Dealing with Uncertainties in CCIVA Research

UKCP09: Increasing the need to learn from experience

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Key Lessons Learned

- **Information needed is that to support decision and policy making**
  - Means starting with the decision / policy – vulnerabilities, sensitivities
  - Means more than just descriptions of the current and future climate or impacts
- **Sustained engagement of users and providers of support**
  - Aim is informed engagement from concept to delivery and beyond
  - Continuous improvement informed by users' needs and science capabilities and developments
- **Both access and support are necessary**
  - Defined and delivered working with users and providers
  - One product / approach does not fit all
  - Single snapshots are insufficient – evolving information and support

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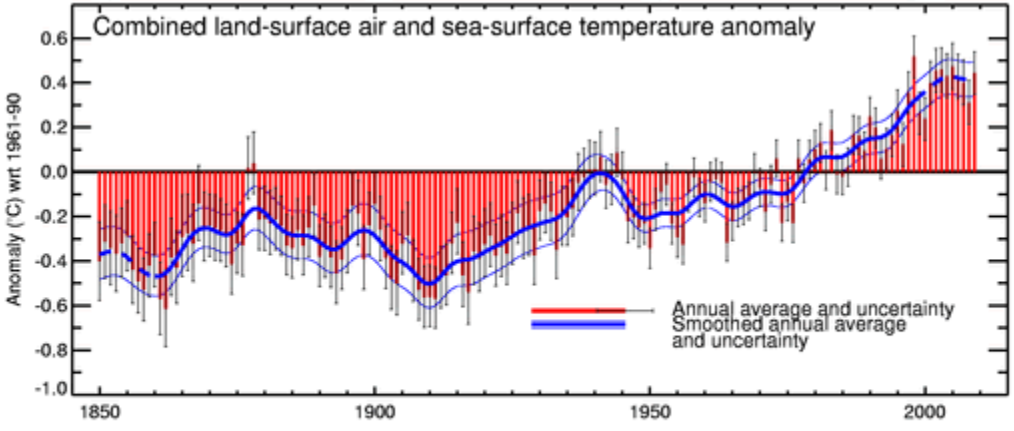
Need for information and support is changing

- Recognition that climate is changing and will continue to change – need for action
- Requirement to move from merely identifying potential climate , impacts and adaptation options to understanding risks and identifying viable and robust adaptation options
- Broadening of community needing and using this type of information – from primarily research to decision support (e.g., statutory requirements)
- Need for information and processes that can inform decision and policy making processes.
- Need for a balance between what science can provide and what the user community requires – product, presentation and support.
- Not just about climate change throughout the century – focus is on today and the near future (next 5 – 10 years).



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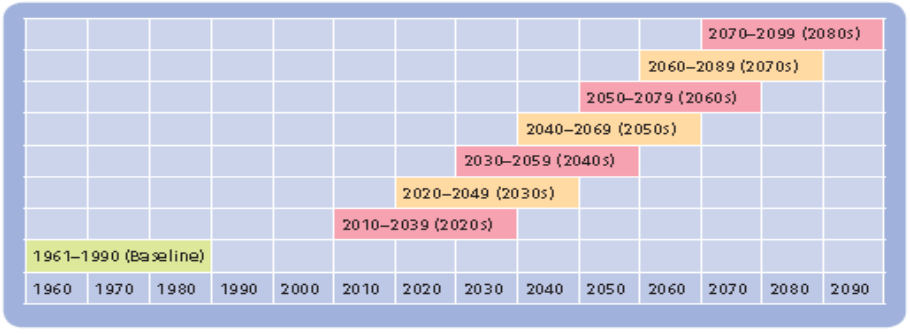
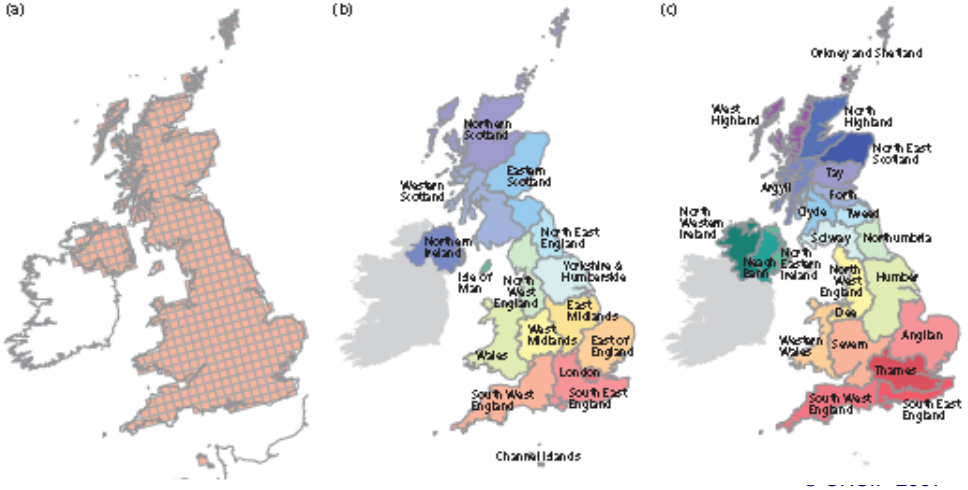
Met Office Hadley Centre

