



Met Office
Hadley Centre

Climate Services in Practice – UK Perspective

Chris Hewitt

ICCS, Columbia University, October 2011



Overview

Perspectives on:

- Why have a climate service?
- What is a climate service?
- UK activities
- Examples of climate services

Why have a Climate Service? Drivers

- Supporting decision making – adaptation, building resilience, mitigation options
 - Reflected in customer requirements, WMO GFCS, UKCIP feedback, consultancy demand, etc.
- Increasing focus:
 - near-term (season-years) climate projections, routinely updated
 - regional and local scales
- Characteristics of hazardous weather
- Impacts on society
- Rapidly growing demand for climate information, data and advice





Managing the risks from a changing climate

“The impact of climate change needs to be made part of an on-going risk management.”

“The Government must help ensure that businesses have the information needed to take action. Most of this data is already in the public domain, but needs to be made available in an easy-to-use format”

CBI report *Whatever the weather*, Sept 2010

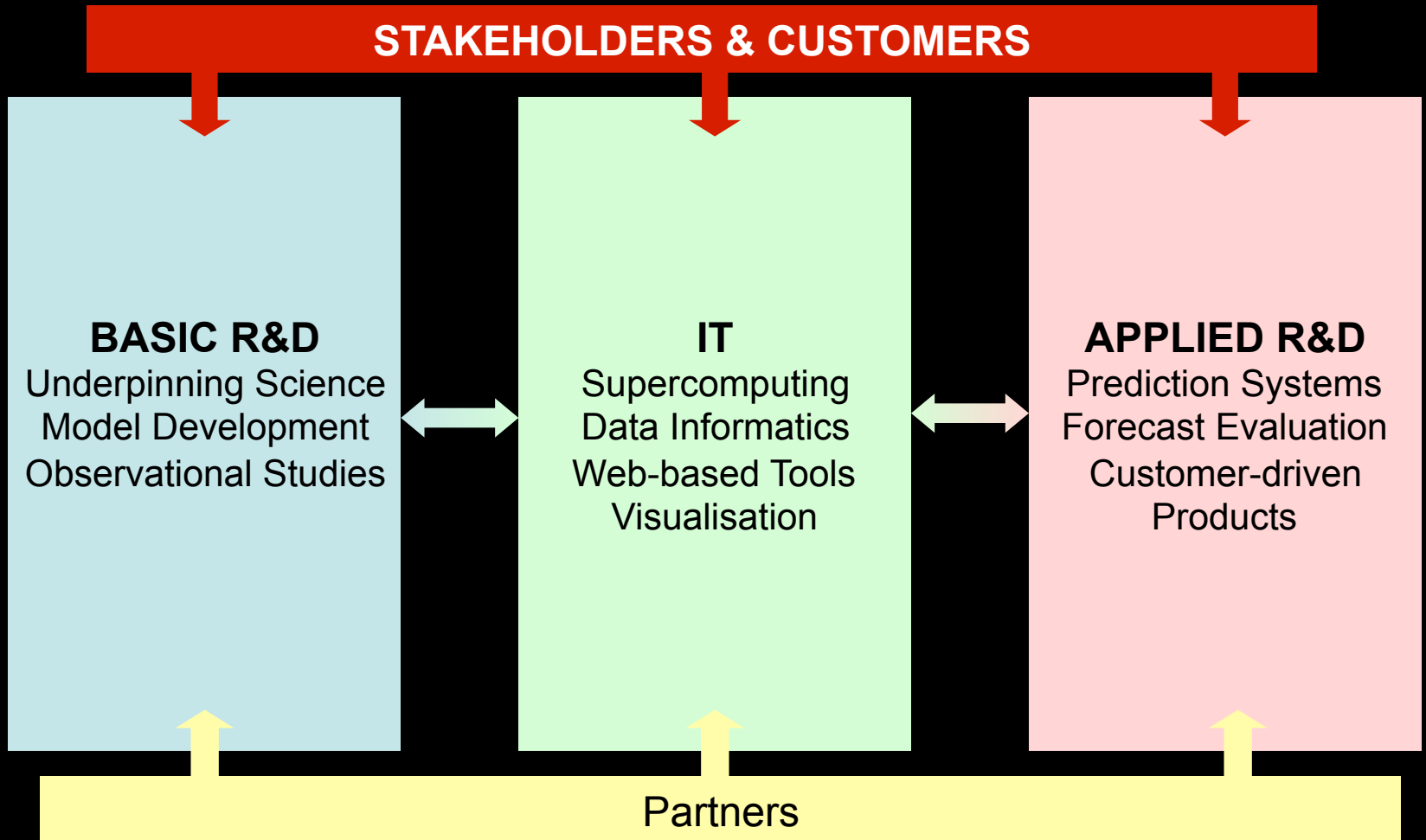


What is a climate service?



