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Understanding and predicting changes in climate systems

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News in Climate Science

News in Climate Science and Exploring boundaries, november 2009

*A Policy brief on developments since the IPCC AR4
report in 2007*



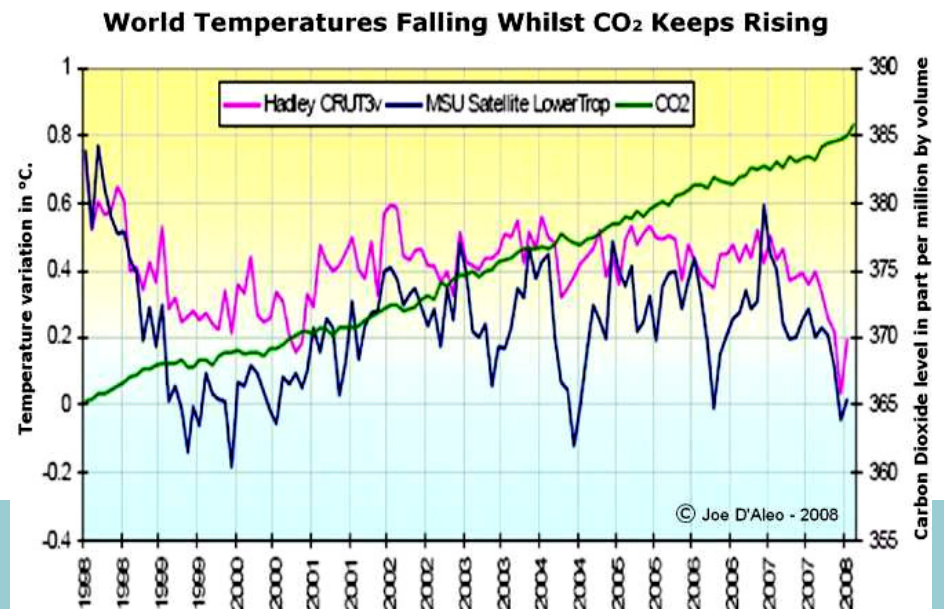
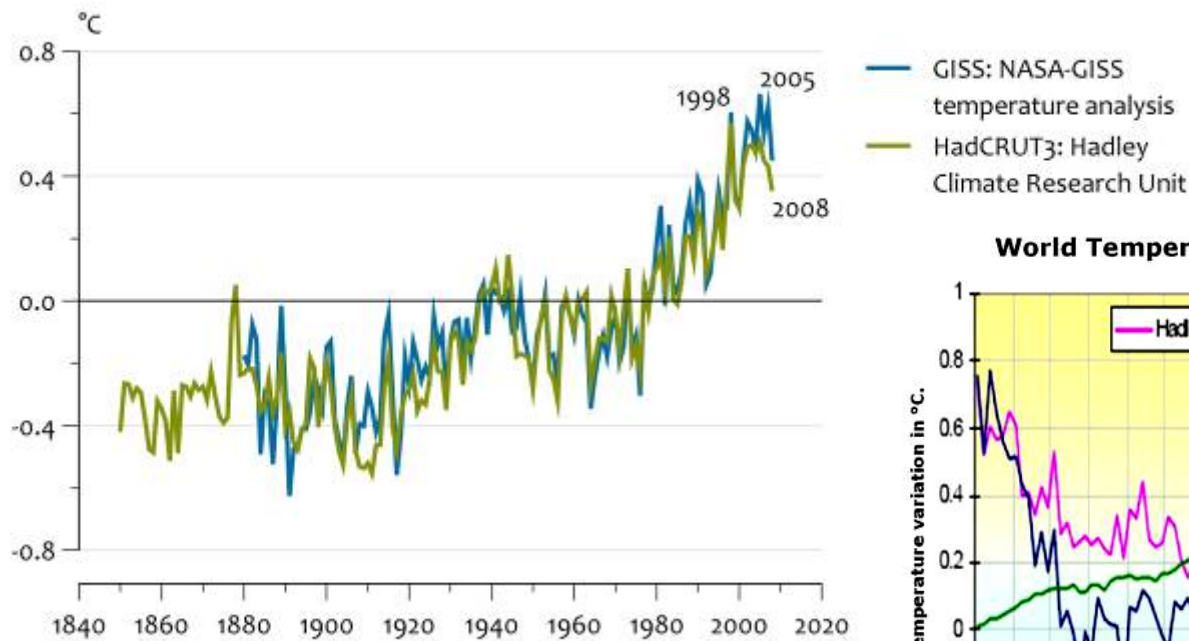
Fact 1:



Global warming since 1998

- Did NOT stop...
- 0,2 C rise per decade since 1975
 - 2009: 0,6 C warmer than 1975
 - 2009: the 5th warmest year since 1856

