WATER SECURITY
Knowledge Exchange Programme

Specific Priority Subject 2.3 Summary Report

Supporting sustainable and resilient management of droughts

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Acronyms

WSKEP Water Security Knowledge Exchange Programme

Acknowledgement

HR Wallingford organised the event.

Summary

This report is the Summary Outcomes Report of the WSKEP Specific Priority Subject Workshop 2.3 on '**Supporting sustainable and resilient management of droughts'**. It includes an introduction reporting the key recommendations resulting from the Workshop. This document will be made available on the Programme website www.wskep.net. The full Participants Outcomes Report was distributed to all participants of the Workshop.

Disclaimer

This document reflects only the combined views participants at the Workshop.

Contents

1. Overview

This workshop on the management of droughts focused on England and Wales.

Workshop discussions led to a broad definition of drought that included household, industrial and environmental demands for water. The main outcome was identification of the need for broad inter-disciplinary research that included social and economics dimensions to understand *water resources drought*.

1.1. Introduction

Ironically the timing of this workshop in mid-April coincided with the drought declarations in several parts of the UK, and regrettably a small number of potential attendees were withdrawn by their respective organisations for operational duties regarding drought management. The consequences of the drought situation drew the attention of participants to the tactical management of drought in the UK. However the workshop also covered long-term strategic issues.

The Environment Agency plays a coordination role in dealing with droughts, as explained in its national and regional drought action plans. The UK Water plcs are required to update their drought management plans every 3 years. At the workshop concerns were expressed about the constraints to adequate management of droughts in the UK, given the increasing demand for water in London and S & E England, and the increasing probability of reduced rainfall and more prevalent drought as a result of climate change.

1.2. What is the big science issue / challenge

The main outcomes from the workshop were *firstly* to call for a broad multi-disciplinary approach to future research in the drought management theme. *Secondly*, as drought intensity, and drought prevalence, are expected to increase significantly in southern parts of the UK, there is a growing need for research into coping strategies and management approaches so that responsible organisations are able to put into place adequate plans and investments. *Thirdly*, the workshop identified that there was scope for improving the relationship between organisations such as the water plcs and the regulatory agencies such as EA/Defra.

1.3. Networks and alliances

Workshop participants appreciated the benefit of alliancing in enabling relevant actors to work together in achieving shared drought management objectives. Furthermore networking, such as this workshop, provided a continuing form of discussion to create new ideas/initiatives and encourage the development of widely relevant research objectives. Clearly the way ahead in dealing with emerging problems such as regional water resources shortage or storage planning, is either for existing networks to evolve to these new challenges or for new networks to form.

There are many programmes and projects on different aspects of drought and drought management already underway. Examples of initiatives that should be relevant to collaborative research in drought management include:-

- Belmont Forum with focus for collaborative research on freshwater security
- EC Programmes
  - ACQUEA is an industry-driven EUREKA cluster promoting innovation and technologies in the European water sector
  - WSSTP - Water Supply and Sanitation Technology Platform
  - FP7 - has its ENV call open (with submission by 16.10.2012)
  - WATEUR – for collaboration with European water organisations
- LWEC includes UKWRIP (UK Water Research and Innovation Partnership) – which has the potential to support work on common drought strategy
- DFID is preparing to implement an initiative on water security for developing countries UK Devolved Governments are providing regional support for initiatives (such as CREW and N8 in Scotland, and WURH in Wales).
- WIG (RCUK Water Interest Group) is a cross-council initiative.
- NERC will call later in 2012 the *UK Droughts & Water Scarcity Programme*. This will focus on collaborative, interdisciplinary research and stakeholder engagement, and will investigate: (i) interrelationships between environmental, socio-economic and cultural drivers of UK droughts, (ii) impacts of UK droughts, and (iii) mitigation and adaptation responses to UK droughts.

1.4. The Water Security KE Programme

The main conclusion about the WSKEP Programme drawn from this workshop was that the exercise was very successful in providing focus to a wide range of regulators, facilitators and practitioners about the research philosophy of NERC and about its research projects and programmes that are particularly relevant to drought management; it also gave a sensible opportunity for information exchange and debate, as well as enabling commentary to be provided by the potential users of future research – both NERC research and non-NERC research - upon the future conduct of research in this area.

