Climate Change

Departmental Open Day, 6th May 2006

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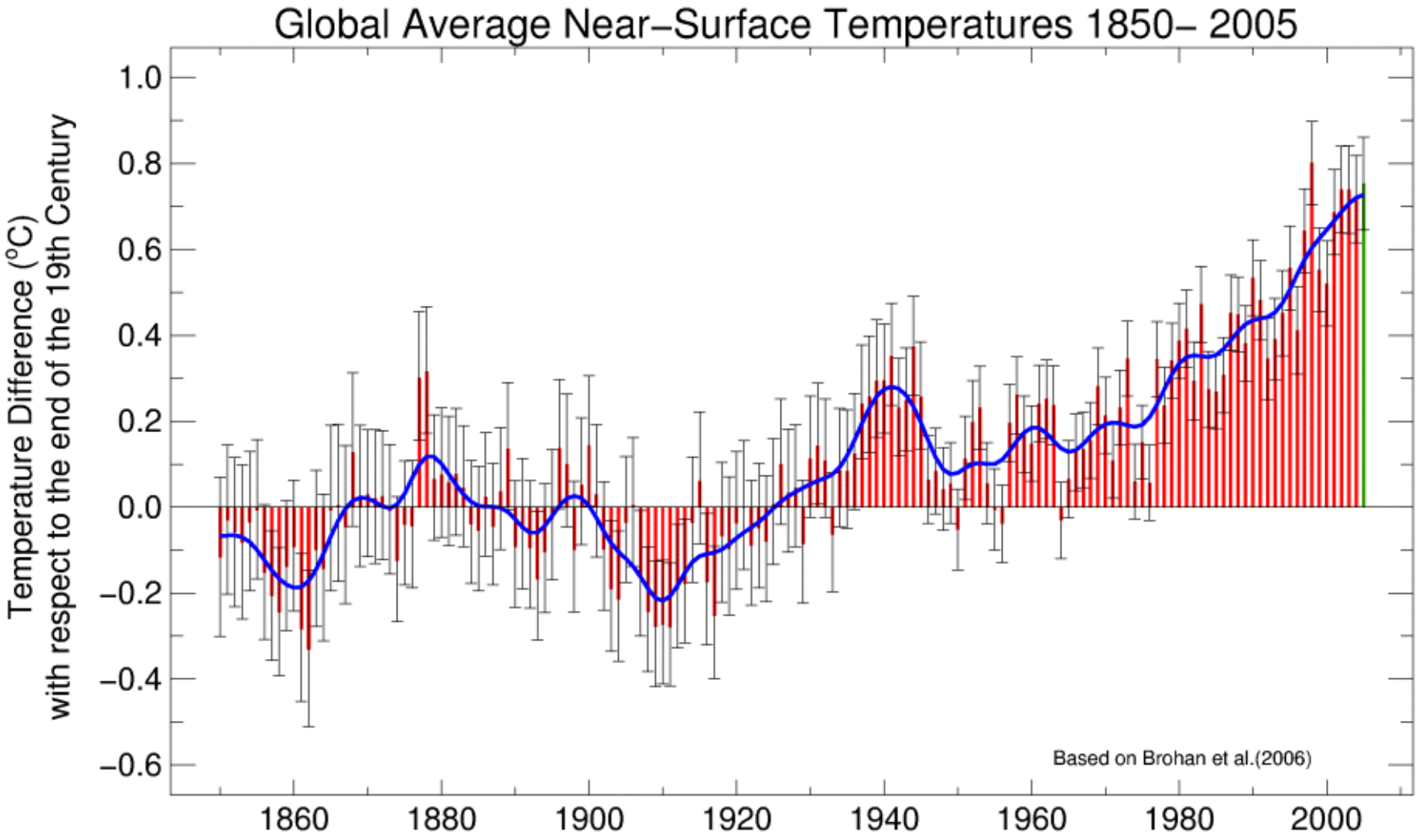
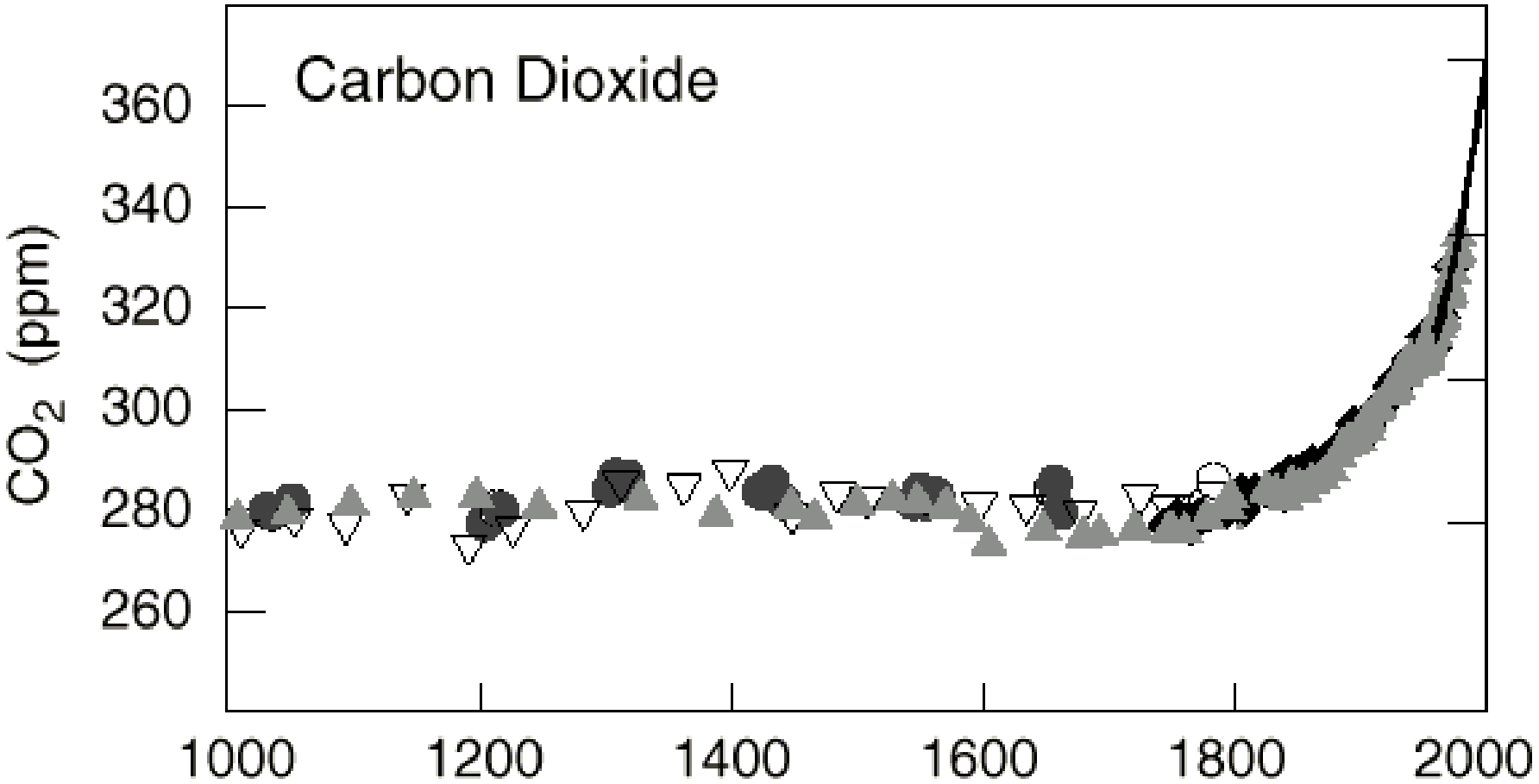
Global warming

