

The 6th Major IPCC Science Report and its Implications

Wednesday 15 September 2021

Session 1 Findings of the Report			
Subject	Speaker	Affiliation	Timing
Welcome	David Warrilow	Royal Meteorological Society	11.00
Introduction from Chair 1	Professor Tim Osborn	University of East Anglia	11.02
Global Climate Change:			
1. Observations and causes	Professor Peter Thorne	Maynooth University	11.05
2. Future projections	Dr Amanda Maycock	Leeds University	11.20
3. Extremes and Surprises	Professor Sonia Seneviratne	ETH Zurich	11.35
Q&A			11.50
Risks and Uncertainty:			
1. Emissions, the carbon cycle and Paris goals	Dr Joeri Rogelj	Grantham Institute, Imperial College London	12.05
2. Regional change/Interactive Atlas	Professor Richard Jones	Met Office	12.20
3. Sea Level Rise	Dr Tamsin Edwards	Kings College, London	12.35
Q&A			12.50
Summing up	Professor Tim Osborn		13.05
LUNCH			13.10
Session 2 What are the implications?			
Welcome	David Warrilow	Royal Meteorological Society	14.00
Introduction from Chair 2	Richard Black	Grantham Institute, Imperial College London	14.02
Guest Speaker	Claire O'Neill	World Business Council for Sustainable Development	14.05
Implications for COP26 and Emissions	Professor Jim Skea Dr Stephan Singer Dr Tom Russon Dr Ganga Shreedhar Tom Burke	IPCC Co-chair WG3 CAN International Scottish Government LSE E3G	14.15
Implications for UK Adaptation	Dr Richard Millar Dr Nigel Miller Kathryn Brown Dr Richenda Connell Professor Suraje Dessai	CCC Defra Wildlife Trusts Willis Towers Watson Leeds University	15.00
Summing up	Richard Black		15.45
Close	David Warrilow		15.55

Professor Tim Osborn

Climatic Research Unit, University of East Anglia



Tim Osborn is the director of the Climatic Research Unit (CRU) at the University of East Anglia (UEA) in Norwich. He has taken various roles with the IPCC including Lead Author and, for the sixth assessment report, Review Editor. Tim's research covers instrumental climate change and climate datasets such as the HadCRUT global temperature record. He also uses measurements from tree-rings to explore climate variability in recent centuries and millennia. For future climate projections, Tim developed the ClimGen pattern-scaling tool for emulating Earth System Models and this has been used in multi-sector studies of the impact of future climate change. He also studies changes in precipitation and drought, in the past as well as in future projections.

Professor Peter Thorne

Maynooth University, County Kildare



Peter Thorne is the director of the ICARUS Climate Research Centre at Maynooth University. He was a CLA on the observed chapter of the WGI contribution to AR6 and is a core writing team member and section facilitator on the forthcoming AR6 synthesis report. He is also co-chair of the Global Climate Observing System Atmospheric Observations Panel for Climate. He completed his PhD at the University of East Anglia on detection and attribution, followed by employment at the Met Office Hadley Centre, the NOAA Cooperative Institute for climate and satellites, and the Nansen Environmental and Remote Sensing Centre. He has published principally on observational climate changes.

Abstract

Observed changes are unequivocal and the changes we have seen are unprecedented in thousands of years. A key innovation in AR6 was undertaking the assessment of observations across all domains and the paleo evidence in a single chapter. Here I will outline the key lines of evidence that lead to the new AR6 assessment.

Dr Amanda Maycock

Institute for Climate and Atmospheric Science, University of Leeds



Amanda Maycock is an Associate Professor in Climate Dynamics and Director of the Institute for Climate and Atmospheric Science at the University of Leeds, where she has been based since 2015. She previously held a NERC Independent Research Fellowship at Leeds and an AXA Postdoctoral Research Fellowship and Junior Research Fellowship at the University of Cambridge. Her research focuses on large-scale climate variability and change, particularly on the use of global climate models to study interactions between the atmosphere and ocean and large-scale atmospheric circulation. She was Lead Author of the WMO/UNEP 2018 Scientific Assessment of

Ozone Assessment and is Lead Author for Chapter 4 (Global and regional future projections) of the IPCC Working Group I Sixth Assessment Report. Amanda was the recipient of a 2018 Philip Leverhulme Prize in Earth Sciences and the EGU

2019 Arne Richter Award for Outstanding Early Career Scientists. Amanda co-leads the World Climate Research Programme (WCRP) SPARC activity on Atmospheric Temperature Changes and their Drivers and is a member of the US CLIVAR working group on the Changing Width of the Tropical Belt.