Met Office

End-to-End Programme from Observations & Models to
Products & Services

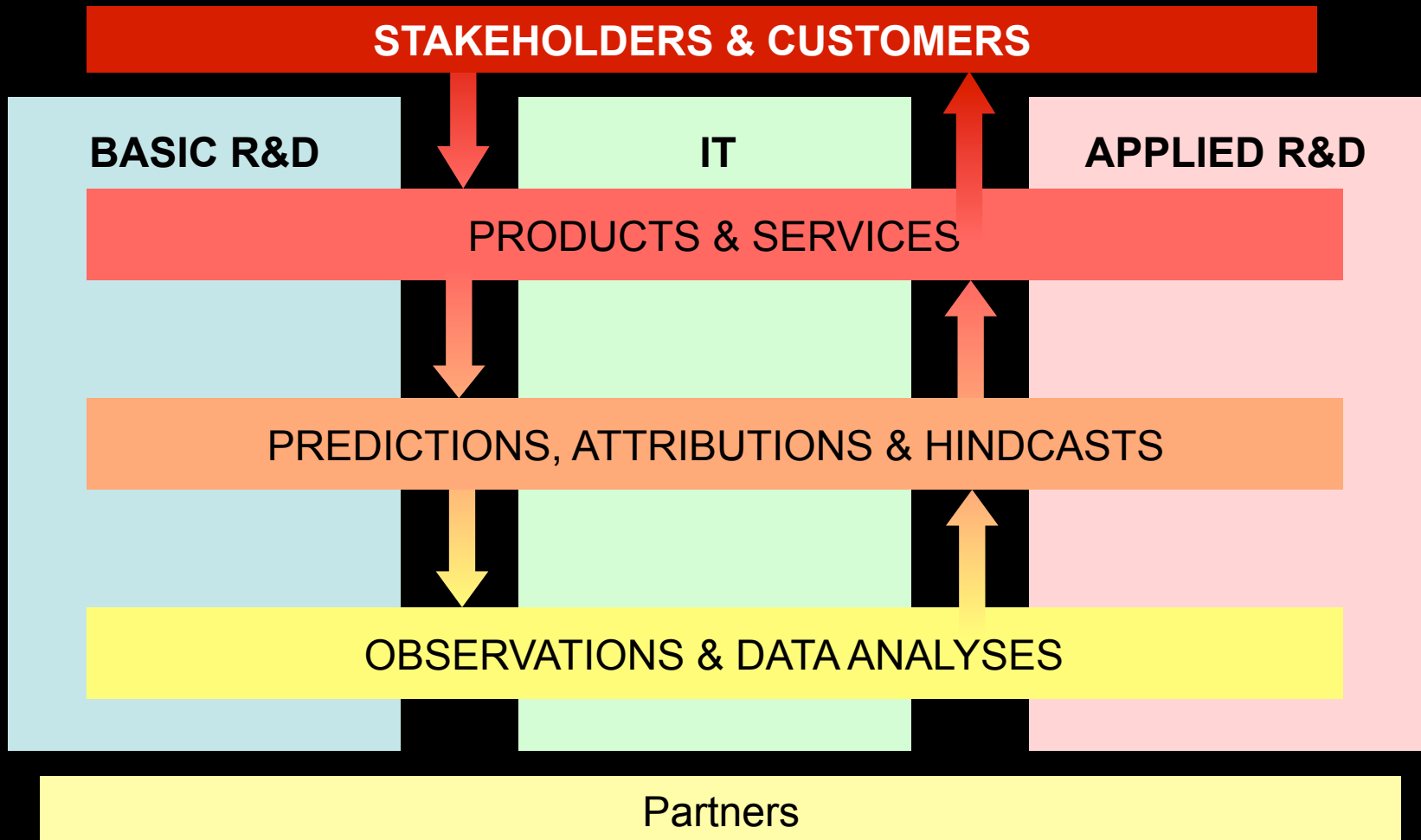




Met Office

What is a climate service?

End-to-End Programme from Observations & Models to Products & Services





Scope of Met Office Climate Service

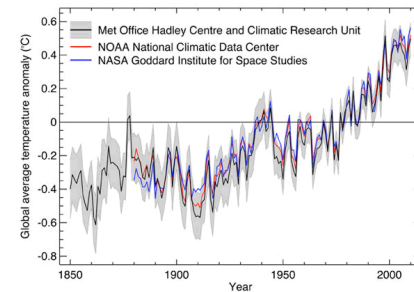
- End-to-end programme from observations&models to products&services
- Importance of monthly-seasonal-decadal timescales
- Develop high-resolution earth system models
- Information and advice on climate extremes and hazardous weather
- Collaboration and strategic partnerships
- Expansion from being the National Weather Service
- Work with other countries to help them provide their climate services

Note: builds on existing climate-related services, underpinning science is at the core, continue to provide advice to inform mitigation policies