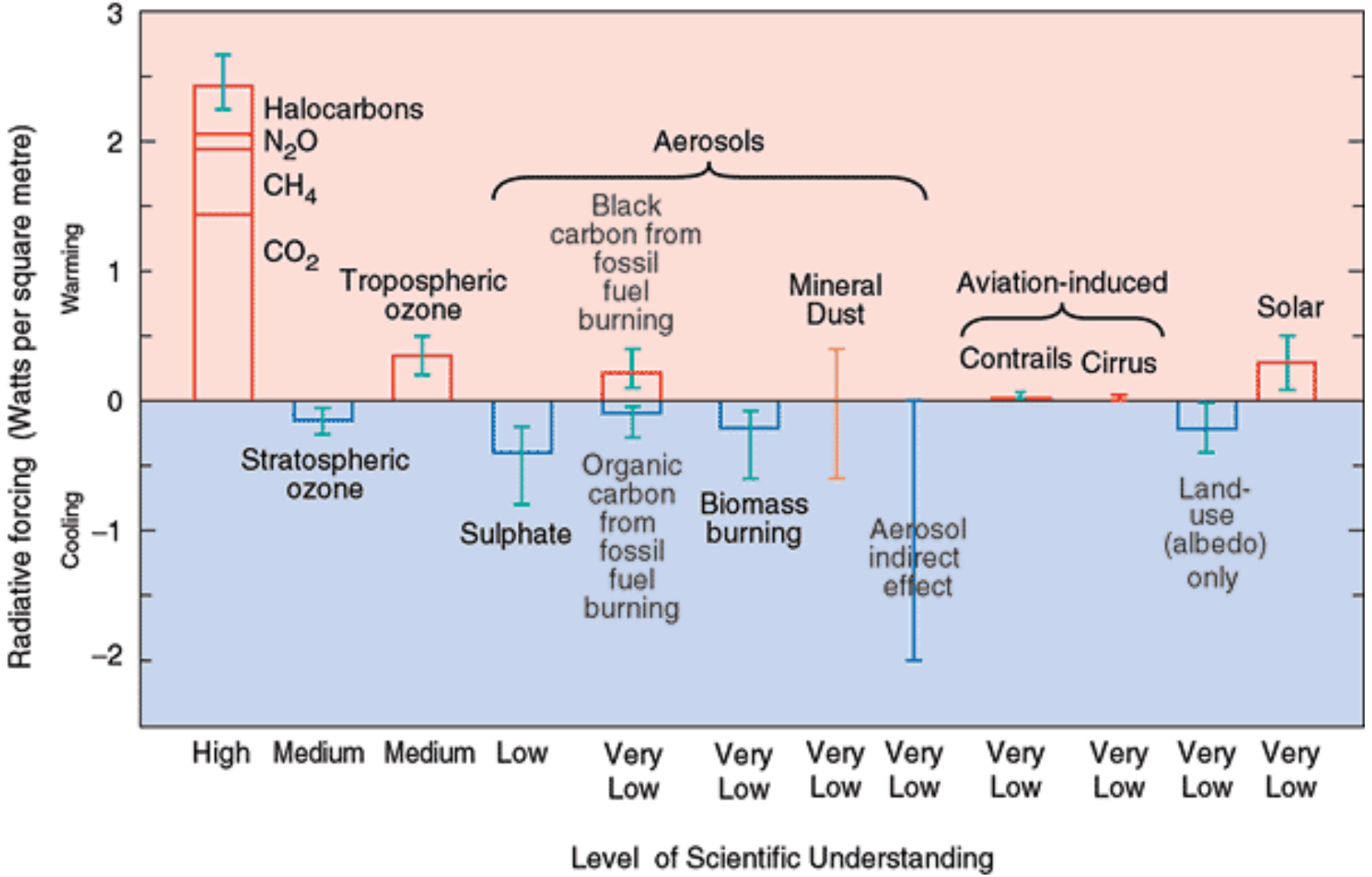


Human activities have changed the composition of the atmosphere since preindustrial times