Global temperature anomalies compared to 1961-1990 average

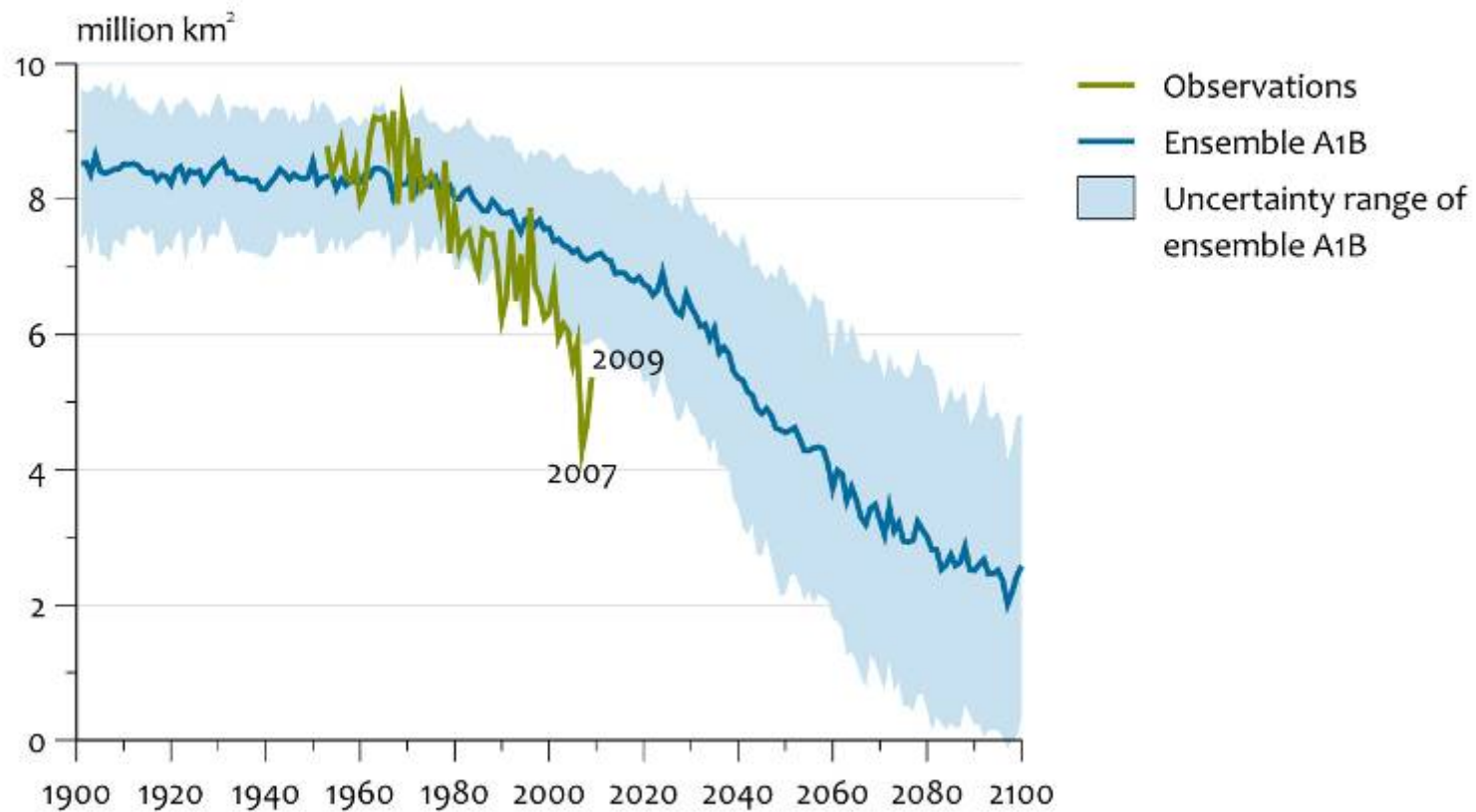


Fact 2:



Arctic sea ice retreat

Minimum arctic ice extent



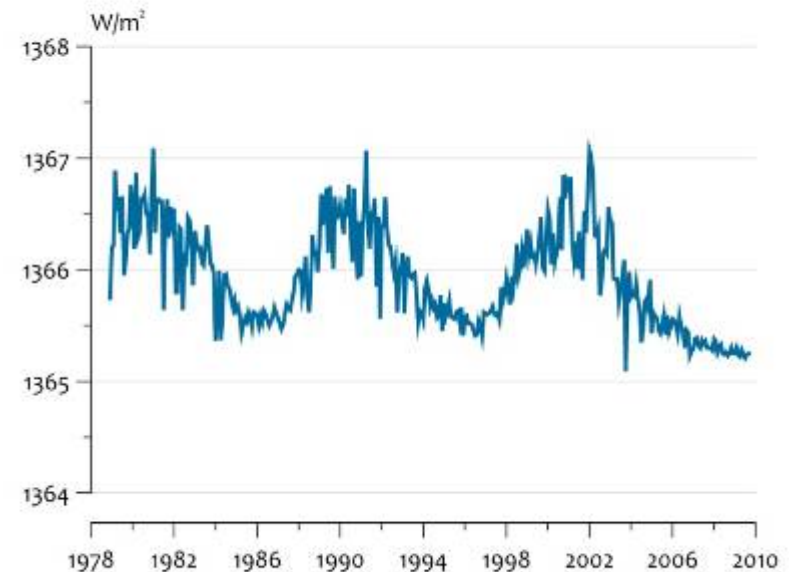
Fact 3:



