

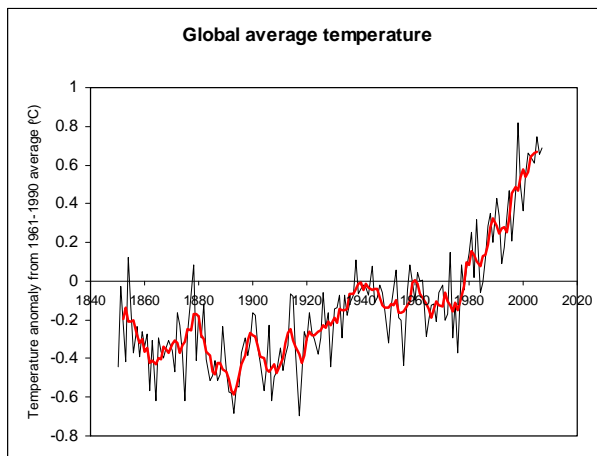


Climate change: science, impacts and consequences

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Walker Institute for Climate System Research
University of Reading

Pang, Kennet & Lambourn Valleys Countryside Projects (FWAG)
Annual meeting, July 2009

Global climate is changing...



**All of the 10
warmest years
since 1850 have
occurred since
1995**

Crutem3gl, Climatic Research Unit, University of East Anglia

What is driving the change in climate?

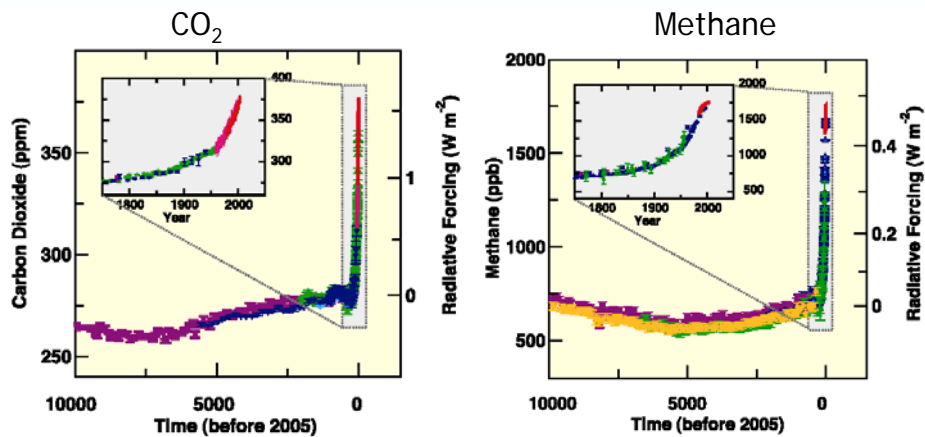
Possible explanations:

- natural variability
- variation in solar output
- increasing concentration of greenhouse gases

“Greenhouse” gases alter the radiative balance of the surface of the earth by trapping outgoing long-wave radiation

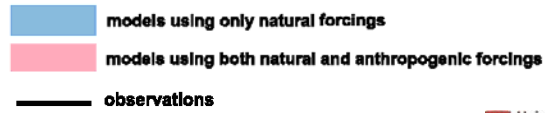
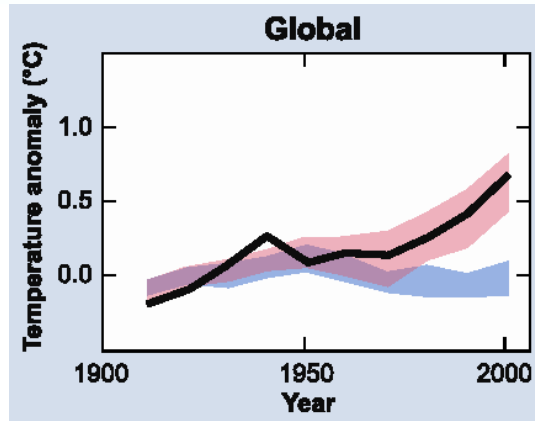
Carbon dioxide (CO₂)
Methane
Nitrous oxides
Water vapour

