# **About Drought**

# About Drought Download

The Royal Society, 6-9 Carlton House Terrace, London SW1Y 5AG 7 November 2019

The RCUK Drought & Water Scarcity programme presents the About Drought Download, bringing together the interdisciplinary UK Droughts & Water Scarcity research programme.



www.AboutDrought.info



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Delegate Pack











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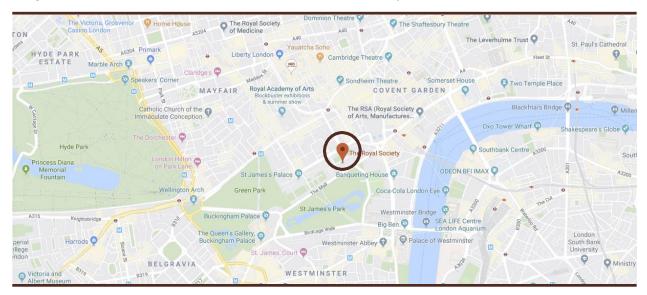
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# **Useful Information**

#### **V**enue

The Royal Society is located between Trafalgar Square and St. James's Park on 6 - 9 Carlton House Terrace, London, SWIY 5AG. The conference takes place throughout the ground floor, starting in the Wellcome Trust Lecture Theatre.

Registration and refreshments are available from 9.30am in the City of London Room I and Marble Hall.



### **Transport**

### Public Transport Links

Nearest Underground stations: Charing Cross and Piccadilly Circus

Bus routes: 12, 13, 15 and 453.

Coach station: Connections from Victoria coach

station

### Car and Coach Parking

The Royal Society is located within the congestion charge zone. On-street parking on Carlton House Terrace and Waterloo Place is available for up to four hours and Westminster City Council's Trafalgar Square car park is also close by.

### **Bicycle Parking**

There are cycle racks along Carlton House Terrace on either side of the Duke of York monument.

#### Accessibility

There are four steps from street level to the doorway. There is a wheelchair lift at the entrance which is operable by Reception staff. Please use the buzzer to the right of the entrance steps.

#### Food & Drink

Please bring your water bottle and re-usable cup to help minimize waste! Refreshments will be served at registration and during breaks. Lunch is buffet style, in the City of London Room I and Marble Hall. If you are unsure if something is suitable, the catering staff will be happy to advise.

Everyone is invited to the drinks reception at the end of the day from 15.45 to 17.00.

#### **Medical Advice**

For First Aid assistance please dial 8888.

In the UK non-emergency medical attention can be sought by calling 111, the NHS helpline. If you have an emergency, call 999.

The nearest Accident & Emergency Unit (A&E) is at St Thomas' Hospital, Lambeth, London SEI 7EQ.

#### Fire Alarm

In the event of a fire alarm sounding (a continuous alarm), please vacate the building via the marked nearest fire exit sign (please note that may be behind you). Do not stop to collect your belongings, do not use lifts, and do not re-enter the building until authorised.

# Welcome

Welcome to the About Drought Download and thank you to all the delegates and exhibitors in attendance. Around 150 people representing a very broad range of interests and expertise join us to connect with this truly interdisciplinary research initiative, the Drought & Water Scarcity Programme



In this e-delegate pack you will find information which illustrates the diverse, interdisciplinary and cross-sectoral content of About Drought and gives a valuable insight into drought and water scarcity.

We would like to thank all our speakers and exhibitors who are sharing their expertise and all the delegates for your questions, comments and opinions which will feed into the future of drought research in the UK.



Our thanks to Thames Water for supplying water-saving gadgets for delegates. Pick yours up at the Water Saving Pledge Photo Booth in City of London Room 3.

Remember to pick up a copy of the About Drought Handbook at the About Drought booth in the Wellcome Trust Lecture Theatre. The handbook draws together the key outputs and outcomes of the programme and it also features a series of interviews with our leading stakeholders, which highlight how successfully we have met our objectives to produce cutting-edge science that has made a demonstrable impact on how decision-makers manage water scarcity in the UK.



Find out more on our website <a href="www.aboutdrought.info">www.aboutdrought.info</a> and view About Drought videos on <a href="YouTube">YouTube</a> or listen to our fascinating podcasts of memories of UK droughts on <a href="SoundCloud">SoundCloud</a>.











# Introduction from Sir Mark Walport

**UK Research & Innovation, Chief Executive** 

This meeting marks the successful culmination of an ambitious five-year interdisciplinary research programme, coordinated across five research councils.