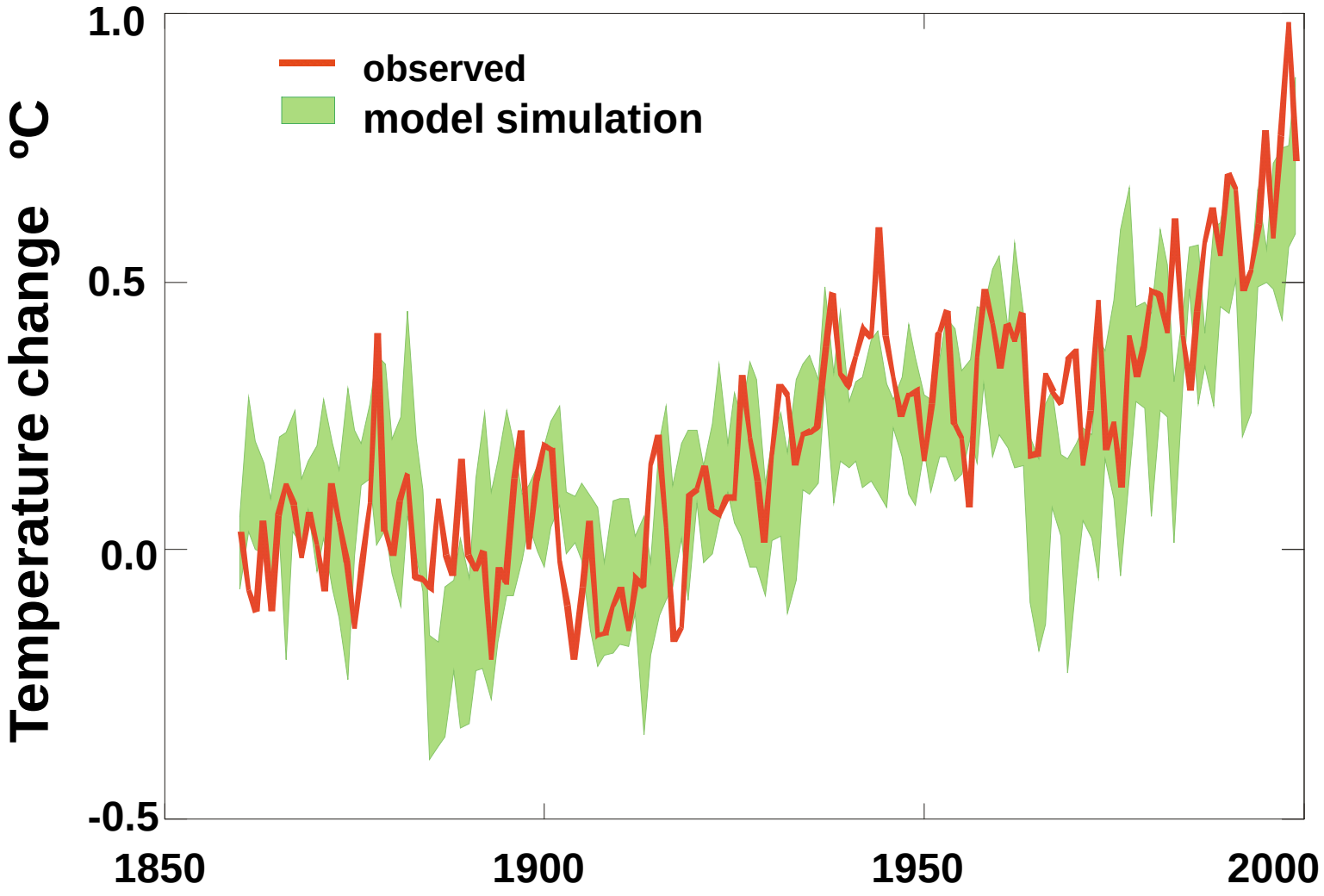
Radiative forcing of the climate system

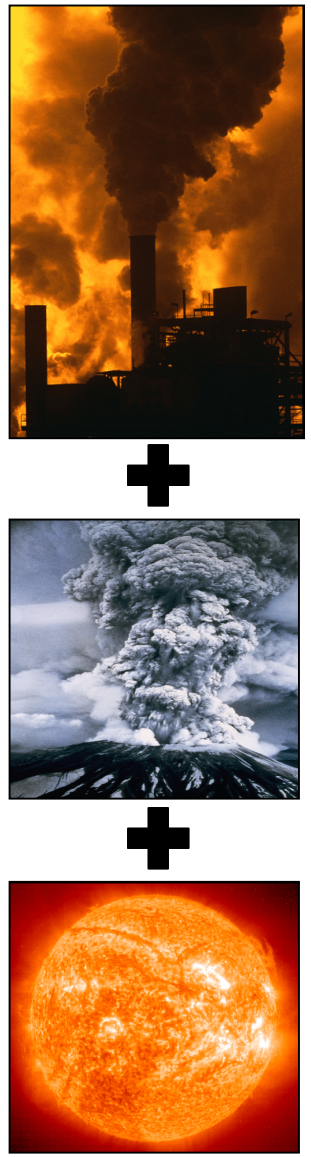
(at 2000 relative to pre-industrial)



Observed and simulated change

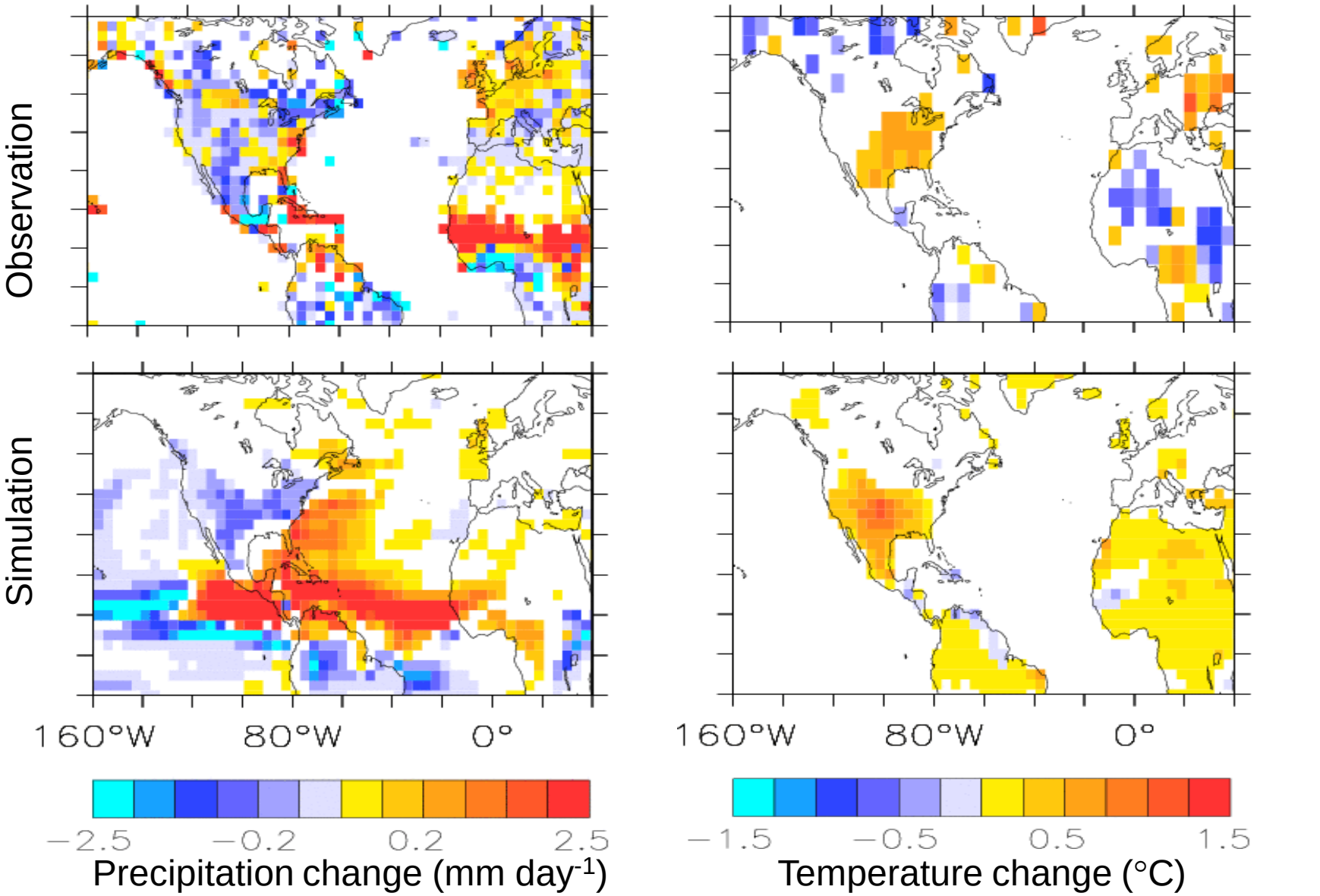
due to both natural and anthropogenic factors





