



THE CLIMATE CHANGE TEACHER CONFERENCE

Monday 24 – Thursday 27 May 2021

Twilight sessions: 4pm – 6pm daily

STEM Learning and its CCEP partners helping teachers use the context of climate change in STEM subjects to inspire and engage young people

The STEM Learning Climate Change Teacher Conference (CCTC) is a new, live-streamed event for Primary and Secondary educators. Organised by STEM Learning and supported by the [Climate Change Educational Partnership](#), the conference aims to support teaching of STEM subjects and enrichment activities using climate change as a context.

Daily Twilight sessions feature Twilight Talks and Twilight Forums on the theme of the day:

TWILIGHT TALKS are live streamed presentations by leading experts on the theme of the day, sharing their knowledge, unveiling cutting-edge research and their hope of what can be achieved for the future, followed by live Q&A.

TWILIGHT FORUMS include a mixture of webinars covering educational research, case study sessions, panel discussions and activities and resources available on the theme of the day. The conversation will carry on in the STEM Community where educators can discuss best practice in the delivery of climate change topics in STEM teaching.

Booking is available both on the [STEM Learning website](#) and Eventbrite [here](#). Registration allows access to the whole conference to join in all four Twilights. Attendees can then simply choose to Zoom into individual days with their own Twilight themes of interest.

MONDAY 24 MAY



WHAT IS CLIMATE CHANGE, WHAT'S CAUSING IT AND EVIDENCE OF CLIMATE CHANGE

4pm - 4.10pm

WELCOME AND INTRODUCTION

Alex Brown, STEM Support Programme Manager, STEM Learning and conference Chair

4.10pm - 5pm

TWILIGHT TALK

As a guest speaker of ESA, you can hear from Professor Andrew Shepherd, the leading expert in the areas of Earth observation, polar science and climate science.

He will present research which focuses on measuring changes of the Antarctic and Greenland ice sheets, on understanding their interaction with the global climate system, and on establishing their contribution to global sea level rise.

[Andrew Shepherd, Professor of Earth Observation](#), University of Leeds, Director of the NERC Centre for Polar Observation and Modelling, Principal Scientific Advisor to the European Space Agency CryoSat satellite mission, and co-leader of the ESA-NASA Ice Sheet Mass Balance Inter-comparison Exercise.

[IMBIE](#) is an international collaboration between scientists, established in 2011 as a community effort to reduce uncertainties in different satellite-based measurements of ice sheet mass balance, and is co-funded by ESA and NASA.

[The Centre for Polar Observation and Modelling](#) (CPOM) is a NERC Centre of Excellence that studies processes in the Earth's polar latitudes that can affect the Earth's albedo, polar atmosphere and ocean circulation, and global sea level.

5pm - 5.45pm

TWILIGHT FORUM

We know climate change is happening, but what can we do about it? This forum and its speakers will introduce you to new, exciting resources that will help you plan and implement climate education in your setting that will inspire hopeful future and behaviour change. Case studies will be shared on how schools have developed innovative approaches to climate

change education and engaged and enabled pupil voice and the challenges of curriculum design.

Dr Verity Jones is a Senior Lecturer at the University of the West of England in Bristol. As a science and geography primary specialist her research interests lie in education and sustainable futures. She has undertaken international projects exploring eco-anxiety, fast fashion, foods – including the potential for edible insects in UK school canteens - and extreme weather events.

Liz Southwell is a Year 6 teacher and science subject leader at Raysfield Primary School in South Gloucestershire; and a fellow of the Primary Science Teaching Trust. Liz will discuss the work of the youth action charity, Kids Against Plastic, how it can encourage children and young people to take action against climate change and how this year's Great Science Share is helping to encourage children to ask questions and investigate the climate change emergency.

Dr Sarah Whitehouse is a Senior Lecturer at the University of the West of England, Bristol will be introducing a free, award winning e-book and teaching resources that have proven to improve understanding and engagement with issues surrounding the threat of water scarcity. This is research informed resources from start to finish!