Water is an essential resource, relied upon by all areas of society. But it is also a finite resource, and multiple increasing pressures on freshwater availability and security pose mounting challenges for sustainable water management in the UK. Effective decision-making around management relies heavily on accurate predictions of water scarcity and a good understanding of its drivers and impacts. It is these needs that the UK Droughts and Water Scarcity programme was address. The programme has successfully brought together world-leading



scientists on the topic of drought across multiple disciplines, who have worked in close collaboration with end-users to investigate the interrelationships between the multiple drivers of drought and its impacts on communities, public infrastructure, industry, and the UK economy more widely. This has provided improved data on drought, teasing out key indicators for early warning and identifying the earliest opportunities to mitigate the impacts of drought to help build resilience in the UK. By focusing on research synthesis, impact generation and stakeholder engagement, the UK Droughts and Water Scarcity programme has also identified the most effective routes for communicating about drought, water scarcity and impact mitigation, helping to ensure that the right information gets to the right people in the right format at the right time.

UKRI's mission is to push the frontiers of human knowledge and understanding to deliver economic impact and support society to become more resilient, sustainable and healthier. The Droughts and Water Scarcity programme is clearly helping to deliver this mission, and I would like to thank the many researchers who have contributed to this programme for their hard work. I would also like to thank the many stakeholders who have supported the programme – your contribution has been integral to its success and I would like to encourage you to continue to engage with the research community so we can build on the outputs of this programme to mitigate the impacts of droughts and water scarcity on the UK.

# About Drought Download 7 Nov, 2019 Royal Society London

# **Programme**

110614111110			
9.30 – 9.55	Registration and Coffee		
10.00-10.45	Welcome and Opening Remarks in the Wellcome Trus Sir Mark Walport, Chief Executive, UKRI Jamie Hannaford, Centre for Ecology & Hydrology Meyrick Gough, Water Resources South East Launch of the About Drought Handbook & Website	t Lecture Hall	
10.45-11.40	A walkthrough About Drought's decision support products. Flash talks leading to a Data Clinic in the Wellcome Trust Lecture Hall  First showing at the Drought Cinema Hall in the		
11.30-12.45	Marble Hall, including the Drought Myth-busting videos  Abstraction & Environmental Flows Panel Event in the Kohn Centre	Exhibits In City of London Rooms I, 2, 3 & the Wellcome Trust Lecture Hall	
12.30-14.30	Lunch Service in City of London 1 and Marble Hall		
12.30-13.30	Explore, learn and enjoy yourself, as <b>Drought doesn't</b> have to be dry  12.45-13.30 <b>Drought Walk</b> leaves at 12.45 from Registration Desk		
	12.30-13.00 <b>Drought Forecasting Game</b> in City of London 1	Including the Water Saving Pledge Booth in	
	13.00-13.30 <b>Singing Water Stories In the UK</b> in the Wellcome Trust Lecture Hall	City of London 3	
13.30-14.45	Breaking News: Quick fire talks in the Wellcome Trust Lecture Hall	and  About Drought  Podcasts in the	
	Final showing at the <b>Drought Cinema Hall</b> in the Marble Hall	Wellcome Trust Hall	
14.30-15.30	Reframing the discourse around drought and water scarcity Panel Event in the Kohn Centre		
15.30-15.45	Closing Addresses		
15.45-17.00	Networking		



# **Data Clinics**

10.45 - 11.40

### Wellcome Trust Lecture Theatre

### Developments in Seasonal Hydrological Forecasting

### Ali Rudd & Katie Smith

Hydrological forecasts, combined with information on current conditions, are critical for proactive water resources management. New products focussing on how dry the ground is and estimates of when conditions will return to normal, as well as innovative new modelling and presentation of hydrological forecasts, have been developed as part of the UK Drought & Water Scarcity Programme. Come along and explore the developments at the seasonal hydrological forecasting data clinic.

### Data and Modelling for Long-Term Water Resources Planning

### Simon Parry & Gemma Coxon

The future of long-term planning will require state-of-the-art datasets and modelling approaches to address the key questions facing the water industry. Participants will be able to explore past and future drought events through the Drought Libraries demonstrator tool, enhancing understanding of drought variability with the potential to provide nationally-consistent stress testing of water supply systems. Participants can also explore results from the hydrological model intercomparison comparing to better understand how well different models can simulate drought behaviour and to guide future hydrological modelling for water resources planning.