Solar influence

- Changes in solar radiation are very unlikely to have a significant warming influence
- A long-lasting period of a quiet sun might reduce temperature by 0.2°C to 0.4°C in a few decades
- Cosmic ray variations have a minor temperature effect

Total Solar Irradiance (TSI), 1979-2009



Fact 4:



Carbon cycle

More insight in positive and negative feedback mechanisms. Total balance: ***less uptake of carbon***

Reasons for concern:

- Permafrost might contain 100% more carbon and could become a source of 10 to 15% of current emissions.
- Fires and droughts could disturb long term terrestrial sink.
- 450 ppm target might be needed to preserve marine ecosystems.

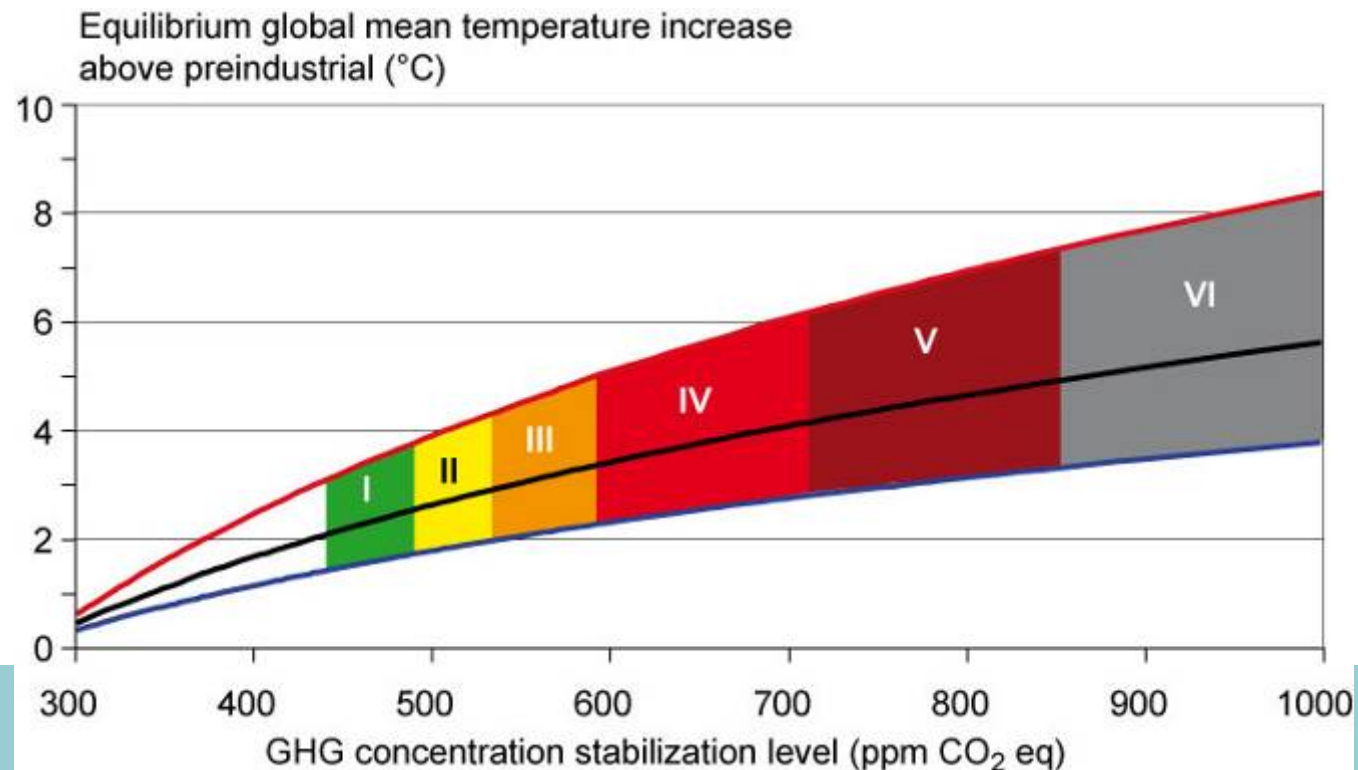
Fact 5:



Climate sensitivity

= equilibrium between temperature and CO₂

Conclusions of IPCC AR4 still holds, however less uncertainty through better understanding of processes



Fact 6:



Sea level rise

- Observations: 17 cm sea level rise since 1900
- Greenland and Antarctica account for 0,5 mm/year, which is accelerating
- New predictions for high-end rise: 1.1 meters sea level rise in 2100 in stead of 0.76 meters



Thank you for your attention