Negotiating future climates for public policy:

a critical assessment of the development of climate scenarios for the UK

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Tyndall Centre for Climate Change Research

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It is funded by three Research Councils - NERC, EPSRC and ESRC –
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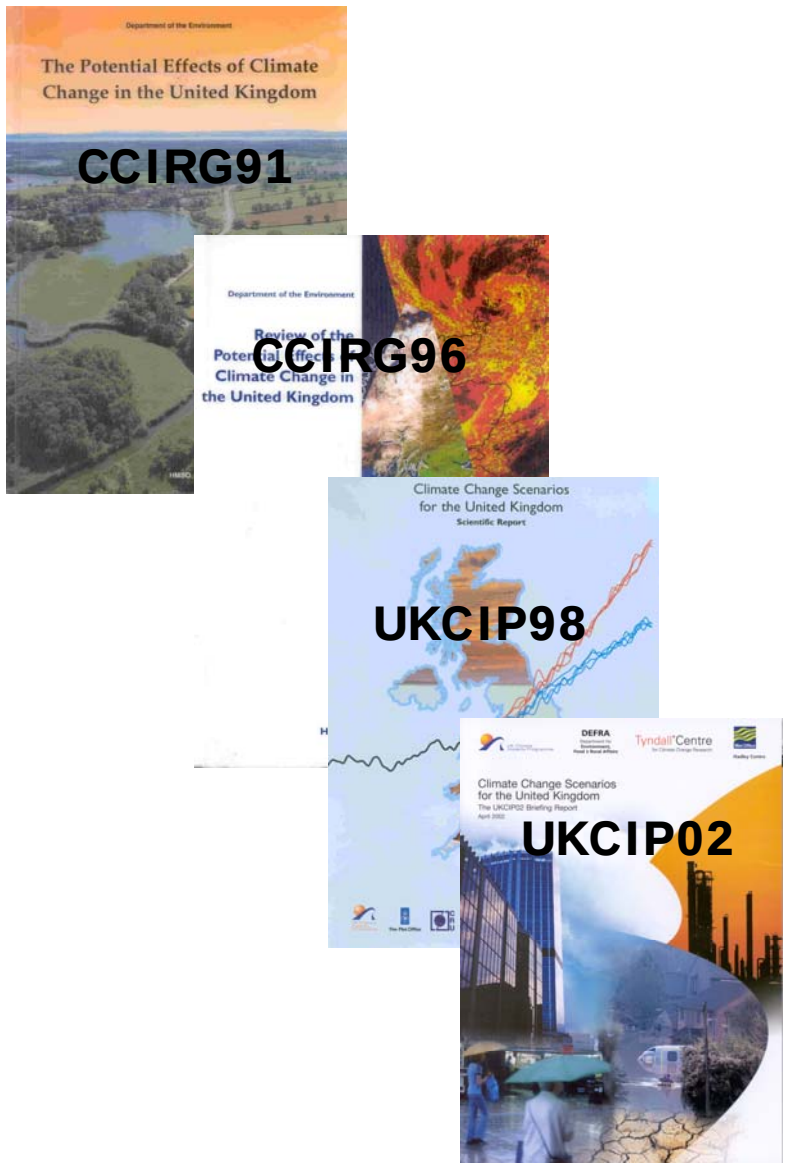
Objectives

- **Using the case study of four generations of UK climate scenarios (1991 to 2002) to explore and understand the processes of negotiation and construction that are embedded in a (set of) climate scenario(s) – their situation as scientific and social objects**



27 Years of Climate Scenarios

- **Analogue scenarios (Wigley *et al.* 1980)**
- **Using GCMs (from mid-1980s)**
- **IPCC scenarios chapter (Mearns & Hulme, 2001)**
- **For the EU (Rotmans *et al.*, 1994)**
- **For the USA (MacCracken *et al.*, 2003)**
- **For Australia (CSIRO; e.g. 1989)**
- **For increasing numbers of nations – Sweden, Portugal, Finland, Spain, Netherlands**
- **From scientific tools to guiding statutory policy**

defra
Department for Environment Food and Rural Affairs

Purpose of the Case Study

Understanding the negotiation/construction process:

- **reveals what information scenarios include and exclude, and why**
- **illustrates the shaping of knowledge through interaction between science and policy**
- **Suggests examples of good practise in future exercises – e.g. UKCIP08; other countries**

Our survey uses published reports, contracts, informal meeting notes of one of the authors, and our analysis uses three framing ideas from STS and SSK ….