www.metoffice.gov.uk/hadobs

Responding to Users Request

- Clearer understanding of uncertainty
- Higher spatial and temporal resolution and including more information on extremes
- Ability to support informed decision making – more robust adaptation and risk management
- Different levels of detail to support a broadening user community
- Historical climate information including information on trends
- Guidance and examples of how to use





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The Response – UKCP09

- Accessible historical climate data and derived variables, plus trends report
- Probabilistic projections available as data, maps and plots
- Analytical tools – weather generator and threshold detector – that allow the user to further analyse the probabilistic projections
- User Interface through which users access the projections and analytical tools
- Guidance and support – how to use (and not use) the provided information, including case studies, targeted guidance, training and reports
- Integrated UKCP09 website linking all this information
- User-provider engagement

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Information Needed

Often more than 'traditional' climate variables

- Consistent with thresholds and sensitivities
- Defined by users – related to impacts, consequences and risks
- Consistent with planning and decision-making processes
- Derived variables and statistics – past, present, trends and near term, as well as climate futures

Able to evolve with the changing needs of users

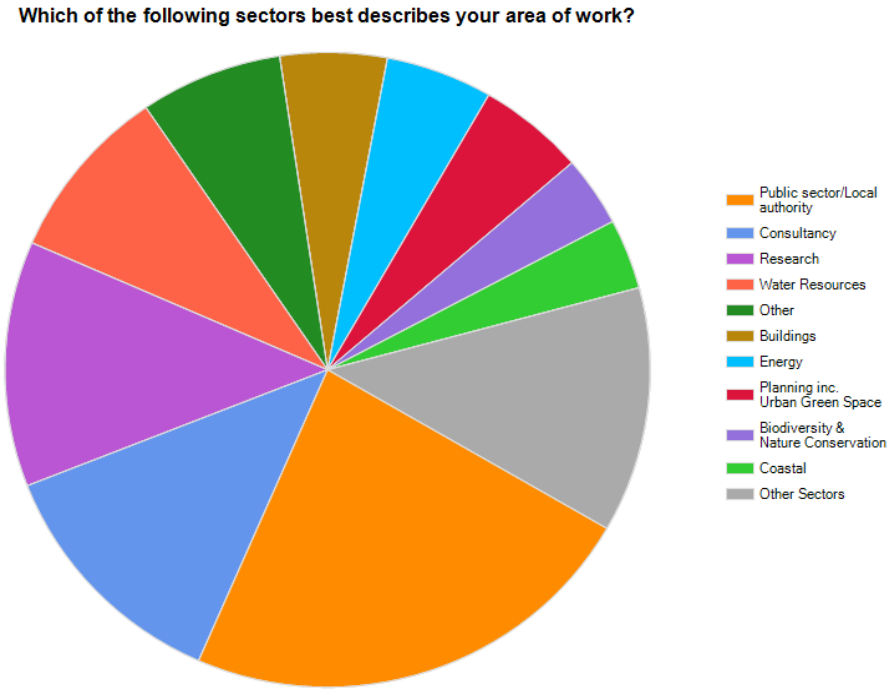
- Flexibility to add enhancements / extras – based on learning while doing
- Able to support adaptation assessments – appraisal and evaluation.