Overview of Met Office Hadley Centre

- Established in 1990, currently about 160 staff
- Undertakes climate research both in a national and international context. Includes:
 - observations and monitoring, attribution, modelling and prediction, science for adaptation and planning
- Strong interactions within the UK (Research Councils, Universities, JWCRP, government, industry)
- Developing a National Climate Service



Levels of engagement

- Global
 - WMO (global producing centre, GFCS), ICCS
 - International projects
 - IPCC
- Regional
 - European collaboration (NMSs, Universities, industry), EU, ENES
- National
 - Strong UK collaborations
 - UKCP09 – national projections
 - UKCIP, national Climate Change Risk Assessment
- Local (e.g. Thames Barrier)





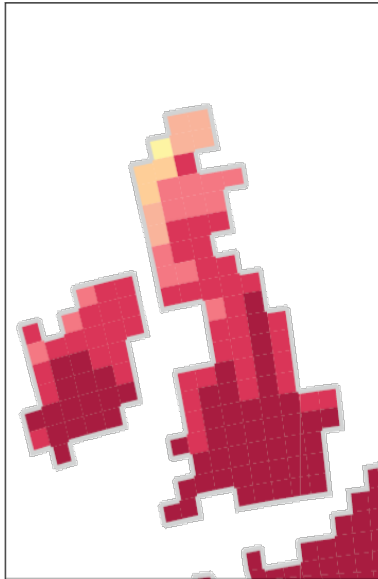
UK activities

- National Climate Projections UKCP09
- UK Climate Impacts Programme
- National Climate Change Risk Assessment



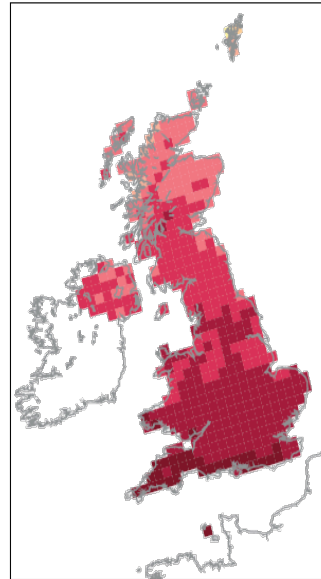
Moving from uncertainty to probabilities/likelihoods

UKCIP02
Single
projection



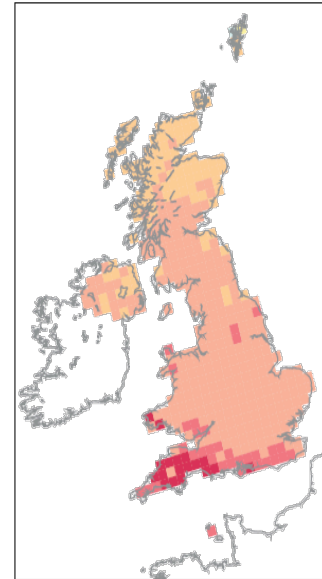
Summer Rainfall 2080's

Very unlikely
to be less
than (10%)

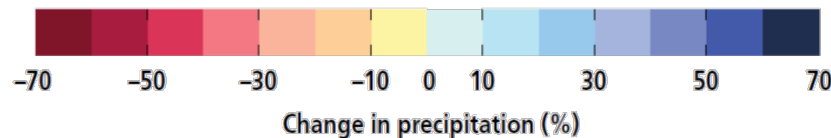
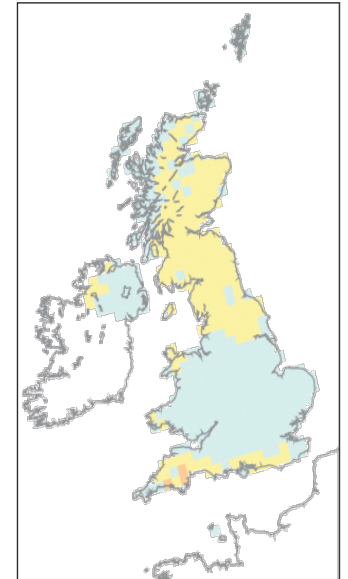


UKCP09

Central
estimate
(50%)



Very unlikely
to be more
than (90%)





UK Climate Projections and Climate Impacts Programme

- UKCP09: a set of projections used for consistent national climate change impacts studies. Based on:
 - large ensemble from HadCM3 climate model
 - combined with results from other climate models
 - constrained by observations
 - expressed in probabilistic form for a set of 30 year mean periods during the 21st Century
- Used for the UKCIP, in a variety of applications, such as flood management, agriculture, construction, energy, health
- Results have been used extensively in the first national Climate Change Risk Assessment, to be published in 2012



