What research outcomes are needed?

Liz Duffy, Head of Climate Evidence
UK Government launch the Plan - A Green Future: Our 25 Year Plan to Improve the Environment

“The environment is something personal to each of us, but it is also something which collectively we hold in trust for the next generation. And we have a responsibility to protect and enhance it”

Theresa May, 11 January 2018
It is this Government’s ambition to leave our environment in a better state than we found it.

The 25 Year Environment Plan will deliver cleaner air and water in our cities and rural landscapes, protect threatened species and provide richer wildlife habitats. It calls for an approach to agriculture, forestry, land use and fishing that puts the environment first.
Our 25-year goals

We will achieve:

- Clean air
- Clean and plentiful water
- Thriving plants and wildlife
- Reduced risk of harm from environmental hazards such as flooding and drought
- Using resources from nature more sustainably and efficiently

Enhanced beauty, heritage and engagement with the natural environment

We will manage pressures on the environment by:

- Mitigating and adapting to climate change
- Minimising waste
- Managing exposure to chemicals
- Enhancing biosecurity

Our policies will focus on:

- Using and managing land sustainably
- Recovering nature and enhancing the beauty of landscapes
- Connecting people with the environment to improve health and wellbeing

- Increasing resource efficiency, and reducing pollution and waste
- Securing clean, productive and biologically diverse seas and oceans
- Protecting and improving the global environment
The Climate Change Act sets UK’s adaptation framework

- The Climate Change Act 2008 requires a UK Climate Change Risk Assessment (CCRA) every 5 years followed by a National Adaptation Programme (NAP) to address the risks identified.
- The Act created an Independent Adaptation Sub-Committee (ASC) of the Committee on Climate Change to advise Government on adaptation and review progress on implementation of the NAP.
- The Act also created an adaptation reporting power (ARP) that enables Government to require infrastructure providers and public bodies to report on their preparedness for climate change.
Climate Change Risk Assessment

- Next (third) CCRA due in 2022
- ASC will deliver the evidence report in 2021
- Identify priority risks to inform Government and DAs
- Mainly a synthesis of available research, with some research projects (funded by Defra and NERC, ESRC, EPSRC)
- Stepping stone to future CCRAs – inc. more focus on systems and accessibility of outputs
UK Climate Projections (UKCP18)

- Major upgrade to the UK Climate Projections released later this year
- Delivered by Met Office Hadley Centre as part of the wider climate programme co-funded by Defra and BEIS
- Update of projections and introduction of new products
- Provide the tools to inform adaptation decisions
- Wider climate resilience research can utilise and build on UKCP18 data
Independent advice to government on building a low-carbon economy and preparing for climate change

UK Climate Change Risk Assessment 2017–evidence gaps
Evidence to inform CCRAs

• The **Evidence Report** for the second CCRA (CCRA2) was published by the Adaptation Sub-Committee (ASC) in July 2016.

• The report identified a large number (over 200) **evidence gaps** that need to be filled to inform future assessments and subsequently the priorities for future National Adaptation Programmes.

• Some of the risks and opportunities assessed in the CCRA were also marked as **research priorities** – those being where we do not currently know enough to know if further action is needed urgently, or not.
Evidence Gaps: Identifying the most urgent risks and opportunities

1. What is the current and future magnitude of risk/opportunity?
   - High, medium or unknown

2. To what extent can we expect the risk/opportunity to be managed?
   - Significant adaptation shortfall
   - Less significant adaptation shortfall

3. Are there benefits to further action in the next five years, over and above what is already planned?
   - Yes
   - No

More urgent → RESEARCH PRIORITY → SUSTAIN CURRENT ACTION → WATCHING BRIEF → Less urgent

Step 1 - This is where we think the Research Councils are most interested
But it is steps 2 and 3 where we have the least evidence

Source: ASC (2016) UK CCRA 2017 – Chapter 2: Approach and context
Evidence Gaps: Priority evidence needs

1. Development of **UK spatial modelling capability** that is able to link different sectors together (e.g. natural environment, human health and infrastructure) and shows the geographical distribution of risks.

2. Development of a consistent set of **socio-economic scenarios** for the UK, including population and technological change.

3. Robust **decision support frameworks** to enable decision makers to assess risks and plan adaptation responses consistently.

4. Continued and enhanced investment in **monitoring** of observed changes in the natural environment, land use, population, the built environment and infrastructure.

5. Better understanding of **behaviour change** in relation to climate risks.

6. Better understanding of what **adaptation options** are available and what their effectiveness is in reducing risk.

A LOT OF THESE MIGHT NOT BE THOUGHT OF AS ‘NEW SCIENCE’ – BUT THESE ARE BIG PRIORITIES FOR US TO DEVELOP BETTER NATIONAL CAPABILITY FOR
Research priority risks: we don’t know enough to know how urgent further action is...

- **Ne3**: Changes in suitability of land for agriculture & forests
- **Ne7**: Risks to freshwater species from high water temperatures
- **Ne13**: Ocean acidification & higher water temperature risks for marine species, fisheries and marine heritage
- **In5**: Risks to bridges and pipelines from high river flows/erosion
- **In11**: Risks to energy, transport & ICT from high winds & lightning
- **In12**: Risks to offshore infrastructure from storms and high waves
- **Bu2**: Risks to business from loss of coastal locations & infrastructure
- **Bu5**: Employee productivity impacts in heatwaves and from severe weather infrastructure disruption
- **PB2**: Risks to passengers from high temperatures on public transport
- **PB6**: Risks to viability of coastal communities from sea level rise
- **PB7**: Risks to building fabric from moisture, wind, and driving rain
- **PB8**: Risks to culturally valued structures and historic environment
- **PB10**: Risks to health from changes in air quality
- **PB11**: Risks to health from vector-borne pathogens
- **It2**: Imported food safety risks
- **It3**: Long-term changes in global food production
- **It5**: Risks to the UK from international violent conflict
- **It6**: Risks to international law and governance
Plans for CCRA3 and beyond

- Small scale research projects being done on flooding and water projections (using UKCP18), behaviour change, interacting risks and thresholds in the natural environment
- Preparation of the risk assessment will also involve new economic analysis
- CCRA3 Evidence Report due out in 2021
- CCRA4 will be prepared by 2027.... What longer-term research can we put in place to inform this?