

Dr James G Dyke Narrative CV

17th September 2020

Organisation: University of Exeter

Position: Senior Lecturer Department of Geography; Assistant Director (Education) Global Systems Institute; Programme Director MSc Global Sustainability Solutions

Contribution to the generation and flow of new ideas, hypotheses, tools or knowledge: I am an interdisciplinary scientist with wide ranging research interests that span natural and social sciences. My doctoral research (2006-2009) was conducted in the Centre for Computational Neuroscience and Robotics at the University of Sussex. My thesis explored how a planetary-scale self-regulating control system can emerge via ecological and evolutionary dynamics. In doing so I demonstrated how population genetics and theoretical ecology theory can underpin notions of planetary homeostasis as developed in Lovelock's Gaia Theory. During my PhD I was one of the authors of a seminal review paper published in *Reviews of Geophysics* on mathematical models of Gaia. My postdoctoral research in the Biospheric Theory and Modelling Group at the Max Plank Institute for Biogeochemistry, Jena, Germany, focussed on how the emergence of life can affect planetary evolution. I helped pioneer the application of non-equilibrium thermodynamics to the study of earth system evolution. My research on how life can affect planets led me to focus on how humans are affecting the Earth. I decided that I would concentrate my academic efforts within the broad area of sustainability science. To that end in 2011 I took up a lectureship at the Institute for Complex Systems Simulation, an EPSRC-funded Doctoral Training Centre based in the School of Electronics and Computer Science at the University of Southampton. I taught masters-level modules on simulation and systems thinking and supervised PhD students who were researching the application of mathematical and simulation techniques to the study of climate, ecological and social systems. Example projects include the development of Agent Based Models to augment Participatory Rural Assessments in Malawi, and simulation of migration in the Maldives. During this time I co-developed a new interdisciplinary MSc in Sustainability. In 2013 I transferred to the School of Geography in order to lead this new programme and contribute to undergraduate teaching. While in the School I co-authored papers on how the Planetary Boundaries framework could be downscaled to regions, a systematic assessment of the sustainability of UK agriculture, and the role of simulations for sustainability. In 2017 I was invited to the Earth Life Science Institute at the Tokyo Institute of Technology as a Visiting Scientist in order to collaborate on a range of Earth science and sustainability projects. During this period I developed new techniques for detecting early warning signals in ecosystems. This completed some of the work I began in 2012 with TEWLS (Toolbox for Early Warnings in Lake Ecosystems). In 2018 I took up a Senior Lectureship in the Global Systems Institute at the University of Exeter. I was appointed Assistant Director in 2019. I have since designed, implemented, and lead the interdisciplinary MSc Global Sustainability Solutions MSc.

Contribution to research teams and the development of others: Where possible I have sought to foster collegiality and promote the engagement of Early Career Researchers (ECR) in interdisciplinary research and teaching. At the University of Southampton I was co-chair of both the Sustainability Science and Complex Systems strategic research groups. I developed a complexity seminar series that showcased ECR research and produced a series of interdisciplinary workshops that focussed on increasing the capacity of ECRs to undertake cross-cutting research and teaching. I was the academic lead for N-Cubed, a science engagement and outreach group which produced events that promoted the value of public engagement to the academic community. I was a co-organiser of the Southampton Science Festival and mentored ECRs during their development of their events. As Assistant Director (Education) of the Global Systems Institute I develop innovative

blended learning content for undergraduate and postgraduate programmes. This involves mentoring ECRs. I have (co)supervised over 30 PGT and 12 PhD students.

Contributions to the research community: Rather than human impacts remaining fixed as climate change progresses, it is to be expected that our actions will change as environmental factors change. This simple assumption produces profound challenges for modelling human and climate systems. Working with the Stockholm Resilience Institute and Potsdam Institute for Climate Impact Research I have co-organised a series of international “LOOPS” workshops that seek to develop new ways of including humans in the “loops” of earth system processes. I have been a co-convenor of LOOPS-related sessions at the at European Geosciences Union annual convention since 2015. Based on this work, in 2016 I was invited to join the editorial board of the journal *Earth System Dynamics*. I have edited highly cited and influential papers such as Hansen et al 2017 “Young people’s burden: requirement of negative CO₂ emissions”. Since 2016 I have served as a reviewer for EU Horizon 2020 fellowship and ITN proposals within the areas of sustainability and complexity science. In 2016 I began working with US-based thinktank the Evolutionary Institute in order to develop and apply techniques to increase co-operation in diverse groups. This merges evolutionary, economic and behavioural theory and practice to produce the “Prosocial” methodology. I completed Prosocial facilitator training in 2019 and have since led in-person and online teaching for organisations such as the Royal Society of Arts, NHS, C40, Transition Towns and the Doughnut Economics Action Lab. I am currently developing a Bristol-based project that will apply Prosocial to community-led sustainability solutions.

Contributions to broader society: I have been communicating to large international audiences about science and sustainability since 2013 when the academic journalism project *The Conversation* published my article on planetary self-regulation and climate change. Since then I have written 47 articles for *The Conversation* which have been republished in over 20 countries and produced 2.9 million views. In 2019 I was nominated by *The Conversation* for the 2020 Maddox Prize, a joint initiative of the charity Sense about Science and the journal *Nature*. Over the past seven years I have written sustainability and climate change articles for the *Guardian*, the *Independent*, the *Ecologist* and many other publishers. Since October 2019 I have written a weekly in-print environmental column for the *i* newspaper. I am currently finishing a photo-based book on climate change due for publication early 2021. I was the writer, producer and presenter of a UK-based climate change documentary “*The Race is on: Secrets and Solutions to Climate Change*”. This has been viewed over 100k times online and has had community screenings in over 10 countries. In 2020 the film won the Science Communication Prize at the 13th Athens International Science Film Festival. In addition to invited academic talks in over ten countries I have delivered and organised numerous public lectures and events. In 2013 I founded the first TEDx events in Southampton. Over five years I developed a series of talks from a range of speakers that include ECRs and community activists. In 2015 I was the first performer for the first Bright Club Southampton event in which I delivered a 7-minute stand-up comedy routine based on sustainability science. I have since given talks and performances in collaboration with artists and musicians. In 2016 I was the host of Pint of Science in Southampton which showcased Southampton-based academic research in pubs and clubs across the city. In 2020 I gave the Royal Geographical Society talk “Can humanity meet the challenge of climate change?”. On the basis of my public work on climate change and sustainability, I was invited to contribute as an expert to the drafting of the 2020 Climate and Ecological Emergency Bill. This Private Members Bill was co-ordinated by a small group of Extinction Rebellion activists. The Bill has since been sponsored by a cross-party list of MPs and will be receiving readings in Westminster.