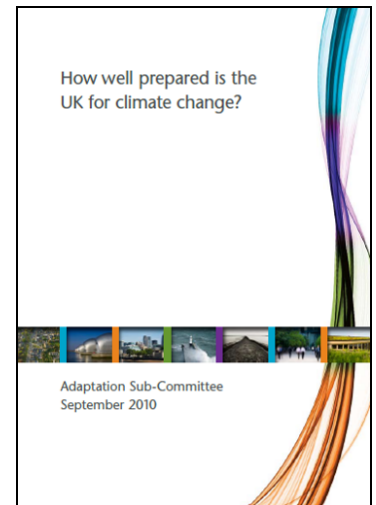


Managing the risks from a changing climate

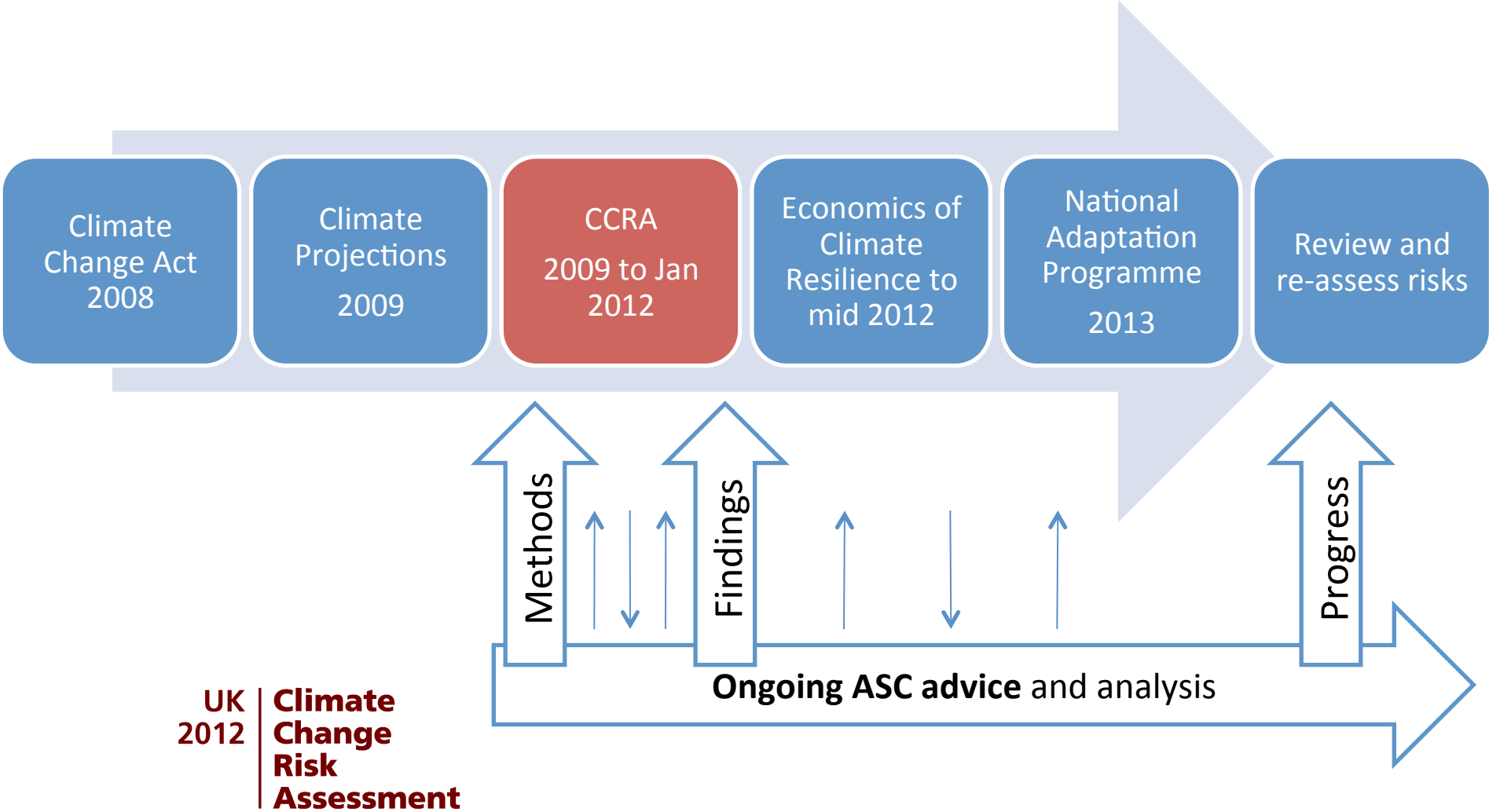
“ Today’ s report provides a wake- up call. It recognises that there is no part of our society which is immune from the effects of climate change. Which means that **every part of our society must think about its resilience.**

We must – all of us – take steps now to recognise the problem, analyse the risk and plan ahead. There is much more to be done. But **the solution is in the hands of us all – as businesses, citizens and consumers.**”