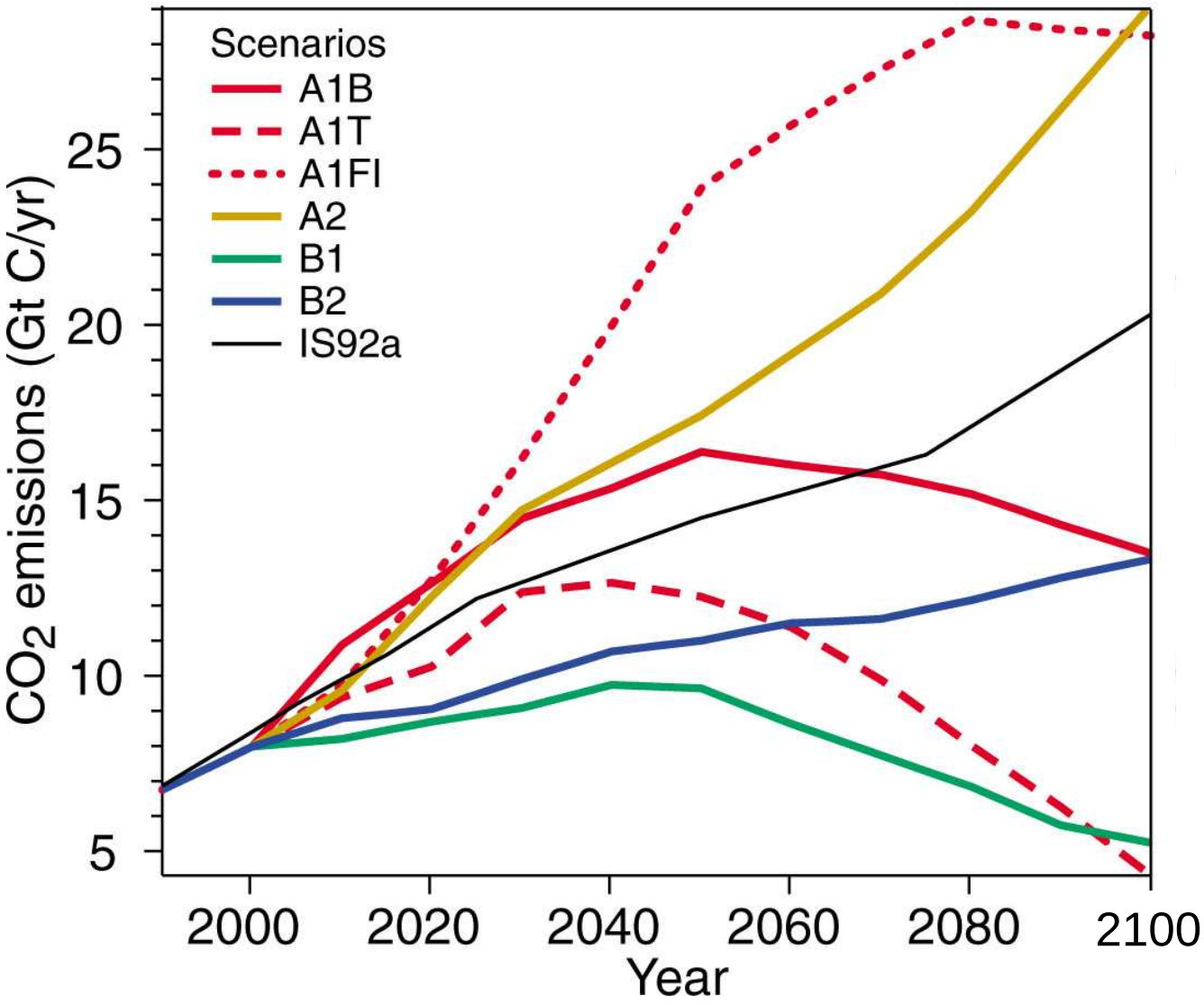
Stott *et al.* (2000)

Atlantic SST influences JJA regional climate

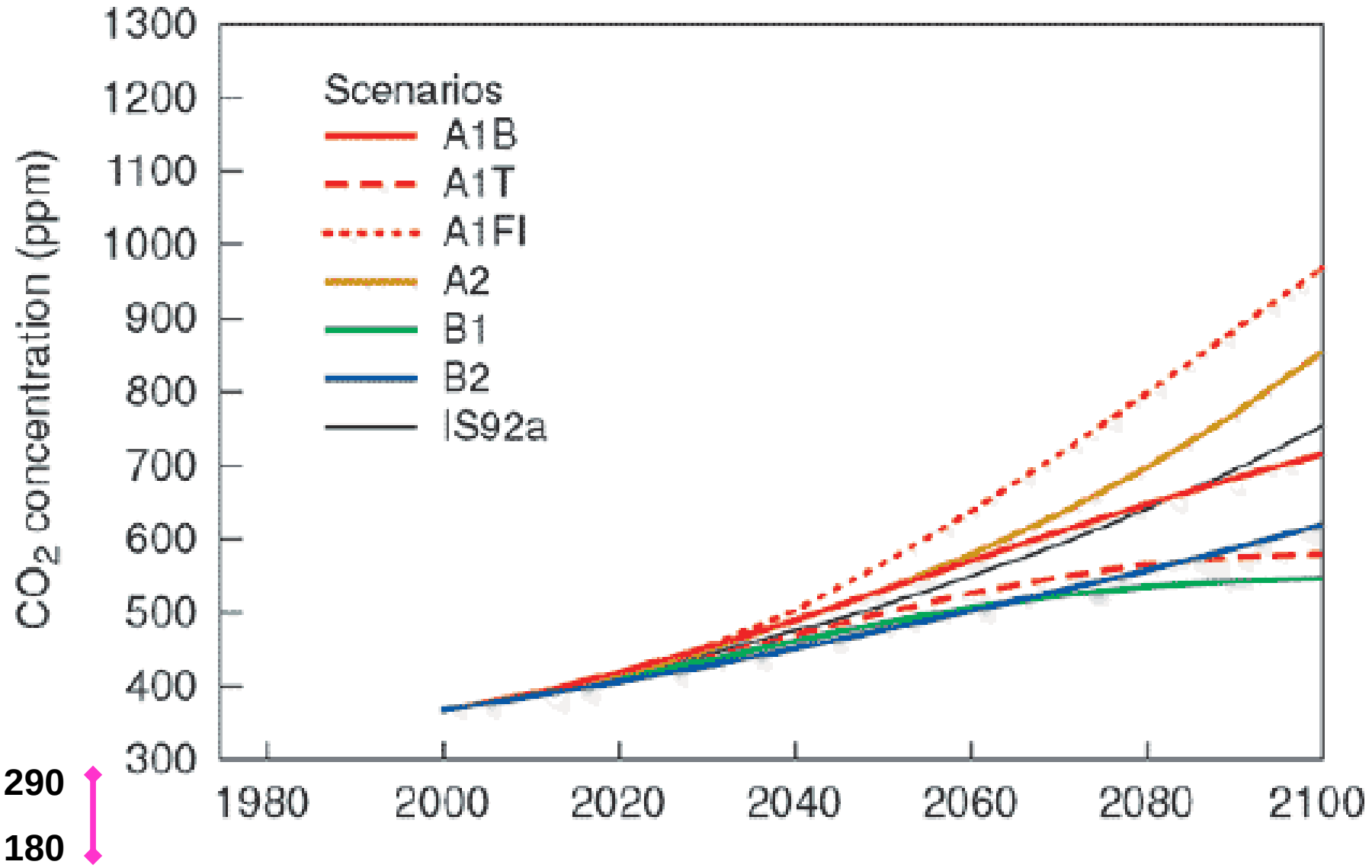


Sutton and Hodson (2005)

