



Climate research priorities in the light of services and stakeholder needs

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Chris Hewitt, Head of Climate Service Development, Met Office Hadley Centre



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Overview

- Global activities - GFCS and Climate Service Partnership
- Regional activities - in Europe
- National activities - climate services in the UK
- Future research priorities

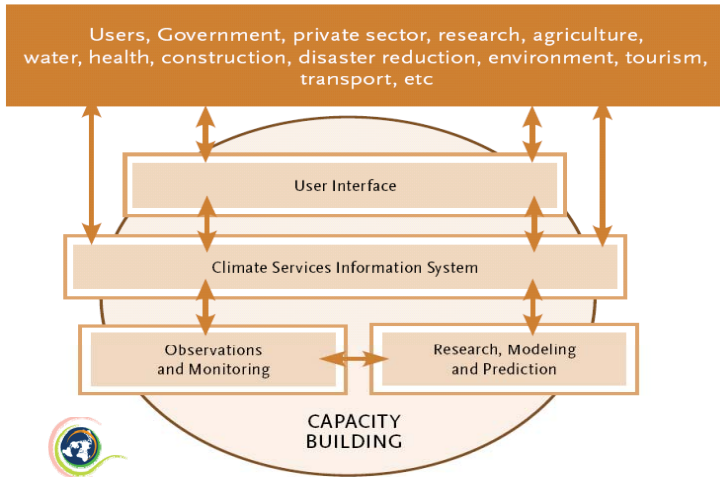


Global Framework for Climate Services

My one-page summary

Vision: Enable society to manage better the risks and opportunities arising from climate variability and change. Using science-based climate information.

The components

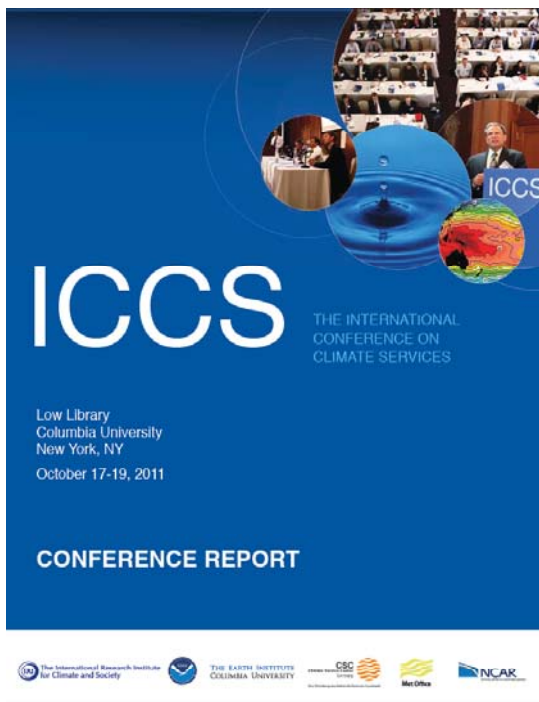


Priorities:

- Vulnerable developing countries
- Capacity building
- Strengthen not duplicate
- 4 initial areas:
 - Agriculture and food security
 - Water management
 - Health
 - Disaster risk reduction

<http://www.wmo.int/gfcs>

Hewitt *et al* (2012) Nature Climate Change



Climate Service Partnership

- A risen from the First International Conference on Climate Services
- Connecting climate service activities
- Forum for collaborating and sharing experiences
- Involves researchers, service providers, donors, decision makers,
- Activities include assessing socio-economic benefits, evaluating climate services
- Annual International Conference



European Commission funded R&D projects related to climate services



ECLISE – demonstrate local climate services to support adaptation policies and conceptualise a European climate service



CLIM-RUN – climate information in the Mediterranean region responding to user needs



NACLIM – improve our understanding of the predictability of the climate in the N. Atlantic/European sector.



SPECS - climate prediction systems for seasonal-to-decadal time scales, to provide actionable climate information.



