ABSTRACTS AND BIOGRAPHIES
The Role for Climate Services in Handling Climate Change Risk: Contributions of UKCP18

Introduction to Climate Services and Handling Climate Risk
Prof Sir Brian Hoskins CBE Hon FRMetS, University of Reading and Grantham Institute

ABSTRACT | A historical perspective on Climate Services and handling climate risk will be given. Various approaches for the decadal to century time-scale will be discussed.

BIOGRAPHY | Sir Brian was the Founding Director of the Grantham Institute for Climate Change and is now its Chair. He has been a Professor in Meteorology at the University of Reading for many years and now holds a part-time post. He has also just finished 10 years as a Member of the UK Committee on Climate Change. He is a member of the scientific academies of the UK, USA and China.

What do Policymakers need from Climate Projections?
Baroness Brown (Julia King), Chair of Adaptation Committee of CCC

ABSTRACT | Baroness Brown chairs the Adaptation Committee of the Committee on Climate Change. The CCC is required under the Climate Change Act to give advice to the government on climate change risks and opportunities, through the UK Climate Change Risk Assessment. The CCC produced an independent Evidence Report for the CCRA, at the request of the government, in 2016, and will do so again in 2021. UKCP18 has been developed on a timescale to allow the results to be fed into the upcoming assessment. Baroness Brown will discuss the CCC's role in the assessment and plans for making use of UKCP18. She will also touch on the Adaptation Committee's analysis of what policy makers need to do to set in place effective adaptation policies and actions, and how climate projections can feed into this.

BIOGRAPHY | Baroness Brown of Cambridge DBE FREng FRS (Julia King) is an engineer, with a career spanning senior engineering and leadership roles in industry and academia. She currently serves as Chair of the CCC's Adaptation Committee; non-executive director of the Offshore Renewable Energy Catapult; and Chair of the Carbon Trust. She was non-executive director of the Green Investment Bank, and led the King Review on decarbonising transport (2008). She is currently supporting the UK offshore wind sector as Sector Champion for the development of the Sector Deal as part of the Government's Industrial Strategy. She is a Fellow of the Royal Academy of Engineering and of the Royal Society, and was awarded DBE for services to higher education and technology. She is a crossbench Peer and a member of the House of Lords European Union Select Committee.

An Overview of UKCP18
Prof Jason Lowe, Met Office Hadley Centre and UKCP18 Project team

ABSTRACT | UKCP18 provides a new set of observational data and climate model projections, produced in partnership by the Met Office, the Environment Agency and Defra. The projections launched in November 2018 consisted of updated probabilistic estimates of future change and global and regional climate model realizations at 60km and 12km, respectively. Alongside the data are a range of guidance materials including science reports, headline messages and pre-prepared maps. A user interface allows the tailoring of model outputs, or raw data can be extracted from the data catalogue. This talk will provide an overview of the UKCP18 products and key messages for the future projected climate of the UK. Further UKCP18 products will be launched later this year.

BIOGRAPHY | Professor Jason Lowe is a Principal Fellow and Head of Climate Services in the Met Office Hadley Centre. He is also Chair of Interdisciplinary Climate Research in the Priestley Centre at the University of Leeds. He has spent considerable time developing and communicating policy relevant science, including having a large involvement in designing several of the Met Office Hadley Centre Climate Programmes. This includes establishing the knowledge integration team and approach at the Met Office, which has regular

contact with policy makers and practices co-development approaches to ensure usability and relevance. Professor Lowe has contributed to the development of innovative and collaborative ways of producing and delivering mitigation advice and was chief scientist on the AVOID1 and AVOID2 programmes. His recent work includes leading the development of the UKCP18 projections.

What does UKCP18 say about Land and Marine Projections?