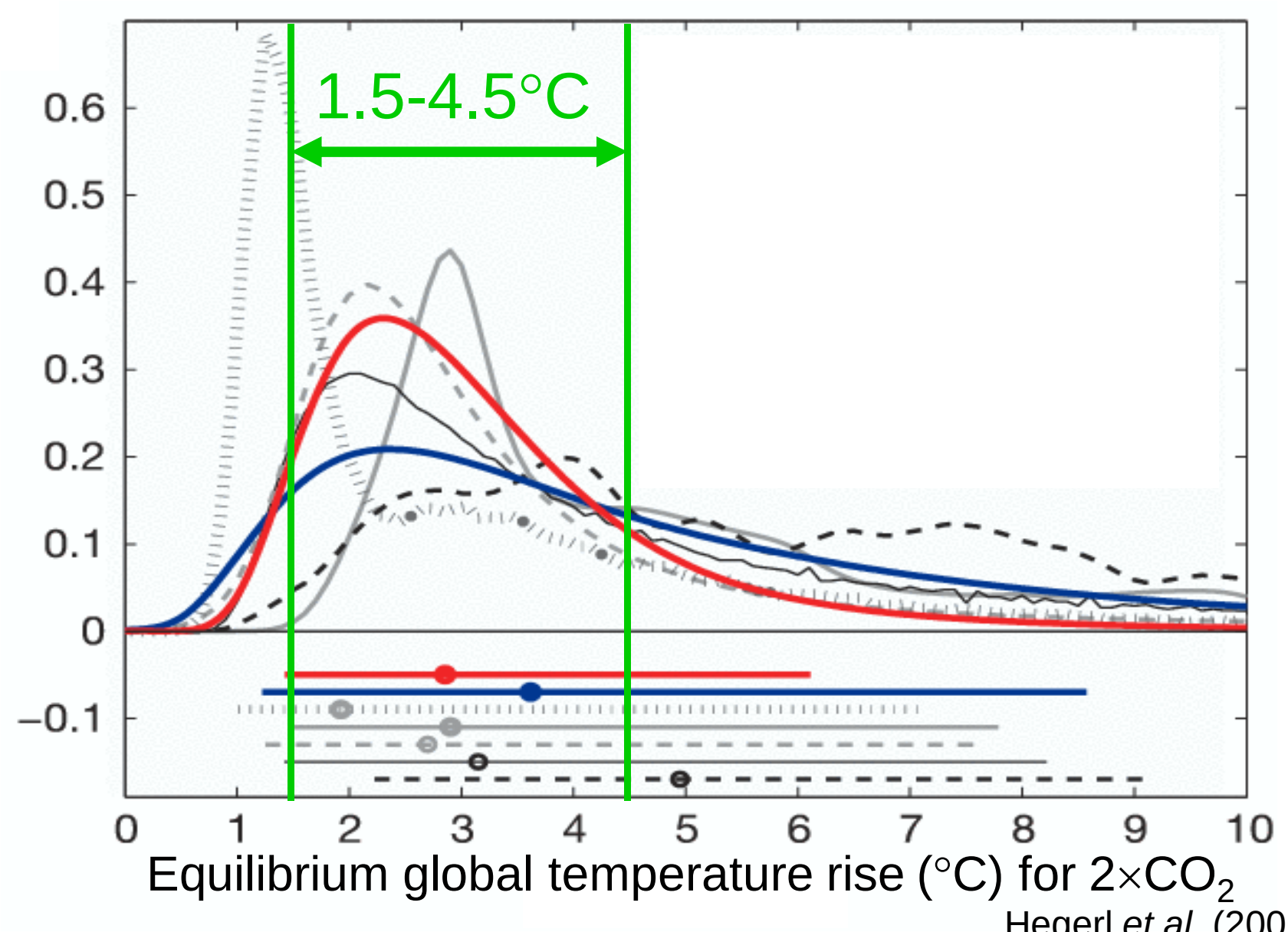
CO_2 emissions in IPCC SRES scenarios



CO_2 concentrations in IPCC SRES scenarios

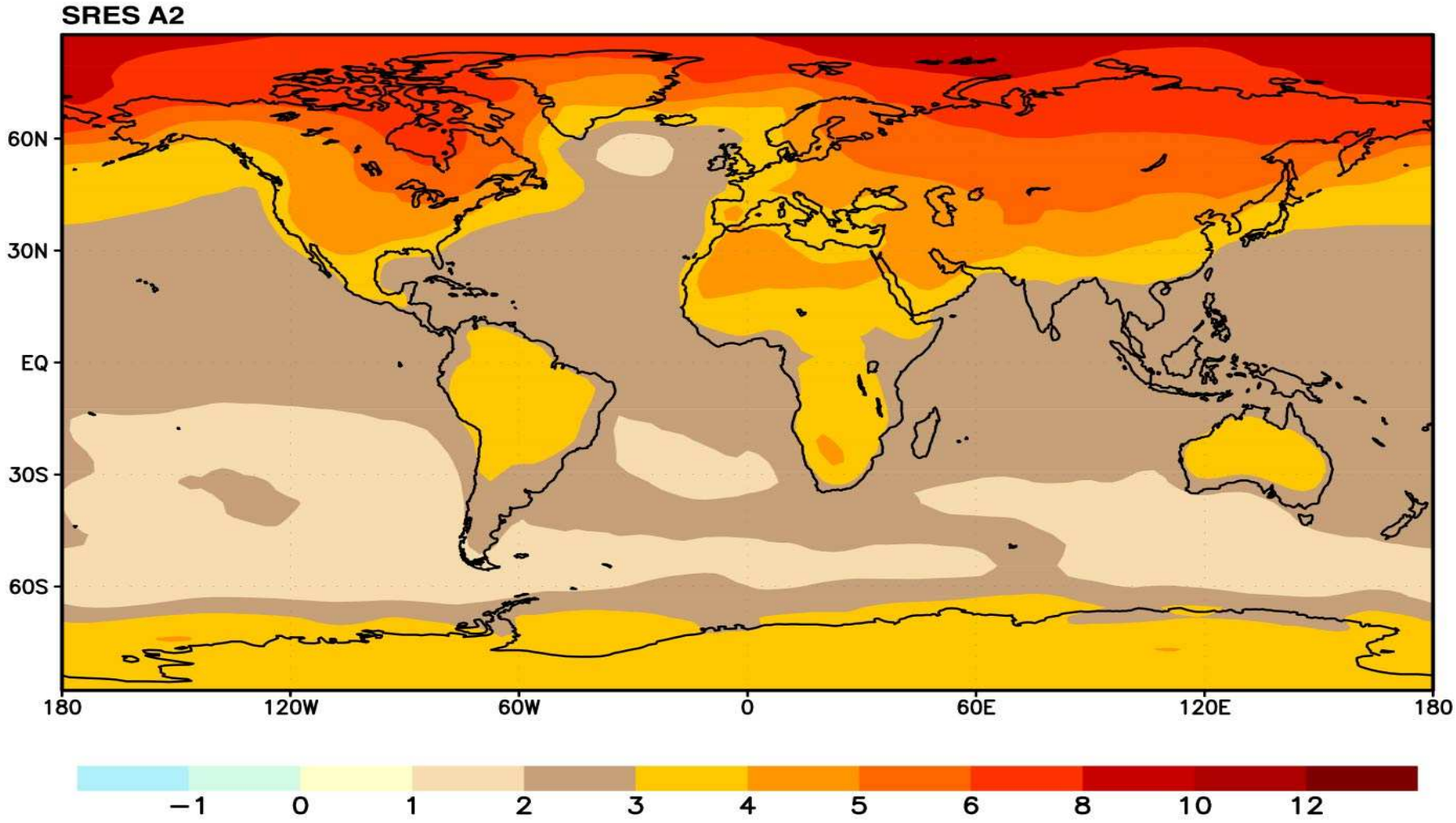


Climate response to radiative forcing



