UK Climate Resilience Workshop
Summary Report

10 September 2018
Amba Hotel, Charing Cross, London
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Background

UK Research & Innovation (UKRI) and the Met Office jointly held a workshop focused on climate resilience on 10 September 2018 in London.

The workshop aimed to bring together the climate resilience community to consider the multidisciplinary climate risk and solutions research that is required to ensure that the UK is resilient to climate variability and changes, and powerfully positioned to exploit the opportunities of adaptation and a transition to a low carbon future.

There were 75 participants in attendance, with representatives across the remits of Arts and Humanities Research Council (AHRC), Economic and Social Research Council (ESRC), Engineering and Physical Sciences Research Council (EPSRC), Natural Environment Research Council (NERC) and the Met Office together with representation from policy (Department for Business, Energy and Industrial Strategy (BEIS), Defra, Department For Transport (DFT), Environment Agency (EA), Committee on Climate Change (CCC)) and business (water, energy, and consultancy).

By holding the workshop, we recognise:

- the UK is undergoing transformations of various types including a transition
- increasing evidence of impacts from extreme weather
- improving resilience requires many disciplines including: engineering, socio-sciences, physical sciences, arts and humanities, communication specialists and buy-in from stakeholders

Figure 1. The presenting organisations
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Activity Details</th>
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<tbody>
<tr>
<td>09:00 – 09:30</td>
<td>Registration and refreshments</td>
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<tr>
<td>09:30 – 10:00</td>
<td>UK Climate Resilience - workshop objectives:</td>
<td>Joint presentation from: Dr Ned Garnett, NERC &amp; Prof. Jason Lowe, Met Office</td>
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<tr>
<td></td>
<td>- Building a multidisciplinary community</td>
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<td>- Identifying current state of research and what is needed to take the UK forwards</td>
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<tr>
<td>10:00 – 10:30</td>
<td>Current Research Activities</td>
<td>Presentations from: Prof. Georgina Endfield, AHRC Prof. Lindsay Beevers, EPSRC</td>
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<td></td>
<td>- 5 x 5 min presentations on current research activities in climate resilience, presented</td>
<td>Prof. Nick Pidgeon, ESRC Dr Adrian Hines, Met Office Prof. Rowan Sutton, NERC</td>
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<td></td>
<td>by researchers representing their communities</td>
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<tr>
<td>10:30 – 11:10</td>
<td>Focus Session 1:</td>
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<td>- What relevant research are you involved in and how might that apply in a multidisciplinary</td>
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<td></td>
<td>way to climate resilience?</td>
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<td></td>
<td>- How would you work across the different communities?</td>
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<tr>
<td>11:10 – 11:40</td>
<td>Refreshments</td>
<td>Joint presentation from: Ms. Kathryn Brown, CCC-ASC &amp; Dr Liz Duffy, Defra</td>
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<tr>
<td>11:40 – 12:10</td>
<td>What research outcomes are needed?</td>
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<td>12:10 – 13:00</td>
<td>Focus Session 2:</td>
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<td>- What are the needs (e.g. economic drivers), problems (e.g. societal issues) and ambitions</td>
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<td></td>
<td>(e.g. opportunities to advance understanding) of UK climate resilience in the next 5-years?</td>
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<td>13:00 – 14:00</td>
<td>Lunch</td>
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<tr>
<td>14:00 – 14:30</td>
<td>Joint working across the Met Office and UKRI communities</td>
<td>Presentations from: Prof. Jason Lowe, Met Office &amp; Dr Jemma Gornall, Met Office</td>
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<tr>
<td>14:30 – 15:15</td>
<td>Focus Session 3:</td>
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<td>- What new research and innovation activities are needed, working across the UKRI and Met</td>
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<td></td>
<td>Office communities, to meet the needs, problems and ambitions of UK climate resilience?</td>
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<tr>
<td>15:15 – 15:45</td>
<td>Next Steps</td>
<td>UKRI/Met Office</td>
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<td>16:00</td>
<td>Close</td>
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</table>

All workshop presentations can be found on the [UK Climate and Weather Workshop webpage](https://ukclimateandweatherworkshop.org).
Workshop format
The workshop consisted of presentations from NERC, Met Office, Defra, researchers across disciplines and the Committee on Climate Change’s Adaptation Sub Committee, as well as several focus group sessions to answer targeted questions surrounding climate resilience research.