Implications for information provide

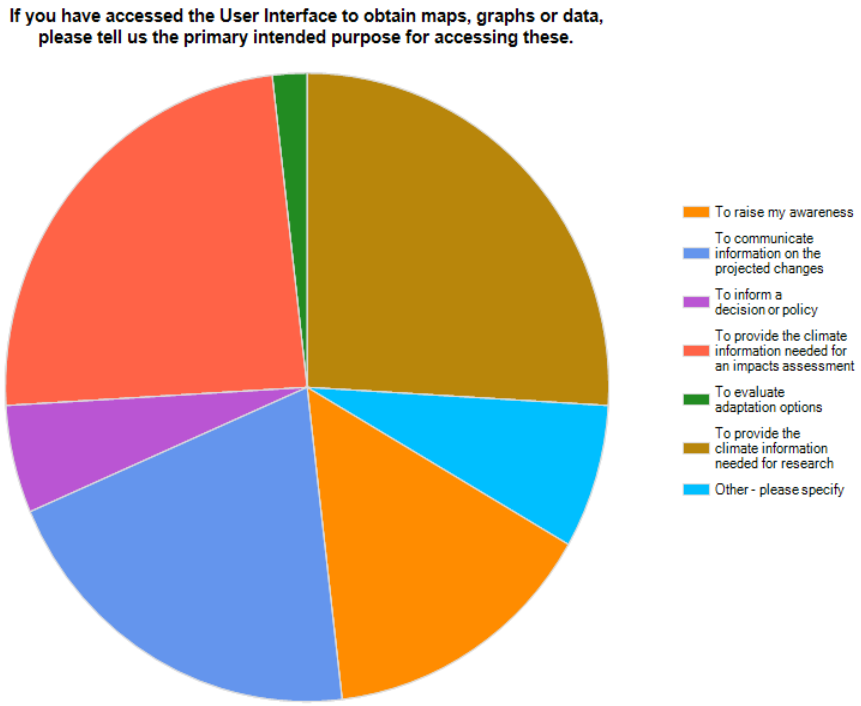
- Balance of needs and science capability and credibility

Who are the Users? Why are they using?

More than researchers



For more than research



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Information Needed

Based on an understanding of:

Nature of the decision

- Timeframe – present, near term, lifecycle management, investment cycles

System(s) of interest – assets, community, ecosystem services, resources

- Understanding sensitivities, thresholds – historical performance and expert/professional/operations experiences

Current situation

- Coping capability and causes of failure - existing adaptation deficit
- Question of what you are adapting from – baseline

Capacity to use information

- Skills and capacity of decision-makers and associated processes

User-Informed Climate Information

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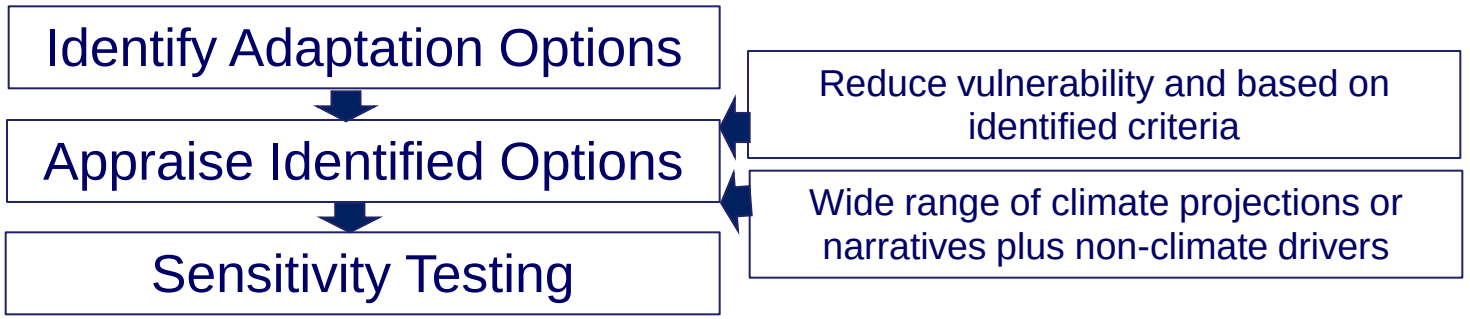
Robust Option Assessment

- **Where uncertainty and vulnerability are high**
- **Identify options that perform well (not necessarily optimally) over a wide range of conditions – now and in the future**
- **Start with no (low)- regrets**



- **Flexible and open-ended adaptation options**
- **Monitoring and evaluation of option performance with identified triggers for change**