Caroline Spelman, Secretary of State for Environment, Sept 2010



The Climate Change Act sets the context for the risk assessment





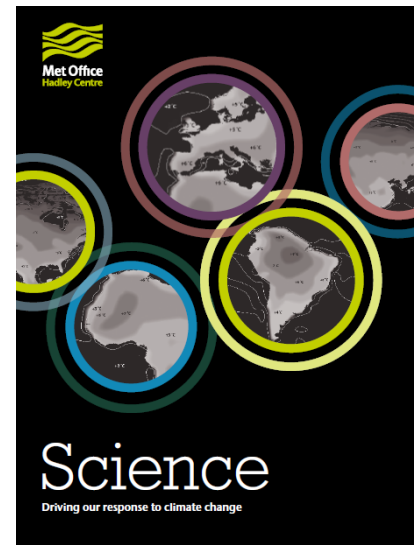
Examples of climate services *(time permitting)*

- UKCP09 – climate scenarios for the UK
- Core Climate Programme
- Flood management planning for London
- UK energy industry
- Nile river flow
- Insurance/reinsurance
- Climate Service Research Partnership in Africa



Core Climate Service - The Met Office Hadley Centre Climate Programme

- DECC and Defra funded programme
 - Collaboration key – science, models, predictions
- Delivers
 - Policy-focused advice and evidence base – mitigation and adaptation
 - Underpinning capability for the UK
- Focus on knowledge integration
 - Policy relevance
 - Expert advice
 - Strong publication record



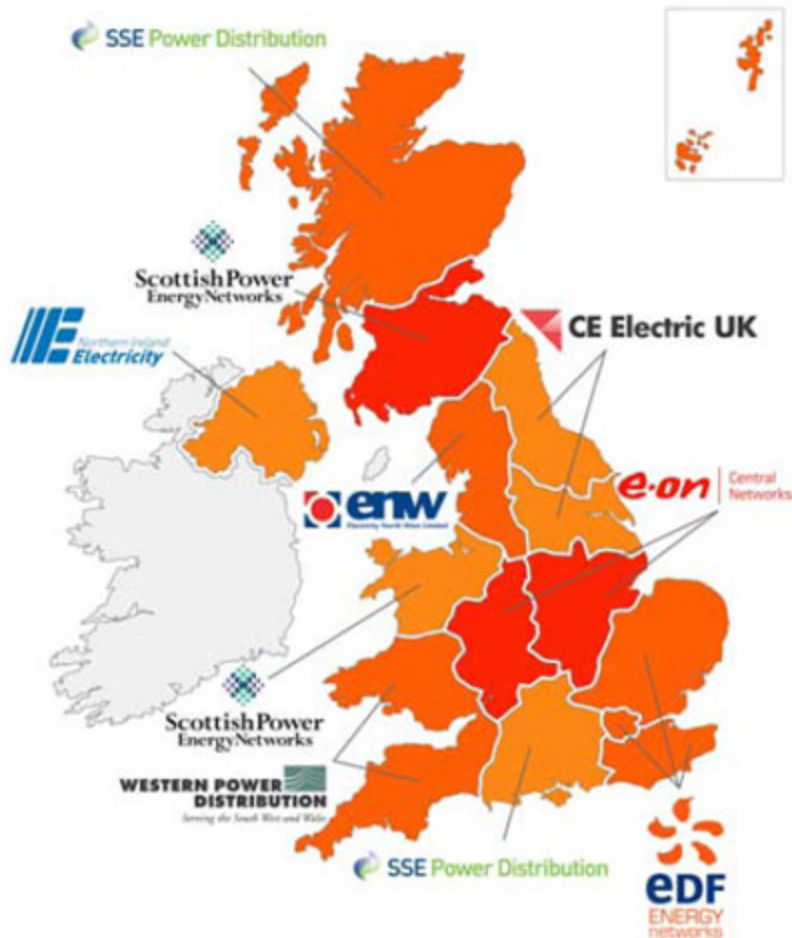


Thames Estuary 2100

- **Aim:** provide advice for the development of a tidal flood risk management plan
- **Customer:** Environment Agency
- **Partners:** Met Office Hadley Centre, Proudman Oceanographic Lab and Centre for Ecology and Hydrology



Electricity Network Resilience Climate Change Risk Assessment



- Equipment
 - Overhead lines
 - Underground cables
 - Substations
- Fault causes:
 - Lightning
 - Slow, sleet & blizzard
 - Wind & gale
- In 2008/2009 258,581 faults occurred on the network causing approx 37.5 million customer interruptions. 8% of the faults were caused by weather.