Dr Matt Palmer, Met Office Hadley Centre and UKCP18 Project team
UKCP18 Marine Projections

ABSTRACT | The UKCP18 Marine Projections are focussed on the drivers of changes in future coastal flood risk, and include projections of: mean sea level rise; storm surges; waves; and tides. We find that mean sea level rise is the dominant factor for changes in coastal flood risk over the 21st Century, with surge and wave changes contributing up to about 10% of this signal. The ongoing effects of glacial isostatic adjustment (also referred to as post-glacial re-bound) and the spatial fingerprint associated with ice loss from Greenland result in a north-south gradient in projected sea level rise, with the largest values in the south of the UK. A novel aspect of UKCP18 is the provision of exploratory projections of sea level rise that extend to 2300. These extended projections show that sea level rise will continue under all emissions scenarios for several centuries. The magnitude of future sea level rise depends strongly on emissions scenario and the largest values are likely to result in substantial changes in tides around the UK. Future ice mass loss from Antarctica remains a key uncertainty, particularly for multi-century projections.

BIOGRAPHY | Dr Matt Palmer is the lead scientist for sea level research at the Met Office Hadley Centre. His work is focussed on understanding the ocean's role in the climate system and developing global and regional sea level projections. He recently led the marine projections for the UKCP18 project and is a lead author on the forthcoming Intergovernmental Panel on Climate Change 6th Assessment Report (IPCC AR6) of Working Group 1. Matt is co-chair of the International Quality controlled Ocean Database initiative (www.iquod.org) and a member of the Ocean Observations Panel for Climate (http://www.goosocean.org/physicsclimate).

James Murphy, Met Office Hadley Centre and UKCP18 Project team
UKCP18 Land Projections

ABSTRACT | UKCP18 includes the largest package of land projections delivered in a set of UK climate scenarios to date. The products were designed to exploit recent developments in climate modelling capability, and to respond to user requirements for more (or different types of) information, based on feedback from usage of the previous UKCP09 scenarios. UKCP18 retains the broad view on uncertainties that was provided by UKCP09, via an updated set of probabilistic projections. These are augmented by new sets of global and regional projections. These are provided as time series of climate model output, that provide flexible dataset for analysis of UK and international impacts, understanding of drivers of regional changes and development of climate change "storylines". All three strands of UKCP18 contribute to an enhanced focus on how climate variability and extreme events will be experienced in a warming world. A brief summary of the projections will be presented, including discussion of the main purposes, strengths and limitations of each strand.

BIOGRAPHY | James has spent his Met Office career developing and evaluating climate model projections on various time scales. Initially this involved dynamical extended-range forecasting to a month ahead, moving subsequently to initialised decadal predictions and multidecadal climate change projections. Understanding and quantifying uncertainties has been a particular focus during the past 15 years, leading to involvement in IPCC, the development of UK climate scenarios, and national climate change risk assessments.

Comparing Different Approaches for Tackling Climate Risk

Dr Fiona Harrison (Chair), Defra

BIOGRAPHY | Fiona is currently Deputy Director for Climate Adaptation & Forestry policy at Defra and has worked in a variety of mainly science-related posts across Whitehall. Before joining the Civil Service, Fiona was part of the senior management team at an internet startup. She spent four years as a Postdoctoral Fellow at the University of Auckland where her research focused on foundations of quantum theory and theoretical understanding of new experimental work in quantum measurement. She holds a DPhil in quantum theory from St Andrews and an MA in Physics and Philosophy from Oxford.

Prof Nick Pidgeon, Understanding Risk Research Group, Cardiff University

ABSTRACT | A major challenge facing climate scientists will be that of communicating to non-specialists the risks and uncertainties surrounding potential changes over the coming years, decades and centuries. This climate communication faces particular challenges as assessments of climate-related changes confront uncertainty more explicitly and adopt risk-based approaches to evaluating impacts. In my contribution I identify some of the communications science that will be needed to meet this challenge and argue for the ambitious, interdisciplinary initiative that its effective application to climate science and the UKCP18 scenarios requires.