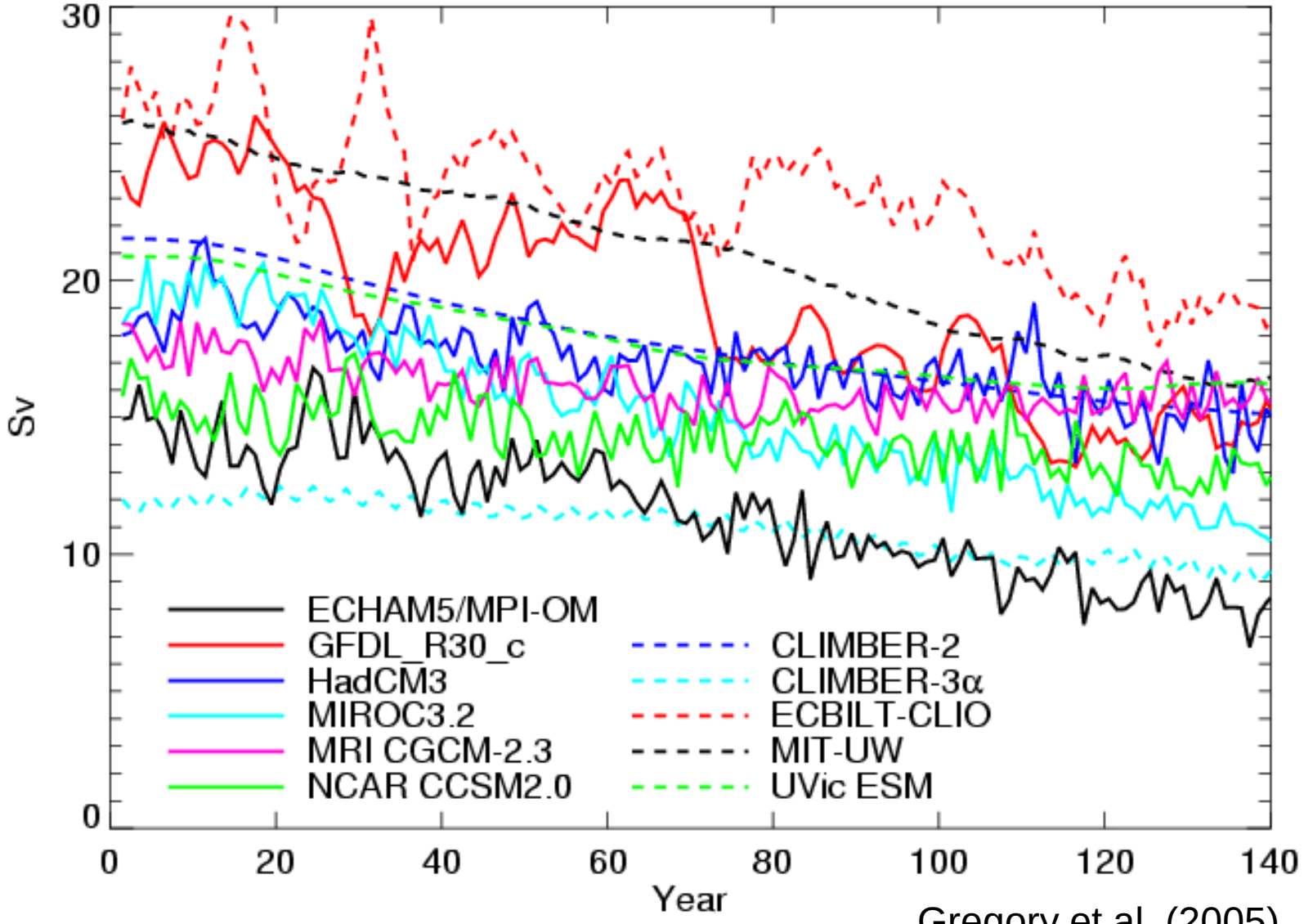
Hegerl *et al.* (2006)

Temperature change during 21st century



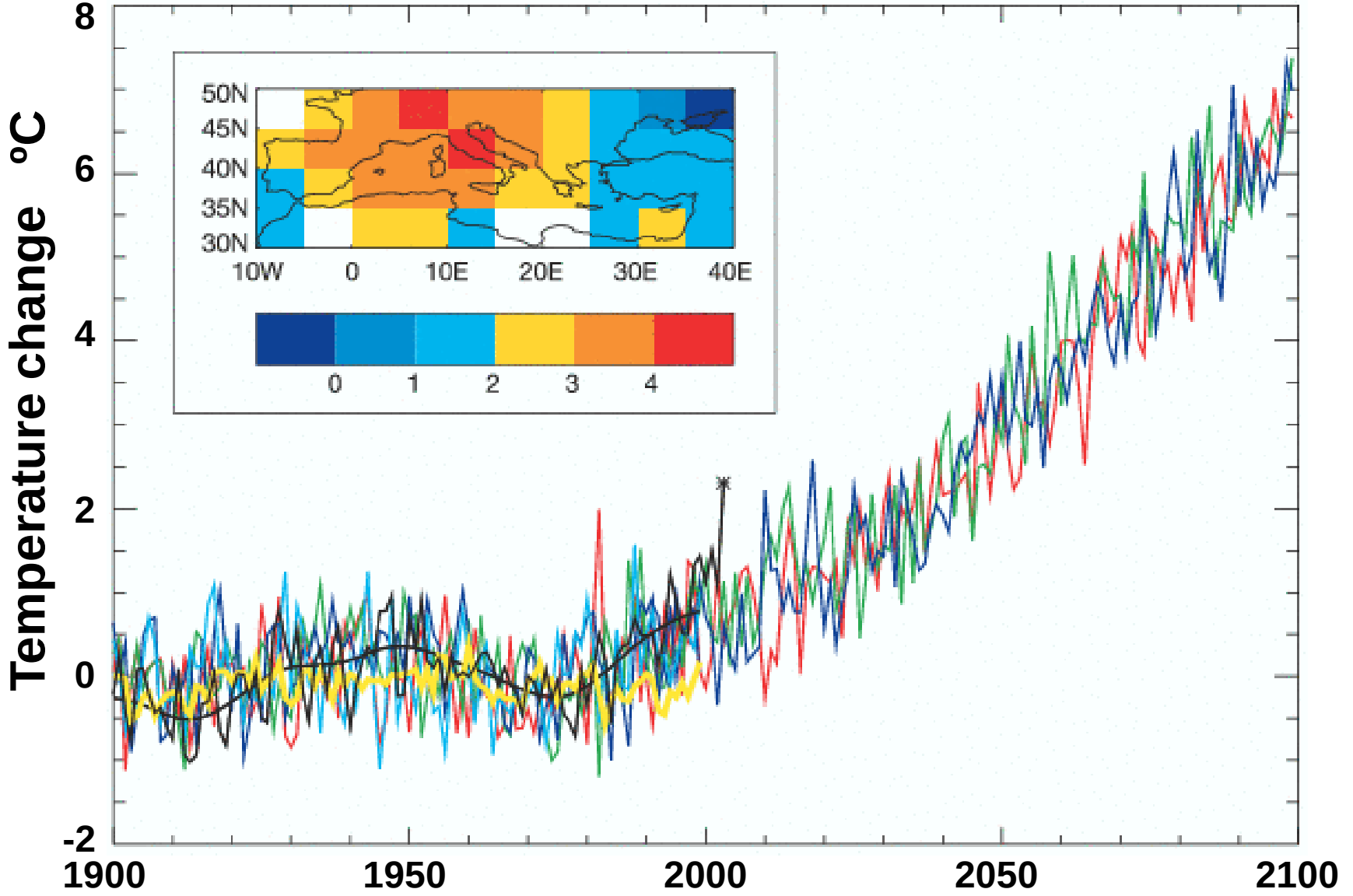
Atlantic meridional overturning circulation