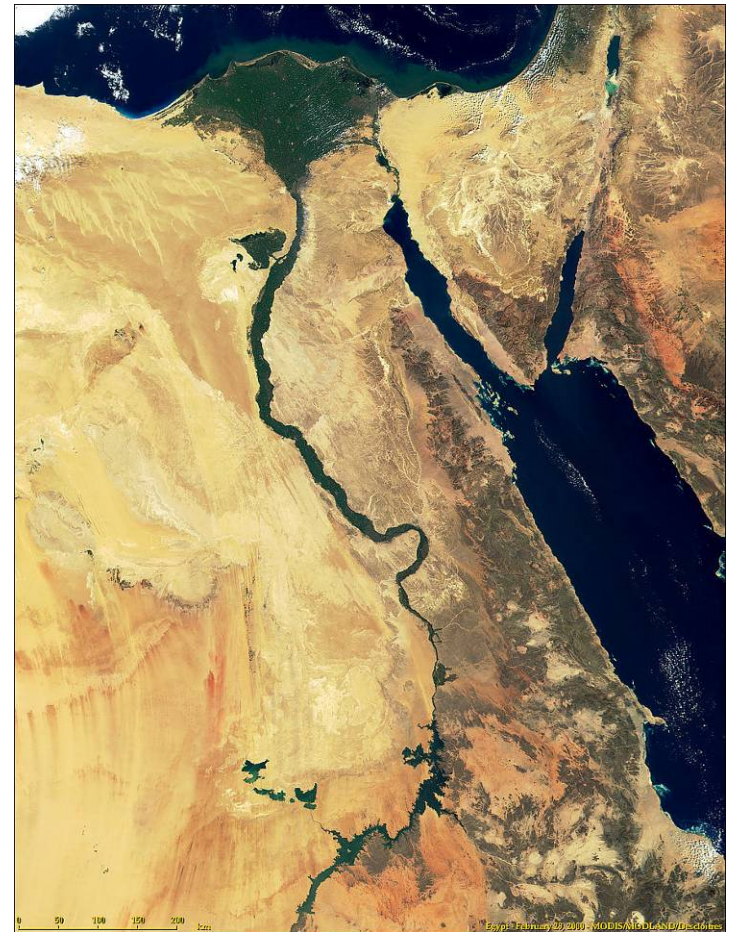
River Nile and Climate Change

River flow and in particular the inflow into the High Aswan Dam.

Customer: Ministry of Water Resources and Irrigation in Egypt

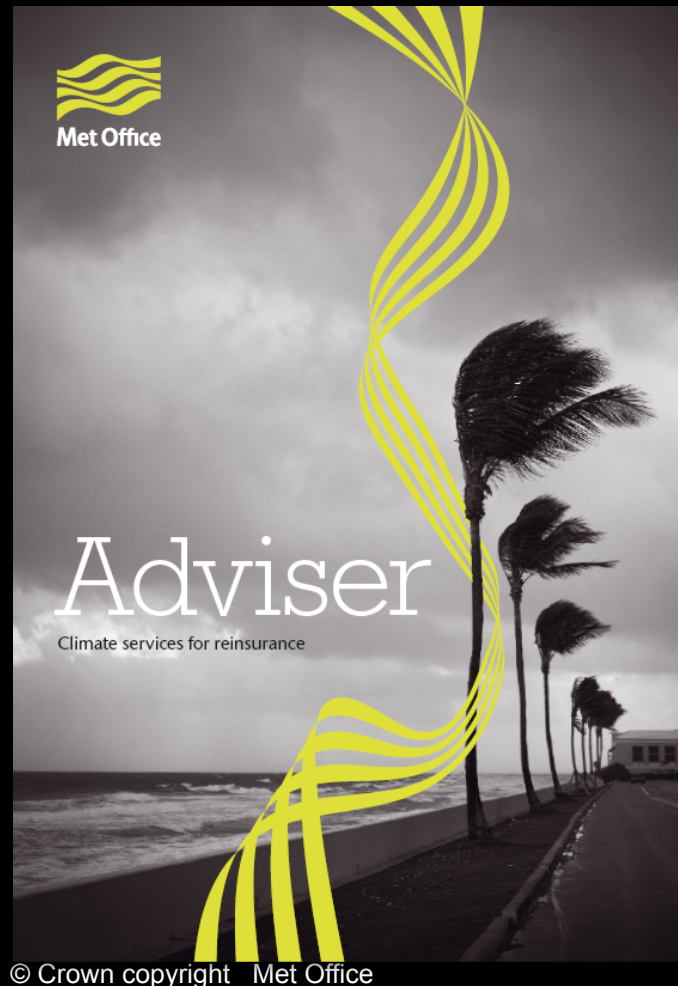
Funder: United Nations Environment Programme

