100’s of \$ per tonne, why do it?



Questions concerning the costs of a carbon tax

- “A carbon tax will raise household energy costs and screw everyone”





Questions concerning the costs of a carbon tax

- “A carbon tax will raise household energy costs and screw everyone”
- How much will the proposed cap and trade system raise energy costs?



Questions concerning the costs of a carbon tax

- “A carbon tax will raise household energy costs and screw everyone”
- How much will the proposed cap and trade system raise energy costs?
- Can you guarantee emission permits will cost less per tonne than the carbon tax?



Questions concerning the costs of a carbon tax

- “A carbon tax will raise household energy costs and screw everyone”
- How much will the proposed cap and trade system raise energy costs?
- Can you guarantee emission permits will cost less per tonne than the carbon tax?
- Are you prepared to let permit prices go over, say, \$30 per tonne? or \$100 per tonne? or \$200?



Questions concerning the aims of international climate conference mandarins

- “It is essential we get an agreement now, for the sake of the planet”





international climate conference mandarins

- “It is essential we get an agreement now, for the sake of the planet”

Suppose at 10 AM this morning, the IPCC announced that scientists had discovered rock-solid, 100% incontrovertible proof that CO₂ cannot affect the climate.

Would this room react with:





international climate conference mandarins

- “It is essential we get an agreement now, for the sake of the planet”

Suppose at 10 AM this morning, the IPCC announced that scientists had discovered rock-solid, 100% incontrovertible proof that CO₂ cannot affect the climate.

Would this room react with:

- Joy, jubilation and relief?





international climate conference mandarins

- “It is essential we get an agreement now, for the sake of the planet”

Suppose at 10 AM this morning, the IPCC announced that scientists had discovered rock-solid, 100% incontrovertible proof that CO₂ cannot affect the climate.

Would this room react with:

- Joy, jubilation and relief?
- Shock, disappointment and despair, giving way to tears and anguish?





Questions concerning whether Canada is shirking

“Canada is an environmental laggard”

“We urge Canada to do more to reduce greenhouse gas emissions”





Questions concerning whether Canada is shirking

“Canada is an environmental laggard”

“We urge Canada to do more to reduce greenhouse gas emissions”

- What if the oil sands...



Questions concerning whether Canada is shirking

“Canada is an environmental laggard”

“We urge Canada to do more to reduce greenhouse gas emissions”

- What if the oil sands...

had been discovered in France?





Questions concerning the benefits of reducing emissions

- We can reduce megatonnes of emissions, and make megatonnes of money

Fighting climate change helps build a competitive and sustainable Canadian economy

The clear connection between environmental considerations and economic competitiveness is leading a transformation of the way the global economy works. Countries are integrating both environmental and economic performance in order to position

Timely investments in innovative technologies for energy use and production not only have the potential to reduce our GHG emissions but also can open up economic opportunities:

Thirty of the largest multinationals in the world, including DuPont, Toyota, British Petroleum, IBM, Kodak, Alcoa, Royal Dutch Shell and Rio Tinto, are also reducing their emissions and profiting by doing so. British Petroleum, for example, has reduced its worldwide emissions to ten per cent below 1990 levels seven years ahead of schedule at a net saving to the company. And IBM has saved approximately \$50 million per year through its energy efficiency initiatives.



Questions concerning the benefits of reducing emissions

- We can reduce megatonnes of emissions, and make megatonnes of money
- If it saves so much money for firms, why do you need regulations, fines and the threat of jail to force them to do it?



Questions concerning the benefits of reducing emissions

- We can reduce megatonnes of emissions, and make megatonnes of money
- If it saves so much money for firms, why do you need regulations, fines and the threat of jail to force them to do it?
- If we'll be so much better off, wouldn't a small fee on emissions be more than enough to spur all these reductions?



Questions concerning the benefits of reducing emissions

- We can reduce megatonnes of emissions, and make megatonnes of money
- If it saves so much money for firms, why do you need regulations, fines and the threat of jail to force them to do it?
- If we'll be so much better off, wouldn't a small fee on emissions be more than enough to spur all these reductions?
- If a small emissions fee is not enough to convince people to reduce emissions, doesn't that mean the abatement costs are large?



Questions concerning the next 10 years

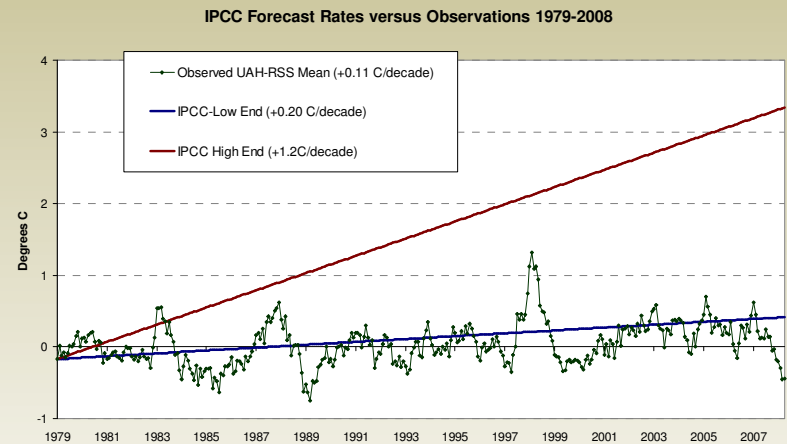
“Climate change is the greatest threat facing the world today.”



Questions concerning the next 10 years

“Climate change is the greatest threat facing the world today.”

What specific data should we follow to measure the size of the threat?

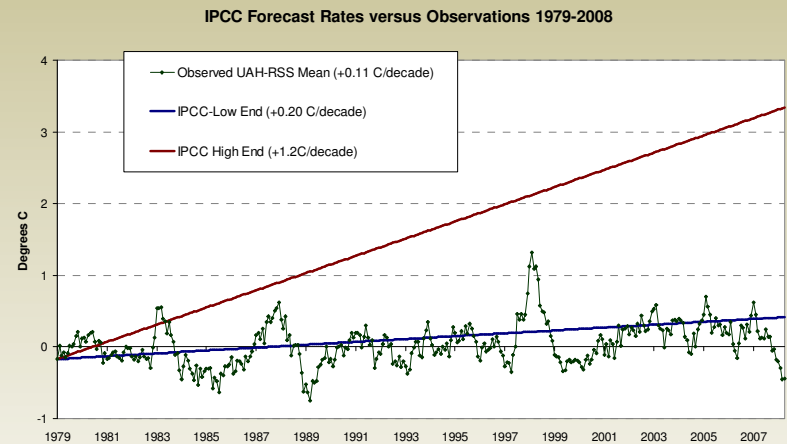




Questions concerning the next 10 years

“Climate change is the greatest threat facing the world today.”

What specific data should we follow to measure the size of the threat?



What patterns in that data, over the next 10 years, would indicate that the threat has been overstated?



Thank you.

- The end.