BIOGRAPHY | Nick is Director of the [Understanding Risk Research Group](#) at Cardiff University and Professor of Environmental Risk. His research looks at public engagement, communication of, and decision-making for environmental and energy technology risks, including climate risk. Nick chaired the 2006 Cross-Party Parliamentary inquiry 'Is a Cross-Party Consensus on Climate Change Possible – or Desirable?' which recommended the setting up of the UK Climate Change Committee. He has been a science advisor to both DECC and DEFRA, and currently to DfT. He was awarded an MBE in the 2014 Queen's Birthday Honours for services to climate change awareness and energy security policy.

Prof Jason Lowe, Met Office

BIOGRAPHY | Professor Jason Lowe is a Principal Fellow and Head of Climate Services in the Met Office Hadley Centre. He is also Chair of Interdisciplinary Climate Research in the Priestley Centre at the University of Leeds. He has spent considerable time developing and communicating policy relevant science, including having a large involvement in designing several of the Met Office Hadley Centre Climate Programmes. This includes establishing the knowledge integration team and approach at the Met Office, which has regular contact with policy makers and practices co-development approaches to ensure usability and relevance. Professor Lowe has contributed to the development of innovative and collaborative ways of producing and delivering mitigation advice and was chief scientist on the AVOID1 and AVOID2 programmes. His recent work includes leading the development of the UKCP18 projections.

Prof Suraje Dessai, University of Leeds

ABSTRACT | Climate risk is generally conceptualised through a "predict then act" or "assess risk of policy" approach. This leads to different emphasis on the amount and precision of climate projection information neededto inform adaptation decisions.

BIOGRAPHY | Suraje Dessai is Professor of Climate Change Adaptation in the School of Earth and Environment at the University of Leeds. His research and teaching focuses on the management of climate change uncertainties, perception of climate risks and the science-policy interface in climate change impacts, adaptation and services. He was the recipient of a European Research Council Starting Grant (2012-17) and is the editor-in-chief of Climate Risk Management (2018-). He's a member of UK's ESRC Centre for Climate Change Economics and Policy and a Lead Author in the IPCC WG1 (The Physical Science Basis) Sixth Assessment Report.

Liz Parkes, Environment Agency

ABSTRACT | I am sure that the climate projections are an important part of the answer, but as ever it's important to understand what the question is first.

We need to better understand climate risk at a national and institutional level, but also to appreciate how it translates into impacts at a local level – within a particular place and for individual communities.

So the question for me is, who are the relevant decision makers in each case? And what is the information that they need in order to better understand and mitigate the risks that they face.

BIOGRAPHY | Liz leads a broad portfolio of work across the Environment Agency with a focus on enhancing our resilience to a changing climate. This has included support to Government's Green Finance Task Force on securing resilient investment and establishing a Climate Ready service to support public and private organisations in climate proofing their future. Liz combines extensive regulatory experience with the ability to

think creatively and strategically about the future and to engage others in that journey. Liz works closely with Defra and BEIS on climate adaptation and mitigation including on the Country's preparedness for exiting the EU.

What does UKCP18 mean to the Practitioner and Academic Community?

Dr Mike Morecroft, Natural England
Using climate projections to support nature conservation and environmental management

ABSTRACT | The natural environment is vulnerable to climate change. Climate is a key determinant of where species can survive and thrive, it affects numerous ecological processes and shapes the nature of habitats. There are also secondary effects of climate change, for example rising sea levels accelerate coastal erosion and affect coastal habitats and periods of drought lead to greater abstraction of water from the natural environment. The need for conservation and land management to adapt to these changing circumstances is widely recognised and adaptation strategies and programmes have been developed by conservation organisations and the government.