EUPORIAS - maximise the usefulness of seasonal-to-decadal climate information through close collaboration with end users.



ECOMS – coordinate across European projects and a ‘think tank’ on future research priorities

EUPORIAS

- Aim: Make seasonal and interannual information more relevant to decision making.
- Approach: start from user needs, rather than capability, to identify science and services needed
- Objectives:
 - Assess user needs, knowledge gaps and vulnerabilities of key sectors
 - Develop a reliable and trusted impact prediction system
 - Develop a set of tools and techniques tailored to user needs for calibrating, downscaling and modelling impacts
 - Produce a set of co-designed prototypes addressing some specific user needs
 - Share knowledge to promote the use of the tools, techniques and prototypes
- 24 partners plus >70 user organisations



Progress: workshop on 'Climate services providers & user needs'

Aim: get knowledge of the use of seasonal-to-decadal information in Europe

30 participants from climate service providers and stakeholders

Main findings:

- Users of seasonal information mainly in the energy, insurance, transport sectors
- Most use lead time predictions of a month up to a season; seasonal forecast users mainly linked to the energy sector;
- No use of decadal forecasts.

Barriers to the use of S2D: Low skill & predictability; limited capacity and relevance/usability of data available; accessibility/communication of information

Solutions to overcome barriers: training and communication; improve skill and predictability; funding

EUPORIAS

How can EUPORIAS help set research priorities?

- Provide information on user requirements and needs
- Develop our understanding of the chain from predictions into impacts and decision for a number of sectors including water, forests, health, transport, agriculture
- Provide a fast loop to check the value of new prediction techniques to decision-makers.

EUPORIAS

ECOMS – European Climate Observations, Modelling and Services

- Close coordination between European projects, primarily in the area of s2d predictions towards climate services,
- Identify and exploit synergies
- Improve links between other activities, especially European and GFCS
- Recommend priorities for research needs in climate modelling and climate services
- Includes representatives from:
 - climate modelling, climate services and infrastructure projects,
 - as well as major European climate modelling and climate service centres



ECOMS Recommendations: Climate Modelling

1. EU Climate Projections 2020 (*EUCP20*)

- Develop a prediction system for the EU region based on current generation of climate models. Focus on high-res, s2d, incl. initialisation and evaluation

2. Developing trust in climate models

- Develop better obs systems, use and evaluate (regionally) multi-model ensembles, more comprehensive ESM, better treatment of uncertainty, improved understanding of key processes and feedbacks

3. EU Projections 2030 (*EUCP30*)

- Develop next generation of climate models, including higher-res, ESM, initialisation, HPC and computational efficiency



ECOMS Recommendations: Climate Services

1. Translation science and Users

- Engage with users across multiple disciplines to co-design and provide user relevant climate information for decision-making

2. Impacts Datasets

- Develop and provide standardised datasets of met. parameters and impact relevant data (e.g. wind storm, flood damage, agri. productivity) at sufficient spatial and temporal resolution for decision-making

3. Downscaling and impacts

- Regional downscaling providing relevant predictions and impacts assessments to support planning and decision-making. Assess accuracy and robustness. Develop expert guidance to enable effective use of climate information