Greenhouse gases



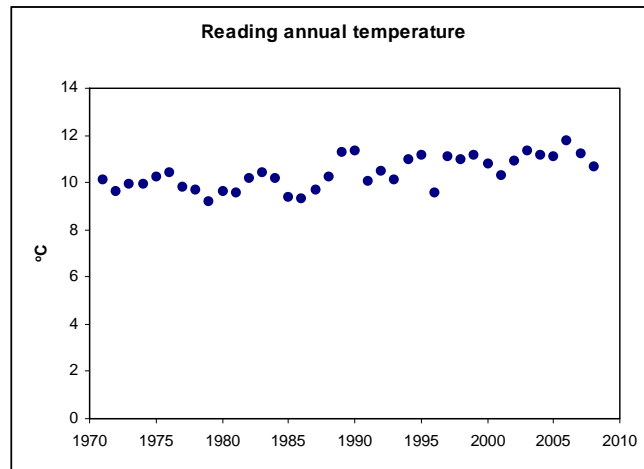
IPCC (2007)

Attributing change

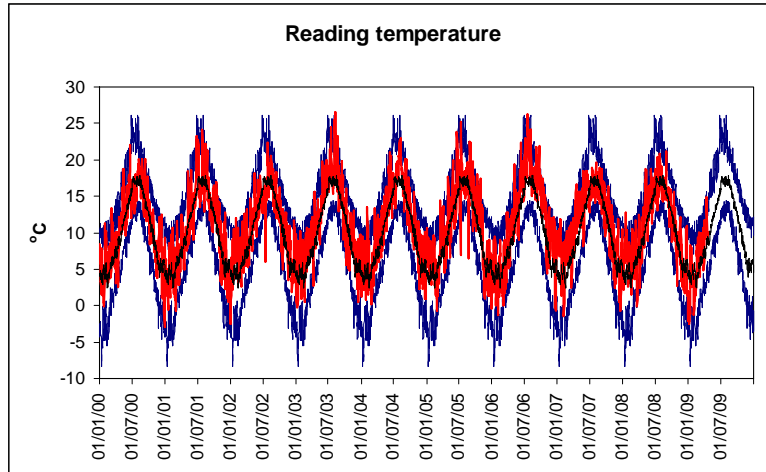


IPCC AR4 WG1 2007

The local scale...



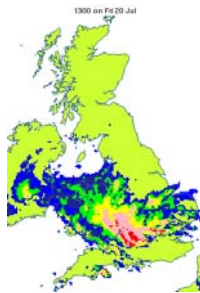
The local scale...



21st century compared to 1971-1990

Change and variability

Climate change is superimposed onto
natural variability

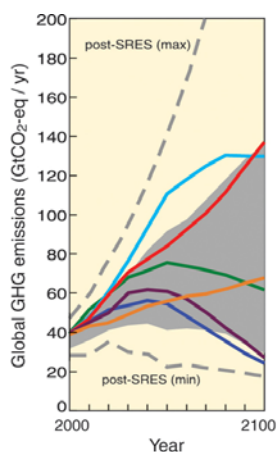


..it does not mean that every year should
be a little bit warmer...

How will climate change in the future?

- How will future emissions change?
- What will happen to greenhouse gases in the atmosphere?
- How will climate respond to the changing atmospheric composition?

Future emissions



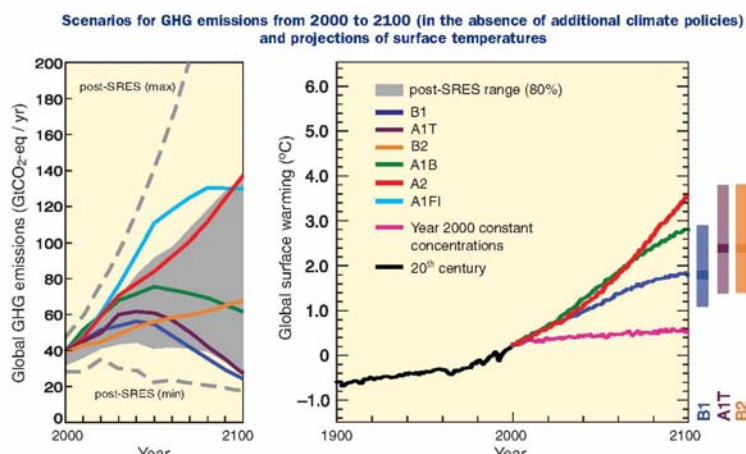
Future emissions depend on rates of population change and economic development

How will climate respond?