Partner: Danish Hydrological Institute





CS:Re Climate service for global risks

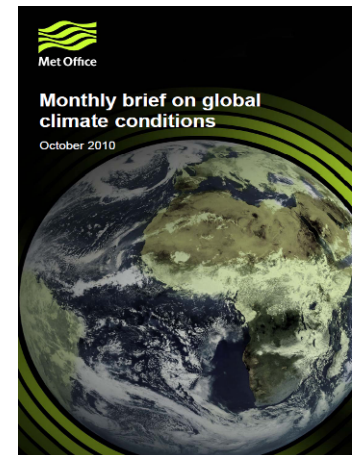
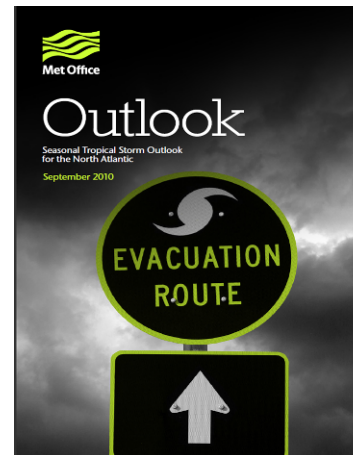
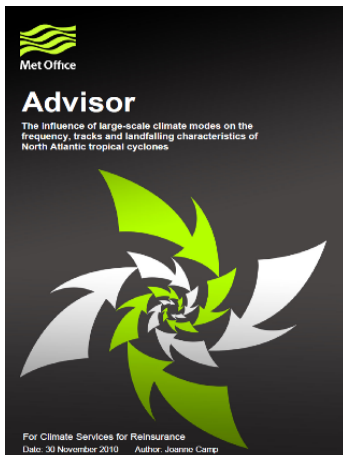


- Climate science relevant to operational risk pricing decisions
- A set of proposals to address core insurance needs:
 - forecasting needs on weeks to 5 year timescales
 - targeted research to extend event forecasts, understand teleconnections and joint perils
 - Maximise the use of joint operational weather and climate science interaction
- Core group of clients joined April 2010 for 6 months CS:Re Phase 1

The climate service for Reinsurance

Reports, regular forecasts, podcasts and teleconferences in four key areas:

- Tropical storms on seasonal to decadal timescale
- Seamless global hazard forecasts
- Science communication
- Research





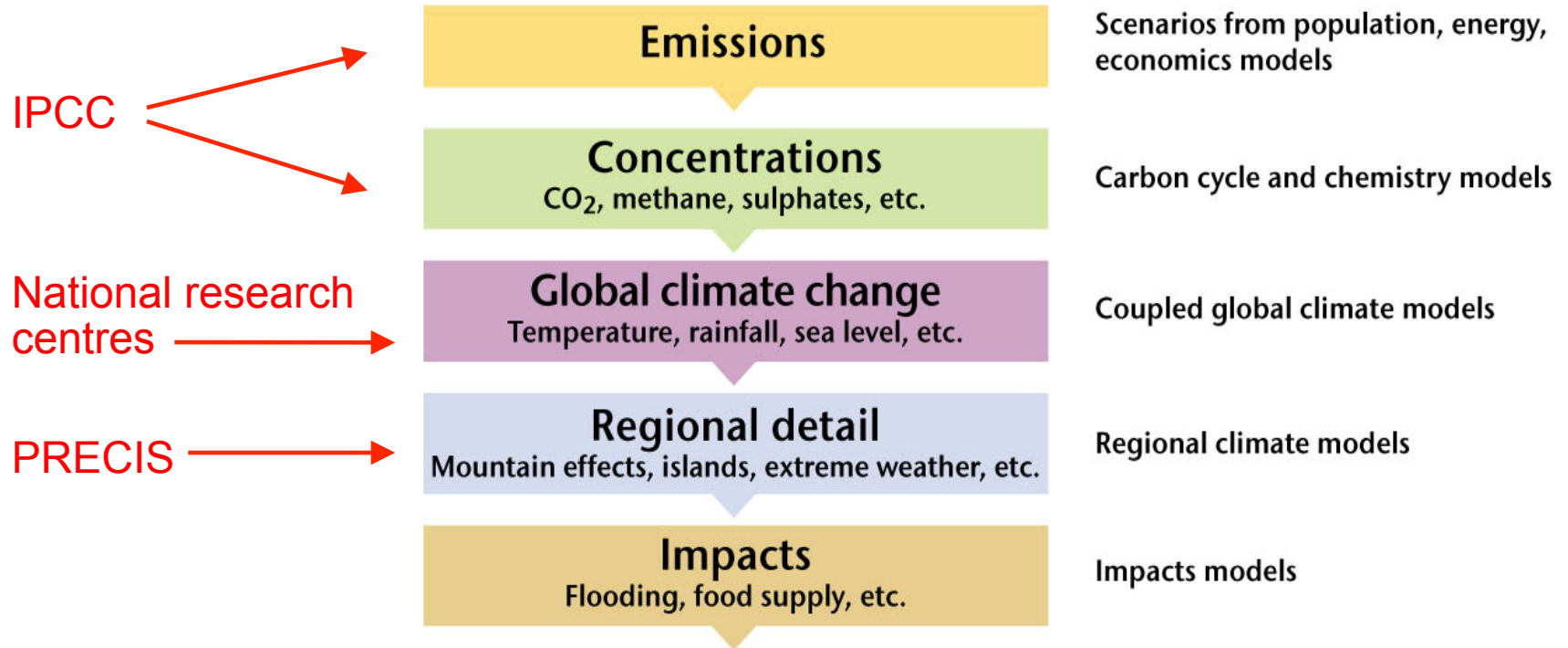
DFID-UKMO Climate Science Research Partnership – African climate and its drivers



