

Evidence and Adaptation Policy in the United Kingdom

Kathryn Humphrey

Evidence Team, Adapting to Climate Change

Programme, Defra

CONTENTS





Evidence to argue the need for policy



An Example of communicating evidence- UK Climate Projections



Evidence to inform how policy should be shaped

Using Evidence for WHY we need to adapt



IMPACT =

GOOD EVIDENCE (not just good science!)

+

COMMUNICATION

+

RELEVANCE

RELEVANCE









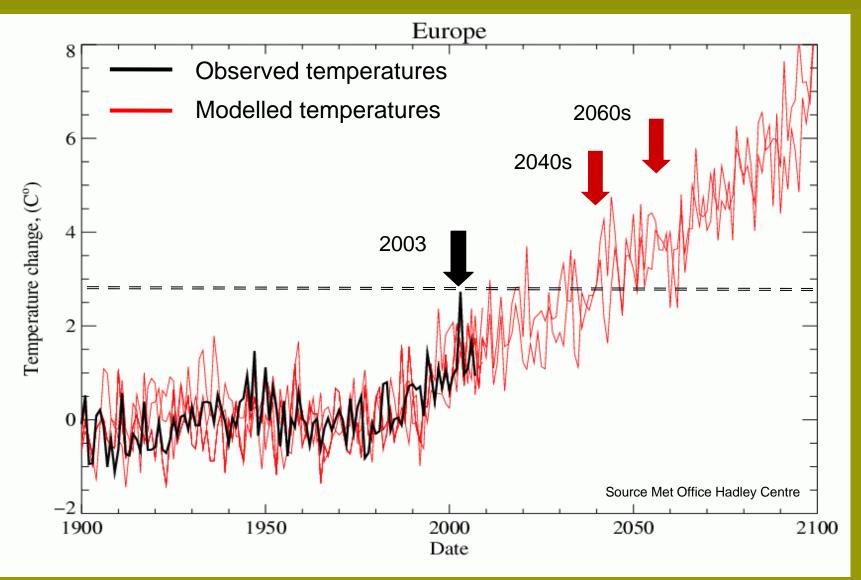
RELEVANCE





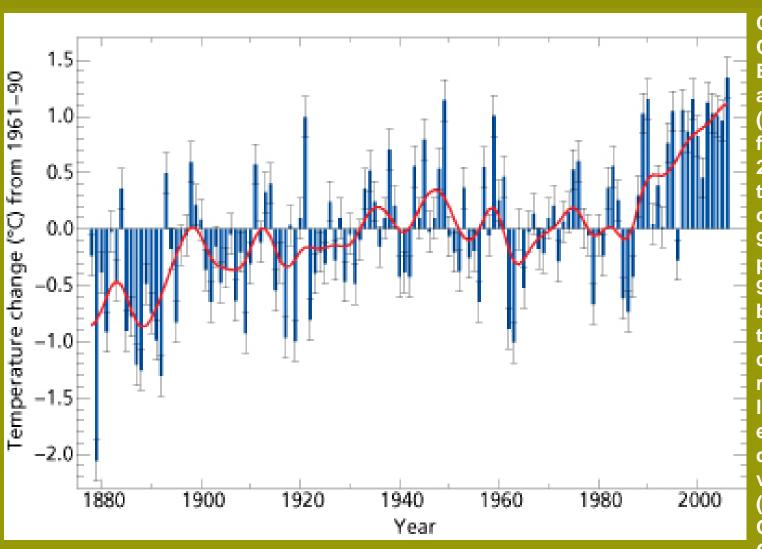
GOOD COMMUNICATION- CLEAR MESSAGES WORK





GOOD COMMUNICATION-TEMPERATURES ARE GOING UP...





in Changes Central **England** annual values (blue bars) from 1877 to 2006 relative to the average over the 1961baseline 90 (about period °C). Error enclose bars the 95% confidence range. The red line emphasises decadal variations. Met (Source: Office Hadley Centre)

IPCC Working Group 2



Global temperature change (relative to pre-industrial)

0°C 1°C 2°C 3°C 4°C 5°C

Falling crop yields in many areas, particularly

developing regions

Possible rising yields in

some high latitude

Falling yields in many developed regions

Water

regions
Small mountain
glaciers disappear –
water supplies
threatened in several

Significant decreases in water availability in many areas, including Mediterranean and Southern Africa

Sea level rise threatens major cities

Ecosystems^s

Extensive

Damage to Coral

Rising number of species face extinction

Extreme^{Reefs}

Weather Rising intensity of storms, forest fires, droughts, flooding and heat

Events waves

Risk of Abrupt and

Major Irreversible

Changes

Increasing risk of dangerous feedbacks and abrupt, large-scale shifts in the climate system

WHAT DOES STERN SAY ABOUT ADAPTATION?