# D-Risk: a planning tool to manage irrigation abstraction and drought risks lan Holman

Water resources for irrigated agriculture and horticulture are under intense pressure. Farm business models need to align cropping programmes to water availability. We will demonstrate D-Risk – an interactive, free, user friendly webtool specifically designed to help you quickly understand your business and drought abstraction risk and thereby support robust decision making for future investment in irrigation infrastructure.

### **DRY** Utility

### Lindsey McEwen & Antonia Liguori

DRY's research has had a strong focus on communications and storytelling, and its 'data' covers a wealth of information. It has a river catchment-based focus, working in seven case-study river catchment areas in England, Wales and Scotland, to reflect different hydrological, socio-economic and cultural gradients in the UK, and to capture local knowledge on drought, water scarcity and water behaviours. DRY Utility is a living archive or bank of resources curated as a result. Come over to explore this novel dataset at our data clinic table.

### Drought data access and visualisation

### Matt Fry

We will demonstrate a number of tools that have been developed within the programme to improve access to datasets. The UK Water Resources Portal provides access to real time river flow status, including standardised drought indicators. The Drought Data Hub enables users to visualise datasets (e.g. modelled river flow and soil moisture under climate change) and to identify and download specific subsets of interest e.g. all model runs for a specific location, or catchment average data for a user defined area.



# About Drought Booth - from numbers to narrative

Sally Stevens, Rebecca Pearce, Sunita Sarkar & Steve Turner

### Wellcome Trust Lecture Hall

Meet the About Drought team and collect your copy of the About Drought Handbook. Hear what it was like to live through drought from the people who were there on our podcasts, take in the dramatic experiences of firefighters battling wildfires in the UK and break down the misconceptions about water shortage and drought in the UK, featuring people on the frontline of its impacts today.



# Drought Risk & You

### Sarah Bunney & Andrew Holmes

### City of London I

This stand will showcase some of the processes and outputs from the DRY (Drought Risk and You) project including guidance on drought risk communication, DRY's work with cartooning and animation as engagement tools, public engagement materials for the DRY catchments, and audio-visual resources generated by the DRY project. It will also explain the rationale for the development of the DRY Utility.

### **IMPETUS**

### Len Shaffrey

### City of London I

The IMPETUS project brought together scientists from the meteorological, land surface, surface water and groundwater communities and social scientists from the water demand and forecast usability communities. The project aimed to improve the forecasting of UK drought on monthly to decadal timescales, by improving meteorological, hydrological and water demand forecasts and how they are combined to produce drought forecasts. This was done in conjunction with stakeholders to ensure that drought forecasts are relevant for decision making.



# Monitoring & Early Warning Lucy Barker, Ali Rudd & Katie Smith

City of London I

Appropriate drought monitoring tools and forecast information are crucial components of proactive drought management. Improvements to both drought monitoring and drought forecasting in the UK have been made in the UK Drought & Water Scarcity Programme. Find out more about the new, interactive, real-time UK Water Resources Portal, GB Relative Dryness maps and developments in seasonal Ensemble Streamflow Prediction forecast methods and applications.

### Historic Droughts

# Jamie Hannaford, Mason Durant & Mark McCarthy

### City of London I

At this stand, we will be showcasing some of the science outputs from the Historic Droughts project, with a focus on our efforts to improve our understanding of past variability in UK droughts and water scarcity episodes. We will discuss the value of historical data rescue and recovery and demonstrate how this has been used to drive hydrological models to reconstruct past river flow and groundwater droughts back to the 1890s. We will also demonstrate how the outcomes have been used to develop a range of tools to help support drought planning and management, as well as resources for public engagement.

# Drought & Groundwater

# John Bloomfield, Matt Ascott, Chris Jackson & Emily Crane

### City of London I

Groundwater resources provide resilience in water supply and maintain flows to ecologically important rivers and wetlands during times of water stress. However, they can also be susceptible to drought. Come and talk with researchers from the British Geological Survey to find out more about groundwater-related data and services for better drought planning and management.



# Drought & Agriculture

### Michael Horswell

### City of London 2

Researchers from the Agriculture work stream will be available to discuss specific outputs of the work stream, including various reports (Synthesis Report, Water Strategy for Agriculture, Impact of Drought on Agricultural and Horticultural crops), the D-Risk tool and the Agricultural Drought Impact Explorer.