Objectives

The primary aims of the workshop were:

1. To facilitate a networking opportunity for multidisciplinary and interdisciplinary research
2. To increase understanding of policy and business requirements in relation to climate resilience research
3. To develop new ideas that fill any current research gaps and deliver multidisciplinary research

Focus Groups

After introductory presentations, the workshop participants were split into groups of 6/7 people for focus sessions. The groups were mixed between each focus session to facilitate collaboration across the community.

The UK has a ‘fragmented multidisciplinary research community
– Lord Krebs

As part of the focus sessions, participants were given several questions to answer, led by group facilitators.

Focus Session 1
The first focus session presented an opportunity for participants to get to know each other and to discuss any research they were working on. They also discussed how working together in a multidisciplinary capacity might support climate resilience research.

What relevant research are you involved in and how might that apply in a multidisciplinary way to climate resilience?

How would you work across the different communities?
Focus Session 2
During the second focus session the participants were reassigned tables to discuss the key focus session question:

What are the needs (e.g. economic drivers); problems (e.g. societal issues); ambitions (e.g. opportunities to advance understanding); of UK climate resilience?

The outputs from the second focus session can be seen below:

<table>
<thead>
<tr>
<th>Needs (e.g. economic drivers):</th>
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<tr>
<td>The UK needs to be able to respond to the various audiences, understanding the different drivers, timescales, and uncertainty that they operate with:</td>
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<td>- Policy - both national (e.g. CCRA) and international (e.g. UN SDGs)</td>
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<td>- Industry – in the development of adaptation strategies, recognising the different levels of maturity between sectors</td>
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<td>- Society e.g. food security</td>
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<td>To achieve this we need:</td>
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<tr>
<td>- to take advantage of UK expertise and make this knowledge and understanding transferable to others</td>
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<td>- to support inter/multi-disciplinary working</td>
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<td>- to better connect researchers with stakeholders allowing for co-production of research to support better decision making</td>
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<td>- to quantify both the economic and non-economic benefits of resilience</td>
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<td>- to develop a positive narrative around these benefits</td>
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<td>- to recognise that resilience is about adaptive planning as well as immediate impact</td>
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<td>- to better understand and assess the effectiveness of adaptation / climate resilience interventions</td>
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</table>
Problems (e.g. societal issues):

- There is a language and communication barrier between different research communities, and stakeholders.
- There is a need to plan for the long term to achieve resilience but the drivers from both policy and industry are largely economic, and the growth agenda promotes short-termism.
- Very different approaches are needed for the different sectors e.g. agriculture, infrastructure, health, and at the same time a systems approach is needed.
- There is currently not enough inclusion of behavioural responses – awareness of issues, crowd behaviours and what that means in relation to the significance of climate impacts and resilience.
- Not everyone is affected by the same issues and so social justice needs to be more fully incorporated.
- Societal messaging – who has the responsibility to communicate to the public (if needed) and how can messages be made relevant? How to use storytelling.
- There are very different scales of change and impact and a need to work across them, from providing localised climate information to understanding how global changes may impact on the UK e.g. within supply chains, and population movement.
- Risk and uncertainty needs to be better communicated to better support decision making.
- Researchers are driven by the REF and need greater incentives for policy and business engagement.
Ambitions:

- A well understood process is developed to deliver climate resilience research which links researchers and stakeholders (industry, policy,) for co-produced outcomes that are compelling and achieve a change in action from decision makers.
- Support, advice and guidance is available to help organisations and local authorities to translate information on resilience into action – through a centre of expertise or other routes. This should include information on different adaptation options and what works.
- Systems thinking is at the core of new research.
- Tools are developed to assess the effectiveness of adaptation / climate resilience interventions.
- Place based demonstrators are developed to help promote a community focus.
- A capability is developed for rapid (research) response when a climate/weather event occurs.
- Consistent metrics for climate risk assessment are developed that make it easier to make a decision.
- Expertise in climate resilience is developed from early career into all areas: industry, academia, policy. Placements is an option to support this.
- Climate resilience is understood within the broader framing of sustainability – co-benefits.
- Climate resilience is built into the education system.
- Opportunities are taken advantage of:
  - Existing data and information
  - Copernicus
  - Artificial Intelligence (AI)
  - Learning from other sectors
    - e.g. health
Focus Session 3