Climate Services: the Application of Climate Science



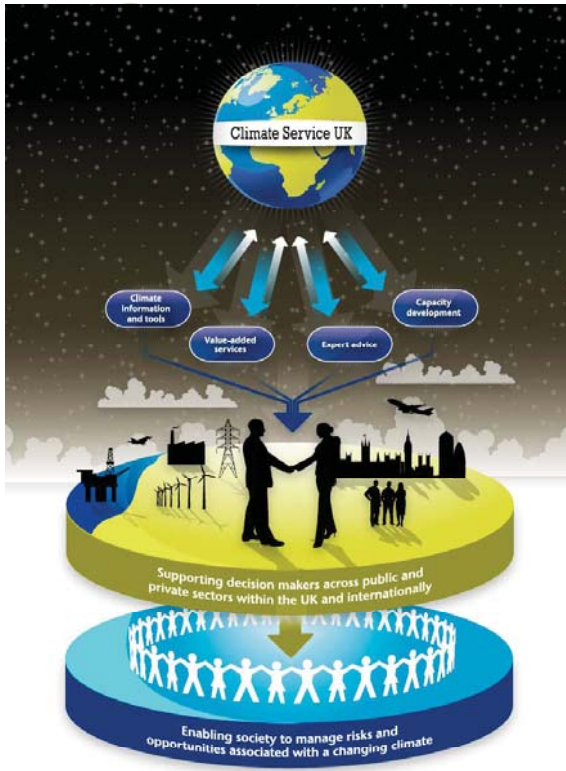
- From mitigation to **mitigation** and **adaptation**
- From **few** to **many** customers/users/stakeholders



- Global century scenarios to **regional predictions, days to decades ahead**
- Climate change to **climate change** and **climate variability**



- Broad climate to **characteristics of weather** including **extremes** and **impacts**
- **Operational delivery** – regularly updated monitoring, forecasts, products & services



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Climate Service UK

Partnership: working with Environment Agency, Natural Environment Research Council and others

User driven: working together through customer partnerships to build knowledge, develop user-relevant tools, and ensure climate information is used in decision-making

Built on and influences a solid base of world-class **underpinning science**

Developed alongside the weather service and building on existing service delivery capability: **seamless weather and climate service**



Met Office Hadley Centre Climate Programme

- Programme of long-term UK Government funding
 - 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



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JWCRP

Joint Weather & Climate Research Partnership



- Aligning **NERC** and **Met Office** research activities
- To ensure that the UK maintains and strengthens its strong international collaborative position in weather and climate science
- Sustain and grow UK's national **capability and research in observing, understanding, modelling and predicting weather and climate**, and their **impacts**, along with the **infrastructure** required
- Align major research initiatives and programmes to ensure the most effective impact of the research and pull-through into the delivery of services to government and business

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Environmental Science to Service Partnership

Met Office



- To develop ways to pull through world class environmental science generated within partner organisations to support the development and delivery of useful services.
- Create and deliver new services by harnessing **data, information, knowledge, predictions, expertise and guidance** skills of partner organisations to inform and support decision making related to planning, operations and risk management
- Create shared innovation capability to stimulate economic growth, deliver societal benefits & generate positive environmental outcomes

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Energy management

Electricity network resilience

- Helping to assess resilience of electricity network to weather-related faults under climate change:
 - Assess frequency of faults on transmission and distribution networks (overhead power-lines and underground cables)
 - Estimate how the frequency of these faults may change in the future with climate change
 - Manage impact of weather and climate on electricity network now and in the future
- Combining the knowledge of climate scientists with industry experts' understanding of thresholds and procedures



Flood management planning for London (Thames Estuary 2100 project)

- **Aim:** provide advice for the development of an adaptable tidal flood risk management plan
- **Partners:** Met Office Hadley Centre, National Oceanography Centre Liverpool and Centre for Ecology and Hydrology
- **Customer:** Environment Agency





Top-level aims:

- improved understanding and modelling of African climate
- improved ‘user-driven’ predictions, products and advice informing adaptation on monthly-seasonal-decadal timescales
- near real-time observational monitoring and attribution system
- strengthened in-country climate science capability, workshops, fellowships

Consultation: to establish climate variables for which improved prediction is a priority to guide the research and maximise its usefulness in practical prediction, resilience building and adaptation

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Summary – climate research priorities for climate services to better meet users’ needs

- Major international climate service activities underway
 - GFCS and CSP assessing user needs, defining research priorities and developing climate services
- European projects:
 - assessing user needs (EUPORIAS, JPI-Climate),
 - developing climate services (EUPORIAS),
 - determining research priorities (ECOMS)
 - and doing research (many)
- Climate Service UK:
 - help decision-makers manage risks and opportunities in UK and abroad

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