Framing Ideas I – supply and demand

Most scientific research is purposeful, e.g. social goals extrinsic to science

Metaphor of 'supply' and 'demand'

The ability to reconcile supply and demand affects the science that gets done, and the knowledge available to decision-makers

"For the UK to lead the world in the prediction of the regional and local impacts of environmental change from months to decades"

NERC draft 2007-2012 strategy

NATURAL ENVIRONMENT RESEARCH COUNCIL

Sarewitz & Pielke, 2006

Framing Ideas II – evaluation criteria

Knowledge systems for sustainable development can be evaluated against criteria of …

- **‘saliency’ (relevant?)**
- **‘credibility’ (adequate?)**
- **‘legitimacy’ (respectful?)**

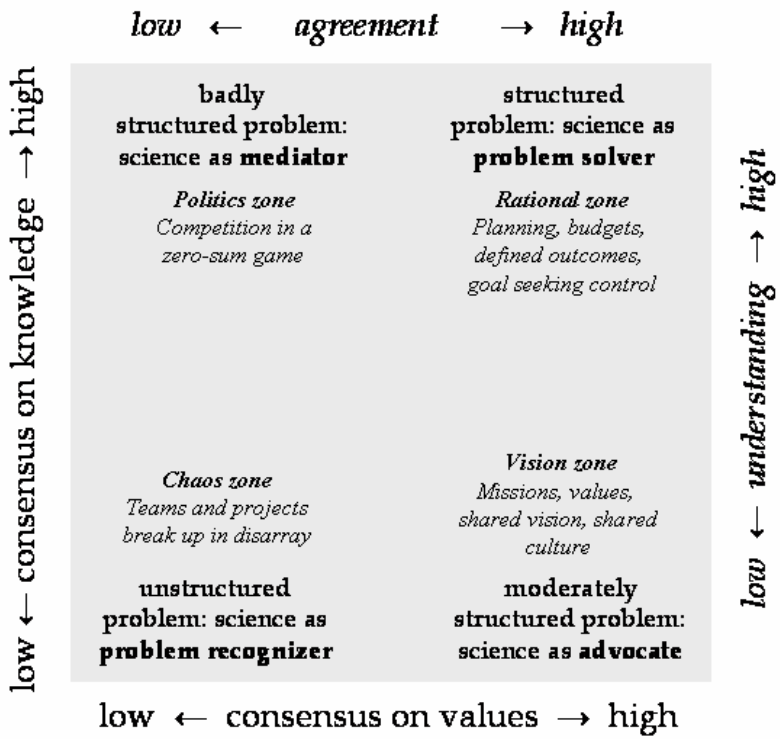
Cash et al., 2003

Framing Ideas III – social construction

Social constructivism from the SSK community

Would suggest that scenarios cannot emerge as a product of a conventional positivist science

How are the interests of society represented in this negotiation process?



De Vries, 2007

Golinksi, 1998; Jassanoff & Wynne, 1998; Latour, 2004

Main actors

Defra / DoE / DETR – commissioning government department

Hadley Centre – Defra-funded climate modelling centre

UEA – higher education research university

UKCIP – UK Climate Impacts Programme, stakeholder facilitated and Defra-funded

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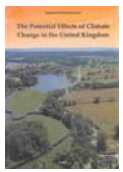
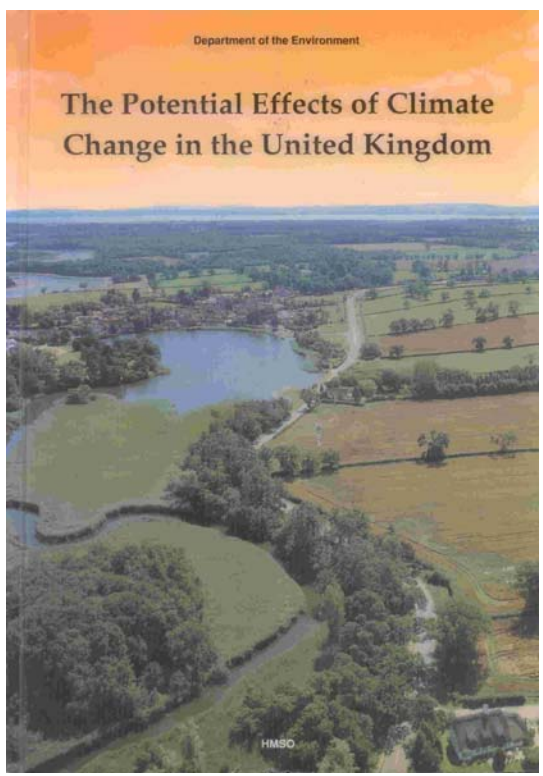
Case Study Timeline

	International	UK	Scenarios	
1990	IPCC-1			
1991		LINK established	CCIRG91	
1992	IS92 emissions			
1993				
1994	UNFCCC into force			
1995				
1996	IPCC-2		CCIRG96	
1997	Kyoto Protocol	UKCIP established		
1998			UKCIP98	
1999				
2000	IPCC SRES emissions	UK CC Programme		
2001	IPCC-3			
2002			UKCIP02	