Abstract

Past IPCC Assessment Reports have predominantly based their future projections on results from multi-model large ensembles (e.g. from the Coupled Model Intercomparison Project). This approach has a number of shortcomings because such “ensembles of opportunity” are not designed to span all sources of uncertainty in the climate system response to external forcing. This talk will explain the new approach adopted in the AR6 WGI report, where multiple lines of evidence are combined to generate future projections for some variables. The lines of evidence are: the assessed uncertainty in climate sensitivity, constraints from observational trends, and a multi-model ensemble. This approach allows the AR6 to assess a narrower uncertainty range for projections of global temperature than was possible in AR5.

Professor Sonia Seneviratne

Institute for Atmospheric and Climate Science, ETH Zurich



Sonia Seneviratne is Professor at the Institute of Atmospheric and Climate Science at ETH Zurich since 2007. She did her PhD thesis in 2003 at ETH Zurich and was a Postdoctoral scientist at NASA/Goddard Space Flight Center. Her research addresses climate change and extreme events, land-climate interactions, and terrestrial water processes. She was a Coordinating Lead Author and Lead Author on several IPCC reports, including the IPCC Special Report on Extreme events (SREX), the IPCC Special Report on 1.5°C Global warming, and the IPCC 6th Assessment report. Sonia belongs to the most cited scientists in her field (<https://usys.ethz.ch/en/news-events/news/archive/2020/11/highly-cited-researchers-2020.html>); ranked 9th on Reuters “hot list” of climate scientists: <https://www.reuters.com/investigates/special-report/climate-change-scientists-list/>). She received several awards for her research, including a Consolidator Grant from the European Research Council (2014), the Macelwane Medal from the American Geophysical Union (2013), and the Hans Oeschger Medal from the European Geosciences Union (2021: <https://www.egu.eu/news/701/egu-announces-its-2021-awards-and-medals/>).

Abstract

This presentation will provide an overview of the main conclusions of the 6th Assessment report from the Intergovernmental Panel on Climate Change on observed and projected changes in weather and climate extremes. For the first time, a full chapter of the IPCC assessment report was dedicated to the topic of weather and climate extremes. The newest evidence shows that changes in extremes are observed in all regions of the world, and that human influence strongly contributed to observed trends. With every increment of global warming, changes in extremes become larger, with important implications for changes in heatwaves, heavy precipitation, droughts, and tropical cyclones depending on the region. All regions are projected to be affected by multiple changes in climate extremes and other climatic impact drivers with increasing global warming, in particular above 2°C of global warming.

Dr Joeri Rogelj

Grantham Institute for Climate Change and the Environment and Centre for Environmental Policy, Imperial College London, International Institute for Applied Systems Analysis (IIASA)



Dr Joeri Rogelj is Director of Research and Lecturer in Climate Change and the Environment at the Grantham Institute at Imperial College London, and a Senior Research Scholar at the International Institute for Applied Systems Analysis. He explores how societies can transform towards more sustainable futures connecting Earth system sciences to the study of societal change and policy. He has published on the effectiveness of international climate agreements such as the Paris Agreement, carbon budgets, net zero emission targets, 1.5°C emissions pathways, and the interaction between climate and sustainable development. Joeri has contributed to several climate change assessments over the past decade. He is a long-serving lead author on the annual Emissions Gap Reports by the

United Nations Environment Programme.

Abstract

Understanding how the planet responds to our greenhouse gas emissions represents the basis from which climate policies and measures are developed. Here we will look at some of the IPCC AR6 updates in our understanding of the sensitivity of global warming to human-made emissions of carbon dioxide, the geophysical requirements for halting warming and the amount of greenhouse gas emissions that can still be emitted while holding warming well below 2°C or 1.5°C.