### **Drought & Environment**

### Nevil Quinn

### City of London 2

Researchers from the Environment work stream will be available to discuss specific outputs of the work stream, including the 5 habitat-based Report Cards and datasets showing the impact of future climates on woodland species. We will also illustrate how About Drought data is informing other catchment-based climate resilience projects.

# Simulating a simulation - water model in sand box

### Andrew McKenzie

### City of London 3

Understanding the interrelationships between different components of the water cycle - precipitation, soil, runoff and aquifers - is key to understanding how droughts propagate through the environment. Often we use digital models to understand these relationships, but a simple physical model of the environment can be used for a vivid illustration of how rivers can be sustained during droughts by baseflow from aquifers, and how abstraction impacts both aquifer levels and river flows.

### **Educational Resources**

### Sara Williams

### City of London 3

This stand will showcase two sets of educational resources for different ages of students: (I) new book DRY: Diary of a Water Superhero, with the accompanying notes for Teachers, aimed at Key Stage 2; (2) one of six sessions on UK Drought being designed collaboratively with the Geographical Association, aimed at GCSE level.



# Water pledge photo booth

# Rachel Mayes

### City of London 3

The essential photo opportunity at the About Drought Download for your online posts. Demonstrate your commitment to tackling drought and water scarcity in the UK by making your water-saving pledge, feel free to grab a prop and take a snap to post on Instagram, Facebook and Twitter using #DroughtDownload. Pick up your free water-saving gadget courtesy of Thames Water as your reward!

### Data Bar

### Matt Fry

### City of London 3

Come along to our Data Bar where you will be able to get hands on with the tools and data created throughout the UK Drought & Water Scarcity Programme. A number of laptops are available for self guided exploration and the programme team will also be on hand to assist and explain.

### Cinema

### Marble Hall

Screening at the About Drought Cinema today!

#### Lamaload A/V, Mark Pilkington:

An audio-visual composition addressing the acoustic ecology of a rural setting. The presence of the Lamaload dam in the Peak District National Park, UK offers an audio-visual experience. Its unique architectural form provides an acoustic screen that magnifies and reflects the sounds of the surrounding area. Photographic and computer generated graphic images of the dam and surrounding area are directly animated by natural and human-made sounds. The result is a reconstruction of spatial-imaginings that critically engage in meaningful ways. Composed at the Thought Universe electronic music studio, Manchester, 2017.

### Drought Myth-Busting Videos:

Make time to catch our short, informative myth-busting videos that bring our research to life for all audiences. If you want to broadcast them to reach your audiences, please contact the Project Office on <a href="mailto:info@aboutdrought.info">info@aboutdrought.info</a>.



# **Lunchtime Events**

# Drought walk – Water efficiency in the public sector

### Kevin Grecksch & Bettina Lange

### Meet at 12.45 at the Registration Desk

Join us on a lunchtime walk through St. James's Park, learn about its water features and function and join us to talk about water efficiency in the work place. During the walk we would like to introduce you to our Primer document on "Water efficiency in the public sector. The role of social norms". The Primer discusses social norms, such as community standards, as an instrument to instigate more efficient water saving behaviour in organisations with a public dimension – universities, schools, hospitals, council buildings and large corporate employers. We would like you to share with us your thoughts, ideas and experiences about social norms and water efficiency in large organisations in an informal and energising format.

Sign up at the About Drought Booth throughout the morning.

# Drought Forecasting Game Len Shaffrey

12.30-13.00 in City of London I

Come along and try your hand at drought forecasting... Not as easy as it sounds, this game gives you insight into this complex subject area in a fun and interactive manner!



# Singing Water Stories In the UK

# Antonia Liguori & Sharron Krause

13.00-13.30 in Wellcome Trust Lecture Hall

This session will explore how storytelling and songwriting can work together to connect individual stories to community narratives, to bridge expert and lay knowledges and to understand how personally meaningful stories can simultaneously have a social impact.

It will draw on micro narratives, digital stories and oral histories collected through the Research Councils UK 'Drought Risk and You' (DRY) project and include two songs composed to reflect on and encapsulate these stories.



# **Panel Events**

### 11.30 - 12.45 Kohn Centre

### Abstraction & Environment Flows

### Chair: Mike Acreman & François Edwards



Do droughts damage river ecosystems and their recovery? Is there a need to balance abstraction needs versus environmental flows during drought? If so, what are the strategies to optimise abstraction to maintain supply and minimise negative environmental impacts? These are some of the key questions that we will be discussing at this panel session.