Adaptation is crucial to deal with the unavoidable impacts of climate change to which the world is already committed.

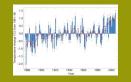
Extra costs of weather-related impacts rising rapidly. Investment is required to reduce damage. Higher temperatures will result in higher costs.

Studies in climate-sensitive sectors point to many adaptation options that will provide benefits in excess of cost. But quantitative information on the costs and benefits of economy-wide adaptation is currently limited.

NEED FOR ADAPTATION IS APPARENT



• The climate of the UK is changing now.



- Climate change is inevitable for the next 30 years, regardless of mitigation efforts.
- The sorts of events we expect to see an increase in will have a major impact on the UK.
- It is NECESSARY to plan adaptation to climate change into existing policies.





Evidence to argue the need for policy



An Example of communicating evidence – UK Climate Projections

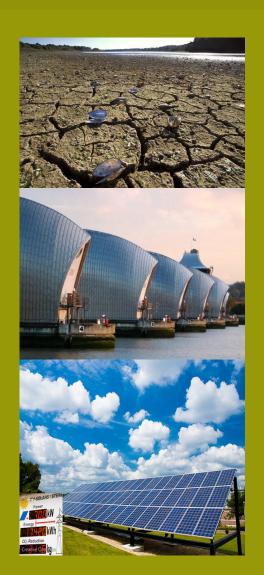


Evidence to inform how policy should be shaped

UKCP09 WAS USED TO PRESENT A 5 POINT CLIMATE PLAN....



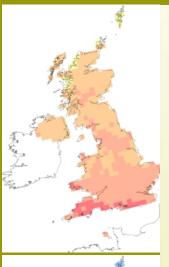
- Global deal at Copenhagen
- Strong action to achieve UK's 80% goal
- Prepare for the impacts of climate change
- Protect the economy, people and the environment
- Seize opportunities for UK



WHAT IS UKCP09?



- UKCP09 are future projections of possible climate for the UK.
- Show us emissions a range of futures
- They quantify probability which helps us manage risk, eg Thames Barrier
- Have been reviewed by 38 experts from 7 countries

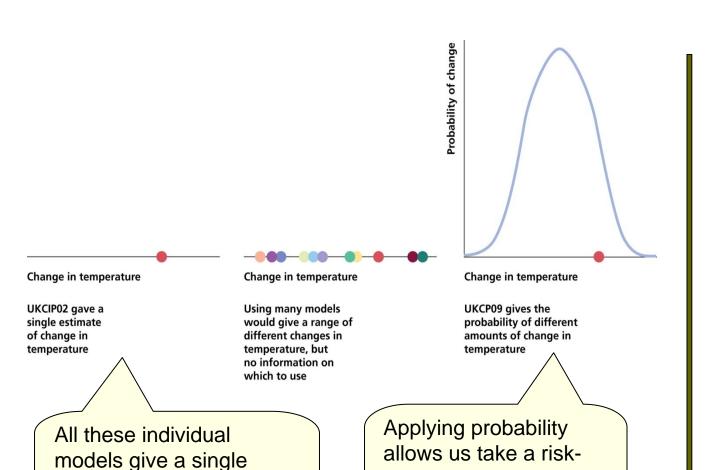


- ✓ Regional variations down to 25km
- √3 global emissions scenarios
- ✓Climate until 2099
- ✓ Temperature, rainfall, cloud cover, sea level



GETTING THE MESSAGE ACROSS-EXPLAINING PROBABILITY





result, but you cannot

uncertainties

judge anything about the

based approach to a

changing climate

We can use other examples to explain the use of probability. Is the a measure of the strength of evidence.