A key outcome was the identification of socio-economic issues as a key area for future research above natural and physical issues such as hydrological research (see Prioritisation table in Section 5).

2. The workshop and report

This workshop was the sixth in a series being run on behalf of the Water Security Knowledge Exchange Programme (WSKEP) with funding from NERC. It was organized by the HR Wallingford.

Nine Priority Subjects were identified at a national consultation event held in June 2011. The theme of this workshop was '**Supporting sustainable and resilient management of droughts'**

The workshop was designed to support the following key aims:

- increase awareness and uptake of research outputs in the focus area of 'Supporting sustainable and resilient management of droughts'
- identify user needs and potential future research projects
- strengthen research/user group collaboration and networks

The workshop was divided into 4 sessions with initial presentations (available separately) as follows:

Session 1 **Setting the scene and making connections**
Introduction: Graham Leeks, CEH Wallingford

Towards a shared understanding of Priority Subject Area
Regulator's Point of View
Dr Glenn Watts, Environment Agency
Practitioner's Point of View
Dr Steven Wade, HR Wallingford

Session 2 **Making the most of current research activity**
Researcher's Point of View
Jamie Hannaford, National River Flow Archives
Introduction to Future Flows Project
Christel Prudhomme, CEH Wallingford

Session 3 **Identify areas for future research activity/collaborations**
Introduction Neil Runnalls, CEH

Session 4 **Alliances, networks and advice to the WSKEP**
Introduction Geoff Pearce, HR Wallingford

The heart of the workshop time was devoted to opportunities for participative working among the 45 delegates. This report features the outcomes from those interactions as written up by delegates during the sessions. As such this report is primarily aimed as an 'aide memoire' for participants.

Elements from this report will be used to inform further development of the Water Security KEP.

3. Towards a shared understanding of the Priority Subject Area

Table groups discussed the contextual presentation by Glen Watts (EA) and Stephen Wade (HR Wallingford).

Drought management is a live issue, although all droughts are different, and there is a need for monitoring, to improve understanding, and for practical research. Such research should cover across: multiple scales (area and time), multiple sectors (interactions), processes (evapotranspiration, catchment response), forecasting and prediction, impacts (scale and duration).

Drought research is reactive, and a larger programme of research is needed. This should cover: (i) synergies with climate change research, (ii) drought impacts, (iii) customer demands and (iv) smarter systems. Drought research needs to strongly involve "decision makers" from the bottom up; for instance the UKWIR research model has been successful in developing practical tools, but water company funding alone is not sufficient to develop the more advanced tools needed to shift towards a "resilience approach".

The Table Groups noted key insights and issues, supported by a brief narrative, that enriched the Drought Management Priority Subject Area, as follows:

Ref	Insight/issue
3.1	Changing nature of droughts?
3.2	What drought event do we plan for?
3.3	Role of public perception/attitudes
3.4	Take a long term view, but build resilience now
3.5	Short and long term health? (Health & social impacts)
3.6	Is the evidence base for environmental and economic impact sufficiency robust?
3.7	Achieving equity and fairness in a time of constraint across all sectors and communicated effectively to all
3.8	Preparedness: enough information to enable required responses
3.9	Over reliance on 1976 as a benchmark
3.10	Non-stationarity in supply & demand
3.11	Data availability/ accessibility inhibits progress & sharing
3.12	Improved communication/public engagement

4. Making the most of current research activity

This session gave participants the opportunity to learn more about current research programmes and to make new connections to add value to research taking place. Jamie Hannaford, National River Flow Archives, gave an overview of research projects. Christel Prudhomme, CEH introduced the NERC Future Flows and Groundwater Levels Project.

An overview of current UK drought research focused on how drought situations are presently monitored, how droughts have different identities, the use of drought catalogues to portray drought history, and the work on spatial coherence in understanding drought across Europe. Work on drought drivers and drought modelling has been a large part of recent research. Research gaps include development of relevant drought indicators, how to characterise severity and impacts of droughts, how to improve drought forecasting and early warning systems.

The Future Flows Project is the first national transient projections of river flow and groundwater levels time series to take account of climate change uncertainty and natural climate variability. The outputs will enable projections to be compared for different sites.