Our panel which compromises of users and co-authors of research who are directly involved in this critical and timely debate, will include short pitches and on the topic of environment flows during drought. The pitches will be followed by an opportunity for questions from the audience and a plenary discussion.



Dr Francois Edwards is Lead River Ecologist at the Centre for Ecology & Hydrology, and is based in the Wallingford campus. He has over 20 years' experience in aquatic ecology in the academic, consultancy and government sectors. He specialises in all aspects of biomonitoring freshwater habitats (water quality, habitat quality, ecosystem health) and is an in-house expert on river restoration, conservation and management. Francois was task lead for the Environment Workstream in ENDOWS.



Prof Michael (Mike) Acreman, is a CEH Fellow, based in Wallingford. He has over 35 years' research experience at the interface of hydrology and freshwater ecology. His specialist interests include hydro-ecological processes in wetlands and definition of ecological flow requirements of rivers, particularly at extremes of floods and droughts. He formed Hydro-Ecology Consulting in 2006, and through which he continues to undertake consultancy work.



Ben Piper, is Consultant at Atkins, Water and Environment and has more than 45 years' experience of water resources planning and management issues, which includes drought and water supply planning in South East England (including successful delivery of three WRMPs), water demand forecasts and water resource investment strategies in the UK and overseas and strategic advice to regulators and government departments.



Dr David Mould is Principal Hydrologist at the Canal & River Trust, responsible for water resources management for the northern half of the Trust's network. He leads the water resources modelling for the whole network, as well as managing volunteer engagement for the team.



Michael J Dunbar, Senior Advisor (Hydroecology) for the Environment Agency, is an experienced environmental flows practitioner, who specialises in quantitative understanding of the impacts of water abstraction, impoundment and drought on river ecosystems, and how these effects are mediated by other environmental pressures, including habitat modification and land management.



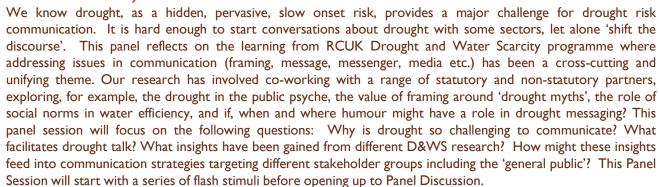
Caroline Howarth, is an experienced freshwater ecologist with the Environment Agency as well as having experience of the drought planning process. Currently team leader of the Environment Agency's National Hydroecology Team and specialising in environmental assessment in water company drought planning.

# **Panel Events**

### 14.30 - 15.30 Kohn Centre

# Reframing the discourse around drought and water scarcity

# Chair: Lindsey McEwen





Professor Lindsey McEwen is Professor in Environmental Management and Director for the Centre for Water, Communities and Resilience at UWE Bristol. Her research interests include: extreme weather histories/archives, water risk management, integration of specialist and lay knowledge to support local risk decision-making; water science communication/education and community-based research. She is Pl for the DRY project and lead for 'Community' and 'Business' workstreams in ENDOWS.



Dr Emma Weitkamp is co-Director of the Science Communication Unit at UWE Bristol. Her research interests broadly address issues in science communication, with a particular interest in the intersection between environmental science, journalism and narrative approaches to communication. In DRY, her focus has been to understand the ways in which stakeholders conceptualise the challenges of communication about drought risk with public groups.



Dr Kevin Grecksch is a British Academy Postdoctoral Fellow based at the University of Oxford's Centre for Socio-Legal Studies. He has been involved in the MaRIUS and ENDOWS projects, working on drought and water scarcity management and water efficiency in the public sector. Kevin has a background in ecological economics, politics and English literature.



Dr Antonia Liguori is a Lecturer in Applied Storytelling at Loughborough University. She is involved in a variety of research projects to develop tools to foster innovation in education; to explore the role of storytelling in today's digital world; to apply digital storytelling as a participatory methodology for interdisciplinary research.



Dr Bettina Lange is an Associate Professor in Law and Regulation, based in the Centre for Socio-Legal Studies, Faculty of Law, University of Oxford. She is interested in socio-legal approaches to understanding environmental regulation, including the mobilization of various environmental science knowledges for regulatory decision-taking in relation to water resources.



Victoria Williams is Water resources senior adviser, Environment Agency. Since 2012, Victoria has been at the forefront of managing dry weather incidents, leading the work on Environment Agency (EA) drought incident planning and ensuring strategic management of drought through the National Drought Group.