Professor Richard Jones

Met Office Hadley Centre, School of Geography and Environment, Oxford University



Richard Jones is a Science Fellow in the Met Office Hadley Centre working on developing regional climate information relevant to adaptation and resilience with a focus on developing countries. He joined the Hadley Centre in 1990 where he developed its regional climate modelling capability and has applied this worldwide in projects and collaborations. Since 2010 he has been a Visiting Professor in the School of Geography and Environment of Oxford University, coordinating Met Office Academic Partnership activities in climate services and African climate and collaborative research on generating regional climate information from large ensemble simulations and on model

development. He was a lead author of the regional climate information chapters of IPCC Assessment Reports Three (Chapter 10) and Four (Chapter 11) for WG I and of Chapter 21, Regional Context, in WG II AR5. He is currently a coordinating lead author of the Atlas chapter and the online Interactive Atlas of the WG I contribution to AR6, and part of the AR6 WGI-II Handshake team.

Abstract

The WG I contribution to the IPCC AR6 has a significantly enhanced focus on regional climate change compared to previous reports. This includes a novel online tool, the Interactive Atlas, facilitating exploration of many of the observational datasets and model projections used as lines of evidence in the assessment. The report demonstrates climate change is affecting all regions and will increasingly do so over coming decades with each region experiencing a diverse and often unique combination of changes in climatic conditions with the potential to cause impacts affecting people or ecosystems. The focus on impact-relevant changes, another new feature, comes from significant effort in cross-WG collaboration to ensure the report is relevant to WG II on Impacts, Adaptation and Vulnerability.

Dr Tamsin Edwards

Department of Geography, King's College London



Dr Tamsin Edwards is a Lead Author on the 6th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), and regularly advises the UK government on the science of climate and sea level rise, and on climate communication. She has made a number of ground-breaking contributions to the understanding of the role of the cryosphere in the climate system, improving the quantification of ice sheet responses to future climate change and has set the standard internationally for pro-active, open and objective communication with the public on climate change and its scientific basis. Tamsin was principle scientific advisor for the BBC documentary *Climate Change by Numbers* and the sole scientific advisor for the BBC *Horizon Guide to Climate Change*. She provided expert advice to the BBC for “Two degrees” with David Attenborough and is the recent recipient of the Royal Meteorological Society’s prestigious Climate Science Communications Award.

Abstract

Global mean sea level change is certain in direction (*virtually certain* to rise this century; *high confidence* it will remain elevated for thousands of years), but uncertain in magnitude, particularly under high levels of warming. The Sixth Assessment Report introduced the concept of Low-Likelihood, High Impact outcomes, whose probability of occurrence is low or not well known but whose potential impacts on society and ecosystems could be high. One example results from deep uncertainty in ice sheet instability processes that cannot yet be ruled out, which would strongly increase ice loss from the Antarctic Ice Sheet for centuries under very high greenhouse gas emissions scenarios.

Richard Black

Grantham Institute, Imperial College London, Energy & Climate Intelligence Unit



Richard Black is a climate change consultant based in Berlin. Richard's background is in broadcasting and journalism – he worked for BBC World Service in various roles including presenting science programmes before becoming BBC News Environment Correspondent in 2002. On leaving the BBC in 2012 Richard was Director of Communications for the [Global Ocean Commission](#) before founding the [Energy and Climate Intelligence Unit \(ECIU\)](#), a London-based think-tank whose core work is to ensure that discourse in the UK on climate change and the energy transition is rooted in evidence. In 2018 he wrote '[Denied: The Rise and Fall of Climate Contrarianism](#)', still the only book about the UK's climate contrarian elite. Richard stepped down from the Directorship of ECIU in 2020, continuing there as Senior Associate working on COP26-related issues. He is an Honorary Research Fellow at the Grantham Institute, Imperial College London. Richard frequently contributes to media, including taking part in the BBC's Sir David Attenborough documentary '[Climate Change: The Facts](#)'. His current interests includes advising nations most vulnerable to climate change en route to COP26 and researching the UK's transition from North Sea oil and gas.

Claire O'Neill

World Business Council for Sustainable Development



Claire O'Neill entered politics in 2007 after a transatlantic career in consulting and finance, initially as a policy advisor to George Osborne, the then Shadow Chancellor and then as the Conservative MP for the Devizes Constituency from 2010 - 2019.