Individuals then gave a short introduction to research work they were involved with. Other participants had the opportunity to connect with programmes that interested them. Comments were captured, and participants logged their interest. 84 connections were noted across 11 research programmes.

5. Identify areas for future research activity / collaborations

Neil Runnalls CEH Wallingford gave an introduction to funding programmes in this area of work. Due to the increasing political profile of water, new initiatives for research and development relevant to drought management are available at the international, European, British, regional and industry levels.

Through table group discussions, individuals were invited to identify key propositions where further research/activity could be of value in taking forward this Priority Subject Area. Fourteen propositions were developed. These were roughly grouped in common themes by participants and discussed, as follows:

Ref	Propositions for further research / activity
5.1	Characterisation of drought
5.2	Information on the extent/frequency/severity of future multi-year droughts, under climate change
5.3	Long term impacts of drought; is it always bad?

5.4	How resilient are ecosystems to drought – are there thresholds? What are the implications for licensing/ drought management
5.5	Best methods for communications and education of status and impact of droughts
5.6	Socio-economic dimensions of drought? E.g. communicating drought, public perceptions, “so what?” behavioural responses.
5.7	Social, economic and health impacts
5.8	How can this be used to reduce water consumption and reconnect communities with the water environment
5.9	Changing attitudes and values in water use
5.10	Understanding dry weather causes in order to predict drought
5.11	Sustainability of management measures
5.12	Change the “levels of service” indicator, what else can we use?
5.13	Improve rainfall to recharge for groundwater systems

Prioritisation

Following the discussion, delegates were given 3 sticky dots to indicate the three propositions they believed should be given priority consideration.

The table below shows the results of this prioritisation:

Ref	Proposition	Dots	Position
5.5	Best methods for communications and education of status and impact of droughts	21	1
5.6	Socio-economic dimensions of drought? E.g. communicating drought, public perceptions, “so what?” behavioural responses.		
5.7	Social, economic and health impacts		
5.8	How can this be used to reduce water consumption and reconnect communities with the water environment		
5.9	Changing attitudes and values in water use.		
5.1	Characterisation of drought	17	2
5.2	Information on the extent/frequency/severity of future multi-year droughts, under climate change		
5.3	Long term impacts of drought; is it always bad?		

5.4	How resilient are ecosystems to drought – are there thresholds? What are the implications for licensing/ drought management	16	3
5.14	Improve rainfall to recharge for groundwater systems.	11	4
5.10	Understanding dry weather causes in order to predict drought	10	5
5.11	Sustainability of management measures		
5.12	Change the “levels of service” indicator, what else can we use?		
5.13	What are the barriers to trading/transferring water and how can they be overcome?		

6. Improving alliances and networks

Geoff Pearce, HR Wallingford gave an overview of alliances and network approaches that help foster research and practice in this area. Different types of networks can be identified (member-driven, fund-driven, over-arching and international network) that provide various fora for idea creation and development. The presentation introduced the range of networks and alliances currently in progress.

Delegates, in table groups, were then invited to make suggestions for steps to further improve communication and networking, as follows:

Ref	**Suggestions to improve networks/communication**
6.1	Networks/ alliances: opportunities good but… access to major funding streams for consultation is limited
6.2	Establish permanent intersectional online forum and research depository
6.3	Interaction with all research councils beyond NERC. Involve other research councils to ensure science and social ideas are picked up
6.4	Framework for short-term exchanges/placements between universities, agencies and governments
6.5	Publication in relevant outlets for water industry, not necessarily just journals
6.6	Improve awareness of research outputs, link differing research groups eg. NERC - UKWIP
6.7	More involvement of practitioners (consultants, water companies etc) in research teams to encourage practical outputs (via KT funds, subcons etc.)

7. How do we maximise the value of the Water Security KEP?

Table groups were invited to suggest ways to maximise the value of the Water Security Knowledge Exchange programme, as follows:

Ref	Insights for WSKEP
7.1	Funding support for users not just researchers for workshop attendance etc.
7.2	Continuation in network over three years
7.3	Data sharing – improve access? National data sets?
7.4	WSKEP to deliver better links between NERC and practical user outputs
7.5	Channel funds into UKWIR
7.6	Learning from international case studies
7.7	A big idea for the WSKEP

End