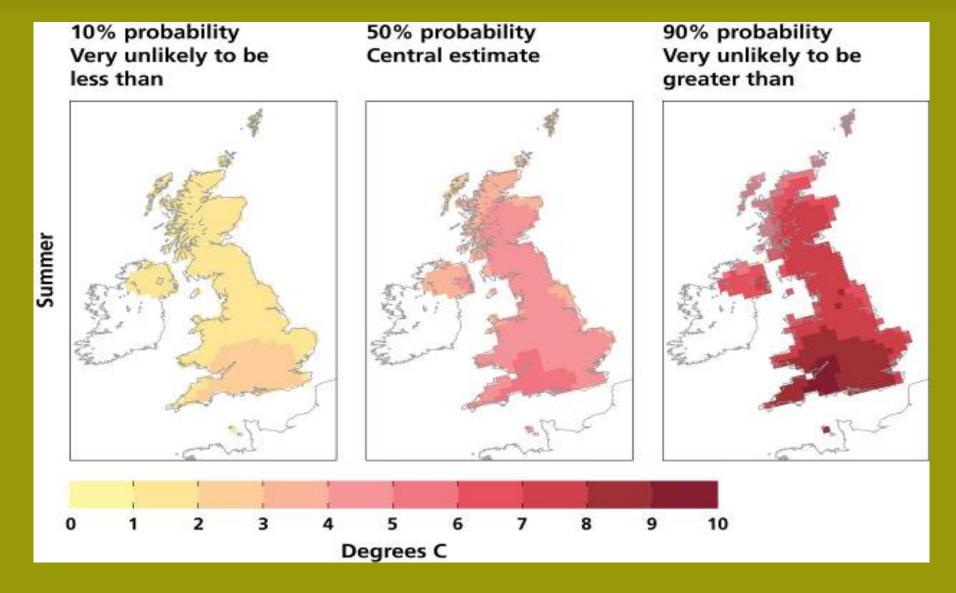


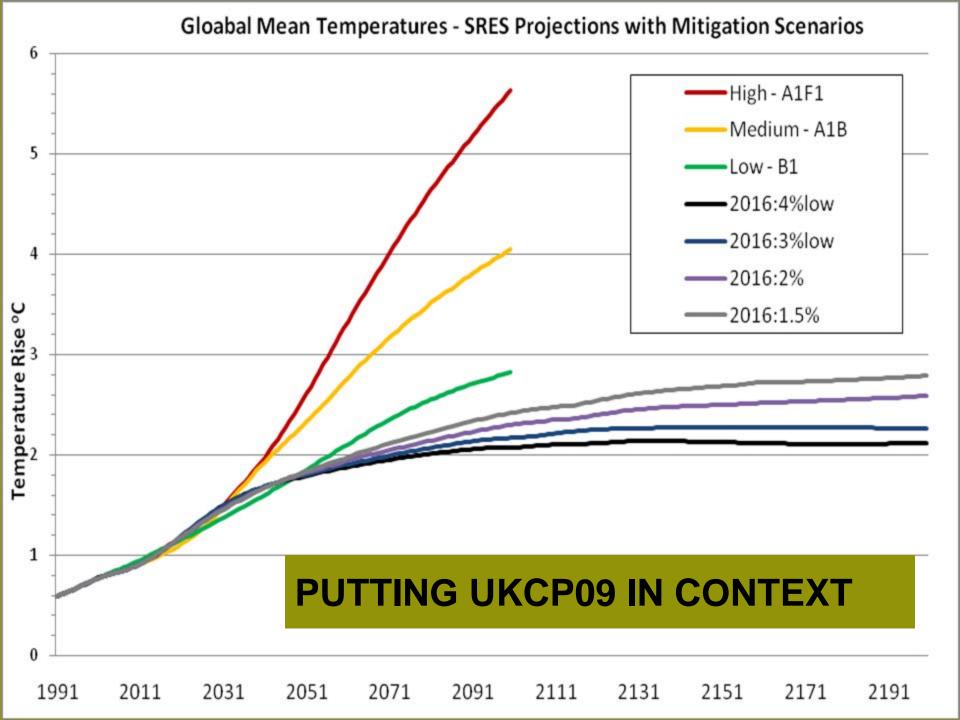




UKCP09 RESULTS- PROBABILISTIC







TAILORING UKCP09 TO THE AUDIENCE



I need to understand national and regional vulnerability and risks

I want **national** headline messages

I want **regional** headline messages

- ✓ Key findings national
- ✓ Pre-Prepared Maps
- ✓ UK Climate Summary report
- ✓ User Guidance

I want **specific outputs** for my area.

I want **local data** for temperature, rain etc

- ✓ Custom Online material
- ✓ Regional/25km grids
- ✓ Pre-Prepared maps
- ✓ User Guidance

I need to understand the model's **detail**

I want **very detailed** scientific information

- ✓ Science reports
- ✓ Custom online material

WHY 25km resolution?



300 km. GCM

(a) 300km GCM: 1979-83 (b) 50km RCM: 1979-83 (c) 25km RCM: 1979-83 (d) CRU observations: 1961-90

50km. Regional model

25km. Regional model 1961-90 Observed climate





Evidence to argue the need for policy



An Example of communicating evidence- UK Climate Projections



Evidence to inform how policy should be shaped

CHALLENGES



 Evidence base is huge, and dispersed in the UK (lots of organisations involved, joining up is difficult as lack of resources/ funding from many partners).