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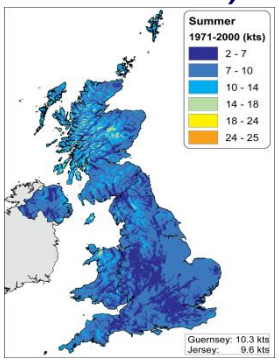
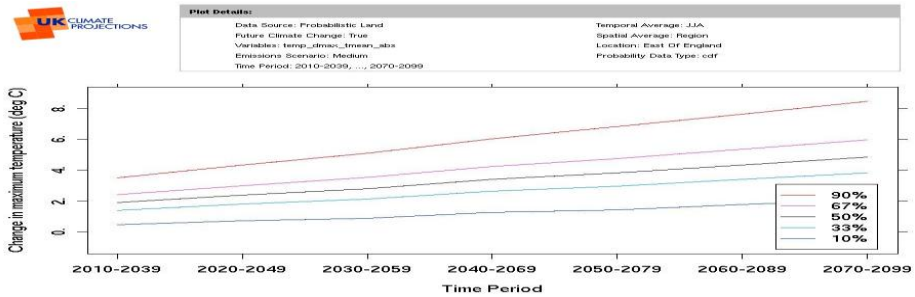
Access to different types of information

- **Not all users need projections data –** what is needed depends on the intended use – *historical information , key findings, headline messages, narratives, maps and graphs, data and analytical tools*



Warmer and wetter winters, with hotter and drier summers
The summer mean daily maximum temperature is projected to increase from 4.8ºC to 8.4ºC.
There is a projected two-fold increase in the frequency of summer drought by the 2050s.

UKCP09 Weather Generator and its associated Threshold Detector



- Need for information that can better inform what other information should be considered, including what more detailed climate data – focus on periods/areas of particular interest and not allowing users to get mesmerised by the numbers

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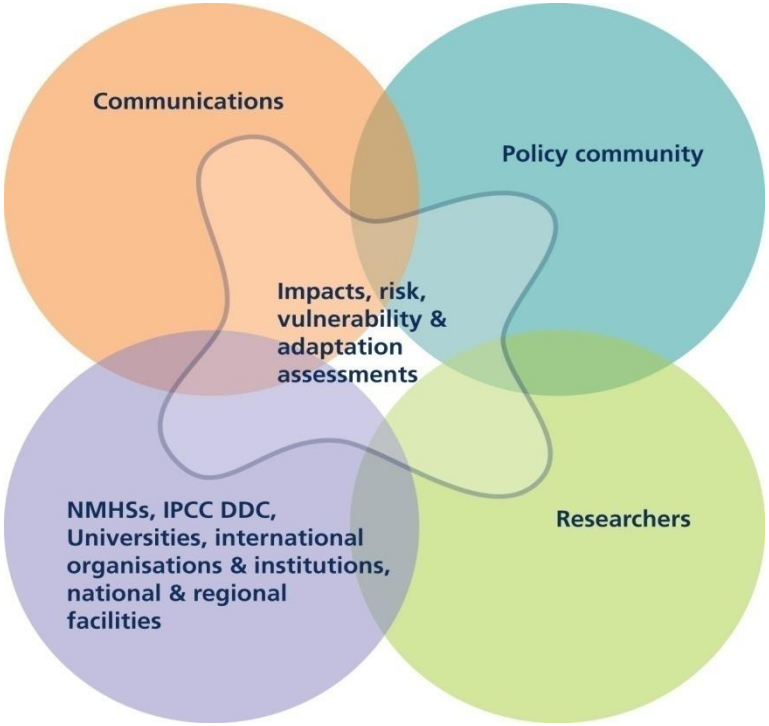
Engaging Providers and Users

Who are the Providers?

- NMHSs, IPCC DDC , Universities, International Organisation and Institutions, and National / Regional Facilities



More than consultations!

Need for informed and sustained engagement involving both users and providers throughout the process – development, dissemination, providing support, evolution, etc.