Michael Wilson is Professor of Drama and Head of Creative Arts at Loughborough University, where he leads a research team in Applied Storytelling. Over the past fifteen years he has led numerous RCUK/UKRI cross-council and European Commission projects that explore the application of storytelling to a variety of social and policy contexts, especially around environmental policy, health, education and social justice.

# **Breaking News**

# Chair: John Bloomfield

Breaking News! Quick fire talks – each speaker will have five minutes to describe their innovative outputs and discuss critical and timely topics about drought. There will be time at the end for further discussions. Come down and listen, in the Wellcome Trust Lecture Theatre.



Launch of ecosystem drought report cards François Edwards

What's the Outlook for 2020 – Part I, DWS programme monitoring and forecasting products

Jamie Hannaford, Len Shaffrey & Katie Smith

What's the Outlook for 2020 – Part 2, Drought prospects from the Environment Agency

Victoria Williams

Drought tracking in chalk streams Simon Parry

Drought impacts of river ecosystems Cedric Laize

Why catchments matter, also for "bubble permitting" Bettina Lange

Coping with drought and water scarcity: lessons for the agricultural sector lan Holman

A water strategy for UK agriculture and horticulture: Increasing the farming sector's resilience to drought and water scarcity risks

Jerry Knox

National Framework & Water Resource Planning Jamie Hannaford

# UK Drought & Water Scarcity Programme

Droughts and water scarcity jointly pose a substantial threat to the environment, agriculture, infrastructure, society and culture in the UK, yet our ability to characterise and predict their occurrence, duration and intensity, as well as minimise their impacts, is often inadequate.

The UK Droughts & Water Scarcity research programme is a five-year interdisciplinary, £12 million+ NERC programme in collaboration with ESRC, EPSRC, BBSRC and AHRC. It is supporting improved decision-making in relation to droughts and water scarcity by providing research that identifies, predicts and responds to the inter-relationships between their multiple drivers and impacts.

The programme's research is UK-focused, and contributes to NERC's natural hazards and climate system strategic science themes.

Four projects are funded under the UK Droughts & Water Scarcity programme:

### Historic Droughts



Understanding past drought episodes to develop improved tools for the future

### **IMPETUS**



Improving predictions of drought to inform user decisions

#### **MaRIUS**



Managing the risks, impacts and uncertainties of drought and water scarcity

### DRY



Bringing together stories and science to support better decisionmaking for drought risk management

The final project, ENDOWS, (known as About Drought) engages with stakeholders, practitioners and the public to involve them in the UK Drought and Water Scarcity programme and to disseminate information about the findings, outputs and datasets from the programme that everyone can use.

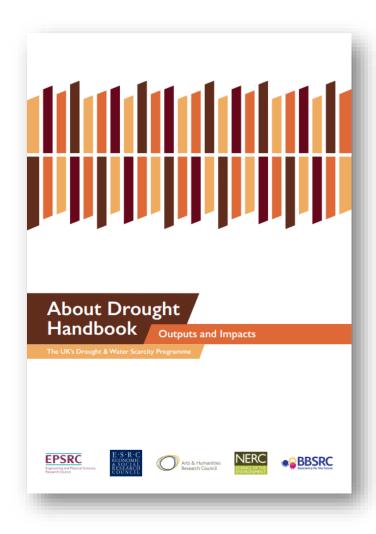


### **PHOTOGRAPHY**

Please note that photography and filming may be taking place throughout the event which may be used on social media, on project websites, in our publications and in other promotional material in future. If you do not wish to appear please inform the photographer and videographer.

# Find out more about the Drought & Water Scarcity Programme

Pick up your copy of the About Drought Handbook:
Outcomes and Impacts from the About Drought Booth in
the Wellcome Trust Lecture Theatre



# **Download About Drought Briefing Notes & Leaflets**

### Briefing notes:





How to plan and manage water resources for public water supply: future directions





Which farming areas of England and Wales are most at risk from economic losses due to drought?

### Leaflets:





Economic impacts of regulatory drought management on irrigated agriculture





Securing a fair share of water: a strategy for agriculture and horticulture





Crop response to a changing climate





**Drought Monitoring & Forecasting** 





D-Risk: helping irrigators manage drought risk

### Using your phone to scan a QR code

If you already have a QR app on your phone, simply hold the screen over the code(s) to be taken to the document(s). You can download a scanner from your app store.

You can also access the document(s) using the hyperlinks.

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