under increasing CO_2



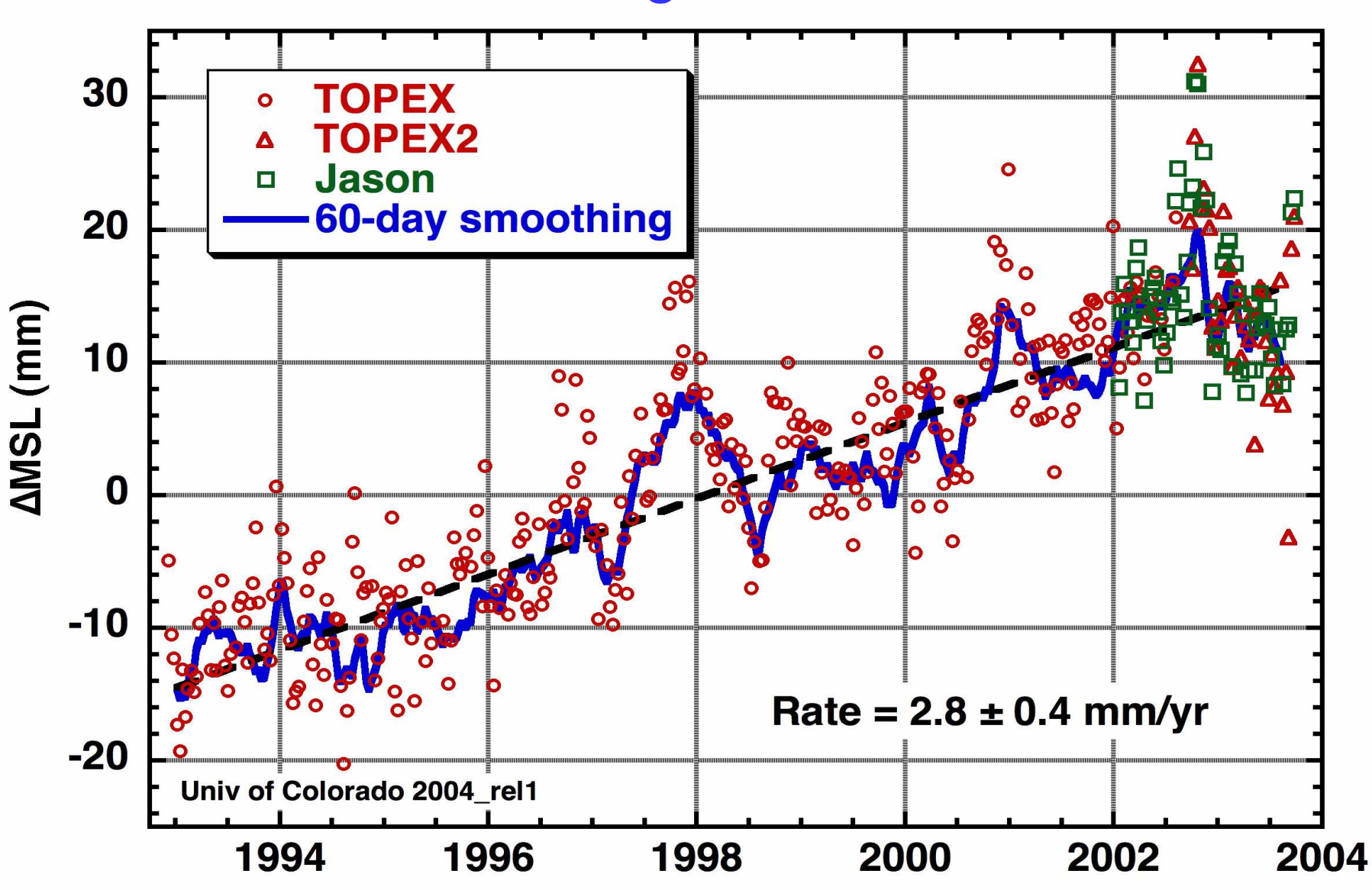
Gregory et al. (2005)

European heatwaves like summer 2003



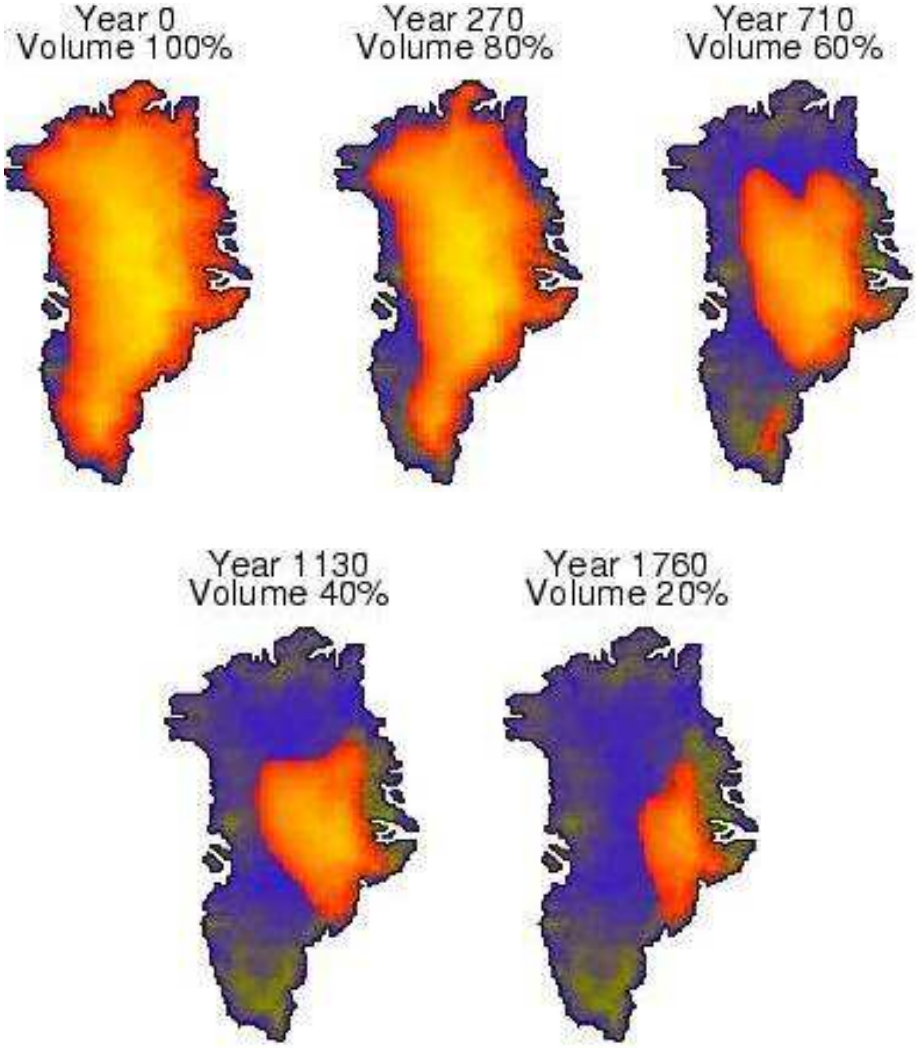
Stott *et al.* (2004)

Global average sea level rise



Cazenave and Nerem (2004)