She served in several Ministerial positions before becoming Climate Change Minister and then attending the UK Cabinet as Minister for Energy and Clean Growth. Claire wrote and implemented the UK's Clean Growth Strategy; formed the Green Finance Taskforce; launched the global Powering Past Coal Alliance to end coal-powered electricity generation and negotiated the UK's Offshore Wind Sector Deal that dramatically dropped the cost of this vital renewable energy source. In 2019 she brought forward the ground-breaking legislation that committed the UK to be a Net Zero emissions economy by 2050 and she also formulated the UK's successful bid to host the United Nations 2020 Climate Change Conference known as COP26. She served as COP26 President-Designate until she left politics in 2020.

Ranked as one of Bloomberg's global "Green 30 for 2020", Claire has now joined the World Business Council for Sustainable Development (WBCSD) as the Managing Director for Climate and Energy, and Natural Climate Solutions. WBCSD is the leading voice for business sustainability and is a global CEO-led organization drawn from all business sectors and all major economies, representing a combined revenue of more than USD \$8.5 trillion and 19 million employees.

In addition, Claire is a Fellow of the Energy Institute.

Tom Burke

Chairman, E3G



Tom Burke is the Chairman of E3G, Third Generation Environmentalism, and a Visiting Professor at both Imperial and University Colleges, London. He is a Senior Associate at the Cambridge Institute for Sustainability Leadership. He is Chairman of the China Dialogue Trust and a Trustee of Black-E Community Arts Project, Liverpool.

He was Environmental Policy Advisor to Rio Tinto plc (part time) 1996 -2016 and served as Senior Advisor to the Foreign Secretary's Special Representative on Climate Change from 2006-12. He was an environmental advisor (part time) to BP plc from 1997-2001. He was appointed by the Secretary of State for Northern Ireland to chair an Independent Review of Environmental Governance in Northern Ireland from 2006-7. He was a member of the Council of English Nature, the statutory advisor to the British Government on biodiversity from 1999-2005. During 2002 he served as an advisor to the Central Policy Group in the Deputy Prime Minister's Office. He was Special Adviser to three Secretaries of State for the Environment from 1991-97 after serving as Director of the Green Alliance from 1982-1991.

He was a Trustee of the Green Alliance from 1979 – 1991 and 1997 – 2016. He served on the London Sustainable Development Commission from 2002-5 and chaired the Editorial Board of ENDS magazine from 2004-10. He was a member of the OECD's High-Level Panel on the Environment 1996-98. He is a Fellow of the Royal Society of Arts and was a member of the Council from 1990-92 sitting on its Environment Committee 1988-96. He also served on the Executive Committee of the National Council of Voluntary Organisations from 1984-89. He was a Visiting Fellow at the Cranfield Institute of Management and a Senior Visiting Fellow at Manchester Business School.

He was formerly Executive Director of Friends of the Earth and a member of the Executive Committee of the European Environmental Bureau 1988-91. He was the Secretary-General of the Bergen 1990 Environment NGO Conference 1988-90. He was a member of the Board of the World Energy Council's Commission 'Energy for Tomorrow's World' 1990-93. In 2007 he was elected a Fellow of the Energy Institute. In 2010 he was elected an Honorary Fellow of the Society for the Environment. He is a Patron of the United Kingdom Environmental Law Association. He is Chairman of the Advisory Council of Earth Capital Partners and a member of the Advisory Board of Glenmont LLP

In 1993 he was appointed to United Nations Environment Programme's 'Global 500' roll of honour. In 1997, he was appointed CBE for services to the environment. He was awarded Royal Humane Society testimonials on Vellum (1967) and Parchment (1970).

Professor Jim Skea
Imperial College, London



Jim Skea is Professor of Sustainable Energy at Imperial College London with research interests in energy, climate change and technological innovation. His current main role is as Co-Chair of IPCC Working Group III for the 6th assessment cycle. He was Research Director of the UK Energy Research Centre 2004-12 and Director of the Policy Studies Institute 1998-2004. He has operated at the interface between research, policy-making and business throughout his career. He was a member of the UK Committee on Climate Change from its inception in 2008 until 2018, and the Chair of Scotland's Just Transition Commission. Until June 2017, he was President of the UK Energy Institute. He was awarded a CBE for services to sustainable energy in 2013 and an OBE for services to sustainable transport in 2004.

Dr Tom Russon
Scottish Government



Dr Tom Russon is the team leader for climate change adaptation and legislation policy in the Scottish Government's Directorate for Energy and Climate Change. Prior to becoming a Civil Servant he worked as a researcher in climate science.