During the third focus session the participants were reassigned tables to discuss the key focus session question:

What new research and innovation activities are needed, working across the UKRI and Met Office communities, to meet the needs, problems and ambitions of UK climate resilience?

The participants also discussed two ‘word clouds’ (Figures 2 and 3). The word clouds were derived from the text that all of the people that applied to the workshop submitted in response to a question in the application form:

Please outline what research you consider is needed to ensure that the UK is resilient to climate variability and change?

Figure 2. ‘Word cloud’ gathered from workshop applicant responses to: ‘Please outline what research you consider is needed to ensure that the UK is resilient to climate variability and change?’
Gaps

**Solutions focus – engaging and communicating with stakeholders**

- Solutions space. There is too much emphasis on researching the problem and not enough on solutions. Problem led interdisciplinary research is needed – building in user needs, decision support tools, and requirements

- Stakeholders need to be involved in the co-production of research – policy, regulators, business (both SMEs and large corporations), society; study of co-production techniques needed

- Greater understanding of the social/psychological barriers to making decisions (at both the individual and organisational level) based on climate change information, including a retrospective study on change as a result of previous climate change research, is needed

- Risk communication – narratives grounding climate risk in experience. NB there is a capacity issue with this – not enough researchers in this space.
Rebalancing of research effort

- There is a lot of information on climate science (hazard) but less information on exposure and vulnerability
- Increased effort on extreme temperatures (v flooding)
- Greater focus on cascading risks
- Mental as well as physical health
- Greater focus on cities and green infrastructure to mitigate climate change

Using existing research

- Focus on applying existing research to achieved the desired impact
- Meta-analysis on climate resilience, identifying what is currently out there and what is being used
- Comparison of different risk frames, and their implementation
- Interaction of different approaches to hazards using existing models

Real world context

- Demonstrators of applying adaptation options
- Greater linking between the weather that is experienced (and data on it) – at a local level - and climate change
- Learning from countries that are already adapted and resilient to climate change e.g. Australia for heat (fires); Netherlands for flooding
- Process for specifically addressing research gaps in CCRA
- Consideration of climate resilience in a wider context, and recognising co-benefits of actions

Additional areas

- Social vulnerability to climate change, including global scale issues with UK impacts e.g. climate-driven migration
- Incorporation of cultural knowledge – bringing in value systems and human behaviour
- Connections within the system and feedbacks – need for a systems approach linking disciplines
- Using new climate change scenarios (UKCP18) to help sectorial planning e.g. flood risk, water resources
- Uncertainty, quantification, decision making
Workshop Wrap-up

UKRI and the Met Office thanked the workshop delegates for their participation and thoughtful discussions. A clear message is the need to draw a diverse community together in order to co-produce research to address climate resilience. The inputs over the day were excellent and represent a positive step towards building a multidisciplinary research community.

Delivery Options

- Requirement for inter/multidisciplinary research in funding calls to help build the community – and pulling together information on what makes interdisciplinary working succeed
- Funding mechanisms that incentivise co-production and impact
- Need for long term funding to provide sustained capability in climate resilience research – at least on a 5-year timescale to meet the needs of the CCRA. Could be a dedicated centre or network of centres of excellence
- Placement programmes between researchers and policy/industry (2-way) – and career recognition for researchers to encourage engagement
- Retreats – intensive research activities for ECRs and established academics to address specific questions
- Evaluation of past multidisciplinary centres to help shape future investments
- Funding could be structure in a framework of different hazards, with cross cutting areas of: methodologies and data; cultural and behavioural change; technological, design and engineering challenges; risk communication and policy development.
- Funding for knowledge brokers