We use computer simulation models of the climate system to project possible future changes in climate

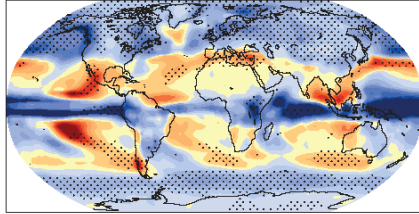


Future global temperature change

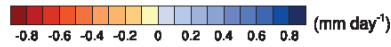


Variations over space

Precipitation A1B: 2080-2099 DJF

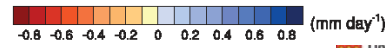
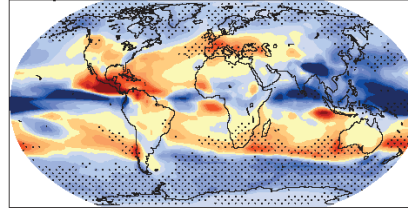


December-February



June-August

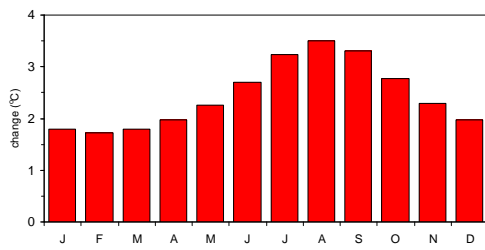
Precipitation A1B: 2080-2099 JJA



IPCC AR4 WG1 2007

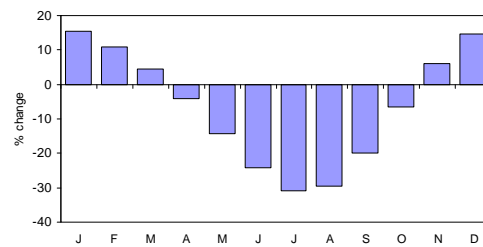
Change in Reading's climate

Change in mean monthly temperature

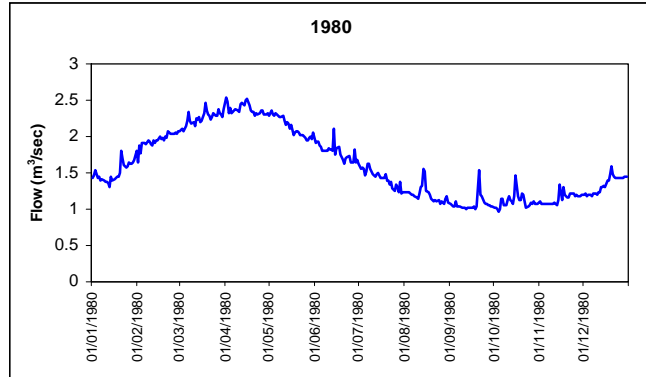


Thames Valley, UKCIPO2 high 2050s

Change in mean monthly rainfall

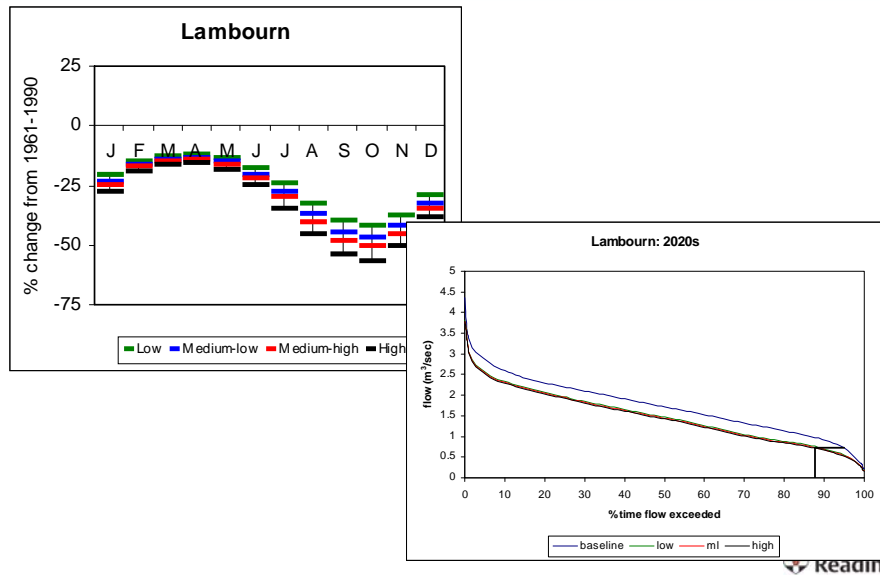


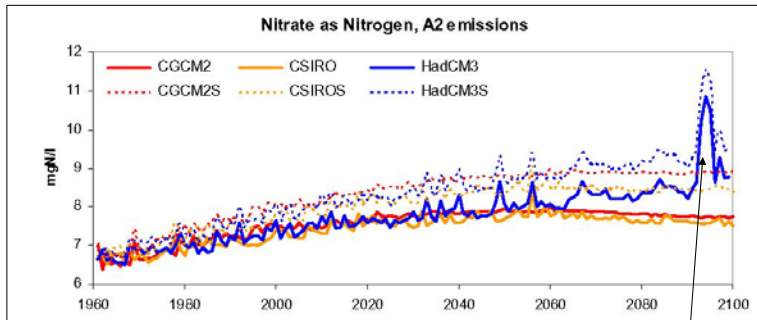
Impacts in the Pang/Lambourn/Kennet



Classic chalk stream
Relatively cool water
Good water quality

Impacts in the Pang/Lambourn/Kennet





Wilby *et al.* (2006)

Effect of drought

Water temperature 2-3°C higher on average by 2050

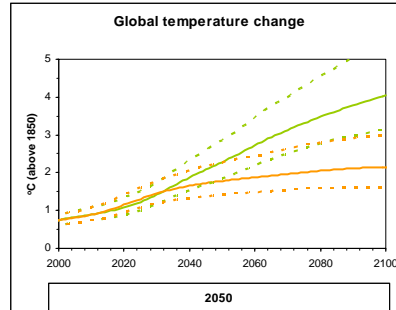
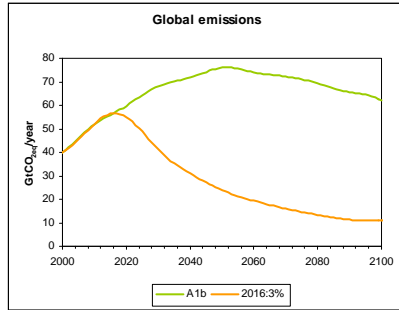
Reduce emissions

By how much?

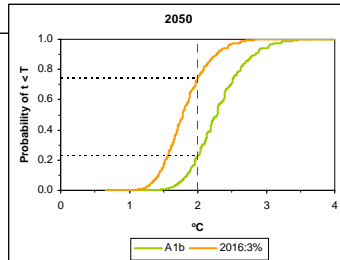