3-year programme, started Jan. 2010. Top-level aims:

- improved understanding and modelling of African climate on monthly-seasonal-decadal timescales
- improved ‘user-driven’ predictions, products and advice informing adaptation
- strengthened climate science capacity in Africa

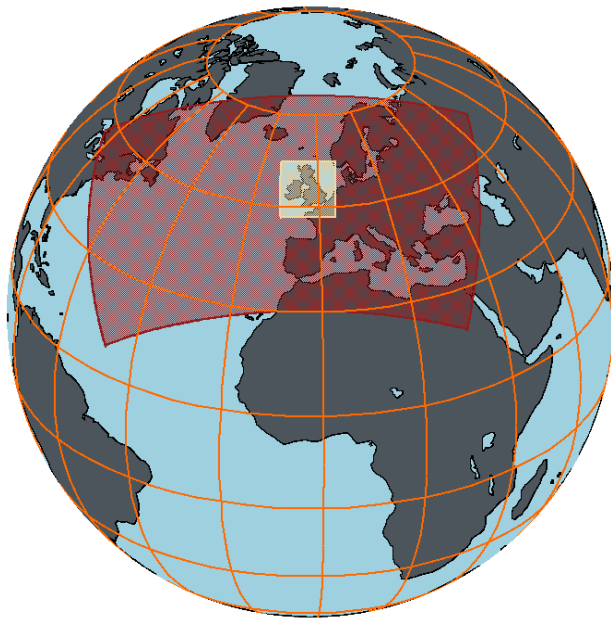
Predicting impacts – where regional climate models fit in



- PRECIS: **P**roviding **R**egional **C**limates for **I**mpact **S**tudies
- Regional climate model that can be applied to any area of the globe
- Used to generate detailed projections of future climate for impact studies

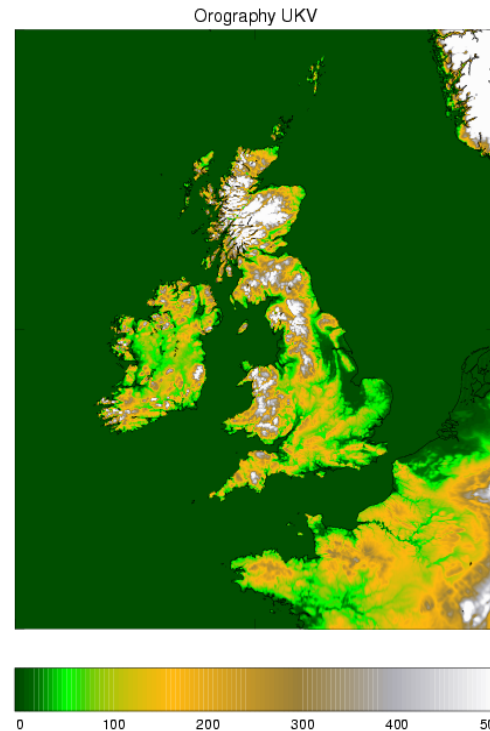
10-year Vision:

Integrated weather and climate prediction
for estimating hazards and risks



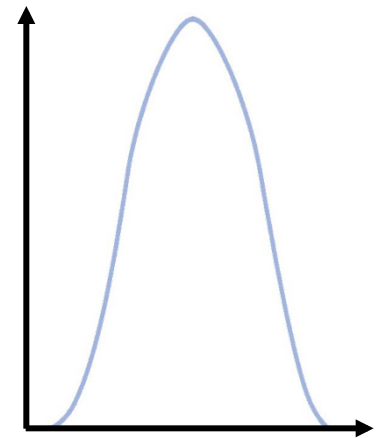
N x Global predictions
at ~20km with lead
times of days to years:

Synoptic drivers



<N x Regional predictions
at ~1km:

Local meteorology



Probability of local
hazard:

Impacts



Concluding thoughts

- Many ‘climate service’ initiatives underway – must build upon what is already happening, and deliver added value
- GFCS:
 - primary objective is to provide services to those communities that are most vulnerable to climate variability and change
 - thoughts about creating National frameworks
 - GFCS needs to be supported by a properly focussed research programme
- Close(r) interaction between users and climate service developers



Met Office
Hadley Centre



Thank you.
Questions?