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Mechanisms for Engaging – Shared Learning

Users' Advisory Panel – representatives of the users

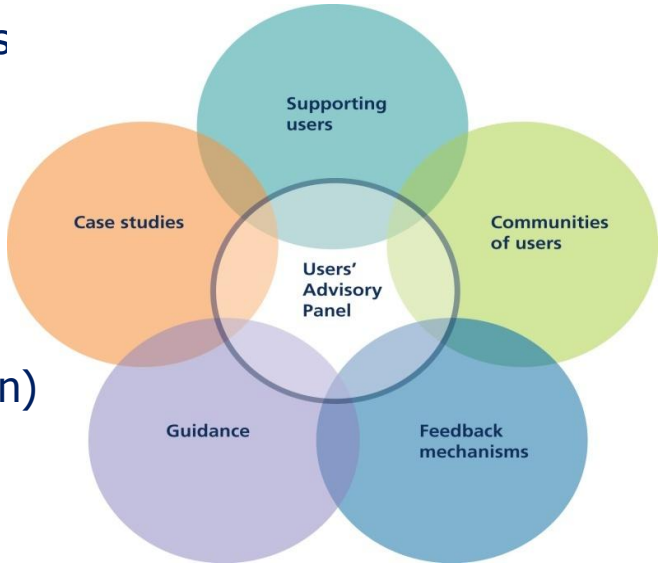
- Providing advice and feedback on proposed directions and developments
- Opportunity to suggest enhancements and extras – new and modifications to the information and support provided

Communities of Users – common interests

- Opportunities to share lessons learned and challenges of using the information – working as a community
- Working with the providers and other experts / practitioners

Guidance (online and hard copy)

- How the information can be used and should not be used and why
- Linking the uses (impacts, vulnerability, risks and adaptation) to the climate science



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Mechanisms for Engaging – Shared Learning

Case Studies – part of the guidance

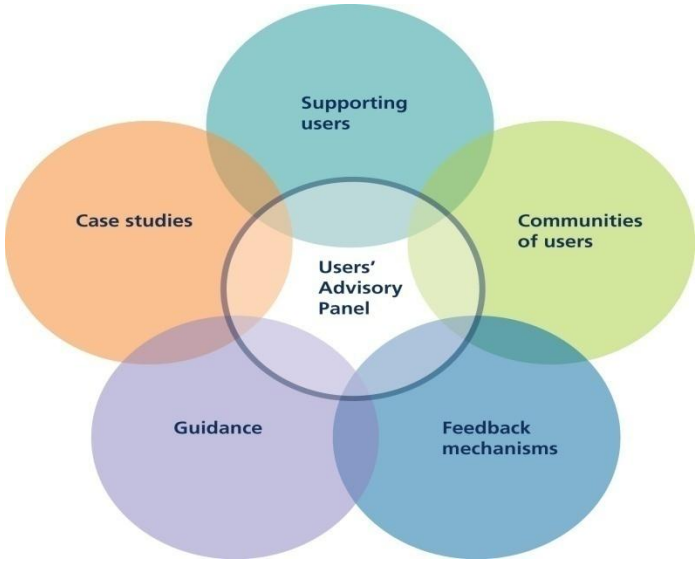
- How others have used the information
- Working with users to demonstrate how they have used the information and why they have chosen to do so

Feedback Mechanisms

- Online feedback opportunities
- Feedback surveys and questionnaires

Supporting Users

- Training (face-to-face) and online (including e-learning and webinars)
- Working with users as part of their assessment processes



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Positive Impacts of Engagement

- Delivered information that was directed at informing use rather than just describing the climate
- Guidance and User Interface user-tested
- Language and terminology understandable to users
- Stakeholder buy-in (ownership) in the process
- Worked Examples available at launch and now providing case studies
- Providers have a better understanding of users needs and priorities
- Users have a better understanding of what can and cannot be delivered and how UKCP09 can and cannot be used
- Desire by users and providers to sustain engagement

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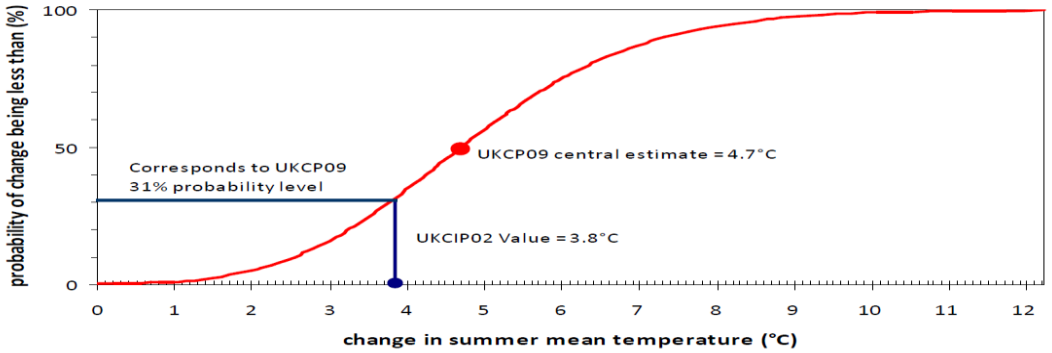
Challenges – Using UKCP09