How can we achieve this?

Adapt to changing conditions

Aim for 80% reduction in UK emissions by 2050



“no policy” 22% chance <2°C
“with policy” 74% chance < 2°C



How do we achieve this?

Why do we disagree on climate change?

We ascribe values of assets, activities, constructs and resources differently

We believe different things about our duties to others and to Nature

We evaluate risks differently

We interpret multiple messages differently

We understand “development” differently

We seek to govern in different ways

Moving forward towards mitigation

- Governments

*Set targets
Ensure action happens*

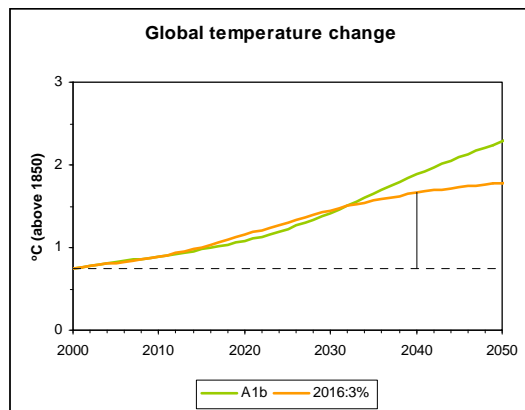
- Business

*Invest and innovate
Reduce costs through
energy efficiency*

- Individuals

*Lobby
Think global, act local..*

Adapting to inevitable change



We are committed to some climate change, and have to work to reduce the effects of these impacts

To sum up...

- Climate change is happening, and will impact upon all of us - in different ways
- It will impact upon the Pang, Lambourn and Kennet catchments
- We need to adapt to changes that we cannot avoid

Thank you

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