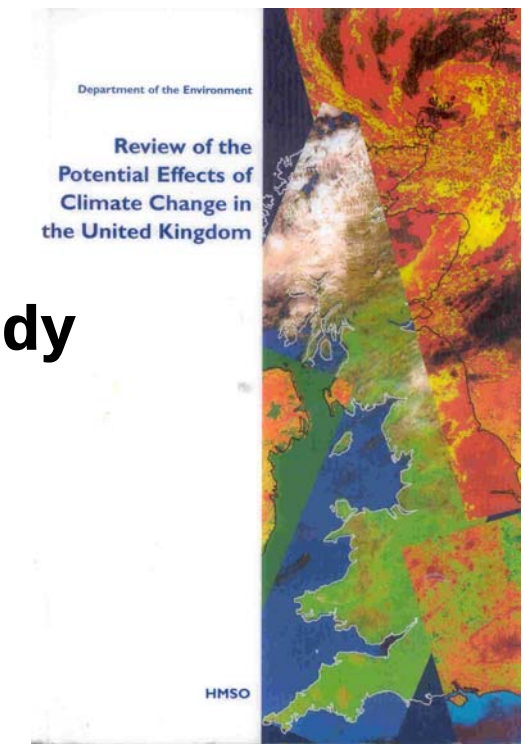
CCIRG91

- To service a DoE Expert Group on UK Impacts
- Constructed by UEA; no consultation; indirect peer review
- Three scenarios; 5 equilibrium GCM 2xCO2 patterns
- 1.5% p.a. forcing; 3±1degC sen.
- 500km resolution; interpolated maps
- No public launch; no portal for access



CCIRG96

- To service a DoE Expert Group on UK Impacts
- Constructed by UEA; no consultation
- HadCM1 transient model
- One scenario; table with 11 other GCMs
- IS92a emissions; 2.5degC clim. sen.
- 300km resolution; interpolated maps
- Cabinet level media launch of impacts study
- Data access via separate LINK portal

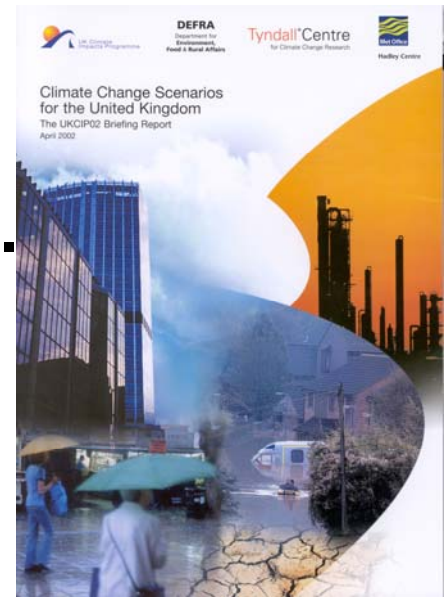


UKCIP98

- First user product of the new (Defra funded) UKCIP
- Constructed by UEA & Hadley; limited consultation
- HadCM2 coupled model ensembles
- Brief results from three other GCMs
- 0.5% and 1% forcing; 1.5 and 4.5degC sen.
- 300km resolution; interpolated maps
- Junior minister media launch
- Data access via separate LINK portal

UKCIP02

- New UKCIP product; based on IPCC TAR science
- Constructed by UEA & Hadley; UKCIP user consultation
- HadCM3, HadAM3, HadRM3 models
- Simple maps from eight other GCMs
- Four scenarios based on SRES worlds; 3degC sen.
- 50km resolution; daily data; 15 variables
- Cabinet-level media launch
- Staffed web portal
- Massive uptake – multiple interpretations in different decision contexts – UKWIR, CIBSE



UKWIR

CIBSE

Analysis I - Supply and Demand

- The UK climate scenarios have been predominantly science-led rather than decision-led
- Only in UKIP02 was a formal consultation mechanism in place, and even here users were not co-negotiators
- Driven by IPCC and Hadley Centre science (novelty)
- Difficulty in balancing supply and demand, e.g.:
  - UKCIP02: 50km resolution traded against representation of uncertainties

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Analysis II - Saliency

- Since 1997 UCKIP has acted as a boundary organisation
- Enhanced saliency of 98 and 02, cf. 91 and 96
- Offers prospect of future organisational learning
- But are there limits to the mediating role of boundary organisations?
  - Co-designed modelling experiments?
  - Conflicting user demands?
  - Multiple framings of uncertainty?

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Analysis III – Credibility and Legitimacy

- Derives from Defra (ownership), IPCC science benchmarks, and Hadley Centre models
- But subjective judgements still required – clim sen, multiple GCMs, forcing, etc.
- Persistent use of pattern-scaling method to secure product design
- Sampling of expert opinion relatively tight – dominant Hadley-UEA axis (cf. U.Reading, NERC)
- Echoes earlier (2000) HoC criticism over source of Defra's climate change advice

Analysis IV – Social Construction

- **Unstated assumptions or belief systems, e.g.:**
  - **Selection of GHG emissions scenarios (IS92a)**
  - **Implicit weight given to UKCIP98 MH scenario**
  - **Technical considerations prevailed over wider debates about different futures (A2 over B1)**
- **Need for greater transparency over these debates and choices**
- **Unavoidable constructivist elements, but '*the operative question is how to distinguish between good constructions and bad*' (Latour, 2004)**

Conclusions

- Constructing climate scenarios is a multi-layered process
- Value-driven choices about scenario design can easily masquerade as debates about technical details
- Scenarios should have traceable accounts of quality assurance of scientific knowledge
- Scenarios should also reveal the actors, values and processes of negotiation

UKCIP08 scenarios
www.ukcip.org.uk/scenarios/ukcip08/default.asp

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