Dr Ganga Shreedhar
Psychological and Behavioural Science, The London School of Economics & Political Science



Ganga is an Assistant Professor in Behavioural Science in LSE's Department of Psychological and Behavioural Science. She is an applied behavioural and experimental economist studying how to change human behaviour in ways that simultaneously benefit people and the planet. Her research looks at how to motivate environmental action across consumer and citizen, and how they can be deployed in behaviourally 'smart' informational campaigns, nudges and incentives to ultimately create sustainable habits

Kathryn Brown

Wildlife Trusts



Kathryn Brown is one of the UK's leading experts on climate change adaptation and has worked for the past 18 years in a range of climate change roles at the Committee on Climate Change (CCC) and Defra. She is currently on secondment at the Wildlife Trusts as their interim Director for Climate Action. Through Kathryn's CCC role as Head of Adaptation, she has directed the production of the UK's most recent Independent Assessment of Climate Risk (CCRA3) and has overseen the CCC's analysis of progress in adapting to climate change in England. In the past she led the Committee's analysis on biodiversity, water, health, emergency planning, agriculture and forestry. Prior to 2012, Kathryn worked in Defra's climate change team for ten years, covering climate change impacts and adaptation evidence, climate projections, international negotiations, and carbon budgets.

Professor Suraje Dessai

School of Earth & Environment, University of Leeds and ESRC Centre for Climate Change Economics and Policy



Suraje Dessai is Professor of Climate Change Adaptation in the School of Earth and Environment at the University of Leeds. His interdisciplinary research and teaching focuses on climate science and decision-making, namely on the management of climate change uncertainties, perception of climate risks and the science-policy interface in climate change impacts, adaptation and services. He has published more than 100 publications and was listed 120 in the Reuters list of the world's top climate scientists. He was the recipient of a European Research Council Starting Grant and the co-editor-in-chief of *Climate Risk Management* (2018-2021). He's a member of the UK's ESRC Centre for Climate Change Economics and Policy, hosted jointly by the University of Leeds and the London School of Economics and co-founder of the research theme on Weather, Climate and Social Science of the University of Leeds – Met Office Academic Partnership. He was Lead Author in the IPCC WG1 (The Physical Science Basis) Sixth Assessment Report and was Lead Author in the IPCC WG2 (Impacts, Adaptation and Vulnerability) Fifth Assessment Report. Since 2019, he is co-Champion of the Strategic Priorities Fund UK Climate Resilience Programme and reviewer of the Evidence Report for the Third UK Climate Change Risk Assessment.

Dr Richenda Connell

Climate and Resilience Hub, Willis Towers Watson



Dr Richenda Connell is a Senior Director in the Willis Towers Watson Climate and Resilience Hub, where she advises banks, investors and insurers on how to embed understanding of physical risk and adaptation into strategy and portfolio management. She has more than 20 years' experience working on physical risk and climate change adaptation. From 2005 to 2020, Richenda was the Co-founder and CTO of Acclimatise, the physical climate risk and adaptation advisory and analytics firm which was acquired by WTW in late 2020. From 1999 to 2005, she was Technical Director and Deputy Director of the UK Climate Impacts Programme (UKCIP).

Richenda holds a doctorate in atmospheric chemistry from the University of Oxford and a BSc (Hons) in chemistry from Imperial College London.

Dr Richard Millar

Climate Change Committee



Richard is currently serving as Head of Adaptation and Climate Science at the Climate Change Committee, The UK's independent adviser on tackling climate change. Over the past few years, Richard has led the science and international context work for the CCC including for its work on the UK Net Zero target, Sixth Carbon Budget and Independent Assessment of Climate Risk. Prior to joining the CCC Richard worked as a researcher in climate science including participating in the IPCC Special Report on Global Warming of 1.5C as a chapter scientist and contributing author.

Dr Nigel Miller

Department for Food and Rural Affairs

I am a professional economist. In my current post, I lead an evidence team of economists and climate scientists in the Climate Division of Defra. Our job is to provide analytical and evidence-based support to facilitate Defra's contribution to the governments emissions targets and lead the government's response to climate adaptation. I have worked as a government adviser, academic and consultant and across multiple sectors, including health, criminal justice, and macroeconomics.