Sam Williams is a primary school teacher at Cotham School Gardens and will be sharing how his school has embedded climate change education into their curriculum. In response to children's voice, curriculum design and engagement with stakeholders the school has evolved innovative approaches that others will undoubtedly find inspirational.

5.45pm - 6pm

TWILIGHT SUMMARY AND MOVING FORWARD

Alex Brown, STEM Support Programme Manager, STEM Learning and conference Chair

TUESDAY 25 MAY



CLIMATE CHANGE MODELS AND PREDICTIONS

4pm - 4.10pm

WELCOME AND INTRODUCTION

Alex Brown, STEM Support Programme Manager, STEM Learning and conference Chair

4.10pm - 5pm

TWILIGHT TALK

In this talk, experts from the Met Office introduce you to the world of climate modelling and climate projections giving an overview of what a climate model is and how they are used to make a range of global and regional climate projections. These models include weather variables, such as temperature and rainfall and in the context of sea level rise.

To highlight the huge importance of these models, the speaker team will demonstrate the application of climate projections for different industrial sectors.

Megan Pearce, Scientific Consultant at the Met Office, has been working in consultancy for the past three years delivering projects across multiple industries and sectors. She contributes to the development and delivery of products and services that enable customers to manage the impact of weather and climate on their business.

In particular, Megan analyses and communicates climate model data to help organisations identify how hazards, risks and opportunities may change in future climates. Previous to this role, Megan worked in the private sector delivering climate, energy and sustainability assessments for planning, and carbon accounting for corporate reporting.

Rachel Perks, Marine Scientist at the Met Office, has a long-term interest in the marine environment, having several years' experience working across both public and private sectors. She has worked on a variety of global projects that consider the impacts of climate change on oceans.

Rachel uses climate models to research how changing sea levels and storm surges affect coastal risk. She has developed numerous models; to simulate wave processes including refraction and diffraction, to subsequently calculate wave overtopping of sea defences. Using the various models, she has analysed how the tide and wave overtopping influences the extent of flooding throughout coastal communities. She has worked with a wide range of

clients including government bodies, developers, insurers and reinsurers. She is passionate about protecting our coasts through both her work and communicating climate change to a wider audience.

James Pope, Climate Scientist at the Met Office, has over a decade of experience working with climate models in a career which has taken him (physically) from Edinburgh to the Met Office (via Leeds and the British Antarctic Survey) and has seen him model the climate of 3 million years ago to the climate of present day Antarctica.

With a background in geology, James has had a long term fascination with the interconnectedness of our climate system, and how different features influence each other.

At the Met Office, James works with the UK Climate Projections, supporting users across Government, industry and the general public; while also carrying out his own research into future changes in weather patterns and improving communication of climate change through the process of creating storylines.

5pm - 5.45pm

TWILIGHT FORUM

With presentations by Graham Stow, Head of Education at Primary Engineer, and Tom Lyons, STEM Enrichment Lead at STEM Learning, this session introduces you to the *STATWARS Climate Change Challenge* and *Climate Detectives*.

STATWARS is a new, free project for both primary and secondary schools which is curriculum mapped, provides lesson plans and resources as well as opportunities for pupils to engage with data and climate professionals. Graham will cover how the project enables pupils to create data-led decisions and actions to positively tackle climate change. He will cover best practice and how the project supports curriculum teaching and learning, skills development and a careers-related learning experience.

[STATWARS Climate Change Challenge](#) is a new data STEM project for KS2 and KS3 pupils designed to enable young people to engage with data in a way that develops skills by investigating and presenting data and to use these skills to inform decision making. Pupils ask questions of data and climate professionals to help inform their project before presenting an infographic poster and a 60 second media pitch (video/animation/recording).

Graham Stow is Head of Education, Research and Qualifications at Primary Engineer. He is a former head of Computing in two Secondary schools and Lecturer in Primary Education at Edge Hill University. His active research areas are in improving STEM education and skills based learning.