Future of the Greenland ice sheet

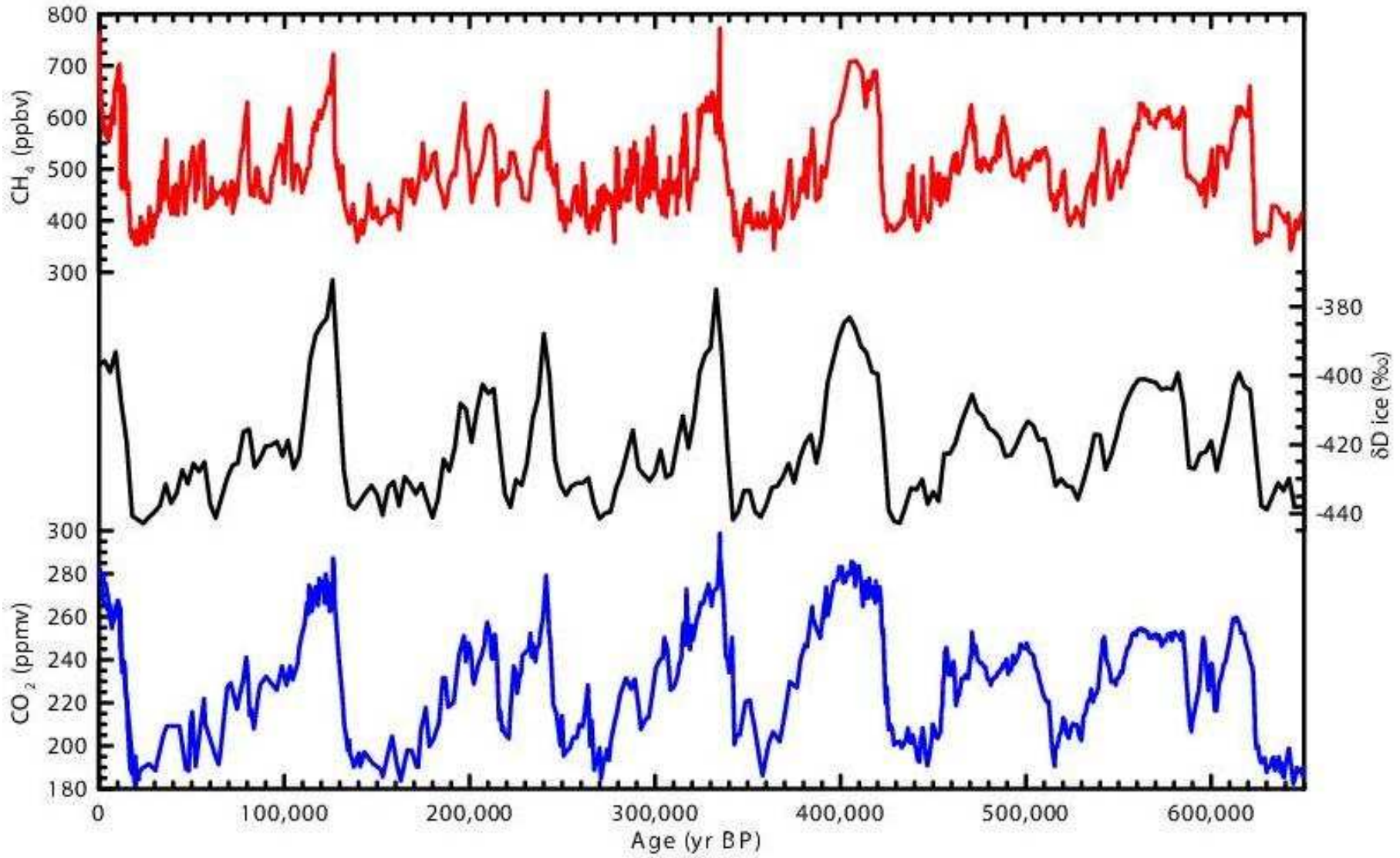


Ridley et al. (2005)

Photo by Roger Braithwaite

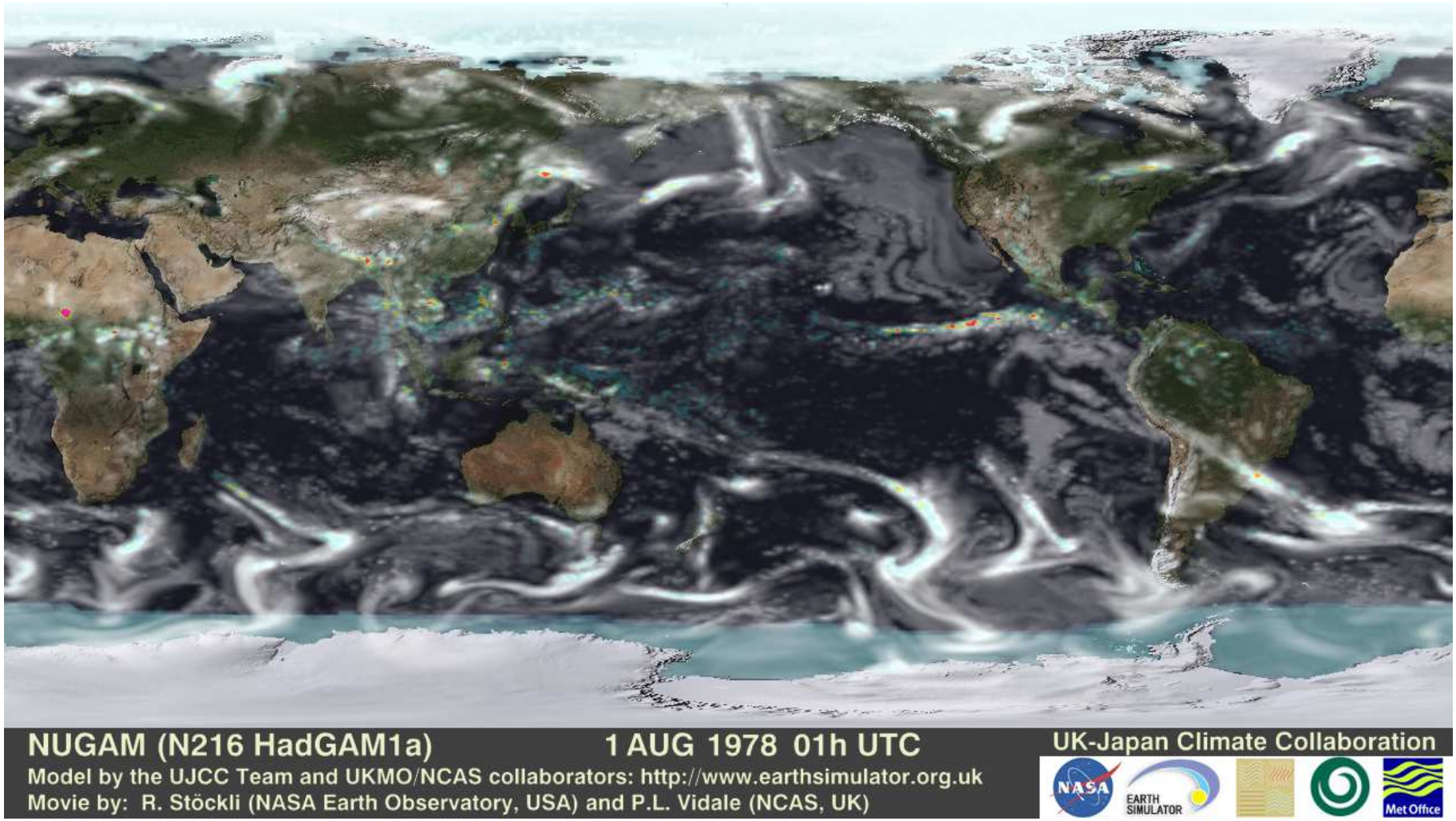
How can we reduce uncertainty?

Climate variations over the last 650 kyr



Adapted by Stocker from Siegenthaler *et al.* (2005)

Climate modelling at high resolution



Conclusions

Climate change is a real and complex phenomenon

Recent climate change is largely anthropogenic

Climate change and sea level rise will be greater in the 21st century than during the 20th, and could have many serious impacts on societies and ecosystem

Sea level will continue to rise for millennia after stabilisation of atmospheric composition

Large uncertainties exist in model predictions, especially on local scales

Adaptation is necessary and mitigation possible