Dealing with uncertainty – will always exist in observations and future

- Deterministic information – brittle adaptation
- Is optimal adaptation appropriate considering uncertainties?
- Desire for single set of information
  - Costs in terms of time and capacity
  - Interpretation of outputs?
  - Easier to use

Does this result in an 'valid ' decision

Who owns the risk?



Balance between providing generic and decision-specific support

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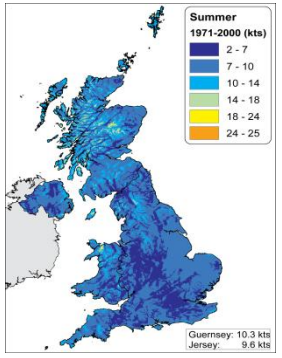
Challenges – Using UKCP09

Higher resolution information

- Misinterpretation that higher resolution = higher accuracy



Enhanced Accessibility

- Mesmerised by the numbers
  - Going straight to the climate data without understanding what is needed (understanding sensitivities and thresholds of system)

Using the guidance

- Going straight to the outputs enhancing the likelihood of ineffective or misuse

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Challenges Ahead - Continuing to Support

Evolving user and provider communities – need to embrace

- User communities and needs are changing – better definition of their needs, new users, enhanced requirements, evolving capacities
- Available climate information and analytical capacities are changing

These suggest that a single periodic snapshot is no longer sufficient – target is to increase utility to users

- Additional and enhanced analytical tools
- Different types of presentations of the available information
- Introduction of new climate information
- Enhanced capability to extract information from the available outputs

Calls for a 'framework' to support bringing in additional and new information and utility

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Challenges Ahead – Engagement

Evolving user and provider communities

- Need for continued and informed engagement to support appropriate use evolving with needs and science
- Recognise the different types of users and information that should be available (generic/specific?)

These suggest the need to explore means for:

- More effectively engaging users across the *emerging* user community – exploring alternative engagement models
- Encouraging sharing of experience and partnership working
- Broadening the community of providers engaged

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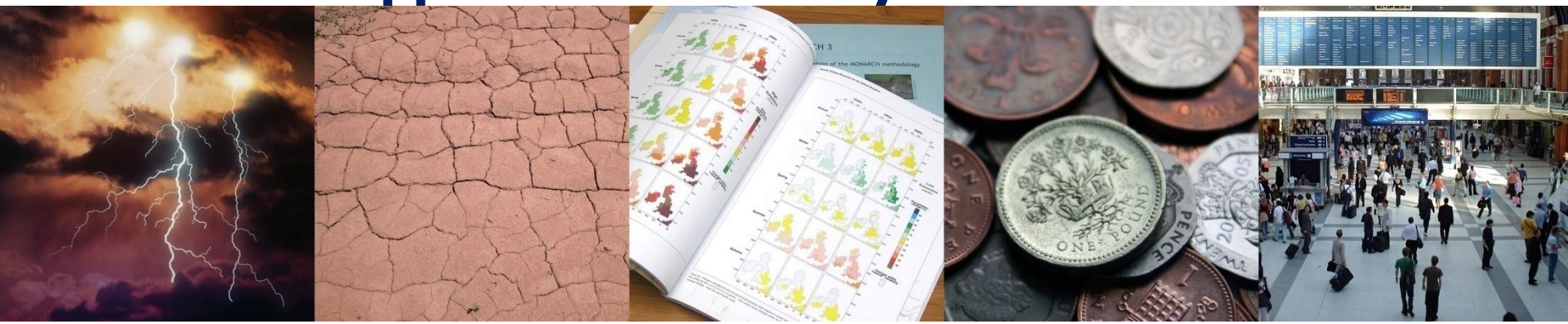
Learning from experience and sharing

Information needed is that to support decision and policy making

Sustained and informed engagement of users and providers

Access and support are necessary



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