[Primary Engineer](#) is an educational not-for-profit organisation which provides programmes to encourage pupils from 3 to 19 years to consider STEM and engineering careers.

Climate Detectives is a free project for children aged 8 to 15 years. Students are challenged to 'make a difference' in understanding and protecting Earth's climate. They will identify a climate problem by observing their local environment and be tasked to investigate it as 'Climate Detectives'. To this end, they will use available Earth Observation data or take

measurements on the ground. Based on their investigation, teams will propose a way to help monitor or reduce the problem. At the end, all participating teams will share their research findings on the Climate Detectives website.

[Climate Detectives](#) is a European Space Agency project which is run in the UK by ESERO-UK. The project runs each year from September and teams can be from a minimum of two students up to a whole class. Students have the opportunity to interact with researchers and professionals working in the arena of space and climate change.

Tom Lyons is the STEM Enrichment Lead, at STEM Learning. He leads the education content for ESERO-UK (the European Space Education Resources Office), the STEM Clubs programme and other challenges and competitions at STEM Learning. Tom was formerly a teacher of physics and electronics and a payload systems engineer.

5.45pm - 6pm

TWILIGHT SUMMARY AND MOVING FORWARD

Alex Brown, STEM Support Programme Manager, STEM Learning and conference Chair.

WEDNESDAY 26 MAY



ADAPTING AND MITIGATING FOR CLIMATE CHANGE

4pm - 4.10pm

WELCOME AND INTRODUCTION

Alex Brown, STEM Support Programme Manager, STEM Learning and conference Chair

4.10pm - 5pm

TWILIGHT TALK

This presentation, given by one of the most highly respected communicators and experts in this field - Alyssa Gilbert, Director of Policy and Translation at the Grantham Institute for Climate Change - will cover key points from today's theme.

With these two approaches - adaptation (making changes to reduce the impact of climate change) and mitigation (reducing greenhouse gas emissions) - Alyssa will highlight their meaning and the action which needs to be taken, both within the UK and internationally; the importance of COP26 and the aims of the summit; the significance of involvement from students and the huge part studying STEM subjects will play in achieving goals.

In preparation for the UK's hosting of the United Nations Framework Convention on Climate Change (UNFCCC) meeting in Glasgow in November 2021, Alyssa is chairing the COP26 Universities Network, a nation-wide network of academics and professionals working to deliver impact on climate change.

Alyssa connects relevant research across the university with policy-makers and businesses. Together with the team at Grantham and academics across Imperial, she delivers outputs for those audiences ranging from briefing papers through to workshops and events.

She has worked with government clients at the international level, in the UK and for other national governments.

Alyssa is currently a member of the Natural Environment Research Council (NERC)'s Advisory Network (NAN). Previously, Alyssa was a Member of NERC's Strategic Programme Advisory Committee (SPAG) and a Board Member of the Climate Markets Investments Association (CMIA). Alyssa has worked on environmental and climate change issues across a range of countries including China, France, Spain, Romania, Morocco, the UK and the US.

5pm - 5.45pm

TWILIGHT FORUM

Drought in the UK – exciting territory for learning, is presented by Professor Lindsey McEwen, Director of the Centre for Water, Communities and Resilience, University of the West of England and Sally Stevens, Communications & Engagement Manager for the Institute for Environmental Analytics, University of Reading.

This forum shares research and knowledge exchange from the four-year UKRI Drought and Water Scarcity programme. It will scene-set and highlight engaging and award-winning resources that are freely available and can be used by different disciplines for young people's learning about drought and water scarcity in STEM and beyond.

The UK is frequently perceived as 'wet' and water as a cheap and infinite resource. Yet drought is a constant threat in the shadows; a hidden, pervasive and uncertain risk that is projected to increase as a result of climate change. Flooding – dramatically visual and emotive – tends to be much more on the radar of the media and the public. Drought represents a 'wicked' problem and it involves multiple stakeholders – not just the organisations with statutory responsibility. It is a problem that everyone of us is empowered to take climate action to address whether in the classroom, home or wider community.