 Adaptation is very context specific – lack of a common metric i.e. different sectors need different solutions.

 Benefits realised long into the future - how do we measure success and justify the programme and spend it incurs without obvious results?

MAPPING EVIDENCE NEEDS



Is the climate changing? Is adaptation needed? Define the How is the UK's climate (Met Office/ Stern Issue changing? (UKCP09) Review/ IPCC/ UNFCCC) What are the risks to the **UK?** (Climate Change Has the policy worked? Evaluate and Understand the Risk Assessment) (Adaptation sub-Situation Adapt THE POLICY committee, indicators) **CYCLE** Which adaptation options work best? (Economic Analysis, How do we **UK Climate Impacts** measure our Programme) efforts? (Indicators) Develop and Implement and **Appraise** How can Monitor Options CURRENT science be **EVIDENCE** used to develop **PROVISION** policy? (Strategic Evidence What are the priorities Fund) for Government? Commit to Prepare for (Climate Change Risk Responsibilities Delivery Assessment)

MAPPING EVIDENCE NEEDS



Can we fill the UKCP09 gaps?-wind, snow, probabilistic marine information? (Met Office)

Can we model on seasonal or decadal timescales? (Met Office) How will internal migration as a result of climate change affect

demand on services?

How will mortality and morbidity change as a result of climate change, particularly increased temperatures?

How will people's behaviour change over time as a result of climate change?

How extreme will worst case events be? (Met Office)

How do we

assess risk?

How is the UK's climate changing? (UKCP09)

What are the risks to the UK? (Climate Change Risk Assessment)

Understand the Situation

What will be the future geographic correlations between people, water and housing?

HOW DO WE PRIORITISE OUR EFFORTS?



Rationale

Are there serious market failures or equity considerations that justify intervening in this area

Impact

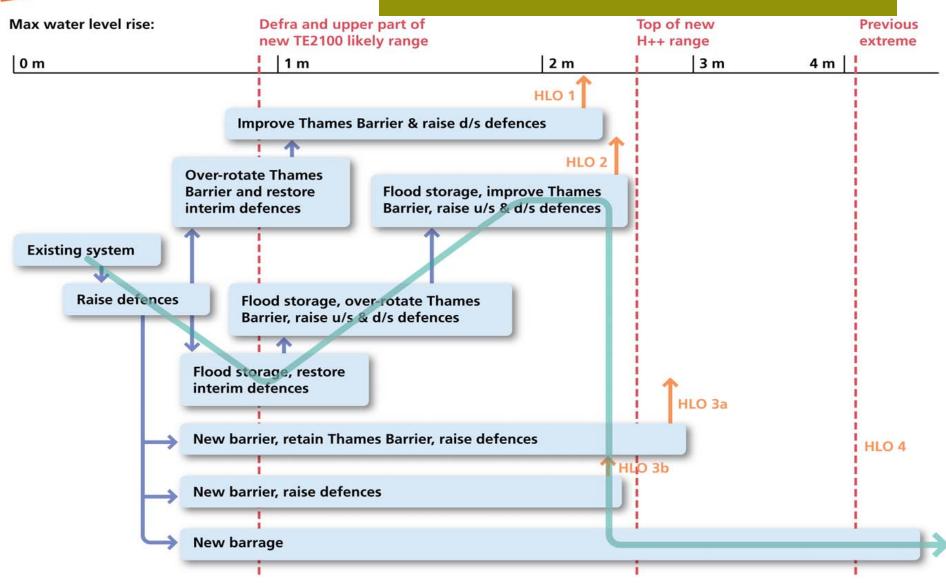
How significant an improvement will in the UK's adaptation to climate change? Will it have cross-cutting benefits?

Timing

Will it prevent costly retrofits, avoid near term losses or prevent irreversible damage?



CASE STUDIES (TE2100)



Key: --- Predicted max water level under each scenario

Measures for managing flood risk indicating effective range against water level

MEASURING SUCCESS-INDICATORS

defra
Department for Environment

What are we doing?

By end 2009

-early 2010

propose...

• an approach for indicator development based on agreed priorities, targets and objectives

an initial basket of indicators



SOME USEFUL WEBSITES



- http://ukclimateprojections.defra.gov.uk
- http://www.defra.gov.uk/adaptation
- http://www.ukcip.org.uk
- http://www.metoffice.gov.uk

Kathryn.Humphrey@defra.gsi.gov.uk