Adaptation for and in the natural environment takes many forms, ranging from adjusting nature reserve management plans to take account of changing species distributions to promoting planned change (managed realignment) at the coast. Better management of the natural environment can also help to reduce the risks climate change presents to society, for example by reducing flood risk and providing cool green spaces in cities. However a common theme is the need to anticipate the type and scale of changes in climate which are likely to happen over different time periods, which is where climate projections come in. In some cases it is possible to model the impacts climate scenarios, for example projections can be used to model how species' distributions may change, with species occurring further north but potentially being lost in the south. In other cases, it may be sufficient to understand the range of plausible future conditions – it is often difficult to quantify the impacts of any given change in climate, but the direction of travel and likely implications can usually be assessed. One important issue is that changes in rainfall and sea level may be more important than the direct effects of rising temperatures, so these elements of UKCP18 will be very useful.

BIOGRAPHY | Mike Morecroft is an ecologist at the government conservation, Natural England, where he leads on climate change adaptation and mitigation. He works closely with policy makers and practitioners, on issues ranging from nature reserve management to the National Adaptation Programme. He led the development of the Natural England / RSPB Climate Change Adaptation Manual, contributed to the Climate Change Risk Assessment and is a lead author for the Intergovernmental Panel on Climate Change. Mike led a research group at the Centre for Ecology and Hydrology before joining Natural England in 2009 and is an Honorary Research Associate at Oxford University.

Dr Geoff Darch, Anglian Water
What UKCP18 means for the Water Industry

ABSTRACT | Geoff will explore what UKCP18 means for the water industry, with a particular focus on water resources management. The water sector is inherently sensitive to climate and companies and regulators have sought to proactively manage weather-related risks through well established planning procedures. The water industry has been a long-standing user of climate services including climate change scenarios. It is also one of just a few sectors which is now delivering adaptation action, with projections being used to inform the implementation of supply and demand side measures ahead of full climate change impacts. UKCP09 presented a significantly expanded package of information which has been used by the water sector in a number of ways. Nonetheless there has been a need to develop additional methods and datasets to address particular requirements, for example regarding drought. At the same time, alternative approaches to decision making uncertainty, which are less immediately dependent on scenarios, have been developed. UKCP18 sees an evolution in the quantity and quality of information, and includes results and data that address specific gaps including the nature of summer rainfall. Other relevant outputs have also been published recently, for example data from the UK Droughts and Water Scarcity research programme. The water industry is reviewing how best to incorporate this information into its own modelling and decision making, whilst working collaboratively with researchers on emerging challenges.

BIOGRAPHY | Geoff is Water Resources Strategy Manager at Anglian Water, responsible for development of long-term plans that balance water supply, demand and risk. He also provides technical advice to senior managers on weather-related risk (especially drought) and climate change. Previously Geoff was Head of Climate Risks and Adaptation at Atkins, where he led applied research and consultancy studies for clients including international finance institutions, governments, environmental agencies and utility companies.

Geoff is a guest lecturer at the University of East Anglia, and sits on several climate change working groups including at CIWEM, BSI and ISO. He holds a PhD in hydro-climatology from UEA.

Dr Ella Howe ,CEFAS
Potential Uses for UKCP18 Marine Projections

ABSTRACT | The UK government run Centre for Environment Fisheries and Aquaculture Sciences (Cefas) undertakes a wide range of marine projects, nationally and overseas. Many of our activities require some element of marine climate change projections to either directly or indirectly inform the project outputs. The UKCP18 projections include a range of marine projections both for the UK and the global ocean, under different emissions scenarios. This talk will briefly review the range of UKCP18 marine projections and highlight examples of the different ways that they might be used within the day to day work undertaken at Cefas.

BIOGRAPHY | Ella is a marine climate change project officer at the Centre for Environment, Fisheries and Aquaculture Sciences (Cefas), her background was researching the effects of ocean acidification on Mediterranean zooplankton. Nowadays, she is interested in science communication, particularly the synthesis of science for policy. She works on the Marine Climate Change Impacts Partnership and is leading the production of the next UK marine climate change report card. Ella is also involved in a variety of other international projects, including the Commonwealth Marine Economies Programme in the Caribbean and South Pacific and adaptation work in the ROPME Sea area (Middle East).