The evidence base for appraising and adapting to drought risk comprises science and knowledge (stories) from experience across a whole variety of sectors – water supply, agriculture, business, environment, built environment, health and wellbeing, and public/communities. This makes exciting territory for learning across a number of themes – climate change, water risk, the flood-drought continuum but also strategies for drought risk management scaling up from the level of the individual citizen, their agency and that of their communities.

Professor Lindsey McEwen is Director of the Centre for Water, Communities and Resilience, University of the West of England, Bristol who headed up the NERC DRY (Drought Risk and You) project. Professor McEwen was responsible for the community-facing knowledge exchange activities.

Sally Stevens is Communications & Engagement Manager for the Institute for Environmental Analytics, University of Reading and coordinated the knowledge exchange activities for the UKRI 'About Drought' Knowledge Exchange project. Sally is currently preparing COP26 engagement activities to engage wider audiences with climate science.

5.45pm - 6pm

TWILIGHT SUMMARY AND MOVING FORWARD

Alex Brown, STEM Support Programme Manager, STEM Learning and conference Chair.

THURSDAY 27 MAY



**MAKING A DIFFERENCE: WHAT CAN WE DO AS INDIVIDUALS
AND WHAT PROJECTS CAN STUDENTS GET INVOLVED IN**

4pm - 4.10pm

WELCOME AND INTRODUCTION

Alex Brown, STEM Support Programme Manager, STEM Learning and conference Chair

4.10pm - 5pm

TWILIGHT TALK

Andy Prentice, the author of a new children's book *Climate Crisis for Beginners* (Usborne), will be in conversation with Dr Ajay Gambhir from The Grantham Institute for Climate Change at Imperial College London. Dr Gambhir acted as one of the expert consultants on the book. They'll be talking about the science behind climate change, and how to communicate this to children, as well as taking your questions.

Andy Prentice is the author of the best-selling children's book from Usborne, *Climate Crisis for Beginners*.

This book explains simply and clearly what the climate is, how it is changing very rapidly at the moment, and the effects this is having on our planet. It tackles suggestions about what needs to change in the way people live, from power stations to farming, and explains why it's so difficult to do. Along the way, it also talks about what individuals can do, including tips on how to keep a clear head and not get overwhelmed by bad news.

Dr Ajay Gambhir is Senior Research Fellow in the Faculty of Natural Sciences, [The Grantham Institute for Climate Change](#), Imperial College London:

The Grantham Institute sits at the heart of the College's work on climate change and the environment. Their mission is to contribute to, and lead on, world-class research, training and innovation towards effective action on climate change and the environment. As part of this, Dr Gambhir's research addresses how society can transition to a low-carbon economy, considering the technologies and measures required to do so.

5pm - 5.45pm

TWILIGHT FORUM

Hosted by the Royal Society, this session gives you an opportunity to hear from their Schools Engagement team about the *Tomorrow's climate scientists* programme and how it can support you and your students. There will be an opportunity to hear from some of the teachers involved in the programme already and learn from classroom activity case studies. The team will also explain how you too could get involved and receive your own funding to run projects in school.

The Royal Society's [Tomorrow's climate scientists](#) programme was started in 2020 to give students an opportunity to take action themselves to address climate and biodiversity issues by carrying out investigative research projects.

As an extension to the 2020 funding round, schools have received grants to carry out research specifically into climate change and biodiversity. These projects will be run in partnership with STEM professionals from industry and academia.

By taking part in these projects students will have the opportunity to:

- Develop problem solving and data handling skills
- Demonstrate their creativity
- Have a voice in the direction of scientific research by working with their STEM partner.

5.45pm - 6pm

TWILIGHT SUMMARY